



On-campus food environment in two European public universities: food purchasing behaviours, choice determinants and opinions on the food availability among the university community

Elikadura-ingurunea campusean Europako bi unibertsitate publikotan: elikagaien erosketaren portaerak, hautaketen faktore erabakigarriak eta elikadura-eskaintzari buruzko iritziak unibertsitate-komunitatean





**ON-CAMPUS FOOD ENVIRONMENT IN TWO EUROPEAN
PUBLIC UNIVERSITIES: FOOD PURCHASING
BEHAVIOURS, CHOICE DETERMINANTS AND OPINIONS
ON THE FOOD AVAILABILITY AMONG THE UNIVERSITY
COMMUNITY**

**ELIKADURA-INGURUNEA CAMPUSEAN EUROPAKO BI
UNIBERTSITATE PUBLIKOTAN: ELIKAGAIEN
EROSKETAREN PORTAERAK, HAUTAKETEN FAKTORE
ERABAKIGARRIAK ETA ELIKADURA-ESKAINTZARI
BURUZKO IRITZIAK UNIBERTSITATE-KOMUNITATEAN**

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PhD thesis

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"Let food be thy medicine and medicine be thy food"

Hippocrates (V century B.C.)

"Your health and wellbeing are not just your responsibility.

*They are social problems that reflect the difficulties
we all experience in the larger environment in which we live"*

(Wendy Wood, 2019)

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ACRONYMS

AECOSAN	Agencia Española de Consumo, Seguridad alimentaria y Nutrición (<i>English: Spanish Agency for Consumption, Food Safety and Nutrition</i>)
ASS	administrative and services staff
CI	confidence interval
ERS	education and/or research staff
FAO	Food and Agriculture Organization of the United Nations
FE	food environment
HNQ	high nutritional quality
LNQ	low nutritional quality
MFU	Matbransjens Faglige Utvalg (<i>English: Norwegian Food and Drink Industry Professional Practices Committee</i>)
NNPS	Nestlé Nutritional Profile System
NOK	Norwegian kroner
NPM	nutritional profile model
OsloMet	Oslo Metropolitan University
SD	standard deviation
SFA	saturated fatty acids

AKRONIMOAK

AECOSAN	Agencia Española de Consumo, Seguridad alimentaria y Nutrición (<i>Euskera: Kontsumoaren, Elikagaien Segurtasunaren eta Nutrizioaren Espainiako Agentzia</i>)
AZP	admisnitrazio eta zerbitzuen pertsonala
EB	Erresuma Batua
EI	elikadura-ingurune
FAO	Food and Agriculture Organization of the United Nations (<i>Euskera: Nekazaritza eta Elikadurarako Nazio Batuen Erakunde</i>)
GAA	gantz-azido ase
IIP	irakasle eta ikertzaile
KNA	kalitate nutrizional altu
KNB	kalitate nutrizional baxu
MFU	Matbransjens Faglige Utvalg (<i>Euskera: Norvegiako Elikagaien eta Edarien Industriako Praktika Profesionalen Batzorde</i>)
NNPS	Nestlé Nutritional Profile System (<i>Euskera: Nestléren nutrizio-profilaren sistema</i>)

SiO	Studentsamskipnaden i Oslo og Akershus (<i>English: student community in Oslo and Akershus</i>)	NOK	Norwegian kroner (<i>Euskera: Norøegiar koronak</i>)
TFA	<i>trans</i> fatty acids	NPE	nutrizio-profilaren eredu
UK	United Kingdom	OMS	Organisation Mondiale de la Santé (<i>Euskara: Munduko Osasun Erakunde</i>)
UPV/EHU	Universidad del País Vasco/Euskal Herriko Unibertsitatea (<i>English: University of the Basque Country</i>)	OsloMet	Oslo Metropolitan University (<i>Euskera: Osloko Unibertsitate Metropolitarra</i>)
WHO	World Health Organization	SiO	Studentsamskipnaden i Oslo og Akershus (<i>Euskera: Osloko eta Akershuseko ikasle-komunitate</i>)
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ABSTRACT

Background: Universities have a strong responsibility to provide a food environment (FE) that enables those who study or work and live in them to make high nutritional quality (HNQ) choices. However, studies carried out on-campus show that these FEs are potentially obesogenic due to the high availability and promotion of energy-dense nutrient-poor foods. Anyway, to date, there are no studies on the FE in European universities that include both external and personal domains.

Objective: The present study had a double objective. On the one hand, it aimed to assess the FE through external dimensions at two European public universities. On the other hand, it aimed to assess personal dimensions of the FE among the university community (students and staff) of these two universities.

Methods: A cross-sectional observational study was conducted across all campuses of the University of the Basque Country – UPV/EHU (in northern Spain) and the main campuses of OsloMet – Oslo Metropolitan University (Norway). A form for recording all foods available and the information provided by the food services were the tools used to obtain information on these environments. To analyse the nutritional profile of commercial products offered three criteria were applied, and also a combination of them. In addition, commercial items were classified according to their processing level, using

LABURPENA

Aurrekariak: Unibertsitateek bertan ikasten edo lan egiten dutenek eta bizi direnek kalitate nutrizional altuko (KNA) erabakiak har ditzaten elikadura-ingurune (EI) bat eskaintzeko ardura handia dute. Hala ere, campusean egindako ikerketek erakusten dute EI horiek potentzialki obesogenikoak direla, energian aberatsak diren eta mantenugaietan pobreak diren elikagaien eskuragarritasun handiaren eta sustapenaren ondorioz. Nolanahi ere, orain arte, Europako unibertsitateetan ez dago kanpoko domeinuak zein domeinu pertsonalak barne hartzen dituen Elari buruzko ikerketarik.

Helburua: Ikerketa honek helburu bikoitza izan zuen. Batetik, Europako bi unibertsitate publikotan EIA kanpodimentsioen bidez aztertzea zuen helburu. Bestetik, bi unibertsitate horietako unibertsitate-komunitatearen (ikasleak eta langileak) arteko Eiko dimentsio pertsonalak aztertzea izan zuen helburu.

Metodoak: Zeharkako behaketazko ikerketa bat egin zen Euskal Herriko Unibertsitateko – UPV/EHUko (Espainiako iparraldean) campus guztietan eta OsloMet – Osloko Unibertsitate Metropolitanarreko (Norvegia) campus nagusietan. Eskuragarri dauden elikagai guztiak erregistratzeko inprimaki bat eta elikadura-zerbitzuek emandako datuak izan ziren ingurune horiei buruzko informazioa lortzeko erabili ziren tresnak. Eskainitako produktu komertzialen nutrizio-profila aztertzeko,

the NOVA system. Home-made products from the UPV/EHU were assessed using the Nestlé's Nutritional Profile System. The foods offered in outlets at the UPV/EHU were also audited, using an adaptation of the methodology proposed by Roy et al. (2016). Food acquisition behaviours, choice determinants and opinions on on-campus food availability were analysed through an online survey. An adapted version of the questionnaire developed by Tam et al. (2017) was used in representative samples (1683 subjects from the UPV/EHU and 129 from OsloMet). Statistical analyses were performed using SPSS for Windows (version 24.0, SPSS Inc., Chicago, IL, USA).

Results: With regard to the first objective, the supply of commercial foods of low nutritional quality (LNQ) was greater at the UPV/EHU (58.5%) compared with OsloMet (39.8%) ($p<0.001$). However, overall, no differences were found in the percentage of ultra-processed products between both universities. In addition, at the UPV/EHU, solid food and hot drinks from vending machines, as well as home-made hot drinks classified as high nutritional quality (HNQ) tended to be more expensive than LNQ alternatives ($p<0.001$). Solid foods of LNQ from vending machines at the UPV/EHU were also promoted to a greater extent than HNQ foods ($p<0.05$). Of the total of food outlets audited at the UPV/EHU, the vending machine was the point of sale that obtained a higher percentage of LNQ (87.7%) compared to the cafeterias/restaurants/canteen (60%)

hiru irizpide aplikatu ziren; baita irizpide horien konbinazioa ere. Gainera, produktu komertzialak euren prozesatze mailaren arabera sailkatu ziren, NOVA sistema erabiliz. UPV/EHUko etxeko produktuak Nestléren Nutrizio-profilaren Sistema erabiliz ebaluatu ziren. Salmenta-puntuetan eskainitako jakiak ere ikuskatu ziren, Roy et al.ek (2016) proposatutako metodologiaren egokitzapena erabiliz. Elikagaiak eskuratzeko portaerak, hautaketen faktore erabakigarriak eta campuseko elikagaien eskuragarritasunari buruzko iritzia online inkesta baten bidez aztertu ziren, Tam et al.ek (2017) garatutako galdetegiaren bertsio egokitua erabiliz. Erabilitako laginak adierazgarriak izan ziren (UPV/EHUko 1.683 pertsona eta OsloMeteko 129). Análisi estatistikoak Windows sistamarako SPSS erabiliz egin ziren (24.0 bertsioa, SPSS Inc., Chicago, IL, AEB).

Emaitzak: Lehen helburuari dagokionez, kalitate nutrizional baxuko (KNB) elikagai komertzialen eskaintza handiagoa izan zen UPV/EHU ($\%58,5$) OsloMetekin ($\%39,8$) alderatuta ($p<0.001$). Hala ere, oro har, ez zen desberdintasunik aurkitu produktu ultraprozesatuen ehunekoan bi unibertsitateen artean. Gainera, UPV/EHU, kalitate nutrizional altuko (KNA) vending makinetako elikagai solidoak eta edari beroak eta etxeko edari beroak KNBko alternatibak baino garestiagoak ziren ($p<0,001$). Era berean, UPV/EHUren vending makinetako KNBko elikagai solidoak gehiago sustatu ziren KNA elikagaiak baino ($p<0,05$). UPV/EHU ikuskatutako salmenta-puntu guztietatik, vending makinak

($p < 0.05$). Regarding the second objective, purchasing habits differed between university community groups and universities, being these behaviours healthier between staff than students, and between the community of OsloMet than those of the UPV/EHU. In addition, the top determinants of food purchasing behaviours in both universities were those related to taste (98.6% at the UPV/EHU, 100% at OsloMet) and cost (86.0% at the UPV/EHU, 89.1% at OsloMet). Finally, the university communities from the UPV/EHU and OsloMet recommended price changes to increase purchasing capacity, increase the availability of products of HNQ and improve the allergen information on labelling.

Conclusions: The supply of commercial foods of LNQ was greater at the UPV/EHU in comparison with OsloMet; however, overall no differences were found in the percentage of ultra-processed products. Food purchasing behaviours in both universities were related to their food supply. The top determinants of food purchasing behaviours at both universities were those related to taste and cost. Interventions that improve food prices, availability of products of HNQ and information on labelling would be well-received in these communities.

lortu zuen KNBkoen ehuneko handiena (%87,7), kafetegi/jatetxe/jantokiarekin (%60) alderatuta ($p < 0,05$). Bigarren helburuari dagokionez, erosteko ohiturak desberdinak izan ziren unibertsitate-komunitateko taldeen eta unibertsitateen artean. Horiek osasuntsuagoak izan ziren langileen artean ikasleen artean baino, eta OsloMet komunitatearen artean UPV/EHU baino. Gainera, bi unibertsitateetan elikagaiak erosteko portaeren faktore erabakigarri nagusiak zaporearekin (%98,6 UPV/EHU, %100 OsloMet) eta kostuarekin (%86,0 UPV/EHU, %89,1 OsloMet) lotutakoak izan ziren. Azkenik, UPV/EHUko eta OsloMeteko unibertsitate-komunitateek erosteko gaitasuna handitzeko prezioak aldatzea gomendatu zuten, baita KNAko produktuen eskuragarritasuna handitzea eta etiketetan alergenoei buruzko informazioa hobetzea ere.

Ondorioak: KNBko elikagai komertzialen eskaintza handiagoa izan zen UPV/EHU OsloMetekin alderatuta; hala ere, oro har, ez zen desberdintasunik aurkitu produktu ultraprozesatuen ehunekoan. Bi unibertsitateetan elikagaiak erosteko portaerak elikagaien hornidurarekin erlazionatuta zeuden. Elikagaiak erosteko portaeren faktore erabakigarri nagusiak zaporearekin eta kostuarekin lotutakoak izan ziren bi unibertsitateetan. Produktuen prezioak, KNA eskuragarritasuna eta etiketei buruzko informazioa hobetzen dituzten esku-hartzeak ondo hartuko lirateke komunitate horietan.

Key words: Food environment; Food-purchasing determinants; Nutrient profiling model; Food processing level; Tertiary-education settings.

Hitz gakoak: Elikadura-ingurunea; Elikagaien erosketaren faktore erabakigarriak; Nutrizio-profilaren eredu; Elikagaien prozesamendu-maila; Hirugarren hezkuntzako inguruneak.

THESIS STRUCTURE

The doctoral thesis has been structured in several chapters.

Firstly, in **Chapter 1**, the background and current status of the subject are explained through the review of the scientific literature carried out. It begins with the description of the concept of food environments, their dimensions and their domains. After describing the influence of food environments on health, an emphasis is placed on organizational food environments, particularly tertiary educations food environments. Finally, the relevance of this study is exposed.

Secondly, in **Chapter 2**, the hypotheses and the general and specific objectives are presented.

Chapter 3 provides a detailed explanation of the methodology used. It describes the analysis of the food environment of the UPV/EHU and OsloMet from a nutritional and food science point of view. Also, it describes the assessment of food purchasing behaviours, choice determinants and opinion on the food availability by the university community (students and staff) from both universities.

In **Chapters 4 and 5**, the results and the discussion of this study are explained, respectively. Based on the discussion of the main results, the contributions of this study regarding the objective set and the aspects that need further investigation are highlighted.

TESIAREN EGITURA

Doktorego tesia hainbat kapitulutan egituratu da.

Lehenik eta behin, **1. kapituluan**, gaiaren aurrekariak eta egungo egoera azaltzen dira, egindako literatura zientifikoa berrikusiz. Hasteko, elikadura-inguruneen kontzeptua, dimentsioak eta domeinuak deskribatzen dira. Elikadura-inguruneek osasunean duten eragina deskribatu ondoren, antolaketa-inguruneetan azpimarratzen da, bereziki hirugarren hezkuntzako elikadura-inguruneetan. Azkenik, azterlan honen garrantzia azaltzen da.

Bigarrenik, **2. kapituluan**, hipotesiak eta helburu orokorrak eta espezifikoak aurkezten dira.

3. kapituluak erabilitako metodologiaren azalpen zehatza ematen du. Atal honek deskribatzen du UPV/EHUren eta OsloMeten elikadura-ingurunearen azterketa, ikuspegi nutrizional eta zientifikotik. Halaber, bi unibertsitateetako unibertsitate-komunitateak (ikasleak eta langileak) elikagaiak erosteko dituen jokabideen ebaluazioa, hautaketan faktore erabakigarriak eta elikagaien eskuragarritasunari buruzko iritziak deskribatzen ditu.

4. eta 5. kapituluetan, ikerketa honen emaitzak eta eztabaida azaltzen dira, hurrenez hurren. Emaitza nagusien eztabaidatik abiatuta, planteatutako helburuari dagokionez ikerketa honen ekarpenak nabarmentzen dira, baita

Chapter 6 presents the main conclusions obtained.

Finally, the references and the appendixes are presented.

ikerketa handiagoa eskatzen duten alderdiak ere.

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1. KAPITULUA. GAIAREN AURREKARIAK ETA EGUNGO EGOERA

1.1. ELIKADURA-INGURUNEAK: KONTZEPTUA, DIMENTSIOAK ETA DOMEINUAK

Azken hamarkadetan, **obesitate**-tasek gora egin dute (Munduko Osasun Erakundea [OMS], 2020). Haren prebalentzia nabarmen handitzen ari da munduko eskualde guztietan (Finucane et al., 2011), bereziki Espainian. Egun, helduen prebalentzia handiena duen Europako herrialdeetako bat Espainia da (Gallus et al., 2015). Osasunaren Inkesta Nazionalaren arabera, 2017an Espainiako biztanleen %37,1ek eta %17,4k gehiegizko pisua eta obesitatea zuten, hurrenez hurren (*Instituto Nacional de Estadística*, 2018). Obesitatearen eragileak, hala nola nutrizio txarra eta jarduera fisikorik eza, ingurune fisiko eta sozialarekin lotuta daudenak, gero eta ezagunagoak dira (French et al., 2001a). Duela gutxira arte, uste zen gizabanakoak zirela beren bizimoduari buruzko hautaketan erantzule bakarrak, erabakiak hartzen ziren inguruneak kontuan hartu gabe. Bai esparru sozioekologikoak, bai teoria kognitibo sozialaren elkarrekiko determinismoaren eraikuntzak, inguruneek eta portaerek aldi berean elkarri eragiten diotela adierazten dute (McAlister et al., 2008).

Gomendio dietetiko osasungarriak babesten dituzten hautaketak sustatzen dituzten inguruneek pertsonen osasun-helburuak lortzea eta/edo mantentzea erraztu dezakete, elikagai mota horien aukeraketa babesten ez duten inguruneekin alderatuta (Roy et al., 2015), hala nola pisu osasungarriko egoera bat eta mikronutrienteen egoera egoki bat lortzea. Nutrizio-kalitate altuko (KNA) produktuen eskuragarritasun eta irisgarritasun baxuak nahiz prezioa altuak, eta nutrizio-kalitate baxuko (KNB) elikagaien (elikagaiak eta edariak barne) marketin zein publizitate oldarkorrek ezaugarri dituzten **elikadura-inguruneek** (EI) elikagai gehiegi hartzea sustatzeko eta pisua handitzen laguntzeko ahalmena dute (Hill eta Peters, 1998).

Campus mailan Elaren azterketa integrala egitea ikerketa honen helburuetatik kanpo badago ere, gure ekarpena kokatzeko labur-labur azalduko ditugu jarraian Elaren definizioak eta kontzeptuak. Lan kontzeptual batean, Glanz et al.ek (2007) lehen aldiz deskribatu zuten EIa, tokiko auzotarraren eskalan, "**komunitateko EI**" bezala, eta dendako eskalan, berriz, "**kontsumitzailearen EI**" bezala. Lehenengo terminoa neurtzeko, pertsonak elikagaien salmenta-puntuetatik hurbil dauden edo eremu geografiko espezifikoko baten barruan dauden elikagaien salmenta-puntuaren dentsitatea edo barietatea kontuan hartzen da (Rideout et al., 2015). Bigarren terminoak elikagaien eta kontsumitzailearentzako informazioaren eskuragarritasuna, barietatea, prezioa eta

kalitatea ditu ezaugarri, hala nola sustapen-kartelak, bai eta KNAa duten aukerek KNBa duten aukeren aldean duten nagusitasun erlatiboa ere (Rideout et al., 2015). Glanz et al.en (2007) kontzeptualizazioak “hor kanpoan” dagoen mundua pertsonak eros eta kontsumi ditzaketen elikagai eta produktu moten arabera kuantifikatu nahi du. Hala ere, “komunitatean” eta “kontsumitzailean” oinarritutako kontzeptuetatik haratago, Ela kontzeptu zabalagoa da, osagai kritiko asko dituena.

Swinburn et al.ek (2013) elikagaien erosketaren, kontsumoaren eta nutrizio-egoeraren egiturazko bultzatzaileak gehitu zituzten Elaren kontzeptuari, eta honela definitu zuten: “ingurune fisiko, ekonomiko, politiko eta soziokultural kolektiboa, elikagaien eta edarien aukeraketan eta pertsonen nutrizio-egoeran eragiten duten aukerak eta baldintzak”. Herforth eta Ahmedek (2015), bestalde, ekarpen garrantzitsua egin zuen ikerketa empirikoa bideratzeko dimentsio neurgarrien multzo bat definitzeari dagokionez. Dimentsio horiek honako hauek izan ziren: “hainbat elikagairen eskuragarritasuna, prezioa, komenigarritasuna eta desiragarritasuna”. Elikadurarako Nekazaritza eta Elikagai Sistemiei buruzko Panel Globalak (Global Panel on Agriculture and Food Systems for Nutrition, 2016) eta Nekazaritza eta Elikadurarako Nazio Batuen Erakundeak (FAO) (FAO, 2016) dimentsio gehiago gehitu zituzten eta pertsonen bizitzaren nahiz eguneroko jardueren eginkizuna sartu zuten Elaren kontzeptuan. Eranste horien ondorioz, honela definitzen da EIa: “inguruko pertsonak beren egunerokotasunean eskura dituzten elikagaiak eta elikagai horien nutrizio-kalitatea, segurtasuna, prezioa, komenigarritasuna, etiketatzea eta sustapena”. FAOk (FAO, 2016) ere lagundu zuen kontzeptu horretan, Ela elikagai-sistemen eta dieten arteko “interfase” gisa kokatu baitzituen. Faktore fisikoek, sozialek, ekonomikoek, kulturek eta politikoek makro-mailan eragina dute Elan eta, oro har, elikadura-sisteman (Baker et al., 2018; Swinburn et al., 2013).

Lehen aipatutako definizio guztien alderdi komun bat da Elaren kontzeptualizazioa elikagaiak erosteko espazioei dagokienez nahiz merkatuan oinarritutako aukera eta mugei dagokionean, izan ere, elikagaiak eskuratzeko eta kontsumitzeko orduan eragina dute pertsonengan. Hala ere, literatura zientifikoan desberdintasun handiak daude termino horren dimentsioen artikulazioan. Alde batetik, maila globalean Elaren aniztasuna dela eta; bestetik, ikerketa egiten duten diziplina akademikoen aniztasunagatik, bakoitzak bere interesak dituelako (adibidez, nutrizioa osasun publikoan, ekonomian, hiri-plangintzan) (Turner et al., 2018).

Ikuspegi sozio-ekologikotik bi domeinu giltzarri identifikatu dira Elaren eraikuntza zabalenaren barruan: “kanpoko domeinua” eta “domeinu pertsonala”. **Kanpoko domeinua** testuinguru jakin baten barruan “hor kanpoan” dauden aukeren eta mugen munduarekin erlazionatzen da. Dimentsio hauek hartzen ditu barnean: elikagaien eskuragarritasuna (elikagaien salmenta-puntuaren hornikuntza egokitzea edo salmenta-puntuetan elikagaiak egotea), prezioak (elikagaien kostua), saltzailearen propietateak (elikagai-saltzaile mota, irekitze-ordutegia eta emandako zerbitzuak), produktuaren propietateak (elikagaien kalitatea, segurtasuna, prozesamendu-maila, balio-bizitza eta ontziratzea) eta marketina (sustapeneko informazioa, branding-a edo markaren kudeaketa, publizitatea, babesletza eta etiketatzea) eta erregulazioa (elikagaien salmentari buruzko politiken erregulazioa). **Domeinu pertsonalak** banakako dimentsio-multzo bat hartzen du, besteak beste, elikagaien eskuragarritasuna (kokapena eta elikagaien salmenta-puntuetikiko distantzia), prezioa (elikagaien kostua eta kontsumitzailearen balioaren pertzepzioa), komenigarritasuna (denbora esleitzea eta prestatzeko erraztasunak) eta desiragarritasuna (lehentasunak, onargarritasuna, gustuak, nahiak, besteak beste) (Caspi et al., 2012; Turner et al., 2018). Eremu eta dimentsio horien arteko elkarrekintza jarraitu eta konplexuek pertsonen elikagaiak eskuratzea eta kontsumitzea baldintzatzen dute.

Elikagaien eskuragarritasuna, prezioa eta irisgarritasuna dimentsioak diru-sarrera handiko herrialdeetan egindako ikerketetan probatu dira emaitza dietetikoekin, nutrizionalekin eta osasunekoekin asoziazioak bilatzeko helburuarekin (Penney et al., 2014). Beraz, erabilgarritasuna neurtzeko, pertsonen etxe edo lanaren inguruko elikagai-iturrien presentzia edo gabezia kontuan hartu da (Bodor et al., 2010; Gibson, 2011; Powell et al., 2010); edo superkermatu nahiz komenentziako denda baten barruko elikagai motak, barietatea eta apaletako espazioa kontuan hartuta (Andreyeva et al., 2008; Hosler et al.). Irisgarritasuna edo hurbiltasun fisikoa etxetik datorren bufer jakin baten barruan elikagaidenden dentsitatearen arabera operazionalizatzen da (Bodor et al., 2010; Moore et al., 2008); edo etxetik hurbilen dagoen elikagaidendara dagoen kale-sarearen distantzia (Apparicio et al. 2007; Sharkey eta Horel, 2008) erosten den elikagaidenda nagusiarekin alderatuta (Aggarwal et al., 2014a; Drewnowski et al., 2012). Elikagaien prezioei dagokionez, erabilera komuneiko elikagaien saskien kostua kalkulatu (Gustafson et al., 2012), zein elikagaidendak saldutako produktuen prezioaren arabera sailkatuz (Drewnowski et al., 2012) neurtu dira.

Irisgarritasuna eta prezioa alderatzen dituzten ikerketen arabera, produktuen prezioen maila fruta nahiz barazki gehiago hartzearekin (Aggarwal et al., 2014a) eta obesitatearen prebalentzia txikiagoarekin (Drewnowski et al., 2012) lotuta dago. Nolanahi ere, ikerketa gehiago egin behar dira ingurune askotako emaitza dietetikoetan, nutrizioaletan eta osasunean eskuragarritasunak, irisgarritasunak eta prezioek duten garrantzi erlatiboa argitzeko. Bestalde, faktore pertsonalen zeregina gutxi aztertu den arren (Penney et al., 2014), ikerketen emaitzek adierazten dute pertzepzio pertsonalak hurbiltasuna baino erabakigarriagoak izan litezkeela elikagaiak eskuratzeko dietetan eta osasunean, batez ere, motordun garraio bide pertsonalak dituzten artean (Aggarwal et al. 2014b; Aggarwal et al. 2016). Merezi du nabarmentzea beharrezkoa dela familia-hezkuntzaren kanpoko domeinuei eta dimentsio pertsonalei heltzea, bi faktore horiek forma ematen baitie pertsonen portaerei, elikagaien eskuraketa eta ondorengo osasun-emaitzak barne.

1.2. NOLA ERAGITEN DUTE ELIKADURA-INGURUNEEK OSASUNEAN?

Azken hamarkadetan, aurrerapen teknologikoen, elikagai-industriaren garapenak, elikadura- eta nekazaritza-politikek eta ekonomia-, gizarte- eta bizitza-aldaketek Elen aldaketa garrantzitsuak bultzatu dituzte (Swinburn et al., 2013). Egun, hainbat inguruetan elikagai prozesatu eta janari laster gehiago dago eskuragarri eta irisgarri egunean zehar, proportzio handiagoetan eta prezio nahiko baxuetan (Swinburn et al., 2013). Eraikitako ingurune horrek egungo obesitate-mailetan eragin dezake, norbanakoen eta komunitateen portaera dietetikoetan eragiten baitu (Hobbs eta Radley, 2020).

Elak eragina izan dezake elikagaien erosketan eta pertsonen elikadura-aukeretan, dieten kalitatean eta dietarekin lotutako osasun-emaitzetan. Hala eta guztiz ere, Elen ezaugarri espezifikoek nola eragiten dieten emaitza espezifikoetara buruzko ebidentzia mistoa da, ziur asko Elak ebaluatzeko aplikatutako ikuspegi metodologikoen aniztasunagatik (Lytle eta Sokol, 2017). Elen ezaugarriek osasunean dituzten eragin espezifikoaren froga sendoen eskasia zuhurtziaz interpretatu behar da, izan ere, arlo horretako ebidentzia mugatuak ez du nahitaez adierazten efektu indartsu baten falta (Rideout et al., 2015).

Hainbat inguruetan gero eta ebidentzia gehiago dago KNAa edo KNBa duten elikagaien eskuragarritasunak eta irisgarritasunak banakako obesitate-arriskuan duen

eraginari buruz (Casey et al., 2014; Fuentes Pacheco et al., 2018; Larson eta Story, 2010; Odoms-Young et al., 2016; Stark et al. 2013). Adibidez, nagusiki elikagai freskoak eskaintzen dituzten supermerkatuekiko irigarritasun hobea izatea fruta eta barazki gehiago hartzearekin (Sharkey et al., 2010) eta gehiegizko pisu/obesitate maila txikiagoarekin lotu zen (Gamba et al., 2015). Era berean, janari lasterreko jatetxeekiko irisgarritasun hobea izatea gehiegizko pisuaren/obesitatearen prebalentzia handiagoarekin lotu zen (Chen et al., 2013). Beste ikerketa batzuek tokiko Elak osasunean duen inpaktuari buruzko aurkikuntzarik ez dagoela edo kontrakoak direla jakinarazi duten arren (den Braver et al., 2018; Wilkins et al., 2019), badirudi Elak elikadura-portaeran duen eragina agerikoa dela. Hala behatu da hainbat agertokitan egindako azterlan askotan, hala nola eskoletan (He et al., 2012), unibertsitateetan (Deliens et al. Al., et al., 2014) eta lantokietan (McCurley et al., 2019; Shokeen eta Aeri, 2020). Azken agertoki horretan, elikagaien eskuragarritasuna arrisku kardiometabolikoarekin (McCurley et al., 2019) eta sindrome metabolikoarekin (Shokeen eta Aeri, 2020) ere lotu da.

1.3. ELIKADURA-INGURUNE OSASUNGARRIAGOAK SORTZEKO ESTRATEGIAK

Ei osasungarriak babesten dituzten politika eta programek ere eragina dute elikadura osasungarrian. Orain arte hainbat politika eta programa ezarri dira Elen osasuna hobetzeko ahaleginean. Esku-hartze horien emaitzak ebaluatzeko ebidentzia mugatua da, baina politika eta programa mota batzuk eraginkorrak izan daitezkeela iradokitzen da (Rideout et al., 2015).

Ebidentziak elikagaien zingirak ezabatzeko **txikizkako salmentetan** aurrera eramandako **esku-hartzeek** dieta hobea eta osasun-emaitzak izatea iradokitzen du. Izan ere, eremu horietan janari lasterren ugaritasuna, zabor-janarien salmenta-puntuak, komenientziako dendak eta likore-dendak gehiago dira nutrizio-kalitate handiko aukerak baino (Gittelsohn et al., 2012). Dendan osasuna sustatzeko estrategiak eta komenientziako denda osasungarriak sortzeko esku-hartzeak konbinatzea bereziki eraginkorra izan daiteke, produktu freskoen eta nutrizio-kalitate handiko produktuen eskuragarritasuna, nagusitasuna eta prezioa hobetzeko (Chrisinger et al., 2018; Escaron et al., 2013; Gittelsohn et al., 2012). Komunitate askok komenientziako dendan programa osasungarriak sortu dituzte, denda horien eguneratze osasungarriak sustatu eta babesteko. Hori horrela,

denda txikietako esku-hartzeak ugaritu dira, batzuk denden auditoria zehatz eta balidatuen bidez ebaluatuak (Cavanaugh et al., 2014; Paek et al., 2014) eta, beste batzuk, ikerketaren neurketa-tresna espezifikoen bidez (Ayala et al., 2013; Dannefer et al., 2012; Song et al., 2009). Lehen emaitzek erakutsi dute arrakasta handia izan dutela elikagai osasungarrien eskuragarritasunean (Ayala et al., 2013; Cavanaugh et al., 2014; Dannefer et al., 2012; Paek et al., 2014; Song et al., 2009).

Elikagaien etiketek (paketearen aurrealdeko etiketak, paketearen atzealdeko etiketak, jatetxeetako menuetako etiketak eta janari-dendetako etiketak barne) eragina izan dezakete kontsumitzailearen elikagaien hautaketetan (Shangguan et al., 2019). Paketearen aurrealdeko etiketek, batez ere semaforo anitzek, ohartarazpen-etiketek eta Nutri-Scorek erosleei laguntzen diete KNAko elikagaiak identifikatzen. Baina ebidentzia sendo gutxi dago ezagutza hobetu horrek benetako erosketa-portaeran eragin nabarmena duela egiaztatzeko (Temple, 2020). Paketearen aurrealdeko etiketek erosleen erosteko asmoan duen eragina ikertzeko gehien erabili den diseinu esperimentalaren ordenagailu baten erosketa simulatua izan zen. Mundu errealeko supermerkatuetan oso ikerketa gutxi egin diren arren, ikerketa horien aurkikuntzek adierazten dute paketearen aurrealdeko etiketek edo apaletako etiketek arrakasta maila txiki bat lor dezaketela (<2%) erosleak KNAko produktuak eros ditzaten konbentzitzeko (Temple, 2020). Menuaren etiketari dagokionez, duela gutxi egindako berrikuspen baten arabera, elikagaien etiketa horrek benetan murriztu dezake etxetik kanpo E-lan eskatutako eta kontsumitutako energia (Littlewood et al., 2016). Nolanahi ere, denbora behar da elikagai-zerbitzuen industriak erregulazioak bete ditzan eta kontsumitzaileak elikagai-zerbitzuen saltokietako menuen etiketekin ohitu daitezzen.

Gobernu batzuek **politika fiskalak** ere erabiltzen dituzte KNBko aukeren eskuragarritasuna mugatzeko, edari azukredunak kasu. KNBko elikagaien eta edarien gaineko zergen ebaluazioek produktu eta nutriente espezifikoen erosketetan murrizketak izan direla erakutsi dute (Sacks et al., 2021). Hala ere, ikerketek zergapetu gabeko KNBko produktuak ordeztzeko potentziala adierazten dute, eta hori kontuan hartu behar da zergen diseinuan. Gainera, badirudi KNAko elikagaien kontsumoa handitzeko subsidioak (prezioen murrizketa) eta hainbat osagaien esku-hartze konbinatuak zergak baino eraginkorragoak direla KNBko produktuen kontsumoa murrizteko (Afshin et al., 2017).

Azkenik, **erakunde** handi asko, hezkuntza- eta osasun-erakundeak barne, KNAko produktuak eskuratzeko politikak hartzen ari dira, erakundearen barruan elikagai mota horien eskuragarritasuna handitzeko nahiz arrazoizko prezioak lortzeko (Niebylski et al., 2014). Eskola publikoetan elikagaiak saltzeko osasunean oinarritutako jarraibideei jarraitzea da EI osasuntsuek babesten duten estrategia mota honen adibide bat, Britainiar Columbia kasu (HealthLinkBC, 2013). Erkidegoko eta eskolako baratzeak erabiltzen dira fruta eta barazkien kontsumoa handitzeko, elikadura-trebetasunak, ezagutza eta jarrerak hobetzeko, bai eta osasun eta ongizate mental eta sozialean laguntzeko ere (Coupland et al., 2011; McCormack et al., 2010). Beste adibide bat Ameriketako Estatu Batuetako Fruta eta Barazki Freskoen Programa da. Programa hori maila nazionalean hedatu zen diru-sarrera txikiko matrikula altuenak zituzten lehen mailako eskoletarako, ikasleei ohiko eskola-ortuetatik kanpo frutak eta barazkiak dohain emateko (Bartlett et al., 2013). Antzeko programa bat ezarri zen Norvegian, bigarren hezkuntzako ikasle guztiei frutak edo barazkiak dohain emateko (Bere et al., 2010). Zonifikazioa eta legeak ere aztertu dira, garapen berrietan KNAko produktuen eskuragarritasuna ziurtatzeko edo komunitate espezifikoetan nahiz eskolen inguruan janari lasterreko sarbidea mugatzeko (Chen eta Florax, 2010); baita haurrei zuzendutako KNBko produktuen publizitatea mugatzeko ere (Center for Science in the Public Interest, 2016; United States Department of Health and Human Services, eta United States Department of Agriculture, 2015).

1.4. ANTOLAKETAKO ELIKADURA-INGURUNEAK: UNIBERTSITATEETAN ESKAINITAKO ELIKAGAIK

Antolaketako EIak hainbat ezaugarri baldintzatzen dituzte, hala nola ingurune instituzionalean elikagaien prestakuntzak, txikizkako salmentak edo elikagaiak hazteko instalazioak (Rideout et al., 2015). Udal-eraikinetan, lantokietan, eskoletan eta ospitaleetan eskaintzen diren elikagaiak barne hartzen dituzte (Mah et al., 2016). Erakunde-inguruneetako Elen zerbitzuak eta azpiegiturak aztertu dituzten ikerketek erakutsi dute lehen, bigarren eta hirugarren mailako hezkuntzako eskola askok mantenugaietan trinkoak ez diren eta gomendio dietetiko osasungarriak babesten ez dituzten elikagaien eta edarien hornidura eskuragarria eta nolanhikoa dutela (Byrd-Bredbenner et al., 2012; Grech et al., 2017; Park eta Papadaki, 2016; Velázquez et al., 2017). Arestian aipatu bezala, elikagaien eskuragarritasuna eta irisgarritasuna funtsezko elementuak dira jokabide

dietetikoetarako, une eta leku jakin batean zer jan daitekeen zehazten baitute (Contento, 2008).

Instituzio-inguruneen testuinguruan, **unibertsitateak** langile asko dituzten eta gero eta ikasle gehiago hezten dituzten zentroak dira (Tsouros et al., 1998). Gainera, azken horiek pisua handitzeko arrisku handiko aldian daude. Bereziki, ikasleek unibertsitateko lehen urtean batez beste 1,36 kg irabazten dituzte, bizimoduen aldaketengatik, jarduera fisikoa eta elikadura-portaerak barne (Vadeboncoeur et al., 2015). Hartzen dituzten elikadura-ohitura horiek helduarotan iraun dezakete, hori dela eta, dieta osasungarria sustatzeko aukera paregabea da (Kelly et al., 2013). Horrez gain, azterlan batzuek adierazten dute unibertsitateko langileek gehiegizko pisuaren eta obesitatearen prebalentzia handiagoa dutela populazio orokorrarekin alderatuta, lanaldirik luzeenen eta faktore psikosozialen ondorioz (Cheong et al., 2010), eta gaixotasun kardiobaskularren zenbait arrisku-faktoreen eraginpean egoteagatik (Sita et al., 2018). Ikasleek eta langileek denbora asko ematen dute campusean, astean 5-30 ordu edo gehiago, urte askoan, eta horregatik, unibertsitateak agertoki estrategikoak izan daitezke KNAko dieta bat sustatzeko. Unibertsitateek komunitateko EI aldatzeko aukera izan eta eman behar dute. Azken horrek, elikagai indibidualen aukeraketetan eragin positiboa izan dezake, KNAko aukera errazena bilatzeko eta, horrela, gizentasuna eta nutrizioarekin lotutako beste gaixotasun batzuk prebenitzeko (Newton et al., 2016; Tam et al., 2017).

Ebidentziak unibertsitateko ikasleen eta langileen gehiegizko pisuaren/obesitatearen eta KNBko elikadura-portaeren artean lotura dagoela erakutsi du campusean (Freedman eta Rubinstein, 2010; Jiang et al., 2019). Gehiegizko pisua/obesitatea zuten langileek eragin handiagoa izan zuten campuseko jantokietako elikagaien aukeretan pisu normalak zituztenek baino (Freedman eta Rubinstein, 2010). Gainera, aurreko ikerketek campusetako EI asko potentzialki obesogenikoak direla iradokitzen dute, energian aberatsak diren eta mantenugaietan pobreak diren elikagaien eskuragarritasun eta sustapenaren ondorioz (Roy et al., 2016). Sarritan, produktu horiek gune publikoetan eskuragarri dauden elikagaien iturri nagusia izaten dira, hala nola unibertsitateetan, non oso hedatuta baitaude campusetan. Gainera, horiek bereziki erakargarriak izaten dira denborarekiko estresatuta dauden goi-mailako hezkuntzako instituzioetako ikasle eta langileentzat (Grech et al., 2017). Hori hirugarren mailako hezkuntzan espero denaren kontrakoa da; izan ere, bizimodu osasungarriak sustatu beharko lituzke, osasunari eragiten dioten bizi

osorako hautaketen oinarria ezar ditzaketenak (Kvaavik et al., 2005). Hirugarren mailako instituzioek osasun publikoko ahaleginetan heldu-gazteengana jotzeko ingurune egokia eskaintzen dute; izan ere, 17,5 milioi ikasle joan ziren goi-mailako hezkuntzazko instituzioetara 2018an Europar Batasunean (Eurostat Statistics Explained, n.d.a) eta 30 eta 34 urte bitarteko gazteen %40 baino gehiago hirugarren mailako hezkuntza osatu zuen (Eurostat Statistics Explained, n.d.b.).

Aipatzekoa da, halaber, **vending makinak** ohikoak direla unibertsitateko Eian, beste instituzio-ingurune batzuetan bezala. European, Espainia da vending makinaren erabileran lider den herrialdeetako bat, 80 biztanleko makina batekin (Raposo et al., 2015) (Europako batez bestekoa 180 biztanleko makina bat da) (European Vending eta Cofee Service Association, n.d.). 2015ean, vending makinei dagokionean Europa mailan, Espainia izan zen nagusi, beste bost herrialderekin batera: Frantzia, Alemania, Italia, Herbehereak eta Erresuma Batua (EB) (European Vending eta Cofee Service Association, n.d.). Salmenta-puntu mota hori balio energetiko handiko, azukre eta koipe asean eduki handiko eta nutrizio-balio txikiko produktu-iturri gisa identifikatu da (Carrad et al., 2015; Grech et al., 2015; Hua eta Ickovics, 2016). Australiako, EBko eta Ameriketako Estatu Batuetako unibertsitate-makinak aztertu diren ikerketetan, KNBko artikuluen proportzioak %85 eta %100 artekoak izan ziren elikagaien kasuan, eta %49 eta %86 artekoak edariaren kasuan (Grech et al., 2017; Horacek et al., 2019; Park eta Papadaki, 2016; Whatnall et al., 2020a).

Elikagaien gustua eta lehentasunak alde batera utzita, salmenta-makinetan kontsumitzaileen erosketetan eragina izan dezaketen beste faktore batzuk prezioak eta sustapena dira (Callaghan et al., 2010; Matthews eta Horacek, 2015). Vending makinaren produktuen prezioak kontsumitzaileen erosketa-ereduetan eragin handia du, eta KNAko aukerak kostu txikian eskaintzen direnean, horien salmentak gora egiten du (Grech et al., 2015; Kocken et al., 2012). Produktuen logotipoek, etiketek eta publizitate-marken marketinak saldutako produktuen kontsumitzaileei ere eragiten diete (Matthews et al., 2014; Minaker et al., 2011). Orain arte, azken faktore hori makinaren barruko edo inguruko sustapenekin eta makinaren kokapenarekin lotutako datuen bidez aztertu da (Grech et al., 2017; Horacek et al., 2019).

1.5. DOKTOREGO-TESI HONEN JUSTIFIKAZIOA

Unibertsitateko Elari buruz orain arte egin diren ikerketa urriak Australiako (Tam et al., 2017) eta Zeelanda Berriko (Roy et al., 2019) unibertsitateei dagozkie. Dakigunagatik, ez dago gai horri buruzko ikerketarik Europako unibertsitateetan. Horregatik, ikerketa honen bidez, Europako hegoaldeko eta iparraldeko bi unibertsitate publikotan Ela ebaluatzea proposatu zen. Zehazki, Euskal Herriko Unibertsitatearen eta OsloMet - Osloko Metropolitikar Unibertsitatearen Elak. Testuinguru soziokultural desberdina zuten bi EI aztertzea erabaki zen; izan ere, faktore soziokulturalak (kultura, aldagai ekonomikoak, elementu politikoak) erabakigarriak dira elikagaien aukeraketan (Chen eta Antonelli, 2020), eta horrek aukera emango liguke antzekotasunak eta desberdintasunak testuinguru horien arabera aztertzeke.

Ela aztertzean, kanpoko eremua eta eremu pertsonala hartu dira kontuan. Kanpoko dimentsioen artean, honako hauek aztertu dira: elikagaien eskuragarritasuna, prezioak, produktuaren propietateak eta merkaturatzea; eta domeinu pertsonalen artean, irisgarritasuna (kontsumitzaileek elikagaiak eta edariak lortzeko duten erraztasuna), bai eta unibertsitate-komunitateak elikagaiak erosterako orduan dituen portaerak, hautaketen faktore erabakigarriak eta campuseko elikagaien eskuragarritasunari buruz dituzten iritziak ere.

Ikerketa honek antzeko beste ikerketa batzuen aldean duen abantaila nagusia (Roy et al., 2019; Tam et al., 2017) unibertsitate-komunitatearen lagin adierazgarri bat aztertzen dugula da, bai eta taldeen artean egon daitezkeen aldeak ere (ikasleak vs. langileak). Kontuan izan behar da elikagaiak aukeratzeko portaera aldagaien arabera aldatzen dela (adibidez, adina, hezkuntza-aurrekariak eta maila sozioekonomikoa) (Qualls-Creekmore et al., 2020), zeinak, aldi berean, desberdinak baitira unibertsitate-komunitateko taldeetan. Gauzak horrela, ikerketa honek antolaketako EI baten izaera sakonki ulertzea ekarriko du. Azken hori ezinbestekoa da, aldaketak burutzea beharrezkoa den ezagutzeko eta, ondorioz, hautaketa dietetikoak hobetzeko.

Gainera, Europako unibertsitateetan vending makinetan saldutako elikagaien eta edarien nutrizio-balioari eta bestelako determinatzaileei buruzko daturik ez dagoenez (Martin Payo et al., 2020; Park eta Papadaki, 2016), eta sektore horrek Espainian duen garrantzia kontuan hartuta, gai horri buruzko datu zientifikoak lortzea beharrezkoa da.

Ildo horretan, Espainiako iparraldeko unibertsitate publiko batean, UPV/EHU, vendingean eskainitako elikagaiak ebaluatzea erabaki genuen, haien nutrizio-profilari eta prozesamendu-mailari arreta berezia eskainita, baita nutrizio-profilean kostuaren eta sustapenaren arabera dauden aldeak ikertzea ere. Azken faktore hori, makinaren barruan duen kokapena kontuan hartuta ebaluatu zena, tresna berria da produktuen sustapena aztertzeko. Izan ere, ez da lehenago erabili vending makinak ebaluatzeko ikerketetan.

Ikerketa honetako aurkikuntzek EIA aldatzeko beharrari buruzko informazioa ematea espero da eta unibertsitate honetan zein antzeko beste batzuetan EIA hobetzeko esku-hartze eraginkorrak diseinatzen diren abiapuntu izatea. Proiektu hau Unibertsitate Osasungarria izeneko CBL 2017/18 deialdiaren 5. erroinkaren barruan kokatzen da. Helburua da dieta eta bizimodu osasungarria sustatzeko ekintzak egitea, burujabetzari eta elikagaien segurtasunari laguntzea, eta osasunerako egokiak diren giro osasungarriak eta lan-giroak sortzea. Gainera, honako hauekin bat dator: UPV/EHUren 2012/17 Plan Estrategikoaren lehentasunezko ildoekin, IKD (Ikaskuntza Kooperatibo eta Dinamiko) hezkuntza-ereduarekin, OMSren giro osasungarrien estrategiarekin, Unibertsitate Osasungarrien Espainiako Sarearen campus osasungarrien sustapenarekin eta Osasun Ministerioaren Osasun Sistema Nazionalaren osasuna sustatzeko eta prebenitzeko estrategiarekin.

CHAPTER 2. HYPOTHESES AND OBJECTIVES

2.1. HYPOTHESES

After reviewing the literature and raising the problem, the following **hypotheses related to the FE in the UPV/EHU and OsloMet** were proposed:

1. More than half of the products offered at the UPV/EHU and OsloMet are of LNQ and have a high level of processing (1a). This same hypothesis was raised for the products from vending machines at the UPV/EHU (1b). Thus, the on-campus food supply does not facilitate the adoption of healthy dietary habits among its community and it does not contribute to creating a healthy FE in its centres. In addition, the UPV/EHU food supply has a higher percentage of foods of LNQ and ultra-processed than OsloMet supply (1c).
2. The percentage of commercial products of LNQ sold at the UPV/EHU and OsloMet is highly variable according to the criteria used for the evaluation of their nutritional profile (2a). This same hypothesis was raised for the products from vending machines at the UPV/EHU (2b).
3. Commercial products of LNQ sold at the UPV/EHU and OsloMet are mostly ultra-processed (3a). This same hypothesis was raised for the products from vending machines at the UPV/EHU (3b).
4. More than half of the food outlets at the UPV/EHU are of LNQ (4a), and the vending machine is the outlet that scores the lowest in terms of availability, accessibility and promotion, compared to the cafeteria/restaurant/canteen and the supermarket (4b).
5. Products of HNQ sold in outlets at the UPV/EHU are more expensive than products of LNQ (5a). This same hypothesis was raised for the products from vending machines at the UPV/EHU (5b).
6. LNQ products from vending machines at the UPV/EHU are more often promoted than HNQ options, based on the product's location in the machine (6).
7. Food purchasing behaviours by the communities of the UPV/EHU and OsloMet are characterized by a frequent choice of hot foods and drinks, followed by cold drinks and snacks (7a). Food purchasing behaviours are healthier between staff

than students (7b), and between the community of OsloMet than those of the UPV/EHU (7c). Moreover, purchasing habits differ in terms of purchasing occasions between the UPV/EHU and OsloMet communities (7d).

8. The food purchasing behaviours of the communities of the UPV/EHU and OsloMet are related to the availability in these FEs (8).
9. The main determinants of food choice are taste, value for money of foods, cost and convenience (availability) in the communities of the UPV/EHU and OsloMet (9a). For young adults, that is, students, cost and sensory perceptions were the most important influence on food selection, while for the staff they were nutrition/health value (9b). Moreover, the UPV/EHU community gives especial importance to convenience, whereas the community of OsloMet does to nutrition/health value and sustainability (9c).
10. There is a significant interest among students and staff of the UPV/EHU and OsloMet in interventions aimed at the increased availability and affordability of products of HNQ, as well as the variety of foods (10a). Changes regarding price are suggested by a higher percentage of students than staff, while those related to the availability of HNQ foods and the help for food choice are more frequent among staff than students (10b). In addition, the UPV/EHU community support changes related to food changes (including vending machine changes), and those from OsloMet, support changes related to help for food options (10c).

2.2. OBJECTIVES

2.2.1. *General objectives*

The present study had a double general objective. On the one hand, it aimed to assess the FE (through external dimensions, such as food availability, prices, product properties and marketing) at two European public universities, the UPV/EHU and OsloMet. On the other hand, it aimed to assess personal dimensions of the FE, such as food purchasing behaviours, choice determinants and opinions on the food availability by students and staff of the aforementioned universities.

2.2.2. *Specific objectives*

To achieve these general objectives, the following **specific objectives** were set:

1. To assess the availability and properties of foods (both foods and drinks included) offered on outlets at the UPV/EHU and OsloMet, and to analyse differences between universities (1a and 1c). This same specific objective was applied to the products from vending machines at the UPV/EHU (1b).
2. To analyse differences in the classifications based on several nutritional profile models of commercial products sold at the UPV/EHU and OsloMet (2a). This same specific objective was applied to the products from vending machines at the UPV/EHU (2b).
3. To examine possible associations between the classifications based on several nutritional profile models and the processing level of commercial products sold at the UPV/EHU and OsloMet (3a). This same specific objective was raised for the products from vending machines at the UPV/EHU (3b).
4. To audit the nutritional quality of food outlets at the UPV/EHU through the dimensions: availability, accessibility and promotion (4a); and to analyse differences according to the type of outlet (cafeteria/restaurant/canteen, vending machine and supermarket) (4b).
5. To investigate the relationship between the nutritional profile of foods (both commercial and home-made products) offered at the UPV/EHU and their cost (5a). This same specific objective was applied to the products from vending machines at the UPV/EHU (5b).
6. To investigate associations between the nutritional profile of foods from vending machines at the UPV/EHU and the product's location in the machine (6).
7. To analyse the on-campus food purchasing behaviours by communities of the UPV/EHU and OsloMet (7a), and to assess differences according to the university community group, that is, among students and staff (7b), and between universities (7c).

8. To investigate possible associations between food purchasing and food availability at the UPV/EHU and OsloMet, as well as differences between universities (8).
9. To assess the main food choice determinants of the communities of the UPV/EHU and OsloMet (9a), and to assess differences according to the university community group (9b), and between universities (9c).
10. To analyse opinions on food availability and suggested changes by the communities of the UPV/EHU and OsloMet (10a), and differences between the university community groups (10b) and between universities (10c).

**CHAPTER 3. STUDY DESIGN, SETTING,
METHODS AND SUBJECTS**

3.1. STUDY DESIGN AND SETTING

A cross-sectional observational study was conducted which assessed food availability and product properties at the UPV/EHU and OsloMet, as well as food purchasing behaviours, choice determinants and opinions on the food availability by the communities of the aforementioned universities. Data on food availability and properties were recorded at all UPV/EHU campuses during the 2016/17 and 2017/18 academic years, and at the main OsloMet campuses during the 2019/20 academic year. The main OsloMet campuses, in terms of students and staff numbers, are Pilestredet and Kjeller campuses. Pilestredet and Kjeller campus had 19,500 students and 2200 staff in the academic year 2019/20, whereas the campus excluded in the present study, Sandvika campus, was about 500 students and only one employee (Oslo Metropolitan University, 2019). The UPV/EHU campuses had 42,598 students and 4782 staff in the academic year 2016/17. The survey on food purchasing behaviours, choice determinants and opinions on food availability was addressed to the entire community (students and staff) of both participating universities. This survey was completed between February and October 2018 at the UPV/EHU, and between March and May 2020 at OsloMet.

3.2. METHODS AND SUBJECTS

An overview of the methods, recorded data, estimated variables and data derived related to the food supply in outlets at the UPV/EHU and OsloMet are shown in **Table 1**.

3.2.1. Registration of the data on the food supply in outlets of the University of the Basque Country - UPV/EHU (including commercial and home-made products)

During the 2016/17 and 2017/18 academic years, data about the food supply from all the outlets (cafeterias/restaurants/canteens, vending machines and the supermarket) of the three campuses of the UPV/EHU (Araba/Álava, Bizkaia and Gipuzkoa) were recorded. During this period, a total of 21 companies were subcontracted by the UPV/EHU to offer food services, 18 for cafeterias/restaurants/canteens, 2 for vending machines and 1 for the supermarket service. These outsourced companies did not change during the study period and neither did the price of the products, except for the prices for

3 out of 7 cafeterias/restaurants/canteens on the campus of Bizkaia. Regarding the vending machines, data were recorded for all the vending machines of the three campuses of the UPV/EHU, except for machines that, due to their location, are not usually accessed by undergraduate students (n=24 vending machines) since they are in buildings earmarked for research. Such is the case of the following vending machines: 11 machines on the campus of Araba/Álava, located at Lascaray and Micaela Portillo Research Centres; 12 vending machines on the campus of Bizkaia, located next to the classrooms of the Cooking School of Leioa (EHL, *Escuela de Hostelería de Leioa*), and at the building of the Institute of Biofisika, the Rectorate, the Aulario II, the Classrooms of Experience, and the Marine Station of Plentzia; and 7 machines of the campus of Gipuzkoa, located in the teacher's room on the third floor of the Faculty of Economics and Business, and at the Vice-Rector's Office, the Joxe Mari Korta Centre, and the Materials Physics Centre (CFM, *Centro de Física de Materiales*).

In this subsection of the study, neither were included the cafeteria/restaurant of the Faculty of Medicine and Nursing (University Hospital of Araba/Álava-Txagorritxu) on the campus of Araba/Álava, nor the cafeteria/restaurant Baserri Jatetxea on the campus of Bizkaia because the companies in charge of these services were not contracted by the UPV/EHU. In total, 203 vending machines, 20 cafeterias/restaurants/canteens and 1 supermarket were analysed at the UPV/EHU. The number of students and staff who were potential consumers of products available at these university's food outlets is shown in **Table 2**.

Data from cafeterias/restaurants/canteens and the supermarket were obtained through interviews with the staff in charge of these services by a single interviewer. To do so, a form developed for this study before data registration was used (**Appendix I**). This form included the following information for commercial products: product description (including flavour or ingredient variations, such as barbecue potato chips), net weight, brand, ingredients, ingredient percentage (if available), nutrition labelling information (if available), price and location of the product. The price per portion was converted to euros for every 1 kg/L (€/kg or €/L) to make comparisons between products.

Table 1. Overview of the methods, recorded data, estimated variables and data derived related to the food supply in outlets at the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Methods	Recorded data	Estimated variables	Data derived from recorded and/or estimated variables
Direct recording of data through forms (Appendix I, II and IV) and photographs taken <i>in situ</i> ^a . Indirect recording of data through the supplying companies.	<i>Commercial product data</i> : description (including flavour or ingredient variations, such as barbecue or plain potato chips), net weight, brand, ingredients, ingredient percentage (if available), nutrition labelling information (if available), price ^a and location of the product ^a (only in vending machines).	Energy, protein, total fat, SFA, TFA, fibre, sugar, sodium and fruit, vegetable and nut content.	Price (€)/kg or L ^a . Classification according to the type and subtype of food and location in vending machines (to assess promotion). NPMs: the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU (MFU, 2013) criteria. NOVA food classification system (Monteiro et al., 2018a). Audit (an adaptation of the method proposed by Roy et al., 2016).
	<i>Home-made product data</i> ^a : description, net weight, ingredients and price.	Energy, SFA, TFA, added sugars, fibre, sodium and calcium.	Price (€)/kg or L. Classification according to the type of food (Appendix III) and components of the menu of the day ^b . NPM: NINPS (Nestlé Company, 2004).

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Fagligle Utaalq*; NNPS, Nestlé Nutritional Profile System; NPM, nutritional profile model; SFA, saturated fatty acids; TFA, *trans* fatty acids. Note: ^aThis method/data was only used/recorded in the UPV/EHU; ^bComponents of the menu of the day: starter, main course, side dish, dessert, and a portion of bread.

Table 2. The population of students and staff of the University Basque Country – UPV/EHU during the 2016/17 academic year.

	Total, n	Women, %	Men, %
Student's total	42,598	53.3	46.7
Bachelor's degree	35,783	53.8	46.3
Masters' degree	3327	48.9	51.1
Specialist/Expert course	519	54.0	46.1
Doctorate	2969	53.1	46.9
Staff's total	7482	51.8	48.2
Teacher and researcher	4360	45.8	54.2
Researcher	591	51.8	48.2
Research fellows	640	56.4	43.6
Administrative staff	1891	64.0	36.0
Total	50,080	53.1	46.9

Note: Data provided by the Rector's Office of the University of the Basque Country – UPV/EHU.

Data related to the food and drinks offered at vending machines were collected through a form (**Appendix II**) developed for this study before data registration. This form included the following information: the number and type of machines, building type in which they are located (academic buildings, library, recreation facilities and cafeterias/canteens, as described by other authors) (Horacek et al., 2019), building floor, product description, location in the machine and portion price. The information collected regarding these products was the same as described above for products from cafeterias/restaurants/canteens. Cold and hot foods were grouped into the same category because the number of hot foods was small (0.9% of total foods). Duplicate items were also noted as other authors previously did (Byrd-Bredbenner et al., 2012) to have complete information about the food offerings in vending machines.

In addition, home-made products sold in cafeterias/restaurants/canteens were photographed to facilitate its subsequent analysis. Two digital photographs were taken of at least one product from each of the food groups described in **Appendix III**, one at a distance of 50 cm from the food or plate and at an angle of 90°, and another at the same distance with an angle of 45° (Lazarte et al., 2012). In addition, a BIC® type pen (14.7 cm long) was placed on the left of the food or plate as a reference to provide a scale of the plate's size, and a small bottle of water (18 cm high) behind it. These photographs were taken with a Canon Powershot SX720HS digital camera. **Figure 1** shows two examples of images taken in one of the cafeterias/restaurants/canteens of the UPV/EHU. Digital photographs were also taken of all machines, specifically a photograph of the entire

machine, with an approximate distance of 2 m from the machine, and a photograph for every two rows, with an approximate distance of 1 m.

The estimation of the portion's size of food was obtained by comparing the measurements of the images taken (height, width and depth) with those dishes from the photo catalogue developed for the European Prospective Investigation into Cancer and Nutrition (EPIC) study (Van Kappel et al., 1994). The dimensions height, width and depth of the foods in the photographs were estimated using Measure™ 2.0 program (version 2.0, C Thing Software). To guarantee the objectivity of the data, there was a single observer (N.M.-P.), who previously conducted a training program to improve the accuracy in portions' estimation (Arroyo et al., 2007). Furthermore, this study employs recipes from the Cooking School of Leioa (EHL, *Escuela de Hostelería de Leioa*) (*Escuela de Hostelería de Leioa*, 2015) or, otherwise, recipes of traditional cooking (Hogarmania, n.d.) and usual portion sizes (Carbajal & Sánchez-Muniz, 2003) to calculate the weight of each ingredient.



Figure 1. Photographs of a plate of one of the cafeterias/restaurants/canteens of the UPV/EHU (taken with an angle of 90° and 45° and a distance of 50 cm, above the plate)

3.2.2. Registration of data on the food supply in outlets of OsloMet – Oslo Metropolitan University (including only commercial products)

During the 2019/20 academic year, data about the food supply of all food outlets (seven canteens, three coffee shops and two vending machines) within two of the three campuses of OsloMet were recorded. The distribution of food outlets by campus was as follows: 8 at Pilestredet campus (6 canteens and 2 coffee shops) and 4 at Kjeller campus (1 canteen, 1 coffee shop and 2 vending machines, one for hot drinks and one for snacks). The food outlets within Pilestredet and Kjeller campuses were identified, thanks to the information provided by the Foundation for Student Life in Oslo and Akershus (Studentsamskipnaden i Oslo og Akershus – SiO). SiO is a student welfare organization that operates food services on campus at universities in Oslo and Akershus (Norway). The food and drinks list was also obtained through SiO. It provided the information described in **Appendix I**, except for the price of the products. Subsequently, the products were categorised using the classification shown in **Table 3**. It should be noted that this list did not include hot drinks such as coffee or chocolate.

Table 3. List of food and drinks analysed.

Product	Group	Subcategory	n (%)	
Solid foods	Fruit	Dried fruit	3 (1.3)	
		Fresh fruit	3 (1.3)	
		Jam	2 (0.8)	
	Nuts	Fried nuts with salt	3 (1.3)	
		Fried nuts without salt	2 (0.8)	
		Natural or toasted nuts without salt	1 (0.4)	
	Salty snacks	Bakery products	18 (7.7)	
		Fried corn	1 (0.4)	
	Sandwiches	Sandwiches	3 (1.3)	
	Sweet snacks	Bakery and pastry	Bakery and pastry	25 (10.6)
			Biscuits	2 (0.8)
			Cereal bars	6 (2.5)
			Chocolate	10 (4.2)
			Chocolate bars	7 (3.0)
			Granola	1 (0.4)
			Ice creams	29 (12.3)
			Jelly beans	1 (0.4)
			Mix of grains	2 (0.8)
			Other dairy products (pudding, porridge, etc.)	Cottage cheese
	Porridge with added sugars	7 (3.0)		
Porridge with sweeteners	3 (1.3)			
Porridge without added sugars	2 (0.8)			

Continuation of Table 3.

Product	Group	Subcategory	n (%)
Solid foods	Other dairy products (pudding, porridge, etc.)	Protein bars	1 (0.4)
		Pudding	1 (0.4)
		Rice pudding with added sugars	3 (1.3)
		Rice pudding with sweeteners	1 (0.4)
	Others (chewing gums, sweets)	Candies with added sugars	11 (4.6)
		Candies with sweeteners	4 (1.7)
		Chewing gums with sweeteners	1 (0.4)
Cold drinks	Bottled water	Bottled water	3 (1.3)
	Carbonated drinks	Carbonated drinks with added sugars	16 (6.8)
		Carbonated drinks with juice	6 (2.5)
		Carbonated drinks with sweeteners	16 (6.8)
		Soda	2 (0.8)
	Dairy drinks	Cappuccino shake	2 (0.8)
		Chocolate shake	8 (3.4)
		Coffee shake	1 (0.4)
		Iced coffee	1 (0.4)
		Mocha shake	2 (0.8)
	Fruit juice	Fruit juice from concentrated	7 (3.0)
		Smoothies	4 (1.7)
		Milk	Milk
	Non-carbonated drinks	Non-carbonated drinks with added sugars	9 (3.8)
		Non-carbonated drinks with sweeteners	1 (0.4)
		Vegetable drinks	Oat milk

3.2.3. Analysis of the food supply in outlets of the University of the Basque Country - UPV/EHU (including commercial and home-made products) and OsloMet - Oslo Metropolitan University (including only commercial products)

The **commercial products** sold in outlets at the UPV/EHU and OsloMet were **categorized** according to the document on food in schools developed by the Spanish Agency for Consumption, Food Safety and Nutrition (*Agencia Española de Consumo, Seguridad Alimentaria y Nutrición* [AECOSAN]) (AECOSAN, 2010) and the Global Food Monitoring Group food categorisation system (Dunford et al., 2012) (**Appendix V**).

Information about the **nutritional composition** of the products sold in outlets at the UPV/EHU was obtained from different sources, as follows (according to the order of preference): nutrition labelling, manufacturer's website and/or the DIAL program 2.12, a food composition database developed for the Spanish population (Ortega et al., 2016). When the nutritional information required for this study was not available in the nutritional labelling or manufacturer's website, these data were estimated from the

ingredient list and the amount for each of them, using the DIAL program 2.12. The DIAL program was completed with the food composition tables of Mataix et al. (2009) whenever necessary. For each product, the energy content and the following nutrients were estimated: proteins, sugars, dietary fibre, total fat, *trans* fatty acids (TFA), saturated fatty acids (SFA) and sodium content. These data were calculated per 100 g of product and per portion. In those products in which TFA data were not available in the nutrition labelling, nor on the manufacturer's website or in the DIAL program (Ortega et al., 2016), they were estimated using the report "Content of *Trans* Fatty Acids in Foods in Spain, 2015" (AECOSAN, 2016), and the food composition database of the United States Department of Agriculture (USDA) (United States Department of Agriculture, Agricultural Research Service, 2019). The nutritional information from products sold in outlets at OsloMet was also obtained from different sources, as follows (according to the order of preference): nutrition labelling, manufacturer's website and/or Kostholdsplanleggeren, a diet tool from the Norwegian Directorate of Health and the Norwegian Food Safety Authority (Norwegian Directorate of Health & Norwegian Food Safety, n.d.).

To indicate the **nutritional quality** of each food or drink item, the following nutrient profiling models (NPMs) were used: those proposed by the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and those of the Norwegian Food and Drink Industry Professional Practices Committee (*Matbransjens Faglige Utvalg* [MFU]) (MFU, 2013). The former criteria are those designed for the food supply present in vending machines, canteens and kiosks in education centres. The AECOSAN criteria have six components: energy, total fat, SFA, TFA, sugar and salt. These criteria set the following limits per 100 g or mL of product: in foods ≤ 400 kcal, ≤ 15.6 g total fat, ≤ 4.4 g SFA, ≤ 1 g TFA, ≤ 30 g sugar and ≤ 1 g salt; and in drinks, ≤ 100 kcal, ≤ 3.9 g total fat, ≤ 1.1 g SFA, ≤ 0.25 g TFA, ≤ 7.5 g sugar and ≤ 0.25 g salt. Products that were over at least one of the cut-offs were considered as LNQ. These criteria focus on energy density and nutrients that have the potential to negatively affect health or "at-risk" nutrients, which can be a limitation when analysing the nutrient profile. For this reason, we also used the UK NPM, which was developed by the UK Food Standards Agency (Department of Health of the UK, 2011).

This instrument is one of the most frequently validated models (Labonté et al., 2018) In addition to the "at-risk" nutrients, the UK NPM also includes foods and nutrients considered to have a beneficial effect on health (i.e., fruit, vegetables, nuts, protein and

fibre). The UK NPM uses a simple scoring system wherein points are allocated based on the nutrient content of 100 g of food or drink. To do so, the nutrient content of each food and drink was assessed against a set of published criteria to determine whether it contains certain nutrients above or below particular thresholds. This model has seven components: energy, SFA, sugar, sodium, “fruit, vegetables and nuts”, fibre and protein; and provides a single score for any given food product, based on calculating the number of points for “negative” nutrients that can be offset by points for “positive” nutrients.

Points are awarded for energy, SFA, sugar and sodium (“A” nutrients) and fruit, vegetable and nut content, fibre and protein (“C” foods and nutrients). The amounts of these components were determined from the food labelling (ingredient list, proportion of the ingredients listed on the label that have the highest percentages and nutrition labelling), manufacturer’s website and/or the dietary assessment that was carried out with the food composition database above-mentioned. The score for “C” foods and nutrients is subtracted from the “A” nutrients score to give a final score. If the score is <4 for foods or <1 for drinks, the product is classified as HNQ. When scores exceed these limits, however, the product is classified as LNQ (e.g., high-saturated fat, sugar and/or salt content). Nonetheless, this model also has limitations, since certain foods with high levels of a particular “at-risk” nutrient (e.g., fat), which are also key sources of some micronutrients, may be classified as LNQ. For example, some cheeses may be classified as LNQ, despite being key sources of dietary calcium and riboflavin. To overcome this limitation, we added other criteria in the evaluation of the nutrient profiling, those that are commonly used to regulate the marketing of products of LNQ to children in Norway, which is a self-regulation scheme operated by the industry through their organization, the MFU criteria (2013).

The MFU provides a list of products of LNQ according to their content in one or more of the following components, in most cases per 100 g of product: total fat, SFA, sugar, salt, nutritional density and energy density. The limits established for each of these components vary according to the type of food. An example is that milk products with more than 15 g added sugar per litre, breakfast cereals with more than 20 g sugar in total per 100 g and yoghurt with more than 11 g sugar in total per 100 g are classified as LNQ according to the MFU criteria. Finally, the resulting categories after applying the above-mentioned three criteria, the AECOSAN, the UK NPM and the MFU criteria, were

combined as follows: if a product had been classified as LNQ according to the three classifications, it was considered LNQ. The rest of the products were categorised as HNQ. This criterion was agreed as being more rigorous than the one that would consider as LNQ those products that were classified as such according to one or more classification systems. In the analysis of the products from the vending machines at the UPV/EHU separately, the resulting categories after applying the AECOSAN and the UK NPM were combined as follows: if a product had been classified as LNQ according to both classifications, it was considered LNQ. The rest of the products were categorised as HNQ. The MFU criteria were not applied to the separate analysis of the products from the vending machines at the UPV/EHU.

Additionally, the food or drink items were classified using the **NOVA system** (Monteiro et al., 2018a), which categorises foods according to their nature, purpose and degree of industrial processing. This system distinguishes between the following groups: (i) unprocessed or minimally processed foods, (ii) processed culinary ingredients, (iii) processed foods and (iv) ultra-processed products. This last group, ultra-processed foods, are formulations made mostly or entirely from substances derived from foods (e.g., casein, lactose, whey, gluten, hydrogenated oils and maltodextrin, among others) and additives (e.g., colour stabilizers, flavour enhancers, non-sugar sweeteners and emulsifiers, among others), with little if any intact unprocessed or minimally processed. In the present study, the category “processed culinary ingredients” was not assessed, except for those sold in the supermarket, because this type of product was not offered in the vending machines and cafeterias/restaurants/canteens studied. However, these types of products were part of ready-to-eat foods such as salads with dressing sold in the vending machines that met the criteria to be classified as processed foods.

The **home-made products** offered in cafeterias/restaurants/canteens at the UPV/EHU were analysed through the **Nestlé Nutritional Profiling System** (NNPS) (Nestlé Company, 2004). This system was designed to support the optimization of the nutritional composition of products. The criteria used in NNPS are each expressed as a percentage of daily reference values per serving or percentage of energy, and based on the recommendations for dietary intakes, issued by authorities such as the WHO (2003) and the dietary reference intakes, published by the US Institute of Medicine (2006). The NNPS works by profiling each food and drink product against specific criteria derived from the

following principles of assessment: (i) the product category and its role in the overall diet, (ii) specific nutritional factors (energy, sodium, added sugars, fructose, TFA and SFA) pertinent to public health and essential nutritional contributions, (iii) maximum and minimum non-compensatory thresholds, and (iv) serving as consumed and reference values specific to adults. Products that did not meet at least one of the cut-offs of the NNPS were considered as LNQ. The rest of the products were categorised as HNQ. To estimate the energy and nutrient intake, all food items were entered into the DIAL program (Ortega et al., 2016). For each product, the energy content and the following nutrients were estimated: total fat, TFA, SFA, protein sodium, added sugars and calcium. As an exception to the NNPS, in the present study, the amount of fructose added was not taken into consideration, as it was not possible to collect through the DIAL program (Ortega et al., 2016), the Spanish food composition tables (Mataix et al., 2009) or the food composition database of the USDA (United States Department of Agriculture, Agricultural Research Service, 2019).

On the other hand, among the home-made products sold in outlets at the UPV/EHU, menu components (**Appendix VI-XXII**) were categorized according to the following documents: the “Consensus Document on Food in Educational Centres” of the AECOSAN (AECOSAN, 2010) and the “Spanish Healthy Eating Guide” (*Sociedad Española de Nutrición Comunitaria*, 2004). The nutritional profile of the menus of the day was also analysed applying the criteria of the NNPS (Nestlé Company, 2004), first to starters and main dishes separately, and second to the menus resulting from all possible combinations of starters, main dishes and desserts. Moreover, the results of the analysis of the menus are expressed as a percentage of the daily reference values for energy and nutrients recommendations for the Spanish population (Serra & Aranceta, 2011). To estimate the energy and nutrient intake, all food items were entered into the DIAL program (Ortega et al., 2016), which is a dietary assessment program. For each menu of the day, the energy content and the following nutrients were estimated: total fat, SFA, TFA, carbohydrates, sugar, added sugar, fibre, protein and sodium.

Both commercial products and home-made products offered in outlets at the UPV/EHU were analysed using an adaptation of the methodology proposed by Roy et al. (2016). These authors developed an index to **audit the quality** of the food supply at the university level, which includes the following aspects: availability, accessibility and

promotion. This tool includes a list of products of HNQ and LNQ that are part of 10 categories (sugar drinks, diet drinks, dairy drinks, other drinks, chocolates and sweets, snacks of LNQ, snacks of HNQ, fruits and nuts, HNQ meals with vegetables as a major component and foods of LNQ). Availability was defined as “food and drink products that are present and ready for purchase within a food outlet or vending machine” (Roy et al., 2016). In the context of this measure, the presence of products of LNQ (e.g., sugar-sweetened drinks) in certain outlets scores 0, while the presence of products of HNQ (e.g., fresh fruit) scores 1. This was the same scoring method used for accessibility of products of LNQ (i.e., 0=highly accessible, 1=less accessible) and promotions (i.e., 0=promoted, 1=not promoted). Alternatively, for products of HNQ, the opposite scoring system was used. For example, fresh fruit was scored as follows – 0=not available, 1=available; 0=less accessible, 1=highly accessible; and 0=not promoted, 1=promoted.

Accessibility was defined as “the ease with which food and drink products can be obtained by consumers” (Larson et al., 2008). In the context of this measure, highly accessible products include: (i) products near cash registers, (ii) withing-floor displays, and (iii) self-serve fridges. Whereas, difficult to access products include: (i) products behind counters, and (ii) made-to-order foods. Finally, promotion was defined as “any form of display, rebate, coupon or sale that is used to announce and encourage purchasing of doos and drink products” (Freeman et al., 2016; Glanz et al., 2005). The criterion for this last measure includes signs, posters, stickers, banners, billboards, table tents, end-of-aisle displays, all of them A4 size or larger.

The maximum score of this index is 148, and the higher the result, the higher the nutritional quality the food outlet is. To interpret the results obtained in the present study, the cut-off points established by the authors of the original index were used. Thus, a food outlet was considered as HNQ if the total score obtained was >86; as LNQ if it was <70; and as moderate nutritional quality if the score was between 70 and 86. Separate total scores were also calculated for individual indicators of availability, accessibility and promotions.

The adaptation of the methodology proposed by Roy et al. (2016) consisted of: first replacing products that were not commonly consumed in the studied environment by others of frequent consumption (in particular, sushi rolls were replaced by small servings); second using UK NPM as a tool to determine if a product was of HNQ or LNQ

in those items in which Roy et al. (2016) established an energy (kJ) limit per serving, and third considering dairy products without added sugars as HNQ. The reason for the second change of this adaptation was because UK NPM is a complete and rigorous scoring system that in addition to energy, also takes into account “at-risk” nutrients and foods/nutrients considered to have a beneficial effect on health (i.e., fruit, vegetables, nuts, protein and fibre). The third change was made because according to the evidence, dairy foods consumption (including full-fat dairy) as part of healthy dietary patterns is related to a neutral to a protective association for cardiometabolic health (Hirahatake et al., 2020).

Finally, the **promotion of food and drinks from vending machines** at the UPV/EHU was assessed through their location in the machines, based on the information recorded in the abovementioned photographs. It should be noted that none of the vending machines analysed had advertisements inside, around or on the vending machine fronts. Merchandising criteria were used to classify the products according to their location in the machine: ground level (at a height of less than 80 cm from the ground); hand level (from 80 cm to 120 cm); eye level (from 120 cm to 170 cm); and head level (more than 170 cm) (*Instituto Datakey, 2014*). To facilitate the data analysis, this classification was regrouped as follows: if the product was located at a height between 80 cm and 170 cm, it was considered to be promoted; in contrast, at heights above 170 cm or under 80 cm, the product was considered to be not promoted.

Promotion was not evaluated for those products that were not directly visible to consumers (all hot drinks and some cold drinks), that is, those from vending machines that were either digital or non-transparent. In all these cases, the product selection panels, in which the list of products offered is displayed, were located at the level of the hands or eyes.

3.2.4. Quality Management of the data related to the food environment of the University of the Basque Country - UPV/EHU and OsloMet - Oslo Metropolitan University

All data were collected by a single researcher (N.M.-P.) and reviewed by another researcher (M.A.-I.). We used unique outlet identification numbers that were attached to each recording sheet. To check for quality data and derived indices (NPMs, level of processing and audit), subsamples of outlets and products were repeatedly examined. The

data set was made available for analysis on a protected central data server. Access to the data is restricted to authorised members of the research team.

3.2.5. On-campus food purchasing behaviours, choice determinants and opinions on food availability by the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University

Data were registered using an adapted version of the **questionnaire used by Tam et al. (2017)**. First, the original version was translated into Spanish and Basque by using the double translation technique (Speber, 2004). Before its piloting, the questionnaire was completed by 5 students, 5 education and/or research staff (ERS), 5 administrative and services staff (ASS) and 5 people who worked in food services at the UPV/EHU, with demand for “debriefing” (Hess & Singer, 1995; Hughes, 2004) and legibility (Barrio-Cantalejo, 2007). The pilot study at the UPV/EHU was conducted with 10 students, 10 ERS and 10 ASS. Second, the English translation of the adapted and piloted version was contrasted with the original version. Third, the English version was reviewed by five academic staff of OsloMet, to ensure that questions were easily understood, free from bias and appropriately structured. The feedback was used to design the final survey instrument we applied in OsloMet. The items that were included in the survey tool applied in OsloMet were the same as those of the questionnaire applied at the UPV/EHU. Items that are not commonly sold in Norwegian food outlets were excluded from the OsloMet questionnaire, such as “small servings” that were not included in the food purchasing behaviours section.

The final adapted version for both universities was divided into 4 sections with 37 questions: demographic characteristics, food purchasing behaviours, choice determinants, and opinions about the current campus FE. Demographic items included sex, age, Faculty or Centre associated with, working/study status (part-time or full-time), hours spent on campus, and for students, degree level (undergraduate or postgraduate). Food purchasing behaviour questions ascertained motives for and frequency of purchasing different types of food.

Opinion items regarding the FE employed a 5-point Likert scale (strongly agree, agree, neutral, disagree, or strongly disagree) to determine views on the current and potential

opportunity to change aspects of the FE and a 0–10 scale (not at all satisfied to extremely satisfied) to determine the satisfaction levels with the provision of foods on campus. Most questions were closed-ended (n=35), but the respondents had the opportunity to provide open-ended suggestions (n=2) regarding improvements to the campus FE. The category analysis of the open-ended questions was undertaken by two of the researchers (N.M.-P. and M.A.-I.) independently and then conjointly. This analysis was conducted by means of text analysis procedures (Popping, 2015). Themes of participant responses were developed through cascading analysis of responses, rather than through an a priori construct. In several steps, the researchers iteratively reviewed answers and generated thematic categories. After the final coding was completed, the categories were combined into major themes.

There were no discrepancies between the categories derived by the two investigators, and none of these categories differed from the opinion items formulated as closed-ended questions. Therefore, these open-ended answers were incorporated into closed-ended answers in the category “agree” of the corresponding item. In particular, at the UPV/EHU, the opinion items formulated as closed-ended questions and the number of open-ended responses that were incorporated into each of them were the following: “variety of food” (n=21), “higher quality foods” (n=9), “cheaper foods” (n=7), “more freshly prepared food” (n=4), “more fresh fruit” (n=2), “more special diet choices” (n=2), “more sustainable products” (n=2) and “the removal of vending machines” (n=2). At OsloMet, were the following: “variety of food” (n=6), “higher quality foods” (n=2), “detailed nutritional information of foods or dishes” (n=1) and “healthier foods for lower cost” (n=1).

Nine questions from the original questionnaire were excluded (questions 8, 17, 26-30 and 35) to adapt them to the characteristics of the environment in which the research was carried out. In addition, the questions about food consumption were adapted with respect to the original questionnaire. Thus, products that were not commonly consumed (e.g., hot ethnic cuisine, casserole/stew/roast/barbecue food/schnitzel and sushi) were replaced by items that were commonly consumed in the current FE (e.g., menu - starter, main course and desserts in both universities, and small servings in the UPV/EHU).

At both universities, the survey was self-administered and completed online. All enrolled students and current staff were eligible to participate. Participants could complete the survey only if they consented to participate in this study on the first page.

Participation was anonymous, but to encourage completion, a gift card prize-draw incentive was used. To ensure respondents were current staff and students, only university emails were considered in the draw. Survey responses were separated from the lucky draw entry to maintain anonymity.

At the UPV/EHU, the survey was completed using the application *SurveyMonkey*TM over 9 months between February and October 2018. The survey was advertised on all three campuses through the Faculties or Centres (using notice boards and social networks) and the Sustainability Directorate of the UPV/EHU. The sample of the UPV/EHU was drawn according to the data on the number of students and staff enrolled or employed at the UPV/EHU (UPV/EHU, 2017), which was 50,080 (42,598 students, 5591 ERS, 1891 ASS). Regarding the distribution of this campus community by sex, the percentage of women was 40.9% (46.7% of students, 52.4% of ERS and 36.0% of ASS were women); by area of knowledge, the percentage of Health Sciences was 15.7% (15.2% of students and 19.3% of ERS were from Health Sciences; knowledge area is a data not applicable to ASS). Taking into account the total population, the sample size was estimated to be a minimum of 382 students, 360 ERS and 320 ASS based on the precision level of +/-5%, the confidence interval (CI) of 95% and $p=0.05$, using the Epidat 3.0 program (Hervada et al., 2006). Finally, 1785 subjects (396 ERS, 300 ASS and 1089 students) participated in the study. The study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving human subjects were approved by the Ethical Committee on Human Research of the UPV/EHU (CEISH/2018/018).

At OsloMet, the survey was completed using in this case the application *Nettskjema* (University Information Technology Centre, University of Oslo, Oslo, Norway) over 12 weeks between March and May 2020. The survey was advertised on participating campuses using electronic newsletters and the university Facebook page. The sample was drawn according to the data on the number of students and staff enrolled or employed at Pilestredet and Kjeller campus in 2019 that was 21,700 (2200 staff and 19,500 students). Regarding the distribution of this campus community by sex, the percentage of women was around 68% (68% of students and 66% of staff were women); by area of knowledge, the percentage of Health Sciences was about 23% (22% of students and 33% of staff were from Health Sciences) (Oslo Metropolitan University, 2019). Taking into account the total population ($n=21,700$), the sample size was estimated to be a minimum of 96 participants

based on the precision level of $\pm 10\%$, the CI of 95% and $p=0.05$, using the Epidat 3.0 program (Hervada et al., 2006). Finally, 129 subjects (seventy-one students and fifty-eight staff) participated in the study.

3.2.6. Quality Management of data related to the survey on food purchasing behaviours, choice determinants and opinions on food availability by the communities of the University of the Basque Country - UPV/EHU and OsloMet - Oslo Metropolitan University

We used unique subject identification numbers that were attached to each register. Only completed questionnaires were included. Data preparation consisted of data cleaning based on traditional approaches, such as identifying inconsistencies, lie scores and response sets. The data set was made available for analysis on a protected central data server. Access to the data is restricted to authorised members of the research team.

3.3. STATISTICAL ANALYSIS

The data were analysed using SPSS for Windows (version 24.0, SPSS Inc., Chicago, IL, USA). The results are expressed as means (standard deviation, SD) for continuous variables and as percentages for categorical variables. The symmetry of the distribution of the continuous variables was determined by a Kolmogorov-Smirnov-Lilliefors test. The differences between variables were calculated with the Mann-Whitney U test. The categorical variables were analysed using χ^2 test or Fisher's exact test.

Each commercial and home-made product offered was counted once, except for the food offered at vending machines at the UPV/EHU. In this last case, as mentioned above, duplicate items were also noted as other authors previously did (Byrd-Bredbenner et al., 2012) to have complete information about the food offerings. In the analysis of differences in on-campus FE among the UPV/EHU and OsloMet, only the product categories available at both universities were included (subsection 4.4.1). All tests were two-sided, and p -values less than 0.05 were considered statistically significant.

The κ coefficient was calculated to investigate the degree of agreement between the three NPMs used (the AECOSAN, the UK NPM and the MFU criteria) and between these

models and NOVA classification. The κ results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect (Landis & Koch, 1977). Regression analyses were applied to examine whether price and promotion were associated with the nutritional quality of food sold in outlets at the UPV/EHU. In particular, simple linear regression models were conducted to assess the possible associations between nutritional quality and price (dependant variable) of all food sold at the UPV/EHU, and binary logistic regressions to assess the associations between nutritional quality and promotion (dependant variable) of products from vending machines. Before conducting the simple linear regressions, the dependant variable was logarithmically transformed to approximate a normal distribution. Separate models were fit for each product category.

In the survey on food purchasing behaviours, preferences and opinions on food availability carried out at the UPV/EHU, all the results were weighted to ensure representativeness of the university community population using weighting coefficients provided by the list of staff and students enrolled or employed at the UPV/EHU in 2016/17 (**Table 4**) (UPV/EHU, 2017). All analyses of the data registered in this UPV/EHU survey were conducted separately for male and female students because of the differences in their eating behaviours (Olfert et al., 2019).

Table 4. Population and sample of the University of the Basque Country - UPV/EHU by professional group and sex.

University community groups	Sex	UPV/EHU population ^a	Theoretical sample n (%)	Real sample	Participation rate, %	Weighting coefficient
Students	Women	19,879 (46.7)	377	665	3.3	29.9
	Men	22,719 (53.3)	378	354	1.6	64.2
	Total	42,598 (85.0)	382 (35.9)	1019	2.4	41.8
ERS	Women	2929 (52.4)	340	231	7.9	12.7
	Men	2662 (47.6)	336	148	5.6	18.0
	Total	5591 (11.2)	360 (33.9)	379	6.8	14.7
ASS	Women	680 (36.0)	246	175	25.7	3.9
	Men	1211 (64.0)	292	110	9.1	11.0
	Total	1891 (3.8)	320 (30.1)	285	15.1	6.6
Total	Total	50,080	1062	1683	3.4	

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff.
Note: ^aUniversity of the Basque Country - UPV/EHU (2017).

In both universities, the UPV/EHU and OsloMet, to simplify the analysis of the survey data, the answers to the questions regarding “determinants in food purchase” were recategorised as “important” (“very important” or “moderately important”) and “not important” (“little important” or “not at all important”); the answers to the questions regarding “proposed changes to the FE” were recategorised as “agree” (“strongly agree” or “agree”) and “disagree” (“neutral”, “disagree”, “strongly disagree” or “not sure”).

CHAPTER 4. RESULTS

4.1. ON-CAMPUS FOOD ENVIRONMENT OF THE UNIVERSITY OF THE BASQUE COUNTRY - UPV/EHU

4.1.1. Analysis of the food environment of the University of the Basque Country - UPV/EHU (including commercial and home-made products)

A total of 9103 foods (5116 commercial products and 3987 homemade products) were found in the food outlets assessed (n= 4047 in the cafeteria/restaurants/canteens; n= 1160 in the supermarket and n= 3894 in vending machines). As presented in **Table 5**, the most available commercial products were sweets snacks (i.e., bakery and pastry products, biscuits) (n= 1403, 27.4% of the total commercial products), followed by salty snacks (i.e., chips, salty bakery products) (n=764, 14.9% of the total commercial products) and sugar-sweetened and/or non-sugar sweetened carbonated drinks (n= 601, 11.7% of the total commercial products). The total number of culinary ingredients sold was of 30: dairy accessories (i.e., cream, evaporated milk) (n= 3), edible oils and emulsions (n=7), salt (n= 1), spices and herbs (n= 6), sweeteners (n=7), vinegar (n= 3) and other culinary ingredients (i.e., yeast, baking soda) (n= 3). All of the culinary ingredients were exclusively for sale in the supermarket.

Approximately two-thirds of the total commercial products were classified as LNQ according to the AECOSAN criteria (64.9%), the UK NPM criteria (59.3%) and the MFU criteria (78.9%). It was slightly lower the percentage of LNQ that resulted from the combination of the three criteria (53.3%) than the percentages obtained for each of the criteria separately. Moreover, the percentage of LNQ was higher in solid foods than in cold drinks for the three NMPs ($p<0.001$). The commercial products that were mostly classified as LNQ were those of the following categories: cocoa powder, sweets and chewing gums with added sugars and sweet snacks. The AECOSAN criteria that foods most frequently did not meet were the energy (62.6%) and total fat content (60.1%); and in cold drinks, the sugar content (33.2%). Additionally, according to the NOVA system, 84.4% of the products were ultra-processed, with significantly more solid foods (90.5%) than cold drinks (75.1%) ($p<0.001$) (**Table 5**). Comparison of the results obtained from the three NPMs showed substantial agreement between the results obtained with the AECOSAN and the UK NPM criteria, a moderate agreement between those obtained with the AECOSAN and the MFU criteria, and none to slight agreement between the classification according to the UK NPM and the MFU criteria (**Table 6**).

Table 5. Nutritional profile and processing level of commercial products sold in food outlets on campus of the University of the Basque Country – UPV/EHU.

Type of product ^a	n (%) ^b	Percentage not meeting the criteria										NOVA system ^h
		AECOSAN ^c , %					UK NPM ^e , %	MFU ^f , %	AECOSAN+ UK+MFU ^g , %	Ultra-processed, %		
		Energy	Total fat	SFA	TFA	Sugars					Salt	
Solid foods												
<i>Cereals and cereals products</i>												
Bread	27 (0.5)	7.4	7.4	7.4	-	66.7	74.1	7.4	92.6	7.4	74.1	
Cereals (breakfast cereals, pasta, etc.)	34 (0.7)	20.6	17.6	8.8	-	14.7	35.3	26.5	82.4	23.5	44.1	
Flour and breadcrumbs	3 (0.1)	-	-	-	-	33.3	33.3	66.7	NA	-	-	
Cold cuts and spreads	44 (0.9)	25.0	47.7	47.7	-	100.0	100.0	77.3	93.2	77.3	84.1	
Convenience foods (pizza, instant soups)	82 (1.6)	1.3	3.8	8.8	-	38.8	45.1	35.4	50.0	27.5	84.1	
<i>Dairy products</i>												
Yoghurts	26 (0.5)	-	-	-	-	-	-	7.7	53.8	-	84.6	
Other dairy products (custard, cream caramel, cheese, etc.)	39 (0.8)	7.7	56.4	69.2	-	5.1	79.5	84.6	84.6	69.2	33.3	
<i>Drink products (not ready to drink)</i>												
Cocoa powder	2 (>0.0)	-	-	-	-	100.0	100.0	100.0	NA	100.0	100.0	
Coffee products	20 (0.4)	5.0	20.0	20.0	-	5.0	20.0	20.0	NA	20.0	40.0	
Infusions	15 (0.3)	-	-	-	-	-	-	-	NA	-	-	
<i>Fish and fish products</i>												
Canned fish	22 (0.4)	-	13.6	4.5	-	40.5	50.0	13.6	54.5	13.6	-	
Fruit and fruit derivatives	79 (1.5)	-	-	-	-	11.4	11.4	8.9	8.9	8.9	8.9	

Continuation of Table 5.

Type of product ^a	n (%) ^b	Percentage not meeting the criteria										NOVA system ^h	
		AECOSAN ^c , %					UK NPM ^e , %	MFUF ^f , %	AECOSAN+ UK+MFU ^g , %	Ultra-processed, %			
		Energy	Total fat	SFA	TFA	Sugars					Salt		Total ^d
Solid foods													
<i>Legumes</i>													
Legumes and legumes derivatives	8 (0.2)	-	-	-	-	25.0	25.0	25.0	-	-	25.0	-	-
Canned legumes	9 (0.2)	-	-	-	-	-	-	-	-	-	-	-	-
Meat and meat products	14 (0.3)	-	42.9	57.1	-	85.7	85.7	85.7	71.4	85.7	71.4	78.6	78.6
Nuts	138 (2.7)	79.0	82.6	14.5	-	73.9	88.4	88.4	39.9	94.9	39.9	81.9	81.9
Salads	27 (0.5)	-	18.5	7.4	-	29.6	44.4	44.4	14.8	29.6	7.4	74.1	74.1
Salty snacks	764 (15.0)	91.9	82.5	44.1	-	88.4	99.5	99.5	79.8	96.9	78.7	97.5	97.5
Sandwiches	194 (3.8)	6.2	16.5	6.7	-	93.3	94.8	94.8	53.1	99.0	53.1	100.0	100.0
Sweet snacks	1403 (27.6)	83.7	84.3	87.0	4.6	7.3	97.6	97.6	94.0	100.0	92.4	99.8	99.8
<i>Sweets and chewing gums</i>													
Sweets with added sugars	31 (0.6)	16.1	-	-	-	-	98.8	98.8	6.5	100.0	93.5	100.0	100.0
Sweets with sweeteners	214 (4.2)	-	-	-	-	-	-	-	-	100.0	-	100.0	100.0
Sauces	27 (0.5)	14.8	25.9	14.8	-	66.7	81.5	81.5	66.7	96.3	63.0	92.6	92.6
<i>Vegetables</i>													
Canned vegetables	10 (0.2)	-	-	-	-	20.0	20.0	20.0	-	20.0	-	-	-
Fresh vegetables	15 (0.3)	-	-	-	-	-	-	-	-	-	-	-	-
Total of solid foods ⁱ	3247 (63.8)	62.6	60.1	51.4	2.0	38.1	82.8	82.8	70.0	91.3	68.5	90.5	90.5
Cold drinks													
Beer	116 (2.3)	-	-	-	-	-	-	-	26.7	NA	-	100.0	100.0
Other alcoholic drinks	80 (1.6)	8.8	-	-	-	8.8	8.8	8.8	22.5	NA	8.8	100.0	100.0
Bottled water	396 (7.8)	-	-	-	-	-	-	-	-	-	-	-	-

Continuation of Table 5.

Type of product ^a	n (%) ^b	Percentage not meeting the criteria										NOVA system ^h	
		AECOSAN ^c , %					UK NPM ^e , %	MFU ^f , %	AECOSAN+ UK+MFU ^g , %	Ultra-processed, %			
		Energy	Total fat	SFA	TFA	Sugars					Salt		Total ^d
Cold drinks													
<i>Carbonated drinks</i>													
with added sugars	310 (6.1)	0.3	-	-	-	90.3	-	90.3	100.0	90.3	100.0	90.3	100.0
with added sugars and sweeteners	105 (2.1)	-	-	-	-	73.3	-	74.3	100.0	74.3	100.0	74.3	100.0
with sweeteners	184 (3.6)	-	-	-	-	-	0.5	0.5	100.0	0.5	100.0	0.5	99.5
without sugar or sweeteners	2 (>0.0)	-	-	-	-	-	-	-	100.0	-	100.0	-	-
Dairy drinks	65 (1.3)	-	-	-	-	83.1	1.5	-	76.9	47.7	46.2	46.2	100.0
Juices	279 (5.5)	-	-	-	-	35.8	1.1	36.9	49.5	24.7	0.4	0.4	85.7
Milk	18 (0.3)	-	-	-	-	-	-	-	33.3	-	-	-	-
<i>Non-carbonated drinks</i>													
with added sugars	39 (0.8)	-	-	-	-	12.8	-	10.3	100.0	7.7	7.7	7.7	100.0
with sweeteners	2 (>0.0)	-	-	-	-	-	-	-	100.0	-	-	-	100.0
with added sugars and sweeteners	236 (4.6)	-	-	-	-	36.4	-	36.4	100.0	36.4	100.0	36.4	100.0
Vegetable drinks	7 (0.1)	-	-	-	-	14.3	-	-	14.3	-	-	-	71.4
Total of cold drinks ⁱ	1839 (36.2)	0.4	-	-	-	33.2	0.3	33.4	40.5	56.9	26.4	26.4	75.0
Total of productsⁱ	5086	40.1	38.3	32.8	1.3	31.5	24.4	64.9	59.3	78.9	53.3	53.3	84.9

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Faglige Urtvalg*; NA, not applied; NPM, nutrient profiling model; LNQ, low nutritional quality; SFA, saturated fatty acids; TFA, *trans* fatty acids. Note: ^aHot drink, such as coffee, tea, etc. are not presented in this table, these drinks were analysed together with those sold in cafeterias/restaurants in the home-made products section; ^bPercentages with respect to the total of products; ^cAECOSAN (2010); ^dThe same product may not meet more than one criterion, and therefore, the sum of the criteria does not result in the total percentage of products that do not meet the AECOSAN criteria; ^eDepartment of Health of the UK (2011); ^fMFU (2013); ^gThe three NPMs were combined as follows: if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered LNQ; ^hMonteiro et al. (2018a); ⁱThe MFU was not applied to 236 products (n=40 foods and n=196 drinks), since these criteria do not contemplate all products analysed in the present study.

Table 6. Percentages of commercial products sold on campus of the University of the Basque Country – UPV/EHU classified into the same or opposite category and agreement between the three NPMs used (the AECOSAN, the UK NPM and the MFU criteria).

	AECOSAN ^a				Kappa coefficient ^b
	LNQ		HNQ		
	n	%	n	%	
UK NPM^c					
Solid foods (n=3247)					0.596
LNQ	2238	68.9	35	1.1	
HNQ	449	13.8	520	15.5	
Total	2687	82.7	560	17.2	
Cold drinks (n=1839)					0.712
LNQ	556	30.2	189	10.3	
HNQ	59	3.2	1035	56.3	
Total	617	33.5	1236	67.2	
Total (n=5086)					0.696
LNQ	2794	54.9	224	4.4	
HNQ	508	10.0	1560	30.7	
Total	3302	64.9	1784	35.1	
MFU^d					
Solid foods (n=3207)					0.472
LNQ	2641	82.3	325	10.1	
HNQ	39	1.2	202	6.3	
Total	2680	8.4	527	16.4	
Cold drinks (n=1643)					0.215
LNQ	482	29.3	565	34.4	
HNQ	126	7.7	470	28.6	
Total	608	37.0	1035	63.0	
Total (n=4850)					0.433
LNQ	3123	64.4	890	18.3	
HNQ	165	3.4	672	13.8	
Total	3288	67.8	1562	32.2	
UK NPM^c					
MFU^{d,e}					
Solid foods (n=3207)					0.287
LNQ	2246	70.0	720	22.4	
HNQ	21	0.6	220	6.9	
Total	2267	70.7	940	29.3	
Cold drinks (n=1853)					0.408
LNQ	618	33.3	429	23.1	
HNQ	78	4.2	518	27.9	
Total	696	37.6	947	51.1	
Total (n=4850)					0.398
LNQ	2864	59.0	1149	23.7	
HNQ	99	2.0	738	15.2	
Total	2963	61.1	1887	38.9	

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Faglige Utvalg*; NPM, nutrient profiling model; NPM, nutrient profiling model; HNQ, high nutritional quality; LNQ, low nutritional quality. Note: ^aAECOSAN (2010); ^bThe kappa results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect; ^cDepartment of Health of the UK (2011); ^dMFU (2013); ^eThe MFU was not applied to 236 products (n=40 foods and n=196 drinks), since these criteria do not contemplate all products analysed in the present study.

In solid foods compared to cold drinks, a lower level of agreement was obtained when comparing the AECOSAN and the UK NPM criteria (specifically in salty snacks, $\kappa=0.040$) and the UK NPM and the MFU criteria (specifically in sandwiches, $\kappa=0.023$). Between the MFU and the AECOSAN criteria, the agreement was lower for cold drinks, specifically in juices ($\kappa=-0.704$). Regarding the comparison between the NPMs and processing level classification, none to slight agreement was observed between the NOVA system and the UK NPM, the AECOSAN criteria and the three NPMs combined (**Table 7**). However, there was a substantial agreement between the NOVA system and the MFU criteria. Cold drinks presented a lower agreement compared to solid foods when comparing the NOVA system with the AECOSAN criteria and the three NPMs combined, specifically in juices ($\kappa=-0.305$ and $\kappa=-0.007$, respectively). Between the NOVA system and the UK NPM and the MFU criteria, there was a lower agreement in solid foods, specifically in cereals with the UK NPM criteria ($\kappa=-0.148$) and dairy products other than yoghurt ($\kappa=-0.250$) with the MFU criteria.

Table 7. Percentages of products sold on campus of the University of the Basque Country – UPV/EHU classified into the same or opposite category and agreement between the three nutrient profiling models used and processing level classification (NOVA system).

	NOVA system ^a				Kappa coefficient ^b
	Ultra-processed		Non-ultra-processed		
	n	%	n	%	
AECOSAN^c					
Solid foods (n=3247)					0.424
LNQ	2593	79.9	94	2.9	
HNQ	345	10.6	215	6.6	
Total	2938	90.5	309	9.5	
Cold drinks (n=1839)					0.210
LNQ	574	31.2	41	2.2	
HNQ	806	43.8	418	22.7	
Total	1380	75.0	459	25.0	
Total (n=5086)					0.361
LNQ	3167	62.3	135	2.6	
HNQ	1151	22.6	633	12.4	
Total	4318	84.9	768	15.1	
UK NPM^d					
Solid foods (n=3247)					0.298
LNQ	2220	68.4	53	1.6	
HNQ	718	22.1	256	7.9	
Total	2938	90.5	309	9.5	
Cold drinks (n=1839)					0.353
LNQ	737	40.1	8	0.4	
HNQ	643	35.0	451	24.5	
Total	1380	75.0	459	26.0	

Continuation of Table 7.

	NOVA system ^a				Kappa coefficient ^b
	Ultra-processed		Non-ultra-processed		
	n	%	n	%	
UK NPM^d					
Total (n=5086)					0.357
LNQ	2957	58.1	61	1.2	
HNQ	1361	26.8	707	13.9	
Total	4318	84.9	768	15.1	
MFU^{e,f}					
Solid foods (n=3207)					0.610
LNQ	2859	89.1	107	3.3	
HNQ	77	2.4	164	5.1	
Total	2936	91.5	271	8.4	
Cold drinks (n=1853)					0.802
LNQ	1044	56.3	3	0.2	
HNQ	140	7.5	456	24.6	
Total	1184	63.9	459	24.8	
Total (n=4850)					0.751
LNQ	3903	80.5	110	2.3	
HNQ	217	4.5	620	12.8	
Total	4120	84.9	730	15.0	
AECOSAN+UK					
NPM+MFU^g					
Solid foods (n=3247)					0.297
LNQ	2181	67.2	43	1.3	
HNQ	757	23.3	266	8.2	
Total	2938	90.5	309	9.5	
Cold drinks (n=1839)					0.212
LNQ	485	26.4	1	>0.0	
HNQ	895	48.7	458	24.9	
Total	1380	75.0	459	25.0	
Total (n=5086)					0.301
LNQ	2666	52.3	44	0.9	
HNQ	1652	32.5	724	14.2	
Total	4318	84.9	768	15.1	

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Faglige Utvalg*; NPM, nutrient profiling model; HNQ, high nutritional quality; LNQ, low nutritional quality. Note: ^aMonteiro et al. (2018a); ^bThe kappa results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect; ^cAECOSAN (2010); ^dDepartment of Health of the UK (2011); ^eMFU (2013); ^fThe MFU was not applied to 236 products (n=40 foods and n=196 drinks), since these criteria do not contemplate all products analysed in the present study; ^gIf a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered as LNQ.

Among home-made products, coffee (n=1002, 25.1% of the total home-made products) and sub sandwiches (n= 481, 12.1% of the total home-made products) were the most available items on campus, as shown in **Table 8**.

Table 8. Home-made food and drinks available in food establishments on campus of the University of the Basque Country – UPV/EHU.

Type of product	n (%) ^b	Percentage not meeting the NNPS criteria ^a , %									
		Energy	Total fat	SFA	TFA	Added sugars	Protein	Sodium	Calcium	Total ^c	
Solid foods											
Snacks											
Mini pizzas	15 (0.4)	100.0	100.0	100.0	-	-	NA	100.0	NA	NA	100.0
Portion (i.e., fried potatoes, croquettes)	66 (1.6)	84.8	95.5	80.3	-	9.1	NA	42.4	NA	NA	97.0
Small servings (e.g., small portion of tortilla)	133 (3.3)	97.0	91.7	76.7	0.8	2.3	NA	83.5	NA	NA	98.5
Sweet snacks	7 (0.2)	100.0	85.7	100.0	-	28.6	NA	42.9	NA	NA	100.0
Total of snacks	221 (5.5)	93.7	93.2	80.1	0.5	5.0	NA	71.0	NA	NA	98.2
Large meals and desserts											
Combined plate	378 (9.5)	92.1	100.0	100.0	6.9	-	6.3	80.4	NA	NA	100.0
Hamburgers	50 (1.2)	86.0	100.0	100.0	34.0	-	-	60.0	NA	NA	100.0
<i>Menu of the day</i>											
Starter	326 (8.2)	25.8	70.6	31.0	0.9	0.3	NA	29.8	NA	NA	78.2
Main course	376 (9.4)	64.1	99.7	86.2	8.8	0.5	13.6	42.6	NA	NA	100.0
<i>Desserts</i>											
Dairy desserts (e.g., crème desserts, flans, rice and milk products)	129 (3.2)	7.0	25.6	24.8	5.4	60.5	-	7.8	-	3.9	72.9
Ice cream	15 (0.4)	-	-	100.0	100.0	100.0	NA	-	NA	NA	100.0
Non-dairy desserts	148 (3.7)	27.7	23.6	26.4	-	21.6	NA	6.1	NA	NA	30.4
Yoghurts	174 (4.4)	-	-	-	57.5	-	-	-	-	-	57.5
Pizza	14 (0.3)	78.6	78.6	100.0	-	-	14.3	71.4	NA	NA	100.0
Salads	32 (0.8)	40.6	96.9	37.5	3.1	-	15.6	28.1	NA	NA	100.0
Sandwiches	97 (2.4)	21.6	88.7	99.0	-	-	23.7	20.6	NA	NA	99.0
Sub sandwiches	481 (12.1)	78.0	78.8	92.9	9.8	-	4.6	75.5	NA	NA	97.1
Total of large meals and desserts	2220 (55.7)	53.4	72.4	67.9	11.2	5.8	5.7	45.6	0.2	0.2	86.6
Total of solid foods	2441 (61.2)	57.1	74.3	69.0	10.2	5.7	5.2	47.9	0.2	0.2	87.6

Continuation of Table 8.

Type of product	n (%) ^b	Percentage not meeting the NNPS criteria ^a , %									
		Energy	Total fat	SFA	TFA	Added sugars	Protein	Sodium	Calcium	Total ^c	
Cold drinks											
Natural juices	22 (0.5)	-	-	-	-	-	NA	-	-	NA	-
Hot drinks											
Broths ^e	17 (0.4)	-	-	-	-	-	NA	-	-	NA	-
Coffee ^{d,e}	1002 (25.1)	0.1	0.1	0.1	-	0.3	-	-	-	0.1	0.3
Hot chocolate ^{d,e}	170 (4.5)	0.6	0.6	0.6	-	1.2	-	-	-	68.8	68.8
Hot milk ^e	109 (2.7)	-	-	-	-	-	-	-	-	-	-
Hot water	1 (>0.0)	-	-	-	-	-	NA	-	-	NA	-
Hot vegetable drinks	11 (0.3)	-	-	-	-	-	NA	90.9	-	NA	90.9
Infusions ^e	214 (5.4)	-	-	-	-	-	NA	-	-	NA	-
Total of hot drinks	1524 (38.2)	0.1	0.1	0.1	-	0.3	-	0.7	-	7.7	8.5
Total of products	3987	35.0	45.5	42.3	6.3	3.6	3.2	29.6	3.1	3.1	56.9

Abbreviations: SFA, saturated fatty acids; TFA, *trans* fatty acids; NA, not applied; NNPS, Nestlé's Nutritional Profile System. Note: ^aNestlé Company, 2004; ^bPercentages with respect to the total of products; ^cThe same product may not meet more than one criterion, and therefore, the sum of the criteria does not result in the total percentage of products that do not fulfil the NNPS criteria; ^dThe protein and calcium criteria only were applied to those coffees (n=997) and hot chocolate (n=169) containing a relevant amount of milk ($\geq 2\%$ milk protein, equivalent to 60% milk); ^eThis item includes hot drinks prepared in cafeterias/restaurants and in vending machines, in both cases the sugar added to drinks such as coffee, chocolate or infusions was not taken into account.

Overall, more than half of the products (56.9%) were classified as LNQ and the criterion not fulfilled more frequently was the energy content, in both solid foods (87.6%) and drinks (8.5%) (Table 8). In order of frequency, the product subcategories with the highest level of non-fulfilment of the NNPS were snacks (98.2%), followed by large meals and desserts (86.6%) and hot drinks (8.5%).

Regarding the nutritional characteristics of the menu of the day, this provided an average of 1052.7 kcal (SD, 229.8), which represented 52.6% of the total kilocalorie intake according to the recommendations for an adult (Table 9). The energy and protein content of the menu of the day was higher than the recommendations for the Spanish population. In addition, the analysis of the dishes of the menu of the day showed that most of the starters consisted of vegetables (53.8%), followed by cereals (pasta or rice) (26.8%), legumes (17.8%) and others (e.g., pizza) (1.5%). The most common main dish was meat (58.5%), followed by fish (28.6%), eggs (10.6%) and others (e.g., croquettes) (2.2%); and the most common garnish on these main dishes were fried potatoes (56.7%), salad (28.8%) and others (e.g., roasted peppers) (14.5%). Regarding the dessert, yoghurt (37.3%) was the most common, followed by sweet dairy desserts (e.g., custard) (24.0%), fruit (23.2%) and sweet non-dairy desserts (e.g., cake) (15.4%). The menus had an average price of 6.7 €.

Table 9. Energy and nutrient content of the menus of the day sold in food establishments (cafeterias/restaurants/canteens) on campus of the University of the Basque Country – UPV/EHU.

Energy and nutrients	Nutritional composition of the menu of the day (n=9,023), mean (SD)	Recommendations for adults
Energy, kcal	1052.7 (229.8)	700 ^a
Carbohydrates, g	78.2 (27.4)	87.5-96.2 ^b
Sugars, g	25.2 (9.2)	
Added sugars, g	8.4 (11.3)	
Total fat, g	57.7 (30.2)	23.3-27.2 ^b
SFA, g	21.1 (12.9)	
TFA, g	0.4 (0.5)	
Fibre, g	10.0 (6.4)	
Protein, g	49.8 (17.9)	17.-26.2 ^b
Sodium, mg	1504.7 (1285.5)	

Abbreviations: SD, standard deviation; SFA, saturated fatty acids; TFA, *trans* fatty acids. Note: ^aBased on the recommendations on the energy intake of the midday meal of the document “*Guide of school canteens. PERSEO (School Reference Pilot Program for Health and Exercise against Obesity guide for school canteens) Program*” (Ministry of Health and Consumption, AECOSAN, Ministry of Education, Social Policy and Sports, 2008); ^bNutritional objectives for the Spanish population (Serra & Aranceta, 2011).

Concerning the systematic attempt to measure indicators of the FE of the UPV/EHU, the mean total score for all food outlets was 67.7 out of 148 and scores ranged from 56 to 77, with the supermarket having the highest score ($p>0.05$), as shown in **Table 10**. According to the cut-off points detailed in the Methods section, 79.5% of the total food outlets analysed were classified as LNQ, 20.5% as moderate nutritional quality and none as HNQ. By type of food outlet, 60.0% of the cafeterias/restaurants/canteens were classified as LNQ and 40.0% as moderate nutritional quality; 87.7% of the vending machines were classified as LNQ and 12.3% as moderate nutritional quality; and the supermarket was categorised as moderate nutritional quality ($p<0.05$). Comparing accessibility by type of food outlet, the supermarket had the highest median for accessibility (26.0 out of a possible 49) and vending machines the lowest (21.2).

Table 10. Audit of the food outlets of the University of the Basque Country - UPV/EHU: total score and availability, accessibility and promotion scores.

Mean score ^a	Type of food outlet				<i>p</i> -value ^b
	Total	Cafeteria/restaurant/ canteen (n=20)	Vending machine (n=57)	Supermarket (n=1)	
Availability	21.3 (1.9)	21.1 (3.0)	21.2 (1.3)	26.0 (-)	0.244
Accessibility	21.5 (2.2)	22.1 (3.6)	21.2 (1.3)	26.0 (-)	0.031
Promotion	24.9 (0.6)	24.6 (1.2)	25.0 (0.0)	25.0 (-)	0.572
Total	67.7 (4.0)	67.9 (6.3)	67.5 (2.3)	77.0 (-)	0.169

^aAdapted from Roy et al. (2016); ^bKruskal-Wallis test was used to assess differences between food outlets in mean score, significant *p*-values are highlighted in bold.

The average price of commercial and home-made products is shown in **Table 11**. Overall, products of LNQ had a significantly higher price than HNQ alternatives ($p<0.001$) in both commercial and home-made products. This same result was also observed for commercial cold drinks ($p<0.001$). However, home-made hot drinks of LNQ had a significantly lower price compared to HNQ alternatives ($p<0.001$). Simple linear regression also showed that the product's price was associated with the nutritional profile. Specifically, commercial cold drinks of HNQ were more likely to have lower prices than LNQ alternatives ($B = -0.30$, 95% CI -0.38, -0.22, $p<0.001$) (**Table 12** - considering the combination of the three NPMs). Whereas, home-made hot drinks that support healthy dietary recommendations were more likely to have higher prices than alternatives of LNQ ($B = 0.69$, 95% CI 0.58, 0.79, $p<0.001$) (**Table 13**).

Table 11. Relationship between nutritional profile and price of commercial and home-made products sold in food outlets on campus of the University of the Basque Country – UPV/EHU.

Type of product (n)	Price (€)/kg or L			p-value ^b
	Total, mean (SD)	HNQ (n=3811), mean (SD)	LNQ (n=4094), mean (SD) ^a	
Commercial products				
Solid foods				
<i>Cereals and cereals products</i>				
Bread (27)	4.1 (2.7)	4.0 (2.8)	5.3 (0.0)	0.091
Cereals (breakfast cereals, pasta, etc.) (34)	3.5 (2.6)	2.9 (2.5)	5.5 (1.7)	0.001
Flour and breadcrumbs (3)	0.7 (0.2)	0.7 (0.2)	-	-
Cold cuts and spreads (44)	16.6 (11.4)	11.3 (2.6)	18.2 (12.5)	0.102
Convenience foods (pizza, instant soups) (82)	10.3 (6.4)	10.1 (7.1)	10.9 (4.3)	0.079
<i>Dairy products</i>				
Yoghurt (26)	4.3 (3.6)	4.3 (3.6)	-	-
Other dairy products (custard, cream caramel, cheese, etc.) (39)	10.3 (4.8)	7.0 (2.9)	11.7 (4.8)	0.001
<i>Drink products</i>				
Cocoa powder (2)	7.1 (0.8)	7.1(0.8)	-	-
Coffee products (20)	23.1 (14.1)	20.6(13.9)	33.2(10.8)	0.099
Infusions (15)	43.0 (22.2)	43.0(22.2)	-	-
<i>Fish and fish products</i>				
Canned fish (22)	24.4(26.0)	24.6 (26.9)	23.1 (24.8)	0.523
Fruit and fruit derivatives (79)	5.2 (4.3)	5.3 (4.5)	4.3 (2.0)	0.931
<i>Legumes</i>				
Canned legumes (9)	5.5 (8.2)	5.5 (8.2)	-	-
Legumes and legumes derivatives (8)	17.0 (7.8)	17.0 (7.8)	-	-
Meat and meat products (14)	9.0 (4.4)	12.5 (5.8)	7.6 (3.1)	0.188
Nuts (138)	12.4 (5.0)	12.4 (11.8)	12.4 (3.2)	0.720
Salads (27)	10.0 (3.7)	10.0 (3.5)	9.7 (7.2)	0.889
Salty snacks (764)	14.4 (7.1)	16.0 (8.3)	13.9 (6.7)	0.010
Sandwiches (194)	7.5 (2.1)	7.6 (2.3)	7.4 (2.0)	0.150
Sweet snacks (1403)	16.6 (9.7)	22.6 (14.2)	16.1 (9.1)	<0.001
<i>Sweets and chewing gums</i>				
with added sugars (31)	22.8 (8.5)	8.2 (2.3)	23.8 (7.9)	0.009
with sweeteners (214)	53.0 (25.1)	53.0 (25.1)	-	-
Sauces (27)	5.8 (8.2)	5.4 (3.3)	6.1 (10.2)	0.083
<i>Vegetables</i>				
Canned vegetables (10)	7.4 (4.3)	7.4 (4.3)	-	-
Fresh vegetables (15)	8.9 (6.8)	8.9 (6.8)	-	-
Total of commercial solid foods (3247)	16.9 (16.9)	21.3 (22.5)	14.9 (8.6)	0.802
Cold drinks				
Beer (116)	4.8 (2.4)	4.8 (2.4)	-	-
Other alcoholic drinks (80)	7.8 (3.9)	7.2 (3.4)	13.6 (5.0)	0.002
Bottled water (396)	0.9 (0.5)	0.9 (0.5)	-	-
<i>Carbonated drinks</i>				
with added sugars (310)	3.0 (1.7)	1.8 (1.2)	3.1 (1.6)	<0.001
with added sugars and sweeteners (105)	3.1 (1.7)	3.1 (1.0)	3.2 (1.8)	0.465
with sweeteners (184)	2.2 (0.7)	2.2 (0.7)	0.3 (-)	0.011

Continuation of Table 11.

Type of product (n)	Price (€)/kg or L			p-value ^b
	Total, mean (SD)	HNQ (n=3,811), mean (SD)	LNQ (n=4,094), mean (SD) ^a	
<i>Carbonated drinks</i>				
without sugar or sweeteners (2)	2.1 (1.3)	2.1 (1.3)	-	-
Dairy drinks (65)	5.8 (4.3)	6.4(5.4)	5.1 (2.4)	0.180
Juices (279)	4.2 (3.1)	4.1 (3.1)	5.0 (-)	0.502
Milk (18)	0.9 (0.2)	0.9 (0.2)	-	-
<i>Non-carbonated drinks</i>				
with added sugars (39)	1.7 (0.9)	1.7 (0.9)	1.7 (0.9)	0.862
with added sugars and sweeteners (236)	2.7 (0.9)	3.0 (1.0)	2.3 (0.5)	<0.001
with sweeteners (2)	1.5 (0.5)	1.5 (0.5)	-	-
Vegetable drinks (7)	1.4(0.3)	1.4 (0.3)	-	-
Total of commercial cold drinks (1839)	3.0 (2.6)	2.9 (2.7)	3.2 (2.2)	<0.001
Total of commercial products (5086)	11.9 (13.7)	10.8 (17.5)	12.8 (9.0)	<0.001
Home-made products				
Snacks				
Mini pizzas (15)	14.6 (4.6)	-	14.6 (4.6)	-
Portion (fried potatoes, croquettes...) (66)	19.9 (7.7)	14.6 (10.1)	20.1 (7.6)	0.472
Small servings (133)	9.4 (3.7)	27.3 (2.7)	9.2 (2.9)	<0.001
Sweet snacks (7)	13.5 (3.8)	-	13.5 (3.8)	-
Total of snacks (221)	13.0 (7.0)	21.0 (9.5)	12.9 (6.9)	0.102
Large meals				
Combined plate (378)	13.6 (5.3)	-	13.6 (5.3)	-
Hamburgers (50)	13.2 (2.4)	-	13.2 (2.4)	-
Pizza (14)	16.4 (1.6)	-	16.4 (1.6)	-
Salads (32)	20.3 (5.3)	-	20.3 (5.3)	-
Sandwiches (97)	13.5 (4.3)	10.2 (-)	13.5 (4.3)	0.536
Sub sandwiches (482)	10.1 (2.6)	13.4 (5.5)	10.0 (2.4)	0.037
Total of large meals ^c (1052)	12.2 (4.6)	13.1 (5.3)	12.2 (4.6)	0.574
Total of home-made solid foods^c (1273)	12.4 (5.1)	14.8 (6.9)	12.3 (5.1)	0.193
Cold drinks				
Natural juices (22)	11.2 (3.6)	11.2 (3.6)	-	-
Hot drinks				
Broth ^d (17)	5.2 (2.0)	5.2 (2.0)	-	-
Coffee ^d (1002)	5.3 (4.1)	5.3 (4.2)	4.5 (2.7)	0.800
Hot chocolate ^d (170)	3.6 (2.8)	6.7 (3.1)	2.2 (0.9)	<0.001
Hot water (1)	1.0 (-)	1.0 (-)	-	-
Hot milk ^d (109)	4.8 (2.0)	4.8 (2.0)	-	-
Hot vegetable drinks (11)	7.0 (0.5)	6.7 (-)	7.1 (0.7)	0.727
Infusions ^d (214)	6.3 (2.5)	6.3 (2.5)	-	-
Total of home-made hot drinks (1524)	5.2 (3.7)	5.4 (3.8)	2.7 (1.6)	<0.001
Total of home-made products^c (2819)	8.5 (5.7)	5.7 (4.0)	11.4 (5.6)	<0.001
Total of foods (referred to commercial and home-made food and drinks) (7905)	10.7 (11.6)	8.9 (14.2)	12.3 (8.1)	<0.001

Continuation of Table 11.

Abbreviations: HNQ, high nutritional quality; LNQ, low nutritional quality; SD, standard deviation. Note: ^aTo classify the commercial products, the combination of the three NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered LNQ. In the case of home-made products, the NNPS (Nestlé Company, 2004) was used; ^bMann-Whitney U test was used to assess differences between HNQ and LNQ, significant *p*-values are highlighted in bold; ^cThe subcategories within the menu of the day were excluded since these items are not sold independently; ^dThis item includes hot drinks prepared in cafeterias/restaurants and in vending machines, in both cases the sugar added to drinks such as coffee, chocolate or infusions was not taken into account.

Table 12. Simple linear regression analyses examining price by NPMs of commercial products offered on campus of the University of the Basque Country – UPV/EHU.

Independent variables ^a	Price ^b			
	Commercial products			
	Solid foods		Cold drinks	
NPMs	<i>B</i> (95% CI)	<i>p</i> -value ^c	<i>B</i> (95% CI)	<i>p</i> -value ^c
AECOSAN criteria ^d	0.19 (0.12, 0.25)	<0.001	-0.55 (-0.63, -0.48)	<0.001
UK NPM criteria ^e	-0.01 (-0.07, 0.04)	0.680	-0.49 (-0.56, -0.42)	<0.001
MFU criteria ^f	-0.76 (-0.85, -0.66)	<0.001	-0.64 (-0.71, -0.57)	<0.001
AECOSAN+UK NPM+MFU ^g	>0.00 (-0.05, 0.06)	0.868	-0.30 (-0.38, -0.22)	<0.001

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; *B*, linear regression coefficient (unstandardised); MFU, *Matbransjens Faglige Utovalg*; NPM, nutrient profiling model; LNQ, low nutritional quality. Note: ^aRef: unfulfillment of the criterion, that is, LNQ; ^bLog transformation was conducted, as data was not normally distributed; ^cSignificant *p*-values are highlighted in bold; ^dAECOSAN (2010); ^eDepartment of Health of the UK (2011); ^fMFU (2013) ^gTo classify the commercial products, the combination of the three NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered LNQ.

Table 13. Simple linear regression analyses examining price by NPM of home-products offered on campus of the University of the Basque Country – UPV/EHU.

Independent variables ^a	Price ^b			
	Home-made products			
	Large meals		Hot drinks	
NPM	<i>B</i> (95% CI)	<i>p</i> -value ^d	<i>B</i> (95% CI)	<i>p</i> -value ^d
NNPS ^d	0.57 (-0.12, 0.23)	0.527	0.69 (0.58, 0.79)	<0.001

Abbreviations: *B*, linear regression coefficient (unstandardised); NPM, nutrient profiling model; NNPS, Nestlé's Nutritional Profile System; LNQ, low nutritional quality. Note: ^aRef: unfulfillment of the criterion, that is, LNQ; ^bLog transformation was conducted, as data was not normally distributed; ^cRegression analysis could not be applied to home-made snacks due to the small sample size in the HNP category for this type of products; ^dSignificant *p*-values are highlighted in bold; ^eNestlé Company (2004).

4.1.2. Analysis of the food products sold in vending machines at the University of the Basque Country - UPV/EHU

A total of 202 vending machines were studied across the three campuses (35 at the Álava/Araba campus, 102 at the Bizkaia campus, and 65 at the Gipuzkoa campus) of the UPV/EHU. According to data provided by the Rector's Office of the UPV/EHU, 42,598 students and 7482 workers were potential consumers of products available at the university's vending machines. Thus, there was one machine for every 248 members of the university community. The number of foods studied by category and subcategories is presented in **Table 14**.

Table 14. Numbers of food products sold in vending machines at the University of the Basque Country - UPV/EHU, by category and subcategory.

Product	Category	Subcategory	n (%)		
Solid foods	Fresh fruit	Fresh fruit	2 (0.1)		
	Nuts	Fried nuts with salt	68 (3.9)		
		Natural or toasted nuts with salt	10 (0.6)		
		Natural or toasted nuts without salt	1 (0.1)		
		Salads	Salads	1 (0.1)	
	Salty snacks	Bakery products (e.g., breadsticks)	Bakery products (e.g., breadsticks)	104 (6.0)	
			Other bakery products (e.g., empanadillas)	2 (0.1)	
			Chips	109 (6.3)	
			Crackers	14 (0.8)	
			Fried corn	27 (1.6)	
			Extruded snacks (e.g., "Doritos")	195 (11.3)	
			Rice/corn cakes	5 (0.3)	
			Sandwiches	Cold sandwiches	168 (9.8)
				Hot sandwiches	16 (0.9)
			Sweet snacks	Bakery and pastry products	Bakery and pastry products
	Biscuits	191 (11.1)			
	Cereal bars	96 (5.6)			
	Chocolate	78 (4.5)			
	Chocolate bars	293 (17.0)			
	Jellybeans	48 (2.8)			
Other food	Candies with added sugars	Candies with added sugars	5 (0.3)		
		Candies with sweeteners	1 (0.1)		
		Chewing gum with sweeteners	82 (4.8)		
Cold drinks	Bottled water	Bottled water	341 (30.1)		
	Beer	Alcohol-free beer	1 (0.1)		
		Beer with alcohol	2 (0.2)		
	Carbonated drinks	Carbonated drinks with added sugars	Carbonated drinks with added sugars	232 (20.5)	
			Carbonated drinks with juice	39 (3.5)	
			Carbonated drinks with sugar and sweeteners	6 (0.5)	
			Carbonated drinks with sweeteners	148 (13.1)	
			Soda	1 (0.1)	

Continuation of Table 14.

Product	Category	Subcategory	n (%)	
Cold drinks	Dairy cold drinks	Chocolate	5 (0.4)	
		Coffee	5 (0.4)	
	Fruit juice	Concentrated juices	1 (0.1)	
		Juice and milk drinks	120 (10.6)	
		Nectars	36 (3.2)	
	Non-carbonated drinks	Isotonic drinks	111 (9.8)	
		Non-carbonated drinks with added sugars	1 (0.1)	
		Non-carbonated drinks with sugar and sweeteners	28 (2.5)	
		Soft drinks with juice	56 (4.9)	
Hot drinks	Coffee	Bonbon coffee	1 (0.1)	
		Cappuccino	73 (7.0)	
		Coffee with a little milk	73 (7.0)	
		Coffee with milk	74 (7.1)	
		Decaffeinated coffee with a little milk	66 (6.4)	
		Decaffeinated coffee with milk	66 (6.4)	
		Decaffeinated cappuccino	29 (2.8)	
		Decaffeinated hazelnut cappuccino	3 (0.3)	
		Hazelnut cappuccino	8 (0.8)	
		Hazelnut coffee	29 (2.8)	
		Irish coffee	1 (0.1)	
		Italian cappuccino	31 (3.0)	
		Large coffee	73 (7.0)	
		Large decaffeinated coffee	28 (2.7)	
		Milk with a little coffee	55 (5.3)	
		Milk with a little decaffeinated coffee	11 (1.1)	
		Mocha	32 (3.1)	
		Small coffee	72 (6.9)	
		Small decaffeinated coffee	64 (6.1)	
		Hot chocolate	Hot chocolate	68 (6.5)
			Hot chocolate with milk	27 (2.6)
			Viennese chocolate	31 (3.0)
			White chocolate	1 (0.1)
	Infusions	Tea	2 (0.2)	
		Tea with lemon	46 (4.4)	
	Milk	Milk	64 (6.2)	
	Other hot drinks	Broths	9 (0.9)	
		Hot water	1 (0.1)	

Table 15 presents the number of vending machines according to campus and building type, the type of vending machine, and the number of products categorised by type. Overall, the percentage of drink machines (70.3% total, 37.6% cold drinks and 32.7% hot drinks) was higher than those of only food and those with mixed offerings ($p < 0.001$) (Table 15). Taking into account the building type, academic buildings had the largest number of vending machines.

Table 15. Types of vending machines and products sold at the University of the Basque Country – UPV/EHU by campus.

Campus	Building types	Type of food vending machine					Type of product					<i>p</i> -value ^a
		Total, n (%)	HF	CD	HD	M	Total, n (%)	HF	CD	HD	CF	
		%					%					
A	Academic buildings	24 (68.6)	-	61.5	72.7	72.7	537 (70.8)	-	64.8	73.9	73.1	0.010
	Library	7 (20.0)	-	23.1	18.2	18.2	157 (20.7)	-	21.5	18.5	21.3	
	Other ^b	4 (11.4)	-	15.4	9.1	9.1	65 (8.6)	-	13.7	7.6	5.6	
	Total	35 (100.0)	-	37.1	31.4	31.4	759	-	30.7	24.2	45.1	
B	Academic buildings	94 (92.2)	100.0	87.8	93.8	96.2	1,756 (91.1)	100.0	82.5	93.5	96.3	0.004
	Library	1 (1.0)	-	-	3.1	-	16 (0.8)	-	-	3.3	-	
	Recreation facilities	2 (2.0)	-	2.4	-	3.8	44 (2.3)	-	2.5	-	3.8	
	Other ^b	5 (4.9)	-	9.8	3.1	-	112 (5.8)	-	15.3	3.3	-	
Total	102 (100.0)	2.9	39.8	25.2	31.1	1,928	0.4	32.6	25.5	41.5		
G	Academic buildings	49 (75.1)	-	72.7	82.6	70.0	919 (76.1)	-	75.7	82.3	72.4	<0.001
	Library	5 (7.7)	-	4.5	8.7	10.0	104 (8.6)	-	5.5	8.8	9.9	
	Other ^b	11 (16.9)	-	22.7	8.7	20.0	184 (15.2)	-	18.8	8.8	17.6	
	Total	65 (100.0)	-	30.8	30.8	38.5	1,207	-	22.5	30.0	47.5	
Total	Academic buildings	167 (82.7)	100.0	78.9	86.4	82.5	3,212 (82.5)	100.0	77.2	86.1	83.7	<0.001
	Library	13 (6.4)	-	5.3	7.6	7.0	277 (7.1)	-	5.7	7.9	7.6	
	Recreation facilities	2 (1.0)	-	1.3	-	1.8	44 (1.1)	-	1.2	-	1.7	
	Other ^b	20 (9.9)	-	14.5	6.1	8.8	361 (9.3)	-	15.8	6.0	7.0	
Total	202 (100.0)	1.5	37.6	32.7	28.2	3894	0.2	29.1	26.7	44.0		

Abbreviations: A, Araba/Álava; B, Bizkaia; CD, cold drinks; CF, cold foods; HD, hot drinks; HF, hot foods; G, Gipuzkoa; M, mixed hot foods/drink. Note: ^aChi-square was used to assess differences in the frequency distribution of types of products by Campus, significant *p*-values are highlighted in bold; ^bOther: vending machines inside cafeterias/restaurants/canteens.

A total of 3894 foods were surveyed in 40 buildings on three campuses. The percentage of drink products was higher compared to that of food items (55.8% vs. 44.2%, $p < 0.001$; percentages calculated from the data presented in Table 14). According to the NOVA system, most of the products offered were categorised as “ultra-processed”, specifically 73.8% of the total (99.7% of solid foods, 69.8% of the cold drinks and 35.3% of the hot drinks, $p < 0.001$) (Table 16).

Table 16. Processing levels of products offered in food vending machines at the University of the Basque Country – UPV/EHU.

Type of product (n)	NOVA classification system ^a , %		
	Not processed ^b	Processed	Ultra-processed
Solid foods			
Fresh fruit (2)	100	-	-
Nuts (79)	1.3	1.3	97.5
Salty snacks (456)	-	-	100.0
Salads (1)	-	100.0	-
<i>Sandwiches</i>			
Cold sandwiches (168)	-	-	100.0
Hot sandwiches (16)	-	-	100.0
<i>Sweets and chewing gum</i>			
with added sugars (5)	-	-	100.0
with sweeteners (83)	-	-	100.0
Sweet snacks (913)	-	-	100.0
Total of solid foods (1723)	0.2	0.1	99.7
Cold drinks			
Beer (3)	-	-	100.0
Bottled water (341)	100	-	-
<i>Carbonated drinks</i>			
with added sugars (234)	-	-	100.0
with added sugars and sweeteners (43)	-	-	100.0
with sweeteners (148)	-	-	100.0
without sugar or sweeteners (1)	-	100.0	-
Dairy products (10)	-	-	100.0
Fruit juice (157)	-	-	100.0
<i>Non-carbonated drinks</i>			
with added sugars (19)	-	-	100.0
with added sugars and sweeteners (177)	-	-	100.0
Total of cold drinks (1133)	30.1	0.1	69.8
Hot drinks			
Broths (9)	-	-	100.0
Coffee (789)	71.0	-	29.0
Hot chocolate (127)	-	-	100.0
Hot water (1)	100.0	-	-
Hot milk (64)	100.0	-	-
Infusions (48)	100.0	-	-
Total of hot drinks (1038)	64.7	-	35.3

Continuation of Table 16.

Type of product (n)	NOVA classification system ^a , %		
	Not processed ^b	Processed	Ultra-processed
Total of products (3894)	26.1	0.1	73.8

Note: ^aMonteiro et al. (2018a); ^bNot processed or minimally processed.

The combination of the two criteria mentioned above, the AECOSAN criteria and the UK NPM criteria, showed that 48.6% of the products were classified as LNQ. It should be noted that among the non-carbonated drinks with added sugars, all met the AECOSAN criteria, while 94.7% did not meet the UK NPM criteria. These differences in the results obtained from the two NPMs are related to discrepancies in constructs and scoring criteria. These products had an average of 5.6 g of sugars per 100 ml (minimum 4.0 g and maximum 6.6 g). The sugar limit according to the AECOSAN criteria is ≤ 7.5 g in 100 ml drinks. Thus, all these items met this and the rest of the AECOSAN criteria. Nevertheless, with the UK NPM criteria, the scores for these “at-risk” nutrients (sugar) and the one assigned to the foods and nutrients considered to have a beneficial effect on health were low or null. Therefore, the results gave a high percentage of items classified as “with LNQ”.

Comparison of the results obtained from the two NPMs used showed an almost perfect agreement between the UK NPM and the AECOSAN criteria (**Table 18**). The lowest level of agreement was obtained for solid foods, specifically, no agreement was observed for nuts ($\kappa=0.032$) and sweet snacks ($\kappa=0.006$), and the agreement was none to slight for cold sandwiches ($\kappa=0.112$). The percentage of products that did not meet the AECOSAN and the UK NPM criteria was higher for solid foods, followed by cold drinks and finally hot drinks. Among hot and cold foods, those products that met to a lesser extent the AECOSAN and/or the UK NPM criteria were salty snacks, hot sandwiches and sweets and chewing gum with added sugars; among cold drinks, dairy products; and among hot drinks, broths and hot chocolate. The AECOSAN criteria that were most frequently unfulfilled were the energy, total fat and SFA quantity in foods and the sugar content in drinks.

Table 17. Nutritional profile of products offered in vending machines at the University of the Basque Country – UPV/EHU.

Type of product	n (%)	Percentage not meeting criteria																		
		AECOSAN criteria ^{a,b} , %					UK													
		Energy	Total fat	SFA	TFA	Sugars	Salt	Total	NPMcriteria ^{b,c} , %	p-value ^d	AECOSAN+UK NPM ^{a,c} , %									
Solid foods																				
Fresh fruit	2 (>0.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuts	79 (2.0)	96.2	-	1.3	55.7	1.3	88.6	98.7	55.7	87.7	0.443	55.7	87.7	0.443	55.7	87.7	0.443	55.7	87.7	
Salty snacks	456 (11.7)	97.4	77.6	48.2	87.7	1.3	92.3	100.0	87.7	-	-	87.7	-	-	87.7	-	-	87.7	-	
Salads	1 (>0.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Sandwiches</i>																				
Cold sandwiches	168 (4.3)	2.4	13.1	3.0	52.0	-	94.6	94.6	50.6	0.002	0.002	50.6	0.002	52.0	0.002	52.0	0.002	52.0	0.002	
Hot sandwiches	16 (0.4)	50.0	62.5	50.0	72.7	-	81.3	100.0	62.5	-	-	62.5	-	72.7	-	72.7	-	72.7	-	
<i>Sweets and chewing gum</i>																				
with added sugars	5 (0.1)	40.0	-	-	100.0	100.0	-	100.0	100.0	-	-	100.0	-	100.0	-	100.0	-	100.0	-	
with sweeteners	83 (2.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweet snacks	913 (23.4)	88.5	88.9	91.2	93.8	75.0	8.7	97.8	95.8	0.577	0.577	95.8	0.577	93.8	0.577	93.8	0.577	93.8	0.577	
Total of solid foods	1723 (44.2)	77.9	69.5	61.9	81.4	40.5	43.1	93.3	82.5	<0.001	<0.001	82.5	<0.001	81.4	<0.001	81.4	<0.001	81.4	<0.001	
Cold drinks																				
Beer	3 (0.1)	-	-	-	-	-	-	-	33.3	-	-	33.3	-	-	-	-	-	-	-	
Bottled water	341 (8.7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Carbonated drinks</i>																				
with added sugars	234 (6.0)	-	-	-	89.7	89.7	-	89.7	89.7	<0.001	<0.001	89.7	<0.001	89.7	<0.001	89.7	<0.001	89.7	<0.001	
with added sugars and sweeteners	43 (1.1)	-	-	-	86.0	86.0	-	86.0	88.4	<0.001	<0.001	88.4	<0.001	86.0	<0.001	86.0	<0.001	86.0	<0.001	
with sweeteners	148 (3.8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
without sugar or sweeteners	1 (>0.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dairy products	10 (0.3)	-	-	-	100.0	100.0	-	100.0	100.0	-	-	100.0	-	100.0	-	100.0	-	100.0	-	
Fruit juice	157 (4.0)	-	-	-	2.5	3.2	-	3.2	9.6	<0.001	<0.001	9.6	<0.001	2.5	<0.001	2.5	<0.001	2.5	<0.001	

Continuation of Table 17.

Type of product	n (%)	Percentage not meeting criteria										
		AECOSAN criteria ^{a,b} , %					UK					
		Energy	Total fat	SFA	TFA	Sugars	Salt	Total	NPM	criteria ^{b,c} , %	<i>p</i> -value ^d	AECOSAN+UK NPM ^{a,c} , %
Cold drinks												
<i>Non-carbonated drinks</i>												
with added sugars	19 (0.5)	-	-	-	-	-	-	-	-	94.7	-	-
with added sugars and sweeteners	177 (4.5)	-	-	-	47.5	47.5	-	47.5	-	80.2	<0.001	47.5
Total of cold drinks	1133 (29.1)	-	-	-	30.5	30.5	-	30.5	-	38.5	<0.001	30.5
Hot drinks												
Broths	9 (0.2)	-	-	-	100.0	-	100.0	100.0	-	100.0	-	100.0
Coffee	789 (20.3)	-	-	-	1.3	1.3	-	1.8	-	2.1	<0.001	1.3
Hot chocolate	127 (3.3)	-	-	-	100.0	100.0	-	100.0	-	100.0	-	100.0
Hot water	1 (>0.0)	-	-	-	-	-	-	-	-	-	-	-
Hot milk	64 (1.6)	-	-	-	-	-	-	-	-	-	-	-
Infusions	48 (1.2)	-	-	-	-	-	-	-	-	2.1	-	-
Total of hot drinks	1038 (26.7)	-	-	-	14.1	13.2	0.9	14.1	-	14.5	<0.001	14.1
Total of products	3894	34.5	30.8	27.4	48.6	30.3	19.3	53.9	-	51.5	<0.001	48.6

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; NPM, nutrient profiling model; SFA, saturated fatty acids; TFA, *trans* fatty acids. Note: ^aAECOSAN (2010); ^bThe same product may not meet more than one criterion, and therefore, the sum of the criteria does not result in the total percentage of products that do not fulfil AECOSAN criteria; ^cDepartment of Health of the UK (2011); ^dChi-square was used to assess differences between percentage not meeting the AECOSAN criteria and the UK NPM criteria, significant *p*-values are highlighted in bold; ^eTo classify the products, the combination of the two NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010) and the UK NPM criteria (Department of Health of the UK, 2011), it was considered LNQ.

Table 18. Percentages of products classified into the same or opposite category and agreement between the two nutrient profiling models (the AECOSAN and the UK NPM criteria).

	AECOSAN ^a				Kappa coefficient ^b
	LNQ		HNQ		
	n	%	n	%	
UK NPM^c					
Solid foods (n=1723)					0.408
LNQ	1403	81.4	19	1.1	
HNQ	204	11.8	97	5.6	
Total	1607	93.3	116	6.7	
Cold drinks (n=1133)					0.825
LNQ	345	30.4	89	7.8	
HNQ	1	0.1	698	61.6	
Total	346	30.5	787	69.5	
Hot drinks (n=1038)					0.984
LNQ	146	14.1	4	0.4	
HNQ	-	-	888	85.5	
Total	146	14.1	892	85.9	
Total (n=3894)					0.837
LNQ	1894	48.6	112	2.9	
HNQ	205	5.3	1683	43.2	
Total	2099	53.9	1795	46.1	

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; NPM, nutrient profiling model; HNQ, high nutritional quality; LNQ, low nutritional quality. Note: ^aAECOSAN (2010); ^bThe kappa results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect; ^cDepartment of Health of the UK (2011).

Regarding the comparison between the NPMs used and processing level classification, in general, a moderate agreement was observed between the NOVA system and each of the NPMs, separately and also combined (**Table 19**). The lowest level of agreement between NPMs and NOVA system was obtained for solid foods.

Table 19. Percentages of products classified into the same or opposite category and agreement between the two nutrient profiling models (the AECOSAN and the UK NPM criteria) and the combination of both and processing level classification (NOVA system).

	NOVA system ^a				Kappa coefficient ^b
	Ultra-processed		Non-ultra-processed		
	n	%	n	%	
AECOSAN^c					
Solid foods (n=1723)					0.047
LNQ	1607	93.3	-	-	
HNQ	113	6.7	3	0.2	
Total	1720	99.8	3	0.2	

Continuation of Table 19.

	NOVA system ^a				Kappa coefficient ^b
	Ultra-processed		Non-ultra-processed		
	n	%	n	%	
AECOSAN^c					
Cold drinks (n=1133)					0.318
LNQ	346	30.5	-	-	
HNQ	446	39.4	341	30.1	
Total	792	69.9	341	30.1	
Hot drinks (n=1038)					0.462
LNQ	146	14.1	-	-	
HNQ	220	21.2	672	64.7	
Total	366	35.3	672	64.7	
Total (n=3894)					0.584
LNQ	2099	53.9	-	-	
HNQ	779	20.0	1,016	26.1	
Total	2878	73.9	1,016	26.1	
UK NPM^d					
Solid foods (n=1723)					0.016
LNQ	1422	82.5	-	-	
HNQ	298	17.3	3	0.2	
Total	1720	99.8	3	0.2	
Cold drinks (n=1133)					0.422
LNQ	434	38.3	-	-	
HNQ	358	31.6	341	30.1	
Total	792	69.9	341	30.1	
Hot drinks (n=1038)					0.473
LNQ	150	14.4	-	-	
HNQ	216	20.8	672	64.7	
Total	366	35.3	672	64.7	
Total (n=3894)					0.546
LNQ	2006	51.5	-	-	
HNQ	872	22.4	1016	26.1	
Total	2878	73.9	1016	26.1	
AECOSAN^{c+}					
UK NPM^e					
Solid foods (n=1723)					0.015
LNQ	1607	93.3	-	-	
HNQ	113	6.6	3	0.2	
Total	1720	99.8	3	0.2	
Cold drinks (n=1133)					0.317
LNQ	346	30.5	-	-	
HNQ	446	39.4	341	30.1	
Total	792	69.9	341	30.1	
Hot drinks (n=1038)					0.462
LNQ	146	14.1	-	-	
HNQ	220	21.2	672	64.7	
Total	366	35.3	672	64.7	
Total (n=3894)					0.501
LNQ	1894	48.6	-	-	
HNQ	984	25.3	1016	26.1	
Total	2878	73.9	1016	26.1	

Continuation of Table 19.

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; NPM, nutrient profiling model; HNQ, high nutritional quality; LNQ, low nutritional quality. Note: ^aMonteiro et al., 2018a; ^bThe kappa results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect; ^cAECOSAN (2010); ^dDepartment of Health of the UK (2011); ^eTo classify the products, the combination of the two NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010) and the UK NPM criteria (Department of Health of the UK, 2011), it was considered LNQ.

Table 20 shows the relationships between nutritional profile and the promotion and price of products offered in vending machines. The solid foods of LNQ, in particular salty and sweet snacks, and hot drinks of LNQ were less expensive than the HNQ options ($p < 0.001$), whereas among cold drinks the results were the reverse ($p < 0.05$). Specifically, the price of bottled water (mean, 0.8; SD, 0.4 €/L) was significantly lower than that of soft drinks (mean, 2.5; SD, 1.1 €/L) ($p < 0.001$). Moreover, hot and cold foods of LNQ were promoted to a greater extent than HNQ foods ($p < 0.05$). With respect to associations between product's price and promotion, the promoted solid foods were more expensive than those that were not promoted (mean, 18.6; SD, 11.6 €/kg vs. 12.1; 6.8 €/kg; $p < 0.001$), while among cold drinks, the result was the opposite (mean, 1.8; SD, 1.2 €/L vs. 2.6; 1.4 €/L; $p < 0.001$).

Simple linear regression analyses showed that the product's price was associated with the nutritional profile. Solid foods ($\beta = 0.31$, 95% CI 0.24, 0.39, $p < 0.001$) and hot drinks that support healthy dietary recommendations ($\beta = 0.46$, 95% CI 0.39, 0.52, $p < 0.001$) were more likely to have higher prices than alternatives of LNQ (**Table 21**). Among cold drinks, this association was inverse ($\beta = -0.57$, 95% CI -0.64, -0.50, $p < 0.001$). Moreover, both solid foods and cold drinks that support healthy dietary recommendations were promoted to a lesser extent than those of LNQ (solid foods, OR = 0.50, 95% CI 0.38, 0.65, $p < 0.001$; cold drinks, OR = 0.45, 95% CI 0.29, 0.70, $p < 0.001$) (**Table 22**).

Table 20. Relationships between nutritional profile and promotion and price of products offered in vending machines at the University of the Basque Country – UPV/EHU.

Type of product (n)	Price, €/kg or L			Promoted products ^a			p-value ^c
	Total, mean (SD)	HNQ (n=1659), mean (SD)	LNQ ^b (n=1894), mean (SD)	Total ^d , n	HNQ (n=327), n (%)	LNQ (n=1184), n (%)	
Solid foods							
Fresh fruit (2)	3.8 (0.2)	3.8 (0.2)	-	-	-	-	-
Nuts (79)	12.6 (4.5)	12.5 (6.4)	12.7 (2.3)	69	28 (40.6)	41 (59.4)	0.099
Salty snacks (456)	14.3 (6.5)	22.0 (6.1)	13.3 (5.9)	356	32 (9.0)	324 (91.0)	<0.001
Salads (1)	6.9 (-)	6.9 (-)	-	-	-	-	-
<i>Sandwiches</i>							
Cold sandwiches (168)	7.3 (2.0)	6.7 (2.1)	10.3 (2.5)	36	18 (50.0)	18 (50.0)	0.936
Hot sandwiches (16)	9.6 (2.8)	7.6 (2.3)	7.0 (1.6)	8	-	8 (100.0)	0.200
<i>Sweets and chewing gum</i>							
with added sugars (5)	26.3 (0.0)	-	26.3 (0.0)	3	-	3 (100.0)	-
with sweeteners (83)	43.2 (12.7)	43.2 (12.7)	-	83	83 (100.0)	-	-
Sweet snacks (913)	18.6 (10.2)	32.8 (10.5)	17.7 (9.5)	797	56 (7.0)	741 (93.0)	0.010
Total of solid foods (1723)	17.2 (11.1)	24.3 (16.6)	15.6 (8.6)	1,352	217 (16.0)	1135 (84.0)	<0.001
Cold drinks							
Beer (3)	3.3 (0.4)	3.3 (0.4)	-	-	-	-	-
Bottled water (341)	0.8 (0.4)	0.8 (0.4)	-	58	58 (100.0)	-	-
<i>Carbonated drinks</i>							
with added sugars (234)	2.6 (1.5)	1.3 (0.6)	2.8 (1.6)	35	-	35 (100.0)	<0.001
with added sugars and sweeteners (43)	2.4 (0.7)	3.0 (0.5)	2.3 (0.7)	5	2 (40.0)	3 (60.0)	1.000
with sweeteners (148)	2.0 (0.5)	2.0 (0.5)	-	21	21 (100.0)	-	-
without added sugars or sweeteners (1)	3.0 (-)	3.0 (-)	-	1	1 (100.0)	-	-

Continuation of Table 20.

Type of product (n)	Price, €/kg or L			Promoted products ^a			p-value ^c
	Total, mean (SD)	HNQ (n=1659), mean (SD)	LNQ ^b (n=1894), mean (SD)	Total ^d , n	HNQ (n=327), n (%)	LNQ (n=1184), n (%)	
Cold drinks							
Dairy products (10)	6.0 (0.4)	-	6.0 (0.4)	1	-	1 (100.0)	-
Fruit juice (157)	2.5 (0.6)	2.5 (0.6)	3.5 (1.1)	8	6 (75.0)	2 (25.0)	0.013
<i>Non-carbonated drinks</i>							
with added sugars (19)	1.9 (1.0)	1.9 (1.0)	-	9	9 (100.0)	-	-
with added sugars and sweeteners (177)	2.5 (0.7)	2.7 (0.8)	2.3 (0.5)	21	13 (61.9)	8 (38.1)	0.079
Total of cold drinks (1133)	2.0 (1.2)	1.7 (1.0)	2.7 (1.4)	159	110 (69.2)	49 (30.8)	<0.001
Hot drinks							
Broths (9)	3.6 (0.5)	-	3.6 (0.5)	-	-	-	-
Coffee (789)	3.6 (1.2)	3.6 (1.2)	4.9 (1.7)	-	-	-	-
Hot chocolate (127)	2.1 (0.9)	-	2.1 (0.9)	-	-	-	-
Hot milk (64)	3.2 (0.7)	3.2 (0.7)	-	-	-	-	-
Hot water (1)	1.0 (-)	1.0 (-)	-	-	-	-	-
Infusions (48)	2.2 (1.0)	2.2 (1.0)	-	-	-	-	-
Total of hot drinks (1038)	3.3 (1.3)	3.5 (1.2)	2.4 (1.2)	-	-	-	-
Total of products (3894)	9.1 (10.4)	6.1 (10.4)	12.2 (9.4)	1,511	327 (21.6)	1184 (78.4)	<0.001

Abbreviations: SD, standard deviation; HNQ, high nutritional quality; LNQ, low nutritional quality; NPM, nutrient profiling model. Note: ^aIf the product was located at a height between 80 cm and 170 cm, it was considered to be promoted; ^bIf a product had been classified as LNQ according to the AECOSAN and UK NPM criteria, it was considered as LNQ; ^cMann-Whitney U test was used to assess differences between HNQ and LNQ, significant p-values are highlighted in bold; ^dProduct promotion was not evaluated for those products that were not in view (n=1677), because all the product selection panels were located at hand or eye level.

Table 21. Simple linear regression analyses examining price by nutritional profile models of products offered on vending machines at the University of the Basque Country - UPV/EHU.

Independent variables ^a	Price ^b					
	Solid foods		Cold drinks ^c		Hot drinks	
	β (95% CI)	<i>p</i> -value ^d	β (95% CI)	<i>p</i> -value ^d	β (95% CI)	<i>p</i> -value ^d
AECOSAN criteria ^e	0.93 (0.82, 1.03)	<0.001	-0.57 (-0.64, -0.50)	<0.001	-0.46 (0.39, 0.52)	<0.001
UK NPM criteria ^f	0.25 (0.18, 0.32)	<0.001	-0.61 (-0.68, -0.54)	<0.001	0.45 (0.39, 0.51)	<0.001
AECOSAN+ UK NPM ^g	0.31 (0.24, 0.39)	<0.001	-0.57 (-0.64, -0.50)	<0.001	0.46 (0.39, 0.52)	<0.001

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; NPM, nutrient profiling model. Note: ^aRef: unfulfillment of the criterion, that is, LNQ; ^bLog transformation was conducted, as data was not normally distributed; ^cBottled water (n=341) was excluded from the analysis; ^dSignificant *p*-values are highlighted in bold; ^eAECOSAN (2010); ^fDepartment of Health of the UK (2011); ^gTo classify the products, the combination of the two NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010) and the UK NPM criteria (Department of Health of the UK, 2011), it was considered LNQ.

Table 22. Binary logistic regression analyses examining promotion by nutritional profile models of products offered on vending machines at the University of the Basque Country - UPV/EHU.

Independent variables ^a	Promotion ^b			
	Solid foods		Cold drinks ^{c,d}	
	OR (95% CI)	<i>p</i> -value ^e	OR (95% CI)	<i>p</i> -value ^e
AECOSAN criteria ^f	2.49 (1.36, 4.58)	0.003	0.46 (0.30, 0.72)	0.001
UK NPM criteria ^g	0.46 (0.35, 0.60)	< 0.001	0.48 (0.32, 0.71)	< 0.001
AECOSAN+UK NPM ^h	0.50 (0.38, 0.65)	< 0.001	0.45 (0.29, 0.70)	< 0.001

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; NPM, nutrient profiling model. Note: ^aRef: unfulfillment of the criterion, that is, LNQ; ^bIf the product was located at a height between 80 cm and 170 cm, it was considered to be promoted; ^cBottled water (n=341) was excluded from the analysis; ^dThe products promotion was not evaluated in those products that were not in view; ^eSignificant *p*-values are highlighted in bold; ^fAECOSAN (2010); ^gDepartment of Health of the UK (2011); ^hTo classify the products, the combination of the two NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010) and the UK NPM criteria (Department of Health of the UK, 2011), it was considered LNQ.

4.2. ON-CAMPUS FOOD PURCHASING BEHAVIOURS, CHOICE DETERMINANTS AND OPINIONS ON FOOD AVAILABILITY BY THE COMMUNITY OF THE UNIVERSITY OF THE BASQUE COUNTRY - UPV/EHU

4.2.1. General characteristics of participants in the survey on food purchasing behaviours, choice determinants and opinions on food availability at the University of the Basque Country - UPV/EHU

The demographic characteristics of the students and staff are shown in **Table 23**. The majority of the students and ERS were from non-Health Sciences (students, 84.4; ERS, 81.8) and enrolled full time (64.7% in the total sample). The percentage of women from the Health Sciences area was higher for both students and ERS ($p < 0.001$). Regarding age, most students (70.7%) were <25 years old, most ERS (50.5%) were between 25-44 years old, and most ASS (68.5%) were over 45 years old (60.3%) ($p < 0.001$). Moreover, approximately 19% of the participants reported following a special diet, and this percentage was higher for ASS than for students and ERS ($p < 0.05$). By sex, significantly more women than men in the three university community groups reported being adhered to a special diet ($p < 0.05$). The most frequent type of special diet in the three groups was a weight loss diet, although the second most frequent differed between groups (students, "vegetarian/vegan diet" - 7.2%; ERS, "therapeutic diets" - 7.6%; ASS, "other diets" - 5.3%).

4.2.2. Food purchasing behaviours and choice determinants of the community of the University of the Basque Country - UPV/EHU

The frequency and place of food purchasing, as well as spending on purchasing, are shown in **Table 24**. A large portion of students and staff (91.6%) had purchased food and on-campus university in the last month. Most (77.6%) reported buying foods or drinks on at least half of the occasions they were on campus. One-third (28.8%) reported spending 5-10€ on foods on campus during an average week. Significantly more ASS reported purchasing foods in the last month (ASS 93.0%; students 91.6%; ERS 90.5%; $p < 0.001$) and spending more while on campus (this variable was dichotomized as "≥20 €" and "<20 €" per week) (spending "≥20 € per week" in AAS 41.8%; ERS 41.2% vs. students 10.8%; $p < 0.001$). Foods were bought mostly in the cafeterias/restaurants (80.5%), followed by the vending machines (72.6%), the university canteen (23.9%) and the supermarket (22.8%).

Table 23. General characteristics of participants of the University of the Basque Country - UPV/EHU in the survey on food purchasing behaviours, choice determinants, and opinions on food availability.

Variables	Students ^a , %			ERS ^a , %			ASS ^a , %			p-value ^c
	Total %	Women	Men	Total	Women	Men	Total	Women	Men	
Age										
<25 years	70.7	85.1	80.2	4.5	3.0	6.1	0.8	0.6	0.9	
25-44 years	21.2	14.3	19.2	50.5	58.9	41.2	30.7	22.3	35.5	
≥45 years	8.1	0.6	0.6	45.1	38.1	52.7	68.5	77.1	63.6	<0.001
Area of knowledge^d										
Health Sciences	16.1	24.8	7.6	18.2	25.5	10.1	19.1	14.3	21.8	
Non-Health Sciences	83.9	75.2	92.4	81.8	74.5	89.9	80.9	85.7	78.2	<0.001
Study/work contract										
Full-time	64.7	59.8	61.0	91.4	90.9	91.9	97.4	94.3	99.1	
Part-time	35.3	40.2	39.0	8.6	9.1	8.1	2.6	5.7	9.1	<0.001
Special diet^e	19.2	19.2	15.3	19.1	21.6	16.2	21.4	24.0	20.0	0.043
Religious diets	0.3	0.3	0.3	0.5	0.9	-	-	-	-	0.007
Therapeutic diets	5.7	5.5	3.4	7.6	7.8	7.4	4.8	8.6	2.7	<0.001
Vegetarian/vegan	6.7	7.2	4.0	4.7	7.8	1.4	2.0	2.3	1.8	0.425
Weight management diets	11.3	11.2	10.7	10.2	9.1	11.5	15.8	21.1	12.7	<0.001
Other diets (e.g., diets low in ultra-processed foods)	2.7	2.2	1.4	5.9	6.9	4.7	5.3	3.4	6.4	0.006

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^b χ^2 test or the Fisher exact test was used to assess differences between sexes; ^c χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold; ^dData not applicable to ASS; ^eMultiple-answer.

Table 24. Frequency and place of food purchasing, and spending on purchasing at the University of the Basque Country – UPV/EHU.

Variables	Students ^a , %			ERS ^a , %			ASS ^a , %			p-value ^c	
	Total	Women	Men	Total	Women	Men	Total	Women	Men		p-value ^b
Eating on campus in the last month	91.6	91.1	92.1	90.5	89.2	91.9	93.0	92.0	93.6	0.193	0.001
Spending on campus											<0.001
<20 €/week	84.6	91.7	87.0	58.8	69.3	47.3	58.2	64.6	54.5		
≥20 €/week	15.4	8.3	13.0	41.2	30.7	52.7	41.8	35.4	45.5		
Purchasing times while on campus											<0.001
<50% of the occasions	60.0	66.0	60.2	45.1	54.1	35.1	39.2	47.4	34.5		
≥50% of the occasions	40.0	34.0	39.8	54.9	45.9	64.9	60.8	52.6	65.5		
Place of purchasing^d											<0.001
Cafeteria/restaurant	80.5	80.0	81.6	77.9	78.8	77.0	80.9	76.0	83.6	0.107	<0.001
Supermarket	22.8	21.9	15.3	28.5	32.9	23.6	25.9	25.1	26.4	<0.001	<0.001
University canteen	23.9	20.8	19.2	42.6	35.9	50.0	40.0	40.0	40.0	<0.001	<0.001
Vending machine	72.6	75.7	74.9	51.5	52.8	50.0	63.6	66.9	61.8	0.035	0.028

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879; men n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^b χ^2 test or the Fisher exact test was used to assess differences between sexes; ^c χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold; ^dMultiple-answer.

In the three groups, more men than women reported purchasing foods in the last month, spending more while on campus and purchasing more frequently. In general, women purchased more in the vending machines, the supermarket and the university canteen than men ($p<0.001$), whereas men purchased more in the cafeterias/restaurants ($p<0.001$).

Table 25 shows the occasions of food purchases while on campus. Both foods and drinks were commonly purchased at lunch and between meals, with more frequent purchases of food at lunchtime and between meals among students than among employees ($p<0.001$). By sex, there was a greater tendency for men to purchase food at lunchtime than women in the three groups ($p<0.001$) and a greater tendency for women to purchase food between meals than men in all groups ($p<0.01$); except for the purchase of drinks between hours in students. Regarding breakfast, this moment of purchase of food was more frequent among employees (ERS, drinks; and ASS, food) ($p<0.001$).

Table 26 displays the purchase of foods (categorised as solid foods and snacks) and drinks, with a frequency of once a week or higher. Hot drinks (61.5%) and foods (60.6%) were the most purchased items, followed by cold drinks (58.4%) and snacks (42.7%). The most widely purchased foods were “coffee, tea, hot chocolate”, bottled water, small servings (e.g., a small portion of tortilla) and hot sandwiches/hamburgers. More students purchased hot small servings, hot sandwiches/hamburgers, and bottled water than employees ($p<0.001$), while more staff purchased “coffee, tea, hot chocolate...” ($p<0.001$).

Furthermore, more ERS and ASS than students purchased the menu of the day ($p<0.001$). By sex, the purchase of hot small servings and hot sandwiches/hamburgers was higher among men than women in the three groups ($p<0.001$). Bringing food from home or purchasing off-campus was also frequent as reported by almost all students and staff (84.0% of the total sample), with a third bringing (36.8%) all or almost all the foods eaten on campus (**Table 27**). The reasons for bringing food from off-campus or home were that they preferred to consume their own food (53.8%) and the cost (45.1%).

Table 25. Occasions of food purchases from a university outlet of the University of the Basque Country – UPV/EHU.

Eating/ drinking occasion ^a	Students ^b , %			ERS ^b , %			ASS ^b , %			p- value ^d
	Total	Women	Men	Total	Women	Men	Total	Women	Men	
Foods										
Breakfast	22.4	25.4	20.6	17.2	16.9	17.6	27.8	24.0	30.0	<0.001
Lunch	67.4	60.9	70.6	23.1	71.9	82.4	31.4	62.9	71.8	<0.001
Dinner	0.5	0.2	0.8	0.2	0.4	-	0.2	0.6	-	0.003
Snack	65.4	74.3	68.4	31.1	37.2	24.3	36.7	40.6	34.5	<0.001
Drinks										
Breakfast	32.8	33.5	29.1	38.5	37.2	39.9	31.2	56.6	49.1	0.018
Lunch	37.4	31.6	43.2	36.6	32.5	41.2	30.9	31.6	43.2	<0.001
Dinner	0.8	0.3	1.4	0.2	0.4	-	1.4	0.6	-	0.028
Snack	45.4	44.5	50.0	36.3	38.5	33.8	27.3	33.7	23.6	<0.001

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aMultiple-answer; ^bThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879, men n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^c χ^2 test or the Fisher exact test was used to assess differences between sexes; ^d χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold.

Table 26. Purchases of food with a frequency of once weekly or higher from a university outlet of the University of the Basque Country – UPV/EHU.

Variables ^a	Total ^b			Students ^b , %			ERS ^b , %			ASS ^b , %			p- value ^d	
	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men		p- value ^c
Foods														
Hot foods														
Combination plate	9.0	5.7	13.0	5.6	3.9	7.4	5.6	3.9	7.4	5.6	9.1	3.6	<0.001	<0.001
Hot sandwiches, hamburgers	31.7	23.8	43.4	15.7	10.4	21.6	15.7	10.4	21.6	21.3	15.4	24.5	<0.001	<0.001
Hot small servings	38.2	33.8	46.3	21.7	16.9	27.0	21.7	16.9	27.0	36.5	30.3	40.0	<0.001	<0.001
Menu of the day ^e	24.9	17.3	22.3	52.8	43.7	62.8	52.8	43.7	62.8	53.8	50.9	55.5	<0.001	<0.001
Other hot foods ^f	6.3	6.3	7.3	3.2	1.7	4.7	3.2	1.7	4.7	2.0	2.3	1.8	<0.001	<0.001
Total hot foods	60.6	48.4	68.9	34.7	55.8	75.7	34.7	55.8	75.7	73.7	67.4	77.3	<0.001	<0.001
Cold foods														
Cold sandwiches	22.8	18.9	29.7	10.6	9.1	12.2	10.6	9.1	12.2	16.8	14.3	18.2	<0.001	<0.001
Cold small servings	20.1	17.4	24.9	9.6	9.1	10.1	9.6	9.1	10.1	20.7	15.4	23.6	<0.001	<0.001
Salads	11.0	9.5	9.9	18.2	18.2	18.2	18.2	18.2	18.2	18.3	21.7	16.4	<0.001	<0.001
Other cold foods ^g	8.7	10.7	8.2	5.4	6.1	4.7	5.4	6.1	4.7	3.7	2.3	4.5	<0.001	<0.001
Total cold foods	40.3	36.8	46.3	29.6	29.4	29.7	29.6	29.4	29.7	36.6	35.4	37.3	<0.001	<0.001
Snacks														
Chewing gum, sweets...	5.6	8.6	4.2	1.6	1.7	1.4	1.6	1.7	1.4	2.6	2.3	2.7	<0.001	<0.001
Chocolate bars	17.9	18.9	20.9	5.0	5.2	4.7	5.0	5.2	4.7	8.7	6.3	10.0	<0.001	<0.001
Fresh fruit	9.1	10.7	6.5	12.5	10.4	14.9	12.5	10.4	14.9	15.0	16.4	12.6	<0.001	<0.001
Nuts	13.2	12.9	15	7.2	9.5	4.7	7.2	9.5	4.7	11.7	13.1	10.9	<0.001	<0.001
Salty snacks	24.1	27.4	25.4	8.8	9.5	8.1	8.8	9.5	8.1	14.7	8.6	18.2	<0.001	<0.001
Sweet snacks	20.8	21.7	24.6	6.0	7.8	4.1	6.0	7.8	4.1	9.5	6.9	10.9	<0.001	<0.001
Other snacks ^h	4.2	3.2	5.9	2.4	0.9	4.1	2.4	0.9	4.1	0.8	0.6	0.9	<0.001	<0.001
Total snacks	42.7	45.4	45.5	24.3	24.2	24.3	24.3	24.2	24.3	35.1	28.0	39.1	<0.001	<0.001

Continuation of Table 26.

Variables ^a	Students ^b , %			ERS ^b , %			ASS ^b , %			p-value ^d
	Total	Women	Men	Total	Women	Men	Total	Women	Men	
Drinks										
Hot drinks										
Broths	0.8	0.3	1.1	0.8	0.9	0.7	0.448	0.6	1.8	0.028
Coffee, tea, hot chocolate...	60.5	54.3	61.3	72.5	72.7	72.3	0.733	78.9	80.0	<0.001
Infusions (e.g., chamomile tea)	11.4	12.2	9.0	16.1	19.0	12.8	<0.001	19.4	16.4	<0.001
Total hot drinks	61.5	55.3	62.1	74.1	74.5	73.6	0.498	81.7	80.0	<0.001
Cold drinks										
Alcoholic drinks	5.7	2.9	8.8	3.3	3.9	2.7	0.013	4.6	5.5	<0.001
Bottled water	49.2	52.8	52.0	30.0	34.6	25.0	<0.001	34.9	36.4	<0.001
Commercial fruit juices	5.9	6.3	6.2	3.9	2.6	5.4	<0.001	2.9	4.5	<0.001
Free alcohol beers	0.7	0.5	0.8	0.5	0.9	-	<0.001	-	3.6	<0.001
Milkshakes	3.0	3.2	3.4	0.8	0.9	0.7	0.448	1.1	4.5	<0.001
Natural fruit juices	8.5	8.1	8.5	10.3	8.7	12.2	<0.001	7.4	8.2	<0.001
Soft drinks, energy drinks, flavoured drinks ...	13.7	14.5	20.3	8.9	6.5	11.5	<0.001	3.4	11.8	<0.001
Other drinks ⁱ	3.9	4.2	4.5	1.3	1.3	1.4	0.857	3.4	2.7	<0.001
Total of cold drink	58.4	61.0	63.0	42.0	43.3	40.5	0.037	43.4	50.9	0.002

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aMultiple-answers; ^bThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879; ERS, women n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^c χ^2 test or the Fisher exact test was used to assess differences between sexes; ^d χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold; ^eThe menu of the day is a midday meal, which normally includes a starter, a main course with a side dish, a dessert, a portion of bread and drink. Usually, there is two or more choices for each course; ^f“Others hot foods”: fried potatoes, pizza; ^g“Other cold foods”: dairy products; ^h“Other snacks”: small pasty, vegetarian snacks; ⁱ“Other drinks”: non-specified on the survey.

Table 27. Bringing food from home or off-campus to the University of the Basque Country – UPV/EHU, and reasons for it.

Variables	Students ^a , %			ERS ^a , %			ASS ^a , %			p-value ^c			
	Total	Women	Men	Total	Women	Men	Total	Women	Men		p-value ^b		
Bringing food from off campus or home	84.0	85.7	93.5	78.8	<0.001	73.9	84.0	62.8	75.2	81.1	71.8	<0.001	<0.001
Amount of food brought off campus or home					<0.001							<0.001	<0.001
Little food	63.3	63.0	48.7	73.2		62.5	48.9	75.0	72.3	65.1	76.4		
Most or all	36.7	37.0	51.3	26.8		37.5	51.1	25.0	27.7	34.9	23.6		
Reasons for bringing food^d													
Convenience	8.7	9.3	7.4	11.0	<0.001	6.1	4.3	8.1	3.6	3.4	3.6		0.777
Helps increase variety	3.8	18.1	16.2	19.8	<0.001	12.0	10.0	14.2	14.8	13.7	15.5		0.300
High price	45.1	48.9	53.1	45.2	<0.001	24.2	22.9	25.7	22.1	27.4	19.1		<0.001
Low quality-price	10.9	11.2	11.7	10.7	0.001	9.3	7.4	11.5	9.1	7.4	10.0		<0.001
Preference for food from off-campus food outlets	3.8	3.9	3.6	4.2	0.001	3.0	2.6	3.4	4.1	3.4	4.5		0.224
Preference for my own food brought from home	53.8	54.7	67.1	43.8	<0.001	48.8	35.8	39.4	49.6	44.6	46.4		<0.001
The food offer does not suit my needs	29.8	29.4	34.6	24.9	<0.001	33.8	36.8	30.4	25.9	31.4	22.7		<0.001

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879, men n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^b χ^2 test or the Fisher exact test was used to assess differences between sexes; ^c χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold; ^dMultiple-answer.

Food purchasing determinants are summarised in **Table 28**. Taste (98.6%) was reported as the most important determinant by the three groups, followed by “good value for money” in students (98.6%), “nutritional value” in ASS (97.0%) and “healthfulness” in ERS (94.4%). By sex, in students, the frequency of the determinants “health” and “how it feels” was higher in women than in men ($p<0.001$). Similar results were observed in ERS and ASS, although in these groups, differences were not registered in favour of women in all the determinants within these two categories (“health” and “how it feels”).

In addition, 38.9% of students and staff reported that discounts such as “2x1 offers” or “offers of large portions of food prepared at reduced prices” influenced their food choice, with statistically significant differences between students (42.3%), ASS (21.2%) and ERS (19.1%) ($p<0.001$). Although less than a quarter (14.7%) reported using the menu’s bonuses, the majority (78.0%) agreed that a loyalty card with which you get discounts on certain foods in the university would influence their choices. The percentage of students (82.1%) who supported the use of loyalty cards was significantly higher than that of ERS (53.1%) and ASS (60.1%) ($p<0.001$). Overall satisfaction with the food sold on campus obtained a score of 6.1 (SD 2.1) out of 10.

4.2.3. Opinions on on-campus food availability by the community of the University of the Basque Country - UPV/EHU

A great majority agreed that it is “important to have the option to consume healthy foods on campus” (98.5%) and that “the university has the responsibility of guaranteeing healthy food among the options available in its centres” (89.6%) (**Table 29**). Additionally, most agreed that “the university should include health-related clauses in foodservice contracting documents to ensure the availability of healthy foods” (90.6%).

Proposed changes to the on-campus FE are shown in **Table 30**. The “top five” opinions suggested about the campus FE and potential changes were “greater capacity to access free filtered drinking water”, “greater capacity to recycle food packaging” and “more healthy options in vending machines”, followed by “discounts for healthy choices” and “allergen labelling”. The first two changes in the “top five” list (“greater capacity to access free filtered drinking water” and “greater capacity to recycle food packaging”) were suggested by a higher percentage of students than employees ($p<0.001$); the third, fourth

and fifth of the “top five” list (“more healthy options in vending machines”, discounts for healthy choices” and “allergen labelling”) were requested above all by the ASS compared to the other two groups ($p<0.01$). Although supported by fewer participants, most reported interest in price changes. More students than staff wanted to see “cheaper foods” and “healthier foods for lower cost” ($p<0.001$), while other proposed price changes were supported by more staff ($p<0.001$). By sex, in the student group, women selected all “top five” potential changes more often than men ($p<0.001$); in the ERS group, men selected the first two potential changes more often than women ($p<0.01$), and for the next three potential changes, it was the other way around ($p<0.05$). Finally, in the ASS group, women selected the third potential change more often than men ($p<0.001$), and for the fourth potential change, it was the other way around ($p<0.001$).

4.3. ON-CAMPUS FOOD ENVIRONMENT, FOOD PURCHASING BEHAVIOURS, CHOICE DETERMINANTS AND OPINIONS ON FOOD AVAILABILITY BY THE COMMUNITY OF OSLOMET - OSLO METROPOLITAN UNIVERSITY

4.3.1. *Analysis of the food environment of OsloMet OsloMet - Oslo Metropolitan University (including only commercial products)*

A total of 256 foods were surveyed at Pilestredet and Kjeller campus of OsloMet. The number of foods studied by category and subcategories is presented in **Table 31**. As shown in **Table 32**, the most common products were sweet snacks (58.5% of the solid foods and 39.1% of the total products) and sugar-sweetened carbonated drinks (23.5% of the total drinks and 7.8% of the total products). Approximately half of the options did not meet the AECOSAN criteria (52.3%) and the UK NPM criteria (46.9%). Moreover, almost two-thirds (73.0%) did not meet the MFU criteria. The AECOSAN criterion that was most frequently unfulfilled was the SFA (42.7%) content in foods and the sugar (31.8%) content in drinks. The combination of the three criteria above-mentioned, the AECOSAN criteria, the UK NPM criteria and the MFU criteria, showed that 39.8% of the products were classified as LNQ. Moreover, according to the NOVA system, most of the products offered were categorized as “ultra-processed”, specifically 87.7% of the foods and 82.4% of drinks.

Table 28. Food choice determinants of the community of the University of the Basque Country – UPV/EHU.

Variables ^a	Total ^{b,c}			Students ^{b,c} , %			ERS ^{b,c} , %			ASS ^{b,c} , %			p-value ^e			
	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men		p-value ^d		
Sensory appeal																
Looks nice	37.5	37.8	37.0	37.0	37.0	38.4	0.003	34.3	37.2	31.1	<0.001	42.2	44.6	40.9	0.120	<0.001
Smells nice	83.8	82.8	87.4	87.4	78.8	78.8	<0.001	80.6	81.4	79.7	0.113	89.0	93.7	86.4	<0.001	<0.001
Tastes good	98.6	98.6	98.6	98.6	98.6	98.6	0.599	98.3	99.1	97.3	<0.001	98.4	98.2	98.9	0.285	0.099
Price																
Cheap	86.0	89.9	91.8	91.8	87.7	87.7	<0.001	60.6	56.7	64.9	<0.001	74.5	77.7	72.7	0.019	<0.001
Good value for money	97.2	98.1	97.4	97.4	98.6	98.6	<0.001	92.2	91.3	93.2	0.008	93.5	96.6	91.8	<0.001	<0.001
Health																
Helps me control weight	65.3	64.5	70.1	70.1	59.6	59.6	<0.001	67.5	66.2	68.9	0.031	76.0	83.4	71.8	<0.001	<0.001
Keeps me healthy	84.7	82.9	88.6	88.6	78.0	78.0	<0.001	94.4	94.8	93.9	0.146	96.2	96.0	96.4	0.711	<0.001
Nutritious	88.2	87.3	90.5	90.5	84.5	84.5	<0.001	92.5	94.8	89.9	<0.001	97.0	96.6	97.3	0.418	<0.001
Convenience																
Easily available	84.9	85.4	85.3	85.3	85.6	85.6	0.331	79.5	86.6	71.6	<0.001	88.6	90.9	87.3	0.018	<0.001
Familiar	59.3	57.9	55.1	55.1	61.2	61.2	<0.001	65.0	64.5	65.5	0.407	74.1	78.3	64.5	0.002	<0.001
What I usually eat	58.5	57.3	63.3	63.3	52.0	52.0	<0.001	63.7	64.5	62.8	0.201	70.2	75.4	67.3	<0.001	<0.001
How it feels																
Helps me deal with stress	54.9	55.6	64.2	64.2	48.0	48.0	<0.001	50.5	48.5	49.3	0.101	51.9	63.4	45.5	<0.001	<0.001
Keeps me awake	68.4	69.5	74.4	74.4	65.3	65.3	<0.001	59.8	64.9	54.1	<0.001	67.2	70.3	65.5	0.032	<0.001
Makes me feel good	77.2	77.2	83.2	83.2	72.0	72.0	<0.001	76.5	82.3	70.3	<0.001	77.9	84.0	74.5	<0.001	0.380

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aMultiple-answers; ^bThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879; men n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^cPercentage of participants who answered “very important” or “moderately important”; ^d χ^2 test or the Fisher exact test was used to assess differences by sex; ^e χ^2 test or the Fisher exact test was used to assess differences by university community group, significant p-values are highlighted in bold.

Table 29. Opinions regarding food environment on campus at the University of the Basque Country – UPV/EHU.

Variables ^a	Total ^{b,c}			Students ^{b,c} , %			ERS ^{b,c} , %			ASS ^{b,c} , %			p-value ^e	
	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men		p-value ^d
I can usually choose healthy foods from the food supply on campus	44.4	52.3	33.8	<0.001	48.1	50.0	49.0	48.1	50.0	46.5	43.4	48.2	0.046	<0.001
Important to have the option of consuming healthy food at university	98.5	98.8	98.3	<0.001	98.7	97.3	98.0	98.7	97.3	98.0	97.7	98.2	0.425	0.004
The university is responsible for guaranteeing healthy food among the options available in its centres	89.6	87.8	90.7	<0.001	90.5	89.9	90.2	90.5	89.9	94.7	96.6	93.6	0.006	<0.001
The university should include clauses related to health in the contracting specifications for food services to ensure the availability of healthy food.	90.6	89.3	90.7	<0.001	93.9	93.9	93.9	93.9	93.9	96.6	97.1	96.4	0.329	<0.001

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aMultiple-answer; ^bThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879; men n=22,719; ERS, women n=2929, men n=2662; ASS, women n=680, men 1211); ^cPercentage of participants who answered that they “strongly agree” or “agree”; ^d χ^2 test or the Fisher exact test was used to assess differences between sexes; ^e χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold.

Table 30. Proposed changes to the campus food environment of the University of the Basque Country – UPV/EHU.

Variables ^{a,b}	Students ^c , %			ERS ^c , %			ASS ^c , %			p-value ^e			
	Total	Women	Men	Total	Women	Men	Total	Women	Men				
Food changes: More...													
Alcoholic drinks	13.4	15.0	9.2	20.1	<0.001	4.8	3.0	6.8	<0.001	3.3	1.1	4.5	<0.001
Choices for religious diets	44.8	46.9	55.6	39.3	<0.001	36.9	42.9	30.4	<0.001	20.7	23.4	19.1	0.026
Ethnic cuisine choices	46.5	48.3	52.5	44.6	<0.001	37.2	37.2	37.2	0.962	33.6	32.0	34.5	0.278
Fast food choices (commercial, i.e., McDonald's)	11.2	12.5	10.4	14.4	<0.001	3.7	3.5	4.1	0.231	4.3	2.3	5.5	0.002
Fresh fruit	82.9	81.6	89.6	74.6	<0.001	91.2	93.1	89.2	<0.001	87.7	88.6	87.3	0.428
Freshly prepared foods	64.3	64.4	62.1	66.4	<0.001	60.3	64.1	56.1	<0.001	74.6	73.1	75.5	0.252
Food trucks on campus	28.4	30.7	29.6	31.6	<0.001	15.9	15.6	16.2	0.500	15.7	16.0	15.5	0.736
Gluten free foods	65.4	66.1	74.7	58.5	<0.001	61.6	65.4	57.4	<0.001	62.7	67.4	60.0	0.001
Lactose free foods	63.8	64.7	76.4	54.5	<0.001	58.8	63.6	53.4	<0.001	58.5	64.0	55.5	<0.001
Foods low in carbohydrates	54.7	54.0	60.8	48.0	<0.001	57.8	60.6	54.7	<0.001	62.0	70.3	57.3	<0.001
Reduced fat foods	76.1	75.5	83.3	68.6	<0.001	78.3	81.4	75.0	<0.001	83.6	85.1	82.7	0.175
Reduced salt foods	67.9	66.7	73.2	61.0	<0.001	72.2	77.1	66.9	<0.001	81.0	79.4	81.8	0.198
Sustainable products	72.3	70.6	73.5	68.1	<0.001	80.4	82.3	78.4	<0.001	85.5	82.3	87.3	0.003
Sweets and confectionery	14.6	16.0	12.6	18.9	<0.001	7.2	8.2	6.1	0.002	6.1	5.7	6.4	0.588
Takeaway food choices	34.2	36.6	32.5	40.1	<0.001	18.6	26.8	9.5	<0.001	26.7	24.0	28.2	0.048
Variety of food	79.2	79.6	80.9	78.5	<0.001	75.6	76.2	75.0	0.299	80.8	78.9	81.8	0.111
Help for food choice													
A mobile application with food and menu information	68.9	71.6	70.4	72.6	<0.001	51.2	49.8	52.7	0.029	60.5	56.6	62.7	0.009

Continuation of Table 30.

Variables ^{a,b}	Total ^c			Students ^c , %			ERS ^c , %			ASS ^c , %			p-value ^e	
	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men		p-value ^d
Help for food choice														
Allergen labelling	84.0	83.9	89.5	79.1	<0.001	83.8	87.4	79.7	<0.001	86.9	86.3	87.3	0.552	0.002
Calorie labelling on foods	67.8	68.2	68.0	68.4	0.389	62.5	59.7	65.5	<0.001	74.7	74.9	74.5	0.891	<0.001
Detailed nutritional information of foods or dishes	73.8	73.3	75.5	71.5	<0.001	75.2	77.9	72.3	<0.001	80.3	87.4	76.4	<0.001	<0.001
Healthy symbols or rating systems to guide healthy food choices (e. g., labelling traffic light)	82.1	82.6	86.0	79.7	<0.001	74.6	74.9	74.3	0.629	91.1	93.1	90.0	0.024	<0.001
Information on websites about food and dishes and their nutritional content	68.0	68.0	69.9	66.4	<0.001	64.9	66.2	63.5	0.034	76.8	76.0	77.3	0.532	<0.001
Labelling indicating organic produce	76.3	76.2	80.3	72.6	<0.001	75.4	80.1	70.3	<0.001	83.3	80.0	83.6	0.046	<0.001
Visual guides for healthier choices	73.3	73.3	79.8	67.5	<0.001	71.7	73.6	69.6	0.001	78.1	76.4	81.1	0.016	<0.001
Changes regarding price														
Cheaper foods	74.2	78.5	77.9	79.1	0.003	46.4	43.7	49.3	<0.001	59.8	50.7	60.9	0.161	<0.001
Discounts for healthy choices	86.1	86.7	88.9	84.7	<0.001	79.7	81.0	78.4	0.016	91.8	86.9	94.5	<0.001	<0.001
Healthier foods for lower cost	55.7	57.6	61.5	54.2	<0.001	43.0	40.3	45.9	<0.001	49.2	42.9	52.7	<0.001	<0.001

Continuation of Table 30.

Variables ^{a,b}	Students ^c , %			ERS ^c , %			ASS ^c , %			p-value ^e			
	Total ^c	Women	Men	p-value ^d	Total	Women	Men	p-value ^d	Total		Women	Men	p-value ^d
Changes regarding price													
Higher quality foods (even for a higher price)	80.2	79.4	78.2	0.004	88.6	88.7	88.5	0.788	88.3	85.1	90.0	0.002	<0.001
More meal deals	82.6	85.3	81.1	<0.001	77.9	80.5	75.0	<0.001	86.9	86.3	87.3	0.552	<0.001
Reward points for healthier food choices	68.5	72.5	66.7	<0.001	58.6	62.8	54.1	<0.001	76.9	71.4	80.0	<0.001	<0.001
Reward points for sustainable food choices	69.7	72.5	68.9	<0.001	60.7	64.9	56.1	<0.001	77.1	72.0	80.0	<0.001	<0.001
Other changes													
Earlier opening times	24.6	25.8	25.4	0.036	16.8	14.3	19.6	<0.001	18.7	22.9	16.4	0.001	<0.001
Freshly made food available for longer hours	66.7	68.3	67.8	0.069	57.0	55.4	58.8	0.011	61.4	70.3	56.4	<0.001	<0.001
Later closing times	36.5	38.5	40.1	<0.001	27.1	24.7	29.7	<0.001	17.8	18.9	17.3	0.393	<0.001
More cafeterias, restaurants, dining rooms, supermarkets at the university	54.2	55.6	54.8	0.084	47.4	46.3	48.6	0.083	50.5	53.1	49.1	0.092	<0.001
More hot food options for longer hours	62.7	64.2	64.4	0.457	53.3	51.9	54.7	0.038	56.8	67.4	50.9	<0.001	<0.001
Vending machine changes													
More healthy options in vending machines	86.5	87.0	81.1	<0.001	85.6	90.9	79.7	<0.001	88.2	91.4	86.4	0.001	0.003
More hot food in vending machines	57.1	59.0	57.3	<0.001	42.8	45.5	39.9	<0.001	57.2	63.4	53.6	<0.001	<0.001
More food for special diets in vending machines	70.4	71.1	61.9	<0.001	64.5	71.0	57.4	<0.001	72.0	78.9	68.2	<0.001	<0.001

Continuation of Table 30.

Variables ^{a,b}	Total ^c			Students ^c , %			ERS ^c , %			ASS ^c , %			p-values	
	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men		p-values ^d
Vending machine changes														
More variety of food in vending machines	77.7	82.9	76.8	63.2	68.4	57.4	75.7	77.7	74.5	0.134				<0.001
More vending machine	35.0	36.7	39.0	17.4	17.3	17.6	21.4	33.7	14.5	<0.001				<0.001
Only healthy options in vending machines	57.8	66.0	48.9	62.2	69.7	54.1	64.9	70.3	61.8	<0.001				<0.001
The removal of vending machines	15.1	14.4	16.7	13.4	9.1	18.2	7.3	5.7	8.2	0.050				<0.001
Facilities provided by the university: Greater capacity to...														
Access free filtered drinking water	87.7	89.6	87.3	84.4	83.1	85.8	82.0	84.0	80.9	0.098				<0.001
Heat meals from home in a microwave	76.8	83.2	75.7	62.7	64.5	60.8	64.1	63.4	64.5	0.604				<0.001
Recycle food packaging	87.3	87.6	87.0	87.0	85.7	88.5	81.5	79.4	82.7	0.073				<0.001

Abbreviations: ASS, administrative and services staff; ERS, education and/or research staff. Note: ^aMultiple-answer; ^bPercentage of participants who answered "strongly agree" or "agree"; ^cThe results were weighted according to the distribution by university community group and sex (total, n=50,080; students, women n=19,879; ERS, women n=2929, men n=2662; ASS, women n=1211); ^d χ^2 test or the Fisher exact test was used to assess differences between sexes; ^e χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold.

Table 31. List of foods analysed at Pilestredet and Kjeller campus of OsloMet – Oslo Metropolitan University.

Product	Group	Subcategory	n (%)		
Cold foods	Fruit	Dried fruit	3 (1.3)		
		Fresh fruit	3 (1.3)		
		Jam	2 (0.8)		
	Nuts	Fried nuts with salt	3 (1.3)		
		Fried nuts without salt	2 (0.8)		
		Natural or toasted nuts without salt	1 (0.4)		
	Salty snacks	Bakery products	18 (7.7)		
		Fried corn	1 (0.4)		
	Sandwiches	Sandwiches	3 (1.3)		
	Sweet snacks	Bakery and pastry	Bakery and pastry	25 (10.6)	
			Biscuits	2 (0.8)	
			Cereal bars	6 (2.5)	
			Chocolate	10 (4.2)	
			Chocolate bars	7 (3.0)	
			Granola	1 (0.4)	
			Ice creams	29 (12.3)	
			Jelly beans	1 (0.4)	
			Mix of grains	2 (0.8)	
			Yoghurts	Natural yoghurt without added sugars or sweeteners	2 (0.8)
				Yoghurts with added sugars	5 (1.9)
				Yoghurts with added sugars and muesli	6 (2.3)
				Yoghurts with sweeteners	3 (1.2)
				Yoghurts with sweeteners and muesli	1 (0.4)
			Other dairy products (pudding, porridge, etc.)	Cottage cheese	Cottage cheese
	Porridge with added sugars	7 (3.0)			
	Porridge with sweeteners	3 (1.3)			
	Porridge without added sugars	2 (0.8)			
	Protein bars	1 (0.4)			
	Pudding	1 (0.4)			
	Rice pudding with added sugars	3 (1.3)			
Rice pudding with sweeteners	1 (0.4)				
Others (chewing gums, sweets)	Candies with added sugars	Candies with added sugars	10 (4.2)		
		Candies with added sugars	4 (1.7)		
		Chewing gums with sweeteners	2 (0.8)		
Cold drinks	Bottled water	Bottled water	3 (1.3)		
	Carbonated drinks	Carbonated drinks with added sugars	16 (6.8)		
		Carbonated drinks with sweeteners	16 (6.8)		
		Carbonated drinks with juice	6 (2.5)		
		Soda	2 (0.8)		
	Dairy drinks	<i>Cappuccino</i> shake	2 (0.8)		
		Chocolate shake	8 (3.4)		
		Coffee shake	1 (0.4)		
		Iced coffee	1 (0.4)		
		Mocha shake	2 (0.8)		
	Fruit juice	Fruit juice from concentrated	7 (3.0)		
		Smoothies	4 (1.7)		

Continuation of Table 31.

Product	Group	Subcategory	n (%)
Cold drinks	Milk	Milk	2 (0.8)
	Non-carbonated drinks	Non-carbonated drinks with added sugars	9 (3.8)
		Non-carbonated drinks with sweeteners	1 (0.4)
	Vegetable drinks	Oat milk	1 (0.4)

Comparison of the results obtained from the three NPMs showed a substantial agreement between the results obtained with the UK NPM and the AECOSAN criteria, a fair-moderate agreement between those obtained with the UK NPM and the MFU criteria, and a slight-fair agreement between the classification according to the AECOSAN and the MFU criteria (**Table 33**). Regarding the comparison between the NPMs and processing level classification, a slight-fair agreement was observed between the NOVA system and each of the NPMs, separately and also combined (**Table 34**).

4.3.2. General characteristics of participants in the survey on food purchasing behaviours, choice determinants and opinions on food availability at OsloMet – Oslo Metropolitan University

Demographic characteristics of the participants in the survey on food purchasing behaviours, choice determinants and opinions on food availability are presented in **Table 35**. The majority of the participants were women (82.2%), enrolled full-time (90.7%) and were mostly from non-Health Sciences (58.9%), with no differences between students and staff for these variables. The percentages of women and subjects from the Health Sciences area were higher in the study sample than in the total population, that is, in the campus community (women, 82.2% in the study sample vs. 68% in the campus community, $p < 0.001$; Health Sciences, 41.1% vs. 23%, $p < 0.001$). As for age, most students (52.1%) were 25-44 years whereas most employees (60.3%) were over 45 years. Among students, 38.0% were undergraduates and 17.1% were postgraduates. Moreover, 32.6% of the participants reported following a special diet, this percentage was higher for students than employees ($p < 0.05$). Vegetarian or vegan diets were the diets most adhered to by the participants, followed by weight-management diets.

Table 32. Nutritional profile and processing level of commercial products sold on campus of OsloMet – Oslo Metropolitan University.

Type of product	n (%) ^a	Percentage not meeting the criteria										NOVA systems ^e , Ultra-processed, %									
		AECOSAN ^b , %					UK NPM ^d , %	MFU ^e , %	AECOSAN+ UK+MFU ^f , %	NOVA systems ^e ,											
		Energy	Total fat	SFA	TFA	Sugar				Salt	Total ^c		Ultra-processed, %	Ultra-processed, %							
Cold foods																					
Fruits	8 (3.1)	-	-	-	-	50.0	-	-	-	-	37.5	37.5	37.5	37.5	37.5						37.5
<i>Dairy products</i>																					
Other dairy products (porridge, pudding, etc.)	18 (7.0)	-	-	-	-	-	-	-	-	-	16.7	83.3	83.3	-	83.3						83.3
Yoghurts	17 (6.6)	-	-	-	-	-	-	-	-	-	5.9	52.9	52.9	-	52.9						88.2
Nuts	6 (2.3)	83.3	83.3	-	-	83.3	-	-	-	-	-	83.3	83.3	-	83.3						50.0
Salty snacks	19 (7.4)	5.3	21.1	21.1	-	68.4	52.6	-	-	-	21.1	36.8	36.8	21.1	36.8						84.2
Sandwiches	3 (1.2)	100.0	100.0	100.0	-	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	100.0						100.0
<i>Sweets and chewing gums</i>																					
with added sugars	11 (4.3)	63.6	-	54.5	-	90.9	9.1	-	-	-	90.9	90.9	90.9	90.9	90.9						100.0
with sweeteners	5 (1.9)	-	-	-	-	40.0	40.0	-	-	-	40.0	40.0	40.0	40.0	40.0						100.0
Sweet snacks	84 (32.8)	41.7	64.3	65.5	-	35.7	1.2	-	-	-	82.1	96.4	96.4	75.0	96.4						94.0
Total of cold foods	171 (66.8)	29.8	38.6	42.7	-	25.7	9.9	-	-	-	55.6	81.3	81.3	49.7	81.3						87.7
Cold drinks																					
Bottled water	3 (1.2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-						-
<i>Carbonated drinks</i>																					
with added sugars	20 (7.8)	-	-	-	-	85.0	-	-	-	-	90.0	100.0	100.0	85.0	100.0						100.0
with sweeteners	17 (6.6)	-	-	-	-	-	-	-	-	-	-	100.0	100.0	-	100.0						100.0
without added sugars or sweeteners	2 (0.8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-						-

Continuation of Table 32.

Type of product	n (%) ^a	Percentage not meeting the criteria										NOVA system ^g , Ultra-processed, %	
		AECOSAN ^b , %					UK NPM ^d , %	MFU ^e , %	AECOSAN+ UK+MFU ^f , %	NOVA system ^g , Ultra-processed, %			
		Energy	Total fat	SFA	TFA	Sugar				Salt	Total ^c		Ultra-processed, %
Cold drinks													
<i>Carbonated drinks</i>													
with added sugars and sweeteners	1 (0.4)	-	-	-	-	-	-	-	-	-	100.0	-	100.0
Dairy drinks	18 (7.0)	-	-	5.6	-	50.0	33.3	66.7	22.2	-	-	-	100.0
Fruit juices	11 (4.3)	-	-	-	-	9.1	-	9.1	9.1	-	-	-	27.3
Milk	2 (0.8)	-	-	-	-	-	-	-	-	-	-	-	-
<i>Non-carbonated drinks</i>													
with added sugars	9 (3.5)	-	-	-	-	-	-	-	11.1	100.0	-	-	100.0
with sweeteners	1 (0.4)	-	-	-	-	-	-	-	-	100.0	-	-	100.0
Vegetable drinks	1 (0.4)	-	-	-	-	-	-	-	100.0	-	-	-	100.0
Total of cold drinks	85 (33.2)	-	-	1.2	-	31.8	7.1	35.3	29.4	56.5	20.0	20.0	82.4
Total of products	256	19.9	25.8	28.9	-	27.7	9.0	52.3	46.9	73.0	39.8	39.8	85.9

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Faglige Utaalq*; NPM, nutrient profiling model; LNQ, low nutritional quality; SFA, saturated fatty acids; TFA, *trans* fatty acids. Note: ^aPercentages with respect to the total of products; ^bAECOSAN (2010); ^cThe same product may not meet more than one criterion, and therefore, the sum of the criteria does not result in the total percentage of products that do not meet the AECOSAN criteria; ^dDepartment of Health of the UK (2011); ^eMFU (2013); ^fThe three NPMs were combined as follows: if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered as LNQ; ^gMonteiro et al. (2018a).

Table 33. Percentages of commercial products sold on campus of OsloMet – Oslo Metropolitan University classified into the same or opposite category and agreement between the three NPMs used (the AECOSAN, the UK NPM and the MFU criteria).

	AECOSAN ^a				Kappa coefficient ^b
	LNQ		HNQ		
	n	%	n	%	
UK NPM^c					
Cold foods (n=171)					0.652
LNQ	85	49.7	10	5.8	
HNQ	19	11.1	57	33.3	
Total	104	60.8	67	39.2	
Cold drinks (n=85)					0.706
LNQ	22	25.9	3	3.5	
HNQ	8	9.4	52	61.2	
Total	30	35.3	55	64.7	
Total (n=256)					0.688
LNQ	107	41.8	13	5.1	
HNQ	27	10.5	109	42.6	
Total	134	52.3	122	47.7	
MFU^d					
Cold foods (n=171)					0.310
LNQ	96	56.1	43	25.1	
HNQ	8	4.7	24	14.0	
Total	104	60.8	67	39.2	
Cold drinks (n=85)					0.003
LNQ	17	20.0	31	36.5	
HNQ	13	15.3	24	28.2	
Total	30	35.3	55	64.7	
Total (n=256)					0.241
LNQ	113	44.1	74	28.9	
HNQ	21	8.2	48	18.7	
Total	134	52.3	122	47.7	
UK NPM^c					
MFU^d					
Cold foods (n=171)					0.447
LNQ	95	55.6	44	25.7	
HNQ	0	0.0	32	18.7	
Total	95	55.6	76	44.4	
Cold drinks (n=85)					0.263
LNQ	20	23.5	28	32.9	
HNQ	5	5.9	32	5.9	
Total	25	29.4	60	70.6	
Total (n=256)					0.415
LNQ	115	44.9	72	28.1	
HNQ	5	2.0	64	25.0	
Total	120	46.9	136	53.1	

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Faglige Utvalg*; NPM, nutrient profiling model; HNQ, high nutritional quality; LNQ, low nutritional quality. Note: ^aAECOSAN (2010); ^bThe kappa results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect; ^cDepartment of Health of the UK (2011); ^dMFU (2013).

Table 34. Percentages of products sold on campus of OsloMet – Oslo Metropolitan University classified into the same or opposite category and agreement between the three nutrient profiling models used and processing level classification (NOVA system).

	NOVA system ^a				Kappa coefficient ^b
	Ultra-processed		Non-ultra-processed		
	n	%	n	%	
AECOSAN^c					
Cold foods (n=171)					-0.116
LNQ	97	56.7	7	4.1	
HNQ	53	31.0	14	8.2	
Total	150	87.7	21	12.3	
Cold drinks (n=85)					-0.308
LNQ	30	35.3	0	0.0	
HNQ	40	47.0	15	17.6	
Total	70	82.3	15	17.6	
Total (n=256)					-0.179
LNQ	127	49.6	7	2.7	
HNQ	93	36.3	29	11.3	
Total	220	85.9	36	14.1	
UK NPM^d					
Cold foods (n=171)					-0.209
LNQ	93	54.4	2	1.2	
HNQ	57	33.3	19	11.1	
Total	150	87.7	21	12.3	
Cold drinks (n=85)					-0.283
LNQ	25	29.4	0	0.0	
HNQ	45	52.9	15	17.6	
Total	70	82.3	15	17.6	
Total(n=256)					-0.243
LNQ	118	46.1	2	0.8	
HNQ	102	39.8	34	13.3	
Total	220	85.9	36	14.1	
MFU^e					
Cold foods (n=171)					-0.192
LNQ	134	78.4	5	2.9	
HNQ	16	9.4	16	9.4	
Total	150	87.7	21	12.3	
Cold drinks (n=85)					-0.368
LNQ	48	56.5	0	0.0	
HNQ	22	25.9	15	17.6	
Total	70	82.3	15	17.6	
Total(n=256)					-0.250
LNQ	182	71.1	5	1.9	
HNQ	38	14.8	31	12.1	
Total	220	85.9	36	14.1	
AECOSAN+UK NPM+MFU^f					
Cold foods (n=171)					-0.198
LNQ	83	48.5	2	1.2	
HNQ	67	39.2	19	11.1	
Total	150	87.7	21	12.3	

Continuation of Table 34.

	NOVA system ^a				Kappa coefficient ^b
	Ultra-processed		Non-ultra-processed		
	n	%	n	%	
AECOSAN+UK NPM+MFU^f					
Cold drinks (n=85)					-0.231
LNQ	17	20.0	0	0.0	
HNQ	53	62.4	15	17.6	
Total	70	82.3	15	17.6	
Total(n=256)					-0.226
LNQ	100	39.1	2	0.8	
HNQ	120	46.9	34	13.3	
Total	220	85.9	36	14.1	

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; MFU, *Matbransjens Faglige Utvalg*; NPM, nutrient profiling model; HNQ, high nutritional quality; LNQ, low nutritional quality. Note: ^aMonteiro et al. (2018a); ^bThe kappa results were interpreted as follows: values ≤ 0 no agreement, 0.1–0.20 none to slight, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial and 0.81–1.00 almost perfect; ^cAECOSAN (2010); ^dDepartment of Health of the UK (2011); ^eMFU (2013); ^fTo classify the commercial products, the combination of the three NPMs was used, that is, if a food or drink had been classified as LNQ according to the AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered LNQ.

Table 35. General characteristics of participants of Pilestredet and Kjeller campus of OsloMet – Oslo Metropolitan University in the survey on food purchasing behaviours, choice determinants, and opinions on food availability.

Variables	Total n=129	Students n=71 n (%)	Staff n=58	p-value ^a
Age				
<25 years	30 (23.3)	30 (42.3)	-	
25-44 years	60 (46.5)	37 (52.1)	23 (39.7)	
≥45 years	39 (30.2)	4 (5.6)	35 (60.3)	<0.001
Area of knowledge				
Health Sciences	53 (41.1)	30 (42.3)	23 (39.7)	
Non-Health Sciences	76 (58.9)	41 (57.7)	35 (60.3)	0.765
Study or work contract				
Full-time	117 (90.7)	65 (91.5)	52 (89.7)	
Part-time	12 (9.3)	6 (8.5)	6 (10.3)	0.713
Special diet^b	42 (32.6)	27 (38.0)	15 (25.9)	0.142
Religious motives	4 (3.1)	3 (4.2)	1 (1.7)	0.627
Therapeutic	12 (9.3)	9 (12.7)	3 (5.2)	0.144
Vegetarian/vegan	20 (15.5)	12 (16.9)	8 (13.8)	0.628
Weight-management	16 (12.4)	7 (9.9)	9 (15.5)	0.332

Note: ^a χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant p-values are highlighted in bold; ^bMultiple-answer.

4.3.3. Food purchasing behaviours and choice determinants of the community of OsloMet – Oslo Metropolitan University

A majority of the respondents (92.2%) had purchased foods from an OsloMet campus in the last month. Among the participants, 54.3% reported buying foods or drinks on at least 50% of the occasions they were on campus. One-third of the participants (32.6%) reported spending between 100 and 200 Norwegian kroner (NOK) on foods on campus during an average week. These purchases were mainly done in the canteen of the campus (72.9%), followed by the cafeterias/restaurants (25.6%) and other (i.e., vending machines) (1.6%) (**Table 36**). No significant differences between students and staff were observed in these four variables: foods and purchasing in the last month, frequency of purchasing, weekly spending on purchasing (this variable was dichotomized as “≥200 NOK” and “<200 NOK”) and purchase place. Both foods and drinks were commonly purchased at lunch and between meals (**Table 37**). This purchase occasion was higher among students than staff ($p<0.05$), with the exception of food purchase for lunch that was similar in both groups ($p>0.05$).

Table 36. Frequency and place of food purchasing, and spending on purchasing at OsloMet – Oslo Metropolitan University.

Variables	Total	Students	Staff	<i>p</i> -value ^a
	n=129	n=71	n=58	
Eating on campus in the last month	119 (92.2)	63 (88.7)	56 (96.6)	0.183
Spending on campus				0.838
<20 NOK/week	99 (76.7)	54 (76.1)	45 (77.6)	
≥20 NOK/week	30 (23.3)	17 (23.9)	13 (22.4)	
Purchasing times while on campus				0.380
<50% of the occasions	59 (45.7)	30 (42.3)	29 (50.0)	
≥50% of the occasions	70 (54.3)	41 (57.7)	29 (50.0)	
Place of purchasing				0.086
Cafeteria/restaurant	33 (25.6)	23 (32.4)	10 (17.2)	
University canteen	94 (72.9)	47 (66.2)	47 (81.0)	
Other (i.e., vending machines, supermarket)	2 (1.6)	1 (1.4)	1 (1.7)	

Abbreviations: NOK, Norwegian kroner. Note: ^a χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold.

Table 37. Occasions of foods purchase from a university outlet of OsloMet – Oslo Metropolitan University.

Eating/drinking occasion ^a	Total n=129	Students n=71 n (%)	Staff n=58	p-value ^b
	Foods			
Breakfast	23 (17.8)	22 (31.0)	1 (1.7)	<0.001
Lunch	117 (90.7)	63 (88.7)	54 (93.1)	0.395
Dinner	28 (21.7)	22 (31.0)	6 (10.3)	0.005
Snack	38 (29.5)	30 (42.3)	8 (13.8)	<0.001
Drinks				
Breakfast	40 (31.0)	30 (42.3)	10 (17.2)	0.002
Lunch	55 (42.6)	41 (57.7)	14 (24.1)	<0.001
Dinner	13 (10.1)	11 (15.5)	2 (3.6)	0.024
Snack	45 (34.9)	31 (43.7)	14 (24.1)	0.021

Note: ^aMultiple-answer; ^b χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold.

Table 38 shows the purchase of foods (categorised as solid foods and snacks) and drinks with a frequency of once a week or higher. Cold foods (87.6%) and drinks (77.5%) were the most purchased items, followed by hot foods (49.7%) and snacks (40.3%). In each category, the products most consumed were salads and hot drinks, such as coffee or hot chocolate, followed by cold sandwiches or wraps. More students than staff consumed cold sandwiches or wraps, fresh fruits, other snacks, and drinks in general ($p < 0.05$).

Bringing food from home or purchasing off-campus was also frequent by almost all students and staff (96.1% of the total sample) (**Table 39**), with almost a half (49.6%) bringing all or almost all the foods eaten on campus. The reasons for bringing food from off-campus were because of the high price (76.0%) and the low quality-price (38.0%) of the on-campus foods, with significantly more students than staff reporting these reasons ($p < 0.05$).

Table 38. Purchases of food with a frequency of once weekly or higher from a university outlet of OsloMet – Oslo Metropolitan University.

Variables ^a	Total n=129	Students n=71 n (%)	Staff n=58	p-value ^b
	Foods			
Hot foods				
Hot sandwiches, wraps, pizzas and burgers	10 (7.8)	9 (12.7)	1 (1.7)	0.023
Menu	24 (18.6)	13 (18.3)	11 (19.0)	0.924
Others hot foods ^c	42 (32.6)	22 (31.0)	20 (34.5)	0.673
Total hot food	63 (48.8)	32 (45.1)	31 (53.4)	0.344

Continuation of Table 38.

Variables ^a	Total n=129	Students n=71	Staff n=58	<i>p</i> -value ^b
	n (%)			
Foods				
Cold foods				
Cold sandwiches or wraps	28 (21.7)	22 (31.0)	6 (10.3)	0.005
Salads	76 (58.9)	40 (56.3)	36 (62.1)	0.510
Others cold foods ^d	14 (10.9)	9 (12.7)	5 (8.6)	0.461
Total cold foods	87 (67.4)	49 (69.0)	38 (65.5)	0.673
Snacks				
Fresh fruit	21 (16.3)	17 (23.9)	4 (6.9)	0.009
Sweet snacks	15 (11.6)	9 (12.7)	6 (10.3)	0.681
Others snacks ^e	16 (12.4)	13 (18.3)	3 (5.2)	0.024
Total snacks	34 (26.4)	26 (36.6)	8 (13.8)	0.003
Drinks				
Hot drinks				
Coffee, tea, hot chocolate...	54 (41.9)	38 (53.5)	16 (27.6)	0.003
Total hot drinks	53 (41.1)	37 (52.1)	16 (27.6)	0.005
Cold drinks				
Soft drinks, energy drinks, flavoured drinks...	19 (14.7)	17 (23.9)	2 (3.4)	0.001
Others drinks ^f	27 (20.9)	26 (36.6)	1 (1.7)	<0.001
Total cold drinks	28 (21.7)	25 (35.2)	3 (5.2)	<0.001

Note: ^aMultiple-answer; ^b χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold; ^c“Others hot foods”: soup, main course, starter, dairy products; ^d“Others cold foods”: dairy products; ^e“Other snacks”: non-specified on the survey; ^f“Other drinks”: iced coffee.

Table 39. Bringing food from home or off-campus to OsloMet – Oslo Metropolitan University, and reasons for it.

Variables	Total n=129	Students n=71	Staff n=58	<i>p</i> -value ^a
	n (%)			
Bringing food from off campus or home	124 (96.1)	68 (95.8)	56 (96.6)	1.000
Amount of food brought off campus or home				0.530
Little food	65 (50.4)	34 (47.9)	31 (53.4)	
Most or all	64 (49.6)	37 (52.1)	27 (46.6)	
Reasons for bringing food^b				
Convenience	24 (18.6)	12 (16.9)	12 (20.7)	0.582
Helps increase variety	42 (32.6)	20 (28.2)	22 (37.9)	0.239
High price	98 (76.0)	59 (83.1)	39 (67.2)	0.036
Low quality-price	49 (38.0)	34 (47.9)	15 (25.9)	0.010
Preference for food from off-campus food outlets	8 (6.2)	4 (5.6)	4 (6.9)	1.000
Preference for my own food brought from home	34 (26.4)	16 (22.5)	18 (31.0)	0.276
The food offer does not suit my dietary needs	22 (17.1)	11 (15.5)	11 (19.0)	0.602

Note: ^a χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold; ^bMultiple-answer

Food purchasing determinants are summarised in **Table 40**. Taste was the most important determinant for the respondents. Availability, cost and nutritional value were also considered as main factors when buying food on campus. No differences were found between students and employees for most purchasing determinants, with the exception of sensory appeal (in particular, smell and look) and health. These aspects were more important for staff than for students ($p < 0.05$). In addition, 39.5% of participants affirmed that “2x1 offers” or “offers of large portions of food prepared at reduced prices” influence their food choice, with statistically significant differences between students and staff (54.9% of students vs. 20.7% of employees, $p < 0.001$). Although 24.0% of the respondents reported using menu passes, more than half (62.0%) agreed that a loyalty card with which you get discounts on certain foods in the university would influence their choices. The percentage of students (70.4%) that supported the use of loyalty cards was significantly higher than that of the staff (51.7%) ($p < 0.05$). Overall satisfaction with foods sold on campus obtained a score of 6.1 (SD 2.0) out of 10.

Table 40. Food choice determinants of the community of OsloMet – Oslo Metropolitan University.

Variables ^a	Total n=129	Students n=71 n (%) ^b	Staff n=58	<i>p</i> -value ^c
Sensory appeal				
Looks nice	91 (70.5)	44 (62.0)	47 (81.0)	0.018
Smells nice	106 (82.2)	54 (76.1)	52 (89.7)	0.045
Tastes good	129 (100.0)	71 (100.0)	58 (100.0)	-
Price				
Cheap	115 (89.1)	63 (88.7)	52 (89.7)	0.867
Good value for money	115 (89.1)	66 (93.0)	49 (84.5)	0.124
Health				
Helps me control weight	54 (41.9)	25 (35.2)	29 (50.0)	0.090
Keeps me healthy	106 (82.2)	54 (76.1)	52 (89.7)	0.045
Nutritious	108 (83.7)	57 (80.3)	51 (87.9)	0.242
Convenience				
Easily available	122 (94.6)	67 (94.4)	55 (94.8)	1.000
Familiar	53 (41.1)	29 (40.8)	24 (41.4)	0.951
What I usually eat	47 (36.4)	26 (36.6)	21 (36.2)	0.961
How it feels				
Helps me deal with stress	37 (28.7)	23 (32.4)	14 (24.1)	0.302
Keeps me awake	91 (70.5)	55 (77.5)	36 (62.1)	0.056
Makes me feel good	102 (79.1)	56 (78.9)	46 (79.3)	0.952

Note: ^aMultiple-answer; ^bPercentage of participants who answered “very important” or “moderately important”; ^c χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold.

4.3.4. Opinions on food availability by the community of OsloMet – Oslo Metropolitan University

Almost all respondents (99.2%) agreed that it is important to have the option to consume healthy foods on campus and that the university has the responsibility of guaranteeing healthy food among the options available in its centres (95.3%) (Table 41). Additionally, most agreed that the university should include health-related clauses in foodservice contracting documents to ensure the availability of healthy foods (77.5%). Moreover, 80.6% of the participants reported that they are not usually able to choose healthy foods from the food supply on campus.

Table 41. Opinions regarding food environment on campus of OsloMet – Oslo Metropolitan University

Variables ^a	Total	Students	Staff	<i>p</i> -value ^c
	n=129	n=71	n=58	
	n (%) ^b			
I can usually choose healthy foods from the food supply on campus	104 (80.6)	60 (84.5)	44 (75.9)	0.217
Important to have option the option of consuming healthy food at university	128 (99.2)	70 (98.6)	58 (100.0)	1.000
The university is responsible for guaranteeing healthy food among the options available in its centres	123 (95.3)	69 (97.2)	54 (93.1)	0.408
The university should include clauses related to health in the contracting specifications for food services to ensure the availability of healthy food	100 (77.5)	(76.1)	(79.3)	0.679

Note: ^aMultiple-answer; ^b Percentage of participants who answered that they “strongly agree” or “agree”; ^c χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold.

The most popular opinions suggested about the campus FE and potential changes, were: “healthier foods for lower cost”, “allergen labelling”, “cheaper foods”, “more discounts for healthy choices”, “fresh fruits”, “freshly cooked/prepared foods”, “greater capacity to recycle food packaging”, “sustainable products”, “reward points for sustainable food choices” and “variety of food” (Table 42). The percentages of students in favour of “more sweets and confectionery”, “cheaper foods”, “higher quality foods (even for a higher price)”, “larger variety of meals”, “more hot food options for longer hours”, “more hot food in vending machines”, “more variety of food in vending machines”, “greater capacity to heat meals from home in a microwave” and “greater capacity to access

free filtered drinking water” were higher than those of employees ($p<0.05$). On the contrary, staff most frequently selected the following changes compared to the students: “more healthy options in vending machines” and “the removal of vending machines”.

Table 42. Proposed changes to the campus food environment of OsloMet – Oslo Metropolitan University.

Variables ^a	Total n=129	Students n=71	Staff n=58	p-value ^c
	n (%) ^b			
Food changes: More...				
Alcoholic drinks	13 (10.1)	9 (12.7)	4 (6.9)	0.278
Choices for religious diets	41 (31.8)	22 (31.0)	19 (32.8)	0.830
Ethnic cuisine choices	67 (51.9)	37 (52.1)	30 (51.7)	0.965
Fast food choices (commercial, i.e., McDonald’s)	7 (5.4)	7 (9.9)	-	0.016
Fresh fruit	96 (74.4)	57 (80.3)	39 (67.2)	0.091
Freshly prepared foods	87 (67.4)	50 (70.4)	37 (63.8)	0.424
Food trucks on campus	56 (43.4)	35 (49.3)	21 (36.2)	0.136
Gluten free foods	45 (34.9)	23 (32.4)	22 (37.9)	0.512
Lactose free foods	50 (38.8)	27 (38.0)	23 (39.7)	0.850
Foods low in carbohydrates	38 (29.5)	17 (23.9)	21 (36.2)	0.129
Reduced fat foods	44 (34.1)	21 (29.6)	23 (39.7)	0.230
Reduced salt foods	60 (46.5)	31 (43.7)	29 (50.0)	0.473
Special diet choices	52 (40.3)	32 (45.1)	20 (34.5)	0.223
Sustainable products	85 (65.9)	42 (59.2)	43 (74.1)	0.074
Sweets and confectionery	11 (8.5)	10 (14.1)	1 (1.7)	0.022
Takeaway food choices	20 (15.5)	15 (21.1)	5 (8.6)	0.051
Variety of food	86 (66.7)	48 (67.6)	38 (65.5)	0.802
Help for food choice				
A mobile application with food and menu information	78 (60.5)	46 (64.8)	32 (55.2)	0.266
Allergen labelling	99 (76.7)	56 (78.9)	43 (74.1)	0.527
Calorie labelling on foods	53 (41.1)	27 (38.0)	26 (44.8)	0.435
Detailed nutritional information of foods or dishes	66 (51.2)	33 (46.5)	33 (56.9)	0.239
Healthy symbols or rating systems to guide healthy food choices (e. g., labelling traffic light)	58 (45.0)	34 (47.9)	24 (41.4)	0.460
Information on websites about food and dishes and their nutritional content	58 (45.0)	32 (45.1)	26 (44.8)	0.978
Labelling indicating organic produce	67 (51.9)	33 (46.5)	34 (58.6)	0.170
Visual guides for healthier choices	71 (55.0)	42 (59.2)	29 (50.0)	0.298
Changes regarding price				
Cheaper foods	98 (76.0)	61 (85.9)	37 (63.8)	0.003
Discounts for healthy choices	97 (75.2)	56 (78.9)	41 (70.7)	0.284

Continuation of Table 42.

Variables ^a	Total n=129	Students n=71	Staff n=58	<i>p</i> -value ^c
	n (%) ^b			
Changes regarding price				
Healthier foods for lower cost	107 (82.9)	60 (84.5)	47 (81.0)	0.602
Higher quality foods (even for a higher price)	71 (55.0)	31 (43.7)	40 (69.0)	0.004
More meal deals	68 (52.7)	44 (62.0)	24 (41.4)	0.020
Reward points for healthier food choices	76 (58.9)	42 (59.2)	34 (58.6)	0.951
Reward points for sustainable food choices	85 (65.9)	46 (64.8)	39 (67.2)	0.770
Other changes				
Earlier opening times	30 (23.3)	19 (26.8)	11 (19.0)	0.297
Freshly made food available for longer hours	68 (52.7)	41 (57.7)	27 (46.6)	0.205
Later closing times	76 (58.9)	46 (64.8)	30 (51.7)	0.134
More cafeterias, restaurants, dining rooms, supermarkets at the university	47 (36.4)	21 (29.6)	26 (44.8)	0.073
More hot food options for longer hours	61 (47.3)	40 (56.3)	21 (36.2)	0.023
Vending machine changes				
More healthy options in vending machines	78 (60.5)	49 (50.0)	29 (69.0)	0.028
More hot food in vending machines	47 (36.4)	34 (47.9)	13 (22.4)	0.003
More food for special diets in vending machines	38 (29.5)	23 (32.4)	15 (25.9)	0.418
More variety of food in vending machines	64 (49.6)	41 (57.7)	23 (39.7)	0.041
More vending machine	21 (16.3)	15 (21.1)	6 (10.3)	0.099
Only healthy options in vending machines	37 (28.7)	19 (26.8)	18 (31.0)	0.593
The removal of vending machines	22 (17.1)	7 (9.9)	15 (25.9)	0.016
Facilities provided by the university: Greater capacity to...				
Access free filtered drinking water	79 (61.2)	54 (76.1)	25 (43.1)	<0.001
Heat meals from home in a microwave	64 (49.6)	42 (59.2)	22 (37.9)	0.016
Recycle food packaging	86 (66.7)	45 (63.4)	41 (70.7)	0.381

Note: ^aVariables with multiple-answer; ^bPercentage of participants who answered that they “strongly agree” or “agree”; ^c χ^2 test or the Fisher exact test was used to assess differences between university community groups, significant *p*-values are highlighted in bold.

4.4. DIFFERENCES IN ON-CAMPUS FOOD ENVIRONMENT, FOOD PURCHASING BEHAVIOURS, CHOICE DETERMINANTS AND OPINIONS ON FOOD AVAILABILITY BETWEEN THE COMMUNITIES OF THE UNIVERSITY OF THE BASQUE COUNTRY - UPV/EHU AND OSLOMET - OSLO METROPOLITAN UNIVERSITY

4.4.1. Differences in on-campus food environment (including only commercial products) between the University of the Basque Country - UPV/EHU and OsloMet - Oslo Metropolitan University

Regarding the nutritional profile of commercial products sold on campus (**Table 43**), the percentage of products classified as LNQ was higher at the UPV/EHU than at OsloMet ($p < 0.001$). Specifically, the subcategories in which these differences were observed were: salty snacks, sweet snacks, dairy products other than yoghurt, sweets and chewing gums with sweeteners and cold dairy drinks ($p < 0.001$). The only subcategory in which the results were the other way around, that is, the percentage of products classified as LNQ was higher in OsloMet than in the UPV/EHU was fruit and fruit derivatives ($p < 0.05$). However, it should be noted that the offer of these products in OsloMet ($n=8$) was considerably lower than that of UPV/EHU ($n=79$). As for the percentage of ultra-processed products, no differences were found between the two universities analysed with regard to the total of products (**Table 44**). However, the percentages of ultra-processed cold foods and cold drinks were higher at OsloMet compared to UPV/EHU ($p < 0.01$). In any case, the product subcategories that presented a higher percentage of products of LNQ at OsloMet were: fruit and fruit derivatives, yoghurt and dairy products other than yoghurt ($p < 0.05$). At UPV/EHU, the subcategories that showed a higher percentage of products of LNQ were: salty snacks, sweet snacks and juices ($p < 0.05$).

4.4.2. Differences in on-campus food purchasing behaviours, choice determinants and opinions on food availability between the communities of the University of the Basque Country - UPV/EHU and OsloMet - Oslo Metropolitan University

Table 45 shows a summary of the socio-cultural factors in order to contextualise the possible influences of these factors on individual food choices by the communities of both universities. Regarding the attitudes to the environment, it should be noted that Spanish culture needs to build good relationships, trust, and engagement of members of a team.

Table 43. Differences in nutritional profile of commercial products sold in food outlets on campus between the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Type of product	Percentage not meeting the criteria														
	n (%) ^a			AFCOSAN criteria ^b , %			UK NPM ^d , %			MFU ^e , %			AFCOSAN+UK NPM+MFU ^f , %		
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	p-value ^c
Cold foods															
Fruit and fruit derivatives	79 (1.7)	8 (3.1)	11.4	50.0	8.9	37.5	8.9	37.5	8.9	37.5	8.9	37.5	8.0	37.5	0.046
<i>Dairy products</i>															
Yoghurts	26 (0.6)	17 (6.6)	-	-	7.7	5.9	53.8	52.9	0.954	1.000	0.954	52.9	-	-	-
Other dairy products (pudding, porridge, etc.)	39 (0.9)	18 (7.0)	79.5	-	84.6	16.7	82.1	83.3	<0.001	<0.001	1.000	83.3	66.7	-	<0.001
Nuts	138 (3.0)	6 (2.3)	88.4	83.3	39.9	-	94.9	83.3	0.295	0.083	0.295	83.3	39.9	-	0.083
Salty snacks	764 (16.9)	19 (7.4)	99.5	68.4	79.6	21.1	96.9	36.8	<0.001	<0.001	<0.001	36.8	78.7	21.1	<0.001
Sandwiches	194 (4.3)	3 (1.2)	94.8	100.0	53.1	100.0	99.0	100.0	1.000	0.251	1.000	100.0	53.1	100.0	0.251
Sweet snacks	1403 (31.0)	84 (32.8)	97.6	79.8	94.0	82.1	100.0	96.4	<0.001	<0.001	<0.001	96.4	92.4	75.0	<0.001

Continuation of Table 43.

Type of product	Percentage not meeting the criteria															
	n (%) ^a		AECOSAN criteria ^b , %				UK NPM ^d , %				MFU ^e , %				AFCOSAN+UK NPM+MFU ^f , %	
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet
Cold foods																
<i>Sweets and chewing gums</i>																
with added sugars	31 (0.7)	11 (4.3)	96.8	90.9	93.5	90.9	100.0	100.0	100.0	100.0	100.0	100.0	93.5	90.9	1.000	1.000
with sweeteners	214 (4.7)	5 (1.9)	-	40.0	-	40.0	<0.001	100.0	100.0	<0.001	100.0	100.0	-	40.0	<0.001	<0.001
Total of cold foods	2888 (63.8)	171 (66.8)	86.8	60.8	74.7	55.6	<0.001	95.7	81.3	<0.001	95.7	81.3	73.3	49.7	<0.001	<0.001
Cold drinks																
Bottled water	396 (8.7)	3 (1.2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carbonated drinks</i>																
with added sugars	310 (6.8)	20 (7.8)	90.3	85.0	91.3	90.0	0.436	100.0	100.0	0.692	100.0	100.0	-	85.0	0.436	0.436
with added sugars and sweeteners	105 (2.3)	1 (0.4)	74.3	-	78.1	100.0	0.264	100.0	100.0	1.000	100.0	100.0	100.0	-	0.264	0.264
with sweeteners	184 (4.1)	17 (6.6)	-	-	-	-	-	100.0	100.0	-	100.0	100.0	74.3	-	-	-
without added sugars or sweeteners	2 (>0.0)	2 (0.8)	100.0	-	100.0	-	0.333	100.0	-	0.333	100.0	-	90.3	-	0.333	0.333

Continuation of Table 43.

Type of product	Percentage not meeting the criteria													
	n (%) ^a			AECOSAN criteria ^b , %			UK NPM ^d , %			MFU ^e , %			AECOSAN+UK NPM+MFU ^f , %	
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet
Cold drinks														
Dairy drinks	65 (1.4)	9 (3.5)	86.2	66.7	76.9	77.8	47.7	-	46.2	-	<0.001	46.2	-	<0.001
Juices	279 (6.2)	1 (0.4)	36.9	9.1	24.7	9.1	49.5	-	0.4	-	0.470	0.4	-	1.000
Milk	18 (0.4)	-	-	-	33.3	-	-	-	-	-	1.000	-	-	-
<i>Non-carbonated drinks</i>														
with added sugars	39 (0.9)	2 (0.8)	10.3	-	74.4	11.1	100.0	100.0	7.7	-	0.001	7.7	-	1.000
with sweeteners	2 (>0.0)	18 (7.0)	-	-	-	-	100.0	100.0	-	-	-	-	-	-
Vegetable drinks	236 (5.2)	1 (0.4)	-	-	14.3	-	-	-	-	-	1.000	-	-	-
Total of cold drinks	1636 (36.2)	85 (33.2)	37.1	35.3	37.0	29.4	57.6	56.5	27.9	20.0	0.157	27.9	20.0	0.112
Total of products	4524	256	70.5	52.3	62.3	46.9	83.2	73.0	58.5	39.8	<0.001	58.5	39.8	<0.001

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; EHU, University of the Basque Country – UPV/EHU; MFU, *Matbransjens Faglige Utvalg*; NPM, nutrient profiling model; LNQ, product of low nutritional quality; OsloMet, Oslo Metropolitan University. Note: ^aPercentages with respect to the total of products for each university (only the product categories available at both universities are included in this table); ^bAECOSAN (2010); ^c χ^2 test or the Fisher exact test was used to assess differences between universities, significant *p*-values are highlighted in bold; ^dDepartment of Health of the UK (2011); ^eMFU (2013); ^fThe three NPMs were combined as follows: if a food or drink had been classified as LNQ according to AECOSAN (AECOSAN, 2010), the UK NPM (Department of Health of the UK, 2011) and the MFU criteria (MFU, 2013), it was considered as LNQ; ^g“Other dairy products”: custard, cream caramel, cheese, pudding etc.

Table 44. Differences in processing level of commercial products sold in food outlets on campus between the University of the Basque Country - UPV/EHU and OsloMet - Oslo Metropolitan University.

Type of product	n (%) ^a		NOVA system ^g Ultra-processed, %		p-value ^c
	EHU	OsloMet	EHU	OsloMet	
Cold foods					
Fruit and fruit derivatives	79 (1.7)	8 (3.1)	8.9	37.5	0.046
<i>Dairy products</i>					
Yoghurts	26 (0.6)	17 (6.6)	84.6	88.2	1.000
Other dairy products (custard, cream caramel, cheese, pudding etc.)	39 (0.9)	18 (7.0)	33.3	83.3	0.001
Nuts	138 (3.0)	6 (2.3)	81.9	50.0	0.088
Salty snacks	764 (16.9)	19 (7.4)	97.5	84.2	0.014
Sandwiches	194 (4.3)	3 (1.2)	100.0	100.0	-
Sweet snacks	1403 (31.0)	84 (32.8)	99.8	94.0	<0.001
<i>Sweets and chewing gums</i>					
with added sugars	31 (0.7)	11 (4.3)	100.0	100.0	-
with sweeteners	214 (4.7)	5 (1.9)	100.0	100.0	-
Total of cold foods	2888 (63.8)	171 (66.8)	82.4	87.7	<0.001
Cold drinks					
Bottled water	396 (8.7)	3 (1.2)	-	-	-
<i>Carbonated drinks</i>					
with added sugars	310 (6.8)	20 (7.8)	100.0	100.0	-
with added sugars and sweeteners	105 (2.3)	1 (0.4)	100.0	100.0	-
with sweeteners	184 (4.1)	17 (6.6)	99.5	100.0	1.000
without added sugars or sweeteners	2 (>0.0)	2 (0.8)	-	-	-
Dairy drinks	65 (1.4)	9 (3.5)	100.0	100.0	-
Juices	279 (6.2)	1 (0.4)	85.7	27.3	<0.001
Milk	18 (0.4)		-	-	-
<i>Non-carbonated drinks</i>					
with added sugars	39 (0.9)	2 (0.8)	100.0	100.0	-
with sweeteners	2 (>0.0)	18 (7.0)	100.0	100.0	-
Vegetable drinks	236 (5.2)	1 (0.4)	71.4	100.0	1.000
Total of cold drinks	1636 (36.2)	85 (33.2)	67.4	82.4	0.004
Total of products	4524	256	85.9	85.9	0.977

Abbreviations: EHU, University of the Basque Country - UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^aMonteiro et al. (2018a); ^b χ^2 test or the Fisher exact test was used to assess differences between universities.

Table 45. Socio-cultural-related features of Spain and Norway influencing individual food choice.

Socio-cultural-related features	Spain	Norway
Culture		
Factors		
Characteristics of the traditional diet	The Mediterranean diet is characterized by a high intake of vegetables and fruits, legumes, olive oil, cereals and nuts, a moderate intake of fish and lean dairy products and a low intake of red meat, and olive oil as a major fat source ^{a,b} . The Southern European Atlantic diet has many elements in common with the Mediterranean diet (consumption of fruits and vegetables, nuts and olive oil) and has some differentiating characteristics such as the increased intake of fish and seafood, potatoes, broths with meat and cabbage, and moderate consumption of lean meats ^c .	The Nordic diet is characterized by a high intake of apples, pears, berries, root and cruciferous vegetables, whole grain and rye bread and cereals, fish (particularly fatty fish), low-fat dairy products, rapeseed oil, potatoes and vegetable fats, among others ^{d,e} .
<u>Intake frequencies</u>	<u>5.2 occasions/day (women & men)</u>	<u>5.4 occasions/day (women)</u> ^f
<u>Snack frequencies</u> ^g	<u>2.4 occasions/day (women)</u> <u>2.5 occasions/day (men)</u>	<u>2.8 occasions/day (women)</u> ^f
Proportion of subjects (greater than 50%) reporting at least one intake occasion at the specific food consumption occasions ^f	Breakfast (97.7%) During morning (61.1%) Lunch (99.5%) During afternoon (74.5%) Dinner (99.1%) ^h	Breakfast (96.7%) Lunch (81.6%) Dinner (89.6%) During evening (75.5%) ^f
Economic variables		
<u>Tertiary educational level</u> ⁱ	<u>13.3%</u>	<u>19.5%</u>
<u>Non-manual occupational class</u> ⁱ	<u>56.2%</u>	<u>40.7%</u>
<u>Average monthly household income in euros</u>	<u>2174.3 euros</u> ^k	<u>2622.4 euros</u> ^l
<u>GDP per capita, 2020 (constant 2011 international \$)</u>	<u>36,215.4</u> ^m	<u>63,585.9</u> ⁿ

Continuation of Table 45.

Socio-cultural-related features	Factors	Spain	Norway
Quality of life^o	Hospital beds per 1000 inhabitants	3	3.8
	Obesity rate among adults	23.8%	23.1
	Physicians per 1000 people	4.07	4.63
Political elements	Food composition	Target, standards and restrictions have been devised to reduce the energy density, salt, SFA, TFA and added sugars for population purposes and foodservice outlets ^p .	An agreement between the Norwegian health authorities and major actors in the food industry has been signed for facilitating a healthier diet in the population is a signed agreement. This agreement contains specific goals related to reducing the intake of salt, added sugar and SFA, and increasing the intake of fruits and berries, vegetables, whole-grain foods, fish and seafood in the population ^q .
	Food labelling	Standard elements being part of the nutrient declaration included energy, total fat, SFA, TFA, carbohydrates, sugar, protein, and sodium, in accordance with the EU regulations, which are being implemented by retailers, supermarkets, and restaurants. Advertisements on food allergies and intolerances appear on the menus of restaurants ^r .	A self-regulation scheme was implemented in 2014 supplementing existing laws in restricting the marketing of unhealthy food and beverages to children and adolescents. This self-regulatory scheme applies to a wide range of communications channels, including print, billboards, online and in cinemas. In addition, food advertising on television directed to children or in connection with children's programs is not permitted ^t .
	Food promotion	Regulations to guide companies in the development, execution and dissemination of advertising for food and drinks on media aimed at children; as well as criteria for the authorization of food promotion campaigns in schools (PAOS code) ^s .	

Continuation of Table 45.

Socio-cultural-related features	Factors	Spain	Norway
Political elements	HNQ food provision	There are healthy food service policies implemented in government-funded settings like schools to ensure that food provision encourages HNQ choice ^a . However, no zoning policies to support the availability of products of HNQ and limit the availability of products of LNQ were developed. Only some plans to modify the food composition to turn in HNQ food ^b .	There are guidelines for healthy food service policies but food is not provided ^c .
	Healthy food environments and diets	Several actions/programmes are currently going on to improve diet-related health habits through education (e.g., IPHASAL program ^d , NAOS strategy ^e).	Several actions/programmes are currently going on to improve diet-related health habits through interventions aimed at facilitating healthy choice (e.g., Norwegian National Action Plan for a Healthier Diet ^f).

Abbreviations: AECOSAN, *Agencia Española de Consumo, Seguridad Alimentaria y Nutrición*; EU, European Union; HNQ, high nutritional quality; LNQ, low nutritional quality; SFA, saturated fatty acids; TFA, *trans* fatty acids. Note: ^aBach-Faig et al. (2011); ^bShen et al. (2015); ^cVaz Velho et al. (2016); ^dAdamsson et al. (2015); ^eMithril et al. (2012); ^fIn the EPIC study, these data correspond to women from the centres of the south and east of Norway; ^gSnack frequency was calculated as all food consumption occasions except “breakfast, “lunch” and “dinner”; ^hThese data correspond to women from the centre of San Sebastian (northern Spain) participating in the EPIC study; ⁱHuseinovic et al. (2016); ^jBasque Country data; ^kInstituto Nacional de Estadística (2016); ^lMackenbach et al. (2008); ^mAECOSAN (2020a); ⁿNorwegian Ministries (2017) & Torheim et al. (2020); ^oAECOSAN (n.d.); ^pAECOSAN (2012); ^qMFU (2013); ^rMonroy-Parada et al. (2021); ^sAECOSAN (2020b); ^tAECOSAN (2005); ^uMinistry of Health and Care Services (2017).

On the contrary, the Norwegian culture requires a direct and consistent attitude, sustainability, and accuracy (StudyCorgi, 2020). Differences in general characteristics of participants in this survey between the UPV/EHU and OsloMet are presented in **Table 46**. There were significantly more women, enrolled full-time and from Health Sciences at OsloMet than at the UPV/EHU ($p<0.001$). Among students, the percentage of postgraduates was significantly higher among participants from OsloMet (31.0%) compared to those from the UPV/EHU (9.8%) ($p<0.001$), and consequently, most students from OsloMet were 25-44 years (52.1%), whereas most students from UPV/EHU were under 25 years (83.4%) ($p<0.001$).

Moreover, the percentage of participants who reported following a special diet was higher in OsloMet than in the UPV/EHU ($p<0.01$). Regarding the most two followed diets at both universities, these were “weight management diet” and “vegetarian/vegan diet”; significantly more participants at OsloMet reported being adhered to a vegetarian or vegan diet than UPV/EHU ($p<0.001$).

The 54.3% of respondents from OsloMet reported buying foods on at least half of the occasions they were on campus compared to the 43.6% from the UPV/EHU ($p<0.05$). However, the spending on food on campus during an average week was similar in both universities (<20€ or < 200 NOK, equivalent to approximately 20 €) (**Table 47**). With respect to the food purchase occasions on campus, more participants from OsloMet purchased foods for lunch and dinner and drinks for dinner compared to UPV/EHU participants ($p<0.001$) (**Table 48**). Whereas, more participants from the UPV/EHU purchased foods as a snack than OsloMet participants ($p<0.001$).

Table 49 displays differences in food purchase with a frequency of once weekly or higher on campus between the two universities. Respondents from the UPV/EHU purchased more hot foods and drinks, cold drinks and snacks than participants from OsloMet ($p<0.05$), whereas OsloMet respondents purchased more cold foods than those from the UPV/EHU ($p<0.001$). In most of the product subcategories, a higher purchase was registered at the UPV/EHU than at OsloMet, except for salads and milkshakes that OsloMet participants bought more frequently ($p<0.01$). In the student group, the UPV/EHU participants purchased more hot sandwiches, wraps, pizzas and burgers, salty and sweet snacks, chocolate bars and bottled water than OsloMet respondents ($p<0.05$).

Table 46. Differences between the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University in general characteristics of participants in the survey on food purchasing behaviours, choice determinants, and opinions on food availability.

Variables	Total, n (%)		Students, n (%)		Staff, n (%)		p-value ^a
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	
Age							
<25 years	868 (51.6)	30 (23.3)	850 (83.4)	30 (42.3)	18 (2.7)	-	0.559
25-44 years	438 (26.0)	60 (46.5)	163 (16.0)	37 (52.1)	275 (41.4)	23 (39.7)	
≥45 years	377 (22.4)	39 (30.2)	6 (0.6)	4 (5.6)	371 (55.9)	35 (60.3)	
Area of knowledge							
Health Sciences	315 (18.7)	53 (41.1)	192 (18.8)	30 (42.3)	123 (18.5)	23 (39.7)	
Non-Health Sciences	1368 (81.3)	76 (58.9)	827 (81.2)	41 (57.7)	541 (81.5)	35 (60.3)	
Study or work contract							
Full-time	1224 (72.7)	117 (90.7)	604 (59.3)	65 (91.5)	620 (93.4)	52 (89.7)	0.285
Part-time	459 (27.3)	12 (9.3)	415 (40.7)	6 (8.5)	44 (6.6)	6 (10.3)	
Special diet							
Religious motives ^b	349 (20.7)	42 (32.6)	211 (20.7)	27 (38.0)	138 (20.8)	15 (25.9)	0.364
Therapeutic ^b	5 (0.3)	4 (3.1)	3 (0.3)	3 (4.2)	2 (0.3)	1 (1.7)	0.222
Vegetarian/vegan ^b	111 (6.6)	11 (8.5)	64 (6.3)	8 (11.3)	47 (7.1)	3 (5.2)	0.789
Weight-management ^b	112 (6.7)	20 (15.5)	86 (8.4)	12 (16.9)	26 (3.9)	8 (13.8)	0.004
	205 (12.2)	16 (12.4)	116 (11.4)	7 (9.9)	89 (13.4)	9 (15.5)	0.652

Abbreviations: EHU, University of the Basque Country – UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^a χ^2 test or the Fisher exact test was used to assess differences between universities. Significant *p*-values are highlighted in bold; ^bMultiple-answer.

Table 47. Differences in frequency and place of food purchasing, and spending on campus between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Variables	Total, n (%)		p-value ^a	Students, n (%)		p-value ^a	Staff, n (%)		p-value ^a
	EHU	OsloMet		EHU	OsloMet		EHU	OsloMet	
Eating on campus in the last month	1538 (91.4)	119 (92.2)	0.735	932 (91.5)	63 (88.7)	0.430	606 (91.3)	56 (96.6)	0.162
Spending on campus			0.642			<0.001			0.011
<20 NOK/week	1321 (78.5)	99 (76.7)		918 (90.1)	54 (76.1)		403 (60.7)	45 (77.6)	
≥20 NOK/week	362 (21.5)	30 (23.3)		101 (9.9)	17 (23.9)		261 (39.3)	13 (22.4)	
Purchasing times while on campus			0.018			<0.001			0.564
<50% of the occasions	950 (56.4)	59 (45.7)		652 (64.0)	30 (42.3)		298 (44.9)	29 (50.0)	
≥50% of the occasions	733 (43.6)	70 (54.3)		367 (36.0)	41 (57.7)		366 (55.1)	29 (50.0)	

Abbreviations: EHU, University of the Basque Country – UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^a χ^2 test or the Fisher exact test was used to assess differences between the university communities, significant p-values are highlighted in bold.

Table 48. Differences in food purchase occasion on campus between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Eating/drinking occasion ^a	Total, n (%)		p-value ^b	Students, n (%)		p-value ^b	Staff, n (%)		p-value ^b
	EHU	OsloMet		EHU	OsloMet		EHU	OsloMet	
Foods									
Breakfast	382 (22.7)	23 (17.8)	0.201	242 (23.7)	22 (31.0)	0.169	149 (21.1)	1 (1.7)	<0.001
Lunch	1132 (67.3)	117 (90.7)	<0.001	655 (64.3)	63 (88.7)	<0.001	477 (71.8)	54 (93.1)	<0.001
Dinner	6 (0.4)	28 (21.7)	<0.001	4 (0.4)	22 (31.0)	<0.001	2 (0.3)	6 (10.3)	<0.001
Snack	967 (57.5)	38 (29.5)	<0.001	736 (72.2)	30 (42.3)	<0.001	231 (34.8)	8 (13.8)	0.001
Drinks									
Breakfast	626 (37.2)	40 (31.0)	0.160	326 (32.0)	30 (42.3)	0.075	300 (45.2)	10 (17.2)	<0.001
Lunch	578 (34.3)	55 (42.6)	0.057	363 (35.6)	41 (57.7)	<0.001	215 (32.4)	14 (24.1)	0.196
Dinner	11 (0.7)	13 (10.1)	<0.001	7 (0.7)	11 (15.5)	<0.001	4 (0.6)	2 (3.6)	0.077
Snack	697 (41.4)	45 (34.9)	0.146	473 (46.4)	31 (43.7)	0.652	224 (33.7)	14 (24.1)	0.136

Abbreviations: EHU, University of the Basque Country – UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^aMultiple-answer; ^b χ^2 test or the Fisher exact test was used to assess differences between the university communities, significant p-values are highlighted in bold.

Table 49. Differences in food purchase with a frequency of once weekly or higher on campus between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Variables	Total, n (%)		p-value ^b		Students, n (%)		p-value ^b		Staff, n (%)		p-value ^b
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	
Foods											
Hot foods											
Hot sandwiches, wraps, pizzas and burgers	422 (25.1)	10 (7.8)	<0.001		312 (30.6)	9 (12.7)	0.001		110 (16.6)	1 (1.7)	0.003
Menu	538 (32.0)	24 (18.6)	0.003		194 (19.0)	13 (18.3)	0.880		344 (51.8)	11 (19.0)	<0.001
Others hot foods ^c	642 (38.1)	42 (32.6)	0.207		435 (42.7)	22 (31.0)	0.053		207 (31.2)	20 (34.5)	0.603
Total hot foods	1010 (60.0)	63 (48.8)	0.013		566 (55.5)	32 (45.1)	0.086		444 (66.9)	31 (53.4)	0.039
Cold foods											
Cold sandwiches or wraps	315 (18.7)	28 (21.7)	0.404		231 (22.7)	22 (31.0)	0.109		84 (12.7)	6 (10.3)	0.610
Salads	223 (13.3)	76 (58.9)	<0.001		98 (9.6)	40 (56.3)	<0.001		40 (56.3)	36 (62.1)	<0.001
Others cold foods ^d	373 (22.2)	14 (10.9)	0.003		265 (26.0)	9 (12.7)	0.012		108 (16.3)	5 (8.6)	0.124
Total cold foods	624 (37.1)	87 (67.4)	<0.001		409 (40.1)	49 (69.0)	<0.001		215 (32.4)	38 (65.5)	<0.001
Snacks											
Chewing gums, sweets...	85 (5.1)	3 (2.3)	0.165		72 (7.1)	2 (2.8)	0.224		13 (2.0)	1 (1.7)	1.000
Chocolate bars	241 (14.3)	5 (3.9)	0.001		200 (19.6)	41 (6.2)	0.001		41 (6.2)	2 (3.4)	0.567
Fresh fruit	180 (10.7)	21 (16.3)	0.052		94 (9.2)	17 (23.9)	<0.001		17 (23.9)	4 (6.9)	0.181
Nuts	203 (12.1)	4 (3.1)	0.002		139 (13.6)	64 (9.6)	0.053		4 (5.6)	-	0.013
Salty snacks	335 (19.9)	2 (1.6)	<0.001		266 (26.1)	2 (2.8)	<0.001		69 (10.4)	-	0.010
Sweet snacks	279 (16.6)	13 (10.1)	0.053		231 (22.7)	8 (11.3)	0.025		8 (11.3)	5 (10.3)	0.605
Others snacks ^e	52 (3.1)	3 (2.3)	0.794		42 (4.1)	3 (4.2)	1.000		10 (1.5)	-	1.000
Total snacks	647 (38.4)	34 (26.4)	0.006		463 (45.4)	26 (36.6)	0.149		184 (27.7)	8 (13.8)	0.021
Drinks											
Hot drinks											
Coffee, hot chocolate...	1079 (64.1)	53 (41.1)	<0.001		578 (56.7)	501 (75.5)	0.449		37 (52.1)	16 (27.6)	<0.001

Continuation of Table 49.

Variables	Total, n (%)		p-value ^b		Students, n (%)		p-value ^b		Staff, n (%)		p-value ^b
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	
Hot drinks											
Infusions (e.g. chamomile tea)	228 (13.5)	5 (3.9)	113 (11.1)	115 (17.3)	0.002	535 (52.5)	218 (32.8)	<0.001	6 (8.5)	1 (1.7)	<0.001
Broths	12 (0.7)	1 (0.8)	6 (0.6)	6 (0.9)	1.000	84 (8.2)	60 (9.0)	0.101	2 (2.8)	-	0.011
Total hot drinks	1100 (65.4)	53 (41.1)	588 (57.7)	37 (52.1)	<0.001	535 (52.5)	218 (32.8)	<0.001	512 (77.1)	16 (27.6)	<0.001
Cold drinks											
Bottled water	753 (44.7)	7 (5.4)	535 (52.5)	218 (32.8)	<0.001	124 (12.2)	17 (23.9)	0.004	51 (7.7)	2 (3.4)	0.302
Natural fruit juices	144 (8.6)	2 (1.6)	84 (8.2)	60 (9.0)	0.005	175 (10.4)	19 (14.7)	0.125	2 (2.8)	-	0.248
Commercial fruit juices	88 (5.2)	2 (1.6)	64 (6.3)	24 (3.6)	0.064	43 (2.6)	9 (7.0)	0.009	10 (1.5)	-	1.000
Soft drinks, energy drinks, flavoured drinks...	175 (10.4)	19 (14.7)	124 (12.2)	17 (23.9)	0.125	43 (2.6)	9 (7.0)	0.009	10 (1.5)	-	1.000
Milkshakes	43 (2.6)	9 (7.0)	33 (3.2)	9 (12.7)	0.009	12 (0.7)	-	1.000	6 (0.9)	-	1.000
Free alcohol beers	12 (0.7)	-	6 (0.6)	-	1.000	77 (4.6)	-	0.005	27 (4.1)	-	0.157
Alcoholic drinks	77 (4.6)	-	50 (4.9)	-	0.005	56 (3.3)	2 (1.6)	0.432	14 (2.1)	-	0.618
Others drinks ^f	56 (3.3)	2 (1.6)	42 (4.1)	2 (2.8)	0.432	905 (53.8)	28 (21.7)	<0.001	292 (44.0)	3 (5.2)	<0.001
Total cold drinks	905 (53.8)	28 (21.7)	409 (40.1)	25 (35.2)	<0.001						

Abbreviations: EHU, University of the Basque Country - UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^aMultiple-answer; ^b χ^2 test or the Fisher exact test was used to assess differences between the university communities, significant *p*-values are highlighted in bold; ^cOthers hot foods^c: soup, main course, starter, dairy products, fried potatoes, small servings (hot small servings and combined plate were include in this subcategory because they are not commonly available at OsloMet); ^dOthers cold foods^d: dairy products, cold small servings (cold small servings were include in this subcategory because they are not commonly available at OsloMet); ^eOther snacks^e: small pasty, vegetarian snacks; ^fOther drinks^f: iced coffee.

Whereas, students from OsloMet compared to those from the UPV/EHU tended to purchase more salads, fresh fruit, soft drinks, energy drinks and flavoured drinks, and milkshakes ($p < 0.01$). Salads were also more frequently purchased by staff from OsloMet compared to the UPV/EHU staff ($p < 0.001$).

Bringing food from home or purchasing off-campus was more frequent among OsloMet students and staff compared to those from the UPV/EHU ($p < 0.001$) (Table 50). The reasons for bringing food from home or purchasing off-campus varied between universities. The three main reasons at the UPV/EHU were (in order according to the percentage of subjects who selected them): “preference for my own food brought from home”, “high price” and “the food offer does not suit my dietary needs”; and at OsloMet: “high price”, “low quality-price” and “helps increase variety”.

Differences in food purchasing determinants on campus between the UPV/EHU and OsloMet are summarised in Table 51. A significantly higher number of respondents from the UPV/EHU compared to those from OsloMet placed greater importance on the “good value for money”, health-related issues (such as, “nutritious”, “keeps me healthy” and “helps me control weight”) and convenience (such as, “familiar” and “usually what I eat”) and “helps me deal with stress” ($p < 0.001$). At OsloMet “looks nice” and “easily available” were considered more important than at the UPV/EHU ($p < 0.01$). These differences between universities were similar in the total sample than for groups of the university community. The three main determinants at the UPV/EHU were (in order according to the percentage of subjects who selected them): “tastes good”, “good value for money” and “nutritious”; and at OsloMet: “tastes good”, “easily available” and “price”.

Although significantly more respondents from OsloMet reported using menu passes compared to participants from the UPV/EHU ($p < 0.05$), significantly more respondents from the UPV/EHU agreed that a loyalty card with which you get discounts on certain foods and drinks in the university would influence their choices ($p > 0.05$). No significant differences were observed in the overall satisfaction with foods sold on campus between both universities ($p < 0.05$). Regarding the opinions about the FE on campus, significantly more students and staff from OsloMet than from the UPV/EHU reported that they are usually able to choose healthy foods from the food supply on campus ($p < 0.001$) (Table 52). Significantly more participants from the UPV/EHU than from OsloMet agreed that

the university should include health-related clauses in foodservice contracting documents to ensure the availability of healthy foods ($p < 0.001$).

Table 53 shows differences in proposed changes to the campus FE between participants from the UPV/EHU and OsloMet. The five most supported changes by participants from the UPV/EHU were the following: “more healthy options in vending machines”, “greater capacity to access free filtered drinking water”, “more fresh fruit”, “greater capacity to recycle food packaging” and “discounts for healthy choices”. Thus, the most supported changes by the UPV/EHU respondents were related to the “facilities provided by the university”, although changes related to the vending machine, food and price were also selected by a high percentage of participants. At OsloMet, the five most supported changes were “healthier foods for lower cost”, “allergen labelling”, “cheaper foods”, “discounts for healthy choices” and “more fresh fruit”. Thus, the most supported changes by OsloMet respondents were related to price first, and second to foods and to help for food choice.

Table 50. Differences in bringing food from off-campus or home between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Variables	Total, n (%)		p-value ^a		Students, n (%)		p-value ^a		Staff, n (%)		p-value ^a
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	
Bringing food from off campus or home	1409 (83.7)	124 (96.1)	<0.001		901 (88.4)	68 (95.8)	0.056		508 (76.5)	56 (96.6)	<0.001
Amount of food brought off campus or home			0.017								0.100
Little food	1027 (61.0)	65 (50.4)			600 (58.9)	34 (47.9)			427 (64.3)	31 (53.4)	
Most or all	656 (39.0)	64 (49.6)			419 (41.1)	37 (52.1)			237 (35.7)	27 (46.6)	
Reasons for bringing food^b											
Convenience	120 (7.1)	24 (18.6)	<0.001		88 (8.6)	12 (16.9)	0.020		32 (4.8)	12 (20.7)	<0.001
Helps increase variety	263 (15.6)	42 (32.6)	<0.001		178 (17.5)	20 (28.2)	0.024		85 (12.8)	22 (37.9)	<0.001
High price	673 (40.0)	98 (76.0)	<0.001		513 (50.3)	59 (83.1)	<0.001		59 (83.1)	39 (67.2)	<0.001
Low quality-price	174 (10.3)	49 (38.0)	<0.001		116 (11.4)	34 (47.9)	<0.001		58 (8.7)	15 (25.9)	<0.001
Preference for food from off-campus food outlets	61 (3.6)	8 (6.2)	0.141		39 (3.8)	4 (5.6)	0.450		22 (3.3)	4 (6.9)	0.160
Preference for my own food brought from home	942 (56.0)	34 (26.4)	<0.001		601 (59.0)	16 (22.5)	<0.001		341 (51.4)	18 (31.0)	0.003
The food offer does not suit my dietary needs	528 (31.4)	22 (17.1)	0.001		318 (31.2)	11 (15.5)	0.005		210 (31.6)	11 (19.0)	0.045

Abbreviations: EHU, University of the Basque Country – UPV/EHU; OsloMet, Oslo Metropolitan University Note: ^a χ^2 test or the Fisher exact test was used to assess differences between the universities' communities, significant *p*-values are highlighted in bold; ^bMultiple-answer.

Table 51. Differences in food choice determinants between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Variables ^a	Total, n (%) ^b		Students, n (%) ^b		Staff, n (%) ^b		p-value ^c
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	
Sensory appeal							
Looks nice	637 (37.8)	91 (70.5)	382 (37.5)	44 (62.0)	255 (38.4)	47 (81.0)	<0.001
Smells nice	1425 (84.7)	106 (82.2)	860 (84.4)	54 (76.1)	565 (85.1)	52 (89.7)	0.558
Tastes good	1659 (98.6)	129 (100.0)	1005 (98.6)	71 (100.0)	654 (98.5)	58 (100.0)	1.000
Price							
Cheap	1351 (80.3)	115 (89.1)	908 (89.1)	63 (88.7)	443 (66.7)	52 (89.7)	0.130
Good value for money	1616 (96.0)	115 (89.1)	997 (97.8)	66 (93.0)	619 (93.2)	49 (84.5)	0.009
Health							
Helps me control weight	1157 (68.7)	54 (41.9)	677 (66.4)	25 (35.2)	480 (72.3)	29 (50.0)	<0.001
Keeps me healthy	1497 (88.9)	106 (82.2)	865 (84.9)	54 (76.1)	632 (95.2)	52 (89.7)	0.113
Nutritious	1529 (90.8)	108 (83.7)	901 (88.4)	57 (80.3)	628 (94.6)	51 (87.9)	0.073
Convenience							
Easily available	1431 (85.0)	122 (94.6)	870 (85.4)	67 (94.4)	561 (84.5)	55 (94.8)	0.077
Familiar	1064 (63.2)	53 (41.1)	602 (59.1)	29 (40.8)	462 (69.6)	24 (41.4)	<0.001
Usually what I eat	1053 (62.6)	47 (36.4)	605 (59.4)	26 (36.6)	448 (67.5)	21 (36.2)	<0.001
How it feels							
Helps me deal with stress	950 (56.4)	37 (28.7)	597 (58.6)	23 (32.4)	353 (53.2)	14 (24.1)	<0.001
Keeps me awake	1151 (68.4)	91 (70.5)	726 (71.2)	55 (77.5)	425 (64.0)	36 (62.1)	0.768
Makes me feel good	1331 (79.1)	102 (79.1)	808 (79.3)	56 (78.9)	523 (78.8)	46 (79.3)	0.834

Abbreviations: EHU, University of the Basque Country – UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^aMultiple-answer; ^bPercentage of participants who answered “very important” or “moderately important”; ^c χ^2 test or the Fisher exact test was used to assess differences between the universities' communities, significant p-values are highlighted in bold.

Table 52. Differences in opinions regarding the food environment on campus between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Variables ^a	Total, n (%) ^b		p-value ^c	Students, n (%) ^b		p-value ^c	Staff, n (%) ^b		p-value ^c
	EHU	OsloMet		EHU	OsloMet		EHU	OsloMet	
I can usually choose healthy foods from the food supply on campus	724 (43.0)	104 (80.6)	<0.001	410 (40.2)	60 (84.5)	<0.001	314 (47.3)	44 (75.9)	<0.001
Important to have option the option of consuming healthy food at university	1656 (98.4)	128 (99.2)	0.717	1005 (98.6)	70 (98.6)	1.000	651 (98.0)	58 (100.0)	0.614
The university is responsible for guaranteeing healthy food among the options available in its centres	1519 (90.3)	123 (95.3)	0.056	905 (88.8)	69 (97.2)	0.027	614 (92.5)	54 (93.1)	1.000
The university should include clauses related to health in the contracting specifications for food services to ensure the availability of healthy food	1551 (92.2)	100 (77.5)	<0.001	919 (90.2)	(76.1)	<0.001	632 (95.2)	(79.3)	<0.001

Abbreviations: EHU, University of the Basque Country – UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^aMultiple-answer; ^bPercentage of participants who answered that they “strongly agree” or “agree”; ^c χ^2 test or the Fisher exact test was used to assess differences between the universities' communities, significant *p*-values are highlighted in bold.

Table 53. Differences in proposed changes to the campus food environment between the communities of the University of the Basque Country – UPV/EHU and OsloMet – Oslo Metropolitan University.

Variables ^a	Total, n (%) ^b		Students, n (%) ^b		Staff, n (%) ^b		p-value ^c
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet	
Food and drinks changes: More...							
Alcoholic drinks	156 (9.3)	13 (10.1)	132 (13.0)	9 (12.7)	24 (3.6)	4 (6.9)	0.946
Choices for religious diets	715 (42.5)	41 (31.8)	509 (50.0)	22 (31.0)	509 (50.0)	19 (32.8)	0.002
Ethnic cuisine choices	742 (44.1)	67 (51.9)	507 (49.8)	37 (52.1)	235 (35.4)	30 (51.7)	0.701
Fast food choices (commercial, i.e., McDonald's)	144 (8.6)	7 (5.4)	120 (11.8)	7 (9.9)	24 (3.6)	-	0.626
Fresh fruit	1458 (86.6)	96 (74.4)	860 (84.4)	57 (80.3)	598 (90.1)	39 (67.2)	0.359
Freshly prepared foods	1090 (64.8)	87 (67.4)	648 (63.6)	50 (70.4)	442 (66.6)	37 (63.8)	0.246
Food trucks on campus	414 (24.6)	56 (43.4)	309 (30.3)	35 (49.3)	105 (15.8)	21 (36.2)	0.001
Gluten free foods	1124 (66.8)	45 (34.9)	704 (69.1)	23 (32.4)	420 (63.3)	22 (37.9)	<0.001
Lactose free foods	1100 (65.4)	50 (38.8)	701 (68.8)	27 (38.0)	399 (60.1)	23 (39.7)	<0.001
Foods low in carbohydrates	981 (58.3)	38 (29.5)	574 (56.3)	17 (23.9)	407 (61.3)	21 (36.2)	<0.001
Reduced fat foods	1336 (79.4)	44 (34.1)	797 (78.2)	21 (29.6)	539 (81.2)	23 (39.7)	<0.001
Reduced salt foods	1209 (71.8)	60 (46.5)	703 (69.0)	31 (43.7)	506 (76.2)	29 (50.0)	<0.001
Special diet choices	1264 (75.1)	52 (40.3)	768 (75.4)	32 (45.1)	496 (74.7)	20 (34.5)	<0.001
Sustainable products	1276 (75.8)	85 (65.9)	730 (71.6)	42 (59.2)	546 (82.2)	43 (74.1)	0.025
Sweets and confectionery	196 (11.6)	11 (8.5)	151 (14.8)	10 (14.1)	45 (6.8)	1 (1.7)	0.866
Takeaway food choices	507 (30.1)	20 (15.5)	358 (35.1)	15 (21.1)	149 (22.4)	5 (8.6)	0.016
Variety of food and drinks	1331 (79.1)	86 (66.7)	816 (80.1)	48 (67.6)	515 (77.6)	38 (65.5)	0.012
Help for food choice							
A mobile application with food and menu information	1086 (64.5)	78 (60.5)	725 (71.1)	46 (64.8)	361 (54.4)	32 (55.2)	0.255
Allergen labelling	1442 (85.7)	99 (76.7)	875 (85.9)	56 (78.9)	567 (85.4)	43 (74.1)	0.106
Calorie labelling on foods	1142 (67.9)	53 (41.1)	694 (68.1)	27 (38.0)	448 (67.5)	26 (44.8)	<0.001
Detailed nutritional information of foods or dishes	1279 (76.0)	66 (51.2)	755 (74.1)	33 (46.5)	524 (78.9)	33 (56.9)	<0.001

Continuation of Table 53.

Variables ^a	Total, n (%) ^b		p-value ^c	Students, n (%) ^b		p-value ^c	Staff, n (%) ^b		p-value ^c
	EHU	OsloMet		EHU	OsloMet		EHU	OsloMet	
Help for food choice									
Healthy symbols or rating systems to guide healthy food choices (e. g., labelling traffic light)	1399 (83.1)	58 (45.0)	<0.001	854 (83.8)	34 (47.9)	<0.001	545 (82.1)	24 (41.4)	<0.001
Information on websites about food and dishes and their nutritional content	1165 (69.2)	58 (45.0)	<0.001	700 (68.7)	32 (45.1)	<0.001	465 (70.0)	26 (44.8)	<0.001
Labelling indicating organic produce	1312 (78.0)	67 (51.9)	<0.001	791 (77.6)	33 (46.5)	<0.001	521 (78.5)	34 (58.6)	0.001
Visual guides for healthier choices	1269 (75.4)	71 (55.0)	<0.001	770 (75.6)	42 (59.2)	0.002	499 (75.2)	29 (50.0)	<0.001
Changes regarding price									
Cheaper foods	1140 (67.7)	98 (76.0)	0.053	798 (78.3)	61 (85.9)	0.130	342 (51.5)	37 (63.8)	0.072
Discounts for healthy choices	1450 (86.2)	97 (75.2)	0.001	891 (87.4)	56 (78.9)	0.039	559 (84.2)	41 (70.7)	0.009
Healthier foods for lower cost	895 (53.2)	107 (82.9)	<0.001	601 (59.0)	60 (84.5)	<0.001	294 (44.3)	47 (81.0)	<0.001
Higher quality foods (even for a higher price)	1389 (82.5)	71 (55.0)	<0.001	805 (79.0)	31 (43.7)	<0.001	584 (88.0)	40 (69.0)	<0.001
More meal deals	1398 (83.1)	68 (52.7)	<0.001	854 (83.8)	44 (62.0)	<0.001	544 (81.9)	24 (41.4)	<0.001
Reward points for healthier food choices	1156 (68.7)	76 (58.9)	0.022	718 (70.5)	42 (59.2)	0.045	438 (66.0)	34 (58.6)	0.260
Reward points for sustainable food choices	1173 (69.7)	85 (65.9)	0.366	726 (71.2)	46 (64.8)	0.247	447 (67.3)	39 (67.2)	0.990
Other changes									
Earlier opening times	385 (22.9)	30 (23.3)	0.921	265 (26.0)	19 (26.8)	0.889	120 (18.1)	11 (19.0)	0.866
Freshly made food and drinks available for longer hours	1094 (65.0)	68 (52.7)	0.005	694 (68.1)	41 (57.7)	0.072	400 (60.2)	27 (46.6)	0.042
Later closing times	539 (32.0)	76 (58.9)	<0.001	386 (37.9)	46 (64.8)	<0.001	153 (23.0)	30 (51.7)	<0.001

Continuation of Table 53.

Variables ^a	Total, n (%) ^b		Students, n (%) ^b		Staff, n (%) ^b		p-value ^c	p-value ^c
	EHU	OsloMet	EHU	OsloMet	EHU	OsloMet		
Other changes								
More cafeterias, restaurants, dining rooms, supermarkets at the university	890 (52.9)	47 (36.4)	564 (55.3)	21 (29.6)	326 (49.1)	26 (44.8)	<0.001	0.533
More hot food options for longer hours	1029 (61.1)	61 (47.3)	654 (64.2)	40 (56.3)	375 (56.5)	21 (36.2)	0.184	0.003
Vending machine changes								
More healthy options in vending machines	1494 (88.8)	78 (60.5)	911 (89.4)	49 (50.0)	583 (87.8)	29 (69.0)	<0.001	<0.001
More hot food and drinks in vending machines	942 (56.0)	47 (36.4)	608 (59.7)	34 (47.9)	334 (49.7)	13 (22.4)	0.051	<0.001
More food for special diets in vending machines	1224 (72.7)	38 (29.5)	762 (74.8)	23 (32.4)	462 (69.6)	15 (25.9)	<0.001	<0.001
More variety of food and drinks in vending machines	1284 (76.3)	64 (49.6)	823 (80.8)	41 (57.7)	461 (69.4)	23 (39.7)	<0.001	<0.001
More vending machine	523 (31.1)	21 (16.3)	382 (37.5)	15 (21.1)	141 (21.2)	6 (10.3)	0.006	0.048
Only healthy options in vending machines	1044 (62.0)	37 (28.7)	612 (60.1)	19 (26.8)	432 (65.1)	18 (31.0)	<0.001	<0.001
The removal of vending machines	222 (13.2)	22 (17.1)	155 (15.2)	7 (9.9)	67 (10.1)	15 (25.9)	0.220	<0.001
Facilities provided by the University:								
Greater capacity to...								
Access free filtered drinking water	1460 (86.7)	79 (61.2)	905 (88.8)	54 (76.1)	555 (83.6)	25 (43.1)	0.001	<0.001
Heat meals from home in a microwave	1242 (73.8)	64 (49.6)	821 (80.6)	42 (59.2)	421 (63.4)	22 (37.9)	<0.001	<0.001
Recycle food and drink packaging	1454 (86.4)	86 (66.7)	895 (87.8)	45 (63.4)	559 (84.2)	41 (70.7)	<0.001	0.009

Abbreviations: EHU, University of the Basque Country - UPV/EHU; OsloMet, Oslo Metropolitan University. Note: ^aVariables with multiple-answer, ordered according to the frequency of response in the total sample (from highest to lowest), within each subsection; ^bPercentage of participants who answered that they “strongly agree” or “agree”; ^c χ^2 test or the Fisher exact test was used to assess differences between the universities communities, significant p-values are highlighted in bold.

5. KAPITULUA. EZTABAIDA

5.1. ELIKADURA-INGURUNEA EUSKAL HERRIKO UNIBERTSITATEKO (UPV/EHU) CAMPUSEAN

5.1.1. *Euskal Herriko Unibertsitateko (UPV/EHU) elikadura-ingurunearen azterketa (produktu komertzialak eta etxeko produktuak barne)*

Atal honen helburua UPV/EHUko elikagaien salmenta-puntuetan eskainitako elikagaien nutrizio-profila eta prozesamendu-maila ebaluatzea izan zen. Laburbilduz, produktuen erdia baino gehiago KNB gisa sailkatu ziren, erabilitako hiru sailkapenen arabera; eta horietako gehienak “ultraprozesatu” gisa sailkatu ziren. Gainera, etxean prestatutako KNAko snack-ak eta edari beroak KNBko alternatibak baino garestiagoak izan ziren.

Gehien eskaintzen ziren produktu komertzialak snack gozoak nahiz gaziak eta gasdun edariak ziren. Hauek kaloria-dentsitate altuak eta koipe zein azukre kopuru handiak zituzten. Produktu motaren arabera nutrizio-profilaren azterketak erakutsi zuen gomendioak gutxien bete zituztenak kakao hautsa, azukre erantsia zuten gozokiak zein txikleak eta snack gozoak izan zirela. Aurkikuntza horiek bat datoz aurretiko ikerketekin (Horacek et al., 2013a; Horacek, 2013b; Roy et al., 2016). Ikerketa horien arabera, KNAa duten aukeren eskaintza baxua da campusean, eta horrek mugatu egiten du kontsumitzaileek KNAa duten produktuak aukeratzeko duten gaitasuna.

Unibertsitate-inguruneetan egindako beste ikerketa batzuek bezala (Byrd-Bredbenner et al., 2012; Horacek et al., 2013a; Horacek et al., 2013b; Roy et al., 2016; Tseng et al., 2016), erabilitako hiru NPEn konbinazioaren arabera, eskainitako produktu komertzialen erdia baino gehiago KNBkoak zirela behatu zen, eta gehienak ultraprozesatuak zirela. Beraz, 1a Hipotesia berretsi zen: UPV/EHUen eskaintzen diren produktuen erdia baino gehiago KNBkoak dira eta prozesamendu-maila handia dute. Nolanahi ere, literaturan, campusean saldutako KNBa duten produktuen proportzioa oso aldakorra izan da, seguruenik erabilitako irizpideak desberdinak izan zirelako (Horacek et al., 2013a; Horacek et al., 2013b; Roy et al., 2016). Ikerketa honetan, hori bera egiaztatu zen erabilitako hiru NPEn arteko adostasun maila aztertzean. Zehazki, funtsezko adostasun bat aurkitu zen AECOSANen eta UK NPEaren irizpideen artean, adostasun moderatu bat AECOSANen eta MFUren irizpideen artean, eta bat ere ez UK NPEaren eta MFUren irizpideen artean. Adostasunik baxuena snack gazituentzat (AECOSANen eta UK NPEren irizpideak konparatzean), sandwichentzat (UK NPEaren eta MFUren irizpideak

konparatzean) eta zukuentzat (AECOSANen eta MFUren irizpideak konparatzean) lortu zen. Ikerketa honetako hiru NPEekin lortutako emaitzen alde horiek eraikuntzetako desadostasunekin eta erabilitako ereduaren puntuazio-irizpideekin lotuta egon litezke. EBko NPEaren irizpideak, esate baterako, mantenugai kritiko asko zigortzen ditu, baina produktu horietarako lortutako puntuazioak beste osagai batzuekin lotutako puntu positiboekin konpentsatzen dira, hala nola “frutekin, barazkiekin eta fruitu lehorrekin” eta zuntzarekin. Hori ez da gertatzen AECOSANen edo MFUren irizpideen kasuan. Zukuei dagokienez, KNB gisa sailkatutako produktu horien ehunekoa handiagoa izan zen MFUren irizpideekin AECOSANekin baino, lehen ereduaren arabera azukre agregatuak dituzten guztiak KNB gisa hartzen baitira; bigarren ereduaren arabera, berriz, azukreentzako muga bat aplikatzen da (7.5 g/100 ml). Hala, hasierako 2a Hipotesia berretsi zen: UPV/EHUn saldutako KNBko produktu komertzialen ehunekoa oso aldakorra da, haien nutrizio-profila ebaluatzeko erabilitako irizpideen arabera.

Elikagai ultraprozesatuen mantenugaien profila, oro har, okerragoa da gutxien prozesatutako elikagairena baino (Luiten et al., 2016). Hala ere, azterlan honetan adostasun ezetik adostasun arin bat ikusi zen NOVA sistemaren eta EBko NPEaren, AECOSANen eta hiru NPEen irizpideen konbinazioren artean, bereziki zukuetan, zerealetan eta jogurtaz bestelako esnekietan. Desadostasun horien arrazoi nagusia da NOVA sistemak ultraprozesatutzat jotzen dituela azukre erantsia duten zukuak, esnekiak eta zerealak. Aldiz, erabilitako NPEek azukre-mugak ezartzen dituzte produktu batek gomendioak betetzen dituen ala ez erabakitzeko. Beraz, elikagai ultraprozesatuek azukre asko izan ohi duten arren, eduki horiek ez dituzte beti NPEen mugak gainditzen. Hala, ez zen baieztatu doktorego-tesi honetan aurreratzen zen hasierako 3a Hipotesia, hots, UPV/EHUn saldutako KNBko produktu komertzial gehienak ultraprozesatuak direla.

Etxeko janariei dagokienez, kafea eta ogitartekoak izan ziren ohikoenak. Gainera, oro har, produktu guztien %60 inguru KNB gisa sailkatu ziren. Beraz, hasierako 1a Hipotesia baieztatu zen, hau da, UPV/EHUn eskainitako etxeko produktuen erdiak baino gehiago KNBkoak direla. Produktu motaren arabera nutrizio-profilaren azterketak erakutsi zuen gomendioak gutxien bete zituztenak snack-ak nahiz janari handiak eta postreak izan zirela; eta gehien bete ez zen irizpidea guztizko gantzen edukia izan zen (elikagai solidoetan). Lehen aipatu bezala, aurkikuntza horiek unibertsitateetan aurrez egindako azterlanen antzekoak dira (Horacek et al., 2013a; Horacek et al., 2013b; Roy et al., 2016),

KNAa duten aukeren eskaintza mugatua dela iradokitzen baitute, eta horrek, energia-eduki handiko eta mantenugai gutxiko produktuak aukeratzea errazten du. Produktu mota hori maiz kontsumitzeak dietaren kalitate okerragoa ekar dezake (Roy et al., 2017).

Eguneko menuaren nutrizio-ezaugarriari dagokienez, nabarmentzekoa da eduki energetiko, gantz eta proteiko handia zuela Espainiako biztanleentzako gomendioekin alderatuta. Gure emaitzek etxetik kanpoko janarien nutrizio-ebaluazioen aurretiko aurkikuntzak berresten dituzte (Lachat et al., 2009a). Gainera, lehen plater ohikoena barazkiak ziren, bigarren plater ohikoena haragia, bigarren plateraren goarnizio ohikoena patata frijituak eta postre ohikoena esnekiak (jogurta barne). Emaitza horiek alderatzeko unibertsitate mailako ikerketa berririk aurkitu ez bada ere, gure aurkikuntzak bat datoz Sancho Uriarte et al.ek (2015) eskola-umeen artean egindako ikerketarekin. Ikerketa honek arrain, arrautza eta fruta eskaintza baxua zela azpimarratu zuen. Hala ere, gure azterlanaren emaitzak ezin izan dira alderatu erreferentziazko balioekin, hala nola NAOS estrategiakoekin (AECOSAN, 2011) edo AECOSAN estrategiakoekin (AECOSAN, 2010), eguneko menuak hainbat lehen plater, bigarren plater eta postreen artean hautatzeko aukera ematen baitzuen. Beraz, ezin izan zen zenbatetsi elikagai-taldeen arabera kontsumo-maiztasuna, kontsumitzaile bakoitzaren aukeraren arabera alda baitaiteke.

UPV/EHUko Elaren adierazleak neurtzeko saiakera sistematikoari dagokionez, gure emaitzek EI horiek ez zirela KNAkoak erakutsi zuten, salmenta-puntuaren eskuragarritasunaren, irisgarritasunaren eta sustapenaren batez besteko puntuazioak (%50 inguru) ahalik eta puntuazio handienaren azpitik geratu baitziren. Emaitza horiek bat datoz Roy et al.en emaitzekin. (2016). Gainera, gure ikerketan, elikagaien salmenta-puntu guztien %79,5 KNB gisa sailkatu ziren, eta gainerakoak, nutrizio-kalitate moderatu gisa. Ondorioz, hasierako 4a Hipotesia baieztatu zen, hau da, UPV/EHUko elikagaien salmenta-puntuaren erdia baino gehiago KNBkoak direla. Elikagaien salmenta-puntuaren arabera alderik ez zen egon ingurumen-kalitatearen indizearen guztizko puntuazioan, ezta indize horren osagaietan ere ez; salbu eta irisgarritasunean, supermerkatuan beste salmenta-puntuetan baino handiagoa izan baitzen. Azken emaitza hori supermerkatuan KNAa zuten produktu gehienak autozerbitzuko apalategietan eskuragarri egotearen ondorioa da. Ebaluatutako hiru salmenta-puntu moten artean, vending makinek lortu zuten KNBko salmenta-puntuaren ehuneko handiena, kafetegi/jatetxe/jantokiekin eta

supermerkatuarekin alderatuta. Horrek berretsi egiten du, neurri batean, hasierako 4b Hipotesia, hau da, vending makina dela eskuragarritasunari, irisgarritasunari eta sustapenari dagokienez punturik txikiena duen establezimendua. Hala ere, kafetegi/jatetxe/jantokiak elikagaien beste salmenta-puntuek baino maila handiagoak izan zituen guztizko puntuazioan, eta aldakortasun handiagoa izan zuen salmenta-puntuen artean.

Gure aurkikuntzek KNBen erosketak direla aukerarik errazena adierazten dute, nahiz eta osasuna sustatzen duen EI batean kontrakoa behar den. Unibertsitateko komunitatearen elikadura-portaerek eragin positiboa izan lezakete EInean egindako aldaketen ondorioz, KNAa duten produktuak hautatzeko aukera izango bailukete. Ebidentziak erakusten du KNAa duten produktuen eskuragarritasuna eta barietatea handitzeak elikagai espezifiko mota horien barruan salmentak handitu ditzakela (Wickramasekaran et al. 2018; Williams et al., 2020). Hirugarren hezkuntzako instituzioak, unibertsitateak kasu, aldaketa horiek inplementatzeko ingurune ezin hobea dira, elikagaien salmenta-puntu eta politiken esku-hartze ugari dituztelako, eta horiek inplementatzea errazagoa izan daitekeelako jabetza komertzialeko inguruneetan baino.

Prezioaren araberako nutrizio-profilaren aldeei dagokienez, oro har, KNBa duten produktuek KNAko alternatibek baino askoz prezio altuagoa izan zuten, bai produktu komertzialetan, bai etxeko produktuetan. Beraz, ez zen baieztatu hasierako 5a Hipotesia, hau da, UPV/EHUn saldutako KNAa duten produktuak KNBko aukerak baino garestiagoak direla, ez behintzat aztertutako guztizko produktuetarako. Hala ere, KNAko etxeko snack-ak eta edari beroak KNBko alternatibak baino askoz garestiagoak ziren. Produktuaren prezioaren eta nutrizio-profilaren arteko azken lotura horiek bat datoz beste egile batzuen aurkikuntzekin (Grech et al., 2017; Lee et al., 2013). Hala ere, beste egile batzuek ez zuten estatistikoki adierazgarriak diren alderik aurkitu (Ng et al., 2019), eta hori KNAko aukera urriengatik izan zitekeela iradoki dute. Nolanahi ere, KNAa eta KNBa duten produktuen prezio erlatiboak eragina izan dezake unibertsitate-komunitatearen elikagaien hautaketan. Prezio-estrategiak, elikagaietarako zergak eta diru-laguntzak barne, KNAen aukera sustatzeko erabili dira (Eyles et al., 2021). Hala ere, dakigunez, ez dago gai horri buruzko ebidentziarik unibertsitateetako salmenta-puntuetan edo vending makinetan saltzen diren elikagai dagokienean.

KNAa duten produktuen prezioa murrizten duten eta KNBa duten produktuen prezioa handitzen duten prezioen estrategiek KNAko aukerak erostea bultzatzen dezakete elikagai-zerbitzuen enpresa instituzionaletan, hala nola unibertsitateetako zerbitzuetan. Prezioek eta produktuen aldaketek salmentak eta irabaziak murriztu ditzaketen kezkek, gerenteeek KNAko aukerak eskaintzea eragotz dezake. Hala ere, ikerketek erakutsi dute KNAa duten produktuen eskuragarritasuna handitzeak, adibidez, vending makinetan, ez zuela eraginik izan guztizko salmentetan (Alfred Health, 2015; Brown et al., 2014). Hala ere, datu longitudinaletan oinarritutako ikerketa gehiago behar dira unibertsitate-komunitate honetan prezioen esku-hartzeak izan dezaketen eraginkortasunari buruzko ebidentzia-oinarri bat garatzeko. Horrek, elikagaien kontsumo-ereduak hobetzen lagun lezake.

Duela gutxi burutu den berrikuspen sistematiko baten arabera, KNAa duten produktuen eskuragarritasuna hobetzeaz eta prezio lehiakorreko estrategiak erabiltzeaz gain, KNBa duten produktuen ano txikiagoak eskaintzeak vending makineetan erositako elikagaien nutrizio-kalitatea hobetu dezake (Grech eta Allman-Farinelli, 2015). Kontsumitzaileek produktu baten pakete osoa jateko joera dute, gomendatutako anoaren tamaina bakarrik kontsumitu beharrean (Antonuk eta Block, 2006). Beraz, produktuen anoen tamaina murrizteak kontsumitutako energia kopurua murriztu dezake, baldin eta prezioa mantentzen ez bada edo igo ere egiten ez bada. Etiketa-prezioari eutsiz produktu baten tamaina murriztea *shrinkflation* (gaztelaniaz, *reduflación*) gisa ezagutzen da (*shrink* - murrizketa eta *inflation* - inflazioz osatutako terminoa) (Investopedia, 2018). Pisunitateko preziorik altuenak tamaina txikiago horiek erosteko asmoa ken diezaieke kontsumitzaileei; izan ere, jakinarazten denez, kalitate-prezio erlazioa oso garrantzitsua da kontsumitzaileentzat (Euromonitor International, 2015, Jensen et al., 2021). Ikerketa gehiago behar dira unibertsitate-ingurunean produktuen anoen tamainaren aldaketek nola eragiten duten kontsumitzaileen hautapen-ohituretan aztertzeko.

Lehen aipatutako ingurumen-estragieiz gain (KNAa duten produktuen aukerak eskuragarriagoak izatea -ez garestiegiak-, KNBa duten produktuen anoen tamaina murriztea), hauta-lekuetan, hala nola unibertsitateetako salmenta-puntuetan, ondorengoak ere ezarri beharko lirateke: eskura dauden KNAko aukerak eskatzen dituzten politikak, KNBa duten produktuen kopurua debekatzea/mugatzea, eta hezkuntza-programak aurrera eramatea. Estrategia mota horiek (ingurumen- eta

hezkuntza-nutrizioko programak) arrakastaz gauzatu dira bai unibertsitateetan (Watanabe-Ito et al., 2020), bai beste ingurune batzuetan, hala nola lantokiko kafetegi eta supermerkatuetan (Steenhuis et al., 2001), beti ere horiek hartzeko eta etengabe ezartzeko zenbait baldintza kontuan hartuta. UPV/EHUn ezarritako estrategietako batzuk honako hauek izan dira: ikasleei zuzendutako elikadura jasangarriari buruzko aurrez aurreko tailer bat, 2017an egin zena (Arroyo-Izaga et al., 2017), Campus Bizia Lab programaren proiektu baten testuinguruan; eta elikadura-zerbitzuekin lotutako kontratueta baldintza-agiriak sartzea. Hala ere, estrategia horietako lehenengoak denboran jarraitutasunik ez izateak eta bigarrenaren ezarpenaren jarraipenik ez izateak zaildu egiten du ingurune horretan elikagaien erosketan eta kontsumoan duen eragina ebaluatzea.

Ikerketa honetako aurkikuntzak testuinguruan hobeto kokatzeko, zenbait muga aitortu behar dira. Lehenik, elikagaiei buruzko datuak une jakin batean erregistratu zirenez, ez ziren elikagaien eskaintzan izandako aldaketak kontuan hartu. Hala ere, aldaketa horiek gutxi izaten dira kontratuaren balio-aldian. Bigarrenik, elikagaien salmenta-puntueta produktuaren salmentak eta kontsumoa ez ziren ebaluatu; muga hori gainditzeko, datu horiek laster aztertzeke asmoa dugu. Muga horiek gorabehera, azterlan honekin lotutako hainbat indargune daude. Lehenik eta behin, dakigunez, azterlan gutxi egin dira Espainiako unibertsitateeta elikagaien salmenta-puntueta saltzen diren elikagaien nutrizio-profiletan (Fernández Torres et al., 2014; Martín Payo et al., 2020), eta batek ere ez du prezioaren araberako alderik aztertu nutrizio-profiletan. Bigarrenik, ikerketa honek Espainiako unibertsitate publiko bateko ikasle eta langileentzako elikagai salmenta-puntu guztien azterketa egin zuen. Antzeko beste ikasketak batzuk unibertsitate campusetako salmenta-puntu batzuk baino ez zituzten ebaluatu (Byrd-Bredbenner et al., 2012; Fernández Torres et al., 2014; Lachat et al., 2009a; Park eta Papadaki, 2016), aurkikuntzen kanpo balioa gutxitzen duena. Azkenik, azterlanean, eskaintzen diren produktuak ebaluatzeke, nahiko tresna berria erabiltzen dugu: argazkigintza digitala (Horacek et al., 2019; Matthews et al., 2014). Metodo hori oso zehatza, fidagarria eta eraginkorra da denboran, eta EIA etengabe ebaluatzeke datuak eskuratzea ahalbidetzen du (Horacek et al., 2019; Matthews et al., 2014).

Laburbilduz, UPV/EHUko elikagaien salmenta-puntueta eskaintzen ziren produktu komertzialen eta etxeko produktuaren proportzio handi bat KNBko kategorian zegoen, eta gehienek prozesamendu-maila altua zuten. Gainera, KNAko zenbait produktu, bereziki

etxean prestatutako ogitarteko zein edari beroak eta elikagai komertzialak, KNBko alternatibak baino garestiagoak ziren. Gainera, UPV/EHUko elikagaien salmenta-puntu guztiak kalitate nutrizional txiki-ertainekoak ziren. Ikerketa honetan lortutako emaitzak eta literaturari buruzko datuak kontuan hartuta, beharrezkotzat jotzen dugu ingurumen-eta hezkuntza-programak ezartzea; baita Europa, estatu eta erakunde mailako politikak uztartzen dituzten estrategiak ezartzea ere. Nolanahi ere, hirugarren hezkuntzako inguruneetako campuseko Elak eta horrek ikasleen nahiz langileen erosketa-erabakietan eta portaera dietetikoetan duen eraginak ikerketa handiagoa eskatzen dute.

5.1.2. Euskal Herriko Unibertsitateko (UPV/EHU) vending makinetan saldutako elikagaien azterketa

Oraingo atalaren helburua UPV/EHUko vending makinetan saldutako elikagaien nutrizio-profilak ebaluatzea zen, eta profil horiek duten kostuaren eta makinan duten kokapenaren arabera dituzten aldeak ikertzea. Produktu ohikoenak snack gozoak (hau da, txokolatezko barrak, gailetak), kafea eta snack gazituak izan ziren. Emaitza horiek bat datoz beste egile batzuekin, unibertsitate mailan (Byrd-Bredbenner et al., 2012; Park eta Papadaki, 2016) zein beste ingurune batzuetan (Kibblewhite et al., 2010; Naylor et al.) egindakoak. Unibertsitate-inguruneetan egindako beste azterlan batzuekin bat etorriz (Byrd-Bredbenner et al., 2012), ikusi zen UPV/EHUko vending makinetan salgai jarritako produktuen ia erdia KNBkoak zirela (hautatutako bi irizpideen konbinazioaren arabera, AECOSANen eta EBko NPEaren irizpideak), eta ia hiru laurdenek prozesamendu-maila handia zutela. Beraz, ez zen erabat baieztatu hasierako 1b Hipotesia, hau da, UPV/EHUko vending makinetan eskaintzen diren produktuen erdiak baino gehiago KNBkoak direla eta prozesamendu-maila altua dutela.

Nolanahi ere, literaturan, unibertsitateko campusetan eskuragarri zeuden makinetan saldutako KNBko artikuluen proportzioa oso aldakorra izan zen, seguruenik erabilitako irizpideak desberdinak izan zirelako (Byrd-Bredbenner et al., 2012; Grech et al., 2017; Horacek et al., 2019; Park eta Papadaki, 2016). Aipatzekoa da, halaber, ikerketa honetan erabilitako prozesamendu-mailaren sailkapenak NPEekiko adostasun-maila baxua erakutsi zuela. Hala, ez zen baieztatu hasierako 3b Hipotesia, hau da, UPV/EHUko vending makinan KNBa duten produktu gehienak ultraprozesatuak direla. Izan ere, elikagai ultraprozesatuek azukre, gatz eta/edo koipe kopuru handia izan ohi duten arren,

eduki horiek ez dituzte beti NPEen mugak gainditzen. Edonola ere, elikagai ultraprozesatuek, oro har, gutxien prozesatutako elikagaiek baino mantenugaien profil okerragoa zuten (Luiten et al., 2016).

Beste egile batzuek adierazi duten bezala, vending makinak KNBa duten elikagaiekin betetzeko arrazoi posible batzuk produktuen bizitza baliagarria eta finantza-kontsiderazioak dira (Lawrence et al., 2009). Ontziratutako ogitartekoez, hala nola gozokiez eta patata frijituek, bizitza erabilgarri luzea izaten dute, eta baliteke hozterik behar ez izatea. Hala ere, gero eta enpresa gehiago hoztu behar ez diren KNAko produktuak merkaturatzeko estrategiak garatzen ari dira. Era berean, elikagai hoztuak saltzeko gero eta makina gehiago daude, galkorrak izan daitezkeen KNAko elikagaiak izan ditzaketenak (Harstein et al. al., 2011; Popp, 2005). Finantza-kontuei dagokienez, KNAa duten produktu berriak merkaturatzea salmentak sustatzeko eta diru-sarreraren galera potentzial guztiak murrizteko modu eraginkorra izan daiteke (Alfred Health, 2015; Brown et al., 2014; Lawrence et al., 2009).

Ikerketa honetan produktu motaren arabeko nutrizio-profilaren analisiak erakutsi zuen gomendioak gutxien betetzen zituztenak elikagai solidoak izan zirela (bereziki, snack gaziak, sandwich beroak eta azukre erantsia duten gozoki eta txikleak); ondoren, edari hotzak (esnekiak batez ere) eta edari beroak (saldak eta txokolate beroa). Elikagai gehienek, snack gaziak eta sandwich beroak barne, energia, guztizko koipe eta gantz-azido ase kopuru handia zituzten; edariek, berriz, azukre kopuru handia. Aurkikuntza horiek bat datoz hainbat ingurutako vending makinetan saldutako elikagaien nutrizio-educia aztertzen duten beste ikerketa batzuekin, hala nola unibertsitateetan (Byrd-Bredbenner et al., 2012; Park eta Papadaki, 2016), osasun zentroetan (Kibblewhite et al., 2010) eta aisialdi-tokietan (Naylor et al., 2010) egindakoak. Horrek, baieztatu egiten du eskuragarri dauden elikagaien nutrizional-kalitate eskasa, baita azukre, guztizko gantz eta gantz aseetan baxuak diren aukeren eskaintza mugatua ere. Vending makinetan KNAa duten produktuen erosketak areagotzeko helburuarekin, vending-aukera nahikoa bermatu behar da, gomendio dietetiko osasungarriak erraztuko dituzten prozesamendu-maila txikiko aukerekin. Estrategia horiek osasuna sustatzeko mezuekin konbinatu beharko lirateke (Hua eta Ickovics, 2016).

Erabilitako bi NPEen arteko adostasun-mailari dagokionez, guztizko produktueterako eta edari hotz nahiz beroetarako ia perfektua izan zela adierazi behar da. Adostasunik

txikiena elikagai solidoetarako lortu zen. Ikerketa honetan lortutako bi NPEen emaitzetan dauden alde horiek eraikuntzetako desadostasunekin eta erabilitako ereduatarako puntuazio-irizpideekin lotuta egon litezke. Izan ere, EBko NPEaren irizpideak sodio, gantz ase eta azukre kopuru handiak zigortzen ditu, baina produktu horietarako lortutako puntuazioak “frutak, barazkiak eta fruitu lehorrak” eta zuntza osagaiekin lotutako puntu positiboekin konpentsatzen dira. Hori ez da AECOSAN ereduaren kasuan gertatzen. Beraz, KNB gisa sailkatutako produktuen ehunekoa (bereziki fruitu lehorrak, snack gozoak eta sandwich hotzak) handiagoa izan zen AECOSANen irizpideekin EBko NPEarekin baino. Hala, hasierako 2b Hipotesia berretsi zen, hau da, UPV/EHUko vending-makinen KNBa duten produktu komertzialen ehunekoa oso aldakorra dela haien nutrizio-profila ebaluatzeko erabilitako irizpideen arabera.

Nutrizio-profilaren diferentziei dagokienez, kostuaren arabera, KNBa duten elikagai solidoak eta edari beroak KNAa duten alternatibak baino askoz ere merkeagoak izan ziren; aldiz, edari hotzen artean, emaitzak kontrakoak izan ziren. Izan ere, ura freskagarriak baino merkeagoa zen askotan. Beraz, ez zen baieztatu hasierako 5b Hipotesia, hau da, UPV/EHUko vending makinetako KNAa duten produktuak KNBa duten produktuak baino garestiagoak direla. KNBa eta prezio altuko elikagaien artean aurkitutako lotura bat dator beste egile batzuen aurkikuntzekin (Grech et al., 2017; Lee et al., 2013). Hala ere, ikerketa guztiek ez zuten erlazio hori aurkitu. Adibidez, Ng et al.ek (2019) ez zuen estatistikoki adierazgarriak diren prezioen alderik aurkitu, eta aurkikuntza hori KNAen aukera urrien ondorio izan zitekeela argudiatu zuten. Zenbait egilek adierazi dutenez, makina vending-en produktuen prezioek eragin handia izan zuten kontsumitzaileen erosketa-patroietan (Grech eta Allman-Farinelli, 2015; Kocken et al., 2012), eta KNAa duten aukerak kostu txikian eskaini zirenean, KNAko aukeren salmentak gora egin zuten (French et al., 2001; Kocken et al., 2012; Whatnall et al., 2020b). Hala ere, prezioetan eta produktuetan egindako esku-hartzeek irabazietan duten eragina oraindik ez da eztaba daezina (Pharis et al., 2018; Viana et al., 2018). Prezioek eta produktuen aldaketek salmentak eta irabaziak murriztu ditzaketelako kezkak gerenteek KNAko aukerak eskaintzea eragotz dezake. Beraz, luzetarako datuetan oinarritutako ikerketa gehigarriak behar dira, ebidentzia-oinarri bat garatzeko, unibertsitate-komunitate honen artean prezioen esku-hartzeek izan dezaketen eraginkortasunari buruz, elikagaien kontsumo-ereduak hobetzen laguntzeko.

Gainera, KNBa zuten produktuak maizago sustatu ziren, batez ere, begien eta eskuen altueran kokatu baitziren. Beraz, hasierako 6 Hipotesia berretsi zen, hau da, UPV/EHUko vending makinak KNBa duten produktuak KNAa duten produktuak baino maizago sustatzen direla. Emaiza horiek bat datoz elikagaien marketinak KNBko elikagaiak sustatzen dituela erakutsi zuten aurretiazko ikerketekin (Cairns et al., 2013). Argi eta garbi frogatu da supermerkatuetan elikagai jakin batzuen erosketak maximizatzen dituzten diseinuak eta produktu espezifikoek kokapena eraginkorrak direla erosketa-portaera manipulatzeko (Stanton, 2015). Ikerketa honetan lortutako emaitzak eta literaturako datuak kontuan hartuta, vending makinetan KNAko produktuen erosketak areagotzeko beharrezkotzat jotzen dugu estrategia batzuk ezartzea. Zehazki, prezio txikiko eta KNAko vending aukera nahikoak espazio estrategikoetan kokatzea. Aldaketa horiek campusean ezartzen direla bermatzeko, politikak ezarri behar dira, Europa, estatu eta erakunde mailako politikak barne.

Europa eta estatu mailan, gobernuko eta kontseiluko erregulazioek goi-mailako hezkuntza-erakundeetan eskaintzen diren elikagai guztiek nutrizio-irizpide osasungarriak betetzea eska lezakete, ebidentzian oinarritutako egungo nutrizio-gomendio nazional eta nazioartekoekin bat etorrita. Gobernu-erregulazioek unibertsitateetan eskaintzen diren elikagaien nutrizio-kalitatea berma dezakete. Erakunde mailan, alderdi interesdunek, hala nola erabakiak hartzen dituztenek (esate baterako, Kontratazioaren Gerenteordetza), elikagaiak banatzen dituzten enpresek eta unibertsitate-komunitateak (ikasleak eta langileak), parte hartu behar dute ildo horretan aldaketak bultzatzeko (Byrd-Bredbenner et al., 2012). Ikerketa honen ondoren, UPV/EHUK neurri batzuk ezarri zituen vending makinetan eskuragarri dauden elikagaien kalitate nutrizionala eta jasangarritasuna hobetzeko (UPV/EHU, 2019). Adibidez, elikagaien salmenta-puntuarekin lotutako kontratuen baldintza-agirietan aldaketak burutu ziren. Hala ere, jarraibideak benetan betetzeko eta betetzearen jarraipena egiteko zailtasunak ikusi dira, ez baitzen plan espezifikorik eman ezarpenaren jarraipena egiteko.

Orain arte, KNAa duten elikagaien eskuragarritasuna hobetzeko osasun-politikak garatu dira, osasun-zentroetarako (Ministry of Health New South Wales, 2009) eta lehen nahiz bigarren mailako eskoletarako (Mozaffarian, 2016; Orava et al., 2016; Vine et al., 2017), besteak beste. Egun, Espainian, eskolei berariazko legeria aplikatzen zaie (17/2011

Legea). Gainera, 2018an, Eusko Jaurlaritzak vending makinetan KNAa duten elikagaien kopurua handitzeko proiektu pilotu bat jarri zuen abian. Eusko Jaurlaritzaren proiektu horren helburua eskoletan, ospitaleetan, unibertsitateetan eta enpresetan eskaintzen diren produktuen %50 KNAkoak izatea zen (Eusko Jaurlaritzako Osasun Saila, 2018). Hala eta guztiz ere, vending makinetan KNAa duten aukeren presentziak kontsumo-portaeretan alderik eragiten duen zehazteko ikerketa gehigarria behar da; izan ere, vending makinaren aukeren %50 edo gehiago KNBkoak izaten jarraitzen dute. Vending makinetan nutrizio-edo snack-politikak ezartzeari dagokionez, goi-mailako hezkuntzako instituzioak/enplegatzaileak ez dira hain proaktiboak izan. Ez dago berariaz unibertsitate-inguruneetarako garatutako jarraibiderik eta gainera, horiek ez dira nahitaezkoak. Beraz, hirugarren hezkuntzako inguruneetarako politika argien gomendioak garatzea beharrezkoa da, unibertsitateko administratzaileak arazoaren kontzientzia hartzera eta vending-hornitzaileei aldaketak eskatzera bideratzeko. Espainian eta Europan horrelako politikarik ez dagoenez, beste herrialde batzuetan garatu eta ezarri direnak har daitezke adibide gisa, hala nola Estatu Batuetakoa (University of California Global Food Initiative, 2018; Wickramasekaran et al., 2018).

Ikerketa honetako aurkikuntzak testuinguruan hobeto kokatzeko, zenbait muga aitortu behar dira. Lehenik, elikagaiei buruzko datuak une jakin batean erregistratu zirenez, ez ziren kontuan hartu elikagaien horniduran izandako aldaketak. Hala ere, aldaketa horiek gutxi izaten dira hornidura-kontratuaren balio-aldian. Bigarrenik, vending makinaren produktuen salmentak edo kontsumoa ez ziren ebaluatu; muga hori gainditzeko, datu horiek laster aztertzeke asmoa dugu. Muga horiek gorabehera, ikerketa honekin lotutako hainbat indargune daude. Lehenik eta behin, dakigunez, Espainiako unibertsitateetako vending makinetako elikagaien eta edarien nutrizio-profilen inguruan azterlan gutxi egin dira (Martin Payo et al., 2020), eta bakar batek ere ez ditu aztertu nutrizio-profilen arteko aldeak, prezioaren eta produktuak makinan zuten lekuaren arabera. Bigarrenik, ikerketa honek Espainiako unibertsitate publiko bateko ikasleek eta langileek erabil zitzaizketen makina guztien analisia jaso zuen. Antzeko beste ikasketa batzuek unibertsitate-campusetako batzuk baino ez zituzten ebaluatu (Byrd-Bredbenner et al., 2012; Lee et al., 2013; Park eta Papadaki, 2016), eta horrek, aurkikuntzen kanpo-balioa murrizten du. Hirugarrenik, azterlanetarako nahiko berria den vending makinak ebaluatzeke tresna bat erabili zen: argazki digitala (Horacek et al., 2019; Matthews et al., 2014). Metodo hori oso zehatza, fidagarria eta eraginkorra da denboran, eta Ela etengabe ebaluatzeke datuak

eskuratzea ahalbidetzen duelako (Horacek et al., 2019; Matthews et al., 2014). Azkenik, produktuen sustapena aztertzeke tresna bat aplikatu zen, aurretik vending makinena ebaluazio-azterketetan erabili ez zena. Produktuak makinan duten kokapenean oinarritutako merkaturatze-irizpide hori baliagarria izan liteke KNAa duten elikagaiak sustatzeko.

Laburbilduz, gure aurkikuntzek iradokitzen dute UPV/EHUko vending makinena produktuen ia erdia KNBkoak zirela nutrizioaren ikuspegitik, eta ia hiru laurdenek prozesamendu-maila handia zutela. Beraz, KNAa duten elikagaien eskuragarritasuna mugatua da. Gainera, KNBa zuten elikagaiak eta edari hotzak KNAko alternatibak baino merkeagoak ziren eta maizago sustatzen ziren (hau da, eskuaren edo begien mailan kokatzen ziren gehienak). Aurkikuntza horiek baliagarriak izan daitezke campusetan vending makinena produktuen osasungarritasuna hobetzera bideratutako esku-hartzeak eta politikak garatzeko. Ingurumen-aldaketa horien ondorioz, litekeena da KNAko aukeren aukeraketa posible eta errazagoak izatea. Etorkizuneko ikerketak esku hartzeko estrategien diseinuan, ezarpenean zein ebaluazioan eta irabazien gaineko efektuan jarri behar du arreta.

5.2. EUSKAL HERRIKO UNIBERTSITATEKO (UPV/EHU) CAMPUSEAN EROSKETA-PORTAERAK, HAUTAKETEN FAKTORE ERABAKIGARRIAK ETA ELIKAGAIEN ESKURAGARRITASUNARI BURUZKO IRITZIAK

Atal honen helburua UPV/EHUko unibertsitate-komunitateko hainbat kolektiboren (ikasleak, IIPak eta AZPak) campusean elikagaien erosketa-portaerak, hautaketena faktore erabakigarriak eta Elari buruzko iritziak aztertzea izan zen. Laburbilduz, emaitzek parte-hartzaile gehienek campusean elikagaiak erosten zituztela erakutsi zuten, batez ere bazkaltzeko eta aperitibo bezala. Edari beroak, botilako ura eta elikagai beroak (adibidez, pintxoak eta sandwichak/hanburbesak) gehien erosi ziren produktuak izan ziren, eta horiek hautatzeko faktore erabakigarriena zaporea izan zen. Campusaren Elan sarrien gomendatutako aldatetako jasangarritasunarekin, KNAa duten produktuen eskaintzarekin, prezioarekin eta etiketetan alergenoei buruzko informazioarekin lotuta zeuden.

Literaturarekin bat, ikerketa honek ikasle eta langile gehienek campusean jaki edo edari batzuk erosi zituztela ikusi zuen (Pelletier eta Laska, 2013; Roy et al., 2019; Tam et al.,

2017). Erosketa gehienak kafetegian/jatetxean eta vending makinetan egin ziren, eta gehienak bazkaltzeko nahiz aperitibo bezala erosi ziren. Emaidza horiek Roy et al.ek (2019) aurkitutakoekin bat egiten dute. Sexuaren arabera alde nabarmenak aurkitu ziren elikagaien erosketen maiztasunean eta gastuan. Izan ere, gizonak emakumeek baino joera handiagoa zuten campusean elikagaiak erosteko eta dirua gastatzeko. Emaidza hori bat dator etxetik janaria ekarri zuten edo campusetik kanpo erosi zuten emakumeen ehuneko handiagoarekin, gizonekin alderatuta. Badirudi azken horren arrazoia euren prestatutako janariaren hobespena eta kostua zirela. Etxetik elikagaiak ekartzen dituzten emakumeen ehunekoa gizonena baino handiagoa izan daiteke tradizionalki emakumeak izan direlako elikagaien erosle eta prestatzaile nagusiak (Bianchi et al., 2000), bai eta emakumeek elikagaien nutrizio-balioari buruzko kezka handiagoak ere dituztelako (ikerketa honetan aurkitu zen bezala).

Gainera, gizonak janari eta edari gehiago erosteko joera zuten bazkaltzeko, batez ere kafetegian/jatetxeetan. Emakumeek, berriz, ordu artean gehiago erosteko joera zuten vending makinetan, supermerkatuan eta unibertsitateko jantokian. Taldearen arabera, ikusi zen AZPak izan zirela campusean elikagaiak gehien erosi zituztenak eta diru gehien gastatu zutenak. Emaidza horrek eragina izan dezake sexuaren arabera banaketan, baita AZP taldearen lanaldiaren arabera ere, beste bi taldeetakoan aldean desberdina baita.

Gutxi gorabehera bost parte-hartzaitetik batek dieta berezi bat jarraitu zuen, bereziki pisua kontrolatzeko dietak, ondoren dieta begetariano edo beganoak ikasleetan, dieta terapeutikoak IIPan eta beste dieta batzuk (adibidez, dieta baxuak elikagai ultraprozesatuetan) AZPan. Emaidza horiek, oro har ikasleei dagozkienak, bat datoz aurretiko ikerketekin (Tam et al., 2017; Zazpe et al. 2013). Horiek gainpisua izatearen kontzientzia gero eta handiagoarekin (Tamim et al., 2006) eta osasun-kezkengatik nahiz arrazoi etiko, ekologiko zein sozialengatik animalia-produktuak baztertze joera gero eta handiagoarekin lotu dira (Leitzmann, 2014). Sexuaren arabera, unibertsitate-komunitateko hiru taldeetan gizon baino emakume gehiagok adierazi zuten dieta berezia jarraitzen ari zirela. Hori bat dator aurreko ikerketekin; izan ere, ikerketa horien arabera, emakumeek gizonak baino aukera gehiago dituzte dieta egiteko. Emakumeek, gainpisua/obesitatea izatekotan, estigma sozialaren eragina jasateko eta ondorio psikosozial indartsuagoak izateko joera handiagoa dute (Voelker et al., 2015).

Ikasleek eta langileek edari beroak (adibidez, kafea, tea, txokolate beroa), botilako ura ta elikagai beroak (adibidez, pintxoak eta sandwichak/hanburgesak) erosteko joera zuten; snack osasungarrienak (zehazki, intxaurrek eta frutak), berriz, gutxiagotan kontsumitzen ziren. Emaizta horiek bat datoz Zeelanda Berriko Unibertsitatean egindako ikerketa batekin. Ikerketa horrek gehien kontsumitzen ziren elikagaiak elikagai beroak zirela ikusi zuen, hala nola haragi-pastelak eta patata frijituak, bai eta edari beroak, hala nola kafea, tea eta/edo txokolate beroa ere. Snack osasungarrienak, ordea, gutxien kontsumitu zirela ikusi zuen (Roy et al., 2019). Hortaz, hasierako 7a Hipotesia berretsi zen: UPV/EHUko komunitateko elikagaien erosketa-portaeren ezaugarria da elikagai eta edari beroen aukeraketa sarria; ondoren, edari hotzena eta snack-ena. Langile baino ikasle gehiagok sandwichak/hanburgesak, pintxoak, snack-ak eta edari hotzak erosi zituzten. Aipatu behar da produktu horietako gehienak KNB gisa sailkatu zirela, erabilitako NPEen arabera, bereziki, sandwich komertzialen %53,1, hanburgesen %100, pintxoaren %98,5, snack gazien %78,7 eta snack gozoen %92,4. Aitzitik, langile gehiagok erosi zituen edari beroak (besteak beste, kafea, tea eta txokolate beroa), entsaladak eta eguneko menua ikasleekin alderatuta. Eguneko menuko osagaien artean KNA gisa sailkatutakoen ehunekoa oso aldakorra izan arren (%0-69,6), edari bero eta entsalada gehienak KNA gisa sailkatu ziren, zehazki, edari beroen %91,5 eta entsaladen %92,6. Emaizta horiek estatus demografikoaren eta sozioekonomikoaren desberdintasunekin lotuta egon litezke (Wills et al., 2019), bai eta faktore indibidualekin (sukaldaritzako trebetasunak, ezagutzak eta pertzepzioak), bai faktore sozialekin (pareen eta arau sozialen eragina), besteak beste (Kabir et al., 2018). Ondorioz, hasierako 7b Hipotesia berretsi zen: elikagaiak erosteko portaerak osasungarriagoak dira langileen artean ikasleen artean baino. Sexuaren arabera, pintxoaren eta sandwich/hanburgesa beroen erosketa handiagoa izan zen gizonen artean emakumeen artean baino hiru taldeetan. Antzeko ereduak behatu dira emakumeek koipe askoko elikagaiak jateko joera txikiagoa zuten beste ikerketa batzuetan (Li et al., 2012; Tam et al., 2017).

Gainera, gehien kontsumitu ziren produktuak unibertsitate honetan maizen eskaini zirenak izan ziren. Ondorioz, hasierako 8 Hipotesia berretsi zen: UPV/EHUko komunitateko elikagaien erosketa-portaerak EI horren eskuragarritasunarekin lotuta daude. Aurkikuntza hori bat dator beste ikerketa batzuekin, izan ere, ingurune komunitarioetan elikagaien eta edarien eskuragarritasuna aldatzeak eragina izan

dezakeela ikasleen erosketan eta kontsumoan iradokitzen dute (Driessen et al., 2014; Fonseca et al., 2021).

Eskuragarri zeuden aurreko ikerketekin bat (Aggarwal, et al 2016; Hebden et al., 2015), zaporea izan zen elikagaien hautaketan faktore erabakigarri garrantzitsuena. Ikerlan honetan, ikasletan prezioa, AZPan “nutrizio-balioa” eta IIPan “osasan-balioa” izan ziren elikagaiak garrantziaren arabera erosteko faktore erabakigarriak. Emaidza horrekin bat, ikasleen ehuneko handi batek jakinarazi zuen deskontuek (adibidez, “2x1 eskaintzak” edo “prezio txikietan prestatutako janari-zati handien eskaintzak”) eragina dutela elikagaien aukeraketan, eta fidelizazio-txartelen erabilera babesten dutela. Emaidza hori adinaren (Muhammad et al., 2017) eta maila sozioekonomikoaren (Darmon eta Drewnowski, 2015) araberrako aldeekin lotuta egon liteke. Hortaz, hasierako 9a Hipotesia partzialki berretsi zen: elikagaiak hautatzeko faktore erabakigarri nagusiak UPV/EHUko komunitatean gustua, elikagaien kalitate-prezio erlazioa, kostua eta egokitasuna (erabilgarritasuna) ziren. Era berean, hasierako 9b Hipotesia berretsi zen: heldu gazteentzat, hau da, ikasleentzat, kostua eta pertzepzio sensorialak dira eraginik garrantzitsuena dutenak elikagaien hautaketan; langileentzat, berriz, nutrizio-/osasan-balioa dira. Campuseko EIneei heltzen dieten etorkizuneko esku-hartzeek kostu baxuan erosteko elikagai zaporetsu eta nutritiboen berehalako eskuragarritasuna bermatzea izan behar dute ardatz.

Gainera, elikagaien nutrizio-balioa/osasan-balioa ere garrantzitsutzat jo zenez, nutrizio-etiketen potentziala edo osasunarekin lotutako nutrizio-adierazpenak estrategia interesgarria izan litezke populazio horretan elikagai osasungarriagoen kontsumoa sustatzeko. Sexuaren arabera, “osasuna” eta “nola sentiarazten zaituen” faktore erabakigarriak garrantzitsuagoak izan ziren emakumeen artean gizonen artean baino, batez ere ikasleen artean. Emaidza horiek aurreko ikerketen antzekoak dira (Kearney et al., 2000; Tam et al., 2017), eta horrek emakumeek garrantzi handiagoa ematen diotela jateari osasan-arrazoiengatik adierazten du.

Gure aurkikuntzak bat datoz campuseko janariarekiko asebetetze orokorra neurritzkoa izan zela iradoki zuten aurretiko ikerketekin (Liang eta Zhang 2009; Roy et al., 2015). Proposatutako bost aldatetetatik bik jasangarritasunari buruzkoak ziren, zehazki, “edateko ur iragaztua dohainik eskuratzeko ahalmen handiagoa” eta “elikagaien ontziak birziklatzeko ahalmen handiagoa”. Emaidza hori bat dator beste egile batzuen aurkikuntzekin (Martinez-Perez et al., 2021; Roy et al., 2015; Tam et al., 2017) eta

elikaduraren munduko joerekin. Ildo horretan, unibertsitateetan arrakastaz garatu eta ezarri dira osasuna eta jasangarritasuna ikuspegi ekologikotik jorratzen dituzten elikagaien zerbitzu-jarraibide instituzionalak (Emory University Sustainable food, 2016; Yale University Green Purchasing, 2011). Gainera, ikerketa honetan, jasangarritasunarekin lotutako iradokizunak gehiago babestu zituzten ikasleen taldeak langileena baino, eta horrek lotura izango du, ziurrenik, adineko belaunaldiak jasangarritasunaz eta horri lotutako arazoez hain kontziente ez izatearekin (Sánchez-Bravo et al., 2020).

Dohainik iragazitako edateko uraren eskuragarritasunari dagokionez, campuseko ur-iturri gehiagok ura doakoa eta edozein unetan eskuragarri izatea ahalbidetuko lukete. Gainera, unibertsitate-komunitatearentzako kostua murrizteaz gain, ingurumenarentzat ere onuragarria izango litzateke, ur-hondakin plastikoak murriztu baitaitezke (Adachi-Mejia et al., 2013). Aipatu behar da zentro batzuek ez dutela ur-iturririk, instalatzeak eta mantentzeak kostu handia baitakar.

Campusaren EInean hirugarren aldaketa ezagunena “aukera osasungarrienak vending makinetan” izan zen, eta hori bat dator EInea behatu duten beste ikerketekin (Liang eta Zhang, 2009; Martinez-Perez et al., 2021; Roy et al., 2019; Tam et al., 2017). Salmenta-puntu gehienak, batez ere vending makinak, KNBko elikagaiez osatuta zeuden, eta gutxieneko barietatea zuten (Horacek et al., 2019; Martinez-Perez eta Arroyo-Izaga, 2021; Whatnall et al., 2020a). Elikagaien inguruko laugarren aldaketa garrantzitsuena kostuari buruzkoa zen, bereziki, “aukera osasungarrietarako deskontuak”. Aurkikuntza horiek hasierako 10a Hipotesia babestu dute, hau da, interes esanguratsua dagoela UPV/EHUn KNAa duten produktuen eskuragarritasun eta eskuragarritasun handiagoari dagokionez, baina ez zen baieztatu elikagaien barietatea handitzeko interesik dagoenik.

Aurreko ikerketek ere “kalitatearen eta prezioaren arteko erlazioa” edo kostua faktore erabakigarriak zirela elikagaiak erosteko berretsi zuten (Martinez-Perez et al., 2021; Roy et al., 2019; Tam et al., 2017). Kontsumitzaile guztiek bezala, unibertsitateko kontsumitzaileek balio hobea nahi dute elikagaien saltokietarako errentagarritasun txikiagoa duten produktuentzat (Gilmore eta Pine II, 2009; Liang eta Zhang, 2009; Tam et al., 2017). Elikagaien prezioak elikagaien erosketan eragina duelako ebidentzia dela eta (Epstein et al., 2012), prezioetan zenbait esku-hartze egin dira, eta aurkikuntza batzuek iradokitzen dute KNAko elikagaietan egindako prezioen deskontuek haien erosketa

handitu dezaketela diru-sarreretan eraginik izan gabe (Grech eta Allman-Farinelli, 2015; Roy et al., 2015). Campusean KNAa duten produktuen eskuragarritasuna eta irisgarritasuna handitzea eraginkorra izan liteke langileentzako eta ikasleentzako EInea hobetzeko. Hala ere, ikerketa gehiago behar da KNBa duten elikagaien prezioak aldi berean igotzearen eta KNAa duten produktuen prezioak murriztearen ondorioak ikertzeko, campuseko elikagai-saltzaileen irabazien gaineko eragina minimizatzeko helburuarekin (An, 2013; Alagiyawanna et al., 2015). UPV/EHU bezalako unibertsitate batean estrategia horiek praktikan jartzea zaila izan daitekeen arren, agian eraginkorragoak izango lirateke campusean KNAko elikagai gehiago eskuratzearekin konbinatuko balira. KNAa duten elikagai eskuragarri gehiago izateak, ziur asko, eragin esanguratsua izango luke erosketan eta kontsumoan.

Proposatutako bosgarren aldaketarik hedatuena etiketetan alergenoei buruzko informazioa hobetzearena izan zen. Aldaketa hori bera izan zen beste unibertsitate publiko batean egindako ikerketaren (Martinez-Perez et al., 2021) lehen bostetan ere. Beste egile batzuek adierazi duten bezala, etiketak handitzeak EInea hobetzeko eraginkorra izan beharko luke (Roy et al., 2015). Aipatzekoa da campuseko EIneko aldaketen lehen bost zerrendetako hirugarren, laugarren eta bostgarrena AZPak eskatu zituela batez ere, beste bi taldeekin alderatuta. Emaitza hau, ziur asko, AZPak dieta berezi bat maizen jarraitu zuen taldea izatearekin lotuta egongo da, bereziki “elikagai ultraprozesatuen dieta baxuak”. Ikasleek ere prezioen aldaketak babestu zituzten. Langile baino ikasle gehiagok “elikagai merkeagoak” ikusi nahi zituzten, bai eta “elikagai osasungarriagoak kostu txikiagoan” ere. Hiru taldeek prezioen aldaketak babestu zituzten arren, langileek batez ere KNAko elikagaien prezioarekin lotutako aldaketak proposatu zituzten; beraz, hasierako 10b Hipotesia partzialki baieztatu zen, hots, prezio-aldaketak langileena baino ikasleen ehuneko handiago batek iradokitzen dituela. Gainera, ondorengo baieztapena berretsi zen: KNAko elikagaien eskuragarritasunarekin eta elikagaiak hautatzeko laguntzarekin lotutakoak ohikoagoak izan ziren ikasleen artean.

Ikerketa honek arreta merezi duten muga gutxi batzuk ditu. Lehenik eta behin, komenentziaren araberako laginketari dagozkion alborapenak ez du inferentzia fidagarriak egiteko aukerarik ematen unibertsitate-komunitate honetako edo hirugarren mailako beste instituzio batzuetako populazioei. Komenentzia laginketak unibertsitateko janari saltokietan interesatuenak erakartzea probableagoa egiten du. Parte hartzeko

erabakiak hainbat faktoreren eragina izan dezake, gizarte-, hezkuntza- eta osasun-baldintzak barne, eta horiek eragina izan dezakete erantzunetan. Edonola ere, *post hoc* potentziaren kalkulua egin zen, eskuragarri zegoen laginaren tamainan oinarrituta. Zehazki, 0.05 alfa errore-tasan oinarrituta, bi ilarako proba bat erabiliz unibertsitate-komunitateko taldeak campusean janaria edo edaria erosi zuten parte-hartzaileen behatutako ehunekoa kalkulatu zen. Horrela, %99ko edo hortik gorako potentzia lortu zen, Roy et al.ek (2019) adierazitakoarekin alderatuta. Bigarrenik, campuseko elikagaien kontsumoari buruzko daturik ez zen erregistratu. Hala ere, litekeena da elikagai horiek erosi zituztela jakinarazi zuten parte-hartzaileek ere kontsumitzea. Gainera, luzetarako ikerketa bat aurrera eraman dugu, lehen urteko ikasleetan elikagaien erosketak eta kontsumoa ebaluatzeko, bai eta haien gorputz-pisuan izan dezaketen eragina ebaluatzeko ere, hau da, Freshman 15 fenomeno (erakutsi gabeko emaitzak). Hirugarrenik, galdetegiaren diseinua dela eta, parte-hartzaileek ezin izan zituzten beren lehentasunak handienetik txikienera sailkatu. Etorkizunean, sailkapen-sistema bat erabiliko da lehentasun bakoitzaren garrantzi erlatiboa aztertzeko.

Muga horiek gorabehera, eta lortutako emaitzak kontuan hartuta, honako hau ondoriozta dezakegu: (i) elikagaiak eta edariak bazkari eta aperitibo bezala erosten ziren eskuarki, eta edari beroak, botilatutako ura nahiz elikagai beroak (adibidez, pintxoak eta sandwichak/hamburguesak) ziren erositako produkturik garrantzitsuenak; (ii) zaporea izan zen elikagaien hautaketan faktore erabakigarriena, ondoren prezioa ikasleentzako, nutrizio-balioa AZPantzako eta osasungarritasuna IIPantzako; eta (iii) campusaren EIneari buruz iradokitako iritzien eta izan zitezkeen aldaketen arabera, unibertsitate-komunitateak campuseko janariarekiko duen gogobetetasuna areagotzeko, etorkizuneko interbentzioek jasangarritasunari erreparatu behar diote, bai eta KNAko elikagaien eskuragarritasuna areagotu, prezioen aldaketak burutu eta alergenoen etiketatako informazioa hobetu ere. Elikagaien horniduran egindako aldaketa horiek, beti ere dastamen-lehentasunak kontuan hartuta, eragin positiboa izan dezakete populazio horren elikagaiak kontsumitzeko ohituretan, eta epe luzera gaixotasun kronikoak izateko arriskua murriztu dezakete. Aurkikuntza horiek garrantzitsuak dira ingurune honetako eta antzeko beste hirugarren hezkuntzako inguruneetan EIA hobetzeko esku-hartzeak planifikatzeko.

5.3. CAMPUSEKO ELIKAGAIEN-INGURUNEA (produktu komertzialak bakarrik barne), EROSKETA-PORTAERAK, HAUTAKETEN FAKTORE ERABAKIGARRIAK ETA ELIKAGAIEN ESKURAGARRITASUNARI BURUZKO IRITZIAK OSLOKO UNIBERTSITATE METROPOLITARRAN (OSLOMET)

Atal honen helburua honako hau izan zen: OsloMeteko Pilestret eta Kjeller campuseko elikagaien salmenta-puntuetan eskaintzen diren elikagai komertzialen nutrizio-profila eta prozesamendu-maila ebaluatzea, bai eta unibertsitate-komunitateko hainbat talderen (ikasleak eta enplegatuak) campusean elikagaien erosteko-portaerak, hautaketan faktore erabakigarriak eta Elari buruz dituzten iritziak aztertzea ere. Laburbilduz, lehen helburuari dagokionez, produktuen ia %40 KNA gisa sailkatu ziren, erabilitako hiru sailkapenen arabera; eta horietako gehienak "ultraprozesatu" gisa sailkatu ziren. Bigarren helburuari dagokionez, elikagai hotzak eta edari beroak izan ziren gehien erosi ziren produktuak. Zaporea, komenigarritasuna (eskuragarritasuna), kostua eta nutrizio-/osasun-balioa izan ziren elikagaiak hautatzerakoan faktore eragile nagusiak. Gainera, campuseko Elari eta balizko aldatetei buruz iradokitako iritzi ohikoenak honako hauei buruzkoak izan ziren: prezio baxuagoak, etiketei buruzko informazio hobea eta elikagai fresko eta osasungarrien bariedade hobea.

Eskainitako produktu komertzial ohikoenak snack gozoak eta azukredun gasdun edariak izan ziren. Horiek gantz-azido ase (GAA) eta azukre kopuru handia zuten, hurrenez hurren. Emaizta horiek unibertsitateetan aurrez egindako ikerketen antzekoak dira (Horacek et al., 2013a; Horacek et al., 2013b; Roy et al., 2016), KNAko aukeren eskaintza mugatua dela iradokitzen baitute, eta horrek energia handiko eta mantenuz gutxiko produktuak aukeratzea errazten du. Horrelako produktuak maiz kontsumitzea gantz eta azukre gehiago hartzearekin lotu da (Pelletier eta Laska, 2013), eta horrek dietaren kalitate okerragoa ekar dezake (Roy et al., 2017).

Unibertsitate-inguruneetan egindako beste ikerketa batzuekin bat (Byrd-Bredbenner et al., 2012; Horacek et al., 2013a; Horacek et al., 2013b; Roy et al., 2016), ikusi zen eskainitako elikagaien hamarretik lau KNAkoak zirela, AECOSANen, EBko NPEaren eta MFUren irizpideen arabera. Beraz, ez zen hasierako 1a Hipotesia baieztatu, OsloMeten eskainitako produktu komertzialen erdia baino gehiago KNAkoak zirela. Adostasun handiena lortu zuten ereduak EBko NPEa eta AECOSANen irizpideak izan ziren; adostasun okerrera lortu zutenak, berriz, AECOSANen eta MFUren irizpideak. Ikerketa honetan hiru NPEen emaitzetatik lortutako aldeak eraikuntzetako desadostasunekin eta erabilitako

ereduetarako puntuazio-irizpideekin lotuta egon litezke. Izan ere, MFUren irizpideak AECOSANen baino murriztaileagoak dira azukre- eta edulkoratzaile-edukiari dagokionez, bereziki edarietan. Beraz, KNB gisa sailkatu ziren produktuen ehunekoa, bereziki azukre erantsiak eta/edo edulkoratzaileak dituzten produktuetan, handiagoa izan zen MFUren irizpideekin AECOSANenekin baino. Hala, 2a Hipotesia berretsi zen: OsloMeten saldutako KNBko produktu komertzialen ehunekoa oso aldakorra da, haien nutrizio-profila ebaluatzeke erabilitako irizpideen arabera.

Bestalde, eskuragarri dauden produktu gehienek prozesamendu maila altua zuten, Norwegian elikagai ultraprozesatuen erosketei buruzko datuekin bat datorrena (Solberg et al., 2016). Beraz, hasierako 1a Hipotesia berretsi zen, OsloMeten eskainitako KNBko produktu komertzial gehienak ultraprozesatuak dira. Literaturan, campusean saldutako KNBko produktuen proportzioa oso aldakorra da, seguruenik erabilitako irizpideak desberdinak izan zirelako (Horacek et al., 2013a; Horacek et al., 2013b; Roy et al., 2016). Nolanahi ere, azterlan honetan erabilitako prozesamendu-mailaren sailkapenak NPEekiko adostasun-maila baxua erakutsi zuen. Beraz, ez zen baieztatu hasierako 3a Hipotesia, OsloMeten saldutako KNBko produktu komertzial gehienak ultraprozesatuak direla. Hau izan liteke elikagai ultraprozesatuek, azukre, gatz eta/edo koipe kopuru handia izan ohi duten arren, eduki horiek ez dituztelako beti NPEen mugak gainditzen. Beste egile batzuek adierazi duten bezala, elikagai ultraprozesatuek, orokorrean, gutxien prozesatutako elikagaiek baino elikagai profil okerragoa dute (Luiten et al., 2016).

Elikagaien erosketari eta elikagaiak hautatzeko faktore eragileei buruzko inkestan ikusi zen parte-hartzaile gehienek zenbait elikagai edo edari erosten zituztela campusean. Gainera, gehienek unibertsitatera joaten ziren aldien erdietan edo gehiagotan egiten zituzten erosketak campusean. Erosketa horiek, oro har, campusetako jantokian eta kafetegi/jatetxean egiten ziren gehienbat, eta jateko/edateko aldiak bazkalorduan eta otordu artean izaten ziren batez ere. Gutxi gorabehera hiru parte-hartzailetik batek dieta berezia jarraitzen zuela adierazi zuen, batez ere dieta begetarianoa edo beganoa, eta ondoren, pisua kontrolatzeko dieta bat. Emaiza hori bat etorri zen alde zurreko ikerketekin (Tam et al., 2017). Ikerketa horien arabera, elikagai-talde batzuk (bereziki haragia) baztertzea osasun-kezkei edo beste sinesmen batzuei (Jun et al., 2016) eta obesitatearen prebalentziari (Kjaer et al., 2016) egozten zitzaizkien.

Ikasleek eta langileek elikagai hotzak (bereziki entsaladak, sandwichak edo wrap-ak) eta edari beroak (kafea eta txokolate beroa) erosteko joera zuten, eta ondoren, elikagai beroak eta snack-ak. Hortaz, emaitza horiek partzialki berretsi egin zuten 7a Hipotesia, hau da, OsloMeteko komunitateetako elikagaien erosketa-portaeren ezaugarria da elikagai eta edari beroen aukeraketa sarria; ondoren, edari hotzena eta snack-ena. Ikasleek, langileekin alderatuta, sandwich edo wrap, ogitarteko eta, oro har, edari gehiago erosi zituzten. Horrek, ikerketa honetan ikasleetan langileetan baino jateko/edateko une gehiago erregistratu izanarekin bat egiten du. Aipatzekoa da sandwichen edo wrapen eta snack gozoen ehuneko handi bat KNB gisa sailkatu zirela erabilitako NPEen arabera, produktuen %100 eta % 75, hurrenez hurren. Hala ere, langileek ez zuten KNAko elikagaien erosketa handiagoa aurkeztu. Horrenbestez, emaitza horiek hasierako 7b Hipotesia partzialki baieztatu zuten, hau da, elikagaiak erosteko portaerak osasungarriagoak direla langileen artean ikasleen artean baino. Edarien kontsumoarekin lotutako emaitzak lagin osoan, bai eta sandwich beroen, wrap-en, pizzen nahiz hanburgesen kontsumoan ikasleen eta langileen artean dauden aldeekin lotutakoak ere, Zeelanda Berriko unibertsitate batean erregistratutakoen antzekoak izan ziren (Roy et al., 2019). Hala ere, ikerketa honetako ikasleek Zeelanda Berrikoek baino maizago jan zuten fruta freskoa (Roy et al., 2019). Bestalde, OsloMeten produktu komertzialen eskaintza bakarrik aztertu zen, ez etxeko produktuak; beraz, ezin izan zen egiaztatu OsloMeteko komunitateetako elikagaien erosketa-portaerak EI horien eskuragarritasunarekin lotuta ote zeuden (8 Hipotesia).

Aurretiko ikerketekin bat (Hebden et al., 2015; Januszewska et al., 2011; Miloševide et al., 2012), elikagaiak erosteko portaeren faktore eragile nagusiak zaporea, komenigarritasuna (erabilgarritasuna), kostua eta nutrizio-/osasun-balioa izan ziren. Ez zen alderik aurkitu ikasleen eta langileen artean, erakargarritasun sentsorialan (usaina eta itxura) eta osasunean izan ezik. Azken faktore horiek garrantzitsuagoak izan ziren langileentzat ikasleentzat baino kontsumorako elikagaiak erosterako orduan. Beraz, hasierako 9a Hipotesia baieztatu zen: elikagaiak hautatzeko faktore erabakigarri nagusiak OsloMeteko komunitatean gustua, elikagaien kalitate-prezio erlazioa, kostua eta egokitasuna (erabilgarritasuna) ziren. Era berean, hasiera 9b Hipotesia partzialki baieztatu zen: heldu gazteentzat, hau da, ikasleentzat, pertzepzio sentsorialak dira eraginik garrantzitsuena duten faktore eragileak elikagaien hautaketan; langileentzat, berriz, nutrizio-/osasun-balioa dira. Kostuari dagokionez, ordea, ez zen alderik aurkitu.

Kostu-faktoreari dagokionez taldeen artean alderik aurkitu ez bazen ere, adierazi behar da langileak baino ikasle gehiagok uste zutela “2x1” edo “prezio murriztuan prestatutako janari-zati handien eskaintzek” eragina dutela elikagaien aukeraketan. Emaiza hori adinaren (Muhammad et al., 2017) eta maila sozioekonomikoaren (Darmon eta Drewnowski, 2015) araberrako aldeekin lotuta egon liteke. Campuseko Eietan etorkizunean egindako esku-hartzeek, kostu baxuan erosteko elikagai zaporetzu eta nutritiboen berehalako eskuragarritasuna bermatzea izan behar dute ardatz. Gainera, elikagaien nutrizio-/osasun-balioa ere garrantzitsutzat jo zenez, nutrizio-etiketen potentziala edo osasunarekin lotutako nutrizio-adierazpenak estrategia interesgarria izan litezke populazio horretan elikagai osasungarriagoen kontsumoa sustatzeko.

Gure aurkikuntzak bat egiten dute alde zaurretik egindako ikerketekin, campuseko janariarekiko asebetetze orokorra barietateak, kalitateak, komenientziak eta bidezko prezioek moderatzen zutela iradoki zutenak (Liang eta Zhang, 2009; Roy et al., 2015). Proposatutako bost aldaketetatik hiru kostuari buruzkoak izan ziren. Inkestatutako gehienek elikagai osasungarriagoak ikusi nahi zituzten, kostu txikiagoan, eta oro har, elikagai merkeagoak. Elikagaien prezioak elikagaien erosketan eragina duelako ebidentzia dela eta (Epstein et al., 2012), prezioetan hainbat esku-hartze egin dira, eta aurkikuntzek iradokitzen dute elikagaien prezio osasungarriaren egindako deskontuek haien erosketa areagotu dezaketela (Phipps et al., 2015; Roy et al., 2015).

Campuseko Eleko bigarren aldaketa ohikoena etiketan alergenoen informazioa hobetzea izan zen, eta, ondoren, elikagai fresko eta osasungarri hornidura handitzea. Beste egile batzuek adierazi duten bezala, campusean etiketak eta aukera freskoak nahiz osasungarriak areagotzea eraginkorra izan liteke Eia hobetzeko (Roy et al., 2015). Saldutako produktuen osasungarritasunarekin lotutako aldaketak ikasle baino langile gehiagok babestu zituzten. Azkenik, proposatutako hamar aldaketetatik hiru jasangarritasunari buruzkoak ziren, zehazki, “elikagaien ontziak birziklatzeko gaitasun handiagoa”, “produktu jasangarriak” eta “elikagai jasangarriak aukeratzeagatik sari-puntuak”. Emaiza hori bat dator beste egile batzuen aurkikuntzekin (Roy et al., 2015; Tam et al., 2017). Ildo horretan, arrakastaz garatu eta ezarri dira unibertsitateetan osasunari eta iraunkortasunari ikuspegi ekologikotik heltzen dieten elikagai-zerbitzuen gidalerro instituzionalak (Emory University Sustainable food, 2016; Yale University Green Purchasing, 2011). Ondorioz, hasierako 10a Hipotesia berretsi zen, hau da, interes handia

dago OsloMeteko ikasleen eta langileen artean KNAko produktuen eskuragarritasun handiagoari eta prezioari zuzendutako esku-hartzeetan, bai eta elikagaien aniztasunean ere. Era berean, hasierako 10b Hipotesia partzialki berretsi zen: prezio-aldaketak langileena baino ikasleen ehuneko handiago batek iradokitzen ditu; KNAko elikagaien eskuragarritasunarekin ohikoagoak izan ziren ikasleen artean. Hala ere, ez ziren alderik aurkitu elikagaiak hautatzeko laguntzarekin lotutako esku-hartzeetan.

Ikerketa honen emaitzak eta beste ikertzaile batzuek egindako esku hartzeko ikerketen emaitzak ikusita, uste dugu prezioa jaisteak, etiketetan alergenoei buruzko informazioa hobetzeak eta campuseko elikagai fresko eta osasungarrien aniztasuna handitzeak gogobetetzea hobetuko zuela eta kontsumo osasungarriagoa sustatuko zuela. Hala ere, elikagai freskoak eta osasungarriak kostu handiagoarekin lotuta egon ohi direnez (Roy et al., 2016), prezioen beherapenen bideragarritasun ekonomikoa ikertu behar dira, bai eta elikagaien erosketa-kostuak murrizteko estrategia posibleak ere. Beste egile batzuek adierazi duten bezala, elikagai osasungarrien eskuragarritasuna errazteak haien kontsumoa handitzen du (Downs et al., 2009; Lachat et al., 2009). KNAko elikagaien prezioa murrizteak (Thow et al., 2010) eta/edo KNBkoak diren produktuen prezioa handitzeak (Alagiyawanna et al., 2015; An, 2013) kontsumoan duten eragina ebaluatu zen aurretiko ikerketan, bi estrategia horien eraginkortasuna frogatu zen. Estrategia horiek campus anitz eta txikiak dituen unibertsitate batean praktikan jartzea, OsloMeten kasuan bezala, zaila izan daitekeen arren, ziurrenik eraginkorrakoak izango lirateke campusean KNAko elikagaien eskuragarritasuna areagotzearekin konbinatutako balirateke. Ziur asko, prezio baxuko KNAko elikagaia eskuragarriago egoteak eragin nabarmena izango luke erosketan eta kontsumoan.

Ikerketa honek lagin adierazgarri bat sortzea lortu bazuen ere, kontuan hartu behar dira hautaketa-alborapenaren muga batzuk. Lehenik eta behin, COVID-19 pandemiak eragina izan zezakeen inkestaren parte-hartze tasan, campusa itxi baitzuten inkesta hasi zenean. Edonola ere, erregistratutako datuak itxi aurrekoak dira. *Post hoc* potentziaren kalkulu bat egin zen, eskura zegoen laginaren tamainan oinarrituta. Bi ilarako proba bat erabiliz eta 0.05 alfa errore-tasan oinarrituta, %98ko potentzia lortu zen campusean elikagaiak edo edariak erosi zituzten parte-hartzaileen artean, Roy et al.ek (2019) jakinarazitako ehunekoarekin alderatuta. Bigarrenik, elikagaien salmenta-puntuetakoa osasunaren ikuspegitik aztertu da produktu komertzialen eskaintza, baina ez etxeko

produktuen eskaintza. Etorkizunean eskaintza osoa ebaluatzeko asmoa dugu, ikerketa honi buruzko ondorio zabalagoak ateratzeko. Hirugarrenik, laginean, emakume gehiago izan ziren gizonak baino, eta, aurreko ikerketek jakinarazi dutenez, emakumeak osasunaz gehiago jabetzen dira elikadurari dagokionez (Levi et al., 2006). Gainera, emakumeen eta osasun-zientzien arloko parte-hartzaileen ehunekoa handiagoa izan zen aztertutako laginean biztanleria osoan baino (Oslo Metropolitan University, 2019), eta horrek ondorioak izan ditzake lan honen ondorioetan. Laugarrenik, baliteke inkestaren emaitzak ikasle-taldearen ikuspegirantz lerratuta egotea, talde honen gehiegizko errepresentakortasuna dela eta. Edonola ere, komenientzia laginketak unibertsitateko janarizko salmenta-puntuetan interesa dutenak erakartzea posibleagoa egiten du. Parte hartzeko edo ez hartzeko erabakiak erantzunetan eragina izan dezaketen hainbat faktoreren eragina izan zezakeen, gizarte-, hezkuntza- eta osasun-baldintzak barne. Beraz, baliteke emaitzak ezin orokortzea unibertsitate-komunitate honetako edo hirugarren mailako beste instituzio batzuetako biztanleriari. Inkestaren beste muga bat inkestan erabilitako galdetegiaren diseinuarekin lotuta egon zen. Parte-hartzaileek ezin izan zituzten beren lehentasunak handienetik txikienera sailkatu. Arazo hori konpontzeko, etorkizuneko ikerketetan sailkapen-sistema bat erabiliko da lehentasun bakoitzaren garrantzi erlatiboa aztertzeko.

Muga horiek gorabehera, eta lortutako emaitzak kontuan hartuta, honako hau ondoriozta dezakegu: (i) salmenta-puntuetan eskaintzen diren produktu komertzialen proportzio handi bat KNBko kategorian dago, eta gehienek prozesamendu-maila handia dute; eta (ii) campuseko EIari buruz iradokitako iritziei eta proposatutako aldaketei dagokionez, unibertsitate-komunitateak campuseko janariarekiko duen gogobetetasuna areagotzeko, etorkizuneko interbentzioek prezioak aldatzea, alergenoen etiketatako informazioa hobetzea eta elikagai freskoen eta osasungarrien barietatea hobetzea izan behar dute helburu. Elikagaien horniduran egindako aldaketa horiek, beti ere dastamen-lehentasunak kontuan hartuta, eragin positiboa izan dezakete populazio horretan elikagaiak kontsumitzeko ohituretan, eta epe luzera gaixotasun kronikoak izateko arriskua murriztu dezakete. Aurkikuntza horiek garrantzitsuak dira ingurune honetako eta antzeko beste hirugarren hezkuntzako inguruneetan EIA hobetzeko esku-hartzeak planifikatzeko.

5.4. CAMPUSEKO ELIKADURA-INGURUNEAREN, EROSKETA-PORTAEREN, HAUTAKETEN FAKTORE ERABAKIGARRIEN ETA ELIKAGAIEN ESKURAGARRITASUNARI BURUZKO IRITZIEN INGURUKO ALDEAK EUSKAL HERRIKO UNIBERTSITATEAREN (UPV/EHU) ETA OSLOKO UNIBERTSITATE METROPOLITARRAREN (OSLOMET) ARTEAN

5.4.1. *Campuseko elikadura-inguruneen arteko aldeak Euskal Herriko Unibertsitatearen (UPV/EHU) eta Osloko Unibertsitate Metropolitarraren (OsloMet) artean (produktu komertzialak soilik barne)*

Azpiatal honen helburua UPV/EHUko eta OsloMeteko elikagaien salmenta-puntuetan eskaintzen diren elikagai komertzialen nutrizio-profilaren eta prozesamendu-mailaren arteko aldeak ebaluatzea izan zen. Laburbilduz, KNBa duten produktuen ehuneko handiagoa izan zen UPV/EHUko OsloMeten baino. Hala ere, oro har, ez zen desberdintasunik aurkitu produktu ultraprozesatuen ehunekoan.

Gure emaitzek erakutsi zuten UPV/EHUK KNBa zuten produktuen eskaintza handiagoa zuela (produktu guztien ia % 60) OsloMetek baino (ia % 40). UPV/EHUK OsloMetekin alderatuta KNBa zuten snack gazi, snack gozo, jogurtaz bestelako esneki, edulkoratzaileak dituzten karamelu eta txikle eta esneki hotz gehiago eskaini zituen. Produktu hauek kaloria-dentsitate handia eta koipe (batez ere, GAA), azukre eta gatz eduki handia zuten, lehen deskribatu bezala (5.1.1 azpiatala). Beraz, 1c Hipotesia berretsi zen: UPV/EHUren elikadura-eskaintzak OsloMetekoa baino KNBkoen ehuneko handiagoa du. Aurkikuntza horiek bat datoz unibertsitate-komunitateak campuseko Elari buruz duen iritziarekin (4.4.2 azpiatala): OsloMeteko ikasle eta langile gehiagok uste dute gai direla elikagai osasungarriak aukeratzeko, UPV/EHUko inkestatuen aldean.

Unibertsitateen arteko desadostasunak, lehenik eta behin, UPV/EHUren (n=42.598 ikasle) eta OsloMeten (n=19.500 ikasle) arteko campus-tamainaren desberdintasunen ondorio izan daitezke, nahiz eta matrikula-kopuru desberdina duten campusak aztertu dituzten beste egile batzuek (campusaren tamainaren adierazle bat) alde esanguratsu gutxi aurkitu dituzten instituzioen artean (Byrd-Bredbenner et al., 2012; Horacek et al., 2013a). Bigarrenik, salmenta-puntuaren kopuruak eta motak ere eragina izan dezakete gure emaitzetan. UPV/EHUko 20 kafetegi/jatetxe/jantoki, 57 makina eta supermerkatu 1 aztertu ziren; OsloMeten, aldiz, 10 kafetegi/jantoki eta vending makina 1. UPV/EHUK elikagaiak salmenta-puntu bat zuen 546 ikasleko, eta OsloMeten, 1.773 ikasleko bat. Horacek et al.en (2013a) ikerketan Estatu Batuetako eskualde ezberdinetako hirugarren

mailako hezkuntzako hamabost instituzioren jantokiko ingurunea aztertu zen. Ikerketa honetan, salmenta-puntuaren proportzioa ikasle bakoitzeko, 913 ikasleko bat izan zen erakunde handietan (≥ 30.000 ikasle) eta bat 816 ikasleko, erakunde ertainetan (15.001-29.999 ikasle). Vending makinaren ratioari dagokienez, UPV/EHUko 248 pertsonako makina batekoa izan zen (ikasleen eta langileak barne), eta OsloMeten, berriz, 10.850 pertsonako makina batekoa. Beraz, UPV/EHUen vending makinak izan zirenez auditorian gutxien baloratutako elikagaien saltokiak, horrek partzialki justifikatzen du EHUk KNB duten produktuen portzentaje handiagoa izatea OsloMetekin alderatuta. Azkenik, Europa iparraldearen eta hegoaldearen arteko eredu dietetikoaren ezberdintasunak ere eragina izan dezakete gure emaitzetan. Jakina denez, kultura-, ingurumen-, teknologia- eta ekonomia-faktoreek zehazten dituzte eredu dietetikoak.

Desberdintasunak kliman (landu daitekeen elikagai-motari eragiten diona zalantzarik gabe), eta dietaren osaera baldintzatzen duten kultura-desberdintasunak (adibidez, Europako ipar-hego joera geografiko batzuk koipean eta karbohidratoen ahorraketan (Lambert et al., 2004)), erabakigarriak izan litezke bi herrialdeetan (Espainia eta Norvegia) elikagaiak kontsumitzeko orduan. Nolanahi ere, eredu dietetiko horiek antzekoak bihurtzen ari dira denborarekin, bizi-mailen igoera orokorraren eta elikagaien sekzioaren globalizazioaren ondorioz (Global Panel on Agriculture and Food Systems for Nutrition, 2016; Trail et al., 2014). Badirudi Europako dietek gero eta antzekotasun handiagoa dutela; izan ere, iparraldeko eta Mediterraneoko herrialdeetako dieta tradizionalak bat egiten dute mendebaldeko dieta baterantz, iparraldeko herrialdeetan fruta eta barazkien proportzioa handitu delako eta Mediterraneoko herrialdeetan animalia-jatorriko produktuen proportzioa handitu delako (Gerbens-Leenes et al., 2010; Schmidhuber eta Trail, 2006).

Bi instituzioetako elikagaien salmenta-puntuetan eskaintzen diren elikagai komertzialen prozesamendu-mailari dagokionez, ez zen alderik aurkitu bi unibertsitateen artean. Hala, ez zen baieztatu hasierako 1c Hipotesia, hots, UPV/EHUren eskaintzak OsloMetekoa baino elikagai ultraprozesatuaren ehuneko handiagoa duela. Oro har, unibertsitateen artean alderik aurkitu ez bazen ere, ultraprozesatuak ziren elikagai eta edari hotzak ohikoagoak izan ziren OsloMeten UPV/EHUen baino. Emaitza horiek bat datoz Monteiro et al.en (2017) ikerketarekin, Norvegiako etxeetan Espainiakoetan baino elikagai ultraprozesatu gehiago daudela erakuntsi zuena. Ikerketa honetan, OsloMeten

maizago eskaini ziren produktu ultraprozesatuak UPV/EHUko eskaintzarekin alderatuta, produktu-azpikategorien arabera, frutak eta fruta deribatuetan eta jogurtaz bestelako esnekiak izan ziren; UPV/EHUUn, aldiz, snack gaziak eta gozoak eta zukuak ohikoagoak izan ziren.

Erabilitako NPEen arteko adostasun mailari dagokionez, bi unibertsitateetan EBko NPEaren eta AECOSANen irizpideen arteko adostasun handia ikusi zen; eta MFUren eta beste bi NPEen irizpideen arteko adostasun baxua (lehen 4.4.1 eta 4.3.1 azpiataletan deskribatzen den bezala). Lehen adierazi bezala, alde horiek eraikuntzetan dauden desadostasunekin eta erabilitako ereduaren puntuazio-irizpideekin lotuta egon daitezke. Gainera, bi unibertsitateetan adostasun txikia ikusi zen NOVA sistemaren eta erabilitako NPEen artean. Izan ere, elikagai ultraprozesatuek azukre, gatz eta/edo koipe ugari izaten dituzte (Luiten et al., 2016), baina eduki horiek ez dituzte beti NPEen mugak gainditzen.

Azpimarratu behar da ikerketa honen muga nagusietako bat bi unibertsitateetan elikagaien salmenta-puntuetan eskaintako produktu komertzialak soilik aztertu direla izan dela, eta ez dela aztertu OsloMeten etxeko produktuen eskaintza. Eskaintza osoa etorkizunean ebaluatzeko asmoa dugu, ondorio zabalagoak ateratzeko. Nolanahi ere, emaitzen arabera, KNBko elikagai komertzialen eskaintza handiagoa izan zen UPV/EHUUn OsloMetekin alderatuta, baina, oro har, ez zen alderik aurkitu produktu ultraprozesatuen ehunekoan. Ondorio horiek kontuan hartuta, hirugarren mailako instituzioetan izandako asistentzia handia eta ingurune horiek ikasleei eta langileei elikagaiak emateko duten izaera itxia kontuan hartuta, ingurune horrek aukera ematen du osasunaren sustatzaile diren EI gehiago sortzeko. Ildo horretan, gure aurkikuntzak funtsezko urratsak dira campuseko oinarrizko inguruneak ulertzeko eta esku hartzeko programen garatzaileak zein legegileak gidatzeko elikadura osasungarria erabat babesten duten campusean EIak sortzeko ahaleginetan.

5.4.2. Campuseko elikagaien erosketa-portaeren, hautaketen faktore erabakigarrien eta elikagaien eskuragarritasunari buruzko iritzien arteko aldeak Euskal Herriko Unibertsitatearen (UPV/EHU) eta Osloko Unibertsitate Metropolitarraren (OsloMet) artean

Azpiatal honen helburua UPV/EHUko eta OsloMeteko komunitateen artean campusean elikagaiak erosteko portaeretan, hautaketen faktore eragileetan eta elikagaien eskuragarritasunari buruzko iritzietan dauden aldeak aztertzea izan zen. Laburbilduz, emaitzek erakutsi zuten aldeak zeudela erosketa-aukerei eta erositako produktu-motari dagokienez aztertutako bi unibertsitateen artean. Gustua eta kostua izan ziren bi unibertsitateetako erosketa-faktore eragile garrantzitsuenak. Gainera, bi unibertsitateetako partaideek iradokitako aldaketen artean, prezioarekin eta elikagaien aldaketekin lotutakoak nabarmendu behar dira.

Gure emaitzek erakutsi zuten bi unibertsitateetan parte-hartzaile gehienek zenbait elikagai edo edari erosi zituztela campusean. Hala ere, UPV/EHUk baino OsloMeteko gehiagok erosi zituzten elikagaiak campusean egon ziren aldien erdietan gutxienez. Gainera, UPV/EHUkoek baino OsloMeteko parte-hartzaile gehiagok etxetik ekarri zituzten elikagaiak edo campusetik kanpo erosi zituzten. Jarduera horretarako arrazoi nagusiak kostua eta banakako lehentasunak izan ziren, eta hori bat dator Tam et al.en (2017) emaitzekin. Edonola ere, astean janarietan egindako batez besteko gastua antzekoa izan zen bi unibertsitateko komunitateetan.

Campusean, erosketak egiteko aukerei dagokienez, UPV/EHUk, galdetutako gehienek elikagaiak eta edariak bazkaltzeko edo ordu batetik bestera askari gisa erosten zituztela aipatu zuten. Emaitza hori Tam et al.en (2017) antzekoa da. OsloMeteko partaideek, aldiz, jakiak eta edariak bazkarirako eta afarirako erosteko joera zuten. Alde horiek izan litezke, neurri batean, ikasteko/lan egiteko ordutegien, ohiko bizilekuaren (campusaren eta bizilekuaren arteko distantzia) eta erosteko ahalmenaren ondorio, bai eta herrialde edo eskualde bakoitzeko testuinguru kultural-sozio-ekonomikoaren ondorio ere. Frogatuta dago janarien eta snack-en maiztasuna eta energia-ahoratzearen denbora-banaketa lotuta daudela kultura- eta ingurumen-faktoreekin (Oltersdorf et al., 1999; Wansink et al., 2010), erantzun metabolikoekin (Farshchi et al., 2005; Heden et al., 2013) eta gosea zein digestioa erregulatzen duten hormona zirkadianoen aldakuntzekin (de Castro, 2004; Hutchison eta Heilbronn, 2016). Hala ere, ikerketa honetan ez dugu ahoratzea aztertzen, erosteko

aukerak baizik; beraz, ezin ditugu emaitzak Huseinovic et al. (2016) bezalako egileekin eztabaidatu. Izan ere, ikerketa horretan Europako herrialdeetako elikadura-ereduak ezaugarritu ziren. Appelhans et al. (2017) adierazi bezala, nolabaiteko arreta-maila behar da elikagaien erosketari buruzko datuak ikerketa epidemiologikoaren dietaren isla gisa interpretatzerako orduan. Nolanahi ere, elikagaien erosketa-datuak tresna baliotsuak dira osasun publikoko nutrizio-ikertzaileentzat, eta horien erabilera nabarmen handitu da azken urteotan. Salmenta-datuak (produktu- eta marka-mailakoak) bereziki baliagarriak dira elikagai-enpresen aldaketek dietan eta osasun publikoan nola eragin dezaketen ebaluatzeko (Bandy et al., 2019).

Produktu-azpikategorien arabera, orokorrean, UPV/EHUko inkestatuek sarriago erosten zituzten artikulu gehienak OsloMetekoekin alderatuta; entsaladak eta irabiatuak izan ezik, horietan emaitzak alderantziz izan baitziren. Barazkien kontsumoa handiagoa izan ohi da Espainian Norvegian baino (Eurostat, 2018), baina beste ikerketa batzuetan ez da desberdintasunik aurkitu herrialde horien artean (Agudo et al., 2002). Hala, entsaladak erostearen emaitza, hein batean, OsloMeteko inkestan parte hartu zuten emakumeen ehuneko UPV/EHUkoa baino handiagoa izan zelako izan daiteke. Unibertsitateko ikasleen artean, emakumeek gizonek baino entsalada gehiago erosi eta kontsumitzen dituzte (El Ansari et al. 2012; Tam et al., 2017) eta, oro har, nutrizioarekin lotutako ohitura osasungarriagoak dituzte (von Bothmer eta Fridlund, 2005). Biztanleria orokorrean, emakume izatea barazkien kontsumo handiagoarekin ere lotu da (Stea et al., 2020). Ikerketa honetan, ezin izan zen alderatu OsloMeteko eta UPV/EHUko komunitateen entsalada komertzialen erosketa, produktu horiek ez baitziren OsloMeten eskaintzan sartzen.

Esnekien kontsumo-ereduei dagokienez, antzeko emaitzak ikusi ziren minbiziari eta nutrizioari buruzko Europako Ikerketa prospektiboan (EPIC) (Hjartåker et al., 2002). Hjartåker et al. (2002) behatu zuten esneki guztiekiko kontsumitutako esnekien proportzioa handiagoa zela Norvegiako hegoaldean (%1) Espainiako iparraldean baino (%0,1). Horrez gain, ikerketa honetan, esnekien eskaintza, produktu guztien portzentaia gisa adierazita, handiagoa izan zen OsloMeten UPV/EHU baino, eta horrek, 8 Hipotesia berresten du: UPV/EHUko eta OsloMeteko komunitateetako elikagaien erosketa-portaerak EI horien eskuragarritasunarekin lotuta daude. 1. Kapituluuan aipatu bezala, unibertsitate-komunitateak denbora asko igarotzen du campusean, eta ezin dira ingurune

horretatik atera elikadura-ohiturak hobetzeko. Beraz, ohitura horiek hobetzeko, komeni da EIneen kanpo-domeinuaren dimentsioak aldatzea, hala nola elikagaien eskuragarritasuna eta produktuaren propietateak.

Unibertsitate-komunitatea taldeka aztertuta, nabarmentzekoa da UPV/EHUko ikasleek OsloMeteko ikasleek baino sandwich, wrap-ak, pizza eta hamburgesa bezalako elikagai bero, snack gazi eta gozo, txokolate-barra eta botilako ur gehiago erosteko joera izan zutela. OsloMeteko ikasleek, berriz, UPV/EHUko ikasleek baino entsalada, fruta fresko, freskagarri, edari energetiko eta zaporedunak eta irabiatuak erosteko joera zuten. OsloMeteko langileek ere UPV/EHUko langileek baino sarriago erosten zituzten entsaladak. Aurkikuntza horiek baieztatu egin zuten hasierako 7c Hipotesia: elikagaiak erosteko portaerak osasuntsuagoak dira OsloMeteko komunitatean UPV/EHUrekin alderatuta. UPV/EHUko eta OsloMeteko partaideen artean erosketen eta elikagai moten arteko aldeak aztertutako laginaren ezaugarrien ondorio izan litezke. Lehen aipatu dugun bezala, OsloMetean inkestan UPV/EHU baino emakume, lanaldi osoko eta Osasun Zientzietako gehiagok parte hartu zuten.

OsloMeteko partaideen artean fruta eta entsalada gehiago erosteari dagokionez, beste egile batzuek produktu horien kontsumo handia aurkitu dute Europako hegoaldean eta iparraldean (Stea et al., 2020), alde handirik gabe Espainia eta Norvegiaren artean (Agudo et al., 2002). Hala ere, freskagarriei dagokionez, Naska et al. (2010) Europa iparraldean, hegoaldeko eskualdeekin alderatuta, etxeetan eskuragarritasun handiagoa ikusi zuten. Nolanahi ere, aipatu behar da ikerketa honetan aztertutako elikagai-talde guztien eskaintza (produktu guztien ehuneko gisa adierazia) handiagoa izan zela ikasleek produktu horiek gehiago erosteko joera zuten unibertsitatean, snack gozoen kasuan izan ezik. Ondorioz, hasierako 8 Hipotesia baieztatu zen: UPV/EHUko eta OsloMeteko komunitateetako elikagaien erosketa-portaerak EI horien eskuragarritasunarekin lotuta daude. Aurkikuntza hori bat dator beste ikerketa batzuekin, ingurune komunitarioetan elikagaien eskuragarritasuna aldatzeak eragina izan dezakeela ikasleen erosketetan nahiz kontsumoan iradokitzen baitute (Driessen et al., 2014; Fonseca et al., 2020).

Parte-hartzaileen bostetik batek baino gehiagok dieta berezia jarraitzen zuten. Ehuneko hori OsloMetean UPV/EHU baino handiagoa zen. OsloMetean gehien jarraitu zen dieta “dieta begetarianoa edo beganoa” izan zen, eta UPV/EHU “pisua kontrolatzeko dieta”. Bi unibertsitateetan, bederatzitik batek, gutxi gorabehera, pisuaren kontrol-erregimena

jarraitu zuen. Espainiako eta Norvegiako helduen erdiek, gutxienez, gehiegizko pisua edo obesitatea dutenez, hori nahiko egokia izan liteke (Marques et al., 2014). Hala ere, gerta daiteke: gehiegizko pisua edo obesitatea duten pertsonen dieta berezi hori ez jarraitzea; gehiegizko pisua/obesitatea ez duten pertsonen pisua kontrolatzeko erregimen bat jarraitzea; edo gehiegizko pisua/obesitatea duten zein ez duten pertsonen dieta berezi hori jarraitzea dietista-nutrizionista batek agindu gabe. Beraz, ikerketa honetan lortutako datuekin, ezin dugu baieztatu dieta berezi hori parte-hartzaileen beharretara egokitzen denik. OsloMeteko partaideen artean, “dieta begetarianoa edo beganoa” jarraitzen dutenen ehunekoa Tam et al.ek (2017) erregistratutakoaren antzekoa izan zen; horrek zerikusia izan dezake animalia-jatorriko produktuak baztertzeko joera gero eta handiagoarekin, osasun-kezkengatik eta arrazoi etiko, ekologiko eta sozialengatik (Leitzmann, 2014).

Aldez aurreko azterketekin bat (Boek et al., 2012; Hebden et al., 2015), bi unibertsitateetan elikagaiak erosteko portaeren faktore eragile nagusiak zapoarekin eta kostuarekin lotutakoak izan ziren; hala ere, UPV/EHUko parte-hartzaileek osasunari ere garrantzi berezia eman zioten, eta OsloMetekoek erosotasunari. Bereziki, OsloMetetik baino UPV/EHUko parte-hartzaile gehiagok adierazi zuten “kalitate-prezio erlazio ona”, osasunarekin lotutako arazoak, egokitasuna eta “estresari aurre egiten laguntzen dit” faktore garrantzitsuak direla elikagaiak aukeratzeko orduan. Aldiz, OsloMeteko inkestan UPV/EHU baino gehiago adierazi zuten “itxura ona” eta “erraz eskuragarri” izatea faktore garrantzitsuak direla. Beraz, hasierako 9c Hipotesia ez zen baieztatu: UPV/EHUko komunitateak garrantzi berezia ematen dio erosotasunari; OsloMeteko komunitateak, berriz, nutrizioaren/osasunaren eta jasangarritasunaren balioari.

Campusean saldutako elikagaiekiko asebetetze orokorrari dagokionez, bi unibertsitateen artean alde nabarmenik ikusi ez bazen ere, UPV/EHUkoak baino OsloMeteko parte-hartzaile gehiagok jakinarazi zuten, oro har, elikagai osasungarriak aukera ditzaketela campusean. Azken emaitza hori aurreko azpiatalean adierazitakoarekin bat dator; izan ere, UPV/EHUkn KNBa zuten produktuen eskaintza OsloMetena baino handiagoa izan zen. Bi unibertsitateetan, proposatu zituzten aldaketa nagusiak “elikagaien aldaketei” eta “prezioaren aldaketei” buruzkoak izan ziren. Ikerketa horietako parte-hartzaile gehienek KNAko produktu gehiago (bereziki, “fruta fresko gehiago”) eta horietan deskontu gehiago ikusi nahi zituzten.

Aipatzekoa da, besteak beste, kostua, kalitate-prezio baxua eta barietate falta izan zirela parte-hartzaileek etxetik janaria ekarri edo campusetik kanpo erosi izanaren arrazoi nagusiak. Beraz, unibertsitate horietako komunitatearen aldetik nahikoa arrazoi dago iradokitzeko kostuen manipulazioa (KNAa duten produktuen alde) eta KNAko produktuen eskaintza handitzea (batez ere produktu freskoak, adibidez, frutak) elikadura osasungarria sustatzeko esku-hartze bideragarriak izan daitezkeela.

Elikagaien kontsumo-portaera hobeak ekarri dituzten ikerketa batzuetan frogatu da kostuen manipulazioa esku-hartze egingarria dela (Darmon et al., 2014; Epstein et al., 2012; Lustig et al., 2012; Phipps et al., 2015; Roy et al., 2015). Alde batetik, kaloria, koipe edo azukre askoko elikagaien prezioak igo daitezke haien kontsumoa murrizteko, eta, bestetik, KNAa duten produktuen prezioak murriztu daitezke kontsumoa sustatzeko, hala nola frutena eta barazkiak. Elikagaien prezioek horien erosketan eta kontsumoan duten eragina behin eta berriz frogatu dute ekonomiari (Putnam et al., 2002), marketinari (Stead et al., 2017), kontsumitzailearen portaerari (Grech eta Allman-Farinelli, 2015; Waterlander et al., 2013) eta epidemiologia nutrizionalari (Drewnowski, 2018) buruzko ikerketek. Prezioaren inguruko aurkikuntza hori bi unibertsitate publikotan egindako ikerketa honetan ere baieztatu da.

Prezioen manipulazio horiek politika publikoen esparruan ezar litezke, berariazko zergak eta sorospenak erabiliz. Hala ere, badirudi, banakako elikadura-portaerak aldatzen saiatzen diren prezio-politikak ez dira modu berdinean eraginkorrak diru-sarreraren maila guztietan. Zenbait ikertzailek iradokitzen dute prezioen esku-hartzeek onura finantzario eta nutrizionaletan diru-sarreraren desberdintasunak areagotu egin ditzaketela eta, ondorioz, elikagaien kontsumoan nahiz dietaren kalitatean desberdintasun sozialak areagotu ditzakete (Darmon et al., 2014; Nordstrom eta Thunstrom, 2011). Beraz, ikerketa gehiago behar da elikagaien gaineko zergaren erreformak pertsonengan izan ditzakeen eragin diferentzialei buruz, haien egoera sozioekonomikoaren eta diru-sarreraren arabera. Gainera, kontuan hartu behar da koipe eta azukre askoko elikagaiak KNAa duten produktuak baino askoz merkeagoak direla, hala nola frutak eta barazkiak (Maillot et al., 2007). Janari mota beraren barruan ere, 4.1.1 azpiatalean aipatu dugun bezala, KNA gisa sailkatutako produktu batzuk KNBko alternatibak baino garestiagoak ziren. Beraz, hainbat estrategia aztertu behar dira campuseko elikagaien saltokiei laguntzeko KNAa duten produktuen erosketak handitzen, irabazien gaineko eragina minimizatzearekin

batera. Lantokian egindako ikerketa batzuen arabera, KNAko aukerak finantzarioki bideragarriak ziren hornitzaileen aldetik (Jensen et al. 2012; Kimathi et al., 2009). Beraz, aniztasuna hobetzeak, KNAko aukera gehiago sartuz, kontsumitzaileak asebeteko lituzke eta irtenbide bideragarria izan liteke campuseko Ela hobetzeko. Zentzu horretan, Tam et al. (2017) aukeratzen jo zuten tokiko produktua erabiltzea elikagaien hornidura osatzeko eta elikagaien erosketa-kostuak murrizteko, eta campuseko saltzaileen artean hornitzaileak finkatzea, prezioen negoziazio-ahalmena handitzeko.

Gure emaitzak ikusita, uste dugu kostuak manipulatzeko beharrezko estrategia litzatekeela unibertsitate-komunitate horien elikadura-ohiturak hobetzeko. Esperimentuak behar dira kontsumitzaileen benetako lehentasunak azaltzeko; baita prezioak manipulatzeko estrategiak erosketen nutrizio-kalitate orokorrean duen eragina ebaluatzean, ordezkapenen eta diru-sarreraren ondorioak hobeto zehazteko ere. Hala eta guztiz ere, ikuspegi hori baliagarria izan liteke, baina ez nahikoa elikadura-ohitura osasungarriak garatzeko eta mantentzeko. Beraz, beste neurri instituzional batzuk ezarri behar dira. Neurri horiek, besteak beste, dietetikari eta nutrizioari buruzko ezagutzak irakastea izan daitezke (adibidez, elikagaien etiketetan nutrizio-informazioaren erabilera motibatuzko eta irakasteko mezuak, praktika dietetika osasungarrien garrantzia nabarmentzeko mezuak, hala nola guztizko koipeatan eta GAAtan baxua den dieta aukeratzea) (Lin eta Yen, 2004); baita sukaldaritza irakastea ere. Era berean, mahai, mikrouhin labe eta hozkailuekin espazioak eskuragarri egitea, beren janaria prestatzen dutenen artean autonomia areagotzeko eta janaria hobeto hautatzeko (Fonseca et al., 2021).

Gainera, UPV/EHUko partaideek “vending makinekin” eta “Unibertsitateak eskaintzen dituen instalazioekin” lotutako aldaketak babestu zituzten, eta OsloMetekoek, berriz, “elikagaiak hautatzeko laguntzarekin” lotutako aldaketak. Zehazki, vending makinetan KNAa duten produktuen eskaintza hobetzeko esku-hartzeak ondo hartuko lirateke UPV/EHUko inkestaturen artean, eta hori bat dator ikerketa honetan aztertutako salmenta-puntuaren nutrizio-kalitateari buruzko emaitzekin. Arestian aipatu bezala (5.1.1 azpiatala), KNBko salmenta-puntuaren ehunekorik handiena zuen salmenta-puntua izan zen vending makina. Aurkikuntza horiek 10c Hipotesia babesten dute, hau da, UPV/EHUko komunitateak elikagaien aldaketekin lotutako aldaketak babesten dituela

(vending makinak barne); OsloMeteko komunitateak, berriz, elikagaien aukerarako laguntzarekin lotutakoak.

“Unibertsitateak eskaintzen dituen instalazioekin” lotutako aldaketei dagokienez, UPV/EHUko parte-hartzaile gehienek iragazitako edateko ura doan eskuratzeko eta elikagaien ontziak birziklatzeko ahalmen handiagoa izatea babestu zuten. Ildo horretan, lantokiko ur-kontsumo globalari buruzko duela gutxi argitaratu den txosten baten arabera, langileak zorientsuagoak eta emankorrakoak sentitzen dira edateko uraren instalazio hobeak eskaintzen zaizkienean (Waterlogic, 2019). Inkesta horrek erakutsi zuen, halaber, erabilera bakarreko hondakin plastikoak ekoizten direnean Espainiako lantokiak arau-hausle txarretakoak diren arren, Norvegia dela urtero alferrik galtzen diren plastikoak botilen kopuru txikienetako baten erantzulea.

OsloMeteko inkestatuek babestutako “elikagaiak hautatzeko laguntzari” (bereziki, “alergenoen etiketatzeari”) lotutako aldaketei dagokienez, adierazi behar da normalean erreakzio alergikoak eragiten dituzten elikagai-alergeno nagusiak ontzietan adierazten direla etiketatzeari buruzko legeriaren derrigortasunaren ondorioz. Hala ere, elikagai-industriak “eduki dezake” etiketa jartzeko hainbat modu erabiltzen ditu, askotan funtsik gabea dena. Ondorioz, ohartarazpen-adierazpen horien balioa murriztu daiteke denborarekin komunikatzeko tresna gisa (Soon eta Manning, 2017). Alergenoek edukiaren etiketatzeari buruzko informazio egokiak kontsumitzaileen elikagaien aukeraketa areagotuko luke, eta aukera informatuak emango lizkieke.

Ikerketa honen muga nagusiak 5.2 eta 5.3 azpiataletan aipatu dira lehen. Laburbilduz, lehenik eta behin, komenentziazko laginketak duen alborapenak ez du aukerarik ematen inferentzia fidagarriak egiteko unibertsitate-komunitate honetako edo hirugarren mailako beste instituzio batzuetako populaziori. Bigarrenik, campuseko elikagaien kontsumoari buruzko daturik ez zen erregistratu, baina litekeena da elikagaiak erosi zituztela jakinarazi zuten parte-hartzaileek ere kontsumitzea. Hirugarrenik, galdetegiaren diseinua dela eta, parte-hartzaileek ezin izan zituzten beren lehentasunak handienetik txikienera sailkatu. Gainera, OsloMeterako laginaren tamaina biztanleria osoa kontuan hartuta kalkulatu zen, ez unibertsitate-komunitateko taldeen arabera. Baliteke OsloMeteko inkestaren emaitzak ikasle-taldearen ikuspegirantz lerratuta egotea, kopurua handiagoa delako. OsloMeteko taldekako adierazgarritasunik ez zegoenez, bi unibertsitateen arteko taldeen ezberdintasunen azterketa mugatua izan zen.

Ikerketa honen indarguneak honako hauek dira: batetik, protokolizatutako neurrien multzo bat sartu zuela Europako bi unibertsitatetako unibertsitate-komunitateen lagin adierazgarrietan. Bestetik, ikerketa honek campuseko elikagaien eskaintzaren, erosketa-portaeren, hautaketen faktore eragileen eta iritzien analisisa konbinatu zituen. Emaitez erakusten dute erosteko ohiturak desberdinak direla unibertsitateen artean, bai erosteko aukerei dagokienez, bai produktu motari dagokionez. Elikagaiak erosteko portaerak aztertutako Eiko eskaintzarekin lotu ziren. UPV/EHUko eta OsloMeteko unibertsitate-komunitateek prezioak aldatzea gomendatu zuten erosteko gaitasuna handitzeko, KNAA duten produktuen eskuragarritasuna handitzeko eta etiketetan alergenoei buruzko informazioa hobetzeko. Etorkizunean nutrizioa sustatzeko, prezioak manipulatzeko estrategiak erabili beharko lirateke, KNAA duten produktuen hornidura handituz (batez ere produktu freskoak, adibidez, frutak) eta elikagaien etiketetan informazioa hobetuz. Nolanahi ere, campusean EIA hobetzeko hartzen diren neurri espezifikokoak unibertsitate bakoitzeko idiosinkrasietara egokitu behar dira. Horretarako, kontuan hartu behar dira, besteak beste, campusaren tamaina, janaria saltzeko guneen kopurua nahiz irekitzeko ordutegia eta ikasleen zein langileen artean dieta osasungarria jarraitzeko ezagutza, jarrerak, sinesmenak eta motibazioa.

CHAPTER 6. CONCLUSIONS

Based on the results obtained in this doctoral thesis, the following conclusions were derived:

1. The supply of commercial foods of LNQ was greater at the UPV/EHU compared with OsloMet. However, overall no differences were found in the percentage of ultra-processed products. More than half of the commercial products offered at the UPV/EHU and almost 40% of those sold at OsloMet were categorized as LNQ and most had a high level of processing. Consequently, at the campus level, the offer of commercial options of HNQ is limited which limits consumers' ability to choose products of HNQ. Commercial foods of LNQ offered in both universities are characterized by high caloric density, fat and sugar content.
2. In both universities, the UPV/EHU and OsloMet, the level of agreement between the three NMPs used (the AECOSAN, the UK NPM and the MFU criteria) ranged from none to substantial, due to the discrepancies in constructs and scoring criteria of sayings NMPs. Additionally, the level of agreement between the processing level of products (estimated with the NOVA system) and the NMPs ranged from none to slight. Although ultra-processed foods usually are characterized by a high content of critical nutrients, these contents do not always exceed the limits of the NPMs.
3. All food outlets of the UPV/EHU were of low-moderate nutritional quality and the vending machine was the outlet with the highest percentage of points of sale of LNQ. Moreover, around 60% of the home-made products offered at the UPV/EHU were classified as LNQ. Thus, the offer of home-made options of HNQ at the UPV/EHU is limited, which favours the choice of high-energy, low-nutrient products.
4. The nutritional quality of certain products (in particular, home-made hot drinks, foods and cold drinks from vending machines) sold at the UPV/EHU was directly associated with the price. In addition, the nutritional quality of the foods and cold drinks from vending machines was inversely related to the promotion of products (i.e., products of LNQ were mostly located at hand or eye level).

5. Food purchasing habits differed between the communities of the UPV/EHU and OsloMet, in terms of purchasing occasions and the type of product. These habits are healthier between staff than students, and between the community of OsloMet than those of the UPV/EHU. These differences could be partly due to the cultural-socio-economic context of each country or region analysed, as well as the characteristics of the samples. In addition, food purchasing behaviours were related to the supply of food in the environments analysed, that is, to the food available at the UPV/EHU and OsloMet.
6. The top determinants of food purchasing behaviours in the communities of the UPV/EHU and OsloMet were those related to taste and cost; however, the university community of the UPV/EHU also gave especial importance to health and those from OsloMet to convenience. Furthermore, food purchasing determinants differed according to the university community group (students and staff), and according to the university. In this way, cost and sensory perceptions were the most important determinants of food choice in the students group, and nutrition/health value in the staff group; and the UPV/EHU community gave special importance to health and those from OsloMet to convenience.
7. Overall satisfaction with campus food was moderate at both universities, even if the perception of having access to HNQ foods was higher in the community of OsloMet than in those of the UPV/EHU. The university communities from the UPV/EHU and OsloMet recommended pricing changes to increase purchasing capacity and availability of an increased offer of products of HNQ, as well as improving the allergen information on labelling. These changes in the food supply, taking into account taste preferences, could positively influence food consumption habits in this population and decrease the risk of chronic disease in the long term. In addition, changes regarding price were more frequently suggested by students than staff, and those related to the availability of HNQ foods and the help for food choice by staff compared to students. The UPV/EHU community support changes in particular related to food (including vending machine changes), and those from OsloMet support changes related to help for food options.

In view of these conclusions, the high attendance in tertiary institutions and the often closed nature of these environments in the provision of foods to students and staff, this

setting provides an opportunity to intervene to create more health-promoting FEs. In this sense, the findings of the present doctoral thesis are important steps for understanding baseline campus environments and for guiding intervention programme developers and policymakers in their efforts to create campus FEs fully supportive of healthy eating. These strategies should combine environmental and educational programs, as well as policies at the European, state and institutional levels. In any case, the nature of the on-campus FE in tertiary-education settings and its effect on students' and staff's purchasing decisions and dietary behaviours require further investigation.

REFERENCES

- Adachi-Mejia, A. M., Longacre, M. R., Skatrud-Mickelson, M., Li, Z., Purvis, L. A., Titus, L. J., Beach, M. L., & Dalton, M. A. (2013). Variation in access to sugar-sweetened beverages in vending machines across rural, town and urban high schools. *Public Health, 127*(5), 485–491.
- Adamsson, V., Reumark, A., Cederholm, T., Vessby, B., Risérus, U., & Johansson, G. (2012). What is a healthy Nordic diet? Foods and nutrients in the NORDIET study. *Food & nutrition research, 56*, 10.
- Afshin, A., Peñalvo, J. L., Del Gobbo, L., Silva, J., Michaelson, M., O'Flaherty, M., Capewell, S., Spiegelman, D., Danaei, G., & Mozaffarian, D. (2017). The prospective impact of food pricing on improving dietary consumption: A systematic review and meta-analysis. *PloS one, 12*(3), e0172277.
- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN (n.d.). *Información alimentaria facilitada al consumidor [Food information provided to the consumer]*. http://www.aesan.gob.es/AECOSAN/web/seguridad_alimentaria/detalle/etiquetado_informacion_alimentaria.htm
- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN [Spanish Agency for Consumption, Food Safety and Nutrition]. (2005). *Estrategia para la Nutrición, Actividad Física, prevención de la Obesidad y Salud (NAOS). Invertir la tendencia de la obesidad. [Strategy for Nutrition, Physical Activity, Obesity Prevention and Health (NAOS). Reverse the obesity trend]*. Ministerio de Sanidad y Consumo [Ministry of Health and Consumption].
- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN [Spanish Agency for Consumption, Food Safety and Nutrition]. (2010). *Documento de consenso sobre la alimentación en los centros educativos [Consensus document on food in educational centres]*. Ministerio de Educación, & Ministerio de Sanidad, Política Social e Igualdad [Ministry of Education, & Ministry of Health, Social Policy and Equality]. https://www.aesan.gob.es/AECOSAN/docs/documentos/nutricion/educanaos/documento_consenso.pdf
- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN [Spanish Agency for Consumption, Food Safety and Nutrition]. (2011). *Evaluación y seguimiento de la Estrategia NAOS: Conjunto Mínimo de Indicadores [Evaluation and monitoring of the NAOS Strategy: Minimum Set of Indicators]*. Ministerio de Sanidad, Política Social e Igualdad [Ministry of Health, Social Policy and Equality]

http://www.aesan.gob.es/AECOSAN/docs/documentos/nutricion/observatorio/2011_documento_indicadores.pdf

Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN (2012). *Código de correulación de la publicidad de alimentos y bebidas dirigida a menores, prevención de la obesidad y salud (código PAOS)* [Code of co-regulation of the advertising of food and beverages directed to minors, prevention of obesity and health (PAOS code)]. http://www.aesan.gob.es/AECOSAN/docs/documentos/nutricion/Nuevo_Codigo_PAOS_2012_espanol.pdf

Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN [Spanish Agency for Consumption, Food Safety and Nutrition]. (2016). *Contenido de ácidos grasos trans en los alimentos en España, 2015* [Content of trans fatty acids in foods in Spain, 2015]. Ministerio de Sanidad, Política Social e Igualdad [Ministry of Health, Social Policy and Equality]. http://www.aesan.gob.es/AECOSAN/docs/documentos/nutricion/Informe_AGT2015.pdf

Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN (2020a). *Collaboration PLAN for the improvement of the composition of food and beverages and other measures* 2020. https://www.aesan.gob.es/AECOSAN/docs/documentos/nutricion/EN_DOSSIER_PLAN_2020.pdf

Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN. (2020b). *Intervención de promoción de hábitos saludables en el ámbito laboral (IPHASAL)* [Intervention to promote healthy habits in the workplace (IPHASAL)]. <https://www.aesan.gob.es/AECOSAN/docs/documentos/nutricion/IPHASAL.pdf>

Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN, & Centro de Investigación y Documentación Educativa [Spanish Agency for Consumption, Food Safety and Nutrition, & Research and Educational Documentation Centre]. (2008). *Guía de comedores escolares. Programa PERSEO* [Guide of school canteens. PERSEO program]. Ministerio de Sanidad y Consumo, & Ministerio de Educación [Ministry of Health and Consumption, & Ministry of Education]. https://www.sennutricion.org/media/guia08_COMEDOR_ESCOLAR_txt.pdf

- Aggarwal, A., Cook, A. J., Jiao, J., Seguin, R. A., Vernez Moudon, A., Hurvitz, P. M., & Drewnowski, A. (2014a). Access to supermarkets and fruit and vegetable consumption. *American journal of public health, 104*(5), 917–923.
- Aggarwal, A., Monsivais, P., Cook, A. J., & Drewnowski, A. (2014b). Positive attitude toward healthy eating predicts higher diet quality at all cost levels of supermarkets. *Journal of the Academy of Nutrition and Dietetics, 114*(2), 266–272.
- Aggarwal, A., Rehm, C. D., Monsivais, P., & Drewnowski, A. (2016). Importance of taste, nutrition, cost and convenience in relation to diet quality: Evidence of nutrition resilience among US adults using National Health and Nutrition Examination Survey (NHANES) 2007-2010. *Preventive medicine, 90*, 184–192.
- Agudo, A., Slimani, N., Ocké, M. C., Naska, A., Miller, A. B., Kroke, A., Bamia, C., Karalis, D., Vineis, P., Palli, D., Bueno-de-Mesquita, H. B., Peeters, P. H., Engeset, D., Hjartåker, A., Navarro, C., Martínez Garcia, C., Wallström, P., Zhang, J. X., Welch, A. A., Spencer, E., ... Riboli, E. (2002). Consumption of vegetables, fruit and other plant foods in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohorts from 10 European countries. *Public health nutrition, 5*(6B), 1179–1196.
- Alagiyawanna, A., Townsend, N., Mytton, O., Scarborough, P., Roberts, N., & Rayner, M. (2015). Studying the consumption and health outcomes of fiscal interventions (taxes and subsidies) on food and beverages in countries of different income classifications; a systematic review. *BMC Public Health, 15*, 887.
- Alfred Health. (2015). *A green light for healthy consumption*. <https://www.alfredhealth.org.au/images/resources/community-and-health-promo/A-green-light-for-healthy-consumption.pdf>
- An, R. (2013). Effectiveness of subsidies in promoting healthy food purchases and consumption: a review of field experiments. *Public Health Nutrition, 16*(7), 1215–1228.
- Andreyeva, T., Blumenthal, D. M., Schwartz, M. B., Long, M. W., & Brownell, K. D. (2008). Availability and prices of foods across stores and neighborhoods: the case of New Haven, Connecticut. *Health affairs, 27*(5), 1381–1388.
- Antonuk, B., & Block, L. G. (2006). The effect of single serving versus entire package nutritional information on consumption norms and actual consumption of a snack food. *Journal of nutrition education and behavior, 38*(6), 365–370.

- Apparicio, P., Cloutier, M. S., & Shearmur, R. (2007). The case of Montréal's missing food deserts: evaluation of accessibility to food supermarkets. *International journal of health geographics*, 6, 4.
- Appelhans, B. M., French, S. A., Tangney, C. C., Powell, L. M., & Wang, Y. (2017). To what extent do food purchases reflect shoppers' diet quality and nutrient intake?. *The international journal of behavioral nutrition and physical activity*, 14(1), 46.
- Arroyo-Izaga, M, de Pancorbo, M. M., Rebato, E., Basabe, N., Insúa, P., Rocandio, M. A., Encinas, D., Telletxea, S., Martinez-Perez, N., Ansotegui, L., Hernández, I, Telleria-Aramburu, N., Bermúdez-Marín, N. (2017). *Talleres para estudiantes*. Alimentación sostenible. <https://www.alimentacionsostenible.org/es/alimentacion-sostenible/talleres-para-estudiantes/>
- Arroyo, M., Martínez de la Pera, C., Ansotegui, L., & Rocandio, A. M. (2007). A short training program improves the accuracy of portion-size estimates in future dietitians. *Archivos Latinoamericanos de Nutrición*, 57, 163-167.
- Ayala, G. X., Baquero, B., Laraia, B. A., Ji, M., & Linnan, L. (2013). Efficacy of a store-based environmental change intervention compared with a delayed treatment control condition on store customers' intake of fruits and vegetables. *Public health nutrition*, 16(11), 1953-1960.
- Bach-Faig, A., Berry, E. M., Lairon, D., Reguant, J., Trichopoulou, A., Dernini, S., Medina, F. X., Battino, M., Belahsen, R., Miranda, G., Serra-Majem, L., & Mediterranean Diet Foundation Expert Group (2011). Mediterranean diet pyramid today. Science and cultural updates. *Public health nutrition*, 14(12A), 2274-2284.
- Baker, P., Hawkes, C., Wingrove, K., Demaio, A. R., Parkhurst, J., Thow, A. M., & Walls, H. (2018). What drives political commitment for nutrition? A review and framework synthesis to inform the United Nations Decade of Action on Nutrition. *BMJ global health*, 3(1), e000485.
- Bandy, L., Adhikari, V., Jebb, S., & Rayner, M. (2019). The use of commercial food purchase data for public health nutrition research: A systematic review. *PloS one*, 14(1), e0210192.
- Barrio-Cantalejo, I. M^a. (2007). *Legibilidad y salud: Los métodos de medición de la legibilidad y su aplicación al diseño de folletos de educación para la salud* [Doctoral dissertation, Universidad Autónoma de Madrid]. <http://hdl.handle.net/10486/2488>
- Bartlett, S., Olsho, L., Klerman, J., Patlan, K. L., Blocklin, M., Connor, P., Abt Associates, Webb, K., Ritchie, L., Wakimoto, P., Crawford, P., & Atkins Center for Weight and

- Health (2013). *Evaluation of the Fresh Fruit and Vegetable Program (FFVP): Final Evaluation Report*. Department of Agriculture, Food and Nutrition Service. <https://fns-prod.azureedge.net/sites/default/files/FFVP.pdf>
- Bere, E., Hilsen, M., & Klepp, K. I. (2010). Effect of the nationwide free school fruit scheme in Norway. *The British journal of nutrition*, *104*(4), 589–594.
- Bianchi, S.M., Milkie, M.A., Sayer, L.C., Robinson, J.P. (2000). Is anyone doing the housework? Trends in the gender division of household labor. *Soc Forces*, *79*, 191–228.
- Bodor, J. N., Rice, J. C., Farley, T. A., Swalm, C. M., & Rose, D. (2010). The association between obesity and urban food environments. *Journal of urban health*, *87*(5), 771–781.
- Boek, S., Bianco-Simeral, S., Chan, K., & Goto, K. (2012). Gender and race are significant determinants of students' food choices on a college campus. *Journal of nutrition education and behavior*, *44*(4), 372–378.
- Brown, M. V., Flint, M., & Fuqua, J. (2014). The effects of a nutrition education intervention on vending machine sales on a university campus. *Journal of American college health*, *62*(7), 512–516.
- Byrd-Bredbenner, C., Johnson, M., Quick, V. M., Walsh, J., Greene, G. W., Hoerr, S., Colby, S. M., Kattelman, K. K., Phillips, B. W., Kidd, T., & Horacek, T. M. (2012). Sweet and salty. An assessment of the snacks and beverages sold in vending machines on US post-secondary institution campuses. *Appetite*, *58*(3), 1143–1151.
- Callaghan, C., Mandich, G., & He, M. (2010). Healthier snacks in school vending machines: a pilot project in four Ontario high schools. *Canadian journal of dietetic practice and research*, *71*(4), 186–191.
- Carbajal, A., & Sánchez-Muniz, F.J. (2003). Practice guide. In MT García-Arias, MC García-Fernández (Eds.). *Nutrition and Dietetics* (pp. 1–130). University of León.
- Cairns, G., Angus, K., Hastings, G., & Caraher, M. (2013). Systematic reviews of the evidence on the nature, extent and effects of food marketing to children. A retrospective summary. *Appetite*, *62*, 209–215.
- Carrad, A. M., Louie, J. C., Milosavljevic, M., Kelly, B., & Flood, V. M. (2015). Consumer support for healthy food and drink vending machines in public places. *Australian and New Zealand journal of public health*, *39*(4), 355–357.
- Casey, R., Oppert, J.-M., Weber, C., Charreire, H., Salze, P., Badariotti, D., Banos, A., Fischler, C., Hernandez, C. G., Chaix, B., Simon, C. (2014). Determinants of childhood

- obesity: what can we learn from built environment studies? *Food Quality and Preference*, 31, 164-72.
- Caspi, C. E., Sorensen, G., Subramanian, S. V., & Kawachi, I. (2012). The local food environment and diet: a systematic review. *Health & place*, 18(5), 1172-1187.
- Cavanaugh, E., Green, S., Mallya, G., Tierney, A., Brensinger, C., & Glanz, K. (2014). Changes in food and beverage environments after an urban corner store intervention. *Preventive medicine*, 65, 7-12.
- Center for Science in the Public Interest. (2016). *Milkshakes, Sugary Cereals, Candy: What Nickelodeon is Peddling to Kids*. <https://cspinet.org/sites/default/files/attachment/Nickelodeon%20brief.pdf>
- Chen, P. J., & Antonelli, M. (2020). Conceptual Models of Food Choice: Influential Factors Related to Foods, Individual Differences, and Society. *Foods*, 9(12), 1898.
- Chen, S. E., & Florax, R. J. (2010). Zoning for health: the obesity epidemic and opportunities for local policy intervention. *The Journal of nutrition*, 140(6), 1181-1184.
- Chen, S. E., Florax, R. J., & Snyder, S. D. (2013). Obesity and fast food in urban markets: a new approach using geo-referenced micro data. *Health economics*, 22(7), 835-856.
- Cheong, S. M., Kandiah, M., Chinna, K., Chan, Y. M., & Saad, H. A. (2010). Prevalence of obesity and factors associated with it in a worksite setting in Malaysia. *Journal of community health*, 35(6), 698-705.
- Chrisinger, B. W., Ramos, A., Shaykis, F., Martinez, T., Banchoff, A. W., Winter, S. J., & King, A. C. (2018). Leveraging Citizen Science for Healthier Food Environments: A Pilot Study to Evaluate Corner Stores in Camden, New Jersey. *Frontiers in public health*, 6, 89.
- Contento, I. R. (2008). Nutrition education: linking research, theory, and practice. *Asia Pacific journal of clinical nutrition*, 17 Suppl 1, 176-179.
- Coupland, K., Rikhy, S., Hill, K., & McNeil D (2011). *State of evidence: The built environment and health 2011-2015*. Public Health Innovation and Decision Support, Population & Public Health, Alberta Health Services. <http://www.albertahealthservices.ca/poph/hi-poph-surv-phids-soe-2011.pdf>
- Dannefer, R., Williams, D. A., Baronberg, S., & Silver, L. (2012). Healthy bodegas: increasing and promoting healthy foods at corner stores in New York City. *American journal of public health*, 102(10), e27-e31.

- Darmon, N., & Drewnowski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. *Nutrition Reviews*, 73(10), 643–660.
- Darmon, N., Lacroix, A., Muller, L., & Ruffieux, B. (2014). Food price policies improve diet quality while increasing socioeconomic inequalities in nutrition. *The international journal of behavioral nutrition and physical activity*, 11, 66.
- de Castro J. M. (2004). The time of day of food intake influences overall intake in humans. *The Journal of nutrition*, 134(1), 104–111.
- Deliens, T., Clarys, P., De Bourdeaudhuij, I., & Deforche, B. (2014). Determinants of eating behaviour in university students: a qualitative study using focus group discussions. *BMC public health*, 14, 53.
- den Braver, N. R., Lakerveld, J., Rutters, F., Schoonmade, L. J., Brug, J., & Beulens, J. (2018). Built environmental characteristics and diabetes: a systematic review and meta-analysis. *BMC medicine*, 16(1), 12.
- Departamento de Salud del Gobierno Vasco [Department of Health of the Basque Government]. (2018). *Initiatives for healthy eating habits in the basque country*. https://www.euskadi.eus/web01-a2aznscp/es/k75aWebPublicacionesWar/k75aObtenerPublicacionDigitalServlet?R01HNoPortal=true&N_LIBR=052129&N_EDIC=0001&C_IDIOM=en&FORMATO=.pdf
- Department of Health of the UK. (2011). *Nutrient Profiling Technical Guidance*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216094/dh_123492.pdf
- Downs, J. S., Loewenstein, G., & Wisdom, J. (2009). Strategies for Promoting Healthier Food Choices. *The American economic review*, 99(2), 159–164.
- Drewnowski A. (2018). Nutrient density: addressing the challenge of obesity. *The British journal of nutrition*, 120(s1), S8–S14.
- Drewnowski, A., Aggarwal, A., Hurvitz, P. M., Monsivais, P., & Moudon, A. V. (2012). Obesity and supermarket access: proximity or price?. *American journal of public health*, 102(8), e74–e80.
- Driessen, C. E., Cameron, A. J., Thornton, L. E., Lai, S. K., & Barnett, L. M. (2014). Effect of changes to the school food environment on eating behaviours and/or body weight in children: a systematic review. *Obesity reviews*, 15(12), 968–982.

- Dunford, E., Webster, J., Metzler, A. B., Czernichow, S., Ni Mhurchu, C., Wolmarans, P., Snowdon, W., L'Abbe, M., Li, N., Maulik, P. K., Barquera, S., Schoj, V., Allemandi, L., Samman, N., de Menezes, E. W., Hassell, T., Ortiz, J., Salazar de Ariza, J., Rahman, A. R., de Núñez, L., ... Food Monitoring Group (2012). International collaborative project to compare and monitor the nutritional composition of processed foods. *European journal of preventive cardiology*, 19(6), 1326–1332.
- El Ansari, W., Stock, C., & Mikolajczyk, R. T. (2012). Relationships between food consumption and living arrangements among university students in four European countries - a cross-sectional study. *Nutrition journal*, 11, 28.
- Emory University Sustainable food. (2016). <http://sustainability.emory.edu/page/1008/Sustainable-Food>
- Epstein, L. H., Jankowiak, N., Nederkoorn, C., Raynor, H. A., French, S. A., & Finkelstein, E. (2012). Experimental research on the relation between food price changes and food-purchasing patterns: a targeted review. *The American Journal of Clinical Nutrition*, 95(4), 789–809.
- Escaron, A. L., Meinen, A. M., Nitzke, S. A., & Martinez-Donate, A. P. (2013). Supermarket and grocery store-based interventions to promote healthful food choices and eating practices: a systematic review. *Preventing chronic disease*, 10, E50.
- Escuela de Hosteleria de Leioa [Cooking School of Leioa]. (2015). <http://www.hostelerialeioa.net/es/index>
- Euromonitor International. (2015, January 4). *Affordability is Key in Global Food Packaging*. <https://blog.euromonitor.com/video/affordability-is-key-in-global-food-packaging/>
- European Vending & Coffee Service Association. (n.d.). <https://www.vending-europe.eu/>
- Eurostat. (2018, March). *Fruit and vegetable consumption statistics*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fruit_and_vegetable_consumption_statistics#Vegetable_consumption
- Eurostat Statistics Explained. (n.d.a). *Tertiary Education Statistics*. https://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics

- Eurostat Statistics Explained. (n.d.b). *Educational Attainment Statistics*. https://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_attainment_statistics
- Eyles, H., Ni Mhurchu, C., Nghiem, N., & Blakely, T. (2012). Food pricing strategies, population diets, and non-communicable disease: a systematic review of simulation studies. *PLoS medicine*, 9(12), e1001353.
- Farshchi, H. R., Taylor, M. A., & Macdonald, I. A. (2005). Beneficial metabolic effects of regular meal frequency on dietary thermogenesis, insulin sensitivity, and fasting lipid profiles in healthy obese women. *The American journal of clinical nutrition*, 81(1), 16–24.
- Fernández Torres, Á., Moreno-Rojas, R., & Cámara Martos, F. (2014). Nutritional content of foods offered and consumed in a Spanish university canteen. *Nutricion hospitalaria*, 31(3), 1302–1308.
- Finucane, M. M., Stevens, G. A., Cowan, M. J., Danaei, G., Lin, J. K., Paciorek, C. J., Singh, G. M., Gutierrez, H. R., Lu, Y., Bahalim, A. N., Farzadfar, F., Riley, L. M., Ezzati, M., & Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group (Body Mass Index) (2011). National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9·1 million participants. *Lancet*, 377(9765), 557–567.
- Fonseca, L. B., Pereira, L. P., Rodrigues, P., Andrade, A., Muraro, A. P., Gorgulho, B. M., Pereira, R. A., & Ferreira, M. G. (2021). Food consumption on campus is associated with meal eating patterns among college students. *The British journal of nutrition*, 126(1), 53–65.
- Food and Agriculture Organization of the United Nations – FAO. (n.d.a). *FAOSTAT Spain*. <https://www.fao.org/faostat/en/#country/203>
- Food and Agriculture Organization of the United Nations – FAO (n.d.b). *FAOSTAT Norway*. <https://www.fao.org/faostat/en/#country/162>
- Food and Agriculture Organization of the United Nations – FAO. (2016). *Influencing food environments for healthy diets*.
- Freedman, M. R., & Rubinstein, R. J. (2010). Obesity and Food Choices Among Faculty and Staff at a Large Urban University. *Journal of American college health*, 59(3), 205–210.
- Freeman, B., Kelly, B., Vandevijvere, S., & Baur, L. (2016). Young adults: beloved by food and drink marketers and forgotten by public health?. *Health promotion international*, 31(4), 954–961.

- French, S. A., Jeffery, R. W., Story, M., Breitlow, K. K., Baxter, J. S., Hannan, P., & Snyder, M. P. (2001b). Pricing and promotion effects on low-fat vending snack purchases: the CHIPS Study. *American journal of public health, 91*(1), 112–117.
- French, S. A., Story, M., & Jeffery, R. W. (2001a). Environmental influences on eating and physical activity. *Annual review of public health, 22*, 309–335.
- Fuentes Pacheco, A., Carrillo Balam, G., Archibald, D., Grant, E., & Skafida, V. (2018). Exploring the relationship between local food environments and obesity in UK, Ireland, Australia and New Zealand: a systematic review protocol. *BMJ open, 8*(2), e018701.
- Gallus, S., Lugo, A., Murisic, B., Bosetti, C., Boffetta, P., & La Vecchia, C. (2015). Overweight and obesity in 16 European countries. *European journal of nutrition, 54*(5), 679–689.
- Gamba, R. J., Schuchter, J., Rutt, C., & Seto, E. Y. (2015). Measuring the food environment and its effects on obesity in the United States: a systematic review of methods and results. *Journal of community health, 40*(3), 464–475.
- Gerbens-Leenes, P. W., Nonhebel, S., & Krol, M. S. (2010). Food consumption patterns and economic growth. Increasing affluence and the use of natural resources. *Appetite, 55*(3), 597–608.
- Gibson D. M. (2011). The neighborhood food environment and adult weight status: estimates from longitudinal data. *American journal of public health, 101*(1), 71–78.
- Gilmore, J.H. & Pine II, B.J. (2009). Authenticity: What Consumers Really Want by James H. Gilmore and B. Joseph Pine II. *Journal of Product Innovation Management, 26*, 355–356.
- Gittelsohn, J., Rowan, M., & Gadhoke, P. (2012). Interventions in small food stores to change the food environment, improve diet, and reduce risk of chronic disease. *Preventing chronic disease, 9*, E59.
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2005). Healthy nutrition environments: concepts and measures. *American journal of health promotion, 19*(5), 330–ii.
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2007). Nutrition Environment Measures Survey in stores (NEMS-S): development and evaluation. *American journal of preventive medicine, 32*(4), 282–289.
- Global Panel on Agriculture and Food Systems for Nutrition. (2016). *Food Systems and Diets: Facing the Challenges of the 21st Century*. <http://glopan.org/sites/default/files/ForesightReport.pdf>

- Grech, A., & Allman-Farinelli, M. (2015). A systematic literature review of nutrition interventions in vending machines that encourage consumers to make healthier choices. *Obesity reviews*, 16(12), 1030-1041.
- Grech, A., Hebden, L., Roy, R., & Allman-Farinelli, M. (2017). Are products sold in university vending machines nutritionally poor? A food environment audit. *Nutrition & dietetics*, 74(2), 185-190.
- Gustafson, A., Hankins, S., & Jilcott, S. (2012). Measures of the consumer food store environment: a systematic review of the evidence 2000-2011. *Journal of community health*, 37(4), 897-911.
- Hartstein, J., Cullen, K. W., Virus, A., El Ghormli, L., Volpe, S. L., Staten, M. A., Bridgman, J. C., Stadler, D. D., Gillis, B., McCormick, S. B., & Mobley, C. C. (2011). Impact of the HEALTHY Study on Vending Machine Offerings in Middle Schools. *Journal of child nutrition & management*, 35(2), 16353.
- He, M., Tucker, P., Gilliland, J., Irwin, J. D., Larsen, K., & Hess, P. (2012). The influence of local food environments on adolescents' food purchasing behaviors. *International journal of environmental research and public health*, 9(4), 1458-1471.
- HealthLinkBC. (2013). *Guidelines for food and beverage sales in BC schools*. Government of British Columbia. https://www2.gov.bc.ca/assets/gov/education/administration/kindergarten-to-grade-12/healthyschools/2015_food_guidelines.pdf
- Hebden, L., Chan, H. N., Louie, J. C., Rangan, A., & Allman-Farinelli, M. (2015). You are what you choose to eat: factors influencing young adults' food selection behaviour. *Journal of Human Nutrition and Dietetics*, 28(4), 401-408.
- Heden, T. D., Liu, Y., Sims, L. J., Whaley-Connell, A. T., Chockalingam, A., Dellsperger, K. C., & Kanaley, J. A. (2013). Meal frequency differentially alters postprandial triacylglycerol and insulin concentrations in obese women. *Obesity (Silver Spring)*, 21(1), 123-129.
- Herforth, A., & Ahmed, S. (2015). The food environment, its effects on dietary consumption, and potential for measurement within agriculture-nutrition interventions. *Food Security*, 7, 505-520.
- Hervada Vidal, X., Santiago Pérez, M.I., Vázquez Fernández, E., Castillo Salgado, C., Loyola Elizondo, E., Silva Ayçaguer, L.C. (2006). *Epidat vs 3.1: Análisis epidemiológico de datos tabulados*. Xunta de Galicia.

- Hess, J., & Singer, E. (1995). The role of respondent “debriefing” questions in questionnaire development. In V. A. Alexandria, *Proceedings of the American Statistical Association (Survey Research Methods Section)* (pp. 1075-1080). American Statistical Association. <https://www.census.gov/srd/papers/pdf/sm9518.pdf>
- Hill, J. O., & Peters, J. C. (1998). Environmental contributions to the obesity epidemic. *Science*, *280*(5368), 1371-1374.
- Hirahatake, K. M., Bruno, R. S., Bolling, B. W., Blesso, C., Alexander, L. M., & Adams, S. H. (2020). Dairy Foods and Dairy Fats: New Perspectives on Pathways Implicated in Cardiometabolic Health. *Advances in nutrition*, *11*(2), 266-279.
- Hjartåker, A., Lagiou, A., Slimani, N., Lund, E., Chirlaque, M. D., Vasilopoulou, E., Zavitsanos, X., Berrino, F., Sacerdote, C., Ocké, M. C., Peeters, P. H., Engeset, D., Skeie, G., Aller, A., Amiano, P., Berglund, G., Nilsson, S., McTaggart, A., Spencer, E. A., Overvad, K., ... Riboli, E. (2002). Consumption of dairy products in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort: data from 35 955 24-hour dietary recalls in 10 European countries. *Public health nutrition*, *5*(6B), 1259-1271.
- Hobbs, M., & Radley, D. (2020). Obesogenic environments and obesity: a comment on 'Are environmental area characteristics at birth associated with overweight and obesity in school-aged children? Findings from the SLOPE (Studying Lifecourse Obesity PrEdictors) population-based cohort in the south of England'. *BMC medicine*, *18*(1), 59.
- Hogarmania. (n.d.). *Recetas de cocina vasca [Basque cooking recipes]*. Baintet Comunicación S.A. <https://www.hogarmania.com/cocina/recetas/listado-1537.html>
- Horacek, T. M., Erdman, M. B., Byrd-Bredbenner, C., Carey, G., Colby, S. M., Greene, G. W., Guo, W., Kattelman, K. K., Olfert, M., Walsh, J., & White, A. B. (2013a). Assessment of the dining environment on and near the campuses of fifteen post-secondary institutions. *Public health nutrition*, *16*(7), 1186-1196.
- Horacek, T. M., Erdman, M. B., Reznar, M. M., Olfert, M., Brown-Esters, O. N., Kattelman, K. K., Kidd, T., Koenings, M., Phillips, B., Quick, V., Shelnut, K. P., & White, A. A. (2013b). Evaluation of the food store environment on and near the campus of 15 postsecondary institutions. *American journal of health promotion*, *27*(4), e81-e90.
- Horacek, T. M., Yildirim, E. D., Matthews Schreiber, M., Byrd-Bredbenner, C., Colby, S., White, A. A., Shelnut, K. P., Olfert, M. D., Mathews, A. E., Riggsbee, K., Franzen-Castle, L., Morrell, J. S., & Kattelman, K. (2019). Development and Validation of the Vending

- Evaluation for Nutrient-Density (VEND)ing Audit. *International journal of environmental research and public health*, 16(3), 514.
- Hosler, A. S., Rajulu, D. T., Fredrick, B. L., & Ronsani, A. E. (2008). Assessing retail fruit and vegetable availability in urban and rural underserved communities. *Preventing chronic disease*, 5(4), A123.
- Hua, S. V., & Ickovics, J. R. (2016). Vending Machines: A Narrative Review of Factors Influencing Items Purchased. *Journal of the Academy of Nutrition and Dietetics*, 116(10), 1578–1588.
- Hughes, K. A. (2004). *Comparing pretesting methods: cognitive interviews, respondent "debriefing" and behavior coding*. Statistical Research Division. <https://www.census.gov/srd/papers/pdf/rsm2004-02.pdf>
- Huseinovic, E., Winkvist, A., Slimani, N., Park, M. K., Freisling, H., Boeing, H., Buckland, G., Schwingshackl, L., Weiderpass, E., Rostgaard-Hansen, A. L., Tjønneland, A., Affret, A., Boutron-Ruault, M. C., Fagherazzi, G., Katzke, V., Kühn, T., Naska, A., Orfanos, P., Trichopoulou, A., Pala, V., ... Forslund, H. B. (2016). Meal patterns across ten European countries - results from the European Prospective Investigation into Cancer and Nutrition (EPIC) calibration study. *Public health nutrition*, 19(15), 2769–2780.
- Hutchison, A. T., & Heilbronn, L. K. (2016). Metabolic impacts of altering meal frequency and timing - Does when we eat matter?. *Biochimie*, 124, 187–197.
- Institute of Medicine of the National Academies. (2006). *Dietary Reference Intakes. The Essential Guide to Nutrient Requirement*. The National Academy Press. <https://doi.org/10.17226/11537>
- Instituto Datakey [Dataley Institute]. (2014). *Merchandising: Definición y Función Del Lineal [Merchandising: Definition and Function of the Linear]*. <http://www.instituto-datakey.com/1025/>
- Instituto Nacional de Estadística [Statistics National Institute] (2016). *Encuesta de Condiciones de Vida (ECV). Año 2015 [Living Conditions Survey (ECV). Year 2015]*. <https://www.ine.es/prensa/np969.pdf>
- Instituto Nacional de Estadística [Statistics National Institute]. (2018). *Determinantes de salud (sobrepeso, consumo de fruta y verdura, tipo de lactancia, actividad física) [Health determinants (overweight, fruit and vegetable consumption, type of breastfeeding, physical activity)]*. https://www.ine.es/ss/Satellite?L=en_GB&c=INESeccion_C&cid=1259926457058&p

- =%5C&pagename=ProductosYServicios%2FPYSLayout¶m1=PYSDetalle¶m3=1259924822888
- Investopedia. (2018, May 10) *Shrinkflation*.
<https://www.investopedia.com/terms/s/shrinkflation.asp>
- Januszczyńska, R., Pieniak, Z., & Verbeke, W. (2011). Food choice questionnaire revisited in four countries. Does it still measure the same?. *Appetite*, 57(1), 94–98.
- Jensen, C., Fang, K., Grech, A., & Rangan, A. (2021). Trends in Sales and Industry Perspectives of Package Sizes of Carbonates and Confectionery Products. *Foods*, 10(5), 1071.
- Jensen, J., Mørkbak, M., & Nordström, J. (2012). Economic Costs and Benefits of Promoting Healthy Takeaway Meals at Workplace Canteens. *Journal of Benefit-Cost Analysis*, 3(4), 1-27.
- Jiang, Y., Wang, J., Wu, S., Li, N., Wang, Y., Liu, J., Xu, X., He, Z., Cheng, Y., Zeng, X., Wang, B., Zhang, C., Zhao, M., Su, Z., Guo, B., Yang, W., & Zheng, R. (2019). Association between Take-Out Food Consumption and Obesity among Chinese University Students: A Cross-Sectional Study. *International journal of environmental research and public health*, 16(6), 1071.
- Jun, J., Arendt, S. W., & Kang, J. (2016) Understanding customers' healthful food selection at restaurants: Roles of attitude, gender, and past experience. *Journal of Foodservice Business Research*, 19, 197–212.
- Kabir, A., Miah, S., & Islam, A. (2018). Factors influencing eating behavior and dietary intake among resident students in a public university in Bangladesh: A qualitative study. *PloS One*, 13(6), e0198801.
- Kearney, M., Kearney, J., Dunne, A., & Gibney, M. (2000). Sociodemographic determinants of perceived influences on food choice in a nationally representative sample of Irish adults. *Public Health Nutrition*, 3(2), 219–226.
- Kelly, N. R., Mazzeo, S. E., & Bean, M. K. (2013). Systematic review of dietary interventions with college students: directions for future research and practice. *Journal of nutrition education and behavior*, 45(4), 304–313.
- Kibblewhite, S., Bowker, S., Jenkins, H.R. (2010) Vending machines in hospitals – Are they healthy?. *Nutrition & food science*, 40, 26–28

- Kimathi, A. N., Gregoire, M. B., Dowling, R. A., & Stone, M. K. (2009). A healthful options food station can improve satisfaction and generate gross profit in a worksite cafeteria. *Journal of the American Dietetic Association, 109*(5), 914–917.
- Kjaer, I. G., Kolle, E., Hansen, B. H., Anderssen, S. A., & Torstveit, M. K. (2015). Obesity prevalence in Norwegian adults assessed by body mass index, waist circumference and fat mass percentage. *Clinical obesity, 5*(4), 211–218.
- Kocken, P. L., Eeuwijk, J., Van Kesteren, N. M., Dusseldorp, E., Buijs, G., Bassa-Dafesh, Z., & Snel, J. (2012). Promoting the purchase of low-calorie foods from school vending machines: a cluster-randomized controlled study. *The Journal of school health, 82*(3), 115–122.
- Kvaavik, E., Andersen, L. F., & Klepp, K. I. (2005). The stability of soft drinks intake from adolescence to adult age and the association between long-term consumption of soft drinks and lifestyle factors and body weight. *Public health nutrition, 8*(2), 149–157.
- Labonté, M. È., Poon, T., Gladanac, B., Ahmed, M., Franco-Arellano, B., Rayner, M., & L'Abbé, M. R. (2018). Nutrient Profile Models with Applications in Government-Led Nutrition Policies Aimed at Health Promotion and Noncommunicable Disease Prevention: A Systematic Review. *Advances in nutrition, 9*(6), 741–788.
- Lachat, C. K., Huybregts, L. F., Roberfroid, D. A., Van Camp, J., Remaut-De Winter, A. M., Debruyne, P., & Kolsteren, P. W. (2009a). Nutritional profile of foods offered and consumed in a Belgian university canteen. *Public health nutrition, 12*(1), 122–128.
- Lachat, C. K., Verstraeten, R., De Meulenaer, B., Menten, J., Huybregts, L. F., Van Camp, J., Roberfroid, D., & Kolsteren, P. W. (2009b). Availability of free fruits and vegetables at canteen lunch improves lunch and daily nutritional profiles: a randomised controlled trial. *The British journal of nutrition, 102*(7), 1030–1037.
- Lambert, J., Agostoni, C., Elmadfa, I., Hulshof, K., Krause, E., Livingstone, B., Socha, P., Pannemans, D., & Samartín, S. (2004). Dietary intake and nutritional status of children and adolescents in Europe. *The British journal of nutrition, 92* Suppl 2, S147–S211.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159–174.
- Larson, N. I., Neumark-Sztainer, D. R., Harnack, L. J., Wall, M. M., Story, M. T., & Eisenberg, M. E. (2008). Fruit and vegetable intake correlates during the transition to young adulthood. *American journal of preventive medicine, 35*(1), 33–37.

- Larson, N., & Story, M. (2010). Are 'competitive foods' sold at school making our children fat?. *Health affairs*, 29(3), 430–435.
- Law 17/2011, of July 5, of Food Safety and Nutrition. *Boletín Oficial del Estado*. 6 July 2011. N°160. <https://www.boe.es/eli/es/1/2011/07/05/17/dof/spa/pdf>
- Lawrence, S., Boyle, M., Craypo, L., & Samuels, S. (2009). The food and beverage vending environment in health care facilities participating in the healthy eating, active communities program. *Pediatrics*, 123 Suppl 5, S287–S292.
- Lazarte, C. E., Encinas, M. E., Alegre, C., & Granfeldt, Y. (2012). Validation of digital photographs, as a tool in 24-h recall, for the improvement of dietary assessment among rural populations in developing countries. *Nutrition Journal*, 11, 61.
- Lee, A., Mhurchu, C. N., Sacks, G., Swinburn, B., Snowdon, W., Vandevijvere, S., Hawkes, C., L'abbé, M., Rayner, M., Sanders, D., Barquera, S., Friel, S., Kelly, B., Kumanyika, S., Lobstein, T., Ma, J., Macmullan, J., Mohan, S., Monteiro, C., Neal, B., ... INFORMAS (2013). Monitoring the price and affordability of foods and diets globally. *Obesity reviews*, 14 Suppl 1, 82–95.
- Leitzmann C. (2014). Vegetarian nutrition: past, present, future. *The American Journal of Clinical Nutrition*, 100 Suppl 1, 496S–502S.
- Levi, A., Chan, K. K., & Pence, D. (2006). Real men do not read labels: the effects of masculinity and involvement on college students' food decisions. *Journal of American college health*, 55(2), 91–98.
- Li, K. K., Concepcion, R. Y., Lee, H., Cardinal, B. J., Ebbeck, V., Woekel, E., & Readdy, R. T. (2012). An examination of sex differences in relation to the eating habits and nutrient intakes of university students. *Journal of Nutrition Education and Behavior*, 44(3), 246–250.
- Liang, X., Zhang, S. (2009). Investigation of customer satisfaction in student food service: an example of student cafeteria in NHH. *International Journal of Quality and Service Sciences*, 1, 113–124.
- Lin, C. T., Lee, J. Y., & Yen, S. T. (2004). Do dietary intakes affect search for nutrient information on food labels?. *Social science & medicine*, 59(9), 1955–1967.
- Littlewood, J. A., Lourenço, S., Iversen, C. L., & Hansen, G. L. (2016). Menu labelling is effective in reducing energy ordered and consumed: a systematic review and meta-analysis of recent studies. *Public health nutrition*, 19(12), 2106–2121.
- Luiten, C. M., Steenhuis, I. H., Eyles, H., Ni Mhurchu, C., & Waterlander, W. E. (2016). Ultra-processed foods have the worst nutrient profile, yet they are the most available

- packaged products in a sample of New Zealand supermarkets. *Public health nutrition*, 19(3), 530–538.
- Lustig, R. H., Schmidt, L. A., & Brindis, C. D. (2012). Public health: The toxic truth about sugar. *Nature*, 482(7383), 27–29.
- Lytle, L. A., & Sokol, R. L. (2017). Measures of the food environment: A systematic review of the field, 2007–2015. *Health & place*, 44, 18–34.
- Mackenbach, J. P., Stirbu, I., Roskam, A. J., Schaap, M. M., Menvielle, G., Leinsalu, M., Kunst, A. E., & European Union Working Group on Socioeconomic Inequalities in Health (2008). Socioeconomic inequalities in health in 22 European countries. *The New England journal of medicine*, 358(23), 2468–2481.
- Mah, C. L., Cook, B., Rideout, K., & Minaker, L. M. (2016). Policy options for healthier retail food environments in city-regions. *Canadian journal of public health*, 107(Suppl 1), 5343.
- Maillot, M., Darmon, N., Darmon, M., Lafay, L., & Drewnowski, A. (2007). Nutrient-dense food groups have high energy costs: an econometric approach to nutrient profiling. *The Journal of nutrition*, 137(7), 1815–1820.
- Marques, A., Peralta, M., Naia, A., Loureiro, N., & de Matos, M. G. (2018). Prevalence of adult overweight and obesity in 20 European countries, 2014. *European journal of public health*, 28(2), 295–300.
- Martin Payo, R., Sánchez Díaz, C., Suarez Colunga, M., García García, R., Blanco Díaz, M., & Fernández Álvarez, M. (2020). Composición nutricional de los alimentos de las vending de edificios públicos universitarios y hospitalarios de Asturias [Nutritional composition of vending foods of public university and hospital buildings in Asturias]. *Atencion primaria*, 52(1), 22–28.
- Martinez-Perez, N., & Arroyo-Izaga, M. (2021). Availability, Nutritional Profile and Processing Level of Food Products Sold in Vending Machines in a Spanish Public University. *International journal of environmental research and public health*, 18(13), 6842.
- Martinez-Perez, N., Torheim, L. E., Castro-Díaz, N., & Arroyo-Izaga, M. (2021). On-campus food environment, purchase behaviours, preferences and opinions in a Norwegian university community. *Public health nutrition*, 1–32. Advance online publication.
- Mataix, J. (2009). *Tabla de composición de alimentos, 5ª edición [Food composition table, 5th edition]*. University of Granada.

- Matbransjens Faglige Utvalg – MFU [Norwegian Food and Drink Industry Professional Practices Committee]. (2013). *English*. <https://mfu.as/english/>
- Matthews, M., Horacek, T.M., Olfert, M.D., Koenings, M.M., Shelnut, K.P., Stocker, C., Golem, D.L., Kattelman, K.K., Colby, S., Franzen-Castle, L., Brown, O.N., Morrell, J.S. (2014). Development, Validation and Implementation of the Health Density Vending Machine Audit Tool (HDVMAT). *Journal of the American Academy of Nutrition and Dietetics*, 114, A65.
- Matthews, M. A., & Horacek, T. M. (2015). Vending machine assessment methodology. A systematic review. *Appetite*, 90, 176–186.
- McAlister, A.L., Perry, C.L., & Parcel, G.S. (2008). How individuals, environments, and health behaviors interact: Social cognitive theory. In K. Glanz, B. K. Rimer & K. Viswanath (Eds.). *Health Behavior and Health Education: Theory, Research, and Practice* (pp. 169–188). Jossey-Bass.
- McCormack, L. A., Laska, M. N., Larson, N. I., & Story, M. (2010). Review of the nutritional implications of farmers' markets and community gardens: a call for evaluation and research efforts. *Journal of the American Dietetic Association*, 110(3), 399–408.
- McCurley, J. L., Levy, D. E., Rimm, E. B., Gelsomin, E. D., Anderson, E. M., Sanford, J. M., & Thorndike, A. N. (2019). Association of Worksite Food Purchases and Employees' Overall Dietary Quality and Health. *American journal of preventive medicine*, 57(1), 87–94.
- Milošević, J., Žeželj, I., Gorton, M., & Barjolle, D. (2012). Understanding the motives for food choice in Western Balkan Countries. *Appetite*, 58(1), 205–214.
- Minaker, L. M., Storey, K. E., Raine, K. D., Spence, J. C., Forbes, L. E., Plotnikoff, R. C., & McCargar, L. J. (2011). Associations between the perceived presence of vending machines and food and beverage logos in schools and adolescents' diet and weight status. *Public health nutrition*, 14(8), 1350–1356.
- Ministry of Health and Care Services (2017). *Norwegian National Action Plan for a Healthier Diet – an outline*. https://www.regjeringen.no/contentassets/fab53cd681b247bfa8c03a3767c75e66/norwegian_national_action_plan_for_a_healthier_diet_an_outline.pdf
- Ministry of Health New South Wales. (2009). *Live Life Well @ Health: Healthier Food & Drink Choices – Staff & Visitors in NSW Health Facilities*. http://www0.health.nsw.gov.au/policies/pd/2009/pdf/PD2009_081.pdf

- Mithril, C., Dragsted, L. O., Meyer, C., Blauert, E., Holt, M. K., & Astrup, A. (2012). Guidelines for the New Nordic Diet. *Public health nutrition, 15*(10), 1941–1947.
- Monroy-Parada, D. X., Prieto-Castillo, L., Ordaz-Castillo, E., Bosqued, M. J., Rodríguez-Artalejo, F., & Royo-Bordonada, M. Á. (2021). Mapa de las políticas nutricionales escolares en España [Map of school nutritional policies in Spain]. *Gaceta sanitaria, 35*(2), 123–129.
- Monteiro, C. A., Cannon, G., Moubarac, J. C., Levy, R. B., Louzada, M., & Jaime, P. C. (2018a). The UN Decade of Nutrition, the NOVA food classification and the trouble with ultra-processing. *Public health nutrition, 21*(1), 5–17.
- Monteiro, C. A., Moubarac, J. C., Levy, R. B., Canella, D. S., Louzada, M., & Cannon, G. (2018b). Household availability of ultra-processed foods and obesity in nineteen European countries. *Public health nutrition, 21*(1), 18–26.
- Moore, L. V., Diez Roux, A. V., Nettleton, J. A., & Jacobs, D. R., Jr (2008). Associations of the local food environment with diet quality--a comparison of assessments based on surveys and geographic information systems: the multi-ethnic study of atherosclerosis. *American journal of epidemiology, 167*(8), 917–924.
- Mozaffarian D. (2016). Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity: A Comprehensive Review. *Circulation, 133*(2), 187–225.
- Muhammad, A., D'Souza, A., Meade, B., Micha, R., & Mozaffarian, D. (2017). How income and food prices influence global dietary intakes by age and sex: evidence from 164 countries. *BMJ Global Health, 2*(3), e000184.
- Naska, A., Bountziouka, V., Trichopoulou, A., & DAFNE Participants (2010). Soft drinks: time trends and correlates in twenty-four European countries. A cross-national study using the DAFNE (Data Food Networking) databank. *Public health nutrition, 13*(9), 1346–1355.
- Naylor, P. J., Bridgewater, L., Purcell, M., Ostry, A., & Wekken, S. V. (2010). Publically funded recreation facilities: obesogenic environments for children and families?. *International journal of environmental research and public health, 7*(5), 2208–2221.
- Nestlé Company. (2004). *The Nestlé Nutritional Profiling System, Its Product Categories and Sets of Criteria*. The Nestlé Nutrition Foundation.
- Newton, J., Dooris, M., & Wills, J. (2016). Healthy universities: an example of a whole-system health-promoting setting. *Global health promotion, 23*(1 Suppl), 57–65.

- Ng, K. W., Sangster, J., & Priestly, J. (2019). Assessing the availability, price, nutritional value and consumer views about foods and beverages from vending machines across university campuses in regional New South Wales, Australia. *Health promotion journal of Australia, 30*(1), 76–82.
- Niebylski, M. L., Lu, T., Campbell, N. R., Arcand, J., Schermel, A., Hua, D., Yeates, K. E., Tobe, S. W., Twohig, P. A., L'Abbé, M. R., & Liu, P. P. (2014). Healthy food procurement policies and their impact. *International journal of environmental research and public health, 11*(3), 2608–2627.
- Nordstrom J, Thunstrom L. (2011). Can targeted food taxes and subsidies improve the diet? Distributional effects among income groups. *Food Policy, 36*, 259–271.
- Norwegian Directorate of Health, & Norwegian Food Safety Authority. (n.d.). *Kostholdsplanleggeren [The diet planner]*. <https://www.kostholdsplanleggeren.no/>
- Norwegian Ministries. (2017). *Norwegian National Action Plan for a Healthier Diet (Nasjonal handlingsplan for bedre kosthold 2017-2021)*. Ministry of Health and Care. https://www.regjeringen.no/contentassets/fab53cd681b247bfa8c03a3767c75e66/norwegian_national_action_plan_for_a_healthier_diet_an_outline.pdf
- Odoms-Young, A., Singleton, C. R., Springfield, S., McNabb, L., & Thompson, T. (2016). Retail Environments as a Venue for Obesity Prevention. *Current obesity reports, 5*(2), 184–191.
- Olfert, M. D., Barr, M. L., Charlier, C. C., Greene, G. W., Zhou, W., & Colby, S. E. (2019). Sex Differences in Lifestyle Behaviors among U.S. College Freshmen. *International Journal of Environmental Research and Public Health, 16*(3), 482.
- Ortega, R. M., López-Sobaler, A. M., Andrés, P., Requejo, A. M., Aparicio, A., & Molinero, L. M. (2016). *Programa DIAL para valoración de dietas y cálculos de alimentación, versión 2.12 [DIAL program for diet assessment and feeding calculations, 2.12]*. Department of Nutrition (Complutense University of Madrid) & Alce Ingeniería, S.L.
- Oltersdorf, U., Schlettwein-gsell, D., & Winkler, G. (1999). Assessing eating patterns-an emerging research topic in nutritional sciences: introduction to the symposium. *Appetite, 32*(1), 1–7.
- Orava, T., Manske, S., & Hanning, R. (2016). Beverages and snacks available in vending machines from a subset of Ontario secondary schools: Do offerings align with provincial nutrition standards?. *Canadian journal of public health, 107*(4-5), e417–e423.

- Oslo Metropolitan University. (2019) *Årsrapport 2019 [Annual report 2019]*.
<https://ansatt.oslomet.no/documents/585743/54495365/%C3%85rsrapportp2019/>
- Paek, H. J., Oh, H. J., Jung, Y., Thompson, T., Alaimo, K., Risley, J., & Mayfield, K. (2014). Assessment of a healthy corner store program (FIT Store) in low-income, urban, and ethnically diverse neighborhoods in Michigan. *Family & community health*, 37(1), 86–99.
- Park, H., & Papadaki, A. (2016). Nutritional value of foods sold in vending machines in a UK University: Formative, cross-sectional research to inform an environmental intervention. *Appetite*, 96, 517–525.
- Pelletier, J.E., Laska, M.N. (2013). Campus food and beverage purchases are associated with indicators of diet quality in college students living off campus. *American journal of health promotion*, 28(2), 80-7.
- Penney, T. L., Almiron-Roig, E., Shearer, C., McIsaac, J. L., & Kirk, S. F. (2014). Modifying the food environment for childhood obesity prevention: challenges and opportunities. *The Proceedings of the Nutrition Society*, 73(2), 226–236.
- Pharis, M. L., Colby, L., Wagner, A., & Mallya, G. (2018). Sales of healthy snacks and beverages following the implementation of healthy vending standards in City of Philadelphia vending machines. *Public health nutrition*, 21(2), 339–345.
- Phipps, E. J., Braitman, L. E., Stites, S. D., Singletary, S. B., Wallace, S. L., Hunt, L., Axelrod, S., Glanz, K., & Uplinger, N. (2015). Impact of a Rewards-Based Incentive Program on Promoting Fruit and Vegetable Purchases. *American journal of public health*, 105(1), 166–172.
- Popp, J. (2005). Breaking the molds: Noncommercial sectors adopt new strategies, tactics and thinking to survive and grow. http://images.centralrestaurant.com/images/trends/pdfs/breaking_moldsRI.pdf
- Popping, R. (2015). Analyzing open-ended questions by means of text analysis procedures. *Bulletin de Méthodologie Sociologique*, 128, 23–39.
- Powell, L. M., Han, E., & Chaloupka, F. J. (2010). Economic contextual factors, food consumption, and obesity among U.S. adolescents. *The Journal of nutrition*, 140(6), 1175–1180.
- Putnam, J. J., Allshouse, J., & Kantor, L.S. (2002). US per capita food supply trends: more calories, refined carbohydrates, and fats. *Food Review*, 25, 2–15.

- Qualls-Creekmore, E, Marlatt, K. L., Aarts, E., Bruce-Keller, A., Church, T. S., Clément, K., Fisher, J. O., Gordon-Larsen, P., Morrison, C. D., Raybould, H. E., Ryan, D. H., Schauer, P. R., Spector, A. C., Spetter, M. S., Stuber, G. D., Berthoud, H. R., & Ravussin, E. (2020). What Should I Eat and Why? The Environmental, Genetic, and Behavioral Determinants of Food Choice: Summary from a Pennington Scientific Symposium. *Obesity, 28*(8).
- Raposo, A., Carrascosa, C., Pérez, E., Saavedra, P., Sanjuán, E., & Millán, R. (2015). Vending machines: Food safety and quality assessment focused on food handlers and the variables involved in the industry. *Food Control, 56*, 177–185.
- Rideout, K., Mah, C.L., & Minaker, L. (2015). *Food Environments: An Introduction for Public Health Practice*. National Collaborating Centre for Environmental Health. https://www.nceh.ca/sites/default/files/Food_Environments_Public_Health_Practice_Dec_2015.pdf
- Roy, R., Hebden, L., Kelly, B., De Gois, T., Ferrone, E. M., Samrout, M., Vermont, S., & Allman-Farinelli, M. (2016). Description, measurement and evaluation of tertiary-education food environments. *The British Journal of Nutrition, 115*(9), 1598-1606.
- Roy, R., Kelly, B., Rangan, A., & Allman-Farinelli, M. (2015). Food Environment Interventions to Improve the Dietary Behavior of Young Adults in Tertiary Education Settings: A Systematic Literature Review. *Journal of the Academy of Nutrition and Dietetics, 115*(10), 1647–81.e1.
- Roy, R., Rangan, A., Hebden, L., Yu Louie, J. C., Tang, L. M., Kay, J., & Allman-Farinelli, M. (2017). Dietary contribution of foods and beverages sold within a university campus and its effect on diet quality of young adults. *Nutrition, 34*, 118–123.
- Roy, R., Soo, D., Conroy, D., Wall, C. R., & Swinburn, B. (2019). Exploring University Food Environment and On-Campus Food Purchasing Behaviors, Preferences, and Opinions. *Journal of Nutrition Education and Behavior, 51*, 865–875.
- Sacks, G., Kwon, J., & Backholer, K. (2021). Do taxes on unhealthy foods and beverages influence food purchases?. *Current nutrition reports*. Advance online publication.
- Sánchez-Bravo, P., Chambers, E., 5th, Noguera-Artiaga, L., López-Lluch, D., Chambers, E., 4th, Carbonell-Barrachina, Á. A., & Sendra, E. (2020). Consumers' Attitude towards the Sustainability of Different Food Categories. *Foods, 9*(11), 1608.
- Sancho Uriarte, P., Cirarda Larrea, F. B., & Valcárcel Alonso, S. (2014). Características nutricionales de los menús escolares en Bizkaia (País Vasco, España) durante el curso

- 2012/2013 [Nutritional characteristics of school lunch menus in Biscay (Basque Country, Spain) in 2012/2013]. *Nutricion hospitalaria*, 31(3), 1309–1316.
- Schmidhuber, J., & Traill, W. B. (2006). The changing structure of diets in the European Union in relation to healthy eating guidelines. *Public health nutrition*, 9(5), 584–595.
- Serra, L., & Aranceta, J. (2011). Objetivos nutricionales para la población española: consenso de la Sociedad Española de Nutrición Comunitaria [Nutritional objectives for the Spanish population: consensus of the Spanish Society of Community Nutrition]. *Revista española de nutrición comunitaria*, 17, 178-199.
- Shangguan, S., Afshin, A., Shulkin, M., Ma, W., Marsden, D., Smith, J., Saheb-Kashaf, M., Shi, P., Micha, R., Imamura, F., Mozaffarian, D., & Food PRICE (Policy Review and Intervention Cost-Effectiveness) Project (2019). A Meta-Analysis of Food Labeling Effects on Consumer Diet Behaviors and Industry Practices. *American journal of preventive medicine*, 56(2), 300–314.
- Sharkey, J. R., & Horel, S. (2008). Neighborhood socioeconomic deprivation and minority composition are associated with better potential spatial access to the ground-truthed food environment in a large rural area. *The Journal of nutrition*, 138(3), 620–627.
- Sharkey, J. R., Johnson, C. M., & Dean, W. R. (2010). Food access and perceptions of the community and household food environment as correlates of fruit and vegetable intake among rural seniors. *BMC geriatrics*, 10, 32.
- Shen, J., Wilmot, K. A., Ghasemzadeh, N., Molloy, D. L., Burkman, G., Mekonnen, G., Gongora, M. C., Quyyumi, A. A., & Sperling, L. S. (2015). Mediterranean Dietary Patterns and Cardiovascular Health. *Annual review of nutrition*, 35, 425–449.
- Shokeen, D., & Aeri, B. T. (2020). What We Eat and Where We Work Is What We Become: Worksite Food Environment Exposure and Cardio-Metabolic Health among Employed Adults of Urban Delhi, India. *Journal of nutritional science and vitaminology*, 66(Supplement), S32–S35.
- Sita, C., Sachita, S., Mausumi, B., & Misra, R. (2018). A study on cardiovascular disease risk factors among faculty members of a tertiary care teaching institute of Kolkata. *The journal of community health management*, 5, 67–71.
- Sociedad Española de Nutrición Comunitaria [Spanish Society of Community Nutrition]. (2004). *Guía de la alimentación saludable [Guide to healthy eating]*. <https://www.nutricioncomunitaria.org/es/noticia/guia-de-alimentacion-saludablesenc>

- Solberg, S. L., Terragni, L., & Granheim, S. I. (2016). Ultra-processed food purchases in Norway: a quantitative study on a representative sample of food retailers. *Public health nutrition, 19*(11), 1990–2001.
- Song, H. J., Gittelsohn, J., Kim, M., Suratkar, S., Sharma, S., & Anliker, J. (2009). A corner store intervention in a low-income urban community is associated with increased availability and sales of some healthy foods. *Public health nutrition, 12*(11), 2060–2067.
- Soon, J. M., & Manning, L. (2017). “May Contain” Allergen Statements: Facilitating or Frustrating Consumers?. *Journal of Consumer Policy, 40*, 447–472.
- Speber, A. D. (2004). Translation and validation of study instruments for cross-cultural research. *Gastroenterology, 126*, S124-S128.
- Stanton, R.A. (2015). Food Retailers and Obesity. *Current obesity reports, 4*, 54–59.
- Stark, J. H., Neckerman, K., Lovasi, G. S., Konty, K., Quinn, J., Arno, P., Viola, D., Harris, T. G., Weiss, C. C., Bader, M. D., & Rundle, A. (2013). Neighbourhood food environments and body mass index among New York City adults. *Journal of epidemiology and community health, 67*(9), 736–742.
- Stea, T. H., Nordheim, O., Bere, E., Stornes, P., & Eikemo, T. A. (2020). Fruit and vegetable consumption in Europe according to gender, educational attainment and regional affiliation-A cross-sectional study in 21 European countries. *PloS one, 15*(5), e0232521.
- Stead, M., MacKintosh, A. M., Findlay, A., Sparks, L., Anderson, A. S., Barton, K., & Eadie, D. (2017). Impact of a targeted direct marketing price promotion intervention (Buywell) on food-purchasing behaviour by low income consumers: a randomised controlled trial. *Journal of human nutrition and dietetics, 30*(4), 524–533.
- Steenhuis, I. H., Van Assema, P., & Glanz, K. (2001). Strengthening environmental and educational nutrition programmes in worksite cafeterias and supermarkets in The Netherlands. *Health promotion international, 16*(1), 21–33.
- Story, M., Kaphingst, K. M., Robinson-O'Brien, R., & Glanz, K. (2008). Creating healthy food and eating environments: policy and environmental approaches. *Annual review of public health, 29*, 253–272.
- StudyCorgi (2020). *Norway and Spain: Intercultural Difference*. <https://studycorgi.com/norway-and-spain-intercultural-difference/>
- Swinburn, B., Sacks, G., Vandevijvere, S., Kumanyika, S., Lobstein, T., Neal, B., Barquera, S., Friel, S., Hawkes, C., Kelly, B., L'abbé, M., Lee, A., Ma, J., Macmullan, J., Mohan, S., Monteiro, C., Rayner, M., Sanders, D., Snowdon, W., Walker, C., ... INFORMAS (2013).

- INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): overview and key principles. *Obesity reviews*, 14 Suppl 1, 1-12.
- Tam, R., Yassa, B., Parker, H., O'Connor, H., & Allman-Farinelli, M. (2017). University students' on-campus food purchasing behaviors, preferences, and opinions on food availability. *Nutrition*, 37, 7-13.
- Tamim, H., Tamim, R., Almawi, W., Rahi, A., Shamseddeen, W., Ghazi, A., Taha, A., & Musharrafieh, U. (2006). Risky weight control among university students. *The International Journal of Eating Disorders*, 39, 80-83.
- Temple, N. J. (2020). Front-of-package food labels: A narrative review. *Appetite*, 144, 104485.
- Thow, A. M., Jan, S., Leeder, S., & Swinburn, B. (2010). The effect of fiscal policy on diet, obesity and chronic disease: a systematic review. *Bulletin of the World Health Organization*, 88(8), 609-614.
- Torheim, L. E., Løvhaug, A. L., Huseby, C. S., Terragni, L., Henjum, S., & Roos G (2020). *The Healthy Food Environment Policy Index (FOOD-EPI). Evidence document for Norway. Food-EPI 2020. OsloMet - Oslo Metropolitan University.* <https://www.jpipen.eu/images/reports/Food-EPI-Evidence-Norway-2020.pdf>
- Truill, W. B., Mazzocchi, M., Shankar, B., & Hallam, D. (2014). Importance of government policies and other influences in transforming global diets. *Nutrition reviews*, 72(9), 591-604.
- Tseng, M., DeGreef, K., Fishler, M., Gipson, R., Koyano, K., & Neill, D. B. (2016). Assessment of a University Campus Food Environment, California, 2015. *Preventing chronic disease*, 13, E18.
- Tsouros, A. D., Dowding G., Thompson J., & Dooris M. (1998). *Health promoting universities. Concept, experience and framework for action.* WHO Regional Office for Europe. <https://apps.who.int/iris/bitstream/handle/10665/108095/9789289012850-eng.pdf?sequence=1&isAllowed=y>
- Turner, C., Aggarwal, A., Walls, H., Herforth, A., Drewnowski, A., Coates, J., Kalamatianou, S., & Kadiyala, S. (2018). Concepts and critical perspectives for food environment research: A global framework with implications for action in low- and middle-income countries. *Global Food Security*, 18, 93-101.

- United States Department of Agriculture, Agricultural Research Service. (2019). *FoodData Central*. <https://fdc.nal.usda.gov/>
- United States Department of Health and Human Services, & United States Department of Agriculture. (2015). *2015 – 2020 Dietary Guidelines for Americans. 8th Edition*. <https://health.gov/our-work/food-nutrition/previous-dietary-guidelines/2015>
- University of California, Global Food Initiative. (2018). *UC Healthy Vending Policy. Implementation & Best Practices Toolkit*. https://www.ucop.edu/global-food-initiative/_files/uc-healthy-vending-toolkit-final-for-dissemination.pdf
- University of the Basque Country – UPV/EHU. (2017). *UPV/EHU en cifras, curso académico 2016/17 [UPV/EHU in figures, academic course 2016/17]*. <http://www.ehu.es/zenbakitan/es/>
- University of the Basque Country – UPV/EHU. (2019). *Solicitud de Expediente – Anexos. Pautas e Instrucciones. Ley 9/2017 de Contratos del Sector Público*. <https://www.ehu.es/documents/1180425/10189353/2.12.20+Pautas+e+Instrucciones.pdf/5f2515eb-12bf-9744-fc16-d8fd41cbcde8?t=1606907347257>
- Vadeboncoeur, C., Townsend, N., & Foster, C. (2015). A meta-analysis of weight gain in first year university students: is freshman 15 a myth?. *BMC obesity*, 2, 22.
- Van Kappel, A., Amoyel, J., Slimani, N., Vozar, B., & Riboli, E. (1994). *EPICSOFT picture book for estimation of food portion sizes*. International Agency for Research on Cancer.
- Vaz Velho, M., Pinheiro, R., Rodriguez, S. (2016). The Atlantic Diet – Origin and features. *International Journal of Food Studies*, 5, 106–119.
- Velazquez, C. E., Black, J. L., & Potvin Kent, M. (2017). Food and Beverage Marketing in Schools: A Review of the Evidence. *International journal of environmental research and public health*, 14(9), 1054.
- Versus. (n.d.). *Norway vs Spain. Quality_of_living*. https://versus.com/en/norway-vs-spain#group_quality_of_living
- Viana, J., Leonard, S. A., Kitay, B., Ansel, D., Angelis, P., & Slusser, W. (2018). Healthier vending machines in a university setting: Effective and financially sustainable. *Appetite*, 121, 263–267.
- Vine, M. M., Harrington, D. W., Butler, A., Patte, K., Godin, K., & Leatherdale, S. T. (2017). Compliance with school nutrition policies in Ontario and Alberta: An assessment of secondary school vending machine data from the COMPASS study. *Canadian journal of public health*, 108(1), e43–e48.

- Voelker, D. K., Reel, J. J., & Greenleaf, C. (2015). Weight status and body image perceptions in adolescents: current perspectives. *Adolescent Health, Medicine and Therapeutics, 6*, 149–158.
- von Bothmer, M. I., & Fridlund, B. (2005). Gender differences in health habits and in motivation for a healthy lifestyle among Swedish university students. *Nursing & health sciences, 7*(2), 107–118.
- Waterlogic. (2019). *Hydration in the Workplace. Report 19/20.*
https://www.waterlogic.com/fileadmin/user_upload/PDF/hydration-report.pdf
- Wansink, B., Payne, C. R., & Shimizu, M. (2010). “Is this a meal or snack?” Situational cues that drive perceptions. (1), 214–216.
- Watanabe-Ito, M., Kishi, E., & Shimizu, Y. (2020). Promoting Healthy Eating Habits for College Students Through Creating Dietary Diaries via a Smartphone App and Social Media Interaction: Online Survey Study. *JMIR mHealth and uHealth, 8*(3), e17613.
- Waterlander, W. E., de Boer, M. R., Schuit, A. J., Seidell, J. C., & Steenhuis, I. H. (2013). Price discounts significantly enhance fruit and vegetable purchases when combined with nutrition education: a randomized controlled supermarket trial. *The American journal of clinical nutrition, 97*(4), 886–895.
- Whatnall, M. C., Ng, H. S., Liau, C. Y., Patterson, A. J., & Hutchesson, M. J. (2020a). What is the nutritional value of food and drinks sold in vending machines at an Australian university? A food environment audit study. *Nutrition & Dietetics, 77*(5), 550–552.
- Whatnall, M. C., Patterson, A. J., & Hutchesson, M. J. (2020b). Effectiveness of Nutrition Interventions in Vending Machines to Encourage the Purchase and Consumption of Healthier Food and Drinks in the University Setting: A Systematic Review. *Nutrients, 12*(3), 876.
- Wickramasekaran, R. N., Robles, B., Dewey, G., & Kuo, T. (2018). Evaluating the Potential Health and Revenue Outcomes of a 100% Healthy Vending Machine Nutrition Policy at a Large Agency in Los Angeles County, 2013-2015. *Journal of public health management and practice, 24*(3), 215–224.
- Wilkins, E., Radley, D., Morris, M., Hobbs, M., Christensen, A., Marwa, W. L., Morrin, A., & Griffiths, C. (2019). A systematic review employing the GeoFERN framework to examine methods, reporting quality and associations between the retail food environment and obesity. *Health & place, 57*, 186–199.

- Williams, M. B., Wang, W., Taniguchi, T., Salvatore, A. L., Groover, W. K., Wetherill, M., Love, C., Cannady, T., Grammar, M., Standridge, J., Fox, J., & Jernigan, V. (2020). Impact of a Healthy Retail Intervention on Fruits and Vegetables and Total Sales in Tribally Owned Convenience Stores: Findings From the THRIVE Study. *Health promotion practice*. Advance online publication.
- Wills, W., Danesi, G., Kapetanaki, A. B., & Hamilton, L. (2019). Socio-Economic Factors, the Food Environment and Lunchtime Food Purchasing by Young People at Secondary School. *International Journal of Environmental Research and Public Health*, 16(9), 1605.
- World Health Organization – WHO. (2003). *Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation*. http://apps.who.int/iris/bitstream/handle/10665/42665/WHO_TRS_916.pdf;jsessionid=895E97C9C60EA6F043BEB1121C6BF974?sequence=1
- World Health Organization – WHO. (2020, June 9). *Obesity and Overweight*. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
- Yale University Green Purchasing. (2011) <http://www.yale.edu/procurement/greenPurchase/Events/CateringEvents.htm>
- Zazpe, I., Marqués, M., Sánchez-Tainta, A., Rodríguez-Mourille, A., Beunza, J. J., Santiago, S., & Fernández-Montero, A. (2013). Hábitos alimentarios y actitudes hacia el cambio en alumnos y trabajadores universitarios españoles [Eating habits and attitudes towards change in Spanish university students and workers]. *Nutricion Hospitalaria*, 28(5), 1673–1680.

APPENDICES

Appendix I. Form for the registration and analysis of data on the offer of commercial products in cafeterias/canteens and the supermarket at the UPV/EHU.

FORM FOR THE REGISTRATION OF DATA: Commercial products in cafeterias/canteens and supermarket

Date:/...../..... **Hour:** **Campus:** (1) Araba/Álava (2) Bizkaia (3) Gipuzkoa **Centre:**

Name of the company:

Name of the person who fulfils this form:

Description	Products		Price (€)	Ingredients (ordered according to quantity)	Ingredient percentage (if available)	Nutritional labelling								
	Net weight (units)	Brand				Energy (kcal)	Fats (g)	SFAs (g)	Sugars (g)	Salt (g)	Other nutrients (units)			

Abbreviations: SFA, saturated fatty acids.

Appendix II. Form for the registration and analysis of data on the offer of food and drinks in vending machines at the UPV/EHU.

FORM FOR THE REGISTRATION OF DATA: Vending machines

Date:/...../..... **Hour:** **Campus:** (1) Araba/Álava (2) Bizkaia (3) Gipuzkoa **Centre:**

Type of machine: (1) Mixed (2) Cold drinks (3) Hot drinks (4) Hot food **No. of rows:** **No. of columns:**

Name of the company: **Physical location of the vending machine:**

Name of the person who completes this form:

Products Description	Net weight (units)	Price (€)	Location in the machine	Ingredients (ordered according to quantity)	Ingredient percentage (if available)	Nutritional labelling				
						Energy (kcal)	Fats (g)	SFAs (g)	Sugars (g)	Salt (g)
			Row	Column						

Abbreviations: SFA, saturated fatty acids.

Appendix III. Classification of the home-made foods.

Classification ^a	
Snacks	1. Mini pizzas
	2. Portions <ul style="list-style-type: none"> 2.1. Olives 2.2. Croquettes 2.3. Chicken nuggets 2.4. Fried potatoes 2.5. Others
	3. Small servings <ul style="list-style-type: none"> 3.1. Small sub-sandwich of serrano ham 3.2. Small portion of tortilla 3.3. Other small servings
	4. Sweet snacks <ul style="list-style-type: none"> 4.1. Cakes
Meals	5. Combination plates
	6. Hamburgers
	7. Menu of the day ^b <ul style="list-style-type: none"> 7.1. <i>Starter</i> <ul style="list-style-type: none"> 7.1.1 Legumes 7.1.2. Pasta 7.1.3. Rice 7.1.4. Vegetables (potato included) 7.1.5. Others 7.2. <i>Main course</i> <ul style="list-style-type: none"> 7.2.1. Egg 7.2.2. Fish 7.2.3. Meat 7.2.4. Others 7.3. <i>Side dish</i> <ul style="list-style-type: none"> 7.3.1. Fried potatoes 7.3.2. Varied salads 7.3.3. Others like cooked potatoes, vegetables, etc. 7.4. <i>Desserts</i> <ul style="list-style-type: none"> 7.4.1. Dairy desserts <ul style="list-style-type: none"> 7.4.1.1. Ice cream 7.4.1.2. Sweet dairy desserts (e.g., flan, custard, curd) 7.4.1.3. Yoghurt 7.4.2. Non-dairy desserts <ul style="list-style-type: none"> 7.4.2.1. Fruit 7.4.2.2. Sweet desserts (e.g., cakes, pastries)
	8. Pizzas
	9. Salads
	10. Sandwiches <ul style="list-style-type: none"> 10.1. Hot sandwiches 10.2. Cold sandwiches
	11. Sub sandwiches <ul style="list-style-type: none"> 11.1. Hot sub sandwiches 11.2. Cold sub sandwiches 11.3. Mixed sub sandwiches

Continuation of Appendix III.

Classification ^a	
Cold drinks	12 Natural fruit juice
Hot drinks	13. Broths
	14. Coffee
	14.1. Coffee with a little milk
	14.2. Coffee with a little soy drink
	14.3. Coffee with milk
	14.4. Coffee with soy drink
	14.5. Decaffeinated coffee with a little milk
	14.6. Decaffeinated coffee with a little soy drink
	14.7. Decaffeinated coffee with milk
	14.8. Decaffeinated coffee with soy drink
	14.9. Long coffee
	14.10. Long decaffeinated coffee
	14.11. Milk with a little coffee
	14.12. Milk with a little decaffeinated coffee
	14.13. Short coffee
	14.14. Short decaffeinated coffee
	14.15. Soy drink with a little coffee
	14.16. Soy drinks with a little decaffeinated coffee
	15. Hot chocolate
	15.1. Hot chocolate
	15.2. Milk with cocoa powder
	15.3. Soy drink with cocoa powder
	16. Hot milk
	16.1. Lactose free milk
	16.2. Milk
	17. Infusions
	17.1. Infusions with theine
	17.2. Infusions without theine
	18. Vegetable drinks
	18.1. Soy drink

Note: ^aClassification based on the “Consensus Document on Food in Educational Centres” of AECOSAN (AECOSAN. (2010). *Documento de consenso sobre la alimentación en los centros educativos [Consensus document on food in educational centres]*. Ministerio de Educación, & Ministerio de Sanidad, Política Social e Igualdad [Ministry of Education, & Ministry of Health, Social Policy and Equality]); ^bBased on the “Healthy Eating Guide” (Sociedad Española de Nutrición Comunitaria [Spanish Society of Community Nutrition]. (2004). *Guía de la alimentación saludable [Guide to healthy eating]*).

Appendix IV. Form to register and analyse data on the offer of home-made products in cafeterias/restaurants/canteens at the UPV/EHU.

**FORM FOR THE REGISTRATION OF DATA: Home-products in
cafeterias/restaurants/canteens**

Date: / / **Hour:** **Campus:** (1) Araba/Álava (2) Bizkaia (3) Gipuzkoa
Centre:

Name of the company:

Name of the person who fulfils this form:

Products		Price (€)	Ingredients (ordered according to quantity)
Description	Net weight (units)		

Appendix V. Classification of the commercial food.

Classification ^a		
Solid foods	1. Cereals and cereals products	1.1. <i>Bread</i>
		1.1.1. Baguette
		1.1.2. Sliced bread
		1.1.3. Toasted bread
		1.1.4. Whole wheat bread
		1.2. <i>Cereals (breakfast cereals, pasta, etc.)</i>
		1.2.1. Corn
		1.2.2. Rice
		1.2.3. Pasta
		1.3. <i>Flour and breadcrumbs</i>
	1.3.1. Breadcrumbs	
	1.3.2. Wheat flour	
	3. Cold cuts and others	2.1. Cheese
		2.2. Chicken breast
		2.3. Ham
		2.4. Lacon
		2.5. Sausage (e.g., chorizo, fuet)
		2.6. Salami
		2.7. Serrano ham
		2.8. Smoked salmon
		2.9. Turkey breast
2.10. Pâté		
2.11. Pork tenderloin		
3. Convenience foods	3.1. Pizza	
	3.2. Pre-cooked plates	
	3.3. Unprepared soups	
4. Dairy products	4.1. <i>Yoghurt</i>	
	4.1.1. Flavoured yoghurt with added sugar	
	4.1.2. Flavoured yoghurt with sweeteners	
	4.1.3. Greek yoghurt	
	4.1.4. Natural yoghurt with added sugars	
	4.1.5. Natural yoghurt with sweeteners	
	4.1.6. Natural yoghurt without added sugars or sweeteners	
	4.1.7. Yoghurt with cereals	
	4.2. <i>Other dairy products</i>	
	4.2.1. Chocolate cup	
	4.2.2. Crème caramel	
	5.2.3. Rice with milk	
	4.2.4. Cottage cheese	
	4.2.5. Porridge with added sugars	
4.2.6. Porridge with sweeteners		
4.2.7. Porridge without added sugars		
4.2.8. Protein bars		
4.2.9. Pudding		
4.2.10. Rice pudding with added sugars		
4.2.11. Rice pudding with sweeteners		

Continuation of Appendix V.

Classification ^a		
Solid foods	5. Drink products (not ready to drink)	5.1. <i>Cocoa powder</i> 5.1.1. Cocoa powder with added sugars 5.2. <i>Coffee products</i> 5.3. <i>Infusions</i> 5.3.1. Tea 5.3.2. Tea with lemon 5.3.3. Other infusions
	6. Fish	6.1. Canned fish
	7. Fruit	7.1. Canned fruit 7.2. Dried fruit 7.3. Fresh fruit 7.4. Fruit purée 7.5. Jam
	8. Legumes	8.1. Canned legumes 8.2. Derived from legumes 8.3. Lentils 8.4. Peas
	9. Meat and meat products	9.1. Chicken 9.2. Meat derivate 9.3. Pork
	10. Nuts	10.1. Fried nuts with salt 10.2. Fried nuts without salt 10.3. Natural or toasted nuts with salt 10.4. Natural or toasted nuts without salt
	11. Salads	
	12. Salty snacks	12.1. Bakery products (e.g., breadsticks) 12.2. Chips 12.3. Crackers 12.4. Extruded snacks (i.e., “Doritos”) 12.5. Fried corn 12.6. Olives 12.7. Other bakery products (e.g., empanadilla) 12.8. Rice/corn cakes
	13. Sandwiches	13.1. Cold sandwiches 13.2. Hot sanwiches
	14. Sauce	14.1. Tomato sauce 14.2. Other sauces
	15. Sweet snacks	15.1. Bakery and pastry 15.2. Biscuits 15.3. Breakfast cereals 15.4. Cereal bars 15.5. Chocolate 15.6. Chocolate bars

Continuation of Appendix V.

Classification ^a		
Solid foods	15. Sweet snacks	15.7. Cocoa cream 15.8. Ice cream 15.9. Jellybeans 15.10. Mix of grains
	16. Sweets and chewing gums	16.1. Candies with added sugars 16.2. Candies with sweeteners 16.3. Chewing gums with added sugars 16.4. Chewing gums with sweeteners
	17. Vegetables	17.1. Fresh vegetables 17.2. Canned vegetables
Culinary ingredients	18. Dairy products	18.1. Cooking cream 18.2. Condensed milk 18.3. Evaporated milk 18.4. Grated or powdered cheese 18.5. Milk powder
	19. Edible oils and emulsions	19.1. Butter 19.2. Olive oil 19.3. Sunflower oil
	20. Salt	
	21. Spices and herbs	21.1. Curry 21.2. Paprika 21.3. Parsley 21.4. Pepper 21.5. Saffron 21.6. Spicy paprika
	22. Sweeteners	22.1. Honey 22.2. Sugar 22.3. Sweetener
	24. Other culinary ingredients	24.1. Bicarbonate of soda 24.2. Brewer's yeast 24.3. Salad dressing
Cold drinks	25. Beer	25.1. Alcohol-free beer 25.2. Beer with alcohol 25.3. Other beers
	26. Bottled water	
	27. Carbonated drinks	27.1. Carbonated drinks with added sugars 27.2. Carbonated drinks with added sugars and sweeteners

Continuation of Appendix V.

Classification ^a		
Cold drinks	27. Carbonated drinks	27.3. Carbonated drinks with juices 27.4. Carbonated drinks with sweeteners 27.5. Carbonated drinks without sugars or sweeteners 27.6. Soda
	28. Dairy drinks	28.1. Cappuccino shake 28.2. Chocolate shake 28.3. Coffee with milk 28.4. Decaffeinated cappuccino 28.5. Decaffeinated coffee with a little milk 28.6. Decaffeinated coffee with milk 28.7. Fruit milkshake 28.8. Iced coffee 28.9. Mocha shake
	29. Juices	29.1. Fruit concentrated juices 29.2. Fruit juice and milk drinks 29.3. Fruit nectars 29.4. Smoothie 29.5. Vegetable juices
	30. Milk	
	31. Non-carbonated drinks	31.1. Isotonic drinks 31.2. Non-carbonated drinks with added sugars 31.3. Non-carbonated drinks with added sugars and sweeteners 31.4. Non-carbonated drinks with sweeteners 31.5. Soft drinks with juice 31.6. Unfermented grape juice
	32. Other alcoholic drinks	32.1. Cava 32.2. Cider 32.3. Cocktail (e.g., Kalimotxo) 32.4. Red wine 32.5. Rosé wine 32.6. Sweet wine 32.7. Txakoli 32.8. White wine
	33. Vegetable drinks	33.1. Oat drink 33.2. Soy drink

Note: ^aAdaptation of the AECOSAN classification (AECOSAN. (2010). *Documento de consenso sobre la alimentación en los centros educativos [Consensus document on food in educational centres]*. Ministerio de Educación, & Ministerio de Sanidad, Política Social e Igualdad [Ministry of Education, & Ministry of Health, Social Policy and Equality]) and the Global Food Monitoring Group categorisation system (Dunford, E., Webster, J., Metzler, A. B., Czernichow, S., Ni Mhurchu, C., Wolmarans, P., Snowdon, W., L'Abbe, M., Li, N., Maulik, P. K., Barquera, S., Schoj, V., Allemandi, L., Samman, N., de Menezes, E. W., Hassell, T., Ortiz, J., Salazar de Ariza, J., Rahman, A. R., de Núñez, L., ... Food Monitoring Group (2012). International collaborative project to compare and monitor the nutritional composition of processed foods. *European journal of preventive cardiology*, 19(6), 1326–1332).

Appendix VI. Menu of the week from March 27 to 31 (2017) of the Leioa Cooking School (Campus of Bizkaia) – spring/ summer season^a.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
STARTER	Poultry salad Carbonara pasta Green beans with potatoes	Mixed salad White beans with clams and shrimp Zucchini stuffed with ham and cheese	Caesar salad Rice with vegetables Swiss chard with potatoes	Orange, fresh cheese and endive salad Minestrone soup Hawaiian pizza	Russian salad Canelloni Rossini Stew with sauce
MAIN COURSE	Carbonada Hake in green sauce Grilled whiting with sauce and steamed potatoes	Turkey thighs braised with vegetables Orly hake with tartar sauce Chilindrón chicken	Pork escalope stuffed with spinach cream Fried flounder with salad Tartlet of cod with garlic (<i>ajoarriero</i>)	Yearling battered with peppers (<i>piperrada</i>) Horse-mackerel in Bilbao style sauce Roasted garlic chicken breast	Roasted pork rib with baked potato Tuna in tomato sauce Yearling villaroy with lettuce salad
DESSERT	Bavarian chocolate cake Cream puff Cream and truffle gypsy arm Seasonal fruit Fruit slup Plain yoghurt	Coffee cream cake Coconut pudding Peach Melba Seasonal fruit Fruit slup Plain yoghurt	Rice cake Butter cream pie Sweet fritter Seasonal fruit Fruit slup Plain yoghurt	Cream and strawberries gypsy arm Puff pastry Rice pudding Seasonal fruit Fruit slup Plain yoghurt	Apple band Goxua Cream and yolk cake Seasonal fruit Fruit slup Plain yoghurt

Note: ^aEscuela de Hosteleria de Leioa [Cooking School of Leioa]. (2015). [http:// www.hostelerialeioa.net/es/index](http://www.hostelerialeioa.net/es/index)

Appendix VII. Menu of the week from November 20 to 24 (2017) of the Leioa Cooking School (Campus of Bizkaia) – autumn/winter season^a.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
STARTER	Pasta salad with walnuts Cuban style rice Green beans with potatoes	Mixed salad Red beans Leek pudding	Txopitea salad Potatoes in green sauce Galician chard	Russian salad Noodles with vegetables, chicken and soy sauce Fish soup	Poultry salad Meat cannelloni Peppers stuffed with fish
MAIN COURSE	Carbonada Hake in green sauce Grilled whiting with sauce and steamed potatoes	Braised chicken with potatoes and cherry tomatoes Cod with vegetable hash (<i>pisto</i>) and Biscayan sauce Pork chop with vinaigrette, potatoes and mayonnaise tomato	Pork escalope stuffed with spinach cream Horse-mackerel in Bilbao style sauce Chilindron chicken	Braised rounded beef with vegetables Fried trout with lettuce Peppers stuffed with meat	Breaded turkey breast with cheese sauce and roasted potatoes Tuna in tomato sauce Roasted rabbit with potatoes and fine herb aioli
DESSERT	Bavarian chocolate cake Cream gypsy arm Cream puff Seasonal fruit Fruit slup Plain yoghurt	Caramel custard Chocolate cake Butter cream pie Seasonal fruit Fruit slup Plain yoghurt	Sweet fritter Truffle and cream cake Kiwi band Seasonal fruit Fruit slup Plain yoghurt	Chocolate crème caramel Pineapple cake Chocolate gypsy arm Seasonal fruit Fruit slup Plain yoghurt	Cream and yolk cake Puff pastry Fruit salad Seasonal fruit Fruit slup Plain yoghurt

Note: ^aEscuela de Hostelería de Leioa [Cooking School of Leioa]. (2015). <http://www.hostelerialeioa.net/es/index>

Appendix VIII. Menu of the week from March 27 to 31 (2017) of the Garai Baserria cafeteria (Campus of Bizkaia) – spring/summer season^a.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
STARTER	Mixed salad Lentils Rice with beef cutlet Carbonara pasta Steamed green beans Sautéed cauliflower Bilbao style vegetable hash (<i>pisto</i>)	Mixed salad White beans Three delights fried rice Home-made pasta Steamed broccoli Leeks with ham Puff pastry stuffed with vegetables and tuna in <i>piquillo</i> pepper sauce	Mixed salad Toulouse beans Pasta with tuna and prawns Paella Steamed cabbages Vegetable soup Sautéed artichokes	Mixed salad White beans with pumpkin Rice with mushrooms and chicken Meat lasagne Vegetables cream Sautéed thistle Grilled zucchini	Mixed salad Pinto beans Cuban style rice Pasta with tomato sauce Grilled mushrooms Gratinéed vegetables Thistle with serrano ham
MAIN COURSE	Roasted chicken Breaded beef steak in sauce Grilled salmon Omelette with tuna	Roasted chicken Rabbit with garlic Grilled horse mackerel Fried eggs with bacon	Roasted chicken Stewed beef Bilbao style red sea scorpion fish Spanish omelette	Roasted chicken Roasted loin with orange Bilbao style horse-mackerel Scrambled eggs with garlic and prawns	Roasted chicken Braised turkey Breaded beef steak in sauce Grilled salmon
DESSERT	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding

 Note: ^aBaserria. (n.d.). *Menu del día* [Menu of the day]. <https://www.baserria.net/es/>

Appendix IX. Menu of the week from November 27 to December 1 (2017) of the Garai Baserria cafeteria (Campus of Bizkaia) – autumn/winter season^a.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
STARTER	Mixed salad White beans with mushrooms and shrimp Rice with beef Carbonara pasta Green beans with serrano ham Vegetable cream Cauliflower gratiné with coriander	Mixed salad Chickpea stew Paella Mexican pasta Steamed thistle Sautéed vegetables with soy and honey Collard greens with serrano ham	Mixed salad Legumes cream Chicken rice Meat lasagne Steamed broccoli Grilled zucchini Crepes stuffed with York and Roquefort	Mixed salad Lentils Seafood rice Sautéed pasta with York and bacon Onion rings Sautéed artichokes Puff pastry stuffed with vegetables with piquillo pepper sauce	Mixed salad Chickpeas with cod and spinach Cuban style rice Granma-style pasta Grilled asparagus Sautéed vegetables with serrano ham Artichokes sautéed with curry
MAIN COURSE	Roasted chicken Poultry pancake with curry sauce Red mullet steak with vegetables Eel and prawn omelette	Roasted chicken Veal round with red wine Bilbao style sea bass Scrambled eggs	Roasted chicken Breaded pork fillet with peppers Bilbao style trout Fried eggs with Frankfurt sausage	Roasted chicken Meatballs in sauce Gratinéed red sea scorpion fish fillet Scrambled eggs with mushrooms	Roasted chicken Cochifrito Bilbao style sea bass Spanish omelette with York and cheese
DESSERT	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard Junket Rice pudding

Note: ^aBaserria. (n.d.). *Menu del día [Menu of the day]*. <https://www.baserria.net/es/>

Appendix X. Menu of the week from March 27 to 31 (2018) of the canteen of the University Pavilion (Campus of Araba) - spring/summer season^a.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
STARTER	Russian salad Paella Spinach cream	Mixed salad Widowed lentils Broccoli with potato	Varied salad Chickpeas Collard greens with potato	Mixed salad Red beans Mushroom cream	Varied salad Pasta with chorizo Green beans with potatoes
MAIN COURSE	Grilled chicken breast Cod croquettes	Pork loin in sauce Baked sole	Meat with tomato John dory breaded	Turkey Rotti Eggs with bacon	Roasted rib Roasted dab
DESSERT	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard	Seasonal fruit Plain yoghurt Flavoured yoghurt Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Crème caramel	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard	Seasonal fruit Plain yoghurt Flavoured yoghurt Crème caramel

Note: ^aUniversity of the Basque Country – UPV/EHU. (n.d.). *Otros servicios en el Campus de Álava. [Other services on the Alava Campus]*. https://www.ehu.es/es/web/araba/beste-zerbitzu-batzuk/-/asset_publisher/0GzL/content/info_otros-servicios-comedores

Appendix XI. Menu of the week from November 20 to 24 (2017) of the canteen of the University Pavilion (Campus of Araba) – autumn/winter season^a.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
STARTER	Mixed salad Cuban style rice Zucchini cream	Mixed salad Red beans Potato with bechamel	Mixed salad Meat cannelloni Vegetable soup	Mixed salad Potatoes with chorizo Spinach cream	Mixed salad Lentils Vegetables cream
MAIN COURSE	Burger in sauce Sole battered	Roasted chicken Southern blue whiting battered	Roasted leg pork Dab with vinaigrette	Sausages with tomato Breaded sole	Chicken breast Omelette
DESSERT	Seasonal fruit Plain yoghurt Flavoured yoghurt Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard	Seasonal fruit Plain yoghurt Flavoured yoghurt Crème caramel	Seasonal fruit Plain yoghurt Flavoured yoghurt Rice pudding	Seasonal fruit Plain yoghurt Flavoured yoghurt Custard

Note: ^aUniversity of the Basque Country – UPV/EHU. (n.d.). *Otros servicios en el Campus de Álava. [Other services on the Alava Campus]*. https://www.ehu.eus/es/web/araba/beste-zerbitzu-batzuk/-/asset_publisher/0GzL/content/info_otros-servicios-comedores



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