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On-campus food purchase behaviors, choice determinants, and opinions on food availability in a Spanish university community



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ABSTRACT

Objective: The aim of this study was to investigate food purchasing behaviors, choice determinants, and opinions about on-campus food availability by a university community and to analyze differences in these aspects between students, education and/or research staff (ERS), and administrative and services staff (ASS), and between males and females.

Methods: This was a cross-sectional study that involved a representative sample of students (n = 1089), ERS (n = 396), and ASS (n = 300) who completed an anonymous online survey. A previously adapted version of the questionnaire was administered. The results were weighted to ensure representativeness of this community population using weighted coefficients.

Results: The results showed that most of the participants purchased food on campus (91.6%), especially for lunch (67.4% of foods and 37.4% of drinks) and snack (65.4% of foods and 45.4% of drinks). Hot drinks (i.e., coffee, tea, hot chocolate etc.; 60.5%), bottled water (49.2%), and hot foods (i.e., small servings [38.2%] and sandwiches/hamburgers [31.7%]) were the most purchased items. Taste (98.6%) was the most important determinant in choice, followed by price for students, nutritional value for ASS, and health value for ERS. The “top 5” opinions suggested for the campus food environment and potential changes were “greater capacity to access free filtered drinking water”, “greater capacity to recycle food packaging”, “more healthy options in vending machines”, “discounts for healthy choices,” and “allergen labeling.”

Conclusion: Interventions that improve sustainability and the affordability of products with high nutritional quality, price-manipulation directives, and allergen information on labeling would be well received among this community.

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Introduction

Overweight and obesity have become serious public health problems in the 21st century. Their prevalence is increasing considerably in all regions of the world [1], especially in Spain. Today, Spain is one of the European countries with the highest prevalence of obesity in adults [2]. According to the National Health Survey, in

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2017, 37.1% and 17.4% of the Spanish population were overweight and obese, respectively [3]. Although the basic drivers of obesity are obvious (e.g., calorie intake greater than calorie expenditure), the causes are multifactorial and complex. Over the past decade, studies exploring the influence of the food environment on dietary behaviors have significantly increased [4]. According to this evidence, food environments characterized by a low availability, accessibility, and affordability of products with high nutritional quality (HNQ), and aggressive marketing and advertisements of food/drinks with low nutritional quality (LNQ) have the potential to promote excessive food intake and contribute to weight gain [5].

In this sense, settings such as workplaces and schools provide practical opportunities for the implementation of comprehensive strategies and an appropriate infrastructure for the prevention of obesity and other nutrition-related diseases [6]. Universities are centers that have many employees and educate a growing number of students [7] who are at a high risk period for weight gain. Students experience an average gain of 1.36 kg within their first year of university due to changes in lifestyles, including physical activity and dietary behaviors, which can persist into later life [8,9]. Moreover, some studies indicate that university staff have a higher prevalence of overweight and obesity than the general population because of longer working hours and psychosocial factors [10] and were exposed to risk factors for various cardiovascular diseases (CVDs) [11]. Because students and staff typically spend a substantial amount of time on campus, as much as 5 to 30 h/wk, or even more, over many years, universities can be strategic settings for promoting a diet of HNQ. Universities can and should provide opportunities to change the community food environment to positively influence individual food choices by making the choice of HNQ the easy choice [12].

Evidence has shown associations between overweight/obesity among both university students and staff and eating behaviors of LNQ on campus [13–15]. Employees with overweight/obesity were more influenced by food choices available in on-campus dining facilities than those with normal weights [14]. Moreover, previous research suggests that many campus food environments are potentially obesogenic due to the high availability and promotion of energy-dense nutrient-poor foods [16,17]. The lack of options of HNQ, convenience, and cost are some of the determinants of food purchasing behaviors in adults [18,19].

The few studies that have been carried out to date on food purchasing, determinants of this purchase, and opinions on food availability on campus correspond to universities in Australia [20] and New Zealand [21]. Both studies observed that a majority purchased food or beverages on campus, which were determined by taste, value, and cost. Additionally, most suggested changes to the food environment aimed at the cost, healthfulness, and variety of the food supply [20,21]. To our knowledge, there are no studies on this topic in European universities. Because of the sociocultural differences between the students from the two Pacific countries just mentioned and European ones, the need to collect scientific data on this topic in European universities was determined. This study may lead to understanding whether there is a need to make changes in campus food environments to improve dietary habits.

The present study had a double objective. On the one hand, it aimed to determine food (referring to food and drinks) purchasing behaviors, choice determinants, and opinions about the food availability by students and staff of the University of the Basque Country (a public university located in northern Spain). On the other hand, it aimed to investigate differences in these aspects between university community groups (students, education and/or research staff [ERS], and administrative and services staff [ASS]) and

between sexes. The main advantage of the present study compared with other similar research [20,21] is that we analyzed a representative sample of university community groups. Considering that food choice behavior varies by factors (e.g., age, educational background, and socioeconomic status) [22] that, in turn, differ in university community groups, this study will provide an in-depth understanding of the nature of an organizational food environment, and whether they need to be modified to improve their dietary choices. Furthermore, the findings will inform the need for modification of the food environment and provide inputs to design effective interventions to improve the food environment in this and similar universities.

Material and methods

Study design and setting

A cross-sectional observational study was conducted to assess the food purchasing behaviors, choice determinants, and opinions of students and staff about the food availability across all three campuses of the University of the Basque Country (UPV/EHU).

Data collection and participants

Data were registered using an adapted version of the questionnaire developed and used by Tam et al. [20]. This instrument was divided into four sections: demographic characteristics, food purchasing behaviors, determinants, and opinions about the current campus food environment. Demographic items included sex, age, faculty associated with, working/study status (part time or full time), hours spent on campus, and for students, degree level (undergraduate or postgraduate). Food purchasing behavior questions ascertained motives for and frequency of purchasing different types of foods and drinks. Opinion items regarding the food environment 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 food environment and a 0–10 scale (*not at all satisfied to extremely satisfied*) to determine the satisfaction levels with the provision of foods and drinks on campus. The Tam et al. questionnaire was based on previously validated tools to ascertain motives for purchasing different types of food or beverage [23] and opinions regarding the food environment [24], and was pilot-tested by students at the University of Sydney using a modified Delphi process [25].

The adaptation of the Tam et al. questionnaire consisted in

- The exclusion of eight specific questions from the University of Sydney (questions 25–32); and
- The adaptation of four questions (questions 18–21) to reflect the environment in which the research was carried out.

In the latter sense, products that were not commonly consumed (e.g., hot ethnic cuisine, casserole/stew/roast/BBQ food/schnitzel, and sushi) were replaced by items that were commonly consumed in the current food environment (e.g., small servings, menu-starter, main course, and desserts). To know the usual food supply, before this study, the availability of food on campus was analyzed. Some of these results have been published elsewhere [26]. The English version of the instrument was translated into Spanish and Basque by using the double translation technique [27].

The transcultural adaptation and validation of the questionnaire were conducted through a pilot study with 10 students, 10 ERS and 10 ASS, in each language, before actual questionnaire distribution. Additionally, before piloting, the questionnaire was completed by five students, five ERS, five ASS, and five individuals who worked in food services, with demand for “debriefing” [28,29] and legibility [30]. In the pilot study, the internal consistency was evaluated for each subsection separately. Cronbach's α results were calculated for the food purchasing behaviors (Spanish version: 0.83, 95% confidence interval [CI], 0.73–0.91; Basque version: 0.77, 95% CI, 0.75–0.80), choice determinants (Spanish version: 0.78, 95% CI, 0.75–0.88; Basque version: 0.76, 95% CI, 0.73–0.86), and opinions about the food availability (Spanish version: 0.90, 95% CI, 0.84–0.95; Basque version: 0.88, 95% CI, 0.85–0.94).

The original questionnaire had 44 items, so the one applied in the present study had 36. Thirty-four questions were closed-ended, but the respondents had the opportunity to provide open-ended suggestions ($n = 2$) regarding improvements to the campus food environment. The category analysis of the open-ended questions was undertaken by two of the researchers independently and then jointly. This analysis was conducted by means of text analysis procedures [31]. 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, 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/drinks” (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).

The survey was self-administered and completed online using the application SurveyMonkey over 9 mo between February and October 2018. The survey was advertised on all three campuses through the centers (using notice boards and social networks) and the Sustainability Directorate of the UPV/EHU. All enrolled students and current staff (ERS and ASS) 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 that 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.

The sample was drawn according to the data on the number of students and staff enrolled or employed at the UPV/EHU [32], which was 50 080 (42 598 students, 5591 ERS, and 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; Table 1); 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 was 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 $\pm 5\%$, the 95% CI and $P = 0.05$, using the Epidat 3.0 program [33]. Finally, 1785 participants (396 ERS, 300 ASS, and 1089 students) were involved 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. Written informed consent was obtained from all participants.

Statistical analysis

Considering data from other studies [20,21], we hypothesized the following:

- Taste, cost, and convenience are the major drivers of food purchase;
- There is significant interest in the increased availability and affordability of products with HNQ, as well as the variety of foods; and
- Interventions that improve food prices and availability and affordability of food with HNQ would be well received among this community.

Moreover, there are differences in food purchase behaviors, choice determinants, and opinions on the food availability between university community groups (probably due to factors such as age, educational level, and socioeconomic status, among others).

The data were analyzed using IBM SPSS Statistics for Windows, version 26 (IBM, Armonk, NY, USA). 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 2016–2017 (Table 1) [32]. The results are expressed as percentages, and the differences were analyzed using the χ^2 test or Fisher's exact test. All analyses were conducted separately for male and female students because of the differences in their eating behaviors [34].

Table 1

Population and sample of the University of the Basque Country (UPV/EHU) by university community group and sex

University community groups	Sex	UPV/EHU* population n (%)	Theoretical sample n (%)	Real sample n (%)	Participation rate (%)	Weighting coefficient
Students	Women	19 879 (46.7)	377	665 (65.3)	3.3	29.9
	Men	22 719 (53.3)	378	354 (34.7)	1.6	64.2
	Total	42 598 (85)	381 (35.9)	1,019 (100)	2.4	41.8
ERS	Women	2929 (52.4)	340	231 (60.9)	7.9	12.7
	Men	2662 (47.6)	336	148 (39.1)	5.6	18
	Total	5 591 (11.2)	360 (33.9)	379 (100)	6.8	14.7
ASS	Women	680 (36)	246	175 (61.4)	25.7	3.9
	Men	1211 (64)	292	110 (38.6)	9.1	11.0
	Total	1891 (3.8)	320 (30.1)	285 (100)	15.1	6.6
Total		50 080	1061	1683	3.4	

ASS, administrative and services staff; ERS, education and/or research staff

*University of the Basque Country – UPV/EHU (2017). UPV/EHU in figures, academic course 2016/17. <http://www.ehu.es/zenbakitan/es/>. Access September 2017.

To simplify the analysis, the answers to the questions regarding “determinants in food purchase” were recategorized 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 food environment” were recategorized as *agree* (strongly agree or agree) and *disagree* (neutral, disagree, strongly disagree, or not sure). All tests were two-sided, and $P < 0.05$ was considered statistically significant.

Results

General characteristics of survey participants

Table 2 shows the demographic characteristics of the students and staff. Most of the students and ERS were from non-health sciences (students, 84.4%; ERS, 81.8%) and enrolled full time (64.7% of the sample). The percentage of women from the health sciences area was higher for both students and ERS ($P < 0.001$). Regarding age, most students (82.5%) were aged < 25 y, most ERS (50.5%) were between ages 25 and 44 y, and most ASS (68.5%) were aged > 45 y ($P < 0.001$). Moreover, $\sim 19\%$ 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 adhering to a special diet ($P < 0.05$). The most frequent type of special diet in the three groups was one aimed at losing weight, although the second most frequent differed between groups (7.2% students: “vegetarian/vegan”; 7.6% ERS: “therapeutic diets”; and 5.3% ASS, “other diets”).

Food purchasing behaviors and choice determinants

The frequency and place of food purchasing, as well as spending on purchasing, are shown in Supplementary Table 1. Nearly 92% of students and staff had purchased food on campus in the previous month. Most (77.6%) reported buying food on at least half of the time they were on campus. One-third (28.8%) reported spending €5 to €10 on foods on campus during an average week. Significantly more ASS reported purchasing foods in the previous month (ASS 93%; students 91.6%; ERS 90.5%; $P < 0.001$) and spending more while on campus (this variable was dichotomized as “ $\geq \$20$ ” and “ $< €20$ ” per week; 41.8% ASS and 41.2% ERS spending $\geq \$20$ /wk in versus 10.8% students; $P < 0.001$). Foods were bought mostly in the cafeteria/restaurant (80.5%), followed by the vending machines (72.6%), the university canteen (23.9%), and the supermarket (22.8%). In the three groups, more men than women reported purchasing foods in the previous month, spending more while on campus and purchasing more frequently. In general, women made more purchases from the vending machines, the supermarket, and

Table 2
General characteristics of participants in this survey of the University of the Basque Country (UPV/EHU)

Variables	Total (N = 50 080) ^a			Students, % (n = 19 879) ^b			P value ^c			ERS, % (n = 2929)			ASS, % (n = 680) ^d			P value ^e		
	Total (N = 42 598) ^a	Women (n = 19 879) ^b	Men (n = 22 719) ^c	Total (N = 5591) ^f	Women (n = 2929)	Men (n = 2662)	Total (N = 1891) ^g	Women (n = 680) ^d	Men (n = 1211) ^e	Total (N = 1891) ^g	Women (n = 680) ^d	Men (n = 1211) ^e	Total (N = 1891) ^g	Women (n = 680) ^d	Men (n = 1211) ^e	Total (N = 1891) ^g	Women (n = 680) ^d	Men (n = 1211) ^e
Age, y	70.7	85.1	80.2	4.5	3	6.1	0.8	0.6	0.9	0.8	0.6	0.9	0.8	0.6	0.9	0.8	0.6	0.9
<25	21.2	14.3	19.2	50.5	58.9	41.2	30.7	22.3	35.5	30.7	22.3	35.5	30.7	22.3	35.5	30.7	22.3	35.5
25–44	8.1	0.6	0.6	45.1	38.1	52.7	68.5	77.1	63.6	68.5	77.1	63.6	68.5	77.1	63.6	68.5	77.1	63.6
≥45																		
Area of knowledge ^h																		
Health sciences	15.6	24.8	7.6	18.2	25.5	10.1	19.1	14.3	21.8	19.1	14.3	21.8	19.1	14.3	21.8	19.1	14.3	21.8
Non-health sciences	84.4	75.2	92.4	81.8	74.5	89.9	80.9	85.7	78.2	80.9	85.7	78.2	80.9	85.7	78.2	80.9	85.7	78.2
Study/work contract																		
Full time	64.7	58.3	61	91.4	90.9	91.9	97.4	94.3	99.1	97.4	94.3	99.1	97.4	94.3	99.1	97.4	94.3	99.1
Part time	35.3	40.2	39	8.6	9.1	8.1	2.6	5.7	9.1	2.6	5.7	9.1	2.6	5.7	9.1	2.6	5.7	9.1
Special diet ⁱ	19.2	23.6	15.3	19.1	21.6	16.2	21.4	24	20	21.4	24	20	21.4	24	20	21.4	24	20
Vegetarian/Vegan	6.7	7.2	4	4.7	7.8	1.4	2	2.3	1.8	2	2.3	1.8	2	2.3	1.8	2	2.3	1.8
Therapeutic diets	5.7	5.5	3.4	7.6	7.8	7.4	4.8	8.6	2.7	4.8	8.6	2.7	4.8	8.6	2.7	4.8	8.6	2.7
Weight management diets	11.3	11.7	10.7	10.2	9.1	11.5	15.8	21.1	12.7	15.8	21.1	12.7	15.8	21.1	12.7	15.8	21.1	12.7
Religious diets	0.3	0.3	0.3	0.5	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-
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	5.3	3.4	6.4	5.3	3.4	6.4	5.3	3.4	6.4

ASS, administrative and services staff; ERS, education and/or research staff.

^aResults were weighted according to the distribution by university community group and sex.^bDifferences between sexes.^cDifferences by university community group. Significant P values are highlighted in bold.^dData not applicable to ASS.^eMultiple answers.

the university canteen than men ($P < 0.001$), who purchased more often from the cafeteria/restaurants ($P < 0.001$).

Table 3 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 employees ($P < 0.001$). By sex, there was a trend toward a greater purchase of food by men than women at lunchtime in the three groups ($P < 0.001$) and a greater purchase of food between meals by women than men ($P < 0.01$), in all groups; 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 4 displays the purchase of foods (categorized as solid foods and snacks) and drinks, with a frequency of once a week or more. 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 etc.,” bottled water, small servings (e.g., small portion of tortilla), and hot sandwiches/hamburgers. More students purchased hot small servings, hot sandwiches/hamburgers, and bottled water than employees ($P < 0.001$), whereas more staff purchased “coffee, tea, hot chocolate etc.” ($P < 0.001$). Furthermore, more ERS and ASS than students purchased 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 all 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% of the sample), with slightly more than one-third bringing (36.8%) all or almost all the foods eaten on campus (Supplementary Table 2). 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%).

Food purchasing determinants are summarized in Table 5. Taste (98.6%) was reported as the most important determinant by the three groups, followed by “good value for money” for students (98.6%), “nutritional value” for ASS (97%), and “healthfulness” for ERS (94.4%). By sex, in students, the frequency of the determinants “health” and “how it feels” was higher for women than men ($P < 0.001$). Similar results were also observed in ERS and ASS, although in these groups, differences were not registered in favor of women in all the determinants within these two categories (“health” and “how it feels”).

Additionally, 38.9% of students and staff reported that discounts such as “2-for-1 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 one-fourth (14.7%) reported using the menu’s bonuses, the majority (78%) 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.

Opinions on on-campus food availability by the university community

A 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 centers” (89.6%; Supplementary Table 3). Additionally, most agreed that “the university should include

Table 3
Occasions of food purchases from a university outlet at the University of the Basque Country (UPV/EHU)

Occasions of food purchase*	Students, %				ERS, %				ASS, %			
	Total (N = 50 080) %	Women (n = 19 879) †	Men (n = 22 719) †	P value ‡	Total (N = 5591) †	Women (n = 2929) †	Men (n = 2662) †	P value ‡	Total (N = 1891) †	Women (n = 680) †	Men (n = 1211) †	P value ‡
		Women (n = 42 598) †	Men (n = 22 719) †	P value ‡	Total (N = 5591) †	Women (n = 2929) †	Men (n = 2662) †	P value ‡	Total (N = 1891) †	Women (n = 680) †	Men (n = 1211) †	P value ‡
Foods												
Breakfast	22.4	22.9	20.6	<0.001	17.2	16.9	17.6	0.501	27.8	24	30.0	<0.001
Lunch	67.4	66.1	70.6	<0.001	23.1	71.9	82.4	<0.001	31.4	62.9	71.8	<0.001
Dinner	0.5	0.5	0.8	<0.001	0.2	0.4	-	0.001	0.2	0.6	-	0.003
Snack	65.4	71.1	68.4	<0.001	31.1	37.2	24.3	<0.001	36.7	40.6	34.5	<0.001
Drinks												
Breakfast	32.8	31.2	29.1	<0.001	38.5	37.2	39.9	0.042	31.2	56.6	49.1	<0.001
Lunch	37.4	37.8	43.2	<0.001	36.6	32.5	41.2	<0.001	30.9	31.6	43.2	<0.001
Dinner	0.8	0.9	1.4	<0.001	0.2	0.4	-	0.001	1.4	0.6	-	0.028
Snack	45.4	47.4	50	<0.001	36.3	38.5	33.8	<0.001	27.3	33.7	23.6	<0.001

ASS, administrative and services staff; ERS, education and/or research staff.

*Multiple answers.

†Results were weighted according to the distribution by university community group and sex.

‡Differences between sexes.

§Differences between university community groups. Significant P values are highlighted in bold.

health-related clauses in food service contracting documents to ensure the availability of healthy foods” (90.6%).

Proposed changes to the food environment are shown in Table 6. The “top 5” opinions suggested about the campus food availability 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 labeling.” The first two changes in the “top 5” list (“greater capacity to access free filtered drinking water” and “greater capacity to recycle food packaging”) were suggested by a larger percentage of students than employees ($P < 0.001$); the third, fourth, and fifth of the “top 5” list (“more healthy options in vending machines,” “discounts for healthy choices,” and “allergen labeling”) were requested by the ASS compared with the other two groups ($P < 0.01$). By sex, in the student group, women selected all “top 5” 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 ($P < 0.001$).

Discussion

The present study aimed to analyze on-campus food purchasing behaviors, choice determinants, and opinions about the food availability by different groups of the university community (students, ERS, and ASS) of the UPV/EHU. In summary, the results showed that most of the participants purchased foods on campus, especially for lunch and snack. Hot drinks, bottled water, and hot foods (e.g., small servings and sandwiches/hamburgers) were the most purchased items, and taste was the most important determinant in its choice. The most recommended changes to the campus food environment were related to sustainability, the offer of products with HNQ, price, and allergen information on labeling.

Consistent with the literature, this study found that most students and staff purchased some food items on campus [20,21,35]. Most purchases were made in the cafeteria/restaurant and the vending machines and were mostly bought for lunch and snack, a result that agrees with Roy et al. [21]. Significant differences by sex were found in frequency and spending on food purchases, as men were more likely to purchase and spent money on-campus food than women. This result is in line with the higher percentage of women who brought food from home or purchased off campus compared with men, which seems to be motivated by preferring self-prepared food and by cost. The higher percentage of women than men bringing food from home may be related to the fact that women have traditionally been the predominant food shoppers and preparers [36], as well as concerns about food nutritional value in women (as we have found in the present study).

Additionally, men tended to purchase more food for lunch and did it mostly in the cafeteria/restaurants, whereas women tended to do it more between meals and bought food in the vending machines, the supermarket, and the university canteen. By group, it was observed that ASSs were the ones who most frequently bought food on campus and who spent the most money on this purchase. This result could be influenced by the distribution by sex and by the working hours of this group, which differed from those of the other two groups.

Approximately one in five participants followed a special diet, especially weight management diets, followed by a vegetarian or vegan diet in students, therapeutic diets in ERS and other diets (e.g., diets low in ultra-processed foods) in ASS. These results, overall,

Table 4
Purchases of food with a frequency of once weekly or more from a university outlet of the University of the Basque Country (UPV/EHU)

Variables*	Total (N = 50 080) [†] , %	Students, %				ERS, %				ASS, %				P value [§]
		Total (N = 42 598) [†]	Women (n = 19 879) [†]	Men (n = 22 719) [†]	P value [‡]	Total (N = 5591) [†]	Women (n = 2929) [†]	Men (n = 2662) [†]	P value [‡]	Total (N = 1891) [†]	Women (n = 680) [†]	Men (n = 1211) [†]	P value [‡]	
Solid foods														
Hot food														
Small servings	38.2	40.5	33.8	46.3	<0.001	21.7	16.9	27	<0.001	36.5	30.3	40	<0.001	<0.001
Sandwiches/ Hamburgers	31.7	34.3	23.8	43.4	<0.001	15.7	10.4	21.6	<0.001	21.3	15.4	24.5	<0.001	<0.001
Menu of the day	24.9	20	17.3	22.3	<0.001	52.8	43.7	62.8	<0.001	53.8	50.9	55.5	0.054	<0.001
Combination plate	9	9.6	5.7	13	<0.001	5.6	3.9	7.4	<0.001	5.6	9.1	3.6	<0.001	<0.001
Other hot foods [¶]	6.3	6.9	6.3	7.3	<0.001	3.2	1.7	4.7	<0.001	2	2.3	1.8	0.425	<0.001
Cold food														
Small servings	20.1	21.4	17.4	24.9	<0.001	9.6	9.1	10.1	0.178	20.7	15.4	23.6	<0.001	<0.001
Sandwiches	22.8	24.7	18.9	29.7	<0.001	10.6	9.1	12.2	<0.001	16.8	14.3	18.2	0.029	<0.001
Salads	11.0	9.7	9.5	9.9	0.150	18.2	18.2	18.2	0.954	18.3	21.7	16.4	0.003	<0.001
Other cold foods [#]	8.7	9.4	10.7	8.2	<0.001	5.4	6.1	4.7	0.027	3.7	2.3	4.5	0.016	<0.001
Snacks														
Salty snacks	24.1	26.5	27.4	25.4	<0.001	8.8	9.5	8.1	0.064	14.7	8.6	18.2	<0.001	<0.001
Sweet snacks	20.8	23.2	21.7	24.6	<0.001	6.0	7.8	4.1	<0.001	9.5	6.9	10.9	0.004	<0.001
Nuts	13.2	14.0	12.9	15	<0.001	7.2	9.5	4.7	<0.001	11.7	13.1	10.9	0.155	<0.001
Fresh fruit	9.1	8.4	10.7	6.5	<0.001	12.5	10.4	14.9	<0.001	15	16.4	12.6	0.024	<0.001
Chocolate bars	17.9	20	18.9	20.9	<0.001	5	5.2	4.7	0.433	8.7	6.3	10	0.007	<0.001
Chewing gum, sweets, etc.	5.6	6.3	8.6	4.2	<0.001	1.6	1.7	1.4	0.241	2.6	2.3	2.7	0.625	<0.001
Other snacks ^{***}	4.2	4.6	3.2	5.9	<0.001	2.4	0.9	4.1	<0.001	0.8	0.6	0.9	0.451	<0.001
Drinks														
Coffee, tea, hot chocolate, etc.	60.5	58	54.3	61.3	<0.001	72.5	72.7	72.3	0.733	79.6	78.9	80	0.537	<0.001
Infusions (e.g., chamomile tea)	11.4	10.5	12.2	9	<0.001	16.1	19	12.8	<0.001	17.5	19.4	16.4	0.092	<0.001
Broths	0.8	0.7	0.3	1.1	<0.001	0.8	0.9	0.7	0.448	1.4	0.6	1.8	0.028	0.009
Bottled water	49.2	52.4	52.8	52	0.097	30	34.6	25	<0.001	35.8	34.9	36.4	0.519	<0.001
Natural fruit juices	8.5	8.3	8.1	8.5	0.187	10.3	8.7	12.2	<0.001	7.9	7.4	8.2	0.602	<0.001
Commercial fruit juices	5.9	6.3	6.3	6.2	0.661	3.9	2.6	5.4	<0.001	3.9	2.9	4.5	0.060	<0.001
Soft drinks, energy drinks, flavored drinks, etc.	13.7	14.5	7.8	20.3	<0.001	8.9	6.5	11.5	<0.001	8.8	3.4	11.8	<0.001	<0.001
Milk shakes	3.0	3.3	3.2	3.4	0.184	0.8	0.9	0.7	0.448	3.3	1.1	4.5	<0.001	<0.001
Alcohol-free beers	0.7	0.7	0.5	0.8	<0.001	0.5	0.9	-	<0.001	2.3	-	3.6	<0.001	<0.001
Alcoholic drinks	5.7	6	2.9	8.8	<0.001	3.3	3.9	2.7	0.013	5.1	4.6	5.5	0.399	<0.001
Other drinks ^{††}	3.9	4.2	3.9	4.5	0.002	1.3	1.3	1.4	0.857	3	3.4	2.7	0.418	<0.001

ASS, administrative and services staff; ERS, education and/or research staff.

*Multiple-answers.

[†]Results were weighted according to the distribution by university community group and sex.

[‡]Differences between sexes.

[§]Differences between university community groups. Significant *P* values are highlighted in bold.

^{||}Menu of the day is a mid-day meal, which normally includes a starter, a main course with a side dish, a dessert, a portion of bread and drink. Usually, there are two or more choices for each course.

[¶]"Others hot foods": fried potatoes, pizza.

[#]"Other cold foods": e.g., dairy products.

^{***}"Other snacks": small pasty, vegetarian snacks.

^{††}"Other drinks": non-specified on the survey.

Table 5
Food choice determinants of the community of the University of the Basque Country (UPV/EHU)

Variables*	Total (N = 50 080) [†]	Students, %				ERS, %				ASS, %				P value [‡]
		Total (N = 42 598) [†]	Women (n = 19 879) [†]	Men (n = 22 719) [†]	P value [‡]	Total (N = 5591) [†]	Women (n = 2929) [†]	Men (n = 2662) [†]	P value [‡]	Total (N = 1891) [†]	Women (n = 680) [†]	Men (n = 1211) [†]	P value [‡]	
Sensory appeal														
Tastes good	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
Smells nice	83.8	82.8	87.4	78.8	< 0.001	80.6	81.4	79.7	0.113	89.0	93.7	86.4	< 0.001	< 0.001
Looks nice	37.5	37.8	37	38.4	0.003	34.3	37.2	31.1	< 0.001	42.2	44.6	40.9	0.120	< 0.001
Price														
Good value for money	97.2	98.1	97.4	98.6	< 0.001	92.2	91.3	93.2	0.008	93.5	96.6	91.8	< 0.001	< 0.001
Cheap	86	89.9	91.8	87.7	< 0.001	60.6	56.7	64.9	< 0.001	74.5	77.7	72.7	0.019	< 0.001
Health														
Nutritious	88.2	87.3	90.5	84.5	< 0.001	92.5	94.8	89.9	< 0.001	97	96.6	97.3	0.418	< 0.001
Keeps me healthy	84.7	82.9	88.6	78	< 0.001	94.4	94.8	93.9	0.146	96.2	96	96.4	0.711	< 0.001
Helps me control weight	65.3	64.5	70.1	59.6	< 0.001	67.5	66.2	68.9	0.031	76	83.4	71.8	< 0.001	< 0.001
Convenience														
Easily available	84.9	85.4	85.3	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	61.2	< 0.001	65	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	52	< 0.001	63.7	64.5	62.8	0.201	70.2	75.4	67.3	< 0.001	< 0.001
How it feels														
Makes me feel good	77.2	77.2	83.2	72	< 0.001	76.5	82.3	70.3	< 0.001	77.9	84	74.5	< 0.001	0.380
Keeps me awake	68.4	69.5	74.4	65.3	< 0.001	59.8	64.9	54.1	< 0.001	67.2	70.3	65.5	0.032	< 0.001
Helps me deal with stress	54.9	55.6	64.2	48	< 0.001	50.5	48.5	49.3	0.101	51.9	63.4	45.5	< 0.001	< 0.001

ASS, administrative and services staff; ERS, education and/or research staff

*Multiple answers.

[†]Results were weighted according to the distribution by university community group and sex.

[‡]Differences between sexes.

[§]Differences between university community groups. Significant P values are highlighted in bold.

Table 6
Proposed changes to the campus food availability of the University of the Basque Country (UPV/EHU)

Variables [†]	Total (N = 50 080) [‡]	Students, %				ERS, %				ASS, %				P value
		Total (N = 42 598) [‡]	Women (n = 19 879) [‡]	Men (n = 22 719) [‡]	P value [§]	Total (N = 5591) [‡]	Women (n = 2929) [‡]	Men (n = 2662) [‡]	P value [§]	Total (N = 1891) [‡]	Women (n = 680) [‡]	Men (n = 1211) [‡]	P value [§]	
Food changes: More...														
Alcoholic drinks	13.4	15.0	9.2	20.1	<0.001	4.8	3	6.8	<0.001	3.3	1.1	4.5	<0.001	<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	<0.001
Ethnic cuisine choices	46.5	48.3	52.5	44.6	<0.001	37.2	37.2	37.2	0.962	33.6	32	34.5	0.278	<0.001
Fast food choices (commercial, e.g., 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	<0.001
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	<0.001
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	<0.001
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	15.5	0.736	<0.001
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	0.001	<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	55.5	<0.001	<0.001
Foods low in carbohydrates	54.7	54	60.8	48	<0.001	57.8	60.6	54.7	<0.001	62	70.3	57.3	<0.001	<0.001
Reduced-fat foods	76.1	75.5	83.3	68.6	<0.001	78.3	81.4	75	<0.001	83.6	85.1	82.7	0.175	<0.001
Reduced salt foods	67.9	66.7	73.2	61	<0.001	72.2	77.1	66.9	<0.001	81	79.4	81.8	0.198	<0.001
Special diet choices	72	71.8	82.1	62.7	<0.001	73.4	77.5	68.9	<0.001	73.6	78.3	70.9	0.001	0.011
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	<0.001
Sweets and confectionery	14.6	16	12.6	18.9	<0.001	7.2	8.2	6.1	0.002	6.1	5.7	6.4	0.588	<0.001
Takeaway food choices	34.2	36.6	32.5	40.1	<0.001	18.6	26.8	9.5	<0.001	26.7	24	28.2	0.048	<0.001
Variety of food	79.2	79.6	80.9	78.5	<0.001	75.6	76.2	75	0.299	80.8	78.9	81.8	0.111	<0.001
Help for food choice														
A mobile app 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	<0.001
Allergen labeling	84	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 labeling 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., labeling traffic light)	82.1	82.6	86	79.7	<0.001	74.6	74.9	74.3	0.629	91.1	93.1	90	0.024	<0.001
Information on websites about food and dishes and their nutritional content	68	68	69.9	66.4	<0.001	64.9	66.2	63.5	0.034	76.8	76	77.3	0.532	<0.001
Labeling indicating organic produce	76.3	76.2	80.3	72.6	<0.001	75.4	80.1	70.3	<0.001	83.3	80	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	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	40.3	45.9	<0.001	49.2	42.9	52.7	<0.001	<0.001
Higher-quality foods (even for a higher price)	80.2	78.8	79.4	78.2	0.004	88.6	88.7	88.5	0.788	88.3	85.1	90	0.002	<0.001
More meal deals	82.6	83	85.3	81.1	<0.001	77.9	80.5	75	<0.001	86.9	86.3	87.3	0.552	<0.001
Reward points for healthier food choices	68.5	69.4	72.5	66.7	<0.001	58.6	62.8	54.1	<0.001	76.9	71.4	80	<0.001	<0.001
Reward points for sustainable food choices	69.7	70.6	72.5	68.9	<0.001	60.7	64.9	56.1	<0.001	77.1	72	80	<0.001	<0.001
Other changes														
Earlier opening times	24.6	25.8	26.3	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	68.6	0.069	57	55.4	58.8	0.011	61.4	70	56.4	<0.001	<0.001
Later closing times	36.5	38.5	36.7	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	55.2	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	64.1	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	93.8	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	60.9	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	81.7	61.9	<0.001	64.5	71	57.4	<0.001	72	78.9	68.2	<0.001	<0.001
More variety of food in vending machines	77.7	79.6	82.9	76.8	<0.001	63.2	68.4	57.4	<0.001	75.7	77.7	74.5	0.134	<0.001

(continued on next page)

Table 6 (Continued)

Variables ^{a,†}	Students, %				ERS, %				ASS, %				P value [‡]
	Total (N = 50 080) [‡]	Men (n = 22 719) [‡]		P value [§]	Total (N = 5591) [‡]	Women (n = 2929) [‡]		P value [§]	Total (N = 1891) [‡]	Men (n = 1211) [‡]		P value [§]	
		Women (n = 19 879) [‡]	Men (n = 22 719) [‡]			Women (n = 2929) [‡]	Men (n = 1211) [‡]			Women (n = 680) [‡]	Men (n = 1211) [‡]		
More vending machine	35.0	37.9	36.7	39.0	17.4	17.3	17.6	17.6	21.4	33.7	14.5	<0.001	
Only healthy options in vending machines	57.8	56.9	66	48.9	62.2	69.7	54.1	54.1	64.9	70.3	61.8	<0.001	
Removal of vending machines	15.1	15.6	14.4	16.7	13.4	9.1	18.2	18.2	7.3	5.7	8.2	0.050	
Changes in what university provides													
Greater capacity to access free filtered drinking water	87.7	88.4	89.6	87.3	84.4	83.1	85.8	85.8	82	84	80.9	0.098	
Greater capacity to recycle food packaging	87.3	87.6	88.3	87	87	85.7	88.5	88.5	81.5	79.4	82.7	0.073	
Greater capacity to heat meals from home in a microwave	76.8	79.2	83.2	75.7	62.7	64.5	60.8	60.8	64.1	63.4	64.5	0.604	

ASS, administrative and services staff; ERS, education and/or research staff.

^aMultiple answers.

[†]Percentage of participants who answered strongly agree or agree.

[‡]Results were weighted according to the distribution by university community group and sex.

[§]Differences by sex.

^{||}Differences by university community group. Significant P values are highlighted in bold.

those corresponding to students, are in line with previous research [20,37], which have been linked to the increasing awareness of being overweight [38] and the growing trend of excluding animal products due to health concerns and ethical, ecologic, and social reasons [39]. By sex, more women than men in the three university community groups reported being following a special diet. This aligns with previous studies addressing that women are more likely than men to diet since they are more prone to be affected by social stigma and experience stronger psychosocial consequences in the case of suffering overweight/obesity [40].

Students and staff tended to purchase hot drinks (e.g., coffee, tea, hot chocolate etc.), bottled water and hot foods (e.g., small servings and sandwiches/hamburgers), whereas healthier snacks such as nuts and fruits were least frequently consumed. These results align with a study conducted at the University of New Zealand that observed that most consumed foods were hot foods, such as meat pies and French fries, and hot drinks, such as coffee, tea and/or hot chocolate, and that healthier snacks were least frequently consumed [21]. More students purchased hot small servings, hot sandwiches/hamburgers, and bottled water than employees, while more staff purchased “coffee, tea, hot chocolate etc.” compared with the other groups. Furthermore, more ERS and ASS purchased the menu of the day compared with students. These results could be related to differences in demographic and socioeconomic status [41], as well as individual factors (cooking skills, knowledge, and perceptions) and societal factors (influence of peers and social norms), among others [42]. By sex, the purchase of small servings and hot sandwiches/hamburgers was higher among men than women in the three groups. Similar patterns have been observed in other studies where women were less likely to eat high-fat foods [20,43].

Consistent with earlier research available [19,44], taste was the most important determinant in food choice. In the present study, price in students, “nutritional value” in ASS and “health value” in ERS were the following food purchasing determinants in order of importance. In accordance with this result, a high percentage of students reported that the discounts (e.g., “2-for-1 offers” or “offers of large portions of food prepared at reduced prices”) influence their food choice and supported the use of loyalty cards. This result could be related to differences by age [45] and socioeconomic status [46]. Thus, future interventions addressing on-campus food environments should focus on ensuring the ready availability of tasty and nutritious foods to purchase at a low cost. Moreover, given that the nutrition/health value of foods was also perceived to be of importance, the potential for nutrition labeling or nutrition/health-related claims could be an interesting strategy to promote the consumption of healthier foods in this population. By sex, the determinants “health” and “how it feels” were more important in women than in men, especially among students. These results are similar to previous research [20,47], indicating a greater concern for eating for health reasons in women.

Our findings are consistent with previous studies that suggested that overall satisfaction with campus food was moderate [24,48]. Two of the five most popular proposed changes to the food environment pertained to sustainability, specifically, “greater capacity to access free filtered drinking water” and “greater capacity to recycle food packaging.” This result agreed with the findings of other authors [20,21,49]. In this line, institutional food service guidelines approaching health and sustainability from an ecological perspective have been developed and successfully implemented at universities [50,51]. Additionally, in the present study, suggestions related to sustainability were more supported by the student group than the employees, which is probably related to the fact that older generations were less aware of sustainability

and its related problems [52]. Regarding the availability of free filtered drinking water, more water fountains on campus would enable water to be free and accessible at any time. Additionally, not only will it reduce the cost for the university community, but it will also be beneficial to the environment because plastic water waste might be reduced [53]. It should be noted that some centers do not have water sources because their installation and maintenance entail a high cost.

The third most popular change to the campus food environment was “more healthy options in vending machines,” which is consistent with the food environment observation by previous studies [20,21,48,49]. Most outlets, particularly vending machines, were often composed of food products with LNQ with minimal variety [26,54,55]. The fourth most popular change to the food environment pertained to cost, in particular, “discounts for healthy choices.” Previous studies also found that cost or good value for money were important determinants of food purchasing [20,21,49]. Like all consumers, university consumers want better value for products that are less profitable for food outlets [20,48,56]. Given the evidence that food price influences food purchasing [57], several pricing interventions have been conducted, with findings suggesting that price discounts on targeted foods of HNQ can increase their purchase without affecting revenue [24,58]. Increasing the availability and accessibility of products with HNQ on campus could be effective in improving the food environment for staff and students. However, further research is needed to investigate the effects of a simultaneous price increase in food with LNQ and price reduction in products with HNQ to minimize the effect on profits for campus food vendors [59,60]. Although putting these strategies into practice in a university with multiple campuses, such as UPV/EHU, could be difficult, they would probably be more effective if combined with increased availability of food with HNQ on-campus. A greater presence of affordable food with HNQ would likely promote a significant effect on purchasing and consumption.

The fifth most popular change proposed was an improvement in allergen information on labelling. This same change was also part of the “top 5” in the study carried out at another public university [49]. As other authors have previously pointed out, increasing labeling should be effective in improving the food environment [50]. It should be noted that the third and fourth of the “top 5” lists of changes to the campus food environment were requested above all by the ASS compared with the other two groups. This result is probably also related to the fact that ASS was the group that most frequently followed a special diet, especially “diets low in ultraprocessed foods.”

The study presents few limitations that deserve attention. First, the inherent bias in convenience sampling does not allow trustworthy inferences to be made about the wider population of this university community or other tertiary institutions. Convenience sampling is more likely to attract those more interested in university food services. The decision to participate may have been influenced by several factors, including social, educational, and health conditions, which may influence the answers. In any case, a post hoc power calculation was performed based on the available sample size, which resulted in power equal to or greater than 99% for the observed percentage of participants by the university community group who bought food on-campus compared to the percentage reported by Roy et al. [21], based on an alpha error rate of 0.05 using a two-tailed test. Second, data on food consumption on-campus were not recorded. However, it is quite likely that participants who reported buying those foods also consumed them. Third, due to the design of the questionnaire, participants could not rank their preferences from highest to lowest. In the future, a ranking system will be used to analyze the relative importance of each preference.

Fourth, the transcultural adaptation and validation of the questionnaire were conducted through a pilot study in a small sample. In this pilot study, the internal consistency of the questionnaire was evaluated and considered acceptable, but test–retest reliability was not investigated. Therefore, it cannot be ruled out that the measurement error of the questionnaire is not attributable to changes in the individuals’ responses over time.

Conclusions

Despite these limitations and considering the results obtained, we can conclude that

- Foods were commonly purchased at lunch and snack, with hot drinks, bottled water, and hot foods (e.g., small servings and sandwiches/hamburgers) being the most purchased items;
- Taste was the most important determinant in food choice, followed by price for students, nutritional value for ASS and healthfulness for ERS; and
- According to the opinions suggested about campus food availability and potential changes, to increase satisfaction with campus food by the university community, future promotion should target sustainability, increasing the products with HNQ, viable price-manipulation directives, and improving the allergen information on labeling.

These changes in the food supply, of course considering taste preferences, could positively affect food consumption habits in this population and decrease the risk for chronic disease in the long term. These findings are relevant for planning interventions to improve the food environment in this and similar tertiary education settings.

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Supplementary materials

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