Food and Health Program
Seed Funding 2017 Project

A new understanding of the university food environment and an assessment of on-campus food purchasing behaviours, preferences and opinions on food availability of university staff and students

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Obesity remains one of the most significant global health burdens that is continuously rising over time.

The food environment-diet relationship is a major promoter of obesity.

- More than a quarter of adults and one fifth of children eat food from out of home food outlets at least once a week.
- Meals eaten outside of the home tend to be associated with higher intakes of sugar, fat, and salt and portion sizes tend to be bigger.
- The increasing consumption of out-of-home meals has been identified as an important factor contributing to rising levels of obesity.
- 18% of meals were eaten out of the home in 2015, up 5% on 2014.
Objective: We aimed to identify areas for improvement for encouraging healthy eating in universities by objectively measuring the environment and to ask staff and students what they would like changed.
Developing an understanding of the university food environment

• Study conducted between April 2017 – June 2017 within 5 campus of the University of Auckland

• 57 outlets (28 food outlets and 29 vending machines) were audited

• Audits were conducted using a validated audit tool – food environment-quality index by Roy et.al.
  • Four outcome measures: availability, accessibility, cost and promotion of food and beverages
  • Based on a positive scoring system, with a maximum achievable score of 199

• Based on the audit tool:
  • A higher score indicates a healthier food environment
  • Food outlets were also categorised into 3 categories – ‘healthy’, ‘intermediate’ and ‘unhealthy’
Audit

Overall median composite score of 79 (IQR = 68 – 100).

26% of the food outlets achieved composite scores equal or above 79.

All food outlets from Grafton, Epsom and Tamaki achieved scores above 79.
Food/beverage products available between high and low scoring outlets

- Water: Low-scoring 22, High-scoring 79
- Salads: Low-scoring 22, High-scoring 48
- Diet soft drinks: Low-scoring 33, High-scoring 55
- Chocolate: Low-scoring 67, High-scoring 10
- Chips/processed snacks: Low-scoring 67, High-scoring 17
- deep-fried foods: Low-scoring 44, High-scoring 14
Food/beverage products accessible between high and low scoring outlets

- Sandwiches
- Salads
- Diet soft drinks
- Chocolate
- Lollies, sweets
- Chips or processed snacks

Low scoring vs. High scoring
Food and beverage products that cost less than the reference price between high and low scoring outlets
Food/beverage products promoted between high and low scoring outlets

- Sandwiches: 34% high scoring, 9% low scoring
- Salads: 33% high scoring, 0% low scoring
- Fresh Fruit: 0% high scoring, 17% low scoring
- Sugar Sweetened Soft Drinks: 0% high scoring, 55% low scoring
- Pies/Pastries: 9% high scoring, 0% low scoring
- Deep Fried Foods: 0% high scoring, 18% low scoring
% and contents of snack vending slots

Average cost of products

- Sugar Sweetened Beverages: $2.45
- Diet Drinks: $2.45
- Dairy Drinks: $4.50
- Water: $3.05
- Chocolate and Confectionary: $2.00
- High Energy Snacks: $1.80
- Lower Energy Snacks: $1.80
- Fruit/Nuts: $2.80
- Cheese/Crackers: $1.80
University staff and students' on-campus food purchasing behaviors, preferences, and opinions on food availability

Over a corresponding 8 week period, staff and students completed an anonymous researcher-designed previously validated survey with both closed (n = 42) and open-ended (n = 2) questions assessing food purchasing, food choice behaviours, and opinions of the campus food environment.

The survey was fully completed by n=1954 respondents. The majority of the respondents were students (n=1542, 79%), followed by staff (n=355, 18%).

Majority purchased food/beverages on campus (79%). Of students surveyed, 93% said they purchase food or drinks on campus.

Responses expressed as proportions or means. For some questions, with multiple responses similar responses were pooled to provide an overall summary of responses in a specific domain.

Pearson's χ² tests to examine the influence of sex and differences between staff and students.

Open-ended responses were categorized by major themes that included type and variety of food and beverages, the pricing of foods, and the healthiness of foods.

With hot beverages e.g. coffees/teas being the most frequently purchased.
Food-purchasing determinants ranked by reported importance overall then split for gender.
The ten most recommended changes suggested for the university food environment based on the level of agreement.

1. Greater capacity to heat meals from home in a microwave
2. Incentives for choosing healthier food options
3. Grab and Go choices
4. More healthy options available
5. Greater capacity to recycle food and beverage packaging
6. Greater capacity to access free filtered drinking water
7. Healthier food
8. Greater variety
9. More meal deals
10. Freshly cooked/prepared food
**Design**  Food environment-quality index was used to assess food outlets. Information on availability, accessibility, promotion, and cost of food/beverages were collated; composite score (maximum = 199), calculated. Outlets were categorised based on their scores, with higher scores depicting healthier outlets.

Over 8 wks., staff/students completed an anonymous researcher-designed survey with closed (n = 42) and open-ended (n = 2) questions assessing purchasing, choice determinants, and opinions about the food environment.

**Setting**  Large urban university in NZ; University of Auckland

**Subjects**  University outlets (n=57), university staff/students (n=1954)

**Results**  Six outlets were categorised as ‘healthy’, two as ‘unhealthy’, and the rest, ‘intermediate’. Median score across outlets was 79 (IQR = 7).

Frequently available food/beverages were water (67% of outlets), fruit drinks (60%), sugar-sweetened beverages (58%), diet beverages (56%) and mixed dishes without vegetables (53%).

Healthy items were less available, accessible, promoted and cost more than unhealthy items.

Majority purchased food/beverages on campus (79%), with hot beverages e.g. coffees/teas being the most frequently purchased.

Value for money, healthiness, and taste determined choice. Common improvements suggested were increasing value for money and healthy options.

**Conclusion**  There is a need for food environment interventions to increase the availability, accessibility, and promotion of healthy food/beverages whilst reducing its cost. There is a demand for healthy food, and that price manipulation is an important lever for change.
Vending machines are a convenient source of energy-dense nutrient-poor food and beverages.

The aim of this pilot study is to evaluate the availability of healthier vending machines and how they affect the purchasing behaviour of staff and students within a university when directly compared with the food purchasing from normal vending machines containing less-healthier choices.

Installed healthier vending machines where the products that had a health star rating of 3.5 or greater and met the National Healthy Food and Drink Policy were added to the new machine configuration.

The total sales of each vending item is recorded at the weekly or biweekly service interval. Total sales for each item is the number of empty vending slots subtracted from the total number of slots restocked at the previous interval.

The preliminary results indicate that the sale of lower-calorie items was influenced by their availability.
This study is being conducted at two carefully matched university food outlets. Both serve approximately the same number of lunches (e.g. 400) per weekday, and offer similar meals at similar prices; they also have similar customer profiles such as university staff and students.

A poster at the food outlets entrance that will read "Look for the 🍂🍂 for your healthy meal selection" and symbols next to targeted foods on the menu board. Existing meals are being nutritionally analysed and selected to target with the symbol in the experimental food outlet. Items are being chosen in both food outlets but only the experimental food outlet will have the food items symbolled, and their prices will be comparable with other menu items on the menu.

Observation 1 will be a baseline measure of lunchtime (11:00 AM to 1:00 PM) food sales at both sites for 2 weeks prior to intervention. The intervention will then be implemented at the experimental site for 4 consecutive weeks. Observations 2 and 3 measure food sales at both cafeterias during the first 2 weeks and the second 2 weeks of the intervention, respectively, to test observed trends.

Seven months later (Observation 4), sales at the experimental food outlet will be measured again for 2 weeks to test for duration of change. The hearts on the menu board will remain in the experimental cafeteria after the initial 4-week intervention.

All food sales data will be collected. Daily sales of targeted and non-targeted menu items at both the experimental and comparison sites will be collected.
Testing new strategies to create healthier food environments in the university setting

**Retail point-of-purchase interventions**

- Increasing the availability of healthy food choices
- Reducing the price of healthy foods and potentially increasing the price of unhealthy items
- Changing the placement of healthy foods within food outlets to make these more prominent.

**Vouchers and incentives to purchase healthier foods and drinks**

A nested control trial will be used to identify the impact of vouchers on purchases of healthy products. Vouchers for specific foods/drinks will be distributed to students for selected food outlets (n = 3) and changes to purchasing patterns at these sites will be compared to control outlets (no vouchers). The types of vouchers used will be varied (e.g., different denominations). Findings will indicate the impact of incentives on behavioural choices.

**Mobile phone application**

To provide more detailed nutrition information on the availability and location of food products on campus and recommend healthier food choices within food categories. Staff/Students will be able to personalise the phone application to determine the contribution of available/purchased foods to their overall dietary intake and compare this to nutrition guidelines. This educational/informational strategy will guide the identification of healthier options using a highly accessed form of media.
Food and Health Program Seed Funding

Research Collaborations

• Professor Boyd Swinburn, Population Health – for improving the healthiness of food environments

• Dr Denise Conroy, Marketing – Faculty of Business and Economics – for consumer choices around eating behaviours

• Catherine Cutler, Commercial Services – for Retail Operations

Research Dissemination


• Conference Presentation: European Congress on Obesity, May 2018, Vienna, Austria: Food for thought – an exploration of a university food environment and a survey of on-campus purchasing behaviours, choice determinants, and opinions on the food environment. (Accepted for Poster Presentation)