Letter of Intent: Evaluating the impact of behavioural insights on promoting sustainable and nutritious food choices at Vancouver General Hospital

Rationale. Diets high in ultra-processed food, red meat and dairy, and low in fruits, vegetables, whole grains, and legumes, are associated with considerable individual health risks^{1,2}, economic costs³, and environmental degradation⁴. Though personal values impact food-related choices, the food environment significantly influences decision-making through subconscious elements such as product placement, item promotion, and relative cost^{5–7}. The ability to exercise personal responsibility when choosing foods can therefore be greatly undermined, with the potential for negative health consequences^{6,8}. Creating nourishing food environments by offering nutrient-dense and low-emissions foods is a strategic policy target for healthcare institutions to align with the Canadian healthcare mandate while decreasing their environmental impact^{9,10}.

Behavioural psychology principles can steer consumers towards healthier choices by modifying the choice environment without altering the available options, for instance by making healthier, more sustainable choices the easiest choice through increased visibility, marketing, and attractiveness^{7,11–13}. These insights have been successfully applied to enhance purchasing of healthier low-emissions items in a number of spaces such as schools and other public institutions¹⁴. However, these impactful interventions have not yet been applied to the hospital cafeteria environment, where meals and snacks tend to be higher in calories, fat and sodium^{15,16}, and also present in an institution where the moral imperative should be to promote healthy choices^{10,17}.

Hypothesis. Applying behavioural psychology principles to the retail food environment can increase the sales of nutrient-dense, low-emissions foods and beverages without adversely altering consumer satisfaction with retail food services.

Objectives.

i) Examine the impact of behavioural interventions on the selection of nutrient-dense, lowemissions foods on customer selection in the VGH cafeteria.

ii) Evaluate staff satisfaction before and after applying behavioural interventions.

Methodology. A before and after study design will be used to evaluate the impact of a behavioural intervention in the hospital cafeteria at Vancouver General Hospital (VGH) on food and beverage selection and customer satisfaction. Prior to the study, a seven-day audit of all foods and beverages available for purchase within the VGH cafeteria was conducted to provide a baseline of item nutritional value (calories, macro- and micro-nutrients, level of processing as per the NOVA classification¹⁸), environmental impact (greenhouse gas [GHG] emissions¹⁹), and marketing strategy (price, location in cafeteria relative to entrance and cash register, horizontal and vertical placement²⁰). All data have been collected, and analysis is underway.

Objective 1. Evidence-based behavioural psychology interventions will be implemented to enhance the visibility of nutrient-dense, low-emissions foods in alignment with Canada's Dietary Guidelines $(CDG)^{21}$ and the Planetary Health Diet $(PHD)^4$. The interventions will focus on the entrees for lunch and dinner, where part of the menu is standardized and the other part variable, and changes daily. Every day, the option that is most aligned with the CDG and PHD while having the lowest associated GHG emissions, hence primarily plant-forward and less processed items, will be highlighted. The interventions will be chosen after the surveys (see Objective 2) are conducted, to ensure they address reported customer motivations, barriers and perceptions as closely as possible. Such interventions could include placing the foods at eye level, in a high-visibility location at the centre of the display, removing foods that do not align with the CDG/PHD

from the promotional display (while remaining available), or being promoted as the "healthy" or "Chef's choice" using flavour-based, cravable language, and vivid photographs to entice customers. While some of the menu items change daily as part of the normal cafeteria operations, no other major changes to item pricing or availability are planned during the time of the study. The interventions are expected to remain in place for 3 months.

Sales data, provided by the Business Initiatives and Support Services (BISS), which oversees hospital food services, will be used to compare purchasing patterns as a result of the intervention. Sales data for the study period will be compared to historical data from January 2018-January 2020, to account for the profound changes in purchasing patterns that occurred during the height of the COVID-19 pandemic. Paired t-tests will be used to compare pre- and post-implementation purchases of nutrient-dense low-emissions meals and to obtain an effect size for the intervention chosen.

Objective 2. Surveys will be conducted with hospital staff and other consumers of hospital food to establish a baseline understanding of what motivations, barriers, and perceptions are held regarding nutrient-dense, low-emissions food, and what beliefs and expectations customers have regarding the role of the cafeteria in providing healthy and sustainable food. The survey will solicit feedback with respect to overall satisfaction and perceptions of availability, acceptability, and affordability of items relative to customer expectations. The survey will also ask questions that seek to elicit which factors matter most to cafeteria customers, such as variety, familiarity, cultural appropriateness, and health goals. Surveys will be sent to staff members via institution-wide email and will be available via QR codes advertised in high-traffic areas, such as at the point of purchase and throughout the cafeteria and dining area.

Baseline survey data will be used to inform and refine the details of the planned behavioural interventions. After the development of proposed behavioural insight interventions, five focus group will be conducted to elicit insights regarding which aspects of salience will be most impactful, and provide feedback on the proposed posters, which will be developed iteratively. The focus group participants will include current cafeteria consumers, and they will be offered a \$50 honorarium for their participation. The focus group session will be recorded, and the results will be used to finalize the behavioural intervention.

Six months after implementing the behavioural intervention, a second survey will be similarly conducted and disseminated to reassess satisfaction as above. Paired t-tests will be used to compare satisfaction levels pre- and post-intervention. Respondents for both surveys will be offered to enter a draw for one of twenty \$25 gift-card prizes for their participation.

Relevance to Dietetics

Canada's health sector contributes 4.6% of national GHG emissions and is the second highest emitting health system on a per capita basis worldwide^{22,23}. The Canadian Net-Zero Emissions Accountability Act mandates that all sectors achieve net zero GHG emissions by 2050, and Canada recently joined the World Health Organization's (WHO) commitment to developing low-carbon, sustainable and resilient health systems^{24,25}. Decarbonizing healthcare, therefore, is an important strategic climate change mitigation target, and adherence to CDG has been named as an important means for reducing GHG emissions^{2,26}.

With the passage of Bill 47, the Health Care Statutes Repeal Act, health authorities throughout British Columbia are repatriating food services in-house²⁷. This repeal comes after decades of outsourcing food service contracts to private corporations, and with this change comes an empowering moment for health authorities to redefine the role of food within hospitals. It is a time of tremendous opportunity for positive change, and dietitians will play a pivotal role in

ensuring the interconnection between global food systems, human health and planetary health is recognized and prioritized.

As the trusted national voice of nutrition, Dietitians of Canada (DC) published a call to action outlining the role of dietitians in contributing to sustainable food systems and sustainable diets (SFS/D)²⁸. DC recommends that "dietitians take an active leadership approach to SFS/D" and "build partnerships with allies across disciplines." Dietitians are encouraged to participate in institutional-level policy revisions and lead initiatives in infrastructure change. They are uniquely qualified to transform food systems by advocating for dietary approaches that support human health and the long-term viability of food systems. By encouraging a style of eating that supports SFS/D, dietitians can lead the shift toward earth-conscious, sustainable dietary practices and play a pivotal role in decreasing the ecological footprint of unsustainable food systems²⁸. This project aims to situate dietitians as leaders by leveraging their role within hospital food services to catalyze system-wide change, in a way that can be scaled across health sectors in Canada and beyond. It highlights the essential role that dietetics professionals play in leading innovative, sustainable change at the institutional level. This project benefits from senior-level support, including the Executive Director of food services at VCH, and the health authority's visionary strategic priorities around planetary health²⁹.

Timeline

2023 Jun Jul Aug	Sep Oct Nov Dec	2024 Jan Feb Mar Apr May
Obj 2: Baseline survey	Obj 2: Focus group	Obj 1: Intervention and sales data review
Jun Jul Aug Sep	Oct Nov Dec 2025	Jan 🔪 Feb 🔪 Mar 🔪 Apr 🔪 May 🏷 Jun

Obj 1: Mid-term report Obj 2: Post-intervention survey Obj 1,2: Data analysis, reporting and dissemination

Budget	Cost/Unit	Total
Year 1: Focus group honorarium (50) + survey prize (40)	\$50x50 + \$25x40	\$3,500
Year 1 (25%) and 2 (75%): Statistician [statistical analysis plan development, data analysis]	\$60/hr x 40hr	\$2,400
Year 1: Graphic designer [iterative design of behavioural intervention posters, with feedback from focus groups]	\$30/hr x 50hr	\$1,500
Year 1: Photographer [including editing and access to pictures]	\$40/hr x 50hr	\$2,000
Year 1 and 2: Printing [posters, survey invitations, etc.]	\$1,500/yr x 2 yr	\$3,000
Year 1: Research assistant [for focus group data collection and transcription]	\$20/hr x 25hr	\$500
Year 2: Dissemination and conference travel	\$1,000	\$1,000
Total Funds Requested		

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