

Environmentally Sustainable Opportunities for Health Systems

Sustainable Food

"Food is the single strongest lever to optimize human health and environmental sustainability on Earth."

Canadian hospitals & residential care facilities spend **\$4 BILLION** ON FOOD ANNUALLY FOR...²

Retail/commercial foodservice for patients, staff, and visitors

- Cafeterias
- Vending machines
- Kiosks



Foodservice for patients' nutrition³

- Nutrition types: meals, oral nutrition supplements, enteral or parenteral feeds
- Models of preparation: centralized/decentralized; on/off-site; cook fresh/chill/freeze
- Modes of delivery: tray line; room service

Catering foodservice for staff and events

Community-oriented foodservice

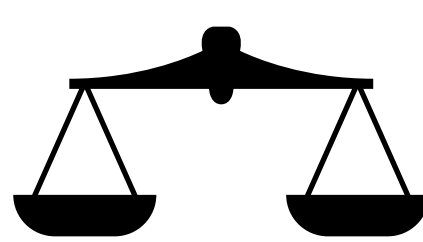
- On-site farmer's markets and pantries
- On-site community gardens
- Off-site healthy food provision

FOOD PRODUCTION is responsible for UP TO **30%** of global GHGs⁴

The AVERAGE DAILY CARBON FOOTPRINT across hospital diets is **4.2 kg CO₂ eq**⁶

Food constitutes **6%** of the National Health Service's CARBON EMISSIONS⁹

FOOD WASTE in the health sector is **2-3x HIGHER** than in other sectors⁵



*Estimate generated using CIHI data on inpatient hospitalizations

FOOD PRODUCTION is one of the **LARGEST** DRIVERS OF GLOBAL ENVIRONMENTAL CHANGE⁴

ENVIRONMENTAL IMPACTS ARISE THROUGHOUT

THE FOOD SUPPLY CHAIN



HEALTH SECTOR SPHERE OF INFLUENCE ON THE FOOD SUPPLY CHAIN

Decisions healthcare facilities make about their internal supply chains can impact:

- the health, recovery and well-being of patients, residents, staff, and communities
- local economies¹¹
- the environment¹¹

There are many ways for the health sector to improve the sustainability of food and the broader food system

1 THINK LOCAL

Health facilities can leverage their buying power, facilities, and trusted reputation to support and develop local food systems and community well-being

LOCAL FOOD PROCUREMENT

Contracts with regional producers who prioritize socioeconomic goals⁵ CAN strengthen the local economy & decrease food transportation emissions

CONDUCT A FOOD ORIGIN AUDIT¹²

Determine what "local" means
Establish baseline values for local food purchases
Set targets for increases in local food procurement
Monitor progress towards targets

ON-SITE CULTIVATION

Larger health facilities can dedicate rooftops or grounds to growing food on-site TO supplement patient food, provide low-carbon therapeutic activity & improve healthy food literacy for patients, staff, and visitors



SET/MEET PROVINCIAL TARGETS

Ministry of Agriculture's Feed B.C (2018) mandate: 30% B.C food purchasing in public facilities¹⁵
In 2018/19, all six B.C health authorities met/came close to meeting this target¹⁴

HEALTHY FOOD ACCESS

Improved healthy food literacy and access for the broader community CAN have upstream health benefits that lessen the need for carbon-emitting future care

ENCOURAGE LOCAL WELLNESS

Grow healthy foods
Post material that promotes healthy food choices
Host farmer's markets
Offer food pantries and teaching kitchens
Deliver healthy foods within the community

SOURCE SUSTAINABLE FOODS

Sustainably produced food reduces agriculture's impact on the environment and climate and ensures nutrition security for current and future generations.³



ADOPT **VALUES-BASED** PROCUREMENT POLICIES to consider the triple bottom line (social, economic, and environmental) and encourage vendor transparency on sustainability metrics¹³

INCREASE THE PROPORTION OF **PLANT-BASED FOODS** as an especially impactful way to improve sustainability and health^{11,15}

In hospitals, carbon footprint varies by diet type⁶
All types (avg.) 4.2 kg CO₂ eq
High-protein 8.1 kg CO₂ eq



This [Hospital Foodservice Program Guide](#) helps care facilities join the global movement to go meatless on Mondays.¹¹



3 MINIMIZE FOOD AND ASSOCIATED WASTE

Undesirable food and unsustainable packaging and serving tools produce significant amounts of avoidable waste in healthcare facilities.

FOOD WASTE

Patient tray waste often reaches **50%**²

PACKAGING & SERVING WASTE

50% of tray waste is packaging¹⁶



Few facilities are equipped to compost food; most food waste goes to landfill and produces methane as it decomposes



Malnourished patients have longer stays and poorer outcomes



Tray waste amounts to a cost of \$45M annually in Canada¹⁷

RECOMMENDED ACTIONS¹³

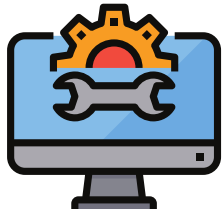
- Conduct patient satisfaction surveys and food waste audits
- Serve fresh, nutritious, flavorful, diverse, and culturally appropriate foods
- Adopt technologies and models that reduce order mix-ups and ensure well-timed meal delivery
- Use vendors that use minimal and/or alternative packaging (that meets patient needs)
- Devise waste management strategies to divert food and associated waste from landfill

REVAMP FOOD SERVICE SYSTEMS & MODELS

Food ordering and delivery systems that prioritize patient preferences and schedules reduce tray waste, improve patient satisfaction, and save costs.^{9,19,20}

SPECIALIZED HOSPITAL

FOODSERVICE SOFTWARE



- meal supplies and preparation
- delivery scheduling
- patient needs and preferences
- costs¹⁸

TRAY LINE MODEL

✗ Food arrives at **set times**...even if the patient is out of the room, resting, or not hungry

ROOM SERVICE MODEL

✓ Patients order from a restaurant-style menu at **any time**

Brisbane's Mater Hospital²¹

- + New food ordering software
- + New room service delivery model



PLATE WASTE (29% to 12%)



FOOD WASTE (15%)



NUTRITIONAL INTAKE



PATIENT SATISFACTION

References

1. EAT-Lancet Commission. 2019. Summary Report of Food in the Anthropocene: the EAT-Lancet commission on healthy diets from sustainable food systems https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf
2. Nourish. 2018. Infographic: The Opportunities for Food in Healthcare. <https://www.nourishhealthcare.ca/full-infographic>
3. Carino, S., Porter, J., Malekpour, S., & Collins, J. 2020. Environmental Sustainability of Hospital Foodservices across the Food Supply Chain: A Systematic Review. *Journal of the Academy of Nutrition and Dietetics*, 120(5), 825–873.
4. Willett, Walter, Johan Rockström, Brent Loken, Marco Springmann, Tim Lang, Sonja Vermeulen, Tara Garnett, et al. "Food in the Anthropocene: The EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems." *The Lancet (British Edition)* 393, no. 10170 (2019): 447–92.
5. Sahal Alharbi, Nouf; Yahia Qattan, Malak; Haji Alhaji, Jawaher. 2020. "Towards Sustainable Food Services in Hospitals: Expanding the Concept of 'Plate Waste' to 'Tray Waste'" *Sustainability* 12, no. 17: 6872.
6. Vidal R, Moliner E, Pikula A, Mena-Nieto A, Ortega A. Comparison of the carbon footprint of different patient diets in a Spanish hospital. *J Health Serv Res Policy*. 2015 Jan;20(1):39-44.
7. Canadian Institute for Health Information. Health DAD/HMDB Inpatient Hospitalizations: Volumes, Length of Stay, and Standardized Rates, 2018-2019. <https://www.cihi.ca/en/dadhmdb-inpatient-hospitalizations-volumes-length-of-stay-and-standardized-rates>
8. Natural Resources Canada. Greenhouse Gas Equivalencies Calculator. <https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/calculator/ghg-calculator.cfm>
9. National Health Service. 2020. Delivering a 'Net Zero' National Health Service <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf>
10. Carino S, Collins J, Malekpour S, Porter J. Environmentally sustainable hospital foodservices: drawing on staff perspectives to guide change. *Sustainable Production and Consumption*. 2021 Jan;25:152-161.
11. Nourish, 2019. A Guide to Sustainable Menus. https://static1.squarespace.com/static/58829365c534a576e10e3a5c/t/5f9cfad387c36362741ba5769/1607445818187/guide_en-1.pdf
12. Lapalme, Hayley, Marley, Elin. 2011. Conducting Food Origin Audits: A step-by-step guide. My Sustainable Canada & Canadian Coalition for Green Health Care, @ <https://greenhealthcare.ca/wp-content/uploads/2020/05/Food-Audits.pdf>
13. Reynolds, Jennifer. 2018. Nourishing the Future of Food in Health Care A Pan-Canadian Policy Scan 2018. <https://mccconnellfoundation.ca/wp-content/uploads/2019/05/Nourishing-the-future-of-health-care.pdf>
14. Feed B.C. 2019. B.C. Food Expenditures in Health Care 2018/19. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/feedbc/healthcare/bc_food_expenditures_report_2018-2019.pdf.pdf
15. Canada's Food Guide. 2020. Healthy Eating and the Environment. <https://food-guide.canada.ca/en/tips-for-healthy-eating/healthy-eating-and-the-environment/>
16. Alharbi, Nouf Sahal, Qattan, Malak Yahia and Alhaji, Jawaher Haji, (2020), Towards Sustainable Food Services in Hospitals: Expanding the Concept of 'Plate Waste' to 'Tray Waste', *Sustainability*, 12, issue 17, p. 1-8
17. Gooch, Martin, Felfel, Abdel. 2014. "\$27 Billion" Revisited: The Cost of Canada's Annual Food Waste. Value Chain Management International Inc. <http://vcm-international.com/wp-content/uploads/2014/12/Food-Waste-in-Canada-27-Billion-Revisited-Dec-10-2014.pdf>
18. Embry, Ann Elizabeth, "Implementation of Specialized Software in Hospital Foodservice Departments: A Multi-Case Study Approach" (2017). *Graduate Theses and Dissertations*. 15299. <https://lib.dr.iastate.edu/etd/15299>
19. Nourish. 2020. Transforming Patient Experience and Reducing Food Waste Through Room Service. <https://static1.squarespace.com/static/58829365c534a576e10e3a5c/t/5f8df62eb0c37e61c4b3c6a4/1603139123877/Executive+Summary+TPF-CHU+Ste-Justine+.pdf>
20. McCray S, Maunder K, Krikowa R, MacKenzie-Shalders K. Room Service Improves Nutritional Intake and Increases Patient Satisfaction While Decreasing Food Waste and Cost. *J Acad Nutr Diet*. 2018 Feb;118(2):284-293
21. Dieticianconnection.com. November 12, 2017. A Revolution in Food Service: The Mater "Room Service" Model (Part 2 of 2). *Infuse Magazine* <https://dietitianconnection.com/news/a-revolution-in-food-service-the-mater-room-service-model-part-2-of-2/>

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