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A qualitative exploration of barriers, facilitators and best practices for implementing environmental sustainability standards and reducing food waste in veterans affairs hospitals

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Abstract

Background: To improve the healthfulness of foods offered while accelerating the use of environmental sustainability practices, it is important to engage hospital food service operators

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AUTHOR CONTRIBUTION

Bethany D. Williams, Stephen J. Onufrak and Amy Lowry Warnock conceptualised the study. All authors contributed to methods development and the drafting of the survey and interview guide. Anne Utech, Bethany D. Williams and Stephanie Jilcott Pitts recruited participants. Bethany D. Williams and Stephanie Jilcott Pitts collected and analysed data and wrote initial version of the manuscript. All authors reviewed the manuscript for critical intellectual content and approved the final version as submitted.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

in the adoption of such practices. The purpose of this study was to explore barriers, facilitators and best practices for implementing environmental sustainability standards in food service among veterans affairs (VA) hospitals in the United States.

Methods: We conducted an online survey with 14 VA hospital food service directors and then 11 qualitative interviews. The survey assessed motivations for initiating sustainability standards and included a self-rating of implementation for each of five standards: increasing plant-forward dishes, procuring and serving sustainable foods that meet organic/fair trade and other certifications, procuring and serving locally produced foods, reducing food waste and reducing energy consumption. Interviews were transcribed verbatim. Qualitative analysis, including coding of themes and subthemes, was conducted by two coders to determine barriers, facilitators and best practices for each of these five standards. Quantitative methods (counts and frequencies) were used to analyse the survey data.

Results: Participants had an average of 5 years of experience implementing sustainability standards. The top three motivators cited were reducing food waste, serving healthier foods and increasing efficiency or cost savings. Barriers revolved around patient preferences, contractual difficulties and costs related to reducing waste. Facilitators included taste testing new recipes that include more sustainable food options and easy access to sustainable products from the prime vendor. Best practices included making familiar dishes plant-forward and plate waste studies to prevent overproduction.

Conclusions: Although there were many barriers to implementation, food service directors had solutions for overcoming challenges and implementing food service sustainability standards, which can be tested in future sustainability initiatives.

Keywords

food waste; healthy food; hospital food service; sustainability

INTRODUCTION

There is growing evidence that human health and our environment are inextricably linked.¹⁻³ Negative health and societal consequences are driven, in part, by degradation of our ecological environment.^{4,5} These environmental consequences are costly, with long-lasting effects on human and community health outcomes. Climate change is now recognised as an urgent public health threat, and communities are beginning to use coordinated and multifactor approaches to address it.⁶

The US health care sector accounts for approximately 10% of total greenhouse gas emissions.⁷ As such, a growing number of hospitals are beginning to invest in strategies that will improve population health outcomes, reduce the hospital's carbon footprint and create long-term cost savings by following sustainable best business practices.⁸ Hospitals educate patients, staff and citizens about the connections between our environment and human health. For example, growing numbers of hospitals are making public commitments to prioritise healthy food availability and environmental sustainability in their food service operations. This includes procuring food with a low carbon footprint and reduced pesticide

exposure, as well as disposing of food in a way that is environmentally friendly and more cost-efficient.⁹

Several national health care organisations are following guidelines that support both health and environmentally friendly food service operations. Examples include the Food Service Guidelines for Federal Facilities,¹⁰ the Good Food Purchasing Program,¹¹ the VA Healthy Diet Guidelines¹² and the Healthy Food in Health Care Standard led by Health Care Without Harm (HCWH) and Practice Greenhealth.¹³ All of these guidelines recommend the use of food service standards that are good for health and protect our environment in five key categories: (1) increasing healthy food environments through more fruits and vegetables and/or plant-forward meal entrees, (2) procuring and serving sustainable foods that meet organic/fair trade and other certifications, (3) procuring locally produced foods, (4) reducing food waste and (5) reducing energy consumption. These guidelines take a holistic approach to health promotion, recognising the economic, environmental and human health benefits.

Food service operators may be reluctant to undertake these practices due to real or perceived challenges. In prior research,¹⁴ barriers to implementing healthier food service guidelines included customer preferences and vendors' lack of options from distributors that met nutrient criteria. Facilitators included having both leadership support and dietitians on board to guide implementation. In a subsequent study to determine best practices for financial sustainability of healthy food service guidelines in hospital cafeterias, the best practices fell within two broad themes: increased demand for – and sales of – healthier foods and supply of healthier foods and beverages.¹⁵ Additionally, facilitators that contributed to the success of institutional procurement practices in municipal facilities in Los Angeles County, California, included examining institutional authority to adopt nutrition standards, educating key stakeholders and educating end users to prepare them for upcoming changes. Barriers included the complex administrative processes for making changes and consumer acceptance of healthier food offerings.¹⁶

These prior studies focused on barriers, facilitators and best practices related to serving and selling healthier foods without addressing the environmental footprint of hospital food service. More recently, others have studied barriers, facilitators and best practices related to sustainability in hospital food service. In a systematic review of environmental sustainability in hospital food service, Carino et al.¹⁷ found that the environmental impact most widely explored was food waste quantities – the focus of many strategies – and economic losses. Dauner et al.¹⁸ found that gaining resources from top-level leaders and disseminating information to stakeholders are critical strategies for successfully implementing healthy and sustainable food service in hospital settings. Carino et al.¹⁹ found that motivations to implement sustainability practices in hospital food service included individual values, practical solutions to problems or government requirements.

Although there have been several studies of sustainable food service standards in hospital settings, fewer studies examined how such practices are implemented in day-to-day operations. To our knowledge, no studies have specifically examined this topic in the context of federally operated hospitals in the United States. In the United States Department of Veterans Affairs (VA), the Veterans Health Administration (VHA) delivers health

care to over 9 million veterans through its medical centres (inpatient units), community living centres (long-term care), rehabilitation programmes and community-based outpatient clinics.²⁰ Within almost all of the 172 VA medical centres, inpatient food operations (>30 million meals/year nationwide) are required to be supervised by a registered dietitian nutritionist chief, who has the responsibility to oversee the patient food operations as well as all the clinical nutrition²¹ care for that medical centre. Inpatient meals are provided through funds appropriated from Congress as part of veterans' medical care and treatment. The national governance for this operational and policy structure is housed in the VHA Nutrition and Food Services (NFS) Program Office in VHA headquarters but is largely overseen by field-based VA nutrition professionals who compose the VHA Nutrition Field Advisory Board (NFAB).²² Given the large number of VA hospitals and large number of meals served per week nationwide, shifting food service operations towards more sustainable practices could have a large positive impact on health and environment.

Few studies have reported on the use of sustainability practices in federal hospital facilities. Therefore, the purpose of this study was to explore barriers, facilitators and best practices for implementing environmental sustainability practices among nutrition and food service managers in federally operated hospitals of the US Department of Veterans Affairs. VA policies impact all VA hospitals; thus, studying and clarifying best practices for sustainability have far-reaching implications.

METHODS

Participant recruitment

In spring 2022, a list of 20 nutrition and food service chiefs and managers from geographically diverse US VA medical centres was generated by a field-based, national nutrition and food service leader in sustainability for NFAB at the VA. These 20 potential participants were recruited via email from the VA's National Nutrition and Food Services Director, with an invitation to voluntarily participate in the study by completing a survey and participating in an interview. The study protocol was reviewed by the East Carolina University Institutional Review Board (IRB), which determined that it did not meet the federal definitions of research involving human participants and therefore did not require IRB approval.

Online survey

The online survey was developed by the research team for the present study and based on information deemed important to understand the background on adoption and implementation of the sustainability practices. It was sent by email to 20 food service chiefs/managers from VA medical centres via Qualtrics. The survey included questions on the length of time the respondent had been in their hospital food service position, the length of time the hospital had been implementing food service sustainability practices, top motivators for implementing such sustainability practices and self-reported rankings of success around the five key practices, with 1 being 'not successful' and 10 being 'very successful'. A 10-point scale was used to allow for maximum variation in responses. The five key practices included (1) increasing plant-forward dishes in the menu cycle,

(2) procuring and serving sustainable foods that meet organic or fair trade criteria and similar certifications, (3) procuring locally produced foods, (4) reducing food waste and (5) reducing energy consumption.

Interview guide

The methods employed in the current study are aligned with those in Moisey et al.,²³ with a focus on qualitative description. The semi-structured interview guide (available upon request) was developed by study co-authors, which included scientists and public health practitioners representing the Nutrition and Obesity Policy Research and Evaluation Network (NOPREN) Food Service Guidelines Workgroup (B.D.W., S.J.P., M.W., J.S., F.A., M.M.), the Centers for Disease Control and Prevention (CDC) (S.O., A.L.W.) and HCWH/Practice Greenhealth (E.S.). The interview guide was designed to understand more about participants' responses to online survey items. The interviews were conducted over Webex, audio-recorded and lasted approximately 45–60 min each. After interviews were transcribed using Webex's transcription feature, transcripts were reviewed and edited for clarity by one investigator.

Data analysis

Online survey data were entered into Excel and analysed using simple counts and percentages. For the qualitative analysis of in-depth interviews, thematic analysis was used, whereby two investigators (B.D.W., S.J.P.) reviewed three data-rich transcripts and created two independent codebooks, which included deductive and inductive codes. Investigators met to review the codebooks and created one consensus codebook to apply to all transcripts. All transcripts were independently double coded by the two researchers, who then met and discussed disagreements on coding, ultimately reaching consensus. There was potential overlap in the coding for a *facilitator* versus a *best practice*, and thus coders also created working definitions, and inclusion and exclusion criteria, for distinguishing what qualified as an implementation facilitator or a best practice. The following definitions were applied during coding: An *implementation facilitator* was a *new* factor in the facility's environment (e.g., supportive/passionate leadership, higher staff capacity and newer eco-friendly facilities) that directly or indirectly supports implementation. An *implementation best practice* was an *existing* factor that had a history of consistently leading to successful implementation outcomes. After all interviews were coded in NVivo (version 12, QSR), we conducted thematic analysis, using the method of Braun and Clarke,²⁴ using the main research questions to determine major themes related to facilitators and barriers for each of the five key food service sustainability practices.

RESULTS

Online survey findings

Overall, 14 food service directors completed the online survey. Participants had been in their positions for an average of 6.3 years (range 0.5–21 years), with an average of 5 years (range 0–12 years) implementing the five key sustainability practices in hospital food service. Ten respondents (71%) reported using vendors other than the VA's contracted prime vendor (broadline distributor) to purchase locally sourced bread, produce and milk. All VA hospitals

are still required to purchase at least 80% of food products from the VA's national prime vendor.

Motivation and self-reported rankings of successful implementation of sustainability practices—The most reported motivators for implementing food service sustainability practices included reducing food waste ($n = 11$), serving healthier foods ($n = 10$) and increasing efficiency or cost savings ($n = 8$). The average self-reported rankings of successful implementation of each of the five food service sustainability practices were as follows: reducing food waste (5.14), increasing plant-forward dishes (3.00), procuring locally produced foods (2.64), reducing energy consumption and non-food waste (2.29) and procuring and serving sustainable foods that meet organic/fair trade and other certifications (1.93).

In-depth interview findings – key factors related to implementation

Of the 14 participants surveyed, 11 completed the full interview. Of those interviewed, there were three VA hospitals in the southern United States, three from the western United States, four from the Midwest and one from the Northeast. Key findings related to implementation of the sustainability practices are summarised as follows, and in Table 1.

Leaders championed sustainable food service—Food service sustainability practices at each hospital were commonly initiated because of a leader or champion in the agency who was committed to environmental sustainability efforts. Other reasons for initiation were due to encouragement from national leadership, national guidelines to pursue sustainability practices in food service, demand from (mostly younger) veterans, or the VA Environmental Health and Safety workgroup or the Green Environmental Management Systems committee encouraged food service staff's engagement with the HCWH/Practice Greenhealth sustainability initiatives. Overall, participants perceived that VA leaders at the local, regional and national levels were supportive of sustainability practices in food service, especially when there would be cost savings and patients would be happier with what was offered.

Existing contract requirements are few—When asked about existing contract requirements for sustainability, participants noted the following: (1) Energy Star requirements for purchasing new equipment, (2) language in the VA's prime vendor (broadline distributor) contract allowing for sustainable food service purchases and (3) the national guideline/standards to procure antibiotic-free chicken and 'local' foods.

Many staff members assisted with implementation—Key facilitators for implementation of food service sustainability practices included the following actors: food operations managers, NFS chief, assistant chief, federal supply schedule service registered dietitian, administrative officers, chefs, cook supervisors, cooks, food service systems dietitian, production manager, supply specialists and informatics dietitians (who track purchases and inventory with Computrition).

Staff support helped drive sustainability practices, but some staff needed to be convinced of the benefits—Participants noted that staff members were usually supportive of sustainability practices in food service, but sometimes it took leadership direction and a culture shift. Staff were usually supportive of strategies to reduce food waste, as they observed how much waste occurs. Staff took an active role in trying to use items that were about to expire and helped use existing inventory during COVID-19–related supply chain shortages. Staff were less knowledgeable, and thus less supportive, about some strategies such as those regarding organic and ethical certifications. Larger team meetings, where sustainability topics were discussed, helped facilitate staff buy-in. Staff were less supportive about some sustainability practices, especially composting and biodigesting, which caused unfamiliar odours.

Rural locations have different facilitators and barriers to implementing food service sustainability practices—The participants noted differences in facilitators and barriers to sustainability practices in rural versus urban food service locations. For example, a participant from a rural hospital noted that living near farms made it easier to obtain local produce contracts. Conversely, living in a rural area was a barrier for another hospital which procured ‘local’ produce from a distant warehouse. Furthermore, this same hospital had difficulty maintaining its local produce contract due to limited order volume. The participant, whose hospital had a garden, noted that being in a rural area facilitated more space for the garden compared to if the hospital were in a more urban area.

COVID-19 made food service sustainability practices more difficult—Overall, the pandemic made it more difficult to prioritise sustainability, given many logistical barriers that had to be overcome. Supply chain shortages limited hospitals acquiring Styrofoam-free goods. Many hospitals chose to use mostly disposables to limit COVID-19 transmission. COVID-19 also limited the ability to hire and keep labour for dishwashing, requiring more disposables. In addition, hospital food donation programmes could not continue due to campus visitor restrictions during the pandemic. Conducting taste tests to try out plant-forward meals was limited after COVID-19.

Barriers, facilitators and best practices for sustainability: Table 2 provides barriers, facilitators and example quotes specific to implementation of each of the five key food service sustainability standards outlined by HCWH/Practice Greenhealth. Table 3 provides best practices for each of the five practices. These are summarised below.

1. Increasing plant-forward dishes

Barriers included patient preferences for meat dishes, difficulty with planning plant-forward menus and difficulty procuring plant-forward products. Facilitators included taste testing new recipes, working with chefs and cooks to develop new recipes and having younger patients who preferred vegetarian and plant-forward dishes. A best practice mentioned by several food service directors was modifying familiar dishes, such as chili and lasagna, and making them plant-forward. Another successful strategy was reducing protein portion sizes compared to vegetables and blending meat and plant-based proteins.

2. Procuring and serving sustainable foods that meet organic, fair trade and/or other ecological or ethical certification

Barriers included difficulty determining which foods and beverages offered by the prime vendor met the certifications, and the lack of procurement, as a priority to justify the time and costs of products that meet certifications. On the contrary, when products meeting certifications were readily available (fair trade coffee and antibiotic-free chicken), priced competitively and offered through the prime vendor, it was easier to implement this sustainability standard. Best practices included working with the prime vendor to determine which products meet certifications and also working with other VA hospitals to ensure that selected products are prioritised and stocked by the prime vendor.

3. Procuring and serving locally/regionally produced items

Barriers included difficulty creating contracts for local vendors, lack of product standardisation and finding farmers who could meet the needs for product quality, pricing, adequate quantities and optimal timing of delivery. Facilitators included having a staff person with the time and desire to champion the local food purchasing effort, starting with the most efficient product to purchase locally (e.g., milk) and communicating the importance of local sourcing to staff and leadership. Best practices included beginning with the least-expensive or highest-quality product to purchase locally, asking for assistance to set up the contracts and having a garden onsite at the hospital.

4. Reducing food waste

Barriers included the time commitment required and difficulty assessing food waste, cost and problems related to waste reduction devices such as the biodigester. Facilitators included staff support, switching to a selective menu where patients select which option they prefer and leadership support. Successful best practices for reducing food waste included food tracking studies to prevent overproduction, monitoring/rotating products to use leftovers and a food donation programme.

5. Reducing energy consumption

Barriers included the perception that food and nutrition service directors were unable to influence energy usage or investment of time/effort/money for technical upgrades, which may be helpful in the long run. Leadership support was an important facilitator, as well as prioritising and goal setting. Best practices included using less plastic and Styrofoam and replacing older equipment with energy-saving options.

DISCUSSION

In this sample of medical centre nutrition and food service managers, barriers to the five key food service sustainability practices included (1) lack of patient preference for plant-forward meals, (2) the time and cost necessary to implement the practices, (3) difficulty finding

products that met certifications from the VA's national prime vendor and (4) the lack of standardisation of locally sourced products. These barriers are in alignment with findings of our previous study,¹⁴ where nutrition and food service directors reported barriers to healthy food service guideline implementation, which included customer preferences for less healthy options and lack of healthy food and beverage options from the prime vendors.

The current study found that facilitators to implementation of sustainability standards in food service included (1) having leadership support, (2) having chefs and dietitians ready to develop recipes that meet criteria and (3) identifying products that meet specialty certification criteria from the prime vendor. Carino et al.¹⁹ found that, among 21 participants from 14 hospitals recruited from 9 countries, enablers for sustainable food service included motivated staff and supportive leadership, which are similar to the findings of the current study. The importance of the prime vendor is highlighted in the current study findings and emphasises the importance of ensuring that prime vendors have sustainability in mind when selecting foods and beverages to feature. Next steps may include a study of prime vendors and the availability of products that meet sustainability practice standards, including barriers to stocking and promoting such items.

It is noteworthy that food waste reduction sustainability standards were the practices that food service directors were most motivated to address and felt they were doing well. There have been many food waste reduction strategies within the federal government, which may have positively influenced VA hospitals' implementation in the current study. Our results that indicated hospitals had increased food waste, given the COVID-19 pandemic, are consistent with the findings of Cook et al.²⁵ However, after the pandemic's initial effects, hospitals recovered and were able to once again devote time and resources to reducing food waste. Future studies should examine hospital efforts to reduce food waste and test best practices to reduce food waste, including donation models and patient choice models.

Also noteworthy are the seemingly contradictory findings regarding rural hospitals and obtaining fresh produce. For some rural hospitals, the order volume was not sufficient to warrant a local produce contract, whereas for others, there was better access to local farmers, making it easier to obtain a local produce contract. This finding warrants further research with a more purposive sample of both rural and urban hospitals, as well as examining barriers and facilitators producers face in working with hospitals to establish contracts.

One of this study's limitations was the small sample size. This study asked only about VA's inpatient meals, but there could be different barriers for cafeterias serving employees or visitors (managed by a different entity, the Veterans Canteen Service). In the future, it would be beneficial to determine hospital-level characteristics, such as inpatient capacity, average number of meals served daily and number of food service employees, and how these factors might impact sustainability efforts. Study strengths include the geographically diverse sample and the breadth of professional experience among respondents.

CONCLUSIONS

In conclusion, there were many facilitators and barriers for the implementation of food service sustainability standards in VA hospitals. Cross-cutting barriers included lack of leadership and staff support, lack of resources to implement the practices and COVID-19–enhanced resource constraints. Cross-cutting facilitators included leaders who were willing to champion the standards, positive staff motivation and buy-in. These barriers and facilitators should be accounted for in future efforts to accelerate food service sustainability standards within federal health care systems or hospitals.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

PEER REVIEW

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jhn.13357>.

REFERENCES

1. Crimmins Alison B, Gamble J, Beard JL, Bell CB, Dodgen JE, et al. The impacts of climate change on human health in the United States: a scientific assessment. Washington, DC: U.S. Global Change Research Program; 2016. p. 1–312. 10.7930/J0R49NQX
2. Centers for Disease Control and Prevention. Climate effects on health [Internet]. 2022 May 3 [cited 2023 Jul 17]. Available from: <https://www.cdc.gov/climateandhealth/effects/default.htm>
3. Ebi KL, Bole A, Crimmins A, Glass G, Saha S, Shimamoto MM, et al. Human health. In: Impacts, risks, and adaptation in the United States: The fourth national climate assessment, Volume II. Washington, DC: U.S. Global Change Research Program; 2018. p. 539–71. 10.7930/NCA4.2018.CH14
4. Kahn LG, Philippat C, Nakayama SF, Slama R, Trasande L. Endocrine-disrupting chemicals: implications for human health. *Lancet Diabetes Endocrinol.* 2020;8(8):703–18. 10.1016/S2213-8587(20)30129-7 [PubMed: 32707118]
5. Nolte CG, Dolwick P, Fann N, Horowitz LW, Naik V, Pinder RW, et al. Chapter 13: Air quality. In: Impacts, risks, and adaptation in the United States: The Fourth National Climate Assessment, Volume II. Washington, DC: U.S. Global Change Research Program; 2018. p. 512–38. 10.7930/NCA4.2018.CH13
6. Melillo JM, Richmond TC, Yohe GW, editors. Climate change impacts in the United States: the Third National Climate Assessment. Washington, DC: U.S. Global Change Research Program; 2014. 10.7930/J0Z31WJ2
7. Eckelman MJ, Sherman J. Environmental impacts of the U.S. health care system and effects on public health. *PLoS ONE.* 2016;11(6):e0157014. 10.1371/journal.pone.0157014 [PubMed: 27280706]
8. Climate and Health. Practice greenhealth. 2024 [cited 2023 Jul 17]. Available from: <https://practicegreenhealth.org/topics/climate-and-health/climate-and-health>
9. The Health Care Climate Challenge. Health care without harm. 2024 [cited 2023 Jul 17]. Available from: <https://noharm-uscanada.org/healthcareclimatechallenge>
10. Food Service Guidelines Federal Workgroup. Food service guidelines for federal facilities. 2017 [cited 2023 Jul 17]. Available from: https://www.cdc.gov/obesity/downloads/guidelines_for_federal_concessions_and_vending_operations.pdf

11. Decrease Health Risks & Healthcare Costs. Impact hub. 2024 [cited 2023 Jul 17]. Available from: [https://impacthub.goodfoodpurchasing.org/ \[...slug\]](https://impacthub.goodfoodpurchasing.org/ [...slug])
12. Food Service Management Veterans Health Administration Directive 1439(1) [Internet]. 2019 Oct 21 [cited 2023 Aug 9]. Available from: https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=8557
13. Practice Greenhealth. Food. 2024 [cited 2023 Jul 17]. Available from: <https://practicegreenhealth.org/topics/food>
14. Jilcott Pitts SB, Graham J, Mojica A, Stewart L, Walter M, Schille C, et al. Implementing healthier foodservice guidelines in hospital and federal 5worksite cafeterias: barriers, facilitators and keys to success. *J Hum Nutr Diet.* 2016;29(6):677–86. 10.1111/jhn.12380 [PubMed: 27126177]
15. Jilcott Pitts S, Schwartz B, Graham J, Warnock AL, Mojica A, Marziale E, et al. Best practices for financial sustainability of healthy food service guidelines in hospital cafeterias. *Prev Chronic Dis.* 2018;15:170477. 10.5888/pcd15.170477
16. Robles B, Wood M, Kimmons J, Kuo T. Comparison of nutrition standards and other recommended procurement practices for improving institutional food offerings in Los Angeles County, 2010–2012. *Adv Nutr.* 2013;4(2):191–202. 10.3945/an.112.003285 [PubMed: 23493535]
17. Carino S, Porter J, Malekpour S, Collins J. Environmental sustainability of hospital foodservices across the food supply chain: a systematic review. *J Acad Nutr Diet.* 2020;120(5):825–73. 10.1016/j.jand.2020.01.001 [PubMed: 32093919]
18. Dauner KN, Lacaille LJ, Schultz JF, Harvie J, Klingner J, Lacaille R, et al. Implementing healthy and sustainable food practices in a hospital cafeteria: a qualitative look at processes, barriers, and facilitators of implementation. *J Hunger Environ Nutr.* 2011;6(3):264–78. 10.1080/19320248.2011.597828
19. Carino S, Malekpour S, Porter J, Collins J. The drivers of environmentally sustainable hospital foodservices. *Front Nutr.* 2021;8:740376. 10.3389/fnut.2021.740376 [PubMed: 34722609]
20. Santo R, Silverman J. Values-aligned food purchasing and service: promising examples from US Federal Agencies and Programs. *Federal Good Food Purchasing Coalition*; 2023. p. 1–16. <https://smallplanetinstitute.org/app.box.com/s/drmbtzz4t3t9m77r07s41s87gurt6h8r>
21. Clinical Nutrition Management and Therapy Veterans Health Administration Directive 1438(1) [Internet]. 2019, Sep 19 [cited 2023 Aug 9]. Available from: https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=8512
22. Leadership Utech A. and communication in the field: from policy to practice. Alexandria, VA: Association for Talent Development. 2013 Dec 15 [cited 2023 Aug 9]. Available from: <https://www.td.org/magazines/the-public-manager/leadership-and-communication-in-the-field-from-policy-to-practice>
23. Moisey LL, A Campbell K, Whitmore C, Jack SM. Advancing qualitative health research approaches in applied nutrition research. *J Hum Nutr Diet.* 2022;35:376–87. [PubMed: 34997658]
24. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3:77–101.
25. Cook N, Goodwin D, Collins J, Porter J. ‘It’s a constant changing environment, and we’re just playing catch up’: hospital food services, food waste, and COVID-19. *Nutr Diet.* 2023;80(2):201–10. 10.1111/1747-0080.12762 [PubMed: 35844090]

Key points

There have been several studies of sustainable food service standards in hospital settings, yet few have examined how these sustainable food service practices are implemented in day-to-day operations in veterans affairs hospitals throughout the United States. The study findings revealed many best practices that can be tested in the future, including increasing plant-forward dishes by modifying familiar dishes and making them plant-forward, procuring locally produced foods by beginning with the highest-quality product to purchase locally and having a garden onsite at the hospital and reducing food waste by food tracking studies to prevent overproduction and a food donation programme.

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TABLE 1

In-depth interview findings - key factors related to implementation themes.

Theme	Example quotes
Leaders championed sustainable food service	<p>‘... our national nutrition and food service director ... they are very supportive of sustainability practices and encourage...the use as much as possible for each facility’. Pt 01</p> <p>‘I would say the general, like the chiefs, you know, the general support is there, they understand the importance, whether ... it’s because it’s the directive or it’s the right thing to do. They understand that it needs to be done’. Pt 04</p>
Existing contract requirements are few	<p>‘Well, I know in our [prime vendor] contract gets a national contract and so all the VAs ... have that, and there is language in that contract about sustainable purchases. But all also are able to have local contracts with bread and milk and produce. We don’t have a produce contract, but we deal with local farmers...’. Pt 13</p>
Staff support helped to drive change, but some needed to be convinced of the benefits of sustainability practices	<p>‘One example is we had a dishwasher when we first started using the composters and she complained of ‘toxic fumes’ coming from the composter. Yeah. We’re like no, that’s the smell of soil gold there ...’. Pt 06</p>
Rural and urban locations have their benefits and barriers when it comes to implementing food service sustainability practices	<p>Living in a rural area makes local produce contracts easier: Just because of where we are, like, we’re in a more rural area. ... we’re near bigger cities by 45 minutes ... But, but we’re more in the country, so we have local farmers. So, you know, if we were in [a large city] maybe, you know, we probably wouldn’t necessarily be able to procure as much locally’. Pt 13</p> <p>Living in a rural area makes local produce contracts more difficult: ‘...And I think to get a produce contract, you’re probably looking at a larger metropolitan area, which is not [xx rural area], or any of the sites that I’m working for now. It wasn’t for a lack of trying and I did look into it for a while. ... we had a produce contract maybe for a year or 2, ...then they dropped it just because... we could only order, I don’t know, like 800 dollars or something every week and that wasn’t enough for them to keep the contract, so we just don’t have the, you know, we didn’t have the volume...’. Pt 05</p>
COVID-19 made food service sustainability practices more difficult	<p>The more ecologically sound disposables were more difficult to procure, as noted by this participant: ‘Yeah, we’re limited on what we can purchase. COVID ... exactly, you know. Yeah, we were Styrofoam-free until that’s all you could buy, or something like that’. Pt 13</p>

Common themes of barriers and facilitators for hospitals implementing five primary healthy and sustainable food service practices.

TABLE 2

Sustainable food service practice	Barriers	Example quotes	Facilitators	Example quotes
Increasing plant-based dishes	<p>Patient preference for meat dishes, non-meat dishes not ordered enough ($n=10$)</p> <p>Difficult to plan menus, staffing ($n=4$)</p> <p>Supply chain issues, cannot find vegetarian/plant-forward products ($n=2$)</p> <p>Does not work with current meal preparation operations ($n=2$)</p>	<p>'I think, our biggest challenge is ... acceptance by the patients, uh, because even on those days where we serve the meat-free items, they're like, you know, "Where's the meat?"' Pt 01</p>	<p>Testing recipes in the cafeteria first, taste testing ($n=5$)</p> <p>Working with chef/cooks to develop recipes ($n=4$)</p> <p>Newer/younger patients have more preference for vegetarian dishes ($n=4$)</p> <p>Prioritisation and goal setting, food service staff personal investment ($n=3$)</p> <p>Prime vendor. A options are available ($n=3$)</p> <p>Advertising vegetarian or plant-forward meals to patients ($n=3$)</p>	<p>'... Having the cafeteria where we can trial different things more so than if we didn't have a cafeteria ... it would probably be harder to get their feedback without more staff, because we can pretty much go to the cafeteria after we serve something and ... it's just easier'. Pt 13</p>
Procuring and serving sustainable foods that meet organic, ecological, fair trade or other ethical certifications	<p>Limitations with prime vendor, that is, 'prime vendor A' (not available, not clear which products meet certifications) ($n=9$)</p> <p>Lack of patient/staff buy-in ($n=4$)</p> <p>Organic foods are more expensive ($n=3$)</p> <p>COVID-19 impacted costs, availability and the supply chain ($n=2$)</p>	<p>'We haven't (made these changes) because it's really not important to our population They like Coffee A. ... They don't care [about ethically sourced coffee]'. Pt 06</p>	<p>Products are easily available and/or reasonably priced (fair trade coffee, antibiotic-free chicken) ($n=6$)</p> <p>Offered through or advertised by prime vendor A ($n=5$)</p> <p>Leadership priorities to procure/serve sustainable foods with certifications ($n=2$)</p>	<p>'... There's a new prime vendor advertisement, and they identify which are sustainable products'. Pt 11</p>
Procuring and serving locally/regionally produced foods	<p>Burden setting up contracts with local farmers (time, contract language and finding examples) ($n=8$)</p> <p>Lack of consistency and standardisation of products (meats, veggies, quantities available, quality, cleanliness, last-minute changes to recipes and menus and price changes) ($n=6$)</p> <p>Finding farmers whose production meets the needs of the facility (quantities needed and timing of delivery) ($n=5$)</p> <p>Local procurement is not a priority to justify resources (time and cost) ($n=5$)</p> <p>Difficulty working with the prime vendor for local products (lack of options, not clear what 'local' means to them) ($n=5$)</p> <p>COVID-19 (impacted costs, availability and supply chain) ($n=3$)</p> <p>Required to purchase 80% of foods from prime vendor ($n=3$)</p>	<p>'From our total food budget, we are obligated to purchase at least 80% of all of our goods from the prime vendor ... and then within that, ... we purchase things that have been negotiated for us at certain costs'. Pt 07</p>	<p>Having someone with time/passion to champion the effort ($n=4$)</p> <p>Support from leadership (assisting with contracts, approving hiring of supportive positions) ($n=2$)</p> <p>Options from local farmers are better compared to the prime vendor (less expensive, easy to work with, better quality, last longer) ($n=4$)</p> <p>Locally grown or produced options offered through the prime vendor ($n=4$)</p> <p>Inherited a long-established contract ($n=2$)</p>	<p>'The first thing you should do then is look at your expenses and see what can you outsource or local source that will save you the biggest chunk of money? ... that's the main reason why he started [pursuing local options] with the milk. There's a big chunk of money and ... then the milk that we were getting from prime vendor A was expiring really quickly after we got it so, there was a lot of food waste there. And we couldn't do anything, whereas the milk we get from Local Company A, you know, it takes a lot longer to expire. it's fresher'. Pt 04</p>
Reducing food waste	<p>Time commitment too large ($n=4$)</p> <p>Food waste and usage is difficult to assess (staff decisions and tracking) ($n=3$)</p> <p>Cost ($n=2$)</p> <p>Issues with biodigestor (a system that biologically digests organic material): smell, sanitation and frequent breakdowns ($n=2$)</p>	<p>'I don't think anything has been necessarily difficult once we do it, it's more finding the time to take on a project. ... Of all the projects we have done, definitely the food pantry has been the bigger project that took</p>	<p>Staff support (motivation and time/effort) ($n=4$)</p> <p>Switching to selective menu where the patient selects the meal to reduce waste ($n=3$)</p> <p>Leadership support (passion) ($n=2$)</p> <p>Practice is cost-/time-efficient ($n=2$)</p>	<p>'We use room service, because it's like short-order cooking. We do a certain amount of prep, and things are actually produced when the meal ticket hits the cooks' area, or the cold prep area, or the sandwich area'. Pt 10</p>

Sustainable food service practice	Barriers	Example quotes	Facilitators	Example quotes
Reducing energy consumption and/or reducing non-food waste	<p>Waste tracking system is not user friendly (technological difficulties and time to manage it) ($n = 2$)</p> <p>Feeling that they are unable to influence energy usage or it's out of their control (food service uses a lot of energy, building is old, would be up to facilities, not a priority) ($n = 7$)</p> <p>Investment of time/effort/money (for technical upgrades and staffing problems) ($n = 7$)</p> <p>Operational impacts of COVID-19 (encouraged to use disposables to prevent spread, patients afraid of exposures through reusable plates, labour shortage so disposables were more convenient) ($n = 3$)</p>	<p>a lot more time, and a lot more effort from other people'. Pt 11</p> <p>'It's not that [our staff] don't care about [these practices], it's just that it takes time and money to make some of the changes happen. [Our IT staff] did a huge electrical upgrade for us a couple years ago ... and that was a huge deal. I mean, they're the ones who put all the contracting packages together, and they lined up all the workers'. Pt 05</p>	<p>Leadership support ($n = 3$)</p> <p>Prioritisation and goal setting, food service staff personal investment ($n = 2$)</p> <p>Practice doesn't impact the customer ($n = 2$)</p>	<p>Disposables are really expensive. So, I mean, unless it's a problem with labor ... there would be not a reason to use disposables'. Pt 02</p>

Participant-recommended best practices for hospitals implementing five primary healthy and sustainable food service practices.

TABLE 3

Sustainable food service practice	Best practices	Example quotes
Increasing plant-based dishes	<p>Modify familiar dishes and make them plant based ($n=8$)</p> <p>Accommodate your demographics (i.e., marketing strategies, taste tests) ($n=6$)</p> <p>Increased offering of vegetarian options ($n=6$)</p> <p>Blending plant and meat proteins, offering seafood, altering portion sizes of proteins versus veggies ($n=5$)</p> <p>Advertise support for local businesses to patients ($n=1$)</p> <p>Work with prime vendor A representative ($n=1$)</p> <p>Hiring a chef ($n=1$)</p> <p>Plant-based focus nutrition education for patients ($n=1$)</p>	<p>I definitely, I think that's a big component to just any menu building is taking your demographics... as we try to implement more plant-based recipes, that's where that marketing kind of like naming comes into play so that. I can still appease, you know, a Vietnam-era veteran, meat-and-potatoes kind of guy, but serve him a vegetarian shepherd's pie and not, you know, completely destroy, like, perception of what a meal should be'. Pt 13</p>
Procuring and serving sustainable foods that meet organic, ecological, fair trade or other ethical certifications	<p>Choose products that are easily available and/or reasonably priced ($n=4$)</p> <p>Work with prime vendor A ($n=4$)</p> <p>Work with other veteran affairs (VA) hospitals to coordinate what products are chosen to ensure that they are prioritised and stocked ($n=1$)</p>	<p>'Like I was mentioning earlier, like, it tends to be something that I will periodically print off to see what they have available. And when we have our weekly menu meetings, maybe once a quarter or twice a year, I'll bring in the list and just say, Here's what they've got right now. Does it make sense to incorporate any of this?' Pt 02</p>
Procuring and serving locally/regionally produced foods	<p>Begin with the least-expensive or highest-quality product to purchase locally ($n=4$)</p> <p>Communicating importance of local food purchasing to staff/leadership ($n=2$)</p> <p>Community outreach and assistance with contracting ($n=1$)</p> <p>Work with vendors and VA contracting to help set up the contracts ($n=1$)</p> <p>Having a garden and gardener on site ($n=1$)</p>	<p>'And I had asked them if they, some of the ones that are the easier to, like, kind of look in that, you purchase a lot are like milk, you know, we use tons of milk. If that's purchased locally, that's a big amount that we can automatically say this is purchase locally... I think that's why I we, we do well, but we have a lot of room to grow, but I guess if you're comparing us to other facilities, that don't have a garden, maybe this a little higher. I don't know'. Pt 11</p>
Reducing food waste	<p>Food tracking/plate waste studies to prevent overproduction ($n=6$)</p> <p>Monitoring/rotating product to use leftovers and/or use products before they expire as per safety guidelines ($n=5$)</p> <p>Food donation programme ($n=5$)</p> <p>Equipment to reduce carbon footprint of waste (pulper, biodigester, oil recycle and/or compost) ($n=3$)</p> <p>Starting small, finding the 'low-hanging fruit' ($n=3$)</p> <p>Improve quality/acceptance of menu ($n=3$) Room service style meals where patient selects their meal, results in less waste ($n=3$)</p> <p>Finding someone to spearhead efforts and having regular team meetings ($n=3$)</p>	<p>'Now that we have, um, Computation, we can actually see, like, hey, we need to prepare this number of chicken, this number of fish. So we're not overproducing. ... I know that's a huge driver for those food service chiefs is to decrease waste, increase patient satisfaction, and a lot of them are doing this inventory connect. So it tracks inventory, so they're not over purchasing'. Pt 05</p>
Reducing energy consumption and/or reducing non-food waste	<p>Practices to use less plastic/Styrofoam (reducing use of straws, biodegradable disposables, etc.) ($n=6$)</p> <p>Replace old equipment with energy-saving options (automatic lights, etc.) ($n=6$)</p> <p>Studies to support practices (e.g., infection control and plate waste) ($n=2$)</p> <p>Communicate to leadership budget justification of energy-saving efforts ($n=2$)</p> <p>Training staff on energy-saving strategies ($n=1$) Make the switch when the budget allows ($n=1$) Implement recycling programme ($n=1$)</p>	<p>'We made a decision to not put straws on all trays, it's by suggestion of the dietician or a practitioner. Or at... resident request.... We have moved to a more biodegradable to-go container. We don't use a lot of them, but, you know, ones that we do are biodegradable, um, plastic silverware ... we try not to use it. We used to use it very freely and now we're just more considerate of that'. Pt 06</p>