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SPECIALTY SECTION

This article was submitted to
Nutrition and Sustainable Diets,
a section of the journal
Frontiers in Sustainable Food Systems

RECEIVED 27 January 2023

ACCEPTED 27 March 2023

PUBLISHED 12 April 2023

CITATION

Schäfer M and Haack M (2023) Overcoming the
efficiency paradigm—The challenges of
introducing local organic beef in canteens.
Front. Sustain. Food Syst. 7:1152185.
doi: 10.3389/fsufs.2023.1152185

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Overcoming the efficiency paradigm—The challenges of introducing local organic beef in canteens

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Introduction: In recent years, there has been a growing recognition that public canteens can play an important role in supporting the transformation toward sustainable food systems and providing access to sustainable and healthy food for everybody—including the most vulnerable groups of the population. One important way in which canteens can contribute to this transformation is by increasing the share of organic and local products. These new political and public demands contrast with the organizational development of canteens over the past few decades, which has mainly been characterized by an increase in economic efficiency and a reduction in costs. Based on a project that was carried out in the Berlin-Brandenburg region (Germany), this paper exemplifies some of the challenges canteens face in the process of introducing organic and local products.

Methods: The empirical results are based on 31 qualitative interviews with canteen managers and kitchen staff as well as with the processing company involved. In addition, a survey of 500 canteen guests was conducted in the participating canteens.

Results: The analysis shows that the canteens had to adapt various organizational practices to ensure a healthy and sustainable diet at manageable cost. Introducing local organic beef in the canteens requires close cooperation with local farmers and processors, a change in procurement practices, transparency around the origin of the products, as well as adapted menu planning.

Discussion: Based on the empirical results, the paper discusses how these challenges can be met and which supportive measures can be taken on different governance levels. To change entrenched practices, process facilitators who support local cooperation along the value added chain are needed, and practical knowledge and professional training must be provided. The article concludes that there is a great potential to foster a sustainable and healthy diet *via* public and private canteens if the tension between efficiency and sustainability orientation can be overcome by adapting framework conditions.

KEYWORDS

canteens, public procurement, local products, kitchen management, public catering, efficiency paradigm, sustainability transformation, organic beef

1. Introduction

Since the beginning of the 2000s, public food procurement and catering have gained recognition for their potential to enhance the transformation toward a sustainable food system (Lehtinen, 2012; Ashe and Sonnino, 2013; Smith et al., 2016). There is a growing awareness that purchasing decisions can promote a healthier food system (Marsden and Morley, 2014) and contribute to issues of public health, economic development, democracy

and environmental integration (Morgan and Sonnino, 2013). Other authors stress the high potential for health prevention due to the fact that (public) canteens can reach a great diversity of people with different socio-economic and cultural backgrounds (Pfefferle et al., 2021).

Yet, as Sonnino (2019, p. 21) states, this “multifunctional potential of public food procurement has often been overlooked due to a priority generally placed on short-term cost saving and economic efficiency in public institutions [...]” In recent decades, (public) canteens have taken on the challenge of increasing economic efficiency and reducing costs that has accompanied the economization of public services in general (Ewert, 2009). This development has taken place in parallel with rationalization, specialization and concentration processes in agriculture and food processing (Marsden, 2012; Tregear et al., 2022).

The pressure to reduce costs has resulted in modified organizational practices throughout the entire process of menu planning, food processing and product procurement (Göbel et al., 2017).

Procurement departments usually aim for cooperation with a few nationally or internationally oriented suppliers who are able to offer a broad product assortment all year round (Roehl and Strassner, 2011; Lopez et al., 2019). The concentration on a few large suppliers reduces the number of administrative tasks and negotiations for the canteens. In addition, institutions with several canteens often bundle their procurement within a central department in order to increase purchasing power, obtain a discount and ensure convenient conditions for claims (Roehl and Strassner, 2011; Fitch and Santo, 2016). At the same time, this development poses a barrier for purchasing products from smaller suppliers or local farmers and processors (Arens-Azevedo, 2012). Furthermore, trans-regionally oriented suppliers rarely offer local products and are often unable to guarantee transparency around the origin of the products (ibid.).

Regarding the types of products used in canteens, a tendency to “outsource” processing can be observed: canteens use more convenience and pre-processed food and ingredients (such as peeled potatoes, pre-cooked vegetables, pre-prepared meat products like burger patties, meat balls, etc. as well as pre-prepared mixtures for sauces, broths, and desserts) (Roehl and Strassner, 2011; Langen et al., 2017). This allows canteen managers to reduce the number of employees and to work with personnel who are not formally trained. At the same time, it makes it easier for them to offer complex and standardized meals. Some authors report a reduction in trained personnel of 30 to 50% and a tendency toward more flexible working conditions, while knowledge and competence around the preparation and processing of food decreases with a lower percentage of trained employees (Rapp and Liesen, 2007; Langen et al., 2017). Besides the reduction in personnel, the limited infrastructure for preparing, processing, and storing food is another reason for the extensive use of convenience products (Steinmeyer, 2018). For meat processing—which is of special interest in this article—this means that only certain parts of the animals are ordered (often in a pre-processed form) and therefore that the skill of using the complete animal “from nose to tail” is largely being eroded (Roehl and Strassner, 2011). This goes hand in hand with the changing preferences of consumers, who are no longer used to eating meals containing offal, such as kidneys or liver (Tucker, 2014).

This article analyses the challenges of canteens in the light of the conflicting demands placed on them, focusing on the barriers canteens face when aiming to introduce more organic and local food into their menus. Specifically, the paper describes the changes in organizational practices in four canteens in the Berlin-Brandenburg region as they transitioned their offer from conventional beef to regionally produced organic beef from pasture-fed animals. After presenting the background to the case study and outlining the structure and approach of the transdisciplinary project (Section 2), we detail the methods applied (Section 3) and present the empirical results (Section 4). The challenges of flexing organizational practices toward providing more sustainable food, and how these challenges can be overcome by adapting framework conditions on different governance levels, are dealt with in the discussion (Section 5).

2. Background to the case study and characteristics of the transdisciplinary research project

The case study on which this paper is based was conducted within a transdisciplinary research project aimed at accompanying the establishment of a local value-added chain in the region Berlin-Brandenburg.¹ To this end, the project team sought to motivate (public) canteens to introduce local, organic, pasture-fed beef into their daily menus and support them in the process of establishing cooperation along the local value-added chain and overcoming any challenges that may arise. Finally, the researchers analyzed the barriers to introducing the innovation and the measures taken by canteens to deal with the difficulties encountered. The following sections give an overview of the background to the case study, the characteristics of the participating organizations, as well as the structure and approaches of the transdisciplinary research project.

2.1. Socio-political background

The study took place in the metropolitan region of Berlin-Brandenburg in north-east Germany. While Berlin is densely populated and has almost no agricultural production, Brandenburg—the federal state that surrounds the German capital—has a low average population density and includes many areas with agricultural production and natural reserves. Due to the low-yielding soils and the high proportion of grassland areas, suckler cow husbandry is of particular importance in north-east Germany (AMI, 2021; Statistik Berlin Brandenburg, 2022). However, a lack of regional infrastructure for slaughtering, processing and logistics, as well as fluctuating market prices, are leading farmers to sell

¹ The project GanzTierStark was funded from 2020 to 2023 by the Federal Ministry of Food and Agriculture as part of the Federal Programme for Organic Agriculture (BÖL). It was managed by the Federal Office for Agriculture and Food (BLE). Further information can be found under www.ganztierstark.de.

the majority of the offspring of suckler cows to fattening farms in other regions of Germany or Europe (Baumgarten, 2020). Despite good agricultural conditions for pasture grazing, there is therefore low availability of local meat products in the German capital region.

By contrast, locally produced food and species-appropriate husbandry have become increasingly important issues for both consumers and policy makers in recent years. Urban food policies as well as objectives at federal state or national level aim to promote a more sustainable diet for people and the environment (Doernberg et al., 2019). Especially in Berlin, but also increasingly in the state of Brandenburg, public canteens are politically incentivised to raise the share of organic and local products they use, while being, at the same time, subject to the demands of economic efficiency described above.

2.2. Description of the participating organizations

As part of the transdisciplinary research project, cooperation between four public and private canteens, a local medium-sized processor and local farmers was established. This section characterizes the organizations involved.

2.2.1. Canteens in Berlin and Brandenburg

The project aimed to reach canteens with different characteristics in terms of size, organizational form and target canteen guests. Table 1 gives an overview of the central characteristics of the four canteens involved in the project.

During the lockdown in the COVID-19 crisis, the canteens were completely closed for some of the time, or only offered takeaway meals. In contrast to pre-pandemic times, the canteens were mostly closed to external guests. The number of guests thus decreased drastically in that period and has generally not recovered since then (due to a higher percentage of people who work from home).

2.2.2. Local processing company

In addition to the canteens, a local meat processor took part in the project. With around 60 employees, the company is the biggest meat processor for organic beef in the region and mainly procures meat from Brandenburg and the surrounding federal states. It sells most of the meat and processed meat products (e.g., sausages, beef patties) via an organic supermarket chain. The cooperation with the canteens established in the course of the research project was developed as a second marketing channel. Due to the various marketing channels of the processor and the possibility of using leftovers for sausage production, it was not necessary for the canteens to use all parts of the animals “from nose to tail.”

The processing company purchases the organic pasture-fed beef from a range of smaller and bigger organic farms in Brandenburg and the surrounding federal states.

TABLE 1 Characteristics of the participating canteens.

Type of canteen	Characteristics (as of 2022)
Canteen 1: Public University	<ul style="list-style-type: none"> • Catering for university students and employees at 6 locations, • Altogether 2,000 meals/day, • Central procurement and meal planning for all locations, • Introduction of organic meat is embedded in a new sustainability strategy; focus on more vegetarian and vegan dishes, • Current share of organic products: 15% (beef, potatoes, rice, coffee, tea), organic certification, • Meal prices for students are subsidized, • Subject to public procurement rules.
Canteen 2: municipal waste company	<ul style="list-style-type: none"> • Catering for employees in 10 locations, • Altogether around 1,250 meals/day, • Central procurement and meal planning for all locations, • Canteen guests with different professional foci (administration vs. waste collection) and significant age differences, • Current share of organic products: 39% (beef, vegetables, dairy products, eggs), organic certification, • Meal prices are subsidized, • Subject to public procurement rules.
Canteen 3: public hospital	<ul style="list-style-type: none"> • Catering for employees of the hospital, • The canteen belongs to a bigger provider responsible for canteen management at numerous locations; central procurement of food, but canteen managers have leeway to order some of the products on their own, • Altogether approx. 250 meals/day for employees, • A few components in organic quality (beef, yogurt, occasionally milk and vegetables), • Meal prices for employees are subsidized, • No need for public tendering.
Canteen 4: newspaper publisher	<ul style="list-style-type: none"> • Canteen restaurant providing employees of a daily newspaper and external guests with food, • Altogether around 350 meals/day, • Beef of organic quality (not certified yet), other meat and poultry from species-appropriate husbandry, • Meal prices for employees are subsidized and much higher for external guests, • No need for public tendering.

2.3. Structure and approaches of the transdisciplinary research project

The transdisciplinary research project runs from February 2020 to May 2023. Besides two research partners, three intermediate organizations within the organic sector received funding to offer supportive services to the partners within the value-added chain (canteens, processor, and farmers).

The main instrument for knowledge transfer and the exchange of experiences between the canteens consisted in regular “kitchen talks” that focused on a certain topic and motivated the exchange between the participating canteen and kitchen managers. If necessary, there was input from the project team or—more often—pioneering canteen managers from other regions of Germany. They were invited to talk about their experiences of dealing with upcoming challenges, such as higher prices of organic beef, by adapting the menu planning, using different cuts of the beef,

TABLE 2 Interviews carried out from April 2020 to November 2022.

Project partner		Type of interview partner (number of interviews)
Canteens	Public University (canteen 1)	<ul style="list-style-type: none"> • Management/Head of Procurement (4) • Kitchen manager and employees (8)
	Municipal waste management (canteen 2)	<ul style="list-style-type: none"> • Management/Head of Procurement (3) • Kitchen manager and employees (2)
	Public hospital (canteen 3)	<ul style="list-style-type: none"> • Kitchen manager (3)
	Newspaper publisher (canteen 4)	<ul style="list-style-type: none"> • Kitchen manager and employees (8)
Processor	Meat-processing company	<ul style="list-style-type: none"> • Management/Head of Sales (3)

motivating the kitchen staff, dealing with public procurement requirements, etc. In the period between May 2020 and November 2022, nine kitchen talks were organized, focusing on different topics. Due to the COVID-19 crisis, these meetings were usually conducted online. In 2021, it was possible to meet in person in one of the canteens and exchange experiences as well as have a meal together.

In addition to the “kitchen talks,” the project offered support by designing communication material and public relations strategies as well as coaching related to public procurement regulation, organic certification, and menu planning. It also organized two workshops for the kitchen employees that provided information on the special qualities of organic meat and the characteristics of pasture-raised, animal-friendly husbandry. In these workshops, illustrative material such as a video interview with a local organic farmer was used. One additional workshop for the kitchen staff dealt with the basics of healthy nutrition and the techniques of how to present the food on the plate. Between 2020 and 2022, two excursions to local organic farms and three excursions to the local processing enterprise were organized for canteen management and kitchen staff. During these excursions, the participants also tasted meat products. The project team went into the canteens on several occasions, providing information to the canteen guests on the new offer, the origin of the organic meat, and the project itself, as well as carrying out a guest survey. On these occasions, posters with information on the project and a map displaying the participating farms were presented.

Parallel to offering these different forms of support to the business partners involved, the project encompassed accompanying research, the material and methods of which are described in the next section.

3. Material and methods

The empirical data were derived from the transdisciplinary research process covering the period from April 2020 to November 2022.

At the beginning of the project, a participatory monitoring plan was developed based on literature research, best-practice interviews and a workshop with the respective case study actors. The monitoring plan included regular interviews and data collection

about the progress and challenges of the transformation process. To be able to trace the organizational changes, information on the status quo in the respective canteens was collected first, and the interviews were repeated every 8–12 months. The semi-structured interviews (Schnell et al., 2013) of approximately 1 h focused on the adaptation strategies of the canteen kitchens in the process of introducing local organic beef into their meal planning.

Based on the monitoring criteria, the following topics were covered during the interviews (see interview guidelines, [Supplementary material 1, 2](#)):

- Development in numbers of meals and guests.
- Involvement of employees in the implementation process; feedback of kitchen staff.
- Satisfaction with the quality of the meat and the cooperation between the kitchen and the local processor.
- Learning processes and opportunities for optimization in the areas of procurement, meal planning, employee involvement and guest communication.

Empirical data for the case study were obtained from $n = 28$ qualitative interviews with the canteen managers and kitchen staff of four canteens in Berlin and Brandenburg as well as from $n = 3$ interviews with the meat-processing company (see [Table 2](#)).

Additionally, data from participatory observation of different workshops (especially the kitchen talks) was included. These workshops allowed us to observe mutual learning processes between the participants from a scientific perspective. At the end of the workshops, the participants were asked to fill out an anonymous digital evaluation sheet. Empirical data (interview transcripts, protocols from workshops and documentation of multilateral exchange) were analyzed *via* content analysis, using the categories of the monitoring concept.

In addition, guest surveys were conducted in the participating canteens with a total of 500 guests. The guest survey addressed the following topics (see questionnaire, [Supplementary material 3](#)):

- Frequency of canteen visits.
- Satisfaction with the beef dishes on offer and the menu in general.
- Preferences regarding the quality and origin of the beef served.
- Attitude toward the use of organic and local products in the canteen.

The data from the guest survey were analyzed using SPSS Statistics.

The results of the monitoring and the guest survey were used to give regular feedback to the cooperating canteens and the processor for the purposes of organizational optimization, improving both the menus on offer, and communication with kitchen staff and canteen guests. They were also used for public relations and publications in practice-oriented as well as scientific media.

4. Results

The results section deals with the challenges the canteen managers faced when introducing local, organic, pasture-fed beef. It begins with the changes in procurement practices,

encompassing also the issue of building trust between the partners along the value-added chain and including local products in public tender procedures (4.1). Section 4.2 deals with the challenge of guaranteeing the local origin of the products and transparent communication processes, followed by Section 4.3, which encompasses changes in meal planning as well as the reaction of the canteen guests to those changes.

To start with a general observation, in most of the canteens the introduction of local organic beef was embedded in an overarching strategic process of responding to political and public demands for an increased contribution to preventive health provision and climate protection goals. When the project team offered to work with the canteens, they therefore took the opportunity to acquire support in an already ongoing process and to overcome the initial barriers of the intended transformation process.

“Since the strategy of our company is focused on sustainability, climate and environmental protection, it is logical that sustainability and healthy nutrition are also of great importance in catering for our guests.” (management of canteen 2)

4.1. Change in procurement processes and public tender procedures

4.1.1. Changing procurement processes

Before the project's work with the canteens, they purchased beef together with other products from trans-regional suppliers. Only one of the canteens was cooperating with a local meat processor for conventionally produced meat. From the canteens' point of view, the advantages of buying food from a nationwide wholesale company are that the purchasing process is quick and easy, and products for the needs of canteen kitchens are available at any time and at favorable prices. The interviewees confirmed scientific literature findings that large suppliers operating nationwide are generally not able to provide products with a guaranteed local origin (Arens-Azevedo, 2012). One of the main barriers to increasing the share of local (and organic) products therefore is that additional suppliers have to be found and contacted. As also described in the literature (ibid.), the canteen managers were very willing to increase the share of local organic products, but they did not have detailed knowledge about who could supply them with the quality and quantities they needed. Integrating those deliveries of rather small quantities in the daily procurement processes is another time-consuming challenge for the canteen managers.

4.1.2. Building trust and learning processes between canteens and local suppliers

As pointed out by the canteen managers, the external support provided by the project, which included information on possible local suppliers and bringing actors together, was very helpful for them in overcoming initial barriers and taking the first steps.

“It was a very good combination of participants—a consultant with a lot of experience on the topic, speakers from the field, and interested canteens facing the same challenges.” (comment by a participating canteen manager in the anonymous evaluation after the kitchen talk on 9 July 2020)

As described above, the organization of visits to farms with pasture-fed husbandry and to the local organic processor was another important element in providing practical knowledge. The possibility of getting to know the living conditions of the pasture-reared cattle and the motivations and efforts of the farmers led to an increase in trust and emotional attachment. Also, getting to know the manufacturing procedures in the processing enterprise and having the opportunity to taste different products helped to build trust, which played a part in convincing the decision-makers of the quality of the pasture-raised beef. The enhanced knowledge about the differences between conventional stall-feeding and organic pasture-reared husbandry enabled partners to find compromises on the pricing of the high-quality beef.

After reaching agreements on products, quantities, prices and delivery dates between canteens and the processing company, the implementation was tested in the canteens. The local supplier had to meet the requirements of the canteens in terms of product quality and customer orientation. Likewise, canteens had to learn that not all the products would be available every day in a local value chain, and that orders must be placed in advance.

“Of course, there are also things that are not available [...], but we are talking about food that also has a special background [...]. And I accept that not everything is always available somewhere.” (kitchen manager of canteen 1)

4.1.3. Including local products in public tenders

Following the decision to purchase local organic beef on a regular basis, the public canteens had to initiate an official invitation for a public tender process. Due to EU regulation, the local origin of products cannot be mentioned as a quality criterion in public tenders—this is to avoid distortion of competition. EU procurement regulation shows a strong focus on economic parameters such as the price, and does not take characteristics such as ecological, social and health criteria sufficiently into account. With Green Public Procurement, the EU has created a voluntary tool which allows public authorities to demand more sustainable goods and services. However, especially when it comes to the procurement of food and catering services, public authorities rarely include any “green” criteria in public tenders (Renda et al., 2012; Haack et al., 2016). One reason is that sustainability criteria are seen as difficult to implement correctly, and contracting authorities fear the legal uncertainty (Schebesta, 2018).

To give smaller regional suppliers the chance to apply for the tender, the procurement managers were coached on how additional qualities could be included. Interesting differences could be observed: in one of the bigger public companies the procurement department was not involved in the project before dealing with setting up the tender; in the other one it was involved at a very early stage. In the first case, it was much more difficult to

convince the person responsible in the procurement department to include further quality criteria in the tender (e.g., a distance that would allow staff to visit the site easily). Another challenge was to implement the formal requirements for the tender (e.g., submission deadlines, indication of references) as well as other content-related requirements (e.g., minimum order quantities, delivery days) in such a way that the effort required to submit the offer is feasible for smaller local suppliers. One of the canteen managers stresses that small and medium-sized enterprises need support to be able to compete with bigger suppliers in those tender processes.

“There is the need to make enterprises fit, also from the political side, to ensure a certain fairness. The whole tender process is about competition... – and the competition is distorted for the small and medium-sized enterprises, since right now they don’t have the possibility of keeping up with the bigger players.”
(manager of canteen 1)

4.2. Guaranteeing the local origin of the beef and transparent communication

One of the challenges of the project was to define “locally produced” and to ensure transparency around the origin of the organic beef for canteens and guests. So far, there is no consensus on the definition of “local origin” in Germany or throughout the EU. The EU quality policy concentrates on specific product qualities that are linked to geographical origin, a product’s traditional character or organic production method (Becker, 2009; Verbeke, 2013). In some German federal states, labels for local products which refer to the boundaries of the respective federal state have been introduced over the past two decades. These labels combine the indication of origin from a specific region with a defined quality (Hauck and Becker, 2015). In these cases, certifications and external controls are needed in order to ensure the defined quality criteria for “locally produced products” are respected. In the region of Berlin-Brandenburg, there was no such legal framework or best-practice example of a definition that the project could directly refer to for the purpose of providing canteens with local organic beef.

4.2.1. Finding a suitable definition

As mentioned in Section 2.1, the production of beef in north-east Germany is characterized by very low slaughtering capacities, especially for organic beef. At present, Brandenburg does not provide a medium-range slaughter for organic beef, but only some small-scale capacities aligned to single farms. The participating meat processor therefore only has the option of cooperating with slaughterhouses in one of the neighboring federal states, Mecklenburg-Western Pomerania or Saxony-Anhalt. To be able to guarantee continuous supply of beef from pasture-reared husbandry, the processor also purchases beef from farmers in the neighboring federal states. Beef is a special case, since increase or decrease in production has to be planned a rather long time ahead due to the 2-year period that is needed to rear the animals.

After some chaired discussions about the expectations of the canteen managers and the practical necessities of the processing

company, the project partners agreed on a definition of “locally produced” as a radius of 200 km around the Berlin television tower. This is a definition that is easy to communicate and can also be monitored effectively on an internal level. It was also agreed that the processor would inform the canteens 1 week before delivery which specific farm the beef would be coming from. This allows the canteen managers to forward the information to the kitchen staff, who can communicate it to the canteen guests. It took quite some time to establish these routines of transparent flows of information, since neither partner was used to it. Internal monitoring of the supplier farms showed that the definition was met in 96% of the cases. Only in exceptional cases—when the availability was limited—did the beef come from farms beyond the 200 km radius.

4.2.2. Communication with canteen guests

The definition was communicated to the canteen guests via a map on the project’s website, on a poster, and via leaflets on special occasions when information was presented in the canteens and a survey was being conducted. The questionnaire also included a question about the guests’ preferential definition of regional origin. In addition to “Brandenburg” as a boundary for local origin, “Brandenburg and the neighboring federal states” and “a radius of 200 km” had a high level of acceptance among the respondents.

4.3. Adaptation of meal planning and reactions of the canteen guests

The canteen managers had to meet the challenge of higher prices for purchasing local organic beef. The additional costs for the purchase of local organic beef were between 30 and 100%, depending on the cut (e.g., minced meat, goulash) and the comparative offer (conventional fresh/frozen meat from national/international production from wholesalers/local butchers). The additional costs per meal, e.g., for a goulash dish, would thus amount to about 1 Euro per meal (assuming a 100% increase in the purchase price of beef and an average meat weight of 155 grams).

4.3.1. Strategies for compensating additional costs

All partner canteens had to consider restrictions on their ability to raise prices for regular meals, as these are subsidized with the goal of providing food at low cost for employees and students. Canteen managements pursued different strategies in their attempt to offer high-quality meat under the given economic restrictions. Overall, three strategies were observed, which were also used in various combinations: (1) reducing the number of meat dishes per week, (2) reducing meat content per dish, and (3) using more economic cuts.

In one of the canteens the weekly number of meals with meat was reduced and new recipes were introduced which included lower quantities of meat. Dishes such as “Asian ragout” or “Summer bowl” contained a higher percentage of vegetables and less meat (80 g) than more meat-based dishes such as a traditional goulash

(160 g). In addition, these traditional dishes were modified by replacing parts of the meat with vegetables, legumes or cereals.

“Such dishes [with a reduced] amount of meat are interesting for canteens when they are introducing organic meat into the menu planning. You don’t have to have 100% meat on the plate—it’s substituted with eggs and breadcrumbs. We even put small cubes of root vegetables in. [...] This is how you reduce the costs and make it possible to sell the meal at a reasonable price.” (kitchen manager of canteen 4)

Another canteen whose guests were used to rather high quantities of meat maintained those quantities but experimented with more economic cuts and increased the price of the beef meals moderately. Purchasing the more economic parts of the animal and changing recipes was a useful strategy for all partner canteens. To reduce the purchasing prices, canteens also ordered fresh meat instead of convenience food (e.g., pre-breaded escalope or ready-to-cook meatballs) as they did before.

In addition to the three strategies found to be applied in the case-study canteens, another approach that—according to the experience of nationwide canteens—has economic and ecological advantages consists in using the whole animal from “nose-to-tail.” The aim is to utilize as many parts of the animal as possible, thus reducing costs and food waste. Due to organizational barriers such as a lack of personnel and space, as well as restrictions in menu planning, none of the canteens could be motivated to follow a “nose-to-tail” strategy of using all cuts of the animal. For the menu planning in canteens, large quantities of a specific cut of the animal are needed. Using different cuts for one dish requires flexibility and additional skills (Tucker, 2014). The approach of planning the menus based on the available ingredients (and not vice versa) seems to be difficult to implement in canteens. However, some of them could be motivated to use cuts they had not used before and offer meals such as liver or tongue. Furthermore, as described in chapter 4.1, the kitchens showed flexibility in menu planning when not all cuts they wanted to order were available.

An exception to these cases of successful implementation was the catering for patients by the hospital canteen. While the kitchen manager succeeded in using local organic beef in the meals for the hospital staff by applying the strategies described, this was not transferable to the catering for hospital patients due to the low food budget for this target group.

4.3.2. Reception by canteen guests and kitchen staff

Most of the new recipes were received very positively by the canteen guests, resulting in a high percentage of meals with beef sold on the respective days. Depending on the canteen and the number of alternative dishes, beef dishes were chosen by an average of 30% of the guests—a similar percentage to that of conventional beef. Only experimental meals such as beef tongue were not as well received by the canteen guests. Overall, the survey amongst the canteen guests showed a very high level of approval for introducing local organic beef from pasture-reared husbandry. Besides “organic” and “local,” “animal welfare” was a very important quality criterion for the guests. The survey also

showed that guests expect the whole meal to be of high quality: they consider fresh and appealing side dishes such as vegetables and potatoes particularly important.

In the first few months, a number of canteen managers reported that some of the kitchen staff were still rather skeptical about introducing local organic beef and worried that there would be low take-up by the canteen guests. In particular, the reduction of meat in the dishes seemed to represent a major change for the kitchen staff.

“I think it is sometimes so unpleasant for our employees, because for years they have put a large portion on the plates and now they are putting a thin slice of roast meat there. It is actually compliant with the principles of the German Association for Nutrition to have 80 grams of meat on the plate and no longer 150 grams. But of course, it is a change and it is unpleasant for some people.” (management of canteen 1)

This example shows that changing societal norms about the composition of meals play an important role in this type of transformation processes. During the project, the kitchen staff became more receptive due to the canteen guests’ positive response (choice of beef meals and feedback in the surveys). The interviews with the kitchen staff also showed that they appreciated cooking with more fresh products and were able to use their creativity and skills. In the interviews, the canteen managers nevertheless emphasize that a single training session or workshop for kitchen staff is not enough. They point out that it is a constant learning process, and it is the responsibility of the canteen management to stay tuned and to further involve their employees in important change processes.

4.3.3. Comparison of the challenges for the canteens

A comparison of the challenges of the four canteens and the ways they chose to overcome these yields some interesting insights. The public canteens were under greater pressure to offer economic meals than the private canteens. In particular, the newspaper company—which is situated in the center of Berlin and has a lot of external guests (including tourists)—was able to compensate the low prices for the employees with rather high prices for the external guests. In the public canteens (the university and a public waste management company), the committees of the employee representatives have to agree to an increase in meal prices. So far, they have had a strong focus on keeping the meal prices as low as possible. The economic pressure on public institutions is especially high in the health sector, which results in very low standard amounts for meals in hospitals. Within the project, the local organic beef therefore could not be offered to the most vulnerable group, the patients of a public hospital, and was served to the hospital employees only.

Introducing local organic beef and meals with a lower percentage of meat was easier in those canteens with younger canteen guests (such as students) and in companies with a clear sustainability focus. It was also easier to convince the staff in smaller organizations than those in bigger companies, who had to invest quite some time in training and motivating the kitchen

staff. The skills of the staff played an important role in maintaining the high quality of the meat during the cooking process. This is more difficult in bigger canteens where the components of the meals have to be prepared some hours before serving them, and are sometimes also transported from a central canteen to smaller locations.

5. Discussion and conclusion

The empirical results exemplarily point out some of the challenges public canteens face when aiming to introduce more local organic products into their daily menus. In this section, we offer some reflections on the transferability of the results (5.1), why the transformation of organizational routines is so difficult (5.2) and which measures can be taken to support it (5.3), as well as more general concluding remarks on why the provision of healthy and sustainable food should be understood as a societal challenge (5.4).

5.1. Transferability of the results

The empirical data are derived from a transdisciplinary research process with four canteens in the metropolitan area of Berlin-Brandenburg. Although the canteens had different characteristics in terms of size, organizational form and the target canteen guests, a broader spectrum would have been useful for obtaining results that would be transferable to a broad range of canteens. Especially in the case of catering for vulnerable target groups (e.g., hospitals, nursing homes), we see a need for further research on how to implement catering with sustainable and healthy food.

The results show the canteens used different strategies to compensate for the additional costs of organic beef, e.g., by implementing changes in the menu planning. At this point, it would be interesting to study to what extent these strategies can also be applied to other types of meat, since, for example, organic pork and chicken have a higher additional price in comparison with products from conventional animal husbandry than is the case with organic beef.

A further possible limitation in the transferability of our results consists in the regional characteristics of the study region. Within the project, the canteens began cooperating with a medium-sized organic processing company that supplies meat from local animal husbandry. Due to the processor's already existing marketing channels, the availability and deliverability of the required quantities and cuts could mostly be guaranteed. The canteens did not have to take the whole animal, as might have been necessary in the case of direct cooperation with a farm or a smaller processor. A "nose-to-tail" approach would have been linked to further implications for the kitchens.

Another aspect requiring further research is the impact on the development of local added value. Due to the small number of canteens in the project and the limited number of meals because of the COVID-19 pandemic, on average only two to three cattle per month were needed during the project period.

As a final limitation for the transferability of the results, we would like to emphasize that the participating canteens were already forerunners, since the introduction of local and organic beef was part of an overarching strategic process toward more sustainability. Reaching a broader variety of less sustainability-oriented canteens would therefore require further effort and more supportive framework conditions (see Section 5.3).

5.2. Challenges of transforming organizational routines in public canteens

The empirical results showed that the canteens were faced with the challenge of changing organizational routines that thus far had been strongly shaped by efficiency principles. The centralized procurement of food products, meal planning and choice of recipes, as well as the use of convenience instead of fresh products, had mainly followed the logic of reducing costs in terms of e.g., prices for the menus, the quantity and quality of the necessary kitchen staff, and spatial capacities for preparing and storing food. However, our survey also showed that the canteen managers are—at the same time—increasingly faced with further demands to contribute to the provision of healthy and sustainable food for a broad range of the population, including vulnerable groups, as well as to supporting the necessary transformation of the food system.

Searching for new suppliers and integrating these new procurement processes into the overall management, introducing meals with new recipes into the regular planning, using fewer convenience products in the kitchen, and communicating the sustainable qualities of the local organic products to the kitchen staff and the canteen guests are time-consuming efforts, which are opposing the dominance of efficiency principles. The complex challenges for communal caterers that go hand in hand with a transformation toward sustainability are mentioned by several authors (Lopez et al., 2019; Kretschmer and Dehm, 2021). Kretschmer and Dehm (2021, p. 3) stress that "it requires not only a change in sourcing and procurement but also a shift in mindset regarding the philosophy, organization, and management of the respective canteen system."

Literature on changes in organizational routines points out that these are only partly dependent on the individual motivation and knowledge of the staff responsible. Organizational routines, understood as bundles of closely connected and interdependent practices (Castelo et al., 2021), are formed by norms, standards and regulation as well as material conditions (e.g., space for preparing and storing food) and equipment (e.g., kitchen equipment to process food products vs. equipment to prepare convenience products) (Nicolini, 2012; Hennchen, 2021).

Dealing with the challenge of minimizing food waste in public canteens, Hennchen (2021) shows, for example, that the size of portions is influenced by standards, by the training provided as part of the standard apprenticeship in cookery, but also by certain kitchen equipment. He also points out that the question of what counts as a portion is no longer decided only by the kitchens themselves but instead predetermined by suppliers further up the food chain for e.g., convenience products. Together with the use of kitchen equipment, the practice of portioning therefore extends

beyond the organizational context of a single kitchen and points to more general developments in the catering industry. Similar observations were made in the case of integrating more local organic products. Regulation around procurement processes on the EU and national level, societal norms such as “canteen food has to be cheap” or “a complete meal contains meat,” and the training of cooks (with a focus on convenience products and meals containing meat) have a strong influence on organizational routines in canteens and cannot be changed from 1 day to the next.

The following sections deal with some of these aspects in more detail.

5.2.1. Influence of public procurement regulation

Tregear et al. (2022) point out that besides the regulation at EU level, the WTO precepts for Most Economically Advantageous Tenders (MEAT) in procurement contract awards place strong emphasis on low cost and efficiency, which represents a challenge in terms of providing quality food that also meets social and environmental criteria. In recent years the European Commission (EC) has developed environmental procurement criteria in the form of tools such as the Green Public Procurement (GPP) or the Sustainable Public Procurement (SPP) agendas (European Commission, 2019). The criticism is often leveled that giving consideration to social and environmental criteria in procurement has so far been voluntary (Kretschmer and Dehm, 2021) and that this notion stands in contrast to the EC Treaty and other conventions that call for the “free movement of goods and equal rights for all market participants” (Krivašonoka, 2017, p. 1). Another problem is that in public institutions the management and decision-making for catering service delivery are often separated from the management of procurement contracts, which makes it difficult to broaden the perspective beyond cost efficiency toward sustainability aspects (Tregear et al., 2022). This problem also occurred in one of the participating institutions, in which the procurement department did not share the vision of purchasing more local products and instead interpreted the leeway for including more quality criteria in the tender in a very narrow way.

As an additional barrier, Kretschmer and Dehm (2021) mention the personnel costs arising from dealing with too many individual deliveries of fresh products from single farms or small enterprises. The higher effort and cost motivate procurement departments to aim for aggregated deliveries by a conventional wholesaler—which often however are not able to guarantee a local origin.

5.2.2. Identification and definition of regional origin

Neither has it been easy thus far for canteens to identify local products, for information on the origin of food products has not yet been standardized. In a study on the difficulties of purchasing more food of local origin, Arens-Azevedo (2012) reports that big suppliers who are active on a national level are not able to mark the products of their huge assortment with the regions of origin due to limited time resources. Concerning the purchase of locally produced meat, only smaller suppliers were able to give reliable information about the farmers they purchase the meat

from. Kretschmer and Dehm (2021) also mention the difficulty of precisely delineating what determines a local or regional product, since the term “of local origin” cannot be uniformly defined. It may be defined as a fixed geographical radius concerning a given location, or it may be defined as a certain district, province, state or country (Clancy and Ruhf, 2010). In the accompanying case study, one of the major challenges was to define regionality in a way that took the specific contextual conditions into account and allowed transparent communication with the canteen guests. By involving the stakeholders along the local value-added chain, the project was successful in defining “local origin” in a way that could be easily communicated, was accepted by canteen managers and guests, and was compatible with the organizational necessities of the processing company.

5.2.3. The influence of training

The lack of certain skills among the kitchen staff is mentioned in the literature. In a study on reducing meat consumption in community catering, Lopez et al. (2019) identify one of the major barriers as the fact that the preparation of low-meat dishes is not sufficiently addressed in the training of staff in the catering sector. Since the higher prices of using more organic and local food in canteens are often compensated by reducing the percentage of meat in the meal, these skills are crucial (ibid.). As we also observed in the participating canteens, this is even more the case, since the design of menus must be fundamentally changed when aiming to reduce meat quantities. Lopez et al. (2019) conclude that offering low-meat dishes entails abolishing the classic three-component structure of menus—meat, satiating side dish and vegetables/salad. The authors identify a severe existing knowledge gap in the out-of-home catering industry in this regard.

To sum up, the complexity of influential factors in organizational routines in canteens helps to understand why introducing locally produced organic products is a challenge, and why none of the kitchen managers involved could be motivated to follow a “nose-to-tail” strategy and use more—or all—parts of the beef. A nose-to-tail strategy would imply a rather radical transformation of daily routines and would require even more extensive changes in practices, including the acquisition of new skills, new kitchen equipment and the willingness of the canteen guests to consume less prominent parts of the beef. Pioneering canteen managers who have adopted this strategy report that the process took several years (statement of a canteen manager who is applying a “nose-to-tail” strategy in a Bavarian canteen, kitchen talk 12.5.2020).

5.3. Measures to support the sustainability transformation of canteens

As shown in Section 5.2, different measures and adaptations on various levels would be necessary to facilitate steps toward the sustainability transformation of canteens. While some changes of procurement regulation, for example, have to be taken on the EU or national level, there are also supportive measures that can be taken

on a local/regional level or by the institutions the catering facilities belong to.

5.3.1. Importance of supportive process facilitators/“caretakers”

In the case study analyzed, the transdisciplinary research project took the role of a “caretaker” who puts the actors along the value-added chain in contact and facilitates the process of getting to know each other’s demands and needs as well as acquiring experience in introducing regional local products into the canteens. Without the support of the project, the canteen managers would probably not have had the staff capacity to search for new suppliers and take the necessary steps to integrate locally produced organic beef into their regular meal planning. The issues that were raised by the project—providing information on the characteristics of organic and pasture-reared husbandry in the region, developing an acceptable definition of local origin, clarifying the terms of trade between the processor and the canteens, developing communication measures for the kitchen staff and the canteen guests, as well as ensuring a long-term perspective by dealing with the issues of certification and procurement processes—served as a guiding frame to ensure canteen managers did not overlook important elements of the transformation process. The successful introduction of local organic beef depended on the mixture of several strategic elements. If the canteens had left out part of them (e.g., communication with the guests or training of the staff) due to restricted resources, there would have been a greater risk of failure. Also, the processing enterprise reported that they did not have enough staff capacity to search for new market partners, especially where these might have different needs and demands in comparison to the existing ones.

The need for external support in overcoming initial barriers and a “caretaker” who structures the process of establishing a new regional value-added chain has also been described in the literature (Ingram et al., 2020; Tuijter, 2021; Braun et al., 2022). Braun et al. (2022, p. 13f.) refer to this intermediate position as “value chain developer” and describe their tasks as “bringing together value chain actors from a specific region and creating a social space in which these actors can work in a collaborative innovation process”. Value chain developers enable the actors to build trust, identify the potential for collaboration, and develop concrete partnerships along the value chain by organizing and facilitating regular activities (ibid.). Gray and Purdy (2019) differentiate three phases of value chain development with different foci on the activities of the value chain developers. The first phase primarily focuses on activities that serve to establish new contacts among local value chain actors, explore the challenges and potential of the value chain, discuss the needs and expectations of the participating actors, and negotiate common goals. Braun et al. (2022) emphasize the importance of getting to know each other personally and establishing trust among the participants in this phase. In our case study, getting to know each other was facilitated by the “kitchen talks”, which in this phase took place approx. every 2 months, and the organization of excursions to the processing enterprise and to farmers who delivered local organic beef to the processor. In particular, it was the excursions and the discussions accompanying

them that established trust between the canteen managers and the processor regarding the quality of the beef and the animal welfare on the participating farms.

The second phase typically contains activities in which the collaboration is tested and improved after gaining initial experience (Braun et al., 2022). In the case study analyzed, test-runs were organized in which the locally produced organic beef was offered in the canteens. These were accompanied by communication measures as well as analysis of the reaction and satisfaction of the canteen guests. As also described by Braun et al. (2022), the test-run revealed the need for specific training, e.g., the transfer of information to the kitchen employees about the characteristics of organic and animal-friendly husbandry, but also the collection of recipes with less meat to compensate for the higher prices of local organic beef. Any problems with the collaboration became transparent in that phase (e.g., providing transparent information on the origin of the beef, and reliable deliveries in terms of quality and quantity) and were dealt with in the period after the first test-run. In that phase, the kitchen talks served the purpose of filling existing knowledge gaps and finding solutions for the problems arising.

The third phase focuses on the incremental improvement of products and processes to ensure a long-term collaboration (ibid). In this phase, issues around preparing the public tender process or questions regarding product-specific organic certification gained in importance. As described by Braun et al. (2022), we too found that the role of the value chain developers or “caretakers” decreased in this phase and was limited to a few, mostly individualized, consultations offering support for more specific institutional challenges.

Besides transdisciplinary research projects, a variety of organizations can take on this intermediate facilitating role, e.g., the organic farming associations, managers of “eco model regions,” or actors engaged in a municipal food strategy. Recently, in Germany, several programmes have been launched on a national or federal level with the aim of establishing “value chain managers,” which shows that there is now increased political awareness of the importance of this facilitation and support (e.g., funding from the Bundesprogramm Ökologischer Landbau, the German government’s federal programme for organic farming and funding by the Ministry for Agriculture, Environment and Climate Change of the Federal State of Brandenburg).

5.3.2. Providing practical knowledge and adapting professional training

As discussed in Section 5.2, organizational routines are shaped by regulation, norms, standards, professional training and the given material conditions, and this has to be kept in mind when approaching canteen managers and kitchen staff with suggestions for integrating more locally produced organic products. Nevertheless, providing information and knowledge is often seen as a key element in motivating individuals and organizations to take transformative steps toward sustainability. Regarding canteens, several authors point out that it is important to provide practical knowledge that supports the modification of routines in direct ways (Lopez et al., 2019; Braun et al., 2022).

Lopez et al. (2019) mention support for the networking of relevant stakeholders *via* regional and local platforms as well as the transfer of experience from best-practice examples as useful elements.

As described in Section 2.3, the project made an effort to provide the canteen managers and staff with very practical knowledge and shared experiences regarding the choice of a local supplier, the changes in menu planning and recipes, ways of approaching the public procurement process, as well as the design of communicative elements for the kitchen staff and the canteen guests. As described above, the main instruments for the transfer of knowledge and experience were the regular “kitchen talks” and bilateral coaching measures. The benefits of canteen and catering service professionals sharing experiences are also stressed by Arens-Azevedo (2012).

Hennchen (2019) introduces the idea of “sharing knowledge by creating supportive cooperation as an alternative to teaching ‘top-down’” in order to make use of practical expertise, ethical values and experiences. Based on a project about avoiding food waste in canteens, he suggests that the exchange between actors in the gastronomic sector not only enables the circulation of knowledge and opportunities for sharing practical skills but also harbors the potential for sharing social norms about “being a good professional” and taking ethical responsibility. In the case study analyzed, the “kitchen talks” also strengthened the motivation of the participating canteen managers and reassured them they were not alone in dealing with the upcoming challenges.

Since the project provided the opportunity to carry out surveys with the canteen guests, this was another knowledge element that could be provided to the canteen managers. Being able to document the high level of approval for offering local organic meat, and communicate this to the central management and the kitchen staff, strengthened the position of the canteen managers in the transformation process.

Tregear et al. (2022) point out that considerable knowledge, skill and agility is demanded of the professionals who organize and operate procurement and catering services, as they are confronted with the challenge of prioritizing between the conflicting imperatives of cost efficiency on the one hand and sustainability and health aspects on the other (Grivins et al., 2018). Morgan (2014) mentions that the status of public sector procurement managers needs to be radically enhanced because these professionals play a key role in securing not just value for money in the narrow economic sense, but also “values for money” in the broader societal sense (see Section 5.3). Tregear et al. (2022) stress the importance of a higher valorization of catering service staff. Our study also showed that the kitchen staff play a central role in the process of introducing innovations such as local organic beef into canteens, and communicating these to the canteen guests. Well-trained kitchen staff also appreciate using their creativity and skills and are motivated by having the leeway to prepare meals with fresh instead of convenience products. We therefore agree with the authors that instruments that promote greater investment in frontline service staff, raise the status of the profession and provide more skills and training are necessary in order to support transformational change and the positive sustainability impact of public catering.

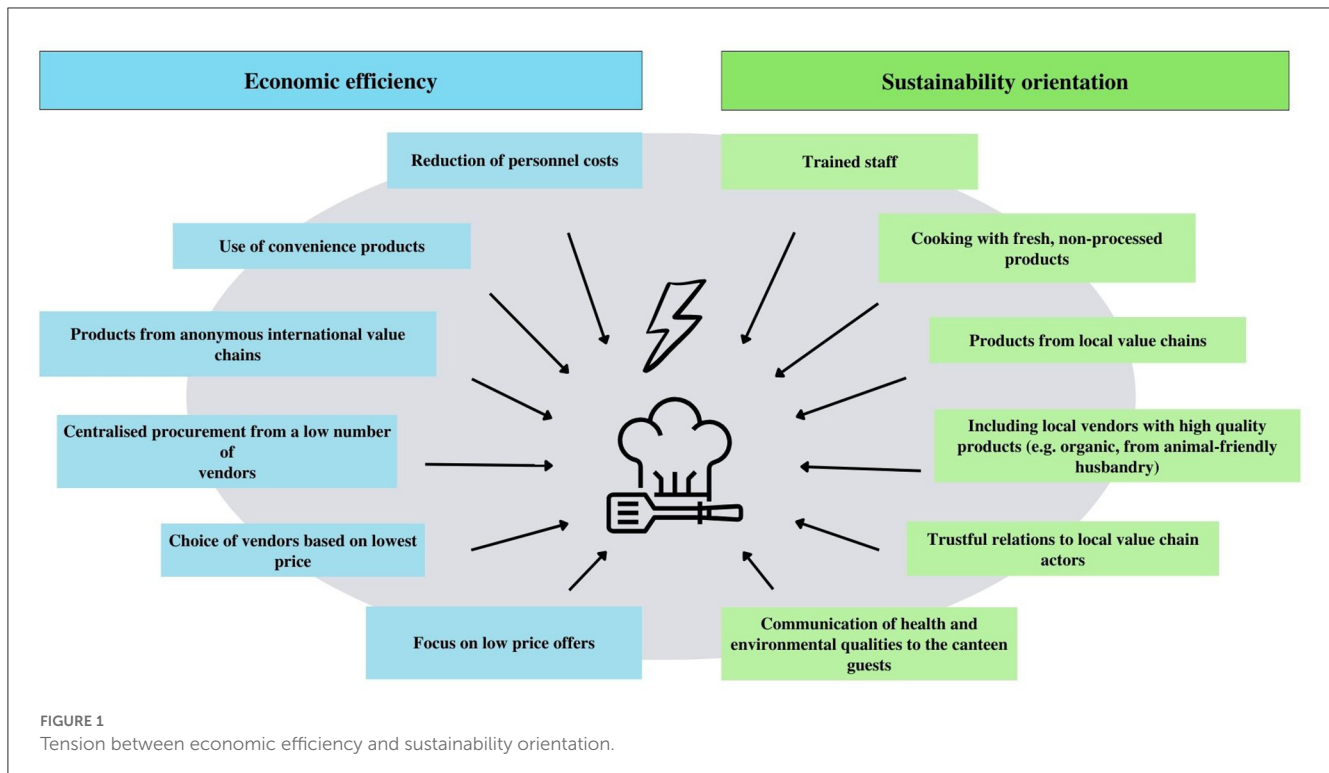
5.4. Provision of healthy and sustainable food as a societal challenge

The reflections in Sections 5.2 and 5.3 show that introducing local organic beef—as one example of a possible measure for improving the quality and sustainability of food in canteens—faces a lot of barriers due to the dominance of efficiency principles, which are inscribed into daily organizational practices in canteens and their regulation. Public catering facilities are increasingly confronted with demands that go beyond providing inexpensive meals for everybody. Morgan and Sonnino (2010) suggest that these emerging challenges call for a “new food equation,” one where the food system must be valued in broader terms than in the past, in order to account for its relation to the wider context of climate change, increasing energy costs, social unrest, financial instability and increasing environmental degradation. Figure 1 visualizes this tension between economic efficiency and sustainability orientation.

Morgan (2014) points out that appeals to individuals as consumers to change their attitudes and behavior by making healthier or more sustainable choices is an approach that will most likely fail because it does not recognize the strong social and economic forces that maintain the status quo. Since individuals are more likely to consider changing their habits and practices in the company of their friends, families and communities, public canteens are one of the societal settings in which sustainable diets should be fostered. This is of even greater relevance since canteens in schools, hospitals and care homes often feed the most vulnerable people in our societies (Marsden and Morley, 2014). The experiences of our case study show that the opportunity to use the provision of high-quality nutrition *via* canteens as a measure in preventive health care has not yet been given enough political priority.

As also shown above, these general reflections on the societal value that should be placed on providing healthy and sustainable food have consequences on different levels. Several authors stress that in future, public catering institutions need to adopt a more comprehensive perspective (Bratt et al., 2013), with better coordination across separate departments and functions (Testa et al., 2016). For public food provision in canteens, Tregear et al. (2022, p. 9) conclude that “this particularly means taking a more holistic view of procurement and service delivery functions to fully maximize their potential for enhanced environmental, economic and nutritional outcomes.”

The discussion about the societal challenge of changing the current food system has gained new momentum due to the publication of the report by the EAT-Lancet Commission on Healthy Diets From Sustainable Food Systems (EAT-Lancet Commission, 2019). The report states that food is the single strongest lever in the optimization of human health and environmental sustainability on a global scale. The health of both people and the planet is heavily shaped by how food is produced, what is consumed, and how much is lost or wasted. The group of scientists recommend a mainly plant-based planetary health diet, which would help avoid severe environmental degradation and prevent several million human deaths annually as part of a Great Food Transformation. Other authors also stress that the parallel consideration of environment and health is favored by the



current state of knowledge, since both dimensions require similar measures (Abrahamse, 2020; Strid et al., 2021; Speck et al., 2022). Public and private canteens can play an important role in this food transformation process if this societal goal is framed by supportive policies on different levels.

Data availability statement

The datasets presented in this article are not readily available because anonymization is very difficult due to the low number of involved canteens. Requests to access the datasets should be directed to schaefer@ztg.tu-berlin.de.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

MS and MH contributed to the conception of the research design. MH was responsible for data collection and analysis under the supervision of MS. MS prepared the initial draft for the manuscript and was responsible for the overall structure, the introduction and the discussion, while MH worked mainly on the results section. Both authors revised all parts of the paper. Both authors contributed to the article and approved the submitted version.

Funding

The project GanzTierStark was funded from 2020 to 2023 by the Federal Ministry of Food and Agriculture as part of the Federal Programme for Organic Agriculture (BÖL). It was managed by the Federal Office for Agriculture and Food (BLE). Further information can be found under www.ganztierstark.de. We acknowledge support by the German Research Foundation and the Open Access Publication Fund of TU Berlin.

Acknowledgments

We wish to thank the colleagues of the project GanzTierStark for contributing to its results: Carola Krieger, Sandra Rajmis, Susanne Salzgeber, Peter Schmidt, Moritz Bor, Rainer Roehl, and Evamarie Stengel. Special thanks go to Carola Krieger, who supported us in preparing the manuscript. Thanks also to Benjamin Hennchen and Jekaterina Markow for a review of an earlier version of the manuscript. We are also grateful to the participating canteens and the processor for their fruitful cooperation within the project, and to the Federal Ministry of Food and Agriculture, which provided the funding.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fsufs.2023.1152185/full#supplementary-material>

References

- Abrahamse, W. (2020). How to effectively encourage sustainable food choices: a mini-review of available evidence. *Front. Psychol.* 11, 589674. doi: 10.3389/fpsyg.2020.589674
- AMI (2021). *AMI Marktbilanz Vieh und Fleisch 2021: Daten, Fakten, Entwicklungen; Deutschland, EU, Welt*. Bonn: Agrarmarkt-Informationsgesellschaft.
- Arens-Azevedo, U. (2012). Regionale Produkte in der Gemeinschaftsverpflegung: aktuelle Situation, Hemmnisse und Förderndes bei der Verwendung. *Vierteljahrshefte Zur Wirtschaftsforschung* 81, 147–161. doi: 10.3790/vjh.81.4.147
- Ashe, L., and Sonnino, R. (2013). At the crossroads: New paradigms of food security, public health nutrition and school food. *Public Health Nutr.* 16, 1020–1027. doi: 10.1017/S1368980012004326
- Baumgarten, H. (2020). *Es war einmal – Struktur der Schlachthöfe in Ostdeutschland*. Bauernzeitung Available online at: <https://www.bauernzeitung.de/hintergrund/es-war-einmal-struktur-derschlachthoefe-in-ostdeutschland/> (accessed March 15, 2023).
- Becker, T. (2009). European food quality policy: the importance of geographical indications, organic certification and food quality assurance schemes in european countries. *Estey Centre J. Int. Law Trade Policy*. 10, 111–130. doi: 10.22004/ag.econ.48796
- Bratt, C., Hallstedt, S., Robert, K.-H., Broman, G., and Oldmark, J. (2013). Assessment of criteria development for public procurement from a strategic sustainability perspective. *J. Cleaner Prod.* 52, 309–316. doi: 10.1016/j.jclepro.2013.02.007
- Braun, C. L., Bitsch, V., and Häring, A. M. (2022). Developing agri-food value chains: learning networks between exploration and exploitation. *J. Agric. Educ. Exten.* 20, 1–22. doi: 10.1080/1389224X.2022.2082499
- Castelo, A. F. M., Schäfer, M., and Silva, M. E. (2021). Food practices as part of daily routines: A conceptual framework for analysing networks of practices. *Appetite* 157, 104978. doi: 10.1016/j.appet.2020.104978
- Clancy, K., and Ruhf, K. (2010). Is local enough? Some arguments for regional food systems. *Choices*. 25, 1–5. doi: 10.22004/ag.econ.93827
- Doernberg, A., Horn, P., Zasada, I., and Piore, A. (2019). Urban food policies in German city regions: An overview of key players and policy instruments. *Food Policy* 89, 101782. doi: 10.1016/j.foodpol.2019.101782
- EAT-Lancet Commission (2019). *Healthy Diets From Sustainable Food Systems: Summary Report of the EAT-Lancet Commission*. Available online at: https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf (accessed January 9, 2023).
- European Commission (2019). *EU green public procurement criteria for food, catering services and vending machines. Commission staff working document*. Available online at: https://ec.europa.eu/environment/gpp/pdf/190927_EU_GPP_criteria_for_food_procurement_and_catering_services (accessed January 21, 2023)
- Ewert, B. (2009). Economization and marketization in the German healthcare system: how do users respond? *German Policy Stud.* 5, 21–44. Available online at: https://www.researchgate.net/publication/267224618_Economization_and_Marketization_in_the_German_Healthcare_System_How_Do_Users_Respond (accessed January 22, 2023).
- Fitch, C., and Santo, R. (2016). *Instituting Change: An Overview of Institutional Food Procurement and Recommendations for Improvement*. The Johns Hopkins Center for a Livable Future. Available online at: <https://clf.jhsph.edu/sites/default/files/hbox2019-01/Instituting-change.pdf> (accessed January 9, 2023).
- Göbel, C., Scheiper, M.-L., Teitscheid, P., Müller, V., Friedrich, S., Engelmann, T., et al. (2017). *Nachhaltig Wirtschaften in der AußerHaus-Gastronomie: Status-quo-Analyse – Struktur und wirtschaftliche Bedeutung, Nachhaltigkeitskommunikation, Trends - Arbeitspapier Nr. 1*. Fachhochschule Münster, Institut für Nachhaltige Ernährung. Available online at: https://www.nahgast.de/wp-content/uploads/2017/09/NAHGAST_APap1_Au%CC%99Fer_Haus-Gastronomie.pdf (accessed January 10, 2023).
- Gray, B., and Purdy, J. (2019). Collaborating for Our Future: Multistakeholder Partnerships for Solving Complex Problems. *Admin. Sci. Quart.* 65, NP7–NP9. doi: 10.1177/0001839219883121
- Grivins, M., Tiesenkopfs, T., Ville, T., and Silvast, T. (2018). Manoeuvring between regulations to achieve locally accepted results: analysis of school meals in Latvia and Finland. *Food Secur.* 10, 1389–1400. doi: 10.1007/s12571-018-0856-6
- Haack, M., Münchhausen, and S., and Häring, A. M. (2016). “Discrepancy between theory and practice: procurement of local and organic food in public catering systems. Social and technological transformation of farming systems: Diverging and converging pathways,” in *IFSA Conference proceedings 2016* (UK: Harper-Adams-University). Available online at: <https://orgprints.org/id/eprint/30011/> (accessed January 17, 2023).
- Hauck, M., and Becker, T. (2015). *Evaluierung des Qualitätszeichens Baden-Württemberg (QZBW) aus der Sicht der Teilnehmer Hohenheimer Agrarökonomische Arbeitsberichte, No. 24, Universität Hohenheim, Institut für Agrarpolitik und Landwirtschaftliche Marktlehre, Stuttgart*. Available online at: <https://nbn-resolving.de/urn:nbn:de:bsz:100-opus-11610> (accessed January 17, 2023).
- Henrichen, B. (2019). Knowing the kitchen: Applying practice theory to issues of food waste in the food service sector. *J. Cleaner Product.* 225, 675–683. doi: 10.1016/j.jclepro.2019.03.293
- Henrichen, B. (2021). What is enough on a plate? Professionals’ practices of providing an adequate portion. in the food service sector. *Food Foodways*. 29, 355–377. doi: 10.1080/07409710.2021.1984610
- Ingram, J., Gaskell, P., Mills, J., and Dwyer, J. (2020). How do we enact co-innovation with stakeholders in agricultural research projects? Managing the complex interplay between contextual and facilitation processes. *J. Rural Stud.* 78, 65–77. doi: 10.1016/j.jrurstud.2020.06.003
- Kretschmer, S., and Dehm, S. (2021). Sustainability transitions in university food service—a living lab approach of locavore meal planning and procurement. *Sustainability* 13, 7305. doi: 10.3390/su13137305
- Krivašonoka, I. (2017). “Regulations of public food procurement: opportunities and challenges,” in *Research for Rural Development* (Jelgava, Latvia: Latvia University of Agriculture). doi: 10.22616/rrd.23.2017.068
- Langen, N., Ohlhausen, P., Speck, M., Rohn, H., Engelmann, T., Neundorf, D., Teitscheid, P. (2017). *Aspekte Praxistauglicher Interventionsstrategien. Perspektiven von Verbraucher*innen, Unternehmen und Wissenschaft*. NAHGAST Arbeitspapier Nr. 6, Berlin. Available online at: https://www.nahgast.de/wp-content/uploads/2018/02/NGast_APap6_Aspekte-praxistauglicher-Interventionsstrategien_21.11.2017 (accessed January 24, 2023).
- Lehtinen, U. (2012). Sustainability and local food procurement: a case study of Finnish public catering. *Br. Food J.* 114, 1053–1071. doi: 10.1108/00070701211252048
- Lopez, V., Teufel, J., and Gensch, C.-O. (2019). How a transformation towards sustainable community catering can succeed. *Sustainability* 12, 101. doi: 10.3390/su12010101
- Marsden, T. (2012). Third natures? Reconstituting space through place-making strategies for sustainability. *Int. J. Sociol. Agric. Food*. 19, 257–274.
- Marsden, T., and Morley, A. (2014). “Current food questions and their scholarly challenges: creating and framing a sustainable food paradigm,” in *Sustainable Food Systems* (Routledge) 1–29. doi: 10.4324/9780203083499
- Morgan, K. (2014). Nourishing the city: The rise of the urban food question in the Global North. *Urban Stud.* 52, 1379–1394. doi: 10.1177/0042098014534902
- Morgan, K., and Sonnino, R. (2010). The urban foodscape: world cities and the new food equation. *Cambridge J. Regions, Econ. Soc.* 3, 209–224. doi: 10.1093/cjres/rsq007
- Morgan, K. and Sonnino, R. (2013). *The School Food Revolution: Public Food and the Challenge of Sustainable Development*. London: Earthscan
- Nicolini, D. (2012) *Practice Theory, Work, and Organization: An Introduction*. Oxford: OUP Oxford.
- Pfefferle, H., Hagspihl, S., and Clausen, K. (2021). Gemeinschaftsverpflegung in Deutschland – Stellenwert und Strukturen. *Ernährungs Umschau*. 8, 470–483. doi: 10.4455/eu.2021.034
- Rapp, H., and Liesen, E. (2007). *Convenience-Produkte in der Gemeinschaftsverpflegung*. Bonn: Aid Spezial.

- Renda, A., Pelkmans, J., Egenhofer, C., Schrefler, L., Luchetta, G., Selçuki, C., et al. (2012). "The uptake of green public procurement in the EU27," in *Study prepared for DG Environment, European Commission, CEPS in collaboration with the College of Europe* (Brussels).
- Roehl, R., and Strassner, C. (2011). *Sektoranalyse Außer-Haus-Markt Schwerpunkt Gemeinschaftsverpflegung. Schriftenreihe des Projektes Nachhaltigkeitsorientiertes Rahmencurriculum für die Ernährungs- und Hauswirtschaftsberufe - Band 2*. Available online at: https://www.fh-muenster.de/oecotrophologie-facility-management/downloads/strassner/veroeffentlichungen/2012_RR_CS_40s.pdf (accessed January 10, 2023).
- Schebesta, H. (2018). Revision of the EU green public procurement criteria for food procurement and catering services – certification schemes as the main determinant for public sustainable food purchases? *Eur. J. Risk Regul.* 9, 316–328. doi: 10.1017/err.2018.24
- Schnell, R., Hill, P., and Esser, E. (2013). *Methoden der empirischen Sozialforschung 10*. Auflage, Oldenburg.
- Smith, J., Andersson, G., Gourlay, R., Karner, S., Mikkelsen, B. E., Sonnino, R., et al. (2016). Balancing competing policy demands: the case of sustainable public sector food procurement. *J. Cleaner Prod.* 112, 249–256. doi: 10.1016/j.jclepro.2015.07.065
- Sonnino, R. (2019). Translating sustainable diets into practice: the potential of public food procurement. *Redes.* 24, 14–29. doi: 10.17058/redes.v24i1.13036
- Speck, M., Wagner, L., Buchborn, F., Steinmeier, F., Friedrich, S., and Langen, N. (2022). How public catering accelerates sustainability: a German case study. *Sustain Sci.* 17, 2287–2299. doi: 10.1007/s11625-022-01183-2
- Statistik Berlin Brandenburg (2022). *Statistischer Bericht. Rinder im Land Brandenburg*. Available online at: https://download.statistik-berlin-brandenburg.de/8302695f7e8f0f1c/bf06de96661b/SB_C\hbox03--09-00_2022h01_BB.pdf (accessed March 15, 2023)
- Steinmeier, F. (2018). "Nachhaltiges Speisenangebot in der Außer-Haus-Gastronomie-Bestehende Hemmnisse und mögliche Pfadabhängigkeiten," in *Nachhaltig Außer Haus Essen: Von der Idee Bis auf Den Teller*, eds P. Teitscheid, N. Langen, M. Speck, and H. Rohn (München: ISS-oekom), 39–49.
- Strid, A., Hallström, E., Sonesson, U., Sjons, J., Winkvist, A., and Bianchi, M. (2021). Sustainability indicators for foods benefiting climate and health. *Sustainability* 13, 3621. doi: 10.3390/su13073621
- Testa, F., Annunziata, E., Iraldo, F., and Frey, M. (2016). Drawbacks and opportunities of green public procurement: an effective tool for sustainable production. *J. Cleaner Produc.* 112, 1893–1900. doi: 10.1016/j.jclepro.2014.09.092
- Tregear, A., Aničić, Z., Arfinic, F., Biasini, B., Bituh, M., Bojović, R., et al. (2022). Routes to sustainability in public food procurement: An investigation of different models in primary school catering. *J. Cleaner Product.* 338, 130604. doi: 10.1016/j.jclepro.2022.130604
- Tucker, C. A. (2014). The significance of sensory appeal for reduced meat consumption. *Appetite.* 81, 168–79. doi: 10.1016/j.appet.2014.06.022
- Tuitjer, G. (2021). Kurze Ketten im Lebensmittelbereich. *Standort.* 45, 181–186. doi: 10.1007/s00548-021-00704-y
- Verbeke, W. (2013). "Food quality policies and consumer interests in the EU," in *Consumer attitudes to food quality products. EAAP – European Federation of Animal Science*, eds M., Klopčič, A., Kuipers, J. F., Hocquette (Wageningen: Wageningen Academic Publishers). doi: 10.3920/978-90-8686-762-2_1