

Leuphana University Lüneburg

Faculty of Sustainability

Environmental Sciences

**Bachelor Thesis**

# Challenges and opportunities of organic and regional food supply in community catering

Insights from a literature review for building cooperation between local producers and  
community catering in kindergartens in the region of Lüneburg as a contribution to  
food sovereignty and sustainable development

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## List of abbreviations

<b>AELF Ebersberg</b>	Amt für Ernährung, Landwirtschaft und Forsten Ebersberg; Fachzentrum Ernährung / Gemeinschaftsverpflegung Oberbayern Ost
<b>ASPHN</b>	Association of State Public Health Nutritionists
<b>BLE</b>	Bundesanstalt für Landwirtschaft und Ernährung
<b>BMU</b>	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit
<b>BÖL</b>	Bundesprogramm Ökologischer Landbau
<b>BÖLN</b>	Geschäftsstelle Bundesprogramm Ökologischer Landbau und andere Formen nachhaltiger Landwirtschaft
<b>CCCP</b>	Common community catering practice
<b>CSA</b>	Community Supported Agriculture
<b>DGE</b>	Deutsche Gesellschaft für Ernährung
<b>EPPI-Centre</b>	Evidence for Policy and Practice Information and Coordinating Centre
<b>EPRS</b>	European Parliamentary Research Service
<b>ETC Group</b>	Action Group on Erosion, Technology and Concentration
<b>F2S</b>	Farm to school
<b>F2S/K</b>	Farm to school / kindergarten
<b>FAO</b>	Food and Agriculture Organization
<b>FS</b>	Food sovereignty
<b>GAP</b>	good agricultural practices
<b>GLOCULL</b>	Globally and locally-sustainable food-water-energy innovation in urban living labs
<b>hto</b>	How to overcome
<b>IAASTD</b>	International Assessment of Agricultural Knowledge, Science and Technology for Development
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>MKULNV NRW</b>	Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen
<b>NFSN</b>	National farm to school network
<b>NSLP</b>	National School Lunch Program
<b>SDGs</b>	Sustainable development goals
<b>SFSC</b>	Short food supply chain

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# 1 Introduction

The currently widespread agricultural practices have been increasingly criticised in recent years. They are especially criticised for being unsustainable on an ecological, economic and social level (compare Kalfagianni & Skordili, 2019). Recent developments in the global food system lead to a lack of transparency and unethical practices with negative impacts on human health and the environment from the consumer's perspective (Wellner & Theuvsen, 2017, p. 235) and to pressure of modernisation and intensification processes from the producer's perspective. This results in fear for farmers' existences (Boddenberg et al., 2017, p. 126) and leads to an increased vulnerability of the current food system (Kalfagianni & Skordili, 2019, pp. 3–4). It endangers long-term reliable food provisions and therefore calls for a change of supply and production practices.

A counter-movement that developed in the 1980s in response to these developments is food sovereignty (FS): A political movement with the aim to empower smallholder farmers and their needs instead of using food as a source of financial profit (Baker & Krumb, 2015, p. 17; Windfuhr & Jonsén, 2005, p. 28). Next to other implementations, short food supply chains (SFSCs) as well as sustainable agricultural practices play a key role within this theory (Altieri, 2018, p. 89; Kay, Mattheisen, McKeon, Meo, & Moragues Faus, 2018, p. 7). For this reason, Community Supported Agriculture (CSA), recently gaining increased popularity, is a specific strategy to realize this concept and to establish an alternative to the current system.

In this context, comparable collaborations between farmers and institutions with communal catering have been less in focus so far. As part of sustainable community catering, the use of organic food in general (compare Niessen & Paffe, 2010) as well as in schools (compare Groß, 2015; Weigel, 2013) and kindergartens in particular (Erhart, Lange-Fricke, Weiler, & Zurek, 2016; compare Kupke, 2017; Tecklenburg, 2016) has already been widely implemented and researched in Germany. In contrast, regional supply as a further aspect of sustainable community catering has mainly been considered in more general terms (compare Braden, 2003; Friedrich, 2012; MKULNV NRW, 2016). Only in the region of Munich, a conversion of catering to regional-organic products was initiated, monitored and evaluated in four day-care centres (compare AELF Ebersberg, 2015).

Within the region of Lüneburg, an example for such a regional-organic cooperation is not known yet. Thus, this project represents the starting point to fill the research gap within the field of sustainable food systems in urban living labs as part of the GLOCULL project<sup>1</sup>. It aims at building up such a

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<sup>1</sup> Standing for '**G**lobally and **LOC**ally-sustainable food-water-energy innovation in **U**rban **L**iving **L**abs' (GLOCULL). In GLOCULL, best-practice projects for the implementation of sustainable food, water and energy systems are to be developed in different international urban living labs, among others in the Lüneburg area.

regional-organic food cooperation between a local farmer and a kindergarten community catering service based on scientific insights and practical persons' knowledge. As above described, the availability of appropriate sources in German-speaking countries is insufficient. In addition, all above mentioned project reports lack a scientific basis so that they do not fulfil this project's claim to offer scientific reliability. Furthermore, the theoretical background – if mentioned at all in the found literature – does not go beyond the motive for regional food supply (AELF Ebersberg, 2015, pp. 6–7), while this GLOCULL sub-project takes aspects like FS and the solidarity idea into account as well. Actively initiating such a project in Lüneburg gives an impulse to share the idea of SFSCs and fair direct collaboration between producers and consumers in further areas (like Lüneburg), thus supporting the overall development.

The above described problems, which this project aims to solve, can be summarised under the term of sustainability problems, as they “tend to be systems problems, where ... behavior are complex and unpredictable and where causes ... are always multiple ... [and] non-linear in nature, cross-scale in time and in space, ... [and] have an evolutionary character” (Holling, Berkes, & Folke, 1998, p. 352). Due to their complexity, many of these sustainability problems are ill-defined problems at the same time. These are characterised by an initial state, that can only be described inaccurately, whose targets cannot be sufficiently known and whose types of barriers to overcome are unknown as well (Scholz & Tietje, 2002, p. 26), which makes them difficult to handle.

Transdisciplinarity aims at solving those ill-defined problems. It

“is a reflexive, integrative, method-driven scientific principle aiming at the solution or transition of societal problems and concurrently of related scientific problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge.” (Lang et al., 2012, pp. 26–27)

Lang et al. (2012, p. 27) refer to three needs to comply with transdisciplinary research. First, it focuses on societally relevant problems, such as the development within the current food system, negatively affecting involved stakeholders like farmers and consumers as well as the system's resilience and the environment. Second, researchers from different disciplines as well as non-academics will be involved in the further steps of this project. Third, solution-oriented knowledge is generated, providing knowledge about how to build up and maintain a direct food cooperation between a farmer and a kindergarten catering service.

The whole project is framed under the backcasting approach. According to Dreborg (1996, p. 815), backcasting is more suitable to tackle sustainability issues than forecasting approaches. It is an explicitly normative approach, “involving working backwards from a particular desirable future end-



point to the present in order to determine the physical feasibility of that future (...)” (Robinson, 1990, pp. 822–823). Backcasting finds application on “long-term complex issues, involving many aspects of society as well as technological innovations and change. The focus of interest is on a perceived societal problem of great importance” (Dreborg, 1996, p. 814), which is given in the context of sustainable kindergarten catering. According to Holmberg and Robert (2000, p. 296), the impulse for applying backcasting is not initiated by market or policy stakeholders, but by other stakeholders, who may be affected or engaged. In the case of this project, the initiative ‘EcoNa’ gave the impulse. EcoNa, belonging to JANUN e. V., runs educational projects on the topic of FS (JANUN e. V., n. d.). The idea to build up a cooperation between a local farm and the catering of a kindergarten in Lüneburg was born here. According to the typical structure of backcasting, possible solutions for the societal problem are envisioned, before the current state is analysed and the backcasting pathways are applied finally (Wiek & Lang, 2016, p. 35). This characteristic course of action of going from practice into science and back to practice again is also applied here.

### 1.1 Course of action

The thesis is structured as follows: First, research objective and research question will be presented, before the topic’s relevance will be explained. Then, the overall context, including a problem description and presentation of solution strategies and concepts, is illustrated. Later, the literature review method as well as the methodological course of action are described, followed by a presentation of the generated results from scientific and grey literature and a discussion about the results’ meaningfulness.

### 1.2 Research objective and research question

The present project is part of the broader project GLOCULL. The cooperation between producers and institutions with communal catering is only one part within the overall frame, which in this case illuminates aspects of local sustainable food systems. The research question for this particular project is:

*How can an application-oriented draft of a regional-ecological cooperation between a local, small-scale farm and the communal catering of a municipal day-care centre for children in the Lüneburg area be developed based on peer reviewed literature and practical expertise?*

This bachelor thesis deals with parts of the conception of this project. A fellow student will use the results as a basis to gain more information from practitioners and to combine both sources to a sound basis. Due to Corona crisis, the implementation of this concept unfortunately cannot be part of this work anymore. Still, the implementation and evaluation of the concept is desirable.

This thesis' research exclusively contains literature work to provide a solid overview of scientific knowledge regarding direct food cooperation implementations between local farmers and kindergarten community catering. Therefore, the results of this thesis only correspond to interim results of the project on food systems. The research question for this thesis is the following:

*What are common practices in community catering (in kindergartens and schools), what weaknesses do they reveal from a sustainability perspective and what visions, goals, motivations and advantages as well as referring challenges exist according to peer reviewed literature?*

This is divided in five sub-questions:

1. *What are common practices regarding community catering in kindergartens and schools?*
2. *What are weaknesses, problems and criticisms about the currently common food supply in community catering (of kindergartens and schools) from a sustainability perspective?*
3. *Which visions and goals as well as motivations and advantages of building up direct cooperation are named?*
4. *Which challenges and barriers determine beforehand and occur during a cooperation and which way of dealing with them is successful?*
5. *What are the most crucial challenges and barriers?*

### 1.3 Relevance

In this chapter, the project's relevance for sustainable development in general, for CSA and SFSCs as part of FS, for farmers and kindergartens will be presented. Furthermore, the relevance within the current COVID-19 pandemic and within transdisciplinary research will be shown.

The Sustainable Development Goals (SDGs), defined and passed in 2015, contain the second goal, which aims to end hunger and all forms of malnutrition until 2030 (United Nations, 2015, p. 17). The agenda itself mentions the support of sustainable agriculture as one strategy to achieve this goal (United Nations, 2015, p. 9).

SFSCs seem promising to support the process towards this aim (Kalfagianni & Skordili, 2019, p. 1). The rising interest in these direct forms of cooperation as well as the high potential reflect the wish for an alternative food system on both consumer and producer side (European coordination via campesina, 2018, p. 21; Wellner & Theuvsen, 2017, p. 235), while "local food schemes remain marginal within the wider European agro-food system" (Augère-Granier, 2016, p. 2). As one opportunity, the concept of CSA offers an attractive reorientation for farmers and end consumers in direct contact (Wellner & Theuvsen, 2017, p. 235), while the concept of FS provides an overall alternative on a more global and political scale (Windfuhr & Jonsén, 2005, pp. 15–16).

Firstly, for local smallholder farmers, the advantage of a direct cooperation lies in their empowerment in contrast to the conventional food chain (Augère-Granier, 2016, p. 1; Windfuhr

& Jonsén, 2005, p. 9). Local economy may be boosted (Augère-Granier, 2016, p. 1) and the direct contact between producers and consumers may lead to more reconnection and a higher grade of income certainty, as consumers may build up an emotional relationship to their 'personal' producer (Augère-Granier, 2016, p. 2). It allows them to achieve increased profits and gain a higher (and fairer) income (Augère-Granier, 2016, p. 1; Augère-Granier, 2016, p. 2), which provide the potential to invest in more sustainable practices (such as organic agriculture). Using sustainable, especially organic agriculture, is necessary to be able to provide local, healthy and nutritious food in the long-term perspective. Secondly for kindergartens, the use of regionally and sustainably produced food fulfils the claim to integrate sustainability strategies in the out-of-home catering (Brunner, Geyer, Jelenko, Weiss, & Astleithner, 2007, p. 219) – especially as the warm meal is increasingly moved outside of private households (Brunner et al., 2007, p. 72) and children are ever more provided with warm meals in day care centres. The rise of the number of kids having their meal in the kindergarten by 160 % between 2008 and 2014 (Tecklenburg, 2016, p. 92) emphasises the potential and the need for change in the mass catering sector. To achieve this, Brunner et al. (2007, p. 214) emphasise the need to integrate more organically produced food in community catering. By initiating and implementing a direct cooperation between a local producer and the lunchtime catering of a day care centre in Lüneburg, this project contributes to promoting a general development towards more self-determination of the actors involved. This idea is a fundamental part of the concept of FS, which again is a contribution to sustainable development (Boddenberg et al., 2017, p. 143). Supplying kindergarten meals regionally and organically additionally offers the possibility to increase the children's consciousness for regional products and to already sensitise for healthy nutrition in young age (Brunner et al., 2007, p. 146).

The current Corona pandemic makes this research topic especially relevant. On the one hand, risks of the existing food system are revealed. Disruptions in global supply chains may temporarily reduce food availability and increase food costs, while local procurement can be more reliable and consistent. Furthermore, connecting to local producers may create a feeling of security (NFSN & ASPHN, 2020, p. 2) and therefore may counteract panic acts of 'Hamsterkäufe'. On the other hand, local farmers struggle, as they rely on seasonal workers, who are only allowed to enter Germany in a limited number and under challenging conditions. Farmers, also in the region of Lüneburg, therefore fear losses and even for their existence (Ruf, 2020). This shows that alternative ways of food supply need to be tested to be able to adapt to extraordinary times. One can assume, that shorter food supply chains as well as more direct contact between producers and consumers would make the food system less vulnerable, as actions taken can be realised more quickly. The higher grade of sovereignty could moderate the negative effects for the food system and more direct interaction between suppliers and consumers may strengthen trust on the consumers side.

Next to the current and general relevance in practice, this project is relevant from a research perspective, too. Agriculture and food supply areas are already in the focus of transdisciplinary transitions towards sustainability, e. g. by the application of Large System Change theory (Dentoni, Waddell, & Waddock, 2017, p. 9). The planned concept as well as its implementation may contribute to a further development of large-scale knowledge by use of a small-scale application.

## 2 Problem description: Modern agriculture<sup>2</sup> and the current food system

The current food system is shaped by the attempt to provide global food security (Baker & Krumb, 2015, p. 17) and is therefore characterised by diverse concentration processes in market segments (Brand, 2017, p. 273), as figure 1 shows. Particularly, this led to a high control level of large retailers, distributors and their subsidiaries, in the consumers' supply with food during the recent 50 years (European coordination via campesina, 2018, p. 21), while it led to implementation

Figure 1: The Global Food System

A double bottleneck of corporate control between farmers and consumers

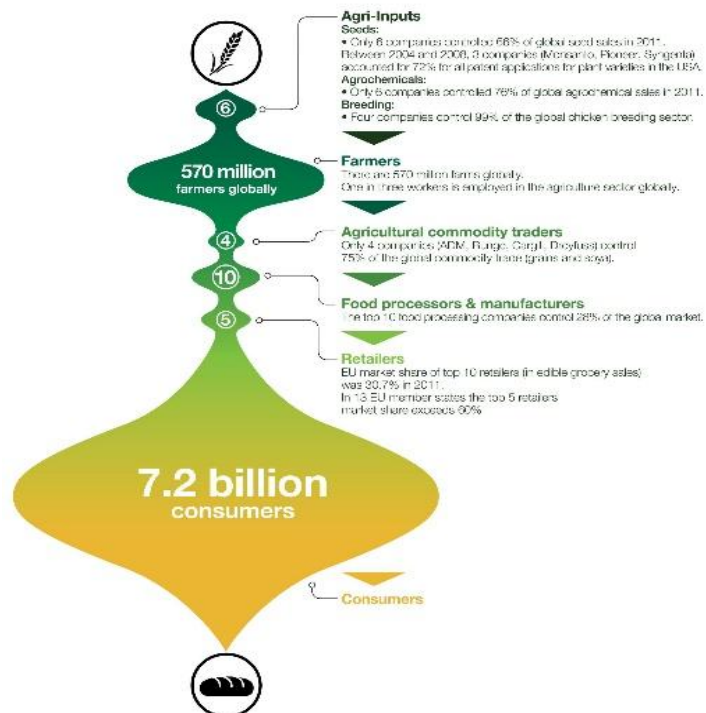


Figure 1: Shape of the global food system (Baker & Krumb, 2015, p. 18)

of industrial thinking and methods in the production process (Brand, 2017, pp. 268–269). As the achievement of global food security is a political goal, many of the presented negative effects result from political decisions, giving reason for criticism against political authorities (Windfuhr & Jonsén, 2005, 3).

Thus, the current food system is criticised for power concentrations (Baker & Krumb, 2015, p. 17; Brand, 2017, p. 273; Augère-Granier, 2016, p. 5; Augère-Granier, 2016, p. 2; Windfuhr & Jonsén, 2005, p. 9), focus on financial profits (Baker & Krumb, 2015, p. 17; Windfuhr & Jonsén, 2005, p. 28) and globally disadvantaging smallholder farmers (Windfuhr & Jonsén, 2005, pp. 3–4).

<sup>2</sup> Within this thesis, modern agriculture is a collective name for global and intensive agriculture, including industrial techniques.

One root cause for the current global food system are (primarily) European and US policies and, resulting from that, subsidies in the food production, so that products can be sold at a price below their production costs, called dumping (Windfuhr & Jonsén, 2005, 28). In 2020, Germany will probably spend 2.1 billion Euros on agriculture subsidies (Deutscher Bauernverband e. V., 2019, p. 136). This does not only destroy local markets in developing countries (Rosset, 2006a, as cited in Martínez-Torres & Rosset, 2010, p. 162) and depresses prices worldwide (Windfuhr & Jonsén, 2005, 28), but also harms smallholder farmers in industrialised countries: The payed (long-term) subsidies advantage large farms (Windfuhr & Jonsén, 2005, 28) but do not reach small ones (Windfuhr & Jonsén, 2005, 7).

Globalisation describes the progress of integrating national into international financial markets with increasing transborder capital and goods transactions. This is accompanied by increasing transnational economic activities, such as varying legal systems and costs. Market potentials between countries lead to financial benefits (Kyrer, 2001, p. 235), and at the same time represent another root cause for the current food system's status. Looking at globalisation from a food system's perspective, it is characterised by the spread of modern technologies of production as well as international trade and production processes (Yeung, 1998, Ohmae, 2005, Snyder, 2009, as cited in Robinson & Carson, 2015, p. 1) being accompanied by increased global interconnectedness (Ietto-Gillies, 2012, Jenkins, 2013, as cited in Robinson & Carson, 2015, p. 1). The result of these connections are what is understood as global market (Robinson & Carson, 2015, p. 2), which again influences farming and production processes. From a food system's point of view, this leads to an increased specialisation of farms and regions, a higher grade of product processing (Robinson & Carson, 2015, p. 2) as well as to an increase in the usage of industrial methods (Brand, 2017, p. 268).

Transporting agricultural products, especially with fresh fruit, fresh vegetables and cut flowers, amounts to five percent of global commodity trade (Diop and Jaffee, 2005, as cited in Robinson & Carson, 2015, p. 3), and therefore takes a relevant position in global commodity trade in general. Together with subsidies in the agriculture sector, this leads to increasing choice and wealth generation (Kalfagianni & Skordili, 2019, p. 3; Robinson & Carson, 2015, p. 1) on the one hand. On the other hand, this results in many disadvantages of the current state, which are shortly presented in the following paragraphs.<sup>3</sup>

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<sup>3</sup> As the use of industrialised methods itself is an intermediate cause of globalisation, there will not be distinguished between effects in agriculture and food provision provoked by globalisation or industrial production methods.

From an ecological perspective, agriculture is fundamentally dependent on the given natural ecosystem (Robinson & Carson, 2015, pp. 5–6). Modern agricultural interventions (e. g. irrigation, modification of soil structure and composition as well as microclimate by use of fertilisers and pesticides, greenhouses and heavy machines) therefore influence the ecosystem negatively. This manifests itself in characteristics of intensive agriculture (BMU, 2017) such as salination, nitrate run-off into watercourses, loss of biodiversity, destruction of major ecosystems (Robinson & Carson, 2015, p. 6) as well as water scarcity (McIntyre, 2009, p. 518). In 2004, the agriculture sector contributed to global greenhouse gas emissions with 14 % (IPCC, 2008, p. 36), which stresses the potential of agricultural practices to decrease climate change consequences (Robinson & Carson, 2015, p. 6). Low food prices within this system are criticised for ignoring external costs (e. g. biodiversity loss; (Kalfagianni & Skordili, 2019, p. 3), which again effects increasing food waste (FAO, 1981, chapter 1.1), thus reinforcing the shown consequences of the current food system.

Economically, the monopolisation of power by supermarket chains, processing industry and trading companies leads to farmers' dependencies (van der Ploeg, 2010, p. 99). Consequentially, it decreases the whole system's resilience (Sage, 2013, p. 3), while increasing instability and delicateness to disruptive factors (McMichael & Schneider, 2011, as cited in Kalfagianni & Skordili, 2019, pp. 3–4). Especially in technology intensive fields, power structures are unbalanced with few transnational groups in powerful positions (ETC Group, 2013, p. 3). The smallholder farmers' access to markets is often depending on large investors being able to exert strong pressure on margins with the consequence that farmers even sell products at a loss (Augère-Granier, 2016, p. 2). Additionally, external costs cannot be saved, but are pushed to other places and / or future times (Kalfagianni & Skordili, 2019, p. 3).

On a social scale, one of the main negative consequences is the political focus on intensive farming, leading to power concentration. That is why policies ignore the needs of smallholder farmers, causing lack of access to inputs and resources for them (Baker & Krumb, 2015, p. 17; Windfuhr & Jonsén, 2005, p. 28) and leading to quickly decreasing numbers of farms (European coordination via campesina, 2018, p. 16). Baker and Krumb (2015, p. 17) state, that the current system does not aim to provide access to good food for everyone, but to gain maximum economical profits. Beyond that, bilateral trade agreements are threatening the livelihoods of farmers (European coordination via campesina, 2018, p. 23). Due to longer food chains, people lose connection to their food (Kalfagianni & Skordili, 2019, p. 4) and highly processed and therefore often unhealthy products imply health problems like obesity (Kalfagianni & Skordili, 2019, p. 4), which may again influence economic issues. Also in the social area, external costs are occurring (Kalfagianni & Skordili, 2019, p. 3).

These explanations clarify the emergence and effects of the current food system. It becomes clear, that political decisions were crucial for shaping the current status and are in the same way crucial to change the overall system towards a more sustainable one. This thesis' overall aim is to support the implementation of a sustainable direct cooperation between small farmers and kindergartens in the region of Lüneburg. It targets to give recommendations for a successful cooperation within the given local occurrences. Although changes within the political frame possibly increase the project's potential, it explicitly does not aim at changing political structures, as this would deviate too far from this thesis' key issue. Therefore, policy changes will only be lightly taken into consideration here.

### 3 Possible solution strategies and concepts

In the following, different strategies and concepts, which may help to change the above described developments of the current food system, will be presented. These are sustainable development, FS as well as more specific forms of sustainable agriculture and food supply.

#### 3.1 Sustainable development

According to the Brundtland definition, "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987, p. 37). For this thesis, the "Doughnut Economics" model by Raworth will be used as basis, which frames the social and economic sphere within the ecological one, hierarchising environmental issues compared to social issues and these again compared to economic matters (Raworth, 2013). The economic sphere contains the planetary boundaries introduced by Rockström et al. (2009, p. 472), while the social sphere consists of the SDGs, building up a plan of action to achieve sustainability (Raworth, 2013). Since our environment is the basis for all actions taken in the other spheres, this hierarchy can be justified. This thesis' content stresses this claim, as all kind of food production is based on ecosystems, that properly work in long term.

#### 3.2 Food sovereignty

In response to the increasing threats smallholder farmers are facing (see chapter 2), the FS movement emerged (Windfuhr & Jonsén, 2005, p. 1). During the 1980s and until 1992, this took place in Latin America, where different rural movements joined forces to give a voice to their claims by founding the organisation La Via Campesina (in English: the peasants' way), which became a global movement up to the millennium (Martínez-Torres & Rosset, 2010, p. 151). In context of the Rome Civil Society Organisation Forum in 1996, the declaration 'Profit for few or food for all – Food Sovereignty and Security to Eliminate the Globalisation of Hunger' was presented. This was the reaction to the sole use of 'food security' by most of NGOs and governments, which was considered as insufficient to solve peasants' problems (European coordination via campesina, 2018, p. 5).

Today, a global network of non-governmental and civil society organisations, social movements as well as forums and declarations stand behind the FS movement, publishing several statements about this issue (Windfuhr & Jonsén, 2005, p. 11). Currently, the term is seen as “an umbrella term for particular approaches to tackling the problems of hunger and malnutrition, as well as promoting rural development, environmental integrity and sustainable livelihoods.” (Windfuhr & Jonsén, 2005, p. 1) and is commonly defined as following:

*“Food Sovereignty is the right of peoples to define their own food and agriculture; to protect and regulate domestic agricultural production and trade in order to achieve sustainable development objectives; to determine the extent to which they want to be self reliant; to restrict the dumping of products in their markets [...]. Food Sovereignty does not negate trade, but rather it promotes the formulation of trade policies and practices that serve the rights of peoples to food and to safe, healthy and ecologically sustainable production.”* (Windfuhr & Jonsén, 2005, p. 1)

To highlight especially relevant elements of the definition, the emphasis on local agricultural production, the necessary link between production costs and prices to prevent dumping and agroecology as food production possibility to achieve sustainability in the fields livelihoods, living landscapes and environmental integrity are worth mentioning (Windfuhr & Jonsén, 2005, p. 13). Therefore, FS stresses the relevance of resource access, fair trade policies and sustainable ways of production (Windfuhr & Jonsén, 2005, p. 4).

FS is a still developing and changing concept, which focuses on the needs of non-industrial working small-scale farmers (Gordillo & Jerónimo, 2013, p. 6). It consists of various theoretical backgrounds, like the ‘Six Pillars of Food Sovereignty’ as main areas for action (The Nyéléni 2007 International Steering Committee, 2007, p. 76) and the ‘Seven Principles of Food Sovereignty’ as proposals to achieve these pillars (Windfuhr & Jonsén, 2005, p. 17). As discussing these would lead too deep into detail, relevant aspects for this thesis will be summarised below:

Next to other principles, FS focuses on ‘Food for people’ by arranging people (especially disadvantaged ones) in the centre of the food system (pillar 1; (The Nyéléni 2007 International Steering Committee, 2007, p. 76) and establishing food as a basic human right (principle 1; (Windfuhr & Jonsén, 2005, p. 17). In addition to that, FS aims at localising the food system by putting “providers and consumers at the centre of decision-making on food issues” as well (The Nyéléni 2007 International Steering Committee, 2007, p. 76). That is how control is put locally, for resources to be used in a socially and environmentally sustainable manner (pillar 4; (The Nyéléni 2007 International Steering Committee, 2007, p. 76), for natural resources to be protected (principle 3; (Windfuhr & Jonsén, 2005, p. 17) and to prevent negative effects in third countries (European coordination via



campesina, 2018, p. 17). One method to achieve this is agroecological farming (pillar 6; (The Nyéléni 2007 International Steering Committee, 2007, p. 76). According to the FS concept, food should be a source of nutrition and less an object of trade or commodity (principle 4; (Windfuhr & Jonsén, 2005, p. 17). For that reason, it tries to prevent food providers from dumping and to offer healthy food for consumers (pillar 3; (The Nyéléni 2007 International Steering Committee, 2007, p. 76).

For this thesis, agroecology and local markets resp. SFSCs are especially important aspects of FS:

As the effect of technical solutions for increased productivity is at its limit, according to Pretty (2001), the future of sustainable agriculture lies in the collective work of smallholder farmers (as cited in Windfuhr & Jonsén, 2005, p. 5), using agroecology as a food production method. This holistic approach aims at “the application of ecological concepts and principles to the design and management of sustainable agroecosystems” (Altieri, 1995, p. 2). Although the main purpose is to reduce agrochemical inputs as much as possible (Altieri, 1995, p. 1), agroecology is considering systems concerning the agroecological system itself as well as the connected social system (Altieri, 2018, p. 21). For this reason, the focus lies predominantly on the supply of local markets (Windfuhr & Jonsén, 2005, pp. 14–15). Advantages of this approach are seen in the increasing resilience of the used ecosystem by optimisation of the system as a whole. On the one hand, it can therefore provide yields in the long term perspective (Altieri, 2018, p. 89) and on the other hand, it can achieve improvements to natural, social and human capital (Pretty, 2008, p. 456). In general, the implementation of agroecology implies the possibility for farmers to try new methods and, especially in industrialised countries, the application of organic agriculture methods (Altieri & Nicholls, 2005, p. 10).

As food supply for citizens is currently highly controlled within the distribution sector (European coordination via campesina, 2018, p. 21), FS aims at strengthening local markets and direct cooperation (The Nyéléni 2007 International Steering Committee, 2007, pp. 27–28). The interest for this change is already quantifiably increasing (Augère-Granier, 2016, p. 1), so that alternative food systems are already built up within the EU (European coordination via campesina, 2018, p. 18). These can be summarised under the term of SFSC, having a minimum of intermediate actors between producer and consumer (Augère-Granier, 2016, p. 3). Regarding the current system’s problems (see chapter 2), the various advantages outweigh the disadvantages, which concern the position of farmers (e. g. higher profit), of consumers (e. g. gaining a better relationship and understanding towards producers), as well as economic (e. g. support of local economy), environmental (e. g. less input of energy, pesticides and fertilizers) and social (increasing social cohesion in urban areas) aspects (Augère-Granier, 2016, pp. 5–6; Augère-Granier, 2016, p. 2). A study carried out in the UK by Pretty et al. (2005, p. 16) emphasizes the positive environmental aspects due to shortened food

supply chains. As one form of SFSC, Augère-Granier (2016, pp. 3–4) names collective cooperation, where producers sell their products to individuals or to consumer groups, e. g. to provide school or hospital catering. As FS advocates highlight such kind of cooperation as well (The Nyéléni 2007 International Steering Committee, 2007, p. 53), this supports the here provided project plan fitting into the concept of FS.

In the intergovernmental context, the terms ‘food security’ and ‘right to food’ are receiving more attention than FS, as the former was appointed to the central concept for intergovernmental processes (Windfuhr & Jonsén, 2005, pp. 22–23). To demonstrate the need to consider FS instead of other concepts, the differences to food security and the right to food will be shown. First of all, the right to food is included in the Universal Declaration of Human rights from 1948 (Windfuhr & Jonsén, 2005, p. 19) and therefore is a legal concept (Windfuhr & Jonsén, 2005, p. 15) stating that “[e]veryone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food [...]” (United Nations General Assembly, 1948, p. 4). Since it is integrated in international law, it has a different character than food security and FS (Windfuhr & Jonsén, 2005, p. 19). In contrast to that, food security and FS are political concepts (Windfuhr & Jonsén, 2005, p. 19). Although both concepts “stress that the central problem today is access to food” (Gordillo & Jerónimo, 2013, p. 6), there are two main differences according to Gordillo and Jerónimo (2013, p. 6): First, food security remains neutral about existing power asymmetries, while the various power imbalances are the starting point for FS, calling “for democratic states to balance these inequalities” (Gordillo & Jerónimo, 2013, p. 6). Second, these concepts differ in the strategy, how food should be produced (Gordillo & Jerónimo, 2013, p. 6). Food security is only focusing on the access to food (Windfuhr & Jonsén, 2005, p. 21) instead of taking an access to production resources into account (Windfuhr & Jonsén, 2005, p. 22) as well as emphasising political need for change, as FS does: “Food Sovereignty (...) is a more precise policy proposal, with proponents challenging political inactivity or other failures to pursue appropriate policies” (Windfuhr & Jonsén, 2005, p. 23). In contrast to that, food security is criticised for being an aim without a concept for its achievement (Windfuhr & Jonsén, 2005, p. 21). As the FS concept on the one hand implements the right to food and additionally rights, e. g. the right to FS and the right to produce (Windfuhr & Jonsén, 2005, p. 24) and takes specific problem solutions into account and on the other hand advocates claim for more attention on the term of FS instead of other concepts, this concept is assessed as being suitable to contribute to sustainable development in regard to the food system.

Although representatives from developing countries already acknowledged FS as more suitable for problem tackling in the end of the 1980s (Windfuhr & Jonsén, 2005, p. 35), only after the food crisis in 2008, FS as well as its advantages are increasingly discussed as a new leading concept (Gordillo

& Jerónimo, 2013, v). First, the Agenda for Sustainable Development aims to “double [...] incomes of small scale food producers [...] through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition” (United Nations, 2015, p. 17) till 2030 (United Nations, 2015, p. 17) and explicitly names strategies, FS claims. Second, in Switzerland a referendum about more FS was carried out in September 2018 (St. Galler Tageblatt, 2018,) and, third, in the subsequent December, the UN General Assembly adopted the ‘United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas’ (La Via Campesina, n. i., p. 1), which was assessed as crucial step towards a more sovereign food system (La Via Campesina, n. i., p. 2). In contrast to these, the European Commission’s proposals for Common Agricultural Policy 2012-2027 was strongly criticised for worsening many problems of agricultural markets (La Via Campesina, 2018).

### 3.3 Sustainable agriculture and food supply

#### 3.3.1 Organic agriculture and CSA

As already mentioned in chapter 3.2, FS seeks for alternative practices in the production of food, one of which is organic agriculture (Altieri & Nicholls, 2005, p. 10). Although organic agriculture, is on the one hand criticised for being insufficient to fulfil the claims for a sustainable agriculture (Herzig & Godemann, 2018, p. 305; Niggli, 2015, p. 4), it is on the other hand a long existing concept (Zerger, 2018), providing latest knowledge about a beneficial alternative to the current practice (Niggli, 2015, pp. 4–5). Alternatives, such as permaculture, were rarely in scientific focus for long time (Mok et al., 2014, p. 32), while ecological farming has developed towards a highly knowledge-based practice (Wachendorf, Buerkert, & Graß, 2018, p. 10) and therefore suits as an objective for this research. Hereafter, the main aspects of organic agriculture will be presented.

Referring to the Council of the European Union (2008, p. 8), organic production is the application of production methods defined within the mentioned regulation, being filled in by further EU regulations, the ‘Öko-Kennzeichenverordnung’ and the ‘Öko-Landbaugesetz’ for Germany (Zerger, 2018, p. 385). According to Zerger (2018, pp. 384–385), apart from these detailed and complicated legal regulations, all forms of ecological farming are based on the following principles:

- Working in closed operating loops,
- Obeying actions for animal welfare,
- No use of chemical-synthetic pesticides for plant protection,
- Maintenance and increase of soil fertility,
- No use of mineral nitrogen fertilizers,
- No genetic engineering and
- Production of high-quality food.

Ecological farming has been proven to increase biodiversity (Niggli, 2015, p. 2) and soil fertility (e. g. higher carbon storage capacity, higher organic matter content, improved water infiltration (Gattinger et al., 2012, p. 4; McIntyre, 2009, p. 183; Niggli, 2015, p. 3)) while decreasing nitrate input into groundwater (Niggli, 2015, p. 2). Besides, ecological agriculture supports rural development (McIntyre, 2009, p. 460) and may create closer links between producers and consumers (McIntyre, 2009, p. 384).

Community Supported Agriculture is a special opportunity to implement SFSCs. It is seen as the renaissance of community-based food production, which disappeared during industrialisation (Boddenberg et al., 2017, p. 127). Within the aim of gaining independence from capitalistic marketing strategies, farmers and consumers share risks, responsibilities and working capital as well as the entire harvest (Boddenberg et al., 2017, pp. 133–134; Sproul & Kropp, 2015, p. 1). Thus, CSA is especially interesting for farms, that are only partially competitive towards the global food market (Boddenberg et al., 2017, pp. 133–134) and which are at risk of falling victim to the "grow or go"<sup>4</sup> problem (Wellner & Theuvsen, 2017, p. 239). It is empirically shown that especially small farms often change to CSA (Boddenberg et al., 2017, p. 144). CSAs have ecological claims in three main principles: Cultivation method (e. g. closed cycle economy), cultivated products (e. g. seed-solid varieties) and distribution practices (local distribution; (Boddenberg et al., 2017, pp. 133–134). The principle of cultivation methods is often implemented by applying organic agriculture and small-scale acreage, which is associated with biodiversity promotion (Wellner & Theuvsen, 2017, p. 239).

To consumers, CSA offers the opportunity to become active in and help to form a sustainable agricultural practice in a community and additionally to be supplied with high quality, organic and regional food. For Farmers, CSA provides the opportunity to be financially safeguarded, sharing risks with members and therefore allowing to work according to own values, while the distribution is ensured (Kraiß & van Elsen, 2009, p. 185). The CSA concept creates opportunities for making the current food system more sovereign (Wellner & Theuvsen, 2017, p. 235), sustainable (Boddenberg et al., 2017, p. 143) and more crisis-proof (Kraiß & van Elsen, 2009, p. 189). According to Boddenberg et al. (2017, pp. 144–145) CSA's position within the food system is still assessed as marginal, but this niche position can be especially promising within crisis situations. They suggest, that "CSA could gain relevance as a socio-political strategy and find resonance and legitimation"<sup>5</sup> (Boddenberg et al., 2017, p. 145) beyond tapped target groups. As the advantages of locally and sustainably grown food

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<sup>4</sup> Translated from German original: „wachse oder weiche“

<sup>5</sup> Original quot: „...[CSA] als gesellschaftspolitische Strategie an Relevanz gewinnen und jenseits der gesellschaftlichen Kreise Widerhall und Legitimation finden“ (translated with DeepL: <https://www.deepl.com/translator>)

are becoming more apparent during the current Covid-19 pandemic, CSAs could accordingly make a profit from them. This could be an impulse for new target groups to overcome current barriers and to engage in CSA (Boddenberg et al., 2017, p. 143). These new target groups may include institutional food provision services, which are actors to be potentially included, but have not been subject for CSAs so far (Kraiß & van Elsen, 2009, p. 190).

### 3.3.2 Regions and regional products

The understanding of a 'region' differs depending on context and interpretation (Sauter & Meyer, 2003, p. 25). Relevant criteria may be natural- or socio-scientific issues (Sauter & Meyer, 2003, p. 25), in general describing a specific area, determined by geographical, political, economic, cultural or demographic issues (Sauter & Meyer, 2003, p. 25), but missing out any geographical indication. Depending on the underlying definition, status and potential of regional food supply are widely ranged (Sauter & Meyer, 2003, p. 26), stressing the need for an explicit definition. Czech et al. (2002) propose a radius of 50 – 100 km as reference for structures of regional supply (as cited in Sauter & Meyer, 2003, p. 26). Although the greatest possible proximity between production and consumption sites is being sought, the practice partners have not yet been determined. In order to ensure enough scope for actions, the Lüneburg region is defined as a 100 km radius around the city centre. Regional products are therefore those products, whose origin can be clearly allocated to this area (Sauter & Meyer, 2003, p. 26). The definition also includes regional processing and marketing of the products (Sauter & Meyer, 2003, pp. 26–27).

## 4 Method and course of action

### 4.1 Literature review

Literature reviews can give an overview of a specific research topic. In order to fulfil accountability and repeatability for this research, the approach of systematic literature review was chosen. The systematic review uses “formal, explicit methods to describe and synthesise evidence” (Potter, 2007, p. 1) and follows a strict methodology within the literature selection process by the inclusion of a detailed protocol to prevent potential author bias, e. g. by making in- and exclusion criteria transparent (Feak & Swales, 2009, p. 3). The systematic literature review is especially suitable “in order to establish a reliable evidence base for recommendations” (Davies et al., 2013, p. 81) for concerned stakeholders. From a broader perspective, this systematic literature review is driven by the need for more sustainability in community catering. From a narrower perspective, the review is driven by the need for certain information, enabling to build up a direct cooperation. The research questions introduced in chapter 1.2 derive from this need and their relevance in terms of content is described in more detail below:

First, it is necessary to know about the current situation, which represents the starting point for every type of change (NFSN, 2018, p. 1). As this thesis' intention is based on the aim of creating more sustainable practices, the criticism of the current practices derives from this status quo. Then, it is needed to capture goals and visions (NFSN, 2018, p. 1). Building up a cooperation is a learning process and in most cases barriers and challenges occur. Knowing about possible challenges and barriers as well as strategies to avoid or overcome these are increasing the overall success (NFSN, 2018, p. 2). Additionally, knowing about one's and other's motivations can increase resistance to challenges and strategies' effectiveness to reach the set goals (Conner et al., 2012, p. 330). The knowledge of most recurrent challenges and barriers may be helpful to prepare strategies to cope with them.

The systematic literature review conducting is oriented at the instructions of Luederitz et al., 2016). Since their approach is explicitly conducted for student-driven systematic reviews, the presented advices were especially suitable for this work<sup>6</sup>.

- I. First, criteria for the selection are defined by translating research aim and research questions into a search string. This search string should be cross-checked to ensure, that the number of results is high enough (as false positive results are occurring), while all potentially relevant literature is included. Databases that are to be used are selected and the search string is applied (Luederitz et al., 2016, p. 3).
- II. Then, the "dataset is imported into a reference management system" (Luederitz et al., 2016, p. 3). If more than one database is used, duplicates need to be removed. Every temporary result gets an individual identification number (Luederitz et al., 2016, p. 3).
- III. To prevent bias, each document should be assessed independently by two persons. Therefore, it is transferred to a spreadsheet assuring access for all reviewers (Luederitz et al., 2016, p. 3).
- IV. More precise criteria, so called inclusion and exclusion criteria, are defined to evaluate each document's suitability to answer the research question. Title and abstract of each temporary result are checked against these criteria (Luederitz et al., 2016, pp. 3–4).
- V. The documents to be included in the literature review need to be gathered. If papers are not available in full-text, this needs to be documented (Luederitz et al., 2016, p. 3).
- VI. The full-text review follows by conducting a systematic qualitative content analysis (Luederitz et al., 2016, pp. 3–4). As this step itself contains further sub-steps, the method is explained in more detail in the following chapter.

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<sup>6</sup> As Luederitz et al. (2016) present a complete instruction from project initialisation until article finalisation, the presented approaches use is restricted to the phase of review procedure here.

## 4.2 Qualitative content analysis

To analyse the collected material the qualitative content analysis by Mayring (2015) is used, which is characterised by being theory-guided and rule-guided. The former refers to an underlying research question, which is justified with regard to content (Mayring, 2015, p. 59) and explained in chapter 4.1. The latter refers to a systematic research process, realised by use of a given structure (Mayring, 2015, p. 50) being explained in this chapter.

Within this broader frame and next to other forms of qualitative content analysis, the structuring content analysis is relevant here as it is extracting and summarising material on specific topics and content areas (Mayring, 2015, p. 99). Referring to Mayring (2015, p. 97), the structuring dimensions need to be specified and derived from the research question (deductive approach). Further differentiation makes up the category system. To decide, which text passages are assigned to which (sub)category, (1) these categories are defined inductively (Mayring, 2015, p. 97), (2) anchor examples are found and to avoid problems of demarcation, (3) coding rules are determined. When these preparations are finished, text passages are assigned to the existing categories, while these can be further adapted and are specified by adding sub-categories (Mayring, 2015, p. 98). The analysis consists of further steps, going on with (4) paraphrasing the extracted material, (5) summarising the sub-categories' content and (6) summarising the more general categories' content (Mayring, 2015, p. 104). Finally, (7) the relevance of mentioned hurdles will be assessed according to their explicit naming as such. As it is stated that quantitative aspects may be involved and that combinations of qualitative and quantitative research are especially meaningful (Mayring, 2015, p. 50), this allows to answer the fifth sub-question (see chapter 1.2).

## 4.3 Explanation of method application

### 4.3.1 Literature review

- i. Research aim and question were translated into the following search string:

TITLE-ABS-KEY ("farm-to-preschool" OR "farm to preschool" OR "farm to school" OR "institutional foodservice" OR "institutional food service" OR "community catering") AND TITLE-ABS-KEY (sustainability OR "organic food" OR "organic farming" OR "local food" OR "local produce" OR guidelines OR "food system" OR "food industry" OR challenges OR barriers OR opportunities OR "common practices")<sup>7</sup>

The search string was entered in the two databases Scopus (advanced search; n=119) and Web of Science (database: Web of Science Core Collection; basic search with two rows; n=93). These were selected, as both only contain peer reviewed articles (Clarivate,

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<sup>7</sup> Complies with search string for Scopus. Field codes varied in Web of Science, so that 'TITLE-ABS-KEY' was replaced by 'TOPIC' (including title, abstract and key words).

2020; Elsevier, 2020a), which increases the research results reliability due to secured data quality (Elsevier, 2020b). By integrating keywords of potentially relevant documents, the search string was cross-checked and promising documents within the search strings' results were ensured.

- ii. Instead of using a reference management system, the dataset was imported into Microsoft Excel and every document got an identification code<sup>8</sup>. Duplicates were removed, so that a total number of 141 documents remained.
- iii. As there was no research group given, all titles were assessed by one person. Therefore, the transfer to a spreadsheet was left out.
- iv. Inclusion and exclusion criteria were worked out. During the exclusion process it turned out that the beforehand defined criteria were too inaccurate, so that further criteria were adopted during the process (for final inclusion and exclusion criteria, see appendix 1). To ensure a uniform application, all documents were assessed twice. By the application of the criteria to title and abstract, 23 documents were selected for full-text analysis (for results of inclusion and exclusion process, see appendix 2).
- v. From these 23 documents, two were excluded due to full text unavailability (A32, B37) and one was excluded due to incompatibility with the format of the coding program MAXQDA (A16; see appendix 3). Finally, the content analysis was carried out on 20 documents (see table 1).
- vi. A systematic qualitative content analysis was conducted as described below.

Table 1: Overview of final literature selection involved in the literature review and associated identification numbers

A103	Bagdonis, J. M., Hinrichs, C. C., & Schafft, K. A. (2009). The emergence and framing of farm-to-school initiatives: Civic engagement, health and local agriculture. <i>Agriculture and Human Values</i> , 26(1-2), 107–119.
A76	Bateman, J., Engel, T., & Meinen, A. (2014). Understanding Wisconsin producer and distributor perceptions to inform farm to school programs and policies. <i>Journal of Hunger &amp; Environmental Nutrition</i> , 9(1), 48–63.
A40	Botkins, E. R., & Roe, B. E. (2018). Understanding participation in farm to school programs: Results integrating school and supply-side factors. <i>Food Policy</i> , 74, 126–137.
A60	Carbone, E. T., DiFulvio, G. T., Susi, T., Nelson-Peterman, J., Lowbridge-Sisley, J., & Collins, J. (2016). Evaluation of an urban farm-to-preschool and families program. <i>International quarterly of community health education</i> , 36(3), 177–187.
A105	Carlsson, L., & Williams, P. L. (2008). New approaches to the health promoting school: Participation in sustainable food systems. <i>Journal of Hunger &amp; Environmental Nutrition</i> , 3(4), 400–417.
A84	Conner, D., King, B., Kolodinsky, J., Roche, E., Koliba, C., & Trubek, A. (2012). You can know your school and feed it too: Vermont farmers' motivations and distribution practices in direct sales to school food services. <i>Agriculture and Human Values</i> , 29(3), 321–332.
B16	Duval, D., Bickel, A., & Frisvold, G. (2019). Farm-to-school programs' local foods activity in southern

<sup>8</sup> Containing the letter A (= Scopus) or B (= Web of Science) and a number. The documents were sorted by their result-order within the databases (see appendix 2).



Arizona: Local foods toolkit applications and lessons. *Journal of Agriculture, Food Systems, and Community Development*, 8(3), 53–72.

A66 Holland, J. H., Thompson, O. M., Godwin, H. H., Pavlovich, N. M., & Stewart, K. B. (2015). Farm-to-school programming in South Carolina: An economic impact projection analysis. *Journal of Hunger & Environmental Nutrition*, 10(4), 526–538.

A97 Izumi, B. T., Alaimo, K., & Hamm, M. W. (2010). Farm-to-school programs: Perspectives of school food service professionals. *Journal of nutrition education and behavior*, 42(2), 83–91.

A110 Izumi, B. T., Rostant, O. S., Moss, M. J., & Hamm, M. W. (2006). Results from the 2004 Michigan farm-to-school survey. *Journal of School Health*, 76(5), 169–174.

A95 Izumi, B. T., Wynne Wright, D., & Hamm, M. W. (2010). Market diversification and social benefits: Motivations of farmers participating in farm to school programs. *Journal of Rural Studies*, 26(4), 374–382.

A104 Kloppenburg, J., Wubben, D., & Grunes, M. (2008). Linking the land and the lunchroom: Lessons from the Wisconsin homegrown lunch project. *Journal of Hunger & Environmental Nutrition*, 3(4), 440–455.

B27 Lehnerd, M., Sacheck, J., Griffin, T., Goldberg, J., & Cash, S. (2018). Farmers' perspectives on the adoption and impacts of nutrition incentive and farm to school programs. *Journal of Agriculture, Food Systems, and Community Development*, 8(1), 147–165.

A78 Pinard, C. A., Smith, T. M., Carpenter, L. R., Chapman, M., Balluff, M., & Yaroch, A. L. (2013). Stakeholders' interest in and challenges to implementing farm-to-school programs, Douglas County, Nebraska, 2010-2011. *Preventing chronic disease*, 10, 1-10.

A30 Rosenthal, A., & Caruso, C. C. (2019). Bringing school foodservice staff back in: Accounting for changes in workloads and mindsets in K-12 values-based procurement. In S. Thottathil & A. Goger (Eds.), *Institutions as conscious food consumers. leveraging purchasing power to drive systems change* (pp. 261–283). London: Elsevier.

A101 Schafft, K. A., Hinrichs, C. C., & Bloom, J. D. (2010). Pennsylvania farm-to-school programs and the articulation of local context. *Journal of Hunger & Environmental Nutrition*, 5(1), 23–40.

A4 Stephens, L., & Oberholtzer, L. (2020). Opportunities and challenges for farm to early care and education in settings serving low-income children. *Journal of Hunger & Environmental Nutrition*, 15(1), 93–106.

A43 Stokes, N., & Arendt, S. W. (2017). Identifying farm to school barriers and keys to success: Perceptions of hourly employees. *Journal of Hunger & Environmental Nutrition*, 12(4), 495–515.

A75 Thompson, O. M., Twomey, M. P., Hemphill, M. A., Keene, K., Seibert, N., Harrison, D. J., & Stewart, K. B. (2014). Farm to school program participation: An emerging market for small or limited-resource farmers? *Journal of Hunger & Environmental Nutrition*, 9(1), 33–47.

A112 Vallianatos, M., Gottlieb, R., & Haase, M. A. (2004). Farm-to-school: Strategies for urban health, combating sprawl, and establishing a community food systems approach. *Journal of Planning Education and Research*, 23(4), 414–423.

The purpose of the selection process was to choose literature, which is helpful for the project. Due to the systematic, precise and mainly content-driven course of action during the in- and exclusion process, the selected documents can serve as scientific knowledge basis to show the state of the art and therefore serve this purpose.

#### 4.3.2 Qualitative content analysis

- (1) The main categories (see appendix 4) were defined, derived from the research sub-questions 1-5 (see chapter 1.2).

(2) As there was no trial run text coding conducted, anchor examples were added only during the coding process itself.

(3) The following coding rules were determined:

a. Determination of unit of analysis (Mayring, 2015, p. 63):

- i. Coding unit (min.): proposition
- ii. Context unit (max.): all material within one document
- iii. Analysis unit: As the documents were incomplete at the time of the start of the analysis, there is no logical structure, after which the documents were worked on (for editing order, see appendix 3)

b. Abstracts are excluded from coding.

When working through all documents, subcategories were added and partly changed on content basis. Anchor examples were added (see appendix 5<sup>9</sup>). To ensure that all coded segments were finally assigned to all fitting categories, all segments were cross-checked, and the affiliation was adjusted. As a certain degree of subjectivity is crucial part of qualitative data analysis (Dellwing, personal communication, 2020) and due to time limits, a segment-coding cross-check by an independent person was not carried out.

(4) Every coding segment was provided with a paraphrase. In some cases, these paraphrases were lifted to a more abstract level in a second round to summarise more content (see appendix 6-11<sup>9</sup>).

(5) Based on the paraphrases, the content of each sub-category was summarised.

(6) Due to the purpose of the literature analysis, a more general summary of the main categories was dispensed with, since a further generalisation of the content would have made it less applicable for the establishment of a cooperation in Lüneburg.

(7) The most crucial hurdles mentioned in the texts were quantitatively analysed. To prevent bias, the multiple mentioning of one sub-category within one text was not taken into account, but the cross-text frequency of mentions was.

## 5 Results

### 5.1 Results from scientific literature

#### 5.1.1 Common community catering practices (CCCP)

##### **Obeying regulations and standards**

According to the literature, certain regulations and standards need to be obeyed within school foodservice in the currently common community catering practice. Strict standards need to be

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<sup>9</sup> Only included in thesis' digital version

followed, such as safety standards and nutrition guidelines (A30, 9-10; A97, 3). Also, broadline distributors only offer products, that meet federal US standards (A97, 6).

### **Time issues**

School foodservice staff has strict time constraints regarding the preparation and serving of the food (A30, 9-11<sup>10</sup>).

### **Financial issues**

In schools, meals can be offered for a low price (A104, 5) and are financed by federal and state subsidies, commodity entitlement and cafeteria sales (A95, 3; A105, 7). There are contrary strategies to save money, which can be summed up as increasing efficiency on the one hand (reduce labour, serve quick meals, make use of primary vendor payment discounts and increase level of industrialised food production; B27, 12; A95, 3; A104, 5<sup>11</sup>) and trying alternative funding (use federal subsidies for sustainable food procurement, implement farm to school (F2S)) on the other (A66, 8; A105, 7). Obligatory packaging again increases the food price within the efficiency-strategy (A97, 6). A97 (1) and A112 (5) state that the food quality is limited by the food service's financial scope. According to A104 (5), the financial scope does not allow any system change.

### **Logistical issues**

Although local food is fresher and of higher quality (A97, 4), it is commonly stored, shipped and processed (A112, 5). Therefore, it needs to be packaged (A97, 6; A104, 5). Distributors normally offer limited varieties of mainstream products to be able "to quickly turn over their products" (A97, 4-5).

### **Preferred vendors**

School foodservices prefer to procure from vendors who provide products year-round, both for reasons of cost-savings and their compliance with food service specifications (A84, 2; A95, 3; A112, 5).

### **Food quality**

Budget restrictions decrease the food quality in schools. To save costs, labour is reduced. Therefore, the preparation of fresh ingredients is declining and is increasingly being replaced by the use of prepacked food components (A104, 6; B27, 12). This intensified processing as well as transportation lowers the food quality (A112, 5).

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<sup>10</sup> The page numbers refer to the automatic specification of the coding program MAXQDA (always starting with 1, also for texts with additional title page). Original page numbers in the publishing journal or similar can be taken from appendix 3.

<sup>11</sup> The references are arranged according to their chronological order according to the tables, see appendix 3.

### **Current working conditions for cafeteria staff**

In the US, the current salaries for foodservice staff are somewhat higher than minimum wage (9,85 \$ compared to 7,25 \$ per hour in 2019) with a high rate of part-time employees among them (A30, 6). Measured against this, the demands on the employees are high: They start early (A30, 9), have a high work quota (A30, 9-11), perform many activities besides their main tasks of cooking and serving (A30, 9) need to be flexible (A30, 10-11) and are still with their hearts at work (A30, 10) without complaining about their working conditions (A30, 9).

### **Current engagement to improve the situation**

To improve the current conditions of food served, federal programs support scratch cooking (B27, 12) and policies to support F2S programs (A76, 4) and local food procurement in schools were passed (A95, 2).

## **5.1.2 Weaknesses and criticism of CCCP regarding sustainability**

### **01 No poverty**

Low wages as well as nonstandard employment (e. g. part-time) contribute to poverty among foodservice staff (A30, 6-7, 9).

### **02 Zero hunger**

Food insecurity among young children represents an urgent problem (A103, 8), which may have negative influence on the children's further development (A4, 2).

### **03 Good health and wellbeing**

Overweight and obesity are widespread health problems (A97, 2; A110, 1; A95, 6), increasing the probability of secondary diseases among children (A4, 2; A101, 2; A104, 2; A112, 5; A60, 3; A66, 3). They grow up within a health-threatening agri-food system (A97, 2; A104, 2; A66, 3), environment (A103, 7, 9; A112, 6) and food culture (A103, 7), which supports unhealthy nutrition. Children eat too few fruits and vegetables (A78, 1; A66, 3), while schools often serve nutritionally inferior food (A97, 1).

### **05 Gender equality**

The majority of employees in low-paying jobs (such as school foodservice staff) are women. They are highly affected by discrimination and gender-based occupational segregation within their job selection. These jobs are characterised by low wages and low chances of promotion (A30, 7).

## **08 Decent work and economic growth**

Regarding the food service, poor working conditions for food service staff predominates in terms of workload (A30, 2, 9-11) and salaries (A30, 6-7, 9). Regarding the food production, the local economy is described as weak (A103, 9) and as there is no real free competition on the food market, vendors have an advantage over direct procurement (A95, 3). Small and medium sized farms are increasingly threatened by a market disadvantage (A97, 2; A112, 7; A95, 5; A66, 3; A110, 1) with the consequences of family farm disappearance (A103, 9; A112, 7) and the need for additional incomes (A112, 7).

## **10 Reduced inequalities**

According to the literature, the current food system exhibits inequalities concerning children's access to high quality early care and education (A4, 3) and to nutritious food (A104, 2; A105, 11; A30, 10) as well as health inequalities (A105, 7). Concerning market chances, small farmers face disadvantages in comparison with large producers (A97, 2) and concerning job quality, inequalities between men and women exist (A30, 7).

## **11 Sustainable cities and communities**

In general, the quality of life in rural communities is decreasing (A103, 9). Particularly, the modern agri-food system as well as food culture threaten rural communities (A97, 2; A103, 7; A104, 2; A66, 11).

## **12 Responsible consumption and production**

From the producer's perspective, there are imbalances concerning farm size (A103, 3; A104, 6; A112, 7; A66, 3). Besides an overall vulnerability of the food production system (A95, 5; A103, 2), most food served at schools has travelled far and is highly processed (A112, 1), budget constraints decrease food quality (A97, 1, 5) and the fast food industry prevents the establishment of F2S programs (A105, 12). From the consumer's perspective, there is a poor food environment predominant (A103, 2, 7; A76, 4; A112, 6), which is supported by federal US school food programs (A66, 8-9).

## **13 Climate action / 14 Life below water / 15 Life on land**

The predominant agri-food system trends threaten the overall environment (A66, 11; A97, 2).

## **16 Peace, justice and strong institutions**

Efforts to improve school food offers are often driven by non-governmentals (A105, 11). According to the literature, this masks the need for federal engagement and funding on the one hand (A105, 7) and symbolises federal exoneration from responsibility on the other (A105, 10-11).

## **17 Partnerships for the goal**

Although both programs aim at improving school food quality, the National School Lunch Program (NSLP) and the F2S program have a rather competing than supporting relationship (A66, 8-9). Also, the understanding that local consumption keeps money in the region and thus benefits the community, is lacking (A103, 9).

### **5.1.3 Visions, goals, motivations and advantages**

#### **5.1.3.1 Goals**

##### **Support environmental sustainability**

They want to support sustainable agricultural practices (A84, 2; A95, 4).

##### **Support of local farmers, community and economy**

Another aim is to support local and regional farms (A43, 2-3; A76, 4; A95, 4; A30, 12) as well as small- and medium-sized farms (A66, 7-8) by creating a market for all of the before mentioned (A84, 2; A95, 1, 3, 7) and to support their viability (A84, 1). Further goals are to support the local community (A97, 7) and strengthen local economies by buying locally (A84, 2).

##### **Provide healthy / fresh and local food of good quality**

According to the literature, people are interested in F2S, because they want to serve fresh and healthy food (A43, 2-3; A60, 3; A66, 7-8; A105, 10; A76, 4; A84, 1-2; A97, 3), serve local food (A66, 7-8; A76, 4), improve meal quality (A30, 12) and improve access to high quality food (A60, 3).

##### **Change in agriculture / food system**

By encouraging in F2S programs, the involved stakeholders aim at creating an alternative, local and sustainable food system (A40, 1; A105, 4, 10; A84, 1; A95, 2, 4; A66, 3) to be able to improve food quality (A60, 3) and to incorporate social and environmental issues as well (A95, 4). Environmental and policy changes at organisational and local community level are therefore considered obligatory (A60, 3).

##### **Change policy regulations to make local food consumption easier**

Additionally, changes of federal regulations on state level and policy changes on organisational and local community level represent a goal themselves to increase local and nutritious food in preschools (A60, 3).

### **Support education and learning**

Stakeholders want to provide agriculture education (A76, 4) as well as health and nutrition education opportunities (A43, 2-3; A60, 3; A66, 7-8; A76, 4; A84, 2) and improve the overall students' learning outcomes (A40, 1).

### **Improve children's nutrition and health**

Another aim of F2S programs is, according to the literature and herein involved stakeholders, to improve childhood nutrition (A40, 1; A43, 2-3; A66, 7-8; A76, 4; A95, 3, 7; A97, 7; A60, 1-2; A112, 6) and health (A105, 15; A76, 13) or both (A66, 3; A76, 4; A30, 12). Others address a decrease in childhood obesity and overweight as further negative health effects (A60, 1; A112, 6)

### **Fight children's food insecurity**

Stakeholders want to ensure food security (A105, 10), reduce hunger (A40, 1; A105, 10) and enable children and families to serve and consume healthier food (A60, 3).

#### *5.1.3.2 Motivations and advantages*

##### **Improving farm to school/kindergarten program in general**

Due to spill-over effects it is likely, that more F2S cooperation emerge within a region of high F2S presence (A40, 10).

##### **Promotion of local food consumption**

The promotion of local food consumption as an intrinsic motivation is mentioned once (A75, 11).

##### **Comply with federal and local nutrition guidelines**

Participation in F2S programs helps to meet the federal guidelines for the US F2S program (A30, 4-5) as well as other new standards and curricular foci (A103, 2).

##### **(Environmental) sustainability issues**

Sustainable motivations and advantages regarding the environment include an increased environmental sustainability in general (A75, 9; 27, 2), reduced greenhouse gas emissions through transportation (A76, 9-10; A105, 11, 14; B27, 10), reduced use of pesticides (A76, 9-10; A105, 14; A110, 3), preservation of farmland (A101, 14; A103, 2, 10; A112, 1-2; B27, 2; A105, 11-12) and agricultural landscape (A103, 9-10), the reduction of urban sprawl (A105, 11-12; A112, 1), the contribution to desirable rural landscapes (A101, 15), a decrease in food waste (A60, 7) as well as a possibility to keep second choice or lower grade produce from being wasted (B27, 10). One stakeholder's motivation to engage in F2S is to support the food system change towards a more

localised, seasonal and sustainable agriculture (A112, 1-2; A95, 7). F2S lowers the barriers between farmers and consumers (A112, 3) and increases the consumption of regionally produced food (A95, 7).

### **Economic issues**

Many stakeholders participate in F2S programs because of general economic motivations (A84, 3-4, 8-9; A95, 5-6), within which financial advantages play a role. These include increased income (A103, 9; A112, 2; B27, 10) and less costs for farmers (A66, 9) as well as the project's affordability (A97, 3) and less food costs for the foodservice (A4, 11; A97, 5; A60, 7; A105, 11). An advantage is also seen in increased average income and employment in general (A66, 11). Additionally, two texts mention less transportation costs as a benefit (A95, 7; A110, 3). Some farmers see the food services as new customer for products that could otherwise not be sold, e. g. surpluses or slightly blemished produce (A76, 10; A84, 3; A95, 6). In comparison to conventional market channels, it allows them to gain higher earnings for out-sized food (e. g. small apples, which are preferred by school food service) and second-class products (A95, 6). Also, farmers value the more diversified market opportunities (B27, 12; A75, 4-5, 11; A43, 3; A66, 3, 9; A76, 9, 10, 14; A84, 3-4; A95, 2, 5-6, 8; A103, 2; A101, 15), even if these initially do not imply increased income (A95, 6, 8) but represent potential for the future (A95, 2) and also market opportunities beyond the cooperation itself (school food service staff for private consumption as additional customer; A95, 6). Farmers want to spread their risk across as many different markets as possible (A95, 5-6, 8) and can gain a more diversified farm income (B27, 2; A75, 9, 13-14; A66, 3) by selling to school food service. The farmer's steady income, especially during fall and winter months (A84, 3; A95, 5-6; A105, 11) is seen as another advantages. Therefore, they hope to increase the sales to schools over time (A95, 2). In one study, a farmer mentioned the advantage of large volume orders when selling to school food service (B27, 10).

### **Social issues**

In general, farmers see socially motivated benefits in the participation of F2S and comparable projects (A84, 3-4, 8; A95, 2, 4-5, 7-8; B27, 11). There is a general motivation to support the stakeholders' local community (A97, 6-7; A103, 9; A76, 41; A84, 3-4; A110, 3; B27, 11) and economy (A97, 7; A101, 14, 16; A105, 12; A76, 10; A103, 2; A110, 3; A60, 7), which is in particular shared by food service staff as well as farmers participating in F2S (A78, 2-3; A110, 3; B27, 12-13; A75, 4; A66, 10; A95, 6-7). Next to general benefits for the local and rural economy and community (A103, 10; A110, 2-3; B27, 2; A60, 7), a positive economic impact regarding average income and employment can be achieved (A66, 11; A105, 14; A76, 10), rural communities can be revitalised and sustained (A103, 10; A110, 3; A112, 3) and money and taxes can be kept within the region (A101, 13; A103, 9; B16, 2; A84, 3; A95, 7-8). This is emphasised by the evidence, that the economic activity generated by



F2S is much higher than the preliminary investment (A66, 3, 9; A95, 7). Furthermore, for export-focused regions, it is a benefit to keep local products in the region instead of importing food (B16, 2-3). Also, stakeholders want to support local farmers (A78, 1-2; A97, 3, 6; A101, 13-14; A103, 7, 10; A112, 2, 8; A30, 4-5; A75, 4; A40, 2; A60, 7; A66, 10; A110, 3; especially in urbanising areas A112, 2), revitalisation of rural agriculture (A103, 10), maintain livelihoods for farming families (A103, 2) and bring income and health to the agricultural base (A60, 7). Furthermore, they are particularly motivated by the wish to support small farms' viability (A101, 15), including those at the urban edge (A112, 1-2). Stakeholders also see a strength of F2S in personal interactions between farmers, students, school food service professionals and staff (A84, 3; A66, 8-9). Especially, an increase of parent engagement in the program itself (A4, 3-4; A60, 7) and in fresh cooking at home is expected and hoped for (A101, 8). Another strength that stakeholders see in F2S is the ability to respond to public (A78, 3; A97, 3) and students' demand (A97, 3; A60, 5) as well as to local needs (A84, 4). Finally, the social motivations include the generation of good public relations (A103, 10; A110, 3; A60, 7; A105, 12, 14; A4, 11; A84, 4) and community capacity (A105, 12). This is supported by evidence from school food service staff and teachers (A97, 7; A103, 10; A110, 2-3; A75, 4). A farmer-specific motivation is to build relationships to nearby communities (B27, 10; A75, 5, 9, 13).

### **Improve children's wellbeing**

The overall motivation is to support the student's healthy diet (A60, 5; A101, 8). In many texts, the motivation to improve children's health (A4, 3-4, 11, 7; A78, 1-2; A101, 13-14; A103, 1, 7-9, 11; A110, 4; A112, 2, 6, 8; A30, 4, 15; A66, 3; A76, 9-10; A95, 4) or nutrition (A66, 8; A76, 9; A84, 3; A95, 6-7) or both are mentioned (B27, 2, 10; A75, 4; A60, 6-7; A76, 14; A95, 6; A112, 1-2; A95, 6-7). Once, cost savings for the taxpayer are mentioned as a follow-up motivation (A66, 12). The evidence of measurably healthier lunch in F2S projects is another advantage contributing to improved health of children (A60, 2). Besides, other stakeholders' motivation is to increase the access to fresh (A4, 11) healthy (A75, 5, 9, 13-14; A105, 11, 14; A95, 2, 8) and safer food for students (A97, 7; A103, 2). According to one paper, food insecurity is a more urgent problem than overweight and obesity in rural settings (A103, 8). Therefore, F2S programs are a strategy to build community food security (A110, 1; A60, 7) and particularly decrease food insecurity among children (A112, 2; B27, 2; A105, 14). Furthermore, F2S programs could be identified as a possibility to improve students' habituation to fruits and vegetables (A60, 2, 7; A78, 3). A better product quality (A103, 9, 11) and knowledge of local cultivation seem to increase fruit and vegetable intake (A110, 4). Stakeholders hope that children will start to be interested in (A103, 9, 11; A95, 6), like (A95, 6) and consume (A95, 8; A110, 3) more fresh fruits and vegetables, if they are exposed to them more often. Food from a direct cooperation is preferred because the products are of higher quality (A78, 3; A97, 4, 7; A103, 7; A110,

2-3; A104, 3; B27, 2; A75, 4; A4, 11), more fresh (A97, 7; A110, 3-4; A112, 2; A30, 15; A75, 4; A60, 7; A105, 11; A4, 11) and tastier (A101, 12; A112, 6; B27, 2). Thus, it is more likely, that children choose them. Classical education can support this. Stakeholders want to engage in F2S cooperation to teach the students about agriculture (A4, 7, 11; A78, 1-2; A101, 14; B27, 10; A75, 5; A95, 2), the food system (A75, 5, 9, 13-14; A105, 14), local food (A101, 14; A112, 2), health issues (A78, 1-2; A112, 3, 8; B27, 10; A103, 10) and food safety (A105, 14). According to the texts, direct food cooperation can provide children with experiential learning (A4, 3-4; A78, 1-2; A112, 3; A66, 8; A103; 11), enabling them to make reasonable choices in the future (105, 11). According to one food service director, F2S builds educational messages into the kind of food served, the way it is prepared and in which environment it is served (A101, 12).

### **Enlarging scope for decision making**

Farmers welcome the ability to purchase smaller quantities (A97, 7; A110, 2-3; A60, 7), while school food services appreciate the wider product variety (A110, 3-4), more transparency about food origin (A110, 3) and broadened possibilities to respond to emerging food trends like vegetarian or low-fat diets (A110, 4), which is all associated with F2S.

### **Stakeholder's connections and personal motivations**

Motivations may also emerge from a personal relationship to one of the topics addressed. Food service staff is proud of serving high quality food (A97, 5) and directing students' food choices towards a desirable direction (A101, 12). Partly, stakeholders participate because it enables them to support people they are related to (apple farmer sells to school, where his children are enrolled; A101, 13-14) or because of personal negative experiences with school food or agriculture (A103, 5; A101, 12).

#### **5.1.4 Challenges and barriers**

The challenges stakeholders faced participating in a F2S program or not, show little difference (A76, 14).

##### *5.1.4.1 Challenges and barriers explicitly beforehand*

#### **Program complexity**

F2S program complexity is a concern (B27, 11).

#### **Natural challenges and barriers**

The seasonal availability of locally produced food (A101, 8; B27, 3; A110, 4), their fitting with the school's need (A75, 5; B27, 9) and thereof deriving difficulties to find key items year-round (A40, 3) describe natural challenges.

### **Economic challenges and barriers**

Literature shows that many stakeholders assume a direct cooperation to be accompanied by increased costs. For farmers, these can be additional costs for GAP (good agricultural practices)<sup>12</sup> or comparable certification (A75, 12, 14), while food services would need additional labour and / or time to process the whole produces (A75, 4). Stakeholders state, that the price points of (especially small) farms and schools are not compatible (A110, 2; A75, 13) as local food is too expensive for food services (A75, 4-5; A40, 3; A110, 4), while cost-effectiveness is a challenge from farmers' point of view (A75, 13-14). The lack of external funding, as stated, still keeps possible cooperation from being started (A4, 11-12). Adding the additional costs to the food price may partly go beyond consumer budget (B27, 2-3). Offering organic food is generally seen as too expensive (A97, 7).

### **Structural challenges and barriers**

First, administrative issues, like contract processes (B27, 9, 10, 12) and payment arrangements can be burdensome (A110, 4; A101, 8). Second, the deviation from common food service practices and routines is a barrier as schools have limited capacity to cook from scratch (B27, 10, 12), alternative vendors' offer is too limited (A40, 3) and F2S is assessed as incompatible with large school food service operations (A101, 11). Third, regarding the distribution of roles it was found, that food service directors play a critical role to make F2S programs a success (A110, 5). Still, F2S community stakeholders use this to attribute project's successes onto the food service director (A103, 6) and at the same time transfer their own responsibility for the project's success to this one person (A103, 5-6). Fourth, regarding procurement, some farmers see their inability to deliver the products themselves as a concern (A75, 11), while food service stakeholders have concerns regarding logistic (B27, 11), delivery of local food (A101, 8; A110, 4), procurement without a vendor (A110, 2) and reliable supply (A110, 4; A101, 8). There are imbalances between supply and demand (B27, 3; A110, 4), as local farmers are not able to supply sufficient quantities (A103, 9), but schools often have large volume needs (B27, 10). Additionally, farmers see the guarantee for a specific quantity as a challenge (B75, 5, 9; B27, 9; A75, 11). Finally, bidding processes (B27, 9-10, 12) and prime vendor considerations are felt to be burdensome (A110, 4).

### **Access as challenges and barriers**

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<sup>12</sup> US food safety certification

According to the literature, there is a lack of information at different points. First, farmers need information (A75, 14) about generally interested schools (B27, 9), what products they want (A75, 9, 11), which requirements for cleaning the products exist (A75, 9, 11) as well as further strategic information (A75, 11). Second, for school districts it is difficult to get information on products (A40, 3).

Difficulties to find potential project partners occurred due to uncertainties about potential partners' interest (B27, 9), lack of interest (A75, 11) and unavailability of a local food source (A110, 2).

Food service directors often mentioned a lack of knowledge about how to implement F2S and about local food procurement (A101, 9). Also, capacity building is assessed as necessary to be able to engage community members and stakeholders for a participation (A78, 2). In addition to that, there is a lack of staff skills to do scratch cooking (B27, 9), a lack of equipment and space in kitchens (B27, 9) and farmers see a lack of value-add production facilities to meet the food services' demands (A75, 13-14).

#### **Procurement standards as challenges and barriers**

For small farmers, general government regulations (e. g. GAP certification) are a major barrier (A75, 9) while for schools, governmental procurement regulations represent a challenge to procure locally (A75, 4). School food services assess the quality of local food as inconsistent and non-competitive (A101, 8; A110, 2, 4). Also, they have food safety concerns (A110, 4), while food safety requirements are a major barrier for farmers (A75, 5). Looking at federal and state regulations concerning food safety, these requirements (e. g. GAP) are a challenge (A75, 4), as they are required to be allowed to sell food to (at least some) schools (A78, 4; A101, 8). This GAP certification barrier particularly affects farms (A75, 5, 9, 11, 14), especially small farms (A75, 12).

#### **Acceptance challenges and barriers**

An urban teacher suggests that it would take some time to get children used to eating fruit and vegetables (A103, 10).

##### *5.1.4.2 Challenges and barriers in general and during the cooperation*

#### **Program complexity**

Program complexity is a barrier (B27, 11) concerning invoicing (A105, 12), the kitchen transition towards cooking from scratch (A66, 10), the mixture of conflicting policies, multiple stakeholders, competing agendas, complex regulations (A66, 10) and the embeddedness in the overall larger political and economic system (A104, 5).

### **Farm to school / kindergarten (F2S/K) maintenance as challenges and barriers**

It may be difficult to encourage and facilitate the ongoing engagement in the long term, especially if the health benefits of serving fresh food are becoming a dominant driver of the project (A103, 11). Also, one may fail to introduce local procurement into the usual school food service structures due to small changes within the instable system (A140, 5).

### **Natural challenges and barriers**

Regarding natural challenges, selling produce during the entire school year is difficult for farmers (A78, 5; A110, 3, 5; A40, 3), while school food services have constraints about the seasonal availability of fresh products (A78, 5; A110, 3; A30, 13; A40, 9; A43, 7; A105, 12; A76, 11; A4, 9-10). Depending on geographical location, short growing seasons may reinforce this (A43, 3,7; A66, 10). Next to water constraints (B16, 4, 15), weather and climate events may make the product prices go up to an unaffordable extend for school food services (A101, 14).

### **Economic challenges and barriers**

There are different opinions about whether financial issues are a benefit (see chapter 5.1.3.2) or a barrier (A60, 6). Schools need to work under budget constraints (B27, 9-10; A30, 1-2, 14; A43, 3-4; A105, 12; A76, 11; A84, 2; A95, 3; A110, 5) to offer meals at a low price (A112, 5), while costs for local foods are often comparatively high (A4, 3, 9-10; A110, 3; A87, 5; A104, 2, 8; A40, 3; A43, 3; A66, 9; A84, 2-3) and farmers cannot decrease the prices for profit reasons (A43, 3-4; A76, 11; A84, 3; B27, 9). A lack of program funding, which would make it possible to achieve a compatible price point of local, sustainably producing farms and schools (A104, 5) is criticised (A43, 4; A84, 2; A66, 10). School food services need to find a balance between financial goals, child nutrition and support of local community (A97, 7), while farmers need to find a balance between the own profit and competitiveness with mainstream distribution companies (A66, 10). This issue may be aggravated, if weather and climate (e. g. droughts) lead to a rise in product price (A101, 14). Missing investments by food service leadership, which could compensate rising transaction costs for managing accounts for multiple farmers (A84, 3) or finance to set up small and efficient processing plants (A104, 6), is criticised (B27, 10).

Preparing fresh produce needs more effort and time (A110, 3; A30, 9, 11-12, 14; A60, 6; A95, 8). Additionally, food service managers lack the time to work closely with their staff, e. g. to adjust them to new tasks (A30, 14) and to coordinate the F2S cooperation (A95, 3). Due to general time constraints, food services prefer to deal with few vendors to maximise the efficiency of ordering and delivery (A104, 5; A112, 5).

School food service's demand for partially processed local products (A78, 5), which are difficult to meet for farmers (A110, 5).

### **Structural challenges and barriers**

Regarding administrative issues (B27, 10), contracting (B27, 9, 10, 12), billing and buy-in can be challenging for staff (A60, 6; A112, 5). Further concerns regard additional administrative effort and time needed (A95, 3), e. g. for project coordination (A66, 10), and planning ahead (A76, 11). Food services generally prefer to deal with few vendors to minimise administrative effort (A112, 5).

Local procurement requires substantial and challenging deviation from the food service's established business (A104, 4). Deviating from established food service practices and routines can be challenging regarding equipment and labour needs (A95, 3), skills to cook from scratch (A95, 3; A66, 10), the degree of flexibility required from food service staff to cook seasonal (A84, 2-3) and impossibility of one-stop-shopping (A110, 5). It may also lead to dissatisfaction of food service staff (A104, 4) and to increased meal rejection by children (A105, 12). Focusing on the industrialised practices, there is generally a high degree of industrialisation of many school food services (A104, 8), which makes it difficult to make children eat different food from what (highly processed) they are used to (A105, 12). If the food service wants to continue to conform to a dual hot pack / cold pack / reheating system, which requires all transportation and service infrastructure to be compatible with a determinate set of physical parameters (A104, 5), this can on the one hand lead to difficulties regarding the preparation level of the delivered food. On the other hand, changing away from vendors to direct marketing (A40, 3) and from heat-and-serve meals to scratch cooking is challenging, too (A30, 11-12; A95, 3) as schools may have a limited capacity to cook from scratch (B27, 10, 12). Within regions highly focusing on export, the participation in F2S programs is accompanied by further structural challenges (B16, 10). Deviating from a familiar system is also challenging regarding routines. Next to a general lack of kitchen staff routines in preparing whole products (A30, 13), new recipes are tried out (A30, 12, 14) and food service staff needs to become adaptive to short-term changes (A30, 14). On the farmers' side, small-scale farmers are often unaccustomed to invoicing, packing and delivery needs of school districts (A112, 5).

A further challenge may be the allocation of responsibilities, if school food services want to receive processed products, but do not have the capacity for doing it (A104, 6; A110, 5). Furthermore, stakeholder participation and engagement can be difficult, if they face resistance from leadership (A140, 6). This may lead to insecurity about stakeholders' roles within the project.

Procurement concerns can occur (A104, 2; A43, 4, 7). Large volume needs of schools (A78, 5; A104, 5; B27, 10; A30, 5; A66, 10; A105, 12) contrast with farmers' limited production capacity (A104, 6; B27,

9, 12; A43, 7; A76, 11). Another challenge for farmers can lie within consistent low-volume sales, arising from limited storage and refrigeration space in schools (A95, 3). Another procurement barrier occurs regarding the reliability of supply. Supply concerns (A104, 2, 7; A43, 4; A104, 8) and unreliable supply (A4, 9-10; A110, 3) – also at short notice (A30, 10) – could be found. Furthermore, farmers have supply concerns with foods that require less preparation (A105, 12). Additionally, logistic concerns were found to arise, including ordering and billing (A4, 4; A112, 5; B27, 10-11; A66, 10) as well as delivery concerns, including transport, frequency and timing of delivery (A110, 3; A66, 10; A105, 12; A95, 3). Two times, lack of infrastructure was mentioned as a barrier to source products from local farmers (A78, 5; A43, 4). Beyond, procurement concerns were found (A43, 4).

Regarding the competition with non-local-direct competitors, farmers have concerns about bidding processes (B27, 9-10, 12). Local farmers need to be competitive towards mainstream food distributors (A66, 10), but non-local and high processed produce are federally advantaged (A112, 5). Additionally, especially smaller farms cannot comply with standards, making it difficult for them to supply schools (A105, 12).

### **Access as challenges and barriers**

Schools lack information about product availability (A40, 9; A4, 9-10), while initiatives or organisations engaged lack information on how or if stand-alone processing equipment would be used by F2S (A104, 6).

Access to certain stakeholders was a challenge. School food services see a lack of local producers from whom to purchase as a challenge to find a project partner (A110, 3, 5; A78, 3). Also, coordinating agents linking farmers and school food service are lacking (A66, 10). Sometimes, a lack of food service director engagement has been noticed (B27, 9-10) as well as a lack of staff for preparing fresh produce (A110, 5; A95, 3; A97, 8). Involved actors also observed a lack of parent and family engagement (A4, 3-4) and interest in the project (A60, 6), although an understanding among all involved partners is crucial (A76, 12).

First, there is a general lack of knowledge about how to implement F2S programs in general (A43, 7; A84, 4). Additionally, food service staff lack general skills (A43, 4, 7), skills regarding preparation methods (A30, 12; A66, 10), food handling (A43, 7; A66, 10-11; A84, 4) and food safety (A66, 10-11). Second, the papers mention lack of training for staff (A4, 11; A110, 5; A112, 5; B27, 9) and providers (A4, 3) as well as lack of food staff qualification to order local items (A4, 9-10) and to handle unregular food purchases (A30, 13). Third, for food services, there is a lack of adequate kitchen facilities (A110, 5; A112, 5; A30, 5; A43, 4; A66, 10; A105, 12; A76, 84; A110, 5; B27, 9), equipment (A110, 5; A30, 5, 13; A43, 4; A66, 10; A84, 2-3; A95, 3; A97, 8; B27, 9) or infrastructure (A30, 1-2),

such as lack of space in general (A60, 6), storage or refrigeration space (A112, 5). Farmers mention a lack of hoop houses and greenhouses to purchase fresh food year-round (A66, 10). Also, there is a lack of processing facilities, especially of smaller size (A104, 6, 8; A112, 5).

### **Procurement standards challenges and barriers**

Within the literature, restrictive, conflicting and complex laws and policies (A30, 1-2; A104, 3-4; A43, 4; A66, 10), lack of federal program funding (A43, 4), federal budget limitation (A43, 3-4; A84, 2) and federal and state procurement regulations (A110, 3, 5; A43, 3) are mentioned. For example, school food services often operate under a contract that requires them to purchase approximately 80 % of their food products through one of the major national food distributors (A104, 5) and F2S programs are disadvantaged due to financial support within NSLP, where processed fruits and vegetables are subsidised (A112, 5). Once, the governmental involvement as such was named as a barrier (A76, 11).

Food service directors as well as farmers have food quality concerns (A110, 3; A76, 11). On the one hand, food services criticise inconsistent quality (A110, 3), a shorter shelf life (A43, 7; A60, 6) and a less appealing look of local produce (A43, 7). On the other hand, farmers are unsure about their ability to comply with product quality standards (A76, 16).

Similarly, farmers as well as food services have food safety concerns (A43, 4; A76, 11; A110, 3, 5), including lack of experience with food safety demands (A66, 10-11). Federal food safety requirements may be a barrier for farmers, which may be overcome according to a food service director (A78, 3). Still, federal food safety requirements represent a barrier, especially for small farms (A105, 12).

### **Communication challenges and barriers**

Communication barriers include the high number of stakeholders involved (A66, 10) and the different terminologies between farmers and schools (A43, 4). Limited communication amongst key stakeholders can be a barrier (A4, 4; A76, 12), which may occur due to different terminologies between farmers and school stakeholders (A76, 12).

### **Acceptance challenges and barriers**

Children complain about or are not willing to eat unfamiliar food (A97, 5; A30, 14; A43, 7; A66, 9), not good-looking food (A30, 9-10) and too healthy food and missing flavour (A30, 16). Education and awareness-raising are necessary to encourage children to eat other foods (A76, 12), otherwise they will throw them away (A30, 17).



### 5.1.5 How to overcome (hto) challenges and barriers

Within the literature, there are general strategies and proposals mentioned, which cannot be assigned to a specific challenge or barrier, so that they will be listed here. Firstly, an increased federal support regarding policy changes, stakeholder skill training and financial support (A75, 15; A4, 12; A105, 16; A40, 10) is assessed as helpful. Secondly, creative supply chain and market strategies (B27, 3; A76, 13) as well as relationships and options for exchange can favour these programs (A76, 16; A40, 10). Thirdly, the involvement of 'champion'-stakeholders seems essential (A76, 12; A103, 6).

#### **Hto lack of experience with F2S/K programs**

Lack of experience with F2S can be overcome by inquiring (external) councils to consider and plan F2S interventions (A103, 6) and by introducing milestones to get into action (A78, 2). Positive spill-over effects can be used to learn from nearby F2S experiences (A40, 10) and avoiding aggressive advocacy helps to create good working climate (A104, 7). Starting with a snack program and with the option to develop towards F2S programs can help involved stakeholders to prepare for more complex actions (A104, 7).

#### **Hto F2S/K starting and maintenance challenges and barriers**

Factors for a successful start or maintenance of F2S programs include a strong leadership with champions' engagement (A60, 6; A103, 5, 11), the creation of a supportive project environment through federal support, policy changes, parental support or participation in a larger project (A60, 5-8; A66, 12; A101, 16), a respectful and positive cooperation and communication between stakeholders, e. g. including constructive criticism (A104, 7; A30, 17-18; A60, 7) to maintain good relationships between stakeholders (A104, 7), addressing stakeholders' motivations for participation and emphasise the 'give and take' motto (A84, 4; A95, 8; A4, 11; A76, 13; A95, 8) and maintenance of positive public relationships and marketing (B27, 12; A60, 7-8; A95, 8). Furthermore, it can be helpful to have a clear plan of action and specific, measurable and realistically achievable goals (A60, 6) and cost-effective fund-raising strategies (A60, 8). Acknowledging the difficulties food services faced within the project publicly may help to increase understanding and engagement (A104, 7).

#### **Hto natural challenges and barriers**

To decrease the influence of seasons on the production, extension methods (hoop houses or greenhouses) can be used (A78, 5; A66, 10) and dairy and meat products can be incorporated (A78, 5). Within a snack program, it is possible to adapt the supply of fruit and vegetables to the seasonal availability of products (A104, 7). To limit the reliability on climate, overall production patterns of a region can be changed, e. g. by changing from cotton and alfalfa to vegetable crops (B16, 4).

### **Hto economic challenges and barriers**

Increased food service staff workload needs to be compensated by increased earnings (A30, 17; A66, 6). Different possibilities to overcome this and further financial barriers described (see chapter 5.1.4), exist. A reliable federal funding (A30, 18; A40, 9; A105, 16; A76, 11; A4, 13) as well as policy changes to increase school food service payment capacity to buy locally would be necessary (A101, 16; A76, 16; A110, 5). Further funding opportunities may be discovered through increased communication and participation in networks (A4, 12) such as support opportunities through dietitians (A105, 16).

Apart from the focus on economic goals, motivations related to childhood nutrition and contribution to community well-being can be emphasised (A84, 3). If there is no additional capital available, a snack program instead of F2S program, which is less costly (A104, 7) and can use supplemental funding through a healthy snack grant in the US (A60, 6), can be initiated. Creating financial plans (A112, 5) as well as planning supply in advance can help school food services in budgeting (A84, 8). In contrast, prices associated with local food procurement can be acceptable and competitive (A78, 5) as food services can save costs due to local procurement (A110, 5; A60, 6; A66, 9-10) and there can be a willingness to pay higher prices for local foods (A78, 5). Still, regular competitive pricing would make F2S more attractive towards school food service directors (A101, 10).

Time savings in school food service business can be achieved by training on how to process local products (A43, 20), creating one institution to order from multiple farms (A101, 10) and by a strong organisational and environmental structure (A60, 6). To enable increased time and effort that cannot be prevented, an appropriate compensation for food service staff's additional effort is necessary (A30, 17). Here, small grants can already help (A112, 5).

### **Hto structural challenges and barriers**

Providing assistance with contracting processes can lower administrative barriers (B27, 11-12).

Generally, it is recommended to start the transformation from industrialised food production to fresh and scratch cooking in smaller school districts, as it is easier there (A104, 5). To manage the switch, investments in schools and kitchen infrastructure and more food service staff training can be done (B27, 12). Alternatively, a snack program can be implemented to avoid technical obstacles, e. g. due to a narrow change range (A104, 7). If healthier food options in school cafeterias are mandated, product change can become easier (A60, 5).

To ensure, that spheres of responsibility are clear, guidance and engagement from food service directors (A104, 6-8) and their critical role as well as 'champions' (A103, 6, 11; A110, 2) are mentioned as important aspects, while parents, teachers and school administrators play a minor role

in shaping design or execution of F2S programs (A103, 6). Besides, individual's and organisation's engagement is more important than broad-based participation (A103, 6). 'Champions' may arise from outside the school system (e. g. NGOs), thus schools need to create a supportive environment for their engagement in F2S (A103, 6). Creating external processing facilities can free farmers and food service staff from additional activities (A104, 6) and distributors do not need to be excluded in principal, but can be encouraged to purchase locally (A112, 5)

Creative supply chain and market strategies (A84, 3) as well as clear growing contracts (easing appropriate farming, menu planning and budgeting) can help to overcome general procurement challenges (A84, 8). To overcome challenges regarding the volume of production, an increased availability of local food is needed (A101, 10). Being able to offer higher volume of production enables farmers in a higher rate to participate in F2S (A84, 9). Contracts may help farmers to plan and carry out farming in a more appropriate way, making them able to fulfil the requested volumes (A84, 8). If this is not possible, the given volume can be used to introduce a snack program, as this has a lower fruit and vegetable volume need (A104, 7). To make logistics and transportation easier, regional food system infrastructure can be supported (A101, 16), procurement and delivery plans (A112, 5) and a logistical support, managing product deliveries, can be introduced (B27, 11-12). Furthermore, the literature provides different creative and collaborative transportation strategies working cross-school and -stakeholder (A84, 3; A95, 7) and propose to integrate more alternative-working suppliers (e. g. collectively selling farms; A95, 8).

To lower competition burdens for local producers, creative ways to skirt bidding processes can be used (A95, 7), e. g. to call local purchase programs as 'pilots' (A84, 3). School districts can use the 'geographic preference strategy', which can increase the competitiveness of local farms within the prescribed bidding process (B27, 12). Also, the market mechanism of offer and demand was mentioned, since an increased demand for local products can lead to advantages for local producers (A76, 10).

### **Hto access as challenges and barriers**

To provide technical assistance to schools it can be helpful to create a federal entity (A84, 2).

It is necessary to provide access to information about relevant federal and state regulations (A101, 10), health and safety information about local food (A101, 10), the project's importance (A103, 10) and potential project partners (A101, 10). The latter may be realised by creating a federal entity, which provides a platform for stakeholders to get into contact (A75, 15). Simultaneously, it can serve for information sharing with other schools (A40, 10).

The burden of finding potential partners can be simplified by introducing straightforward matching programs, technology and assistance (marketplaces, networks, involvement of external actors; B27, 11-12; A105, 16; A76, 12; A78, 2; A40, 10). Also 'development days' can be a location to bring potential stakeholders together (A105, 16). In rural areas, purchasing from a community-involved farmer can lead to advantaging commitment (A104, 5). For school food directors it can also be helpful to introduce a testing phase with many producers, from which some are taken over for a long-term project (A112, 4). To find access to parents and families, they can be invited to special events and community dinners, where local food is prepared (A66, 8).

A lack of capacity building and knowledge can be overcome by the assistance of farmers (to modify practices to meet school's needs or to implement food safety regulations; A101, 16; A112, 5) and school food service directors (to develop a system for buying from multiple stakeholders; A101, 10; A112, 5), by providing training (A30, 17; A105, 16; A4, 13) and by developing an online toolkit to be used by the stakeholders (A78, 2). Experience with F2S program helps stakeholders to assess resources needed for a project's implementation (A78, 5). In a comparable way, the lack of training and qualification can be faced. Training is needed for school food service to enable them to meet requirements, implement multiple cooperation elements, budget management, menu planning, seasonal purchasing and scratch cooking (A4, 11-13). More specifically, school food directors need training on developing workflow processes and messaging strategies and on helping staff maximise their skills (A30, 17-18). School food service staff needs training to manage increased time and resource effort required to prepare fresh food, to pilot new items and recipes to develop best practices and to support increased engagement and encouragement (A4, 11; A30, 18; A60, 5-6), which can be offered by school food directors (A43, 20). Peer-to-peer training is another possibility to share knowledge, tools and strategies (A4, 13) and training should be offered to dietitians and teachers (A60, 6; A105, 16). Furthermore, directors should ensure the availability of all necessary equipment (A43, 20). Missing but needed equipment must be acquired (A30, 17; A60, 5), e. g. by sufficient funding (A30, 18), as small grants can already be helpful (A112, 5). Strong organisational and environmental structures help to provide suitable equipment and enough space for food preparation (A60, 6).

### **Hto procurement standards challenges and barriers**

Regarding general federal and state regulations, efforts should focus on minimizing local food procurement barriers (B27, 12-13; A66, 11-12). This can be done by changes of public policy and institutional regulatory environments (A104, 3-4, 6, 8) and by introducing legislation making it easier for small and medium farms to participate in F2S (A105, 13; A76, 16). To drive these changes forward, a network, working on necessary legislative and policy changes, can be created (A104, 3-4)

and public policies and institutions can be supported by emphasizing societal goals and advantages (A112, 5). The adaptation of F2S can be made more attractive by creating a marketplace to connect stakeholders (A40, 10). Circumvent barriers, e. g. bidding processes and EU laws (A104, 5; A105, 13; A95, 7) and exhaust the possibilities under the given circumstances, e. g. by spreading the light-version (snack-program) among schools (A104, 5) can be another strategy. Food quality can be ensured by implementing evaluations (A30, 18), while food safety can be ensured by producers' commitment to food service practices (A76, 13). Furthermore, food made available through F2S is often grown with less pesticides than food acquired through standard procurement (A112, 7). Modifying federal food safety standards for small and limited-resource farmers, certifying whole farm instead of specific commodities, can help those farmers to comply with these standards (A75, 15).

### **Hto communication challenges and barriers**

Generally, communication amongst key stakeholders need to increase, which can be supported by communication training (A60, 5), school food service directors' encouragement (A104, 6) and use of external meetings as communication platform (A103, 6). This can help to develop a shared language (A76, 12). Communication needs to increase between internal and external stakeholders (A104, 7; A60, 6), teachers and foodservice staff (A60, 5-6), farmers and school food service (A95, 8) as well as farmers and students (B27, 12). Regular meetings can help to achieve this (A60, 6) and can best be implemented by project champions (A103, 5). If it is debatable, whether to implement F2S, since some parties are willing to implement F2S and others are not, school administrators should enable discussion and debate between stakeholders (A60, 7).

### **Hto acceptance challenges and barriers**

To provide general acceptance for F2S projects, it is helpful to train students, parents and the community on its importance (A66, 12), e. g. by offering workshops on the educational and health benefits of local and sustainable procurement. Development days built into the school year can provide an appropriate framework (A105, 16). To increase children's acceptance towards locally grown fresh and nutritious food, it is helpful to prepare and serve the food in a way that is attractive for children (A60, 5-6). Similarly, it is advisable to combine the menu changes with classical educational components (A104, 8; A60, 5-6), experiential learning experiences such as farm trips and taste testing (A97, 5; A60, 5, 7) and direct contact between students and their food producers (A97, 5). Furthermore, the use of external pressures promoting fresh in contrast to other food (e. g. by restricting or banning it) can support the process of acceptance (A104, 8; A112, 6-7). Encouragement and engagement (A60, 4-5, 7), especially from kitchen staff (A97, 5) as well as positive role models by

teachers, parents and staff can lower the burden to try and eat the food (A112, 4; A60, 5). This can be achieved by training for teachers and food service staff supporting engagement and encouragement (A60, 6). Asking students about their opinion on the food and include their opinion into decision making can increase acceptance, too (A30, 18). It was also noted that children's likes and dislikes are still relatively plastic, so that multiple exposures and related activities increase their willingness to eat fresh food (A104, 8).

**5.1.6 Most crucial challenges and barriers**

All barriers and challenges, which are emphasised within the texts or which are the text’s top 3 challenges and barriers are listed in table 2.

Taking a broader perspective and looking at the number of mentioning for each main category, structural challenges and barriers (20 mentioning) seem to be most crucial, followed by access (10 mentioning), economic (8 mentioning), and natural challenges (6 mentioning) as well as barriers concerning procurement standards (5 mentioning).

Looking at each sub-category separately, the distribution changes substantially. Here, financial issues are mentioned most often, half of which is containing the aspect of high costs of local food (A4, A40, A75, A78, A104, A110, B27). Concerns about seasonal availability of locally produced food follow (A4, A40, A75, A78, A110, B27). Further main concerns are volume of production (A75, A78, A95, B27) and supply reliability (A4, A101, A104, A110) with four documents discussing these and delivery logistics and transportation challenges and barriers (A95, A112, B27) as well as access to information challenges (A4, A40, A75), mentioned in three documents.

*Table 2: Most crucial challenges and barriers with frequency of appearance and reference*

<b>Category</b>	<b>No of documents mentioned in</b>	<b>Document identification No</b>
<b>11.1 natural challenges and barriers</b>	<b>6</b>	
11.1.1 seasonality of fruits and vegetables	6	A4, A40, A75, A78, A110, B27
<b>11.2 economic challenges and barriers</b>	<b>8</b>	
11.2.1 financial issues	7	A4, A40, A75, A78, A104, A110, B27
11.2.2 lack of partially processed products	1	A78
<b>11.3 structural challenges and barriers</b>	<b>20</b>	

11.3.1 administration	2	A112, B27
11.3.2 deviation from established food service practices and routines	1	A40
11.3.2.1 industrialised food production	2	A104, B27
11.3.2.2 lack of routines due to irregular products (& their preparation)	1	A30
11.3.3 procurement	2	A40, A104
11.3.3.1 volume of production	4	A75, A78, A95, B27
11.3.3.2 unreliable supply	4	A4, A101, A104, A110
11.3.3.3 delivery logistics and transportation challenges and barriers	3	A95, A112, B27
11.3.4 competition with non-local competitors	1	B27
<b>11.4 access as challenges and barriers</b>	<b>10</b>	
11.4.1 access to information	3	A4, A40, A75
11.4.2 access to stakeholders as challenges and barriers		
11.4.2.1 find potential partners	1	A110
11.4.2.2 stakeholder engagement	1	B27
11.4.3 access to resources as challenges and barriers		
11.4.3.2 lack of training and qualification	2	A4, B27
11.4.3.3 access to facilities and equipment	2	A95, B27
11.4.3.4 value-add production facilities	1	A75
<b>11.5 procurement standards challenges and barriers</b>	<b>5</b>	
11.5.1 federal and state regulations	2	A75, A110
11.5.2 food quality as challenges and barriers	2	A76, A101
11.5.3 food safety and standards as challenges and barriers		
11.5.3.1 federal and state regulations	1	A75

## 5.2 Results from grey literature

To assess the applicability of the generated information from scientific literature to the given case in Lüneburg (for results' restriction, see chapter 6.2), findings from grey literature serve as comparative value. Their generation was not conducted like a scientific literature review, but still, the category system was used to summarise relevant information.

Regarding common community catering practices in Germany, public tenders for food procurement in kindergartens contain a minimum share of organically produced food in many federal states (Erhart et al., 2016, p. 12), but cooks are often described as reserved towards changing to organic

food. Furthermore, a lack of qualified staff to work with organic food and advanced training opportunities are mentioned (Niessen & Paffe, 2010, p. 10).

The only mentioned goal stated in AELF Ebersberg (2015, p. 3) is that the program aims at supporting a healthy childhood nutrition, which is consistent with the results of the US studies.

All motivations and advantages found could be assigned to those within the main literature review. These include ecological (less transportation and greenhouse gas emissions; AELF Ebersberg, 2015, p. 19; AELF Ebersberg, 2015, p. 14), economic (support of local community, economy and farmers; AELF Ebersberg, 2015, p. 19; AELF Ebersberg, 2015, p. 14; AELF Ebersberg, 2015, p. 7) as well as social aspects (e. g. generation of good public relations, wish to improve children's health and meet public demands; AELF Ebersberg, 2015, p. 7; Niessen & Paffe, 2010, pp. 6–7; Niessen & Paffe, 2010, p. 9; Niessen & Paffe, 2010, p. 9).

Regarding challenges and barriers towards local food procurement, these do not differ from the scientific literature. Within the grey literature, they include financial (AELF Ebersberg, 2015, p. 5; Erhart et al., 2016, p. 28; Niessen & Paffe, 2010, p. 12; Niessen & Paffe, 2010, p. 11) and time challenges (AELF Ebersberg, 2015, p. 14; AELF Ebersberg, 2015, p. 3; MKULNV NRW, 2016, p. 7), structural challenges such as the distribution of roles (Groß, 2015, p. 67), routines (Groß, 2015, p. 58) and the volume of production (Niessen & Paffe, 2010, p. 11; Niessen & Paffe, 2010, p. 11) as well as additional challenges regarding knowledge and capacity building (Erhart et al., 2016, p. 5; Niessen & Paffe, 2010, p. 12). With regard to the use of organic food, vendors' incomplete product range, unsuitable package sizes, too high minimum order values, longer order times and organisational challenges in the kitchen are structural barriers mentioned additionally (Groß, 2015, pp. 53–54; Groß, 2015, p. 59; Niessen & Paffe, 2010, pp. 11–12; Niessen & Paffe, 2010, p. 10). As Groß (2015, p. 69) found out, this leads to a feeling of helplessness among possibly responsible stakeholders as given structures seem difficult to change. Among food service stakeholders, existing prejudices and wrong information about organic food procurement hinder the use of organic products (Erhart et al., 2016, p. 7; Groß, 2015, pp. 56–57; Niessen & Paffe, 2010, p. 10) and make catering services fear a missing acceptance from their clients (Niessen & Paffe, 2010, pp. 13–14). Interestingly, Groß (2015, p. 56) found those using organic foods to see less procurement challenges than those not using organic products.

The strategies to overcome challenges and barriers mostly deal with those faced, when introducing organic food: To simplify a start, certain product groups can be replaced, before further steps are taken (AELF Ebersberg, 2015, p. 6; AELF Ebersberg, 2015, p. 9; AELF Ebersberg, 2015, p. 23; Erhart et



al., 2016, p. 33; Erhart et al., 2016, p. 30; Groß, 2015, pp. 24–26)<sup>13</sup>. Furthermore, it is important to maintain long-term assistance and coaching (Niessen & Paffe, 2010, p. 17). To overcome increased costs due to organic product procurement, it is recommended to reduce the meals' meat proportion (AELF Ebersberg, 2015, p. 9; AELF Ebersberg, 2015, p. 10), establish procurement partnerships (AELF Ebersberg, 2015, p. 10; AELF Ebersberg, 2015, p. 19; Groß, 2015, pp. 24–26), optimise kitchen management (AELF Ebersberg, 2015, p. 23; AELF Ebersberg, 2015, p. 27), avoid organic convenience products (Erhart et al., 2016, p. 16), have good planning and creativity (AELF Ebersberg, 2015, p. 23; Erhart et al., 2016, p. 17; Niessen & Paffe, 2010, p. 12) and consider seasonal (and therefore cheaper) products (Groß, 2015, pp. 24–26). Regarding the deviation from established practices, organic procurement can become a routine (Groß, 2015, p. 58). Further structural challenges can be jointly faced in workshops (Erhart et al., 2016, p. 8; Erhart et al., 2016, p. 9; Erhart et al., 2016, p. 5) and collective procurement (Erhart et al., 2016, p. 5), while acceptance can be gained by sensitising for the topic (AELF Ebersberg, 2015, p. 9; Niessen & Paffe, 2010, p. 10), e. g. by using the homepage as information channel and building a relationship between kitchen staff and clients (Erhart et al., 2016, p. 30).

Familiar strategies to overcome challenges and barriers within the change to regional food include good communication with all stakeholders (MKULNV NRW, 2016, pp. 22–23) and introducing food topics in other areas (Erhart et al., 2016, pp. 7–8; Groß, 2015, p. 64). New strategies are to have collective goals and motivations (AELF Ebersberg, 2015, p. 34), replace separate product groups first (MKULNV NRW, 2016, p. 20), preserve fruits and vegetables during their season for winter and spring (AELF Ebersberg, 2015, p. 23) and offer whole seasonal meals (MKULNV NRW, 2016, p. 20).

High costs (which parents sometimes cannot afford), lack of profit for the catering service (Groß, 2015, p. 67), procurement and interconnected engagement and motivation of involved stakeholders were identified as most crucial challenges for the use of organic food in schools (Niessen & Paffe, 2010, p. 16).

Next to the familiar categories and in contrast to any scientific literature, MKULNV NRW (2016) and AELF Ebersberg (2015) provide instructions how to take action to change to organic and regional food. As they mainly do not differ except from AELF Ebersberg (2015) taking organic and regional procurement into account, the latter one will shortly be presented: Generally, it is recommended to involve all necessary stakeholders, to meet regularly and to nominate a food representative (AELF Ebersberg, 2015, p. 20). Then, information needs to be gathered, collected and shared (AELF Ebersberg, 2015, p. 21) and a status quo analysis should be conducted to gain an overview over

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<sup>13</sup> A recommended order is to start with fruits and vegetables, wheat and dry products and continuing with dairy products, eggs and meat (AELF Ebersberg, 2015, p. 6; AELF Ebersberg, 2015, p. 9).

resources and possibilities (AELF Ebersberg, 2015, p. 21). After determining goals and a time frame (AELF Ebersberg, 2015, p. 22), the menu needs to be optimised (e. g. according to DGE<sup>14</sup> standards), which is the basis to adapt these to organic and regional standards (AELF Ebersberg, 2015, pp. 22–23). Use of the free online organic menu manager is recommended as it supports the menu optimisation (AELF Ebersberg, 2015, p. 27).

## 6 Discussion and reflection

### 6.1 Summary of the results and answers to research questions

The literature review revealed much information, which answers the research questions defined above (see chapter 1.2). As a detailed answer is given in the results (see chapter 5), the findings will be shortly summarised here.

Regarding the first and second question, the common community catering practices are strongly influenced by profitability considerations (see chapter 5.1.1 & 5.2). This is done at the expense of sustainability aspects in all spheres: Farming and production methods harm the environment (ecological sphere), unhealthy food and bad working conditions harm people (social sphere) and irresponsible production harms the economy in long-term (economic sphere; see chapter 5.1.2 & 5.2).

Regarding the third question (visions, goals, motivations and advantages of cooperation practices), the goals illustrate the need for change for these issues, concerning the ecological (e. g. support of sustainable agricultural practices), social (e. g. provision of healthy, fresh and local food of good quality, support education and learning) and economic perspective (e. g. support of local farmers, community and economy) in the same way. Motivations to engage in direct cooperation and advantages of doing so can be assigned to the spheres of sustainability as well, but partly go beyond, as they also address motivations deriving from personal experience of and advantages for the stakeholders themselves, e. g. an enlarged scope of making decisions and more interconnectedness (see chapter 5.1.3 & 5.2). Visions were never mentioned.

To answer the fourth question, challenges and barriers mainly occur regarding natural, economic and structural issues as well as concerns about access, procurement standards, communication and acceptance. Comparing challenges and barriers beforehand and during a cooperation, it can be noticed that some challenges beforehand occurring or expected challenges actually arise during the cooperation. These are for example the seasonal availability of regional vegetables and fruits, financial barriers and administrative difficulties. As the diversity of challenges and barriers noted during a cooperation exceeds those expected beforehand (e. g. communication challenges and

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<sup>14</sup> Deutsche Gesellschaft für Ernährung

access to certain stakeholders), some difficulties may not be predictable in advance. This emphasises the complexity of the sustainability problems faced in school and kindergarten community catering. It is reflected by the various, complex and often individual ways to overcome certain challenges and barriers. Still, it is noteworthy, that the literature provides possibilities to overcome nearly every challenge mentioned (see chapter 5.1.4, 5.1.5 & 5.2).

Answering the fifth question regarding the most crucial challenges and barriers, structural and access challenges seem to play major roles when looking at the main categories. However, by looking at the more specific subcategories, high costs of local food and seasonality of fruits and vegetables and difficulties to sell products year-round represent the main challenges (see chapter 5.1.6). Grey literature supports all these findings (see chapter 5.2). Considering most crucial challenges and barriers from the beginning on can be helpful to find possibilities to deal with them in advance and to avoid them in the best case, thus increasing the cooperation's success.

## 6.2 Content reflection

However helpful the knowledge gained from scientific literature may seem, the results' applicability must nevertheless be viewed critically. First of all, all articles deal with projects in the USA. Due to possible differences in government regulations and support as well as other influencing factors (e.g. different status quo, food culture or infrastructure), it may not be possible or at least difficult to apply the results to an example in Germany. Furthermore, 18 out of 20 sources deal with F2S projects. On the one hand, this may call the transferability to kindergartens into question, as the framework conditions differ. Kindergartens, for example, have usually fewer children and therefore provide a smaller number of children with food, which can play a role regarding time and effort aspects, calculations and flexibility. On the other hand, ways to make regional-ecological care attractive to the eaters can vary depending on the age and developmental phase of the children.

Another aspect to consider is the support and organisation of F2S programs. The National Farm to School Network (NFSN) is a US platform supporting the implementation of F2S and farm to early care in the USA, which has driven the spread of the concept in the US. They are supported by non-profit organisations, state agencies and universities (NFSN, 2020), which increases their scope of action and is possibly the reason for their nationwide spread. During the search for regional literature, such an organisation could not be found for Europe or Germany, which may explain the low level of popularity and related research in Germany. The high level of organisation and support in the US may explain, why this topic (especially F2S) is a research topic in such a wide range of publications with examples from the US compared to those from Europe or Germany. This questions the applicability to our project in Lüneburg as the underlying network is missing.

Regarding silence data, any kinds of visions are missing. This may be a result of inaccurate use of terms (as the author afterwards reflected that goals can be visions and vice versa) and of unsuitable literature focusing on other aspects. Furthermore, the research question included geographical aspects (local production) and those regarding production methods (organic). The scientific literature mainly focuses on the local production, while alternative (organic) production methods are only mentioned once and described as too expensive (A97, 7). This silence data about production methods can probably also be attributed to the fact that the literature deals exclusively with the US F2S project and that the primary program's intention is not to support environmental sustainability aspects, but to support social and economic purposes. This is also reflected by the goals found within the scientific literature: Especially the support of local communities, economy and farmers as well as childhood health concerns are dominating, while the goal to support sustainable agricultural practices is only mentioned twice (see chapter 5.1.3.1). This clearly shows the discrepancy between the goals of the US F2S programs and the project in Lüneburg and can be a sign that the described actions taken within the literature may not be obligatorily linked to the goals, as healthy food must not necessarily be local.

To sum up, the generated results from the scientific literature are regionally bound, based on support and its organisation and structure, include silence data and partly show divergent intentions. To increase the value of the work, a real-world check was needed. To do so, the results were compared to and complemented by grey literature from German projects (see chapter 5.2). These documents were already mentioned in the introduction<sup>15</sup> and cannot fulfil the scientific standards but are assessed as appropriate to serve as a comparative group.

The cross-check with grey literature could on the one hand provide new information about procurement of organic food, which supplements the knowledge gained before, in a meaningful way. The use of organic food could even be shown to include further difficulties, which are partly familiar from the use of local food and described in the scientific literature. The most crucial challenges and barriers mainly overlap, while procurement barriers specifically related to organic food are new. The crucial role of champions seems equally essential for the success of organic and local food provision. On the other hand, the comparison of information about the implementation of local food makes it possible to assess the core literature review. It could be shown that the content is mostly identical between scientific and grey literature. Just a couple of strategies how to overcome challenges and barriers were not mentioned before, e. g. replacing certain product groups and continuing progressively and offering whole seasonal meals. But – as already noticed during the paraphrasing

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<sup>15</sup> From these, only five ones will be included, which either focus on the implementation of organic food in community catering and / or on the local supply of kindergartens

process – especially mentioned possible solutions generally seem very individual, depending on stakeholders' mindsets, agency-internal structures and effort as well as the overall environment. Restrictively, it must be noted, that the cross-check was carried out on a very small scope and it remains unclear, whether the selected grey literature represents a common understanding on the topic and for the middle-European area. Nevertheless, the high agreement between scientific and grey literature gives reason to assume, that the status does not differ substantially. Furthermore, the instructions represent an additional value for the implementation and may be a way to compensate the missing organisational basis of the NFSN.

### 6.3 Methods reflection

Reflecting on the methods used, these could not always be put precisely into practice. Normally, a literature review is conducted by more than only one person, which allows cross-checks and discussion during the process (see chapter 4). As this literature review is conducted by a single author, this was not possible (partly due to time constraints, too) and may call the results' meaningfulness into question. At this point it must be stated that a value-free qualitative analysis is impossible to conduct and that the opinions about its need for objectivity seem to differ, as Dellwing, personal communication (personal communication, 2020) assesses the subjectivity as a crucial aspect of qualitative data analysis to gain interesting insights. At this point, the author can state that the analysis was conducted as comprehensively and objectively as possible, although it is clear that personal background and decisions always influence the result in a way.

Regarding the article selection process, the search string application exclusively in English may have set the focus on literature from English-speaking countries. Furthermore, a complete inclusion of all relevant literature within the scope of this thesis cannot be ensured. The author further reflects that within the application of in- and exclusion criteria to collect relevant literature, the focus lay on farmers and food services as main stakeholders. During the literature review it became clear that it would have been helpful to involve literature about further stakeholders, who can be involved in such cooperation in a helpful way. Additionally, the unavailability of some selected articles and from that resulting exclusion from the literature review may have reduced the result.

Regarding the qualitative content analysis as such, the implementation without any second person's cross-check can again be criticised. Due to differences, discussions and the need for compromises, it is imaginable that the results would have had a slightly different focus or would have been structured in a different way. Nevertheless, the same principle applies in this respect as in the article selection process. Furthermore, no difference was made between results from research done in a paper or information cited from other authors' research. Although many citations can be an indicator that specific information is especially important, only including gained knowledge from a paper's research

would have shown a clearer overview as duplications would have been avoided. However, in doing so, some relevant information would not have been involved at all.

The research was planned directly before and conducted during the Covid-19 pandemic in Germany. Therefore, the project (which was planned to be implemented) needed to be changed into a more theoretical one. As the time period was characterised by short-term decisions and uncertainties, many changes and adaptations needed to be made, which complicated the working process. It would be very much appreciated by the author if the project would be continued and finally implemented. Additionally, the project was planned as two-part from beginning on. The unfamiliar approach to work together, while the parts are built upon each other required a high level of agreement and was therefore challenging. With this literature review, the interim goal of creating actionable knowledge is gained, but it cannot be assessed yet, to what extent this is helpful for the project's further steps.

## 7 Conclusion and outlook

The literature review revealed new information about community catering, its criticism regarding sustainability as well as challenges and barriers and how to overcome them when implementing organic-ecological food provision. Nevertheless, a possible bias during the coding and selection processes must be considered regarding the significance of the data. It could be justified that projects like the one planned for Lüneburg can contribute to FS and furthermore it could be shown, what kind of ideals exist about sustainable food system and production. Still, the herein presented suggestions are not yet fully compatible with concepts like CSA. Checking additional possibilities to combine CSA and kindergarten food could be a further research objective. Besides, more effort could be put into research about organic procurement and the roles, concerns, motivations and contribution of further involved stakeholders as these aspects were only discussed to a limited extent. Within this project, the results will be used as basis for the coding and analysis of the interviews with local stakeholders in Lüneburg. The emerging similarities and differences between the results will be used as source of information to classify and thereby support the local project here. It is desirable that these results can contribute to the overall project's success, but – especially in combination with the further project parts – they can also be helpful for other regions and opportunities, that aim at implementing the idea of regional-organic procurement in community catering of educational institutions.

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## 9 Declaration of independence

I hereby affirm that I wrote the work independently and did not use any other sources and aids than those indicated. All parts of the work that have been taken over literally or in spirit from other sources have been marked as such. I have not yet submitted the paper in the same or a similar form to any examination board.

Borken, 10.07.2020

## Appendix<sup>16</sup>

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	<b>Textmarke nicht definiert.</b>
Appendix 6: CCCP coding segment paraphrases .....	<b>Fehler! Textmarke nicht definiert.</b>
Appendix 7: Weaknesses & criticism about CCCP regarding sustainability coding segment paraphrases .....	<b>Fehler! Textmarke nicht definiert.</b>
Appendix 8: Visions, goals, motivations and advantages coding segment paraphrases .....	<b>Fehler!</b>
	<b>Textmarke nicht definiert.</b>
Appendix 9: Challenges and barriers coding segment paraphrases ..	<b>Fehler! Textmarke nicht definiert.</b>
Appendix 10: How to overcome (hto) challenges and barriers coding segment paraphrases.....	<b>Fehler!</b>
	<b>Textmarke nicht definiert.</b>
Appendix 11: Most crucial challenges and barriers coding segment paraphrases .....	<b>Fehler! Textmarke nicht definiert.</b>

*Appendix 1: Criteria catalogue for content- and format-driven selection of documents, applied to title and abstract (in accordance to Davies et al. (2013, p. 82) and Fink (2010, pp. 59–60))*

CRITERION TYPE	ABBR.	INCLUSION CRITERIA	EXCLUSION CRITERIA
<b>PUBLICATION<sup>17</sup> LANGUAGE DATABASE<sup>17</sup></b>	PL	Include only studies in English.	
<b>DOCUMENT TYPE</b>	DT	Include journal articles, reviews and book chapters	
<b>TOPIC</b>	To	Include only studies, that deal with <ul style="list-style-type: none"> <li>• community catering (in schools, kindergartens, early care or education settings) or</li> <li>• farm to school/preschool/kindergarten</li> </ul>	Education for Sustainable Development, nutrition and health aspects as main research objective  products except from agriculture (e. g. seafood)

<sup>16</sup> For space reasons, appendix 5 - 11 are only included in the thesis' digital version.

<sup>17</sup> Criteria are already given due to the selection of terms within the search string (all in English language) and due to the use of the two search engines, which only contain peer reviewed literature.

		as part of food system transition towards sustainability (regional supply and / or organically produced products) (itself as main aspect)	<p>studies deal with</p> <ul style="list-style-type: none"> <li>• criteria definition for appropriate praxis partners or regions</li> <li>• policy perspective, recommendations and claims</li> <li>• advantages of regionally or organically grown products</li> <li>• irrelevant or marginally relevant issues for cooperations in middle Europe (e. g. food safety)</li> </ul>
<b>SETTING / PARTICIPANTS</b>	S/P	Focus on either producers (farms) and / or community catering service as part of the food system (institutions).	Focus on end consumers (pupils, students or kids in the kindergarten), distributors or fishers
<b>DATE OF PUBLICATION</b>	DoP	Literature should have been published between 2000 and 2020	
<b>GEOGRAPHICAL SPREAD</b>	GS	Literature should relate primarily to studies in Germany, together with examples from other European countries and north America.	

*Appendix 2: Results from the search-string application in Scopus and Web of Science with listed in- and exclusion criteria (abbreviations see appendix 1) for content- and format-driven selection and finally included documents in bold print; document-No marked with \* were contained in both search engines; no data available for empty fields*

<b>NO</b>	<b>AUTHOR(S)</b>	<b>TITLE</b>	<b>YEA</b>	<b>P</b>	<b>D</b>	<b>D</b>	<b>T</b>	<b>S/</b>	<b>DOP</b>	<b>G</b>
			<b>R</b>	<b>L</b>	<b>L</b>	<b>T</b>	<b>O</b>	<b>P</b>		<b>S</b>
<b>A1*</b>	Read Q.D., Brown S., Cuéllar A.D., Finn S.M., Gephart J.A., Marston L.T., Meyer E., Weitz K.A., Muth M.K.	Assessing the environmental impacts of halving food loss and waste along the food supply chain	2020	✓	✓	✓	x	x	✓	✓
<b>A2</b>	Lehnerd M.E., Goldberg J.P., Folta S.C., Cash S.B., Griffin T.S., Lucas R., Sacheck J.M.	Qualitative Exploration of Farm to School Program Adoption and Expansion in Massachusetts Schools	2020	✓	✓	✓	x	x	✓	✓
<b>A3*</b>	Prescott M.P., Cleary R., Bonanno A., Costanigro M.,	Farm to School Activities and Student Outcomes: A Systematic Review	2020	✓	✓	✓	x	x	✓	✓

	Jablonski B.B.R., Long A.B.									
<b>A4*</b>	<b>Stephens L., Oberholtzer L.</b>	<b>Opportunities and challenges for farm to early care and education in settings serving low-income children</b>	<b>2020</b>	✓	✓	✓	✓	✓	✓	✓
<b>A5*</b>	Lopez V., Teufel J., Gensch C.-O.	How a transformation towards sustainable community catering can succeed	2020	✓	✓	✓	x	✓	✓	✓
<b>A6</b>	Ignasiak K.R., Peterson K.D.	Implementation and Evaluation of a Small-Scale Farm to School Program in Rural Wisconsin Area Elementary Schools	2020	✓	✓	✓	x	x	✓	✓
<b>A7*</b>	Burt K.G., Lindel N., Wang J., Burgermaster M., Fera J.	A Nationwide Snapshot of the Predictors of and Barriers to School Garden Success	2019	✓	✓	✓	x	x	✓	✓
<b>A8*</b>	Rains C.B., Giombi K.C., Joshi A.	Farm-to-school education grants reach low-income children and encourage them to learn about fruits and vegetables	2019	✓	✓	✓	x	x	✓	✓
<b>A9*</b>	Schultz C., Thorlton J.	Access to Fresh Fruits and Vegetables in School Lunches: A Policy Analysis	2019	✓	✓	✓	x	x	✓	✓
<b>A10*</b>	O'Hara J.K., Benson M.C.	The impact of local agricultural production on farm to school expenditures	2019	✓	✓	✓	x	✓	✓	✓
<b>A11*</b>	Christensen L.O., Jablonski B.B.R., O'Hara J.K.	School districts and their local food supply chains	2019	✓	✓	✓	x	x	✓	✓
<b>A12*</b>	Boys K.A., Fraser A.M.	Linking small fruit and vegetable farmers and institutional foodservice operations: Marketing challenges and considerations	2019	✓	✓	✓	x	✓	✓	✓
<b>A13</b>	Juneja, V.K., Golden, C.E., Mishra, A., Harrison, M.A., Mohr, T.B.	Predictive Model for Growth of Bacillus cereus at Temperatures Applicable to Cooling of Cooked Pasta	2019	✓	✓	✓	x	x	✓	✓
<b>A14*</b>	O'Hara J.K., McClenachan L.	Factors influencing 'Sea to School' purchases of local seafood products	2019	✓	✓	✓	x	x	✓	✓
<b>A15*</b>	Fitzsimmons J., O'Hara J.K.	Market Channel Procurement Strategy and School Meal Costs in Farm-to-School Programs	2019	✓	✓	x	x	x	✓	✓
<b>A16*</b>	<b>Qu S., Fischer L., Rumble J.</b>	<b>Building bridges between producers and schools: The role of Extension in the farm to school program</b>	<b>2019</b>	✓	✓	✓	✓	✓	✓	✓

<b>A17*</b>	Motta V.	The Impact of Local Food Expenditure on School Foodservice Revenues	2019	✓	✓	✓	x	✓	✓	✓
<b>A18</b>	Plakias Z.T., Demko I., Katchova A.L.	Direct marketing channel choices among US farmers: Evidence from the Local Food Marketing Practices Survey	2019	✓	✓	✓	x	✓	✓	✓
<b>A19*</b>	Thompson J.J., Stinnett A.	Confronting the Goldilocks Problem: Encountering “The Middle” in Anthropological Studies of Food and Agriculture	2018	✓	✓	✓	x	x	✓	✓
<b>A20*</b>	Dannefer R., Power L., Berger R., Sacks R., Roberts C., Bikoff R., Solomon E.	Process evaluation of a farm-to-preschool program in New York City	2018	✓	✓	✓	x	x	✓	✓
<b>A21*</b>	Mansfield J.L., Savaiano D.A.	Collaboration Challenges and Opportunities: A Survey of School Foodservice Directors and Community Health Coalition Members	2018	✓	✓	✓	x	✓	✓	✓
<b>A22*</b>	Valero Gaspar T., Ávila Torres J.M., Varela- Moreiras G.	Healthy gastronomy education: challenges and opportunities in the institutional food service [Educación para una gastronomía saludable: retos y oportunidades en la alimentación institucional]	2018	✓	✓	✓	x	✓	✓	✓
<b>A23*</b>	Mahyudin N.A., Mat Daud N.I.H., Ab Rashid N.- K.M., Muhialdin B.J., Saari N., Noordin W.N.	Bacterial attachment and biofilm formation on stainless steel surface and their in vitro inhibition by marine fungal extracts	2018	✓	✓	✓	x	x	✓	✓
<b>A24*</b>	Greer A.E., Davis S., Sandolo C., Gaudet N., Castrogivanni B.	Formative Research to Create a Farm-to-School Program for High School Students in a Lower Income, Diverse, Urban Community	2018	✓	✓	✓	x	x	✓	✓
<b>A25</b>	Niemeyer K.	Organic model regions in the Bavarian alpine region. Developing potentials and building local capacity [Öko-Modellregionen im bayerischen Alpenraum: Potenziale entwickeln und Kompetenzen vor Ort stärken]	2018	x	✓	✓	✓	✓	✓	✓
<b>A26*</b>	Hayes D., Dodson L.	Practice Paper of the Academy of Nutrition and Dietetics: Comprehensive Nutrition Programs and Services in Schools	2018	✓	✓	✓	x	x	✓	✓



A27*	Powell L.J., Wittman H.	Farm to school in British Columbia: mobilizing food literacy for food sovereignty	2018	✓	✓	✓	x	x	✓	✓
A28	Park S., Kim J.-S., Jung E.-K.	Institutional foodservice personnel's perception and use of care foods for elderly individuals' chewing and swallowing ability	2018	✓	✓	✓	x	✓	✓	✓
A29	Goger A.M.	Situating institutional foodservice in agro-food value chains: Overcoming market power and structure with values-based procurement	2018	✓	✓	✓	x	x	✓	✓
A30	<b>Rosenthal A., Caruso C.C.</b>	<b>Bringing school foodservice staff back in: Accounting for changes in workloads and mindsets in K-12 values-based procurement</b>	<b>2018</b>	✓	✓	✓	✓	✓	✓	✓
A31	Thottathil S.E.	Introduction: Institutions as conscious food consumers	2018	✓	✓	✓	x	✓	✓	✓
A32	<b>Shanks C.B., Bass T.M., Schumacher J.B.</b>	<b>Montana's beef-to-school project: Making connections to enhance local agriculture</b>	<b>2018</b>	✓	✓	✓	✓	✓	✓	✓
A33	Jones K., Pfeifer K., Castillo G.	Trends in the global food system and implications for institutional foodservice	2018	✓	✓	✓	x	x	✓	✓
A34	Santo R.E., Fitch C.M.	From foodservice management contracts to u.s. federal legislation: Progress and barriers in values-based food procurement policies	2018	✓	✓	✓	x	✓	✓	✓
A35	Richman N.J., Allison P.H., Leighton H.R.	Farm to Institution New England: Mobilizing the Power of a Region's Institutions to Transform a Region's Food System	2018	✓	✓	✓	x	✓	✓	✓
A36	Mulik K.	Institutional markets supporting mid-sized farms: A case study of Iowa	2018	✓	✓	✓	x	✓	✓	✓
A37	Colasanti K., Matts C., Wojciak K.K.	Making local sourcing standard practice: Lessons from Michigan	2018	✓	✓	✓	x	x	✓	✓
A38	Snyder O.P., Jr.	Foodservice operations: HACCP principles	2018	✓	✓	✓	x	✓	✓	✓
A39	Smith J., Cuesta G.	Hunger in the fields: Food insecurity and food access among farmworker families in Migrant and Seasonal Head Start	2018	✓	✓	x	x	✓	✓	✓
A40*	<b>Botkins E.R., Roe B.E.</b>	<b>Understanding participation in farm to school programs: Results integrating school and supply-side factors</b>	<b>2018</b>	✓	✓	✓	✓	✓	✓	✓
A41*	McCarthy A.C., Steiner A.S., Houser	Do State Farm-to-School-Related Laws Increase Participation in Farm-to-School	2017	✓	✓	✓	x	x	✓	✓

	R.F.	Programs?								
<b>A42*</b>	Hoffman J.A., Schmidt E.M., Wirth C., Johnson S., Sobell S.A., Pelissier K., Harris D.M., Izumi B.T.	Farm to Preschool: The State of the Research Literature and a Snapshot of National Practice	2017	✓	✓	✓	x	x	✓	✓
<b>A43*</b>	<b>Stokes N., Arendt S.W.</b>	<b>Identifying Farm to School Barriers and Keys to Success: Perceptions of Hourly Employees</b>	<b>2017</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>
<b>A44*</b>	Thompson J.J., Brawner A.J., Kaila U.	“You can’t manage with your heart”: risk and responsibility in farm to school food safety	2017	✓	✓	✓	x	x	✓	✓
<b>A45*</b>	Harper K., Sands C., Angarita Horowitz D., Totman M., Maitín M., Rosado J.S., Colon J., Alger N.	Food justice youth development: using Photovoice to study urban school food systems	2017	✓	✓	✓	x	x	✓	✓
<b>A46</b>	Love D.C., Pinto da Silva P., Olson J., Fry J.P., Clay P.M.	Fisheries, food, and health in the USA: The importance of aligning fisheries and health policies	2017	✓	✓	✓	x	x	✓	✓
<b>A47</b>	Lyson H.C.	Leadership, partnerships, and civic engagement: A case study of school food reform in California	2017	✓	✓	✓	x	x	✓	✓
<b>A48*</b>	Kang M., Hebert P.R., Thompsen R., VanDusen A.	An analysis of energy and cost saving opportunities: Lighting system considerations for an institutional food service facility	2017	✓	✓	✓	x	✓	✓	✓
<b>A49*</b>	Van Wieren G.	The New Sacred Farm	2017	✓	✓	✓	x	x	✓	✓
<b>A50*</b>	Turner L., Eliason M., Sandoval A., Chaloupka F.J.	Increasing Prevalence of US Elementary School Gardens, but Disparities Reduce Opportunities for Disadvantaged Students	2016	✓	✓	✓	x	x	✓	✓
<b>A51*</b>	Martinez S.W.	Policies supporting local food in the United States	2016	✓	✓	✓	x	x	✓	✓
<b>A52</b>	Kahn B.A., Brandenberger L.P.	Developing protocols for fall sweet corn production in the south-central United States	2016	✓	✓	✓	x	x	✓	✓
<b>A53*</b>	Costello C., Birisci E., McGarvey R.G.	Food waste in campus dining operations: Inventory of pre- and post-consumer mass by food category, and estimation of embodied greenhouse gas	2016	✓	✓	✓	x	x	✓	✓

	emissions									
<b>A54*</b>	Tsui E.K., Morillo A.	How cooks navigate nutrition, hunger and care in public-sector foodservice settings	2016	✓	✓	✓	x	✓	✓	✓
<b>A55*</b>	Ohri-Vachaspati P., Turner L., Adams M.A., Bruening M., Chaloupka F.J.	School Resources and Engagement in Technical Assistance Programs Is Associated with Higher Prevalence of Salad Bars in Elementary School Lunches in the United States	2016	✓	✓	✓	x	x	✓	✓
<b>A56*</b>	Matts C., Conner D.S., Fisher C., Tyler S., Hamm M.W.	Farmer perspectives of Farm to Institution in Michigan: 2012 Survey results of vegetable farmers	2016	✓	✓	✓	x	✓	✓	✓
<b>A57*</b>	Crovetto M., Henríquez C., Parraguez R., Montenegro M.J.S.	Relationship between institutional food service in Nursery Schools and Household feeding with the nutritional status of preschool children attending two Nursery Schools in Valparaiso, Chile	2016	✓	✓	✓	x	x	✓	x
<b>A58*</b>	Tsui E.K.	Pan de yuca and brown rice: The meanings of “good” food for cooks working in publicly funded foodservice	2016	✓	✓	✓	x	✓	✓	✓
<b>A59</b>	Johnson R.	The role of local and regional food systems in U.S. farm policy	2016	✓	✓	✓	x	x	✓	✓
<b>A60*</b>	<b>Carbone E.T., DiFulvio G.T., Susi T., Nelson-Peterman J., Lowbridge-Sisley J., Collins J.</b>	<b>Evaluation of an urban Farm-to-Preschool and Families program</b>	<b>2016</b>	✓	✓	✓	✓	✓	✓	✓
<b>A61</b>	Ahn J., Seo S.	The influences of sustainability management at institutional foodservice on store image and behavioral intention	2015	✓	✓	✓	x	✓	✓	✓
<b>A62</b>	Wright K.G., Sirsat S.A., Neal J.A., Gibson K.E.	Growth of local food systems: A review of potential food safety implications	2015	✓	✓	✓	x	x	✓	✓
<b>A63</b>	Crawford J.	Local and regional food systems: Trends, resources and federal initiatives	2015	✓	✓	✓	x	x	✓	✓
<b>A64</b>	Low S.A., Adalja A., Beaulieu E., Key N., Martinez S.,	Trends in U.S. local and regional food systems	2015	✓	✓	✓	x	x	✓	✓

	Melton A., Perez A., Ralston K., Stewart H., Suttles S., Vogel S.									
<b>A65*</b>	Neff R.A., Merrigan K., Wallinga D.	A food systems approach to healthy food and agriculture policy	2015	✓	✓	✓	x	x	✓	✓
<b>A66*</b>	<b>Holland J.H., Thompson O.M., Godwin H.H., Pavlovich N.M., Stewart K.B.</b>	<b>Farm-to-School Programming in South Carolina: An Economic Impact Projection Analysis</b>	<b>2015</b>	✓	✓	✓	✓	✓	✓	✓
<b>A67*</b>	Jones S.J., Childers C., Weaver A.T., Ball J.	SC Farm-to-School Programs Encourages Children to Consume Vegetables	2015	✓	✓	✓	x	x	✓	✓
<b>A68</b>	Erickson G.S., Barken M., Barken D.	Caroline Elementary School's hybrid garden: a case study in social marketing	2015	✓	✓	✓	x	x	✓	✓
<b>A69*</b>	Kim S., Yoon J., Shin J.	Sustainable business- and industry foodservice: Consumers' perception and willingness to pay a premium in South Korea	2015	✓	✓	✓	x	x	✓	x
<b>A70*</b>	Viator C., Blitstein J., Brophy J.E., Fraser A.	Preventing and controlling foodborne disease in commercial and institutional food service settings: A systematic review of published intervention studies	2015	✓	✓	✓	x	✓	✓	✓
<b>A71*</b>	Lahou E., Jacxsens L., Van Landeghem F., Uyttendaele M.	Microbiological sampling plan based on risk classification to verify supplier selection and production of served meals in food service operation	2014	✓	✓	✓	x	x	✓	✓
<b>A72</b>	Broz C.C., Hammond R.K.	Dysphagia: Education needs assessment for future health-care foodservice employees	2014	✓	✓	✓	x	x	✓	✓
<b>A73*</b>	Conner D.S., Sevoian N., Heiss S.N., Berlin L.	The Diverse Values and Motivations of Vermont Farm to Institution Supply Chain Actors	2014	✓	✓	✓	x	✓	✓	✓
<b>A74</b>	Thompson O.M., Ghelardini L., Keene K.L., Stewart K.B.	Farm-to-school programmes in the USA: An examination of state-level enacted, pending and vetoed or dead bills	2014	✓	✓	✓	x	x	✓	✓
<b>A75</b>	<b>Thompson O.M., Twomey M.P., Hemphill</b>	<b>Farm to School Program Participation: An Emerging Market for Small or Limited-Resource Farmers?</b>	<b>2014</b>	✓	✓	✓	✓	✓	✓	✓

	<b>M.A., Keene K., Seibert N., Harrison D.J., Stewart K.B.</b>									
<b>A76</b>	<b>Bateman J., Engel T., Meinen A.</b>	<b>Understanding Wisconsin Producer and Distributor Perceptions to Inform Farm to School Programs and Policies</b>	<b>2014</b>	✓	✓	✓	✓	✓	✓	✓
<b>A77</b>	Caichac H. A., Mediano S. F., Blanco P. G., Lera M. L., Gloria Yáñez G. C., Vio del R. F., Olivares C. S.	Food and nutrition intervention for miners with cardiovascular risk factors, based on formative research [Intervención en alimentación y nutrición para mineros con factores de riesgo cardiovascular, basada en la investigación formative]	2013	✓	✓	✓	x	x	✓	✓
<b>A78*</b>	<b>Pinard C.A., Smith T.M., Carpenter L.R., Chapman M., Balluff M., Yaroch A.L.</b>	<b>Stakeholders' interest in and challenges to implementing farm-to-school programs, douglas county, Nebraska, 2010-2011</b>	<b>2013</b>	✓	✓	✓	✓	✓	✓	✓
<b>A79*</b>	Smith S., Wleklinski D., Roth S.L., Tragoudas U.	Does school size affect interest for purchasing local foods in the midwest?	2013	✓	✓	✓	x	✓	✓	✓
<b>A80</b>	Johnson R., Cowan T., Aussenberg R.A.	The role of local food systems in United States farm policy	2012	✓	✓	✓	x	x	✓	✓
<b>A81</b>	Gibson W.H., Cole D.J.	Local food systems: Markets, trends and federal programs	2012	✓	✓	x	x	x	✓	✓
<b>A82*</b>	Lukas M., Strassner C.	Practical sustainability in community catering services [Praxisorientiertes nachhaltigkeitshandeln in der gemeinschaftsgastronomie]	2012	✓	✓	✓	x	✓	✓	✓
<b>A83*</b>	Russo V.M., Shrefler J.	Bunching onion culture in greenhouse and hoop house	2012	✓	✓	✓	x	✓	✓	✓
<b>A84*</b>	<b>Conner D., King B., Kolodinsky J., Roche E., Koliba C., Trubek A.</b>	<b>You can know your school and feed it too: Vermont farmers' motivations and distribution practices in direct sales to school food services</b>	<b>2012</b>	✓	✓	✓	✓	✓	✓	✓
<b>A85*</b>	Feenstra G., Ohmart J.	The evolution of the school food and farm to school movement in the United States: Connecting childhood health, farms, and communities	2012	✓	✓	✓	x	✓	✓	✓
<b>A86*</b>	Ratcliffe M.M.	A sample theory-based logic model to improve program development, implementation, and sustainability of farm to school programs	2012	✓	✓	✓	x	x	✓	✓

A87*	Roche E., Conner D., Kolodinsky J.M., Buckwalter E., Berlin L., Powers A.	Social cognitive theory as a framework for considering farm to school programming	2012	✓	✓	✓	x	x	✓	✓
A88*	Colasanti K.J.A., Matts C., Hamm M.W.	Results from the 2009 Michigan Farm to School Survey: Participation Grows from 2004	2012	✓	✓	✓	x	x	✓	✓
A89*	Kimmons J., Jones S., McPeak H.H., Bowden B.	Developing and implementing health and sustainability guidelines for institutional food service	2012	✓	✓	x	x	x	✓	✓
A90*	Harris D., Lott M., Lakins V., Bowden B., Kimmons J.	Farm to institution: Creating access to healthy local and regional foods	2012	✓	✓	x	x	✓	✓	✓
A91	Ledoux E., Cloutier E., Fournier P.-S.	The influence of flexible management practices on the sharing of experiential knowledge in the workplace: A case study of food service helpers	2012	✓	✓	x	x	✓	✓	✓
A92	Hoffman J.A., Agrawal T., Wirth C., Watts C., Adeduntan G., Myles L., Castaneda- Sceppa C.	Farm to Family: Increasing Access to Affordable Fruits and Vegetables Among Urban Head Start Families	2012	✓	✓	✓	x	x	✓	✓
A93*	Rodrigues K.L., Silva J.A., Aleixo J.A.G.	Effect of the implementation of the hazard analysis critical control point (HACCP) prerequisite program in an institutional foodservice unit in Southern Brazil [Efeito da implementação do programa pré requisitos para análise de perigos e pontos críticos de controle (APPCC) em um serviço de alimentação institucional do sul do Brasil]	2012	✓	✓	✓	x	✓	✓	x
A94	Mikkelsen B.E., Sylvest J.	Organic Foods on the Public Plate: Technical Challenge or Organizational Change?	2012	✓	✓	✓	x	x	✓	✓
A95*	Izumi B.T., Wynne Wright D., Hamm M.W.	<b>Market diversification and social benefits: Motivations of farmers participating in farm to school programs</b>	2010	✓	✓	✓	✓	✓	✓	✓
A96*	Sonnino R.	Escaping the local trap: Insights on re-localization from school food reform	2010	✓	✓	✓	x	x	✓	✓
A97*	Izumi B.T., Alaimo K.,	<b>Farm-to-School Programs: Perspectives of School Food</b>	2010	✓	✓	✓	✓	✓	✓	✓

	<b>Hamm M.W.</b>	<b>Service Professionals</b>								
<b>A98</b>	Martinez S., Hand M., da Pra M., Pollack S., Ralston K., Smith T., Vogel S., Clark S., Lohr L., Low S., Newman C.	Local food systems: Concepts, impacts, and issues	2010	✓	✓	✓	x	x	✓	✓
<b>A99</b>	King R.P., Hand M.S., DiGiacomo G., Clancy K., Gomez M.I., Hardesty S.D., Lev L., McLaughlin E.W.	Comparing the structure, size, and performance of local and mainstream food supply chains	2010	✓	✓	✓	x	x	✓	✓
<b>A100*</b>	Izumi B.T., Wright D.W., Hamm M.W.	Farm to school programs: Exploring the role of regionally- based food distributors in alternative agrifood networks	2010	✓	✓	✓	✓	x	✓	✓
<b>A101</b>	<b>Schafft K., Hinrichs C.C., Bloom J.D.</b>	<b>Pennsylvania farm-to-school programs and the articulation of local context</b>	<b>2010</b>	✓	✓	✓	✓	✓	✓	✓
<b>A102</b>	Vázquez M.B., Curia A., Hough G.	Sensory descriptive analysis, sensory acceptability and expectation studies on biscuits with reduced added salt and increased fiber	2009	✓	✓	✓	x	x	✓	✓
<b>A103*</b>	<b>Bagdonis J.M., Hinrichs C.C., Schafft K.A.</b>	<b>The emergence and framing of farm-to-school initiatives: Civic engagement, health and local agriculture</b>	<b>2009</b>	✓	✓	✓	✓	✓	✓	✓
<b>A104</b>	<b>Kloppenburg J., Wubben D., Grunes M.</b>	<b>Linking the land and the lunchroom: Lessons from the wisconsin homegrown lunch project</b>	<b>2008</b>	✓	✓	✓	✓	✓	✓	✓
<b>A105</b>	<b>Carlsson L., Williams P.L.</b>	<b>New approaches to the health promoting school: Participation in sustainable food systems</b>	<b>2008</b>	✓	✓	✓	✓	✓	✓	✓
<b>A106</b>	Joshi A., Azuma A.M., Feenstra G.	Do farm-to-school programs make a difference? findings and future research needs	2008	✓	✓	✓	✓	x	✓	✓
<b>A107*</b>	Vogt R.A., Kaiser L.L.	Still a time to act: A review of institutional marketing of regionally-grown food	2008	✓	✓	x	x	✓	✓	✓
<b>A108*</b>	Nelson R.G., Campbell B.L., Ebel R.C., Dozier Jr. W.A.	The current state of the satsuma marketing effort in Alabama	2008	✓	✓	x	x	x	✓	✓
<b>A109*</b>	Allen P., Guthman J.	From "old school" to "farm-to- school": Neoliberalization from	2006	✓	✓	✓	x	x	✓	✓

		the ground up								
<b>A110*</b>	<b>Izumi B.T., Rostant O.S., Moss M.J., Hamm M.W.</b>	<b>Results from the 2004 Michigan farm-to-school survey</b>	<b>2006</b>	✓	✓	✓	✓	✓	✓	✓
<b>A111*</b>	Winne M.	Education for change	2005	✓	✓	✓	x	x	✓	✓
<b>A112*</b>	<b>Vallianatos M., Gottlieb R., Haase M.A.</b>	<b>Farm-to-school: Strategies for urban health, combating sprawl, and establishing a community food systems approach</b>	<b>2004</b>	✓	✓	✓	✓	✓	✓	✓
<b>A113*</b>	Fontanarosa M., Novelle L., Conversano C., Musti M., Tantillo M.G.	Detection of Bacillus species in selected meals from an Apulian catering service	2004	✓	✓	✓	x	✓	✓	✓
<b>A114</b>	Legnani P., Leoni E., Brunozzi A.	Food-related hazards associated with public food establishments and community catering services: Epidemiological aspects and prevention guidelines in the Emilia-Romagna Region [Rischi alimentari nella ristorazione collettiva: Aspetti epidemiologici ed indirizzi di prevenzione nella Regione Emilia Romagna]	1998	✓	✓	✓	x	✓	x	✓
<b>A115*</b>	Glanz K., Lankenau B., Foerster S., Temple S., Mullis R., Schmid T.	Environmental and Policy Approaches to Cardiovascular Disease Prevention Through Nutrition: Opportunities for State and Local Action	1995	✓	✓	✓	x	x	x	✓
<b>A116</b>	Paulus K.	Possible systems of community catering [MOGLICHE SYSTEME DER GEMEINSCHAFTSVERPFLEGUN G]	1974	✓	✓	✓	x	x	x	✓
<b>A117</b>	Astier Dumas M.	Community catering. Are the rations of vitamin B1, calcium and magnesium adequate? [REPAS COLLECTIFS. LES RATIONS EN VITAMINE B1, CALCIUM ET MAGNESIUM SONT-ELLES SUFFISANTES?]	1973	✓	✓	✓	x	x	x	✓
<b>A118</b>	Wanderstock J.J.	Food analogs	1968	✓	✓	✓	x	x	x	✓
<b>A119</b>	Bjorkman A., Delphin K.A.	Sweden's Nacka Hospital Food System Centralizes Preparation and Distribution	1966	✓	✓	✓	x	x	x	✓
<b>B8</b>	Motsenbocker , Carl; Besse, Crystal	Improving Local Food Systems with Farm to School	2019	✓	✓	x			✓	✓



<b>B16</b>	<b>Duval, Dari; Bickel, Ashley K.; Frisvold, George B.</b>	<b>Farm-to-school programs' local foods activity in Southern Arizona: Local foods toolkit applications and lessons</b>	<b>2019</b>	✓	✓	✓	✓	✓	✓	✓
<b>B17</b>	Christensen, Libby; Jablonski, Becca B. R.; Stephens, Lacy; Joshi, Anupama	Evaluating the economic impacts of farm-to-school procurement: An approach for primary and secondary financial data collection of producers selling to schools	2019	✓	✓	✓	x	✓	✓	✓
<b>B19</b>	Watson, Jonathan Adam; Treadwell, Danielle; Bucklin, Ray	Economic impact assessment of local food procurement in Southwest Florida's farm-to- school programs	2018	✓	✓	✓	x	x	✓	✓
<b>B20</b>	Calancie, Larissa; Cooksey- Stowers, Kristen; Palmer, Anne; Frost, Natasha; Calhoun, Holly; Piner, Abbey; Webb, Karen	Toward a community impact assessment for food policy councils: Identifying potential impact domains	2018	✓	✓	✓	x	x	✓	✓
<b>B25</b>	Kumpulainen, Tommi; Vainio, Annukka; Sandell, Mani; Hopia, Anu	The effect of gender, age and product type on the origin induced food product experience among young consumers in Finland	2018	✓	✓	✓	x	x	✓	✓
<b>B26</b>	de Freitas Coca, Estevan Leopoldo; Barbosa, Ricardo, Jr.	School gardens in Vancouver, Canada as part of the "second generation" of food sovereignty	2018	✓	✓	✓	x	x	✓	✓
<b>B27</b>	<b>Lehnerd, Megan E.; Sacheck, Jennifer M.; Griffin, Timothy S.; Goldberg, Jeanne P.; Cash, Sean B.</b>	<b>Farmers' perspectives on adoption and impacts of nutrition incentive and farm to school programs</b>	<b>2018</b>	✓	✓	✓	✓	✓	✓	✓
<b>B32</b>	Burt, Kate Gardner; Koch, Pamela; Contento, Isobel	Implementing and Sustaining School Gardens by Integrating the Curriculum	2017	✓	✓	✓	x	x	✓	✓
<b>B33</b>	Trivette, Shawn A.	Invoices on scraps of paper: trust and reciprocity in local food systems	2017	✓	✓	✓	x	✓	✓	✓

<b>B35</b>	Brinkley, Catherine	Visualizing the social and geographical embeddedness of local food systems	2017	✓	✓	✓	x	x	✓	✓
<b>B36</b>	Cairns, Kate	Connecting to food: cultivating children in the school garden	2017	✓	✓	✓	x	x	✓	✓
<b>B37</b> FEHLER TEXTMARK E NICHT DEFINIERT.	<b>Hartline, Morgan E.; Albrecht, Julie A.; Ritter- Gooder, Paula</b>	<b>A Mixed-Methods Case Study of 4 Rural Schools before Initiating Local Farm-to School-Programs</b>	<b>2017</b>	✓	✓	✓	✓	✓	✓	✓
<b>B45</b>	Sands, Catherine; Stewart, Carol; Bankert, Sarah; Hillman, Alexandra; Fries, Laura	Building an airplane while flying it: One community's experience with community food transformation	2016	✓	✓	✓	x	x	✓	✓
<b>B47</b>	Rysin, Olya; Dunning, Rebecca	Economic viability of a food hub business: Assessment of annual operational expenses and revenues	2016	✓	✓	✓	x	✓	✓	✓
<b>B53</b>	von Germeten, Jan-Paul; Hartmann, Monika	Analysis of Rural and Urban Supply Chains in the European School Fruit Scheme Using Qualitative Interviews and Network Analysis of Content	2016	✓	✓	✓	x	✓	✓	✓
<b>B56</b>	Yamashita, Lina; Robinson, Diana	Making visible the people who feed us: Educating for critical food literacy through multicultural texts	2015	✓	✓	✓	x	x	✓	✓
<b>B58</b>	Perrett, Allison; Jackson, Charlie	Local food, food democracy, and food hubs	2015	✓	✓	✓	x	x	✓	✓
<b>B59</b>	Askelson, Natoshia M.; Cornish, Disa Lubker; Golembiewski, Elizabeth	Rural school food service director perceptions on voluntary school meal reforms	2015	✓	✓	✓	x	✓	✓	✓
<b>B60</b>	Raison, Brian; Scheer, Scott D.	Potential of local food use in the Ohio health care industry: An exploratory study	2015	✓	✓	✓	x	✓	✓	✓
<b>B68</b>	Byker, Carmen J.; Pinard, Courtney A.; Yaroch, Amy L.; Serrano, Elena L.	New NSLP Guidelines: Challenges and Opportunities for Nutrition Education Practitioners and Researchers	2013	✓	✓	✓	x	x	✓	✓
<b>B70</b>	Seabra, L.; Rolim, P.; Fernandes, E.; Cardonha, A.	A Case Study: Nutritional Status of Workers from a Nutritional Foodservice	2013	✓	✓	x			✓	✓

Appendix 3: Summary of content- and format-driven selection of documents and further technical exclusion criteria from the qualitative content analysis with official page no; finally included documents in bold print

NO	AUTHOR(S)	TITLE	YEAR	FULL-TEXT AVAILABILITY	INCOMPATIBILITY WITH CODING PROGRAM	PROCESSING ORDER	OFFICIAL PAGE NO
<b>A4</b>	<b>Stephens L., Oberholtzer L.</b>	<b>Opportunities and challenges for farm to early care and education in settings serving low-income children</b>	<b>2020</b>	✓	✓	<b>1</b>	<b>p+91</b>
A16	Qu S., Fischer L., Rumble J.	Building bridges between producers and schools: The role of Extension in the farm to school program	2019	✓	×		
<b>A30</b>	<b>Rosenthal A., Caruso C.C.</b>	<b>Bringing school foodservice staff back in: Accounting for changes in workloads and mindsets in K-12 values-based procurement</b>	<b>2018</b>	✓	✓	<b>11</b>	<b>p+260</b>
A32	Shanks C.B., Bass T.M., Schumacher J.B.	Montana's beef-to-school project: Making connections to enhance local agriculture	2018	×	✓		
<b>A40</b>	<b>Botkins E.R., Roe B.E.</b>	<b>Understanding participation in farm to school programs: Results integrating school and supply-side factors</b>	<b>2018</b>	✓	✓	<b>13</b>	<b>p+125</b>
<b>A43</b>	<b>Stokes N., Arendt S.W.</b>	<b>Identifying Farm to School Barriers and Keys to Success: Perceptions of Hourly Employees</b>	<b>2017</b>	✓	✓	<b>14</b>	<b>p+493</b>
<b>A60</b>	<b>Carbone E.T., DiFulvio G.T., Susi T., Nelson-Peterman J., Lowbridge-Sisley J., Collins J.</b>	<b>Evaluation of an urban Farm-to-Preschool and Families program</b>	<b>2016</b>	✓	✓	<b>15</b>	<b>p+176</b>
<b>A66</b>	<b>Holland J.H., Thompson O.M., Godwin H.H., Pavlovich N.M., Stewart K.B.</b>	<b>Farm-to-School Programming in South Carolina: An Economic Impact Projection Analysis</b>	<b>2015</b>	✓	✓	<b>16</b>	<b>p+425</b>
<b>A75</b>	<b>Thompson O.M., Twomey M.P., Hemphill M.A., Keene K., Seibert N., Harrison D.J., Stewart K.B.</b>	<b>Farm to School Program Participation: An Emerging Market for Small or Limited-Resource Farmers?</b>	<b>2014</b>	✓	✓	<b>12</b>	<b>p+30</b>

A76	Bateman J., Engel T., Meinen A.	Understanding Wisconsin Producer and Distributor Perceptions to Inform Farm to School Programs and Policies	2014	✓	✓	18	p+45
A78	Pinard C.A., Smith T.M., Carpenter L.R., Chapman M., Balluff M., Yaroch A.L.	Stakeholders' interest in and challenges to implementing farm-to-school programs, douglas county, Nebraska, 2010-2011	2013	✓	✓	2	p
A84	Conner D., King B., Kolodinsky J., Roche E., Koliba C., Trubek A.	You can know your school and feed it too: Vermont farmers' motivations and distribution practices in direct sales to school food services	2012	✓	✓	19	p+320
A95	Izumi B.T., Wynne Wright D., Hamm M.W.	Market diversification and social benefits: Motivations of farmers participating in farm to school programs	2010	✓	✓	20	p+373
A97	Izumi B.T., Alaimo K., Hamm M.W.	Farm-to-School Programs: Perspectives of School Food Service Professionals	2010	✓	✓	3	p+82
A101	Schafft K., Hinrichs C.C., Bloom J.D.	Pennsylvania farm-to-school programs and the articulation of local context	2010	✓	✓	4	p+22
A103	Bagdonis J.M., Hinrichs C.C., Schafft K.A.	The emergence and framing of farm-to-school initiatives: Civic engagement, health and local agriculture	2009	✓	✓	5	p+106
A104	Kloppenburg J., Wubben D., Grunes M.	Linking the land and the lunchroom: Lessons from the wisconsin homegrown lunch project	2008	✓	✓	7	P+439 <sup>18</sup>
A105	Carlsson L., Williams P.L.	New approaches to the health promoting school: Participation in sustainable food systems	2008	✓	✓	17	p+397
A110	Izumi B.T., Rostant O.S., Moss M.J., Hamm M.W.	Results from the 2004 Michigan farm-to-school survey	2006	✓	✓	6	p+168
A112	Vallianatos M., Gottlieb R., Haase M.A.	Farm-to-school: Strategies for urban health, combating sprawl, and establishing a community food systems approach	2004	✓	✓	8	p+413

<sup>18</sup> Two original text pages are on one page in MAXQDA.

B16	Duval, Dari; Bickel, Ashley K.; Frisvold, George B.	Farm-to-school programs' local foods activity in Southern Arizona: Local foods toolkit applications and lessons	2019	✓	✓	9	p+52
B27	Lehnerd, Megan E.; Sacheck, Jennifer M.; Griffin, Timothy S.; Goldberg, Jeanne P.; Cash, Sean B.	Farmers' perspectives on adoption and impacts of nutrition incentive and farm to school programs	2018	✓	✓	10	p+146
B37	Hartline, Morgan E.; Albrecht, Julie A.; Ritter-Gooder, Paula	A Mixed-Methods Case Study of 4 Rural Schools before Initiating Local Farm-to School-Programs	2017	×	✓		

Appendix 4: Summary of the code system, including the main codes, associated definitions and anchor examples established at the beginning of the analysis

## CODING CATEGORY, DEFINITION AND ANCHOR EXAMPLE

### 1 GRÜN - interesting, but not relevant

### 2 VIOLETT - exclusion

### 3 BLAU

### 4 ROT

### 5 GELB - basic information

#### 6 1 common community catering practices (CCCP)

descriptive & non-judgemental: value-free description of commonly utilised practices in community catering before implementing farm to school/kindergarten programs

#### 7 2 weaknesses & criticism about CCCP regarding sustainability

problematic & normative codes: weaknesses, problems and criticism about the currently common food supply in community catering (including schools, kindergartens, early care or education settings) from a sustainability perspective<sup>19</sup>

##### 7.1 01 no poverty

End poverty in all its forms everywhere

*“Low wages and nonstandard employment have contributed to the rise of the working poor (Appelbaum, Bernhardt and Murnane, 2003; Fine, 2005), those formally employed who do not earn enough to support their families. This phenomenon is likely due to many determinants, and Appelbaum and colleagues emphasize the role of wages, which have not kept pace with inflation, as well as the decline of labor unions” (A30: 6: 2579 - 7: 86)*

##### 7.2 02 zero hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

*“Additionally, the school counselor remarks that she is “not certain that obesity is a problem in the school.” Rather, she says that a “lack of access to food—any kind of food” is the more urgent problem.” (A103: 8: 4881 - 8: 5090)*

<sup>19</sup> Notes for definition of sub-categories derive from United Nations (2015, p. 14).

### **7.3 03 good health and wellbeing**

Ensure healthy lives and promote wellbeing for all at all ages

*“Scholars across diverse disciplines have argued that these agrifood system trends threaten the public’s health as well as the environment and rural communities.9-11” (A97: 2: 1040 - 2: 1209)*

### **7.4 04 quality education**

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

### **7.5 05 gender equality**

Achieve gender equality and empower all women and girls

*“Still, a combination of outright discrimination and gender-based occupational segregation has left the majority of women trapped in low-paying jobs with few or no benefits or opportunities for advancement” (2005, p. 4). School foodservice work is no exception: it continues to be a highly-gendered occupation, with an approximately 86 percent female workforce (U.S. Department of Labor Bureau of Labor Statistics, 2018).” (A30: 7: 522 - 7: 956)*

### **7.6 06 clean water and sanitation**

Ensure availability and sustainable management of water and sanitation for all

### **7.7 07 affordable and clean energy**

Ensure access to affordable, reliable, sustainable and modern energy for all

### **7.8 08 decent work and economic growth**

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

*“Inextricably linked to health and nutrition are food and agriculture. Across the country, farmers and farmland are disappearing at an alarming rate in part due to increased competition from global markets. Currently, over 80% of the farmland in the United States is managed by medium-sized farmers whose existence is increasingly threatened.10” (A110: 1: 3861 - 1: 4209)*

### **7.9 09 industry innovation and infrastructure**

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

### **7.10 10 reduced inequalities**

Reduce inequality within and among countries

*“by age four, only 17% of low-income children are enrolled in high quality ECE programs due to limited availability of high quality care in low-income communities and prohibitive cost of care.2,10 The inequities in access to high quality ECE point to the need for evidence-based interventions that increase the quality of ECE for children from low-income families.10,11” (A4: 3: 232 - 3: 608)*

### **7.11 11 sustainable cities and communities**

Make cities and human settlements inclusive, safe, resilient and sustainable

*“Scholars across diverse disciplines have argued that these agrifood system trends threaten the public’s health as well as the environment and rural communities.9-11” (A97: 2: 1040 - 2: 1209)*

### **7.12 12 responsible consumption and production**

Ensure sustainable consumption and production patterns

*“The second area of public concern focuses on the increasing industrialization of the modern food system and the social distancing this creates between food production and consumption.1 Recent media attention to food scares such as E. coli contamination of spinach,*

*uncertainties about bovine spongiform encephalopathy (so-called “mad cow disease”), and debates about the social, environmental and ethical implications of transgenic foods have only stoked widening public perception of an industrialized and globally extended food system gone awry. These food fears and anxieties have made many consumers more interested than ever in knowing where their food originates and how it is produced (Blay-Palmer 2008).” (A103: 2: 1105 - 2: 1829)*

### **7.13 13 climate action**

Take urgent action to combat climate change and its impacts

*“Scholars across diverse disciplines have argued that these agrifood system trends threaten the public’s health as well as the environment and rural communities.9-11” (A97: 2: 1040 - 2: 1209)*

### **7.14 14 life below water**

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

*“Scholars across diverse disciplines have argued that these agrifood system trends threaten the public’s health as well as the environment and rural communities.9-11” (A97: 2: 1040 - 2: 1209)*

### **7.15 15 life on land**

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

*“Scholars across diverse disciplines have argued that these agrifood system trends threaten the public’s health as well as the environment and rural communities.9-11” (A97: 2: 1040 - 2: 1209)*

### **7.16 16 peace, justice and strong institutions**

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

*„Allen and Guthman<sup>14</sup> assert that this lack of federal support symbolizes the devolution of responsibility for the quality of food served in schools from the federal government to local institutions or even volunteers.” (A105: 10: 2517 - 11: 156)*

### **7.17 17 partnerships for the goal**

Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

*„It’d be good. It’d just be extra income for the farmers in the district and those individuals in the district. And any money that we can keep in the district, I’d like to see that. So, that is the benefit. The benefit is to support those people who are supporting the school by their taxes.” (A103: 9: 4059 - 9: 4353)*

## **8 3 visions, goals, motivations and advantages**

### **8.1 visions**

best possible outcome imaginable due to F2S/K, leading to an improved food supply in community catering (regarding sustainability issues)

### **8.2 goals**

main aim to achieve due to F2S/K

### **8.3 motivations and advantages**

motivations to engage in and advantages of farm to institution programs for involved stakeholders

## **9 4.1 challenges and barriers**

*“The findings presented herein show little difference in the perceptions of opportunities, barriers, and social conditions between producers who were and who were not selling to schools. Both groups of*

*producers emphasized the same themes within the opportunities, barriers, and social conditions categories, with the slight difference that, within the barriers category, producers not selling to schools equally emphasized challenges and product standards, whereas producers selling to schools emphasized only challenges.” (A76: 14: 38 - 14: 567)*

#### **9.1 challenges and barriers explicitly beforehand**

beforehand challenges and barriers restricting cooperation's implementation and challenges and barriers being expected to occur

#### **9.2 challenges and barriers in general and during the cooperation**

challenges and barriers occur during a cooperation

#### **10 4.2 how to overcome (hto) challenges and barriers**

approved strategies and ideas how to overcome specific barriers and challenges before or during a cooperation

*“As barriers to purchasing local foods were similar for both groups, wide reaching intervention, education, and policy changes are needed to support programs in overcoming these barriers.” (A4: 12: 2826 - 12: 3020)*

#### **11 5 most crucial challenges and barriers**

Most crucial challenges and barriers (according to the text) explicitly mentioned as those, either called 'major barrier' (or comparable) or described as barrier for a majority of studie's participants. If a ranking of barriers is carried out, the three most mentioned barriers are included.