Investigating Uppsala Regional Alternative Food Networks
– an explorative case study on Farmer-to-Wholesale Food Hubs

En undersökning av Uppsala Regionala Alternativa Livsmedelsnätverk -
en explorativ fallstudie om producent-till-grossist Food Hubs

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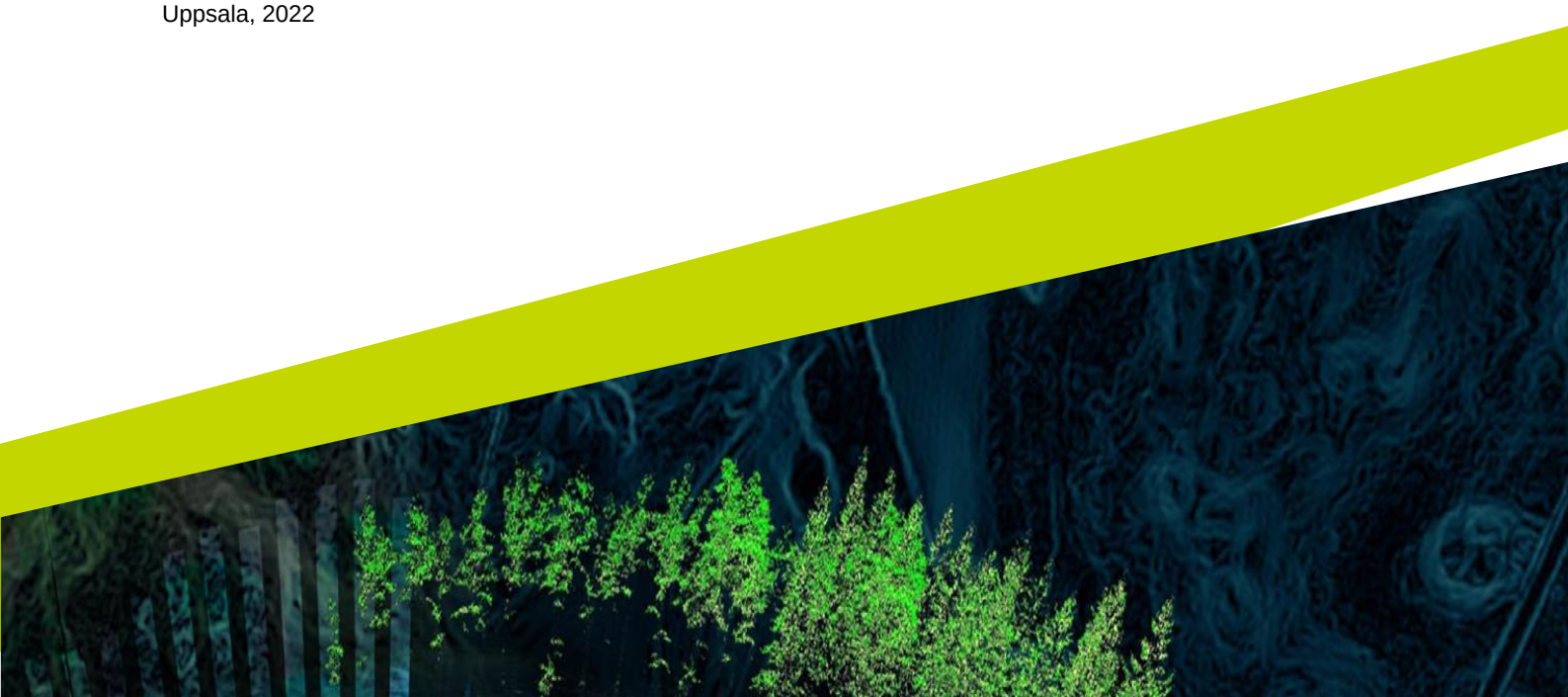

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Abstract

The sustainability crisis that conventional food systems are suffering worldwide has recently led Sweden and Uppsala County to publish reports on new food strategies. Solutions for the problems need collaborative efforts from a multiplicity of actors. This study dives into the role of Alternative Food Networks (AFNs) which offer substitutes to unsustainable food products sourced from industrialised conventional food systems. These networks have always existed, but are increasing in relevance in Sweden, especially in towns like Uppsala as reflected in consumption choices by citizens. However, different factors have made AFNs less relevant and less convenient than in other countries. Many types of initiatives and organisations form AFNs, this study looks at the relevance of a type of initiative called Food Hubs (FHs). A FH is an organisation that is responsible for the aggregation and/or distribution of food products in proximity with the goal of supporting local and regional economies. The aim is to investigate opportunities for the development of Food Hubs in the surroundings of Uppsala City, Sweden and use them to support the development of a sustainable food system in the region. The lack of academic knowledge regarding AFNs in this region resulted in the design of an explorative study. For that, we investigate relevant aspects for the potential formation of a FH by; investigating the attitudes that microenterprise producers and local wholesale buyers have towards this idea of a farmer to wholesale FH. The sample of wholesale buyers consist of a variety of food service actors and four local retailers which already are part of local AFNs or showed qualities that indicated their potential interest. The study also aims to identify some of the products and the approximated volumes that the participant farmers produced. The authors also collect data on the attitudes of the producers toward an increase in production and what their capacity could be if it was used to its full potential without changing their predominantly sustainable methods. Five research questions were formed to answer the above points. All this information was gathered through structured and semi structured interviews. The results show that many microenterprise farmers in the studied region produce mostly livestock and grains, but vegetable and fruit production also occur when the season arrives or in greenhouses. Their attitudes towards increase in production were to a greater extent negative since they felt content with the current models and were sceptical about the costs they would incur and the reliability of it. On the other hand, the wholesale buyers expressed more positive interest towards a FH as they were keen to support local food systems and had since it would theoretically provide local produce conveniently to them. However, they emphasised that they are not prepared to pay more, and that reliability is key for their involvement. FHs have been successful in some parts of the world like the US; hence their feasibility is also possible in Uppsala only if the hubs are able to create value for the actors in this region. Regardless of the negative attitudes towards collaborating with FH and increasing production, we saw many signs of food actors in AFNs who prioritize different values than the CFS.

Keywords: Alternative Food Networks, Local Food Systems, Regional Food Hub, Swedish Food Strategy, Ät UPPsala Län, Small-scale Farmers, Microenterprises, Wholesale, Food Service, Retail

Popular Science Summary

Food is essential for human survival. Therefore, we have the responsibility to secure a sustainable, healthy and sufficient food supply in the long term and increase the chances of survival. In High Income Countries like Sweden, we can say that the main way to produce, distribute and commercialize food is through what is called the "conventional food system". This system is dependent on long & complex supply chains that transport food from far away locations and passing through several intermediaries. And the production is often done on a large scale by specializing in few products and intensively producing it with the goal of maximizing the amounts producest at the lowest cost. In the last decades, the scientific community has been able to prove that the conventional food system is becoming increasingly vulnerable to environmental, social and economic challenges such as population growth, climate change, economic crises, logistical challenges etc… These challenges have motivated the Swedish government to design national and regional strategies and goals around the food system. They include an increase in value and quantities of food supply while supporting sustainable practices and small scale farmers.

This study takes a look at the food system of Uppsala city and surroundings. It dives into the role of "Alternative Food Networks" which is a name given to any network of actors that handle food related products and services in a different way than the conventional system. For example, by aiming to minimize the impact on the environment, supporting local producers, producing rare varieties of food… According to research from other High Income Countries, these networks have the capacity to create systems that are designed to provide healthy and sufficient food in the long term. But these networks face many challenges in a system that is dominated by maximizing profit and production efficiency. Therefore, the authors of this study explore the conditions and attitudes of local food actors towards the formation of an organisation that aims to facilitate the commercialization of food produced by local small scale producers. This type of organisation is often called a "Food Hub" which is defined as an entity that aggregates, distributes and markets source-identified foods from local small scale producers. And since one of the national food strategic goals is to make sustainable food more accessible, we investigate the formation of a Food Hub that aims to supply food to wholesale purchasers i.e. restaurants, cafeterias, caterings, local supermarkets, bakeries etc… We interview both the potential producers and the purchasers about their attitudes towards the idea, what and how much food would be sold through it and what services the Food Hub would have to give to be relevant.

Our results show that most farmers in the studied region produce mostly livestock and grains but vegetable and fruit production also occurs when the season arrives or in greenhouses. Their attitudes towards increase in production was to a greater extent negative since they felt content with the current business models, were skeptical about the costs they would incur and doubted the reliability of the Food Hub. On the other hand, the wholesale purchasers expressed more positive interest towards a Food Hub as they were keen to support local food systems since it would theoretically conveniently provide local produce to them. However, they emphasized that they are not prepared to pay more and that reliability is key for their involvement. Their feasibility is possible in Uppsala only if the hubs are able to create some kind of extra value for the purchasers and consumers in this region that encourages them to internalize the extra costs. Regardless of the overall negative attitudes towards collaborating with Food Hub and increasing production, we saw many signs of food actors in Alternative Food Hubs who prioritize different values than the CFS.

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Abbreviations

AFN - Alternative Food Networks

CFS - Conventional Food System

FH - Food Hub

HIC - High Income Country

SFSC - Short Food Supply Chain

1. Introduction

This chapter introduces the reader to the larger picture behind Alternative Food Networks and Food Hubs. It addresses relevant sustainability issues of the conventional agri-food system, briefly discusses the particularities of Uppsala and Swedish contexts, and ends by presenting the aim and research questions.

Background

Since the industrial revolution, new methods of production and distribution of food have made food systems highly diverse. As countries industrialised, agriculture was also made more efficient, becoming a precursor to economic growth and inducing enormous structural transformations in economies around the globe (Byerlee et al. 2019). Most of the countries at the forefront of industrialization are now High Income Countries (HIC) which have experienced rural restructuring and decreaprodsing relative value of agriculture for domestic growth (Jarosz 2008). A good example is the Nordic country of Sweden, whose agriculture accounts for less than 1.5% of GDP today (Worldbank 2022) and depends on imported food and inputs to feed its population (Sellberg et al. 2020). The food systems that result from this transition are increasingly dependent on long complex supply chains and agricultural specialisation for bringing productive efficiency and feeding its population (McMichael & Rogaly 2005). This global and industrial agrifood system is sometimes referred to as the Conventional Food System (CFS).

The CFS is characterised by offering wide access to a broad variety of imported cheap foods to economies integrated into the global economic system (Trobe et al. 2000). On the other hand, recent literature shows that the new configurations create vulnerabilities and that CFSs are suffering a sustainability crisis (Pollan 2007 ; Vermeulen et al. 2012). Because of the key role of food security for the survival of the human species, it is worthy to highlight some of the issues in today's CFSs. Despite EU agricultural policy trying to reduce the negative externalities of conventional agriculture, the abundant and cheap supply of food in the CFS continues to come at a cost to the environment. The intensification of production and degradation of natural capital causes biodiversity loss, soil degradation, and water and air pollution (Stoate et al. 2009; Rockström et al. 2009). The dependence on cheap imports also generates emissions from long distance transportation contributing to climate change (Rockström, 2009). Socially, the supply chains in the CFS are known to create a power imbalance between the actors along the chain and alienate consumers from the origin of the food (Kalfagianni & Skordili 2018). The complexity of the CFS makes predictions regarding supply and demand difficult which proves its insufficiency for bringing long-term food security and social well-being (Tietz 2021). Moreover, a trend of people leaving rural areas in

HIC because of mechanisation represents a loss of context-specific knowledge and traditional agricultural skills (Jarosz 2008). When it comes to the economic issues of CFS, the 2008 global economic crisis taught us that a global agrifood system is prone to serious shocks in the food markets (Pain 2015). The most affected are often microenterprise farmers whose labour-intensive model of farming is made uncompetitive by increasingly demanding supply chains, lack of economies of scale and an overall bias of public institutions in supporting the industrialised large scale model (Byerlee et al. 2019; Joltreau and Smith, 2020).

If CFSs fail to achieve the needed transitions towards a sustainable food system and equitable regional development, we must develop the tools that enable such risk-averse food system networks. Initiatives by public institutions, private actors and civic society to rearrange the CFS are growing in number and have been referred to as Alternative Food Networks (AFNs). Renting et al. (2003) defines AFNs as: *"[...] a broad embracing term to cover newly emerging networks of producers, consumers, and other actors that embody alternatives to the more standardised industrial mode of food supply [...]"*. We have taken interest in a type of organisation that builds AFNs referred to as a Food Hub (FH). Our interest for it comes from its potential to develop long-term economic, socio-environmental sustainability and resiliency in local food systems. It does so by facilitating collaborations and services among physically proximate food actors, mainly by aggregating and distributing food that is produced in the geographical region where the FH is settled (USDA, n.d). The aggregation of food supplies make the FHs a potential solution for microenterprise farmers who alone can't satisfy the demand of wholesale buyers e.g. food service and retailers. By definition, they are different from the standard agricultural cooperatives or local wholesale distributors in that they also try to deal with the local communities' concerns around food (Matson et al. 2014).

Problem Discussion

The mainstream food systems of mostly the industrialised parts of the world have been dominated by large and/or private corporations that are characterised with huge amounts of production (Cleveland et al. 2014). This has in turn caused negative environmental consequences and social instabilities (*ibid.*). To achieve sustainable food systems by reducing the above mentioned externalities, an increasing interest in alternative food networks has been portrayed. Generally, FHs and AFNs have proven to have the potential to grow local food markets, increase supply of differentiated and ethically produced foods, strengthen the community and social networks, induce healthy food behaviour and consumption patterns of an economy, preserve local knowledge, increase resiliency in local food systems… (Renting et al. 2003 ; Bui et al. 2016; Barham et al. 2012; Stover et al. 2021). In the US, FHs have been seen to successfully fulfil their part in achieving sustainable food value chains (Matson and Thayer 2013) through the swift connection of several producers with small to mid-scale wholesale buyers. They have been referred to as "logistical vehicles" that facilitate local food supply chains (*ibid.*).

Not only have they managed to fulfil social achievements, they have also promoted independent financial profitability (*ibid.*).
FHs are less developed in Sweden than they are in other countries like the US or France (Renting et al., 2012). The success of FHs in other HICs and their underrepresentation in Sweden raises the question of their viability in the studied region. The investigated region consists of Uppsala city and an area of 40km radius; organisations like the described FHs exist and mostly run as traditional businesses, but none focus on wholesale buyers. Most producers choose to form AFNs by selling directly to final consumers, and this has resulted in research with a consistent focus on consumers and their motives (Charatsari et al. 2020). Researchers have summarised the challenges that hinder the development of FHs in Uppsala as; economic viability, the discrepancy of interest and engagement of citizens, a missing organisational network system, limited local funds from regional budgets and partially the current COVID-19 pandemic (Tietz 2021).

We believe that FHs can offer tools and other solutions to some of the CFS challenges that are targeted in the new Swedish National Food Strategy adopted in 2017. The strategy states that it generally aims to strengthen the national food system by making exports competitive while increasing the degree of self-sufficiency and contributing to a sustainable development (Svenska Näringsdepartementet 2017). Uppsala Municipality also followed by designing a regional development strategy in March 2021 with targets to be reached in 2030. A branch of the strategy is the project “Ät Uppsala Län" which includes a 35% increase of production and 50% increase in production value to contribute to a sustainable and competitive Uppsala food system (Uppsala-Länsstyrelsen 2021). The strategy encourages collaboration between food actors and new initiatives by organisations to develop a well-functioning food supply chain with good communication, logistics and sustainable enterprise development. These networks should aim to make it easy for consumers to procure locally produced food and create a reliable local food supply that contributes to open landscapes, crisis preparedness, higher self-sufficiency rates, rural development, among other benefits (Renting et al. 2003 ; Bui et al. 2016).

The identified gap in literature is the lack of sufficient knowledge regarding the conditions and attitudes towards the development of a concrete type of AFN organisation, a farmer-to-wholesale FH in Uppsala. The findings can be used to get further insights into the reality of the microenterprise farmers and wholesale buyers to continue looking for viable initiatives while contributing to the national and regional food strategies.

Purpose

As introduced in the problem statement, the general research purpose is to explore some of the conditions for the establishment of a Farmer-to-wholesaler FH that

covers an area of 40km radius from Uppsala centre. Our first aim is to explore local food supply from the sample of microenterprise food producers including types of food and approximate quantities. Secondly, the authors ask the sample of producers what their attitudes are regarding an increase of production. We follow up this question by asking them if their current capacity allows them to increase volumes. And lastly, the authors explore the attitudes of microenterprise farmers and wholesale buyers toward supplying and sourcing local food from each other with the support of a FH. Below are the research questions that helped us collect the findings:

RQ 1: What type of foods are produced by farming microenterprises (producers) in the studied region and what are the approximate amounts?

RQ 2: What are the attitudes of the microenterprise farmers (producers) regarding an increase of production?

RQ 3: How much are the microenterprise farmers able to increase in quantity of production in terms of current infrastructure capacity?

RQ 4: What are the attitudes towards the formation of a FH in the studied region?

RQ 5: What are the desired services and/or characteristics from a FH in the studied region?

Delimitations

Before presenting any literature, we want to state some delimitations of the scope of this study to further clarify the purpose. Firstly, we decided not to sample intensive large-scale farmers that are deeply integrated in the CFS. That is mainly because they already have the capability to supply wholesale without the need of a FH. In addition to this, there are several reasons for why developing Alternative Food Networks and production models is key for resilience and sustainability of a food system. For example, Sellberg et al. (2020) shares data from Jordbruksverket that affirms how small-scale farming is key for the preservation of pasturelands which are among the most species-rich nature types. It is also important to clarify that the interest in FHs for the studied area is to explore possibilities for wholesale buyers to buy regional food more consistently and help grow regional food systems. The type of FH of interest is one that works with foodservice, retail or institutions, not those who help with sales to final consumers, which already exist in the studied area. Moreover, we did not consider the idea of a food hub that covers extensive geographical areas, in this case it covers Uppsala city and surroundings. The reason for this decision are the benefits associated with social and physical proximity when forming food networks (EU 2013).

We realise that the purpose of this study could be misinterpreted, the reader could think that we are investigating the internal barriers and opportunities of FH

organisations. But our aim is to understand the attitudes of the farmers and buyers towards the theoretical existence of one in the region. The confusion may arise from the fact that an FH can be managed and owned by the farmers and buyers themselves, so when asking for their attitudes, some might share attitudes in relation to the running and management of the organisations, instead of the perspective of it as a third party.

2. Frame of Reference

This chapter introduces an overview of up-to-date research within the topic and related theories. It also gives an overview of the characteristics and peculiarities of the studied region that will be useful for the analysis and discussion of the findings.

Method for constructing the frame of reference

The nature of this explorative study makes a broad literature review. This review provided a good knowledge base with regards to the topic under study. It also enhanced the identification of any inconsistencies surrounding this area of study, i.e. any conflicts in research or any open questions remaining from previous research that could use our own addition. The online databases used to access the relevant articles were Google Scholar, Web of Sciences, the SLU digital library, Epsilon, divaPortal, Uppsala University digital library and some reports, articles and databases found through Google Search. Different keywords were used in the search engines to review the literature including: Alternative Food Systems, Local Food Systems, Conventional Food Systems, Alternative Food Networks, Swedish Food Strategy, Short Food Supply Chains, Food Hubs, Regional Food Hubs, Food Value Chain, Small-Scale Farming, Local Food shed Assessments, Local Food Supply Capacity and more. They were often used in combination with keywords such as; EU, Sweden, Uppsala, Mapping, Wholesale, Restaurants, Retail etc… Most of these keywords were translated to Swedish to find studies and data specific to the area studied.

Firstly, to collect relevant sources on Alternative Food Networks (AFNs), systematic research for existing literature, including up-to-date research and related concepts within the field was done to define the concept and frame the importance of the study's purpose. The scope of this study explores the role of a Food Hub which embraces the locality of a food system and fits into the idea of AFNs. Therefore, any literature that referred to locality was prioritised while other aspects of AFNs such as quality were considered secondary. AFNs literature was mostly based on Uppsala region data from a recently published study called the “BraMaten Research Report” (Stover et al. 2021). It was financed partly by the EU and led by the founder of “Bramaten", a start-up Food Hub in Uppsala that was unsuccessful in finding a viable model and attracting the interest of regional food actors.

Secondly, a thorough literature review on FHs was performed so the reader understands the origin of the concept and the diversity of definitions and types that exist. Using case studies from other contexts allows the authors to have a point of

reference and analyse and discuss the results. Literature about functioning FHs was mostly based on academic case studies and reports from the US. The United States Department of Agriculture (USDA), among other sources, have issued reports where FHs are defined and exemplified in detail using real cases from the US. But whenever possible, relevant literature from Uppland and Sweden was used to represent an accurate current state of literature. The last section of the literature review provided a general overview of the characteristics of the studied area including types of farms and wholesale buyers in a 40km radius from Uppsala centre. It did so by reviewing databases, public reports and internet searches to get a picture of what are the most common foods grown, the most common distributors and any data relevant for understanding the context in which the FH would potentially be created.

Alternative food networks (AFNs)

The definition of AFNs used in this study is taken from Renting et al. (2003): "*a broad embracing term to cover newly emerging networks of producers, consumers, and other actors that embody alternatives to the more standardised industrial mode of food supply [...]*". As we can see, AFNs are not defined by what they are, but by what they are not (Michel-Villarreal et al. 2019). AFNs broad definition result in a fuzzy set of literature on the topic, but to put it simply, their formation is around different values and goals than the mainstream (CFS) and its practices are often "bottom-up" solutions (Gruvaeus & Dahlin 2021 ; Bui et al. 2016). Because of their bottom-up approaches, AFNs often start as reactions to context specific challenges at a community level which usually means that they focus on a limited geographical area. Their expansion is also connected to the increasing consumer interest and demand for local food in Sweden (Granvik et al. 2017 ; Björklund et al. 2008). In a study by Stover et al. (2021), the authors found a clear trend among the AFN managers that they interviewed in Uppsala. The main reason these managers create these networks is because they feel that there are lots of sustainability, environmental, social, and economic challenges that the EU and of course Sweden can only respond to if they develop the agricultural system (Stover et al. 2021). Table 1 can help us understand the differences between conventional food systems and alternative food systems by relating them to contrasting concepts:

Table 1: *Conventional food systems VS Alternative food systems* (Stover et al. 2021)

Conventional	Alternative
Modern	Postmodern
Manufactured/Processed	Natural/Fresh
Mass (large scale) production	Craft / artisanal (small scale) production
Long food supply chains	Short food supply chains
Costs externalized	Costs internalized
Rationalized	Traditional
Standardized	Diversity
Monoculture	Biodiversity
Homogenization of foods	Regional palates
Hypermarkets	Local markets
Agrochemicals	Organic/Sustainable farming
Quantity	Quality
Fast food	Slow food
Dissembeded	Embedded

Engaging in AFNs can have manifold motivations: ecological stewardship, justice, opposing commercialism, preserving heritage, or something as simple as sharing with a peer (Gruvaeus & Dahlin 2021). Every AFN has its own priorities; they can be compared depending on their financial viability, sustainable impact, usability, and engagement level according to Stover et al. (2021). Moreover, food system researchers have observed that a shift from the industrialised conventional food sector towards a re-localized food and farming regime has been signalled by the newly emerging AFNs (Sonnino and Marsden 2005). As we mentioned, they often emerge in HIC as a response to the CFS that farm intensive and industrialised monocultures with complex supply chains, and heavy use of fossil fuels, thus having a huge negative impact on the environment. Additionally, the origin and development of AFNs has been hugely influenced by logistical problems being faced in the small-scale farming business (Stover et al. 2021). By design, AFN platforms are meant to propagate product flow management with little or no fee for their services by decentralising logistics operations that are often managed largely by the producers and consumers themselves.

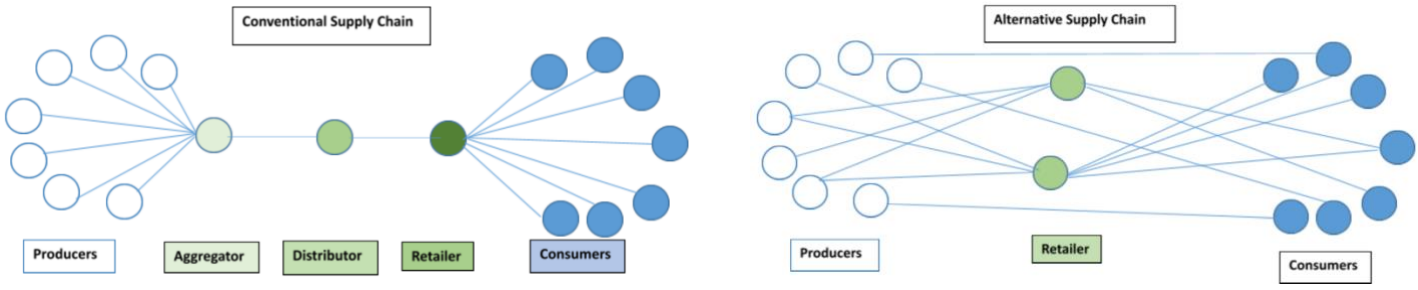


Figure 1: Conventional Supply Chain versus Alternative Supply Chain

Figure 1 shows a visible comparison of CFSs versus AFNs. The food processors are excluded in these visuals as the focus of this study is mainly on the producers

and wholesale buyers. An assumption is made that the producers are responsible for the processing. But in reality, there might be an extra step in between the producer and retailer/consumer such as a slaughterhouse for the meat to be cut and packaged. An alternative supply chain is characterised by its flexibility compared to a conventional supply chain. These networks are often decentralised, and they have no or very limited intermediaries which is an attribute of interest for a lot of businesses and their customers (Stover et al. 2021).

Benefits of AFNs

The most characteristic services are related to aggregating produce, and distribution of food (Stover et al. 2021). Often there is proximity between actors which is what characterises the Short Food Supply Chains (SFSCs) that are formed in the process. Though there are different forms, they share a common characteristic of social and/or physical proximity, meaning that they are geographically close or have few or no intermediaries, which can increase the chances of forming beneficial relationships (EU 2013). These networks hold great potential for helping producers capture a bigger proportion of added value, create conditions for the creation and transmission of new knowledge, make the youth interested in agriculture, and influence public policies (Bui et al. 2016). For buyers and consumers, AFNs bring them closer to the origins of their food, strengthen the community and social networks, induce healthy food behaviour and consumption patterns of an economy (Renting et al. 2003 ; Bui et al. 2016). All of this creates the conditions for innovative ideas and solutions for common problems. Some examples of these initiatives are farmers' markets or Community Supported Agriculture (CSA) and food cooperatives that aim to expand socially equitable forms of production, distribution and consumption of food (Tietz 2021).

From a customers' point of view, SFSCs transfer more complete information about the origin of the food and bring regional development (Giampietri et al. 2015; EU 2013). For producers, SFSCs retain a higher share of added value, the possibility to share intangible values of the local production and the ability to regain market power (EU 2013). Additionally, Stover et al. (2021) allude that considering that products are grown locally, then consumers receive highly nutritious and healthy fresh foods. AFNs also enable increased socialisation between the actors since the products are local and traceable, enabling full transparency to the buyers about food production methods and creating trust.

AFNs do not only represent local and healthy food choices and highlight injustice practices, but rather address deep institutional and societal problems (Korcekova 2017; Tietz 2021). Wästfelt and Eriksson (2017) summarise that the distinction and favour of large scale producers to small scale farmers makes not only the livelihoods of the latter vulnerable, but also the local economy and community. Apart from that, Cappelli and Cini (2020) support that SFSCs can represent a potential lifeline in case of severe crisis and disruption of global supply chains. The concept of "resilience" can help understand the benefits of a strong local food system. Granvik et al. (2017) relates localization to resilience, an adaptation process that any type of system needs for maintaining food security in the long term. For

socio ecological systems, resilience refers to the capability to withstand shocks such as a natural catastrophe or economic crises.
"In socio-ecological resilience frameworks, social and ecological systems are considered linked and interdependent on one another through the connections between well-being, economic activities, and environmental conditions"(Cretney 2014).

Food system resiliency can benefit from some of the characteristics of a local food system. A closer proximity between food actors along the chain can make communication more efficient and respond to shocks faster and more effectively. The decentralisation of power among actors and flexible processes are also key to adapt to the specific local conditions (Granvik et al. 2017). Stover et al. (2021) adds that AFNs have a huge role in enabling more ecologically resilient food systems. There is currently pressure by national and international organisations to adopt practices that are meant to propagate resilience of our land and crops to disasters like drought, floods, climate change and even forest fires (Stover et al. 2021), and thus control climate change. In contrast to the global industrial agricultural system that is degenerative in its processes, AFNs can build soil fertility and boost natural cycles through regenerative agricultural practices that could resist climate change, protect ecosystem services, and improve the soil, biodiversity, and water (*ibid.*). AFNs come in handy to protect and safeguard the vulnerable farmers and their more traditional practices which otherwise could varnish due to pressure of the industrialised food system (*ibid.*). These networks also make it possible to create closed loop food systems by circulating food produce and its waste by-products within proximity (*ibid.*).

Renting et al. (2003) discusses how AFNs embody a potential way out for vulnerable regional production systems, whose survival was threatened by market liberalisation and productivist technological development in the CFS dominated communities. More harmonious interactions within the community are encouraged which in turn lead to increased democratic participation and engagement in governance on multiple levels and allows for more money retention in the communities (Andrée et al. 2019; Sage 2003). But for that, other variables such as the right policy also need to be considered for AFN development. Often, provinces have specific food system policies that accommodate local conditions. The "connectedness" of these policies to the local needs are key to the success of the regional policy. Research finds that applying one type of policy for all puts the smaller scale initiatives and businesses at risk (Stroink and Nelson 2013). Some policy changes and administrative support could be very useful in supporting microenterprises like AFNs. These businesses are important as they play a huge role in supporting the safety and hygiene standards of local farmers. Some researchers even claim that the active participation and effort that AFNs is known to bring, could help achieve social change and sustainable transitions on national and global level (Grauerholz & Owens 2015; Holt Giménez & Shattuck 2011). However, there is an overestimation about the desired transformations in civil societies (Holt Giménez & Shattuck 2011). It is undeniable that AFNs do challenge political authorities, corporate food regimes, and the responsible persons in decision making like big retailers, but these powerful actors often prefer to

maintain “business as usual” mechanisms for sustainability (von Oelreich & Milestad 2017).

Barriers of AFN development

Besides many opportunities and benefits, difficulties lay in the relocation of food systems. These can arise from a shortage of mediators in the food supply chains, lack of infrastructure to replace the dependence on the conventional system and from a difficulty of facilitating ecologically responsible farming methods (Clapp 2020)**.** For example, most Swedish farms are family owned and during peak season, labour shortage problems and high energy prices are faced (*ibid.*). This in turn creates imbalances between fixed assets put or incorporated into the business versus the outputs/profits (*ibid.*), reducing chances of any interest in collaborations. They struggle to even hire new employees so that they have enough labour due to the fear of tax burdens. Therefore, common considerations have been that any successful AFN has to offer better margins to the producer compared to the CFS network (*ibid.*).

Part of the economic instability also comes from the difficulty of encouraging food actors to trust and collaborate with an AFN in the long term. A clear benefit is expected from the AFN to the farmer and/or consumer for very little or no money at all. This has made the financial feasibility of AFNs a challenge. However, according to Stover et al. (2021), the ability to generate enough revenue to meet operating expenses and still manage to service and grow can be financially viable. Those AFNs that have some membership fees, order fees or some mark-ups on the sold products to cover some administrative costs are the ones thriving and with higher status (*ibid.*). But those that have already been established in one type of AFN run the risk of not willing to change because they usually function thanks to loyal customers in their communities. This hinders them from raising prices to be more profitable as they want to keep them affordable so that relationships are maintained with their neighbouring long-time customers (*ibid.*).

Some producers design AFNs by selling directly to the consumer, but many feel that a lot of time is invested and used up when preparing and following up on orders (*ibid.*). But actors continue to work with them because the alternatives are not attractive. This is clear in Stover et al. (2021) quote: “*several producers confirmed that they participate in AFNs because they appreciate the ideals behind the concept, but that the distribution of their products within these networks does not generate a real income*”. It's important to note that not all organisations or networks that call themselves AFNs support small scale farmers. This causes market confusion, resistance, and insincere competitions between food actors (Stover et al. 2021). These barriers are generally a product of the underdeveloped AFNs and little knowledge and engagement from society. Clapp (2020) describes some of the social challenges for the development of AFNs as balancing and making justice prevail in global food systems and creating awareness about the problems. A crucial requirement to keep an AFN going is active participation, however, it is increasingly difficult to achieve this because in urban areas, a continuous

disconnection between production and food consumption is progressing (Clapp 2020).

Regional Food Hubs

While the definition of Alternative Food Networks refers to any alternative configuration of a food system, "Food Hubs" are a concrete type of AFN organisation that deals with services related to the distribution of local food. Since FHs are less developed in Sweden than they are in other countries, the fuzziness of the concept results in broad definitions like the one provided by The US National Food Hub Collaboration. This definition is also arguably the most widely used one (Fischer et al. 2015):

"a business or organisation that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand" (USDA, n.d)

This definition refers to the role of FHs in making regional food transactions more efficient by aggregating and distributing food. It makes clear that FHs embrace locality; it's in their nature to work with geographically proximate food actors. The definition also emphasises two main characteristics: (1) on the supply side, a FH provides services and creates opportunities to enter new markets, (2) on the demand side, a FH offers added value by facilitating access to source-identified food. This definition does not tell us much about the structure of the organisation or its more specific operations, allowing us to refer to many types of organisational arrangements as FHs. For example, a Non-Profit FH whose goal is to increase access to healthy food versus a Cooperative FH whose goal is to facilitate local food transactions (Fischer et al. 2015). A broad definition is handy for an explorative study especially if the concept at stake has not been studied much.

On the negative side, the broad scope can make the food actors underestimate the potential of FHs and AFNs in providing more than the neoclassical cost and benefit analysis of value. FHs are special because they add value to the actors involved and sometimes to broader society *(ibid)*. Fischer et al. (2015) analysis of the definition of a FH helps us understand this:

"...there is a strong narrative in the (albeit scant) food hub literature that to earn the title of "food hub" (as opposed to "regional food distribution business"), an entity needs somehow to do more than just conduct this type of business—that they need to be a regional food distribution business "plus". *It is the meaning of* "plus" *that has proven difficult to distinguish or categorise."* (Fischer et al. 2015))

This "plus" could be anything from saving time costs, improving market share, reliability of supplies and differentiating products to broader impacts similar to those that AFN have, like preserving the quality of farmland, introducing the use of

sustainable agricultural practices, supporting the viability of microenterprise farmers, and making healthy food accessible to the population (Barham et al. 2012). They work closely with both supply and demand sides and help negotiate acceptable conditions. The possible dismissal of the "plus" when defining the value-oriented Food Hub, made some academics like Barham et al. (2012) use the term "Regional Food Hubs" where he defines them as "*mechanisms for creating large, consistent, reliable supplies of mostly locally or regionally produced foods".* Adding the word "regional" stresses the "alternative aspect" of a FH, but for simplicity, our study will refer to them as Food Hubs (FHs).

FHs can provide a broader range of services such as investing in food distribution infrastructure (e.g. owning or renting a warehouse and a truck for drop-offs and pickups), in processing infrastructure (e.g. packing, labelling and light processing such as trimming, cutting) and in storage (e.g. owning or renting cold/dry storages) (Barham et al. 2012). Some FHs may collaborate with other actors who can provide these services instead of owning the infrastructure themselves. It should be clear by now that FHs are not to be mixed up with a farmers/public market. The main difference is that farmers' markets do not usually coordinate supply chains and actively help farmers expand their capacity to market their products. But there are exceptions, Barham et al. (2012) reports that some farmers/public markets in the USA are diversifying their operations by getting involved in aggregation and strategically helping the farmers which can be referred to as FH activities. To understand the diversity of FHs we reviewed different types of classifications of them. Horst et al. (2011) classified them by some of their functions on Table 2. Barham et al. (2012) classifies them by the market that they serve and by their legal structure. This study will refer to a Farm to business/institution model when talking about an FH.

Table 2: Types of FHs classified by the market they serve (Barham et al. 2012)

By functions	By market they serve	By legal structure
Online Food Hub Network	*Farm-to-business/institution model*	*Nonprofit FH:This one will often be initiated by civic society.*
Ethnic/Artisanal Food Hub	*Farm-to-consumer model:*	*Privately held FH: Owned by one or many individuals*
Education and Human Service–Focused Food Hub	*Hybrid model*	*Cooperative FH: Owned by producers and/or consumers.*
Neighbourhood-Based Food Hub		*Publicly held FH: State or city-owned FH*
Regional Aggregation Food Hub		
Rural Town Food Hub		
Hybrid Food Hub		

Opportunities and challenges for development of a FH

FHs are often formed with bottom-up approaches, and this requires diversity, connectivity, trust and communication between the actors to innovate a viable way to run it (Stroink and Nelson 2013). In places like Uppsala, farmer-to-wholesale FHs are non-existent and farmers/wholesale buyers interested in one may have to be involved in starting it. This may be a barrier for both the farmers and the wholesale buyers who do not have the knowledge or resources to bring it to life. The initiation process of FHs can be explained through the theory of Complex Adaptive Systems (CASs). This theory states that food systems, including local and industrial systems, are dynamic and constantly evolving together (Stroink and Nelson 2013). Because of the dynamic changes, it is hard to predict outcomes and food actors become hesitant to join them and risk falling into a poverty trap (*ibid*). Another challenge is how the development of FHs and AFNs are closely correlated to the development of ICTs (Information and Communication Technologies) as these tools are relatively inexpensive and increase the convenience of ordering and transfer of information. This may affect the receptivity of certain actors who prefer doing business the way they have always done. On the other hand, this could also be an opportunity for actors who are open to innovate and/or are used to the technology. ICT developments are examples of initiatives that have enabled producers and customers to interact and make it easier to communicate, connect and manage logistics better (*ibid*). These platforms offer a collaborative connection service compared to the logistics services of the centralised models (Stover et al. 2021). Following sections present opportunities and challenges for producers and wholesale buyers separately:

Producer Opportunities

FHs takes the role of a distributor and offers the opportunity to microenterprise farmers to grow their business and/or diversify market channels. The more straightforward benefits that producers get from FHs are the services they can offer. Table 3 is a list of services provided by FHs in the US:

Table 3: Common services provided by a FH (Barham et al. 2012)

Operational Services	Producer Services
Distribution	*Actively linking producers and buyers*
Aggregation	*Transportation, on-farm pickup*
Brokering	*Production and postharvest handling training*
Branding and market promotion	*Business management services and guidance*
Light processing	*Value-added product development*
Product storage	*Food safety and good agricultural practices (GAP) training*
Packaging and repackaging	*Liability insurance*

Producers often lack economies of scale and infrastructure to access more demanding commercial food service or retail markets on their own. A FH attempts to solve this issue through SFSCs that use collaboration, transparency and sharing to attain an efficient distribution system (Stover et al. 2021). By opening the doors to wholesale buyers, farmers can diversify their income sources and diversify production. Moreover, working with a FH often implies a collaboration for coordinating prices and quantities according to the anticipated demand, which represents long term security. FHs are also able to differentiate the food products in the market and charge a premium for being locally produced (and often organic or produced more traditionally) which increases the total profit in the chain. On top of that, the SFSCs that characterise FHs allows the farmer to retain more value relative to conventional long food supply chains (Barham et al. 2012). But this does not always mean more profit, it depends on the efficiency of FHs in providing their services. Another opportunity that a FH can offer is to help and educate the farmers on the dynamics of today's food system. These can provide educational activities related to production, health, composting, recycling and even cooking. Being directly involved in food distribution, FHs can help to stabilise and create a fair market and promote the sharing of resources among businesses (Stroink and Nelson 2013 ; Barham et al. 2012).

Producer Challenges

Farmer to wholesale FHs is non-existent in Uppsala and little is invested to develop them. Those selling directly to consumer markets may feel like joining a FH represents a loss since it will most likely take a share of their profit. For microenterprise farmers, this form of commercialization is not viable since it means additional labour, infrastructure, and land available. Moreover, the fact that many farmers may also desire to use environmentally friendly methods of production, can make it costly for them because of the limitation of what kind of inputs they can use (Barham et al. 2012). More barriers that they perceived in joining a FH are the costs of following the product's liability risk and the lack of processing facilities for livestock producers to supply enough (*ibid.*). The multiple case study by Barham et al. (2012) shows that small scale producers experience difficulties to meet food safety requirements from the buyers, preventing them from joining a FH. And some buyers may require insurance or certain certifications that producers may not be willing to acquire. Another challenge for producers selling their produce through wholesale is that the locally produced product might compete against substitutes that are labelled as local but are only locally processed or prepared (*ibid.*). Lastly, it's possible that small scale farmers feel comfortable with their business model and have a customer base that they are loyal to and a business model adapted to direct sales which makes them hesitant to join a FH and stop selling to their current customer base (*ibid.*)

Wholesale Buyer Opportunities

For wholesale buyers, the FHs represent being able to purchase food in bulk from any type of producer in a single transaction. Meaning that they have access to any scale and type of farming; big/small and traditional/conventional farmers. These

wholesale buyers can also benefit from a variety of services that the FH can offer. Based on (Barham et al. 2012): delivery systems, ordering systems, light processing, linking to farmers, value-added product development and liability insurance. From the mentioned services, the key economic opportunities for wholesale buyers are to save costs of buying from independent local farmers since FHs aggregate the food and sell it all in one transaction. Another opportunity comes with diversifying supply; the buyer has more foods to choose from and can supply food when the standard distributors are not able to deliver enough or the right type of food. Moreover, producers in a FH may grow types of food that are not common in the global market (Barham et al. 2012). The differentiated characteristics of a FH can add value to the food sold; it can be marketed as healthy, fresh, socially and environmentally sustainable which allows the foodservice or retail to charge a premium and increase their revenues.

Wholesale Buyer Challenges

Economic barriers were the most prominent barrier to joining a FH. The most common is that the wholesale buyers do not buy from FHs because the food often costs more than their conventional distributor (Barham et al. 2012). This is often the case even if the supplied products are differentiated and represent a competitive advantage *(ibid)*. Hellwinckel & Velandia (2016) find that there are mixed results regarding the attitudes towards buying through a FH, some would like to pay the same as they do now, and others add a premium for the services of the FH. In areas where agriculture is relatively scarce, the inconsistent or insufficient supply of local foods can make wholesale buyers hesitant to commit to buying from a FH in the long term (Barham et al. 2012). Wholesale buyers also shared that the small-scale producers do not always meet the policy requirements of food safety or do not have the official certifications that they demand when buying food products (Hellwinckel & Velandia, 2016). Hellwinckel & Velandia (2016) study in the US asked 20 restaurant chefs who described the challenges they face when they use local food in their menus; finding the right amounts and varieties of food, the costs of logistics and transport, the potential higher prices, the time spent buying the food and the ability to transfer the cost of the value-added food to customers (Hellwinckel et. al, 2016). These challenges matter for retailers too, the difference is that they usually can adapt to the varieties of food a bit easier.

The local food system

To study the potential of an organisation that distributes locally produced food, there is a need to gather information on the types and quantities of food currently produced and the estimated maximum production potential of the area. “Food shed” emerged as a concept used when analysing local food systems; it was originally used to refer to the geographical area that provides food to a certain community of people. It is also used to represent the importance of protecting the source of the food we consume (Peters et al. 2009). Galzki et al. (2015) add that the direct

connection between people and agricultural land instils a sense of responsibility among local actors. There is a great deal of pride associated with increasing the self-sufficiency of a community (*ibid.*). Blum-Evitts (2009) points to the importance of local food sheds because of their potential to help develop alternatives to the global CFS. Understanding the local food shed in terms of types and quantities of food can bring benefits such as regional development, promoting local business activities, social and environmental benefits (*ibid*). In a system where all actors (producers, wholesale buyers, and consumers) are capable of understanding where their food is produced and relate it to their regional characteristics (because the products are embedded with information), direct relationships with strong bonds of trust are created (Aggestam et al. 2017). Following is a section that presents the characteristics of the area under investigation.

Uppsala region food system

The Swedish food system is oligopolistic, meaning that it is very concentrated and includes relatively few key stakeholders (Stover et al. 2021) This is exemplified by the limited number of dominant retailers with 96% of grocery shopping being done in the 3 major retail chains (Ica, Coop, Axfood). It is also characterised by productions that are linked to fossil fuel intensive monocultures, and large supply chain participants. This has excluded small scale farmers that make use of alternative and more sustainable production methods. More trends that create obstacles for microenterprise producers operating in AFNs are seen in Sweden according to Stover et al. (2021). For example, since the COVID 19 pandemic, online food purchases have increased, meaning producers have to be in a position to deliver home deliveries for customers, which is a challenge for most microenterprise producers.

Large grain production dominates this region of Uppsala Municipality. Half of the arable land is used for grain farming by local producers, making it one of the nation's bread baskets. It also has natural pastures that are in good condition, food tourism and close proximity to large markets (Länstyrelsen-Uppsala-Län 2019). In research by Lönnerud (2012), the author lists the main foods produced in Uppsala as grains, dairy products, meat and eggs, vegetables, fruits and berries. Sweden is generally a net exporter of grain and in the investigated region, overproduction of this grain has been experienced (Lönnerud, 2012). The production of animal foodstuffs such as milk is lower in Uppsala compared to Sweden generally (ibid). When it comes to meat production and supply, it is considered low since local production only caters for about a fifth of the local need (*ibid.*). Sweden does not have a lot of land suitable for crops, but a great share of natural pastures, which farmers use to raise and sell high quality meat and dairy (*ibid.*) However, there are signs of trends that may reduce the amount for meat per capita soon, such as meat alternatives promoted to fight climate change. But the demand is not likely to disappear completely, and locally produced meat can serve as a substitute for imported meats. The area studied included some of the Stockholm-Mälaren region which is also dominated by grain (Sellberg et al. 2020). About 35% of the national

grain production comes from this region. However, over the years, it has been observed that agricultural land area has decreased whilst total production volume remains constant, an indicator of intensification of production. The studied area is at a medium altitude and is formed by the city of Uppsala with its ~235.000 inhabitants and surrounding towns like Enköping, Märsta and Knivsta with no more than ~28.000 inhabitants each (*ibid.*).

Sweden, Uppsala & AFNs

In the strategies and action plans of "Ät Uppsala län", the involvement of diverse stakeholders and supply chains are seen as crucial to building a sustainable food system (Stover et al. 2021). As of now, the existing AFNs do not have power enough to change the food system or fully support microenterprise since they aren't financially viable. There is still a need for more work and maximum support from the government through supportive policies. If implemented well, local food networks could aid the Uppland region in reaching its 2030 agenda of a more sustainable food system. Research has shown that it is difficult to maintain economic viability by AFNs in Sweden (Stover et al. 2021) due to the limited number of engaged participants. In most cases, actors in AFNs must sell their services to bigger suppliers (e.g., bigger retailers) or integrate with the CFS to be able to stay afloat economically (*ibid.*). Labour issues also characterise AFNs in the Uppland region as they depend on free labour. The business holders end up overworking and taking up duties that could have been done by respective employees, without any compensation for it (*ibid*). Also, because most farmers value loyalty, they prefer not to collaborate (regardless of the possibility for expansion and a chance to sell more) and sell to their loyal customers instead of "strangers" (*ibid*).

Stover et al. 2021 make a good point when they say that the concept of a AFN lies somewhere on the spectrum between a professional middleman approach that aims to grow a sustainable business and a sharing economy community building approach with no fees and no ambition to be a profit-driven business. There are different models that can easily describe and divide AFNs in the Uppland region of Sweden according to Stover et al. (2021). These are all presented under Appendix X together with a list of functional AFN initiatives that have been identified in Uppsala over the years. Seven AFNs are described according to Tietz (2021):

- *UltiMat*, a food cooperative and non-profit association at Ultuna Student Union UltiMat which acts as a forum for the distribution of local and sustainable food in Uppsala. The organisation is built with eight board members who carry out their assignments voluntarily. They work with 16 farmers who live in or are close to Uppsala and were chosen according to three criteria: local production, environmental care, and animal welfare, and having no intermediaries.

- *The Campus Garden* aims to lower the climate footprint of the city by gathering different ideas from staff and students at the Swedish University of Agricultural Sciences and Uppsala University. The AFN provides a platform for collaborative education and research towards a sustainable food future. Based on their Facebook page, the AFN is very active and has a total of 644 followers now. They have organised several activities, and one of the most recent one is the Open Gardening Day where they prepare the kitchen garden and continuously plant new crops.

- *REKO Uppsala* is the most successful AFN in Uppsala. This is evidenced by its member numbers on its Facebook platform (16800 members). It does not consider itself to be an organisation or a company, so there is no membership and no concealed costs. This platform purely connects local producers from Uppsala County with consumers without the involvement of any intermediaries.

- *Svenska Delikatesser*, a small grocery shop that sells only organic and local food that is strictly produced in Sweden.

- *Bruised Food Club*, a nonprofit initiative which aims to prevent food waste and stop hunger in the city of Uppsala. It collects food wasted in food service and retail and donates it through what is called a "rescued food market". According to their impact report of 2021 they rescued 7.9 tonnes of food which they donated to 2.500 people.

- *Flogsta Matkooperativ*, working as a direct link between local farmers and consumers to order and buy organic products directly from the farmer. It also provides a platform for producers and customers to interact and share experiences. It is not very big (161 followers on Facebook) and has been inactive since the COVID 19 pandemic started.

They operate on different focus points such as lowering climate footprints, distribution, and prevention of food waste by redistribution practices, and promotion of organic farming and purchase of organic foods. Another AFN organisation called "*BraMaten´s*" primary idea before it became a local food cooperative in the Väktargatan community, was to create a semi-professional and more business-oriented Food Hub aimed at final consumers but was not successful. Managers from the studied regions AFNs have proposed several innovative ways to make viable and convenient alternative food networks, for example, small scale producers can have collection points at the farm where customers buy directly. It is very convenient for the producers but however, it restricts customers. What is more convenient for consumers is the "Home Delivery Door-to-door" strategy. This is however time consuming and very expensive for the microenterprise farmers, who are probably already struggling financially. Further, meeting points with pre-ordered products have also worked before where customers pre-order and then meet the producer to pick them up at a designated pick-up location.

Stover et al. (2021) mention that one of Uppsalas biggest challenges is also the lack of strong networks between farmers which other regions in Sweden have and allow them to have more successful initiatives. Regardless of the many challenges faced, their study showed that producers have optimism about AFNs since there is a rising trend in the interest in locally produced foods (Stover et al. 2021). The research by Stover et al. (2021) recommended concrete approaches for how AFNs can be formed in the Uppsala Region, which are valuable as starting points for the discussion of our own results.

"The business-friendly approach"

96% of Swedes do their shopping from the main grocery store chains. This approach of the formation of an AFN adapts to the mechanisms and structures of the CFS by introducing the local foods to already established markets. The idea is that creating structures and operations and bringing these to people rather than bringing people to them is more efficient. For example, Stover et al. (2021) suggest that the AFN organisation could be hired and work within a distribution or retail company to get access to their infrastructure. Or the AFN organisation can operate as an external business for more than one wholesale buyer or for the producers as a type of FH. The authors of the same study exemplified roles of an FH in this approach as the following.

"These external local food hubs would for example: support the digitalization of local farmer stories and products; bring micro-farms together under hyper-local brand names; organise processing, certification, and collection of goods from farms to the large retailers nearest hub or to public sector buyers. The large retailers would then use their extensive resources to store and refrigerate the products and manage the sale and distribution to customers." (Stover et al. 2021)

"The grassroots bottom-up approach"

The key aspect of this second approach is that the producers form and own the organisation themselves. Creating more chances to clearly separate their differentiated products in a market where consumers don't fall into the trap of choosing the cheaper and less sustainable alternative. This type of market is preferred by customers who demand transparency and want to support grassroots movements. An example is REKO RING that takes no fees for their provided services. The problem is that organisations like REKO RING become difficult to manage the bigger your volumes sold are because of their Facebook ordering system. And the buyer also spends time ordering from the different producers. Therefore, REKO is not the best alternative for wholesale buyers who want to order bigger volumes.

Stover et al. (2021) present a third more radical model called the "**resilient food communities (the whole systems approach)".** Here, multidisciplinary approaches by different stakeholders to build community and a transformation of the culture around food would bring the needed environmental and social long-term solutions to our challenges. These descriptions go beyond the creation of one AFN organisation, they refer to more holistic and systemic changes that include direct involvement by citizens, private companies, government agencies etc.... They are

very valuable points to keep at the forefront of any kind of development as it builds social capital and creates context specific knowledge that is valuable in the face of long-term challenges.

3. Methodology

In this section, the methods applied in the study are described. To begin with, a presentation of the research philosophy and approach is given, followed by the method for constructing the frame of reference, data collection and data analysis methods. It ends with a discussion of the trustworthiness of the research.

Research Approach

The philosophy of this research is represented through the choice of research paradigm. This social study follows an interpretivist approach where the subjective descriptions of reality are the base for what is regarded as reality (Collis and Hussey 2013). The approach is often used for exploring social phenomena such as the attitudes towards an innovative idea which cannot be accurately **measured** or hypothesised. Since this study aims to understand food actors' attitudes towards the idea of a FH, an interpretivist paradigm is essential. Moreover, this study takes an inductive research approach which aims at investigating patterns and ideas rather than testing a hypothesis. This kind of study needs a transparent and "self-reflexive" process, in inductive research it is quite difficult to do objective research whilst excluding one 's own positionality in the research process (Reiter 2017).

The current research uses an Explorative Case study research approach. The research problems identified in this study are broad and the available literature scarce, making it fit for exploratory research. An exploratory study refers to making attempts to discover new and interesting things by working one's way through a research topic (Swedberg 2020). These studies can take different forms depending on the purpose; they can consist of a non-researched topic that is given a first tentative analysis or an already researched topic that is further explored to get new ideas and maybe new hypotheses (Collis and Hussey 2013). There are standard, informal, high risk, and pilot explorative studies. The current study is categorised as a standard explorative method used when the topic is little known, and the aim is to produce publishable work using a mixed method approach (*ibid.*). Within these exploratory research, both qualitative and quantitative methods can be used. Kelle (2006) simplifies this in a statement: "*....in a sociological investigation, quantitative methods can describe the actions of large numbers of different actors, whereas qualitative methods provide information about possible reasons for these actions".* Hammarberg et al. (2016) supports these notions by adding that what qualitative methods do is to answer questions about the meaning, perspective, and experiences from the participant`s point of view.

We chose a mixed method approach that makes use of semi structured interviews as our Case study's data collection method. The quantitative side of our research is

the compilation of estimated amounts of foods produced from the interviews while the qualitative side is the findings of the participants' attitudes.

Our focus is on the Uppland region, and all participants interviewed were from this region. Starman (2013) explains that a case study has been debated over the years to be a method of research on its own but however, many documented research have used it as a form of qualitative research. We have followed this route in our study. Adding to the above, a "*Case study research aims to explore and depict a setting with a view to advancing understanding*" (Cousin 2005). Below, Figure 2 gives a visual presentation of the research approach and methods used to answer our research questions.

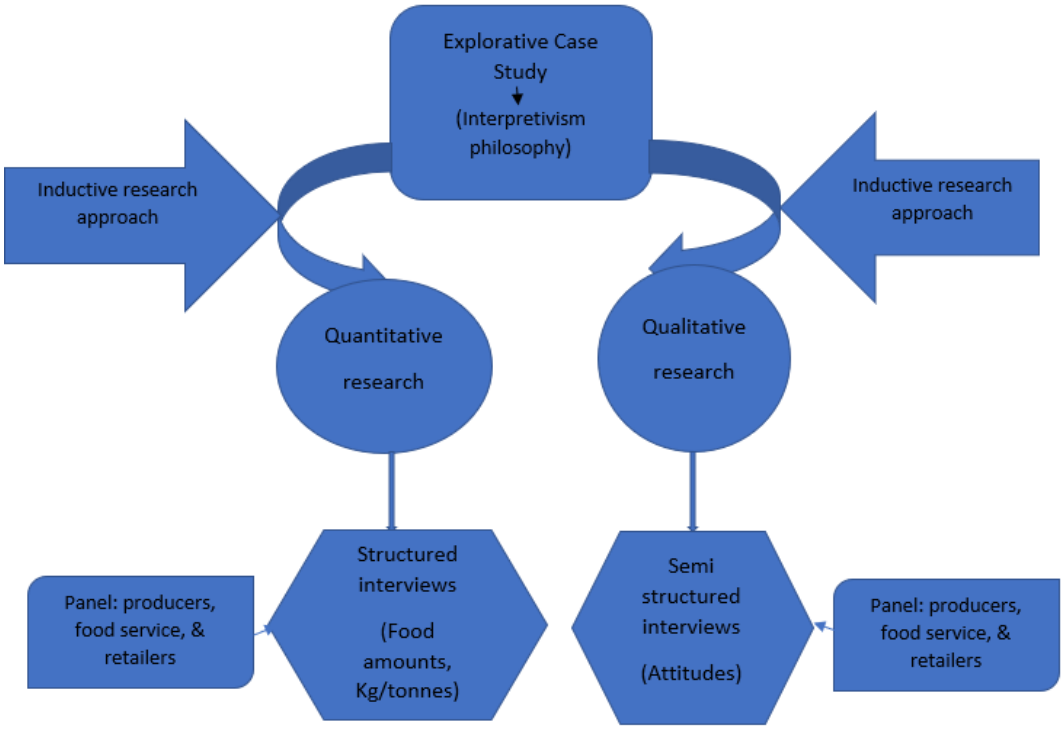


Figure 2: Research approach

Data Collection

This qualitative data collection consisted of interviews. The objective was to gather in-depth insights on the attitudes of actors (producers, food service, and retail) in Uppsala towards the idea of introducing a Farmer-to-Wholesaler FH in their area. Because of the diversity in characteristics of participants (type of business, types of products, types of sales channels, different customers, etc.), the questions were adjusted accordingly to fit the context and increase the quality of the responses. The producers had a separate set of questions compared to the restaurants and/or retailers (Appendix B).

Interviews

A popular way to gather qualitative research data are interviews, a widely used type are semi structured interviews (Griffee 2005). This method has been chosen for this study because questions are predetermined but also open- ended, meaning that the participant is free to ask for clarification or explain more than what is asked, allowing for deeper discussions and unexpected results (Collis and Hussey 2013). Before an interview, the interviewer needs to carefully design it to get a smooth interview flow, i.e. deciding whom to interview, how many interviews to make, what questions to ask, the venue or location to carry them out, when to stop, how to collect the data (taking notes, just listening, recording and transcribing later), etc. (Griffee 2005). This study explores a wide and complex field of knowledge which has resulted in a diverse sample as an effort to get a representation of all the participants.

First, we decided whom to interview based on our research topic (Uppsala food actors). We made an estimate of how many people we would like to interview which was initially 30 for each of the actors (producers, food service and retail) in a bid to have a representative sample size. Further, we decided we would record, take notes and transcribe the data collected afterwards. The plan was to stop once there was nothing new being obtained from the interviews. The questions interview guide was adapted for each type of groups of interest which were divided by producers and wholesale buyers, and by the type of food served. But they were presented in the same order to all participants in each group, which is important in research. A set of flexible questions was useful to control and ensure the conversation did not get out of line but still covered the valuable parts of the topic being studied. It is referred to as the "interview guide" and can be found under Appendix B. To get some useful insights that may have been missed in the answer, some follow up questions to explain *why*, *why not*, and *how* were added. The interview process was made as simple and casual as possible to enable participants to express themselves openly so that the real attitudes were gathered. Notes were taken during the interviews; audios were recorded, and data transcription was done as soon as the interview sessions were completed to remember the nuances of the conversation. Table 4, 5 and 6 presents the types and characteristics of the interviewed individuals: producers (P), food service (SE), and retailers (RE). In addition to the characteristics, the producers were asked to estimate quantities of foods they produce, and the results are presented in Table 7 in the results sections.

Table 4: Producers

Codes (Producers)	Type of Producers	Characteristics (Type of production)
P1	Meat producer	Organic
P2	Meat producer	Conventional
P3	Meat producer	Organic
P4	Meat producer	Grass fed
P5	Meat producer	KRAV certified
P6	Meat producer	Organic & Grass fed
P7	Meat producer	Grass Fed & KRAV certified
P8	Meat & Dairy	KRAV certified & Grass fed
P9	Meat & Honey	KRAV certified & Grass fed
P10	Meat & Grains	KRAVcertified & Grass fed
P11	Meat & Grains	Grass fed beef & Organic
P12	Game meat & Grains	Wild meat
P13	Vegetables, Fruits & Meat	KRAVcertified
P14	Vegetables	KRAVcertified
P15	Vegetables	KRAVcertified
P16	Honey	KRAVcertified

Table 5: Food service

Codes (Food service)	Type of Food Service	Characteristics: Size of Food service (servings per day)
SE1	A la carte dinner	60-80 diners/ day
SE2	A la carte dinner	*Not specified*
SE3	Lunch & Catering service	200 diners/ day
SE4	Small cultural restaurant	40-50 diners/ day
SE5	Catering for big school Casual Lunch & Dinner	300 diners/ day lunch for school kids 50 dinner diners/ day
SE6	Casual Lunch & Dinner & Catering	80-90 diners/ day
SE7	Catering for big private preschool Lunch casual restaurant	180 diners/ day
SE8	Lunch & weekends dinner casual restaurant Catering	120 diners/ day
SE9	All day dine-in restaurant	30-40 diners/ day
SE10	A la carte dinner	40 diners/ day
SE11	Franchise casual cultural	100-120 diners/ day
SE12	Bakery franchise (2)	200 customers/day
SE13	Bakery	100 customers/ day

Table 6: Retailers

Codes (Retailer)	Type of Retailer	Characteristics: Size of Retailer (Yearly Revenue)
RE1	Gourmet meat retailer	38 881 000 KR
RE2	Ethical retailer of food and artisan products	5 735 000 KR
RE3	Ethical retailer of food and artisan products with a focus on local food	2 834 000 KR
RE4	Ethical retailer of food and artisan products	1 000 000 KR

In total, 16 producers, 11 restaurants, 2 Bakeries and 4 retailers were interviewed. All of them were within a 40km radius from Uppsala city (Map in Appendix A). A total of 33 interviews, from over 70 that we initially contacted, were done. And regarding food service and Retail, more than half denied their participation mostly because of the time-consuming nature of a food service business. Due to the slowly recovering COVID 19 situation and for convenience, most interviews were done by phone and digitally through zoom (2).

The selection of producers was done by searching on the internet, mostly through websites like Ekologisk-mat.se, Gardsnara.se, and Fjardhundraland.se or through local distributor organisations such as Uppsalabondens and Gårdssällskapet. These were the producers who make themselves available on the internet and are

contactable either through calls, emails, or Facebook messages. The focus was to only collect from micro-enterprises, which according to the EU must have a turnover of less than 2 million Euro and fewer than 10 employees (Stover et al. 2021). This is because most large scale or intensive conventional producers are already maximising their production, and the Swedish food strategy (Tietz 2021) also mentions strengthening opportunities to small scale producers as well, thus our study serves to fulfil this purpose. Only 1 out of 13 livestock farmers sold exclusively through an intermediary and that is P3 who had the highest production of meat from all the producers by far (107,5 tonnes a year). From the remaining 12 producers that sold meat, 5 exclusively sold direct to consumers through AFNs such as REKO RING, home deliveries, farm shops or farmers market and the other 7 combined direct sales and through intermediaries. And regarding the 3 vegetable farmers, their products were only sold directly to consumers while the honey Producer (P16) combined sales to the wholesaler and his farm shop.

Similarly, the retailers were found through internet Google Search. Only private microenterprise retailers who fit into the AFN network were chosen. This was based on the fact that our study investigates opportunities for the development of AFNs which are bottom-up approaches with "alternative" characteristics related to scale, quality, differentiated products and local production (Barbera and Dagnes 2016). Retailers are the least represented since they are very few compared to restaurants which are plentiful in the Uppland region. Moreover, the focus in this study was on microenterprise businesses, hence the exclusion of larger retail chains like ICA, COOP, or Hemköp. Restaurant selection was done with preference to those that represent one or more of the AFN concepts (proximity, locality, quality, embeddedness, and restaurant size). They are also sampled from the most populated towns in the studied region, with Uppsala as the most represented. The search for restaurants and retailers was carried out in different forms: walk-ins for some of the restaurants in Uppsala city and the rest through Google Search if they made themselves available to find. Further, the snowball method was used to find more participants in this study, especially for the producers. This is a nonprobability sample selection method where participants recommend/refer to other participants that they believe might have some characteristic of interest to the research (Johnson 2014).

Identification of products and volumes

To quantify volumes of food produced and mapping food sheds, careful measurements need to be done. In this study, a concept adopted from one type of mapping that is described by Brown et al. (2017) as "participatory mapping" is used to identify food products and their volumes. This concept is mainly used in social research. The collection of data for this is done using stakeholder interviews. In general terms, this participatory discovery procedure is useful in research to organise or display some information in a visual way in the form of tables, graphs or geographical maps for example. Producers were asked to give estimates of total amounts (tonnes or Kg per year) of food they produced. The empirics were used for getting an insight of the types and approximate amounts of food in the Uppsala local food system, as well as to identify any possible trends between actors in it.

The initial idea was to do a proper mapping exercise for the producers and interested buyers in Uppland for future collaborations, but most actors wanted to remain anonymous. For the total local demand for food to be known, the whole population of producers and consumers should be accurately represented. Once it turned out that we would not get the accurate quantities, we focused more on their attitudes, and asked them to further give reasons for their responses so that we get a clear picture of what motivations they have behind those responses.

The producers were however asked to give an estimate of the number of products they made per year. The data obtained from the interviews was presented in a table and later described and analysed under the results section. The variables that we have interest in are the quantity produced per year, the types of products, how active they are as sellers during the year and details regarding the quantity of animals they had if they raised livestock. Morrison et al. (2011) adds that the choice of the region or the geographical area under study should be selected after scrutiny. Some regions/areas might for example be composed of little farmland/actors whilst some contain most of them. This must be examined properly before drawing conclusions to avoid positively or negatively skewed data, thus distorting the authenticity and representativeness of the chosen sample for the study. We had a background search of the region under study and managed to gather information about the actors in this area and if they would be representative enough in this study. This was all provided in the frame of reference to prepare the reader on what to expect.

Attitudes

In this study, the aim was to find out the attitudes of actors towards the idea of introducing a new actor in the food supply chain in the form of a FH (which was done through semi-structured interviews). The authors aimed to get a picture of what these actors thought, felt, their motives, drive, and views about this concept/opinion. The interviewees were asked what reasons/motivations could make them join a FH. To get a deeper understanding of these reasons, the interviewees were given room to explain their feelings and reasoning behind the answers that they gave. Similarly, this was done for reasons why they would not join a FH. To make them explore their ideas even more, they were also asked to freely suggest what they would expect from an organisation like this one. For those that struggled to come up with any idea, we gave them examples of the services that we had gathered from our literature review so that they could have an idea and direction, then be able to suggest their own. The interview process was carried out as explained above.

Data Analysis

The thematic data analysis method was used to analyse the collected data from the interviews. Thematic analysis *"is a method for identifying, analysing and reporting patterns (themes) within data"* (Braun and Clarke 2006) by organising and describing data sets in richer detail. After the interviews were recorded, data transcription followed where the authors noted down the most important/relevant parts of the interviews word for word. Thematic data analysis is flexible and does

not require use of sophisticated theoretical approaches (Nowell et al. 2017). It also makes it easy to gather diverse perspectives of participants and smoothly highlights points of resemblance and any differences, thus achieving any unforeseen insights (*ibid.*). Braun and Clarke (2006) emphasise the importance of transparency when it comes to thematic analysis since this method "*works both to reflect reality and to unpick or unravel the surface of 'reality''.* The theoretical position of the analysis should clearly show any assumptions on the nature of the data and what it represents in reality. To identify themes, either inductive or deductive approaches can be used. Because the current study is exploratory and inductive, the inductive approach was used. Braun and Clarke (2006) define the inductive approach as a method with which the derived themes have a strong link with the collected data. This is in line with Bowen (2006)`s definition: "*inductive analysis means the patterns, themes, and categories of analysis come from the data rather than being imposed on them prior to data collection and analysis*." There are six phases in the thematic analysis procedure (Table 7). If followed properly, a sound analysis is achieved.

Table 7. Phases of thematic data analysis (Braun and Clarke 2006)

Phase		Description of the process
1.	Familiarising yourself with your data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas
2.	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code
3.	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
4.	Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis
5.	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme
6.	Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis

These stages were followed during this study. The thematic analysis process is not linear; the researchers are flexible to move back and forth throughout the phases. Data coding was done to single out patterns and interesting features from the interview transcripts, followed by the identification of themes from codes. Each of us started by coding the data from the interviews that they carried out, then we compared each other's codes, finalised the codes and decided themes together for consistency's sake. The themes chosen were strongly linked to the data collected from the interviews and were also eligible to answer the research questions of the study. Appendix C shows a figure displaying the coding process and the other procedures of the thematic analysis. Also, in Appendix D, the generated themes are illustrated. The theory of knowledge (research epistemology) applied in this study makes use of a realism/essentialist approach since the authors used speculation to understand the experiences and reality of the participants without deeply theorising any socio-economic contexts (Braun and Clarke 2006).

Trustworthiness

Connelly (2016) defines trustworthiness as the degree and magnitude of confidence in data, interpretation and the methods used to ensure the quality of a study. It is identified using four criteria: credibility, dependability, confirmability and transferability. According to Connelly (2016), credibility is the confidence in the truth of a study and confirmability is when the researcher's interpretations and findings are clearly derived from the data (Nowell et al. 2017). In this study, the authors investigate opportunities for collaborations in Uppsala`s local food system. First, it is important to explore and understand the current state/position of the food actors, then investigate their attitudes towards expansion and collaborations in the form of food hubs. For this to be a credible study, the researchers have to be by no means biased. This is achieved by sending data to participants for them to confirm and then incorporate any corrections and feedback given by the participants. After data transcription, we sent back the transcripts to the interview participants so that they would confirm and agree to the use of the data. Polit and Beck (2014) adds to the confirmability definition that "*confirmability is the neutrality or the degree to which findings are consistent and could be repeated.*

To define the dependability of a study, logic and consistency come in (Connelly 2016). If readers can easily follow the research process, then dependability has been achieved. *"Dependability refers to the stability of the data over time and over the conditions of the study"* (Polit and Beck 2014). We have tried to present the research process and methods thoroughly, logically, and clearly in a way that anyone (researchers and readers) can also repeat the study under the same conditions. Nowell et al. (2017) refers to transferability as how general the study is, in the sense that, can the findings be applied to other situations and populations? We consider our study to be general. Local food systems can be studied, supported, and improved in any set up or location. Our findings can be used to further research on AFNs in Uppsala or they can be compared and the procedure we used applied in different parts of Sweden, or even internationally as a reference to the feasibility of related studies.

Nancy et al. (2014) emphasises on ways to enhance the trustworthiness of a study. They discuss the triangulation methods, more specifically the method triangulation which serves to give a deeper and more comprehensive understanding of the phenomena under consideration by applying several data collection methods. In this study, triangulation was applied. Authors first used a mixed method approach (Case study and Interviews) to collect data and then involved the participants by having them check and confirm the data. Another triangulation method that is commonly used and is more or less like method triangulation is investigator triangulation where more than one author is involved in the research investigation (Nancy et al. 2014). Two authors were involved in the study and data source triangulation was done with different sources to increase the richness of information.

After interviews were completed, we worked together to code and generate themes for our results. This process made use of a lot of feedback sessions where we cross checked each other's work and discussed several times to ensure consistency. Not

neglecting the importance of ethics in research, which falls in the same path as trustworthiness, the participants were informed about the purpose of the interview and the research before starting, and why they were individuals of interest. Furthermore, participants agreed to be recorded and were informed about their right for anonymity, and a chance to look at, and approve, the transcripts from the interviews. All this was important as it supports the trustworthiness and credibility of the study, at the same time avoiding any form of ethical conflict.

Limitations

Limitations are those variables or influencers that are beyond the researcher's control. Because these can affect the results of a study, they are important to present before results so that they prepare the reader on what to expect. We acknowledge the issues of representability of using examples from outside Sweden but given the lack of quality data regarding FH initiatives in Sweden, US cases can make for a good example given their similar level of development and culture. Like Fischer et al. (2015) stated, it is possible that the broad scope can make the food actors underestimate the potential of FHs and AFNs in providing more than the traditional market opportunities. Something that we realised early into the process of data collection was a difficulty to communicate clearly what a FH represents and what it can offer because of its broad definition. We think that some may not have seen the full potential of a FH; it could take any form and not necessarily keep margins of the sales. Concepts like AFN or FH are fuzzy and hard to explain to the participants. This could make their attitudes a bit different from what they would be if they could see or experience the initiative.

Also acknowledged is the limitation of representing the whole region through a limited sample and estimations. Morrison et al. (2011) expounds on the consequences that this is associated with. If data is suppressed, then spatial distributions are observed, which limits the quality of the study or its results. As mentioned in first section of results of identified products and volumes, initially the idea was to do a mapping exercise but due to anonymity reasons preferred by most participants, it became a challenge. We neither had the time nor resources to interview more producers to increase the representability of our samples. If our purpose was the identification of volumes and types of produced food at the local scale, a misrepresentation of quantities has a negative effect on the potential collaboration between producers and wholesale buyers. Irregularities can lead to producers failing to meet customer demand if the mapping was not a true representation/reflection of the supplier-customer demand.

Further, due to the subsidising COVID 19 situation, our interviews had to be through the telephone to attain social distance since some people are still in fear of getting in contact with strangers. This can produce fewer quality findings compared to in-person interviews. Also, we had a limited time for data collection. We believe more time would mean more interviews and thus better and more accurate and representable data. Moreover, we interviewed a mix of food service, specific

cuisines, catering companies who serve schools, bakeries... Discussing these together may not give full attention to the different actors' individual situations, thus creating a bias or lack in the results. There was also a lack of related previous studies in the area. This limited us during our discussion because little is known about the bigger context of the topic.

Another limitation of concern is the conflict of biased views in the interview process and in the discussion. A researcher's experience can influence their study. Our personal views, knowledge, and experiences on this topic of interest could influence our interpretation of the findings. We however did our best to provide a balanced analysis that weighted barriers and opportunities equally, not supporting one part more than the other.

4. Results and analysis

Here we present and start analysing the empirical findings of our study by answering the 5 Research Questions. The aforementioned are written at the start of each subsection.

4.1 Identifying the food supply

The following section presents the findings answering RQ1. First, what and how much each Producer participant produces per year is shown on a simplified table. Following this are descriptions of the characteristics of the Producer such as how active they are as sellers.

RQ 1: *What type of foods are produced by farming microenterprises (producers) in the studied region and what are the approximate amounts?*

Table 8: Types of food and quantities produced by Livestock Producer participants

Code	Products sold	Quantities (per year)
P1	Lamb	~0,6 tonnes
P2	Pork (Bacon, sausages, ham, smoked meat, falukorv, Christmas pork…)	6 -12 tonnes
P3	Pork	107,5 tonnes
P4	Beef	3,3 tonnes
P5	a. Beef b. Lamb	a. 36 tonnes b. 6 tonnes
P6	Beef	8 tonnes
P7	Beef a. fava bean d. autumn wheat b. Oat e. Rapeseed c. autumn rye	14,4 tonnes a. 20 tonnes d. 60 tonnes b. 60 tonnes e. 30 tonnes c. 20 tonnes
P8	a. Milk b. Beef	a. 7050 L (every two days) b. 3,85 tonnes
P9	a. Honey b. Lamb c. Beef	a. 1-2 tonnes b. 1,6 tonnes c. 1,25 tonnes

Table 9: Types of food and quantities produced by producers practising mixed farming

P7	**Beef** a. fava bean d. autumn wheat b. Oat e. Rapeseed c. autumn rye	14,4 tonnes a. 20 tonnes d. 60 tonnes b. 60 tonnes e. 30 tonnes c. 20 tonnes
P8	a. Milk b. Beef	a. 7050 L (every two days) b. 3,85 tonnes
P9	a. Honey b. Lamb c. Beef	a. 1-2 tonnes b. 1,6 tonnes c. 1,25 tonnes
P10	a. Beef b. Oat c. Barley d. Rapeseed	a. 10,38 c. 4 - 5 c. 4 d. 1,5 - 2
P11	a. Beef b. Grains	a. 13 tonnes b. 390 tonnes
P12	a. Game meat (red deer, fallow deer, reindeer, moose/elk and roe deer/western roe deer) b. Wheat	a. 500 - 700kg b. 1000 ha

Table 10: Types of food and quantities produced by producers Vegetables, Fruits, and Honey farming

P10	a. Beef b. Oat c. Barley d. Rapeseed	a. 10,38 c. 4 - 5 c. 4 d. 1,5 - 2
P11	a. Beef b. Grains	a. 13 tonnes b. 390 tonnes
P12	a. Game meat (red deer, fallow deer, reindeer, moose/elk and roe deer/western roe deer) b. Wheat	a. 500 - 700kg b. 1000 ha
P13	Vegetables (Salad, cauliflower, chili, ruccola, spinach…) Fruit (strawberry, apples…) Beef Nuts	Mainly Asparagus (40.000kr)
P14	Chili, Potatoes, Peppers, Kale, Tomatoes, cucumbers, celery, beans, onions, spices, cucumbers, Brussels sprouts, cabbage, sour beard juice, pickled red cabbage, pickled yellow carrot and carrot, pickles, and sauerkraut	1 or 1,5 hectares. *No info* *(They don't weigh it)*
P15 CSA	Potatoes, carrots, tomatoes, cabbage, eggplant, beets, grass, cereals, iceberg lettuce, broccoli…	*No info* *(Do not put a price on KG)*
P16	Honey	80 tonnes

The tables above map the type of food products sold by the sample of microenterprise producers interviewed in the studied region and how much they approximately produce each year. The same tables with detailed information can be found under Appendix E, which also includes how active they are as sellers and further details. Just like the literature review anticipated, those participants that participated in AFNs expressed awareness of food system sustainability challenges and a will to run socially and environmentally equitable forms of production, distribution, and consumption of food (Tietz 2021). This was reflected in 87% of the producers practising either KRAV, organic or grass-fed livestock production.

The sample of Producer participants was relatively heterogeneous in their characteristics and together they had a highly diverse range in food types and variants. Six (38%) producers only produced meat with beef as the most common, followed by pork and lamb. Seven (44%) producers practised mixed farming and combined a production of meat with grains, milk, vegetables, or honey. Among the types of crops were wheat, oat, barley, rapeseed, rye, fava bean and a variety of vegetables. Meat was therefore the most common product, with 13 out of 16 (81%) of them currently producing it exclusively or in combination with other foods. Sixty nine percent of those who produced meat had a production under 15 tonnes of slaughter weight meat per year. The reasons for the small quantities where various; P8 was a milk Producer and meat was a by-product of it, P9 sold game meat which is limited and the rest either had smaller amounts because meat wasn't their main product or were practising livestock agriculture as a side income and did not need or want more. The other 31% of meat producers varied between 12 and 42 tonnes a year while one pork producer had around 107,5 tonnes of meat ready to sell every year. The main types of production in the studied region that Länsstyrelsen-Uppsala-Län (2019) and Lönnerud (2012) shared were represented in our sample. Eggs were the only product that was not mentioned. The Producer participants' main agricultural productions were grains, meat, milk and some vegetable and fruits production.

Of the 16 producers interviewed, 3 (19%) were vegetable and fruit producers. Out of the three, one combined it with smaller scale grain production (P15) and another with beef production (P13). The types of vegetables grown varied extensively since these 3 vegetable farmers (P13, P14 & P15) practise intercropping to satisfy the demand for diversity of local products. Combined, the 3 farmers claim to have offered over 50 types of vegetables (only some of them are represented in Table 10). One vegetable Producer processed some of the products and sold them. Regarding the weight quantities of vegetables, the farmers had a difficult time estimating it. The amounts vary between seasons and crops and the producers had no track of the weight of their production, therefore these were difficult to represent. P14 was represented by writing the available area of cultivation they have. For Producer P1 who mainly sold asparagus, they approximated the amounts by telling us how much money he makes from selling them each year (40.000kr). P14 did not weigh their produce after harvest and P15 sells through CSA schemes where the food is sold by boxes and not by weight. Lastly, Producer P16 only produced honey, around 80 tonnes a year.

When asked how long they were active sellers throughout a year, all of them answered that they were active if they had supply. Those that cultivated grains, vegetables and fruits followed the seasonality of the products. The few that had larger production had to diversify buyers and sold through larger meat or grain distributors. The livestock farmers who sold their meat directly to consumers tried to plan their slaughter in a way that allows them to always have something in storage. While those who sold their meat through a slaughterhouse, or a distributor adapted their slaughtering schemes to the demands of the distributors.

4.2 Attitudes of producers regarding increase of production

RQ 2: *What are the attitudes of the microenterprise farmers regarding an increase of production?*
RQ 3: *How much are the microenterprise farmers able to increase in quantity of production in terms of current infrastructure capacity?*

Since both Research Questions concern the increase in production of the Producer participants, they are presented together to allow for clear comparisons and cross analysis.

Code	Attitude towards increase	Possibility to increase production (available infrastructure) Yes No
P1		
P2		
P3		
P4		
P5		
P6		
P7		
P8		

Code	Attitude towards increase	Possibility to increase production (available infrastructure) Yes No
P9		
P10		
P11		
P12	(No information on grains)	
P13		
P14		
P15		
P16		

The right column on Table 11 shows the findings regarding the capacity of the Producer participants to increase their volumes of production per year based on the potential of their current infrastructure (without making major investments). Cells that are marked in green show that the producer has possibilities to increase quantity (the detailed table in Appendix G contains more information such as how much more they would be able to produce). Highlighted in red are the producers that say that they are not able to increase production with their current infrastructure. Fifty six percent producers say that their infrastructure allows them to produce more if it becomes actual for them. Some of them were able to increase as much as double the current production while the rest were able to have smaller increases. 43% of producers said that they are not able to increase production.

To enhance the quality of this analysis, the attitudes towards why the producers would or wouldn't increase production are shown on the left column of Table 12 (the detailed table in Appendix D contains the codes). The cells marked in red show that the Producer has negative attitudes towards increasing the quantity of production and the cells highlighted in green are those that indicate an interest in increasing production if the right conditions are met. Overall, there was a trend of negative attitudes, 11 (69%) producers had only negative attitudes, 4 (25%) had mixed attitudes and 1 had only positive attitudes. When comparing the two, we notice that possessing more capacity of production than what is currently used does not necessarily mean that the Producer will have a positive attitude towards exploiting that extra capacity. This kind of finding is relevant for this study since the authors are investigating the conditions for a FH that satisfies wholesale demand which often demands higher quantities than direct sales to final consumers.

Regarding those that mentioned negative attitudes

Most Producer attitudes towards an increase of production were negative. 9 out of 16 (56%) producers mentioned that they were satisfied with the amounts produced for different reasons. 6 out of 16 (44%) say that it is because of limited resources available such as time, space, labour force, and in the case of 3 producers (19%), it's the energy to do it, since they are getting old and have no one to pass the farm onwards to.

Regarding the specific situation of each participant, P11 produces grains and meat and says that they would have to invest in expanding their animal house if they wanted to increase production. The attitude towards an increase in production was negative because they could not see a better alternative than the model they run at this time. More details related to this attitude are found in the findings under section 4.3.1. P5 shared a similar attitude that referred to the limited choices of selling channels a small producer can make in the wholesale market and expressed satisfaction with their current way of doing things. Similarly, milk Producer P8 and meat/honey Producer P9 say that they are satisfied with the prices and quantities they produce now. Producer P14 has no capacity for intensifying the production of vegetables as they are limited in land. Regarding their attitude towards increasing quantities, they say that they are satisfied since the ones who run the farm are getting old which is also the case for P1 and P6 (19% of participants sharing the same reason). Finally, meat and grain producer P3 says they would struggle finding demand for the food if they increased production, so they are satisfied. P4 is a meat Producer who is limited by the amount of storage and labour to increase production since farming is just a side income. They say that they value free time and increasing amounts would mean less of it. These finding is interesting as it shows that some producers in AFNs do not have the same priorities and values as actors in the CFS who look to maximise production efficiency.

More specific reasons for why they were limited and could not increase were mentioned:

P10 has meat and grain production and cannot increase production because the organic certification puts limits on how intensive the farming can be. On the other hand, P10 was also the only participant who shared positive attitudes towards increasing if the opportunity for more space for their agriculture arise. P12 sells

game meat which is limited by the availability and the rules of hunting each season. Even if it is not up to them to decide if they can increase their share, they enjoy the mall sale and direct sales with customers which could be lost if they would sell larger amounts. Moreover, two (13%) producers said that increasing production is not possible because of limited feed to give to their livestock. P3 and P12 produced the feed for their livestock and to increase production of meat, the other must also increase since the livestock depends on the amount of feed they can produce. The practice of producing your own feed which supports circular use of resources and internalises the impact which is characteristic of producers in AFNs.

The next negative attitude that was mentioned among the producers was mentioned by 8 out of 16 (50%) producers. They either specified that producing more meant less money per unit or said that they were satisfied with current prices they receive, which we indirectly interpret to say that the increase of production would mean a drop in price for their product. For example, P15 has capacity to produce more than what they do but does not want to increase because the more you sell, the lower the prices you receive in wholesale markets. 38% of producers were satisfied because they currently sold through direct sales where prices are high and expects the FH to not be able to compete with that. P2 had produced larger amounts in the past but decided to cut production so they could do the processing too, therefore the farm has a capacity for much more production. On the other hand, P4 has no possibility to expand because farming is a side income, and they don't have the resources. P6 said that the costs and the prices they receive now forces them to stay at their current way of doing things, but they do have more capacity in their farm.

Being satisfied with a small-scale model or selling directly to consumers was another reason for not increasing production. Surprisingly, only 2 (13%) producers specified this reason, but it is possible that some of them did not feel the need to say it since it is assumed that an actor forms an AFN because it prefers to run an alternative model to the large-scale conventional model. For example, P8 is a milk Producer who has no space for keeping more animals. Their attitude towards increasing is negative because they enjoy the smaller scale model and values the relationship they have made with their direct customers. This is supported by the fact that they have not increased the price of their milk in 6 years, just to keep their customers happy. The literature review had anticipated that because loyalty and social trust is high among AFN actors, some might be hesitant to increase production to join a FH because they prefer to maintain the relationships they have built (Stover et al. 2021).

Regarding those that mentioned positive attitudes:

The reasons highlighted in green on the left column of Table 11 were those that indicate an interest in increasing production: 5 out of 16 (31%) producers mentioned that they had positive attitudes towards increasing production quantities if certain conditions would be met. But the same 5 producers also gave reasons for why they can't physically increase. 9 out of 16 (56%) said yes when asked if they have unused capacity for increasing production. But only 5 out of 16 (31%) producers mentioned that they would consider increasing production quantities if certain conditions would be met. These conditions varied among the participants;

P4 and P5 (13%) producer participants said that if they had more storage space for their products, they would be interested in producing more. While P4 was hesitant because it's a part time job and did not want to work more. On the other hand, P5 specifies that if the value given for the food is high enough, they would expand their production. But as of now, they don't see any better ways than their current model of commercialization. P10 is interested in expanding but needs to invest in more space for production as his ecological production does not allow for more. P13 says they would increase towards the right buyer, referring to a buyer that meets his conditions. They claimed that they could easily double production of products if they decided to use their full potential. Lastly, P7 says that they already plan to increase their production of meat and grains, around a 30-40% increase of both grains and meat.

4.4Attitudes towards a FH

RQ 4: *What are the attitudes towards the formation of a FH in the studied region?*

The findings are displayed under two headlines: Reasons for having interest in a FH and Reasons for not having interest in a FH. Each of these two sections presents themes that arose from the coding of the data. For the producers, the reasons are presented independently, but for the wholesale buyers (restaurants, Bakeries, and retailers), the reasons are presented together. Details regarding the process of coding and creation of themes can be found under Appendix C and D. The participants will be referred to their respective code which is displayed in tables (or appendix) 4, 5 & 6. Table 12 presents a summary of the attitudes compiled from this study.

Table 12: Attitudes towards a FH

	Reasons for joining a FH	***Reasons for not joining a FH***
Producers	○ Business support	○ Satisfied with current business model ○ Not economically viable ○ New partnership risks ○ Uncertainty in the future of enterprise
Wholesale buyers (Restaurants, Bakeries, & Retailers)	○ Support local food systems ○ Business value addition ○ Logistical convenience ○ Ethical values	○ Not economically viable ○ Negative environmental externalities ○ Unfit for current business model ○ Satisfied with current marketing model ○ Market uncertainty

Producers

- *Reasons for having interest in a FH (Producer)*

Reasons why producers would join a FH are presented and described under the themes that arose after coding them.

Business support

When asked what the reasons for collaborating with a FH are, producers only gave reasons related to the benefits it gives them as a business. Thirty eight percent of producers mentioned that a FH could help with developing a more efficient business model by taking responsibility for certain business activities. Most of them agreed that help with logistics such as transportation, packaging and storage space would be beneficial. Three meat producers mentioned that storage for ageing or preserving the meat and transport to and from slaughterhouses, and customers was key for them since it is very time consuming and expensive:

"Of course i would prefer to have access to a FH warehouse, delivering from the farm requires some kind of cooling system, that could be expensive for my type of business" ***P4***

Furthermore, 1 out of 3 vegetable farmers mentioned that they would join a FH to get help with finding clients and selling surplus produce:

"Sometimes it's not so easy to find clients so it's good to have other channels" ***P15***

Similarly, a meat Producer (P1) says that a FH would be good since it represents more demand for their products and allows them to distance themselves from a precautionary production model. That is, to produce as much as they want and sell it without being afraid that it will go to waste. P10 shares a similar statement which refers to the FH helping find customers which is difficult for them now.

Our findings were like what Stover et al. (2021) and Barham et al. (2012) say about the development of FHs being mainly influenced by the fact that small scale farmers face a lot of logistical problems. And Stover et al. (2021) also unveiled that FHs represent opportunities for finding new customers which is what some of our participants expected. In conclusion, from a producer perspective, the attitudes towards FHs generally represent a way to aggregate customers, design a convenient distribution system and find customers.

- *Reasons for not having interest in FH (Producer)*

Reasons why producers would not join a FH are presented and described under the themes that arose after coding them.

Satisfied with current business model

Over 50% producers in this study mentioned the same factors for why they are not interested in a FH. For example, many were satisfied with their current way of doing business. P1 mentions that they are generally doing good and hints to the fact that being KRAV certified puts limits on things (such as the quantities of animals kept per unit of area), so a FH cannot do much for them:

"I am doing pretty well where I am, with the presumption that I am KRAV and ecologic, yeah" ***P1***

P6 mentions that they have been in the farming business for decades and have enough demand, they don't feel like expanding or changing their model. Other producers such as P11 have intermediaries who sell the meat directly to consumers and see it as the best option on the market now. The same Producer shares that a FH would only be interesting if it offered more added value somehow. P6 says that if they look to keep more margins, it is easier to sell directly to consumers than to join a FH.

Among our producer interviewees, 10 out of 16 participants had some or all sales directly to consumers. Five out of the 10 appreciate direct sales and are afraid that it is lost selling through a FH.

"A social interaction that is completely missed. It would not feel very good for a car to come and pick up the animals and we do not see them anymore. Because we have other income we can think more about feelings than the economic aspects" ***P1***

P1 is a part time meat Producer who says that it wouldn't feel good to send the animals to the slaughterhouse and not know how they are sold. Their reason for valuing that is the fact that they do not live only from the farming income which allows them to make decisions outside economic constraints. The milk Producer P8 says that direct sales are important for consumers who know that all the money goes to the Producer. And P3 shares that they wouldn't mind selling to wholesalers, but he would like to keep a direct relationship with the buyer.

"Very nice to sell directly to customers, we lose a lot of control if we work with a FH" ***P1***

Another important reason for preferring direct sales is the control that the producer has over the business and the transactions. P12 is comfortable with the size of their business, they want to keep it small scale and be in direct contact with the customers. P16 also refers to the loss of trust between seller and buyer when intermediaries are involved as a reason to consider joining a FH. P8 specifies that working through an intermediary would complicate the transactions as more rules would have to be followed, making the business management more difficult.

Further, producers expressed a negative interest towards a FH because they felt like they already had the necessary resources to manage their business. This is not something specifically represented in our literature review, but an interesting finding to discuss. The honey farmer (P16) says that the services of an FH would have been beneficial back when they started the business. Now P16 has employees and is well connected to wholesale buyers which makes him reluctant to join a FH since he sees no benefits in it. Similarly, meat producers P5, P4 and P3 share that

they already have their supply chains built so they do not need the services of a FH for that:

"We send directly to the slaughterhouse; we do not need an intermediary for it" ***P5***

P2 have been in the business so long that they prefer collaborating with the intermediaries they already are acquainted with rather than giving away the responsibility to a new FH. While one meat and grain Producer (P10) referred to the support of government programmes that help small scale farmers as enough for helping them with sustainable business development.

It was clear that many of our findings reflected previous findings in other settings. Just like Hellwinckel & Velandia (2016) outlined, the main reasons for producers not being interested in joining a FH are being comfortable with current business status, loyalty to customer base, and direct sales preference. Stover et al. (2021) also finds that producers selling through direct sales often think it is a better way than through longer chains with intermediaries. Galzki et al. (2015) discussed how direct contact instils some sense of responsibility and pride in local actors and that is clear in our findings too. Lastly, Andrée et al. (2019) confer that for proper AFN functioning (in our case a FH), the right policies must be in place to increase democratic participation and engagement. All these facts support our findings.

Not economically viable

Amongst the producers, 44% of them mention that they do not see a FH as an economically viable business model, hence they would not join. The main reason is that they believe there will be a loss of margins because of the presence of an intermediary:

"It's become very expensive to have middlemen, I sell it at 55kr to the slaughterhouse and 170kr if I sell directly to the consumer." **P10**

Reasonably, the viability of producers with small volumes or diverse types of food, is a potential barrier and to handle wholesale buyers would be achieved only by an increase in production volumes or other more specific arrangements. This seems to be a potential challenge for small farmers interviewed since most are not interested in producing more while some lack the conditions for an increase (discussed further under 4.6). A vegetable Producer (P15) shares that they used to practise mono-cropping and sell to wholesalers but that it wasn't worth it since prices per kg dropped the more, they produced:

"When we started, we grew more volume, for example 1 hectare of iceberg lettuce and it became 20 tons or 50 tons of cabbage. I could continue to do that but I'm not interested in that. Then you lose value of the vegetables" ***P15***

The producers that mention that there is a loss of margins are either direct sellers or don't believe that a FH can offer more economic value than current options on the market. Two producers expressed that they don't believe that selling through a FH will give more value to the transactions than other options. P5 thinks that dealing with smaller distributors such as an FH requires lots of effort and does not bring enough value in exchange. Small scale producers expressed that a FH will not be viable since selling to wholesalers represents complexities in their business model. They mention extra costs of storage and transport, difficulties to meet wholesale requirements and expectations:

"it is so complicated and there are many expectations, and the time should be right when we can deliver so that's complicated" ***P6***

This is similar to what the Food Hub theorist Barham et al. (2012) had mentioned in his research, that FHs have been detailed with regards to their financial viability. Our observations were also in line with Stover et al. (2021) claims that not enough revenue is generated to meet operating expenses and growth of an AFN at the same time. This has proven to be a big limitation for AFNs in different parts of the world.

New partnership risks

"It's expensive and you can't trust it." ***P16***

Three out of 16 producers mentioned that they are hesitant to collaborate with a FH since they cannot trust an organisation that does not exist yet and that they can't see what more they can do for their individual businesses compared to existing wholesale distributors that offer similar opportunities. One example is P10 who compares a FH to Gårdsällskapet who aggregates meat products and distributes it to households in the Uppsala region. The participant expressed that it felt risky to join a new organisation when alternatives already exist.

A factor that producers have which was not specified in our literature review but observed in this study, is the fear of taking up new partnership risks. Stroink and Nelson (2013) described that the dynamic nature of a local food system is hard to make predictions of or may be seen as a poverty trap. Therefore, it depends on how much the actors in consideration are willing to trust and partake.

Uncertainty in the future of enterprise

Out of the 16 interviewed, three Producer participants (P1, P6 & P14) shared that the reason for not being very interested in a FH is that the future of their business is not known because of insecurity around who will manage it when they are not able to work anymore. This statement is exemplified by meat Producer P6 who says that he and his business partner do not want to invest too much in their business by dealing with a FH because their plan is to retire from it as they are getting old and do not want a change of routines:

"I and my brother are getting older and we want to start doing things that we were not able to do whilst focusing on this business when we were young." ***P6***

Wholesale buyers

- *Reasons for having interest in a FH*

Reasons why wholesale buyers would join a FH are presented and described under the themes that arose after coding them.

Support local food systems

Even if the trend among wholesale buyers shows most negative attitudes towards the interest for joining a FH in the region, it was interesting to find out that the actors were aware that joining a FH can bring added value to the environment and society. A motivation factor for joining a FH mentioned by 3 out of 4 retailers is that a FH is good for the development of local food systems. They all say that it Food is good since it is supposed to help the individual producers maintain their business and benefit them financially. RE3 says that certain consumers look for local food to support small-scale farming. This also applies to the restaurant participants. Of the 13 restaurants that answered, 5 said that they would join a FH because it would support the development of local food systems. Three (SE8, SE12, and SE3) of them referred to the fact that it would benefit the individual producers.

"The benefits from buying locally produced is that people look for it, feels good to support the local producers" ***RE3***

"I would diversify to another local supplier like a FH if it was viable, you want to support local producers" ***SE12***

"An FH is both good and bad, you want to support locally produced and the environment" ***SE5***

Further, two restaurant participants also referred to the importance of supporting locally produced food because of its benefits to the community and the environment. Results from this study unveil how the participants saw a more convenient opportunity to receive their raw materials, and at the same time supporting several aspects of regional development.

" If you have environmental consciousness, that is the value of contributing to climate change mitigation and such. Not necessarily making more money from it" ***SE10***

RE4 who specialise in local food, has strict supplier conditions. The actor shared that they buy all they can from within Sweden to support the national food market:

"We buy a few things like chocolate and coffee from a small company that works with small producers from other parts of the world but anything that can be produced in Sweden, we buy it in Sweden." ***RE4***

Conclusively, (31%) food service participants expressed that a FH could minimise negative impacts from the distribution of food such as transportation emissions. restaurant SE10 shares that if you value the environment more than the profits, buying through a FH is good.

All these findings are in line with Renting et al. (2003), Giampietri et al. (2015) and Bui et al. (2016)`s discussions that food actors join FHs to support the local development, environmental preservation, and bringing consumers close to the origins of their foods, thus maintaining cultural heritages and social networks. They also support claims made by Stover et al. (2021) that Uppland has recorded an increase in health and environmentally conscious residents, who increasingly demand organic locally produced food, making some wholesalers focus on strictly

selling Swedish and organic food, like participant RE4. SLU students demand ecologically produced food and the elderly value tradition, so they like to see that "made in Sweden" label.

Business value adding

When asked why they would join a FH, 3 out of 13 restaurants mentioned it would add value to their business model. SE6 says that having an additional distributor allows the business to diversify suppliers and reach more kinds of products. Participants of this study repeatedly mention how valuable closer connections and direct interaction enhance social security (the confidence to do business in one's community).

*"The FH could give value to our business, if people can trust it"**SE13***

Restaurants SE10 and SE13 say that collaborating with a FH would give more status to their business if customers were aware and trust the claims. SE8s view on this was that collaborating with an FH will add value to their business only if the FH issues local certification.

*"That would mean fresher vegetables, the fresher, the better the taste and quality of food" **SE3***

Amongst the 13 food service participants, 4 pointed out that they would buy from a FH because it would add value to the food and the business. They mentioned that the quality of the food would be better through a FH because it's fresher than conventional ones. Restaurant SE9 even mentioned that Swedish meat is better than imported as a reason for buying through a FH. Similar findings have been found by Stover et al. (2021, who shows that because the products are grown locally, and often organically, it ensures that consumers receive very fresh and nutritious food.

As also discussed by many authors in previous studies (Barham et al. (2012), Granvik et al. (2017), and Björklund et al. (2008), our findings support the Wholesale Buyer claims that a FH would bring value and a better status to a business. Santini and Gomez y Paloma (2013) add that FHs open greater opportunities to increase trust between buyers and sellers because of transparency and proximity, just as expressed by our participants.

Logistical convenience

Just like for producers, logistics was an important aspect for being positive about a FH for the wholesale buyers too. RE1 is a small meat retailer that thinks a FH would be very convenient because they aggregate orders from several small producers and deliver it together:

*" It would make it very easy for us if there was one distributor that took care of aggregating and delivering at once from many smaller local producers" RE**1***

Ethical values

All the retailers mentioned ethical reasons for collaborating with a FH. The ethical values referred to both social and environmental aspects. For example, meat retailer RE1 shares that buying food from Sweden ensures that the livestock animals are treated well. RE1 also says that buying local reduces transport distances which is good for the environment. The others referred to mitigating climate change, supporting producers etc…

"You want Swedish animals, so you know that the animals are well. [...] environmental aspects with fewer distances…" ***RE1***

- *Reasons for not having interest in a FH (wholesale buyers)*

Reasons why wholesale buyers would not join a FH are presented and described under the themes that arose after coding them.

Not economically viable

Of the 13 restaurants, 6 of them say that collaborating with a FH is not economically viable since local produce is usually more expensive. SE12 shares that the customer might stop buying if they increase prices after purchasing locally:

"If we purchase locally and increase prices a bit, it's good and bad. It would be more positive externalities for the supply chain, but the customer might stop purchasing because it is expensive" ***SE12***

Restaurant SE4 shares that it would be inefficient to diversify suppliers of food since it is time consuming to order from different distributors:

"What will be difficult is to diversify distributors and the time it takes to buy specific things from each one." ***SE4***

The retailers answered in line with what the restaurant participants said. Two out of 4 retailers say that buying from a FH would not be economically viable for them. RE4 refers to the fact that they are a small retailer and if they bought from a FH, they wouldn't be able to buy enough to get bulk prices like larger retailers could get.

"We are still too small to buy in real bulk such that we get discounts, like the bigger stores you know they can lower the prices and curb the costs, but we are small" ***RE4***

RE2 believes that a FH would be expensive since the small local producers sell their products at a high price from the start. If the FH is to get any economic remuneration for their services, it would compromise how much margins the retailer can get. Retailer RE2 also says that a FH does not fit for small retailers like them because the fixed costs would be too high. The small and frequent shipments from the far away locations of the producers would most likely not be viable for the FH, they believe:

*"I order so little that the fixed costs become big, for example the shipments and making people find you, especially for the producers who are far away in rural areas "****RE2***

All these findings are in line with Hellwinckel & Velandia (2016) discussions about challenges that restaurants and retailers can face from using local food in their menus. Among them are the costs of logistics and transport, the potential higher prices, the time spent buying the food and the ability to transfer the cost of the value-added food to customers…, which is all represented in our findings.

Negative environmental externalities

One restaurant (SE4) was aware of the challenges that food transportation can bring about and responded that buying from their conventional source was better than from an FH which would be unnecessary and emit more than just buying from one:

> *" There will be a lot of transport if you buy from several distributors "**SE4***

This is in line with Rockström et al. 2009 research on the planetary boundaries which taught us that depending on cheap and far-distance transportations can create more emissions, and thus contribute to climate change.

Unfit for current business model

Interestingly, four out of the 13 food services had special reasons for why a FH would not be compatible with their way of doing business. SE3 offers catering service every day to large numbers of people and therefore is dependent on large quantities of food delivered every week. A FH does not sound optimal for their business model as it may struggle to meet their demands. Restaurant SE4 only serves Thai traditional food and says that a FH will not offer the type of products they need. Restaurant SE7 says that adding a supplier to their business would be resource heavy as there are only two people running the business. Lastly, restaurant SE11 says that they are a national franchise and that their contract forces them to buy from certain distributors. Only a small share of products would be able to be purchased through a FH.

Satisfied with current marketing model

When retailer RE2 was asked to share its attitudes towards a FH, they said that a FH doesn't need to help them with marketing or making information about products and producers available because they already do that in their internet platforms:

> *"The information flow is already taken care of by us and many of the producers also have marketing on their own pages. So that part is taken care of for retails like me" **RE2***

This confirms the findings by Stroink and Nelson (2013) who stated that the success of AFNs is partly linked to their use of ICTs which has given them the opportunity to market their products transparently.

Market uncertainty

retailer RE2 shares that crisis such as the Covid 19 pandemic or the war in Ukraine creates uncertainties in the food market and the food systems overall. The retailer shared that it is difficult to know how the consumers will react and therefore collaborating with a FH may be risky right now:

"Right now with covid, Ukraine etc. it's extra complicated to know what is going to happen with food markets; will people buy and spend more on Swedish to support local resilience, will people start saving money because the energy is going up, or will people eat to cope with the crisis?" ***RE2***

4.5 Preferred characteristics of a FH (producers, food service & retail)

RQ 5: *What are the desired services and/or characteristics from a FH in the studied region?*

For clarity and convenience, the findings from all three types of actors are presented and analysed together to get deeper insights into how a FH should look like in the studied region. This way, we can clearly see what the actors have in common and their differences.

Table 13: Themes representing preferred characteristics of a FH by the food actors

Preferred characteristics of a FH (Producers, Food Service & Retail)
• *Transparent business model* • *Logistical services* • *Minimised economic costs* • *Reliability* • *Offering differentiated products* • *Business services & Value Adding*

The three types of participants agreed the FH should be a transparent organisation that offers affordable and reliable logistical services. Some of the buyers (food service and retail) emphasised that it should have a focus on handling food with a special care for the environment and society. For example, 75% of the retailers mentioned that the FH should focus on differentiated products (local, organic, animal welfare, grass fed etc...). They also mentioned that they would need the FH to offer food and services that add value to their business such as a local certification or high-quality food. Among the Producer participants 13% mentioned that they would only join if they could co-manage the organisation. Thirteen percent of producers also made clear that they would need the FH to take care of many aspects of the business such as branding and other things that are needed when commercialising food through a wholesale distributor since they only handle production now. Further details regarding the themes that arose among the participants are presented below:

Transparent business model

"That a centralised organisation can provide information that we then give to consumers is of great interest from the people who buy from us" ***RE1***

The 3 types of actors that were interviewed shared that a FH needs to be transparent by enabling the flow of quality information regarding all the steps of production and distribution to the buyers and customers. This was the most important for retailers where 3 out of 4 (75%) retailers emphasised the importance of it for them and for their customers. Meat Producer P1 says that the FH should have a social media page where this can be efficiently shared with customers. While RE2 adds that their enterprise also aims to act as an educative platform for consumer society who needs to think environmentally, and emphasises on the importance of protecting sources of food:

"I want people to understand that we don't just go and get the milk anytime and that it is easily available, people must think about the climate, that we must take our time and plan etc.. [...] People must understand that we need to eat the food produced around here or the sources disappear" ***RE2***

As the literature review showed, AFNs are often a response to CFS networks which are characterised by a long emotional distance between production and consumption (Sonnino and Marsden 2005). This fact was clearly reflected in our findings regarding a transparent organisational model that is essential in an FH. Some of Renting et al. (2003) and Bui et al. (2016) findings are also confirmed since the participants wanted the transparency and information flow to bring consumers closer to the origins of the food, strengthen social networks, induce healthy food behaviour and consumption patterns. Stover et al. (2021) shared that to be more transparent, AFNs often use ICTs to allow quality flow of information. This was mentioned by at least one Producer participant who claimed that the region's FH should have a convenient online platform for it.

Logistical services

Two out of thirteen (15%) food services mentioned that it would be very convenient for them to get the local products aggregated by the FH in the same delivery as their current national wholesale distributors:

"What will be difficult is to diversify distributors and the time it takes to buy specific things from each one. So, it would only be good if everything went through one and the same distributor, as we do now" ***SE4***

Another key characteristic that all types of participants mentioned was the need for various types of logistical services to increase efficiency and convenience, characteristics that all types of actor's share. Moreover, the interviewed wholesale buyers shared examples of services that FH buyers need: producers such as P8 needed a distributor that could collect the milk every two days, or she would not be able to join since she lacks the storage. Thirteen percent of producers mentioned access to storage as a characteristic. Restaurants also mention the importance of well organised logistical services. SE3 shared that if they join a FH, it will have to give more frequent deliveries than what they get now so the freshness of the products is ensured. One food service (SE4) and a retailer (RE2) said that the FH

needed to adapt to their needs for purchasing smaller amounts of food at a time, at a reasonable price. The retailer's reason for making small orders is that they want to communicate to the customers that producing and selling food is a complex process that requires planning, and that convenience is not to be taken for granted:

"I want to buy very little at a time, only the necessary, to teach people that there is no abundance of these products [...]" ***RE2***

Because of the heterogeneous population of producers, they prefer an organisation that is flexible and adapts to the needs of each actor involved. Stover et al. (2021) and Barham et. al. (2012) mentioned that logistics was especially a concern for small scale producers which is confirmed in the findings.

Minimised economic costs

All types of actors mentioned attitudes related to the expected economic costs of a FH. It is important for the producers that an FH will not interfere with the margins earned per product as we also could see under 4.1.1 under "Reasons for not joining FH". Their expectation is that a FH should allow producers to keep the majority of profits:

"It's all about the added value ending up with the farmer, otherwise it does not matter. The prices offered need to be attractive for the farmer" ***P3***

On the buyer's side, 31% of food service costs cannot be so high that they make less money than what is currently made. Some restaurants were even restricted by costs, such as SE11 who is part of a franchise, and the contract only allows them to buy through alternative distributors if the price is lower and quality the same or better.

Regarding the retailers, 2 out of 4 (50%) also say that the FH should make sure that the costs are as low as possible for the products and the transport, preferably not more than what they currently spend. 2 out of 4 (50%) retailers say that it is beneficial to get one aggregated delivery where many producers and the FH share the transport costs to make it economically viable given the recent rise in energy prices:

"Joint delivery is what we can benefit from, producers and this food hub can share the transport costs and that would be cheap for us. Since the transport costs are dramatically increasing, those kinds of hubs can really help." ***RE4***

Stover et al. (2021) specified that the lesser intermediaries, the fairer prices for the farmers. Besides, literature from Barham et al. (2012) mentioned that many wholesale buyers are hesitant to buy from a FH because the costs are often higher than conventional distribution, and that was what our participants believed too. Therefore, they all preferred a FH that had minimised economic costs. The same author says that AFNs are supposed to help with distribution at little or no cost which is what all the interviewed actors were saying given their limited economic power.

Reliability

"The FH could give value to our business, but it needs to be genuine" ***SE13***

Both types of buyers mentioned the importance of a reliable organisation. 2 out of 13 (15%) of food services referred to the importance of generally complying with the conditions and promises. For example, SE13 is a bakery that shared that it would be valuable to have an FH that it must be genuine about the claims they give regarding their services and added value so wholesalers feel like they can trust it and commit. Moreover, 2 out of 4 (50%) retailers mentioned the reliability of the delivery system to be important. RE4 says that it is not easy to buy from local producers because they cannot always deliver, and they say that an FH would have to help with their consistency:

"The services of interest or what I can say is missing in this area is mainly that the producers, some of them are easy to cooperate with but some are not, some are swift with delivering, some not, so this kind of hub really could help with the delivery thing" ***RE4***

Offering differentiated products

Most retailers (75%) mentioned that it is important that the FH can offer products that are differentiated in some way. RE4 says that their customers often look for organic and local goods. Both RE1 and RE3 agree that the food needs to have a certain standard of quality to be fit for their store. R3 says that their shop only sells food that is Fairtrade, healthy and that comes with "a story", meaning that the customer gets information about the production and the supply chain. The fairness aspect refers to ethical standards behind the organisation and its products which both food service and retail made claims about. Regarding the food service 2 out of 13 (15%) mentioned that the FH should consider the ethics behind the production of the local food such as having requirements for good handling of animals:

"What would be good from an FH is that you know that there is a requirement for good handling of animals" ***SE5***

While 2 out of 4 (50%) retailers also mentioned a strong ethical model that minimises negative externalities while maximising value for producers is required; RE2 exemplified this saying that for them and many of their customers, the environmental aspects are more important than getting cheap prices.

"For me it's mainly the transport and environmental aspect. Some people around here seem to care about this, they have some "climate change anxiety [...] it's not about pressing producers' costs down, but to help every party" ***RE2***

Regarding the food services, 3 out of 13 (23%) mentioned the importance of differentiated products regarding healthy and quality local food. SE7 is a restaurant that also cooks food for children in school and their focus is on serving good food to them. Restaurant SE11 says that the quality of the food is what would push them to buy from a FH. If the FH quality of food is worse than what their current distributors have, they wouldn't be interested. Similarly, SE12 is a bakery that has

high standards of quality and healthiness, the FH should offer similar or better than what they have now:

"With us, you will find a craft, we create all our products from scratch in a place where we can fine-tune every detail to perfection. To be able to do that, we only use unprocessed raw materials, and we use Swedish and locally produced raw materials as much as possible." ***SE12***

Barham et al. (2012) claimed that the differentiated characteristics of a FH can add value to the food sold. And that seems to be what the buyers that we interviewed also thought and expected to charge a premium, offering better food, acting ethically etc…

Business services & Value Adding

Some livestock producers expected the FH to facilitate them with distribution, branding and market promotion, storage, actively linking producers and buyers, value added product development or business management services if they would ever join one:

"If they buy the animals at the right price, it's good. We are fully dedicated to the production so all other services must be taken care of by the food hub in that case" ***P11***

Some food service and producers mentioned that the FH should offer certain types of services for their internal business. Meat Producer P3, who only handles production and lets the slaughterhouse take responsibility for the commercialization of the meat, says that a FH would have to take care of the things that sellers take care of (such as branding and other necessary activities) if they would join. Another producer (P11) claims the same thing and adds that the FH generally has to offer value or a service that other buyers don't. Food service participant SE3 shared similar claims regarding the FH helping with certain business aspects such as issuing certifications in the case of or facilitating partnerships with other food system actors:

"Certifications are attractive, right now we are KRAV certified, and we want more certifications. [...] I would also like to get some good connections from this service" ***SE3***

Regarding the services that producers want in a FH, many of the producer participants mentioned the same services that Barham et al. (2012) names in his FH research: Aggregation, distribution, branding and market promotion, storage, actively linking producers and buyers, value added product development and business management services. Barham et al. (2012) also claims that it's common for livestock producers to lack processing facilities which limits their quantities supplied and this was also found in the studied region.

Cooperative model

The last theme was one raised only by 2 out of 16 (13%) producers. P12 and P4 say that they would only be interested in a FH if it allowed them to have control over decisions and management.

"About the food hub, yes and no. We would work with them, only if it's an organisation that can be controlled because we like to be in control". ***P12***

This means that the FH would have a model like a cooperative where all stakeholders are able to influence and take decisions. This was a very interesting finding given that an FH can work as a cooperative that is owned and managed by the producers and/or buyers (Fischer et al. 2015). This was only mentioned by two producers, since we did not specifically ask what form of FH, they preferred we got no more insight. The majority talked about it as a private intermediary without expressing if that was their preference. Knowing that this is a condition for some, tells us that if a FH gets created (or they create it) they will be able to provide knowledge and fairness to the organisation.

5. Discussion

The following section attempts to discuss the findings from all the Research Questions together to get the holistic perspective of their practical implications. It starts with a discussion of the supply side; how the formation of a FH would look by discussing the available foods and volumes followed by discussing the producer's perspective on the idea. The next section discusses the demand side by raising opportunities and challenges for the wholesale buyers and the role of consumers on the matter. The third section will discuss the findings in relation to the Uppsala Region food strategy. The fourth section gives more specific insights into how the formation of the FH could take place. Then we discuss some broader challenges (macro-challenges) of forming this type of organisation and/or contributing to a sustainable food system. It finalises with recommendations for future research.

The Uppsala region local food supply

The most common foods being produced among the sampled participants were animal foodstuffs or a mix of the former and grains. That makes them the products with the most potential to be commercialised in a farmer to wholesale FH in the studied region. Sweden generally does not have much suitable land for cultivation but does have natural pasture lands, therefore we expected the producers in the area to mostly produce animal foodstuffs. Even though Lönnerud (2012) said that animal foodstuffs production is lower in the region than in the rest of Sweden only covering ⅕ of the local demand, it seems to be common among microenterprise farmers to raise livestock in the studied region. The availability of quality pasture lands, the lack of arable land and the proof that smaller scale farmers raise livestock in the region could represent a window of opportunity for the increased commercialization of this type of products.

The quantities that the participant producers sell annually are relatively small, only 4 (25%) of the producers produced enough to combine direct sales with sales through intermediaries reliably, at the time of the interview. But only to a certain extent, and as a few expressed, they would probably collaborate directly with the physical stores or food services directly to retain as much value as possible. These were more likely to have a positive attitude towards a collaboration with a FH, with the condition that margins would be similar. All of them were either grain or meat producers, while one was a vegetable producer. On the other hand, most of the producers practised direct sales and/or had small scale production. Additionally, for many of the producers, farming was just a side income in their household. We also found that most of the producer participants did not produce at maximum capacity, and many said that they had capacity for more if they needed. This means that with the right conditions it is possible to increase some local supply for food in small

scale farms with relatively little investment. The barrier here is that the majority gave negative attitudes towards increasing, as they do not see enough value in it yet, feel satisfied or don't have the investments.

The role of a Food Hub for Uppsala region producers

AFNs share characteristics no matter where they are formed, such as the popularity among microenterprise farmers to join them. And these types of farmers have many things in common such as concerns around costs and capacity to transform their business models (Barham et al. 2012). We were not surprised when the producers' participants in the Uppsala region to a greater extent expressed negative attitudes towards the idea of a FH. Based on their reasons for not joining and their preferred characteristics for an Uppsala FH we found that generally, they expect relatively cheap and convenient services and prioritise logistical services since most of them have financial limitations (Stover et al. 2021). For example, a few commented on their advanced age and insecurity about the future of the farm, so they preferred to stay in business as usual. The producers of older age or those practising as a side income are only willing to collaborate with a FH if it doesn't require them to spend more time and resources while offering similar margins to direct sales. However, some of the interviewed producer participants preferred keeping the direct sales model and would still not be interested as they are running their farms as part time jobs and are not very motivated by a growth or change in their business. The preference for direct sales is understandable, the concept of running SFSCs like the FH in question is partly to allow small-scale producers retain a higher share of the profits (Barham et al. 2012). This means that the producers are economically incentivized to continue selling directly to consumers (where the price received per kg is higher than selling to distributors) if they are looking to maximise profits without creating economies of scale.

Our definition of FH that we shared with the interviewees was broad and we noticed that most of them interpreted it as a conventional intermediary who takes a large margin. Also, some producers felt they wanted to be in control and felt that a FH would take it away. This may have made participants more hesitant to show interest, but in reality, an FH can take any shape and even offer free services depending on who forms it (*ibid*). For example, if the producers would own the FH as Barham et. al (2012) exemplifies with US examples, there would be no need for paying for labour costs since they would stand for them. More reasons for the general negative attitude were clear when the majority said that they already had the necessary resources to manage a successful business; enough demand, enough volume, good prices received... Also because of the dynamic changes that forming a new business model implies, they may feel like it is hard to predict outcomes and food actors become hesitant to join them.

The opportunities for a FH in the region from a microenterprise producer perspective seem to be based on the ability of the initiative to offer internal business support i.e., service related to resources, logistics, marketing, finding clients, selling surplus produce etc... We also found that the FH could play a role in helping those that want to start a farming enterprise in the region when two farmers said that the services of an FH would have been beneficial back when they started the business.

Pressuring the existing microenterprise farmers to be more efficient or increasing volumes is not the solution, for now there is not much interest unless there is assurance it pays off. And that may only happen if the consumer internalises the cost, government subsidies, free labour, or combination of the three.

Demand for local food in the Uppsala region

For a successful FH, both supply and demand sides of the market need to be considered. The next discussion looks at the attitudes and preferences for wholesale buyers if a FH would be formed:

Role of a Food Hub for Uppsala region wholesale buyers

Food service and retailer participants found more reasons to join a FH than the producer participants, probably because they are in a less vulnerable position as they always can turn to their standard national wholesale distributors if the FH fails to deliver. But they still mentioned many reasons for why they wouldn't join. The negative attitudes of the wholesale buyers often arise from assuming that the FH would not be able to provide them with the products or volumes that they need. One restaurant mentioned that they run a catering company and require huge amounts of products every week, so they think that a FH would not meet the requirements. Also, buying locally is considered expensive since there is not enough supply to purchase in bulk, at least not for the most popular foods. We understand that the idea of a farmer to wholesale FH initially suggests a need for a large supply to satisfy the demand. However, initiatives start one collaboration at a time, and these accommodate the needs so a FH can still be relevant. Others mention that due to their nature of business, e.g., Thai restaurants with special supplier needs, a FH is likely not to be able to provide them with what they want.

Moreover, from the retailer's perspective, those that had a large offering of local products and were well connected to the producers, were proud of their enterprise. They had worked hard to build their network, which made them hesitant towards a FH. They did not really see much value unless the FH would not take high margins or pressure prices down. Additionally, many food services and retailers expressed that they have valuable bonds and relationships with their customers, and most likely do not want to risk their dissatisfaction, this is supported by the Uppsala case study by Stover et.al (2021).

Most wholesale buyers referenced the fact that they are aware that a sustainable food system is achievable through supporting local actors and minimising the pressure on the environment. They added that they wouldn't hesitate to join a FH if it was viable for them. It was interesting to see that regardless of all the technological developments over the years, which could have made people not need and support each other, there were signs of community sense. Seeing that actors of the region are aware of the benefits of a stronger local food system is a good sign of potential to enhance community union and development. Producers did not

express the same point since the majority already form AFNs and practise ethical values in their business, we think it is most likely a given for them.

Among the retailer's positive attitudes was that the FH could aggregate and deliver local food more conveniently than other networks. They also saw the value in FH as a potential diversification of supply channels. Additionally, a general regard for ethical reasons was mentioned mostly among retail and food service. For example, one meat producer and another retailer discuss how they think Swedish meat is healthier and better than imported meat. Reason for this being based on the welfare of the animals. It is valuable for them to know how and where the animals they buy, eat or sell have been raised. Some producers in this study even mentioned that sending animals to slaughterhouses and not knowing where it goes makes them feel bad. Moreover, most of the wholesale buyers also mentioned how buying locally would reduce transport emissions; have a positive impact towards the mitigation of climate change and help support local food systems. Anyhow, they made clear that a FH would only be interesting if it made sure to offer reliability, convenience, and competitive prices.

Awareness and consumption choices

To form a FH, food actors must consider how final consumers think and behave. Customers play a big role in the development of a sustainable food system. Granvik et al. (2017), Björklund et al. (2008) and Stover et al. (2021) had mentioned signs of an increasing number of health and environmentally conscious residents in Sweden and Uppsala, which is what one retailer participant said that they also experienced. Customer satisfaction is key, and the retailer noticed that the customers are mostly students in the surrounding universities and elderly people who value their heritage, which serves a sign for demand for local and consciously produced foods. There seems to be awareness about this among both wholesalers, consumers and even producers who practise sustainable agriculture to some extent. One sign is that most of the wholesale buyers agreed that it would be more interesting if the FH focused on selling differentiated food products and adding value to their business. These are all good signs of an opportunity for developing the local community. As much as the industry today is to a greater extent conventional (Morgan and Murdoch 2000), with the right conditions and ideas the minority can still have influence and creates a higher chance for these networks to develop in the future.

But it is important to keep in mind that local food systems and environmental sustainability are tightly linked. There are several environmental dilemmas that make the assessment of the good production systems in an AFN difficult. The impacts of environmentally destructive conventional intensive farming are becoming common knowledge. But consumer choices are difficult, and they are the ones that create demand. Something such as knowing whether it's better to buy tomatoes from a Swedish local greenhouse producer or a Spanish open field producer is very hard to find out. The same with buying a local and conventionally produced apple or an ecological one from Germany. We noticed that the benefits of less transportation from buying locally were not clear for every participant. One food service participant reflected that buying locally, which meant adding a

distributor to their suppliers, could mean an increase in emissions since it could have been bought from their current one. These kinds of concerns need to be considered when designing a FH. Another example of environmental dilemmas is that strengthening production in a region is dependent on land availability. Intensifying production has negative impacts on the land and ecosystems while land expansion does too; what to do depends on local conditions (Matson et al. 1997). Unless we make a careful life cycle analysis of the specific product that compares its impact in relation to its next best alternative, we cannot ensure its benefits. This is increasingly important for conscious consumers who look for products or buy from organisations that transfer transparent information.

Like Eugenio et al. (2017) findings from other settings, we found that many wholesale buyers in Uppsala Regions see value in the co-certification mechanism based on the consumer/producer relationships, rather than opting for quality certifications. This refers to a local label or just the transmission of the information about the food's origin to the customer, so they can make informed consumption choices. But there was a clear trend that contrasted between the two types of actors (producer and wholesale buyer): the producers that already sold in SFSC direct to consumers felt that a FH could create more distance with the consumer deteriorating the transfer of information, while the wholesale buyers, especially food service, saw it as a potential way to bring consumers closer to consumption. And retailers have mixed feelings, their attitudes depended on how much information they were transferring now. If we are optimistic, a FH could do its best to maintain and enhance the relationship between producer and consumer for those who already have it and create it for those who don't have it yet. One of the goals of transferring quality information to the customer is that potentially, the consumer internalises the extra costs. But the ability to transfer the cost of value-added food to customers is constrained; if they prioritise buying local food and supplies, they may react negatively and stop visiting those places.

If FHs have been successful elsewhere, e.g., in the US (Barham et al. 2012), it is worth finding if there is a need or interest for one in the region. It is clear from the findings that a FH is only interesting for the interviewed actors if it’s able to create added value of some kind and ensure its reliability. Given the situation, it is likely an FH in the studied region would be run by non-profits or the producers and wholesale buyers themselves, since private initiatives often look to make profits which makes it not worth it for the other actors whose margins are reduced.

The Uppsala Regional food strategy “Ät Uppsala Län”

The Swedish and Uppsala Län food strategies state a need for increasing domestic production, an increase in supply of sustainably produced food and support the viability of small-scale farming. The wholesale buyers showed an interest in supporting a sustainable system if the FH ran an efficient and reliable model. Regarding the participant producers could play a role in contributing to these goals.

Even if small, the potential of increasing production in the region would help achieve some of the goals of the national and the Uppsala Regional food strategy. But only if the production had a focus on maximising sustainability and if it is competitive in the market. We suggested that the most common foods grown being animal foodstuffs and grains, be the ones that are focused on in the FH. We are aware of the need for a decrease in animal food production because of sustainability and health issues (Steinfeld, 2006) so it's worth mentioning that buying animal foodstuffs from the region does not mean an increase in meat consumption but offering a substitute. Nor does it mean that there is enough meat produced to satisfy all the demand in the region. It means an opportunity to use local resources in a sustainable manner to support the local economy and strengthen the food system.

The fact that our producer participants were already practising some methods of farming that tried to minimise the pressure on the environment, is a sign that more development in this field is more likely. There were two producers that practised mixed farming using circularity of resources by feeding the livestock with their own grains which is resource efficient but also puts limits on how much it can produce. Another producer shares that practising organic farming put a limit on how much he is allowed to produce per unit of area. The correlation between using sustainable methods of production and the limited capacity to produce more volumes was clear. An opportunity was identified when we found that 14 (87%) producers practised either KRAV or organic agriculture that sometimes exceeded the requirements of the label. Stover et al. (2021) alluded that considering that products are grown locally and organically, then consumers receive highly nutritious and healthy fresh foods. For example, most of the livestock producers grass fed their animals which is linked to an increased quality and healthiness of food and better for the natural environment than industrially produced. While the global industrial agricultural system is known to be degenerative in its processes, these are an example of how AFNs can build soil fertility and boost natural cycles through sustainable agricultural practices that could resist climate change, protect ecosystem services, and improve the soil, biodiversity, and water (Stover et al. 2021).

Formation of a wholesaler-to-producer FH in the Uppsala region

Even if this study investigated a radius of 40km from Uppsala, it does not mean that the FH in consideration only would cover this precise area. But it's important to keep in mind that the purpose of a FH is partly to create a sense of community and bring actors closer, so the more distance between producers and buyers means a risk of losing some of the benefits of this proximity. In this case it is up to the actors in the FH to evaluate if including producers or wholesale buyers that are further away is appropriate.

Opportunities and recommendations

The heterogeneity of the sample of producers in terms of quantities, types and varieties of food products and their different expectations for what the FH should provide could limit the efficient formation of a FH. But in terms of what is available now, the results show that if an FH is formed it would mostly be formed by farmers with animal foodstuffs or grains and handle vegetables when their seasons arrive or if some grow them in greenhouses. Because of the limited volumes available, the FH would most likely not act as the main supplier for the wholesaler buyers, but as a secondary one that delivers when stock is available or when the producers are able to deliver. Because of the diversity in type of foods produced and the seasonality of the vegetables and fruits, the wholesale buyers need to be flexible, creative, and fast to respond when products are available. Lastly, there are also producers that may run types of business which crave a need for special arrangements such as the participant who was a hunter and offered game meat when the season arrived. A FH could offer help finding buyers for these "unusual" and more "exclusive" products in the market.

Given the interest of the participant wholesale buyers in supporting environmental and social values, a FH could represent an opportunity for them to add value and create a stimulating work environment. Retailers and food service would be able to offer seasonal and local foods as a promotion or special dish on their menu. Alternatively, the FH could focus on working with smaller food service or retail stores that either specialise in certain products or are able to charge higher prices. A risk is that regional food only becomes accessible for the people with higher income, which is not socially equitable. We also recommend the idea of focusing on products that can be preserved for longer periods of time. Examples could be flour from grains, oil, curated meats, processed vegetables, and fruits etc… One example is a bakery that we interviewed who mentioned that they already bought flour and other products from regional producers and that a FH could make this even easier for them. Processed foods are often higher in price than the fresh products, allowing the producers to get higher profits. But they would have to take care of the processing of the food or collaborate with actors that have access to that infrastructure.

If a FH is to be considered in the region, it is valuable to look at other initiatives around the world where you see many types of examples adapted to their specific challenges. As Barham et al. (2012) see in the US, FHs can provide a broader range of services such as investing in food distribution infrastructure (e.g. owning or renting a warehouse and a truck for drop-offs and pickups), in processing infrastructure (e.g. packing, labelling and light processing such as trimming, cutting) and in storage (e.g. owning or renting cold/dry storages). All of these things could be valuable to consider by the food actors, so they make the most out of their value chains. For example, some FHs may collaborate with other actors who can provide these services instead of owning the infrastructure themselves. And other initiatives that involve the transactions of food in Uppsala can potentially benefit from collaborating with an FH too. Some have supplies of food that they aggregate or rescue and donate, such as "Uppsala Bruised Club". A potential idea is that the supply of food can be redirected back into the value chain again by including it in

the FHs stock where, for example the wholesalers could buy from when they are short of something and avoid calling a distributor or going to a supermarket.

One of the main issues are the challenges of achieving enough scale for it to deliver the amounts and types of food needed. Therefore, we believe that an important characteristic of the collaboration is flexibility to changing availability of supplies. This is also a key aspect of a sustainable food system and systems that deal with small scale farmers and their dynamic and uncertain production and distribution schemes. Given the many issues that selling to wholesale gives, an alternative is to create a Food Hub that is not necessarily strictly selling to wholesale. Given the high interest of producers to sell directly to consumers because of the closer social proximity and the increased margins received, the Food Hub could offer services that do not interrupt these beneficial aspects.
We can summarise two types of likely developments:

- First would be the continuation of the status quo; the conventional system continues to be strengthened and AFNs stay distantly alternative and not supported by no more than a minority of people who make the effort to maintain the practice. The CFS may succeed in bringing food security from global networks but will struggle if these are interrupted by certain economic, political, or environmental crises.

- The second alternative is that there is a bottom-up movement of change that comes from broader society where consumers start to try to contribute to a stable food system by supporting local food production whenever possible. A parallel affordable market to the CFS is created that may be partly based on free labour, but optimistically run by cooperatives or private organisations that offer affordable services or receive donations/state support. The supplies may initially be low, but community members may decide to start or expand farms and find zones optimal for any kind of food production that aligns with AFN values in the region. This movement most likely coexists with the CFS which is expected to also make a sustainable transition in its own methods.

The participant retailers can be seen as very valuable actors in the regional food system. If the formation of an FH comes from a “grassroots bottom-up approach”, they already have an established network with trust and communication channels. With the interest from the owners, the retailers already have resources and infrastructure in place to help the formation of a FH. We believe that the two retailers that were the most local and connected to the producers are the ones who could bring the knowledge to help the mediation with the farmers. Their ICT platforms could be the inspiration for the FH to help make purchases convenient and use their knowledge to represent the right values and educate consumers. This idea would probably still need the involvement of actors such as civil society or government who would support them with resources to succeed. But it is important to add that any type of support needs to be carefully designed to satisfy the specific needs of the actors that are in most need. This alludes to the statement by Stroink

and Nelson (2013) about the risk of not considering smaller scale initiatives when introducing new policies which put farms and livelihoods at risk.

To conclude this discussion of the extensive set of findings, we can say that the participants are aware of the potential benefits of the FH, but since it is a very new thing, they are not sure if they should trust it. It would be beneficial if they and the customers could understand the potential role of a FH clearly: origins, mission, way of operation, production methods used by the farmers, product information, etc. Systems like REKO ring (Tietz 2021) are supported because the actors have experienced that they are straightforward and easy to use for all actors, making it more trustworthy and engaging with increasingly more food actors. This could lead to a suggestion for government support to develop a FH; Stover et al. (2021) shares those public institutions could play an important role in getting these types of initiatives started through supportive policies. But it is key that the policies aren't disconnected from the processes of local initiatives, so they protect the vulnerable actors and increase their interest in growing in scale or in number.

Macro-challenges for the formation of a FH in Uppsala Region

A crucial requirement to keep an AFN going is active participation, however, it is increasingly difficult to achieve this because in urban areas, a continuous disconnection between production and food consumption is progressings. If harmonious interactions within the community are realized, they could lead to increased democratic participation and engagement in governance on multiple levels (Renting et al. 2003). But there is an overestimation about the desired transformations that AFNs can bring in civil societies (Holt Giménez & Shattuck 2011). Clapp (2020) states that besides many opportunities and benefits, difficulties lay in the relocation of food systems. It is undeniable that AFNs do challenge political authorities, corporate food regimes, and the responsible persons in decision making like big retailers, but these powerful actors often prefer to maintain "business as usual" mechanisms for sustainability (von Oelreich & Milestad 2017).

Clapp (2020) adds that that there are social challenges for the development of AFNs, among them, balancing and making justice prevail in global food systems and creating awareness about the problems. A clear challenge is consumer behaviour. Final consumers are the ones who create demand and if they are not interested in buying regional food, the supply chain does not see the value in offering it. Food is considered a commodity and if people see it this way, they will always choose the cheapest or most convenient alternative. This makes it hard for initiatives like FHs which require more effort and money to purchase from. Therefore, it is as important to spread awareness and conscience about the sustainability of the regional food system, as it is to ensure a reliable supply of food. The combinations of all the participant actors' attitudes and barriers makes a formation of a FH difficult. Moreover, with the current irregularities that have been occurring in the world, the likes of COVID 19 and the Ukraine war, make the matter more complicated. So, some actors are sceptical about trying new things. Just like a retailer owner shared; they don't know if the food system demands will react by investing in the CFS or in local food systems when instabilities happen in the supply

chain. Cappelli and Cini (2020) support that certain AFNs can represent a potential lifeline in case of severe crisis and disruption of global supply chains, so in the long term, we suggest that looking into these initiatives can help contribute to a sustainable transition of the food system.

To conclude this discussion, even if there were more themes under negative attitudes towards collaborating with FH and increasing production, we saw many signs of food actors in AFNs who prioritize different things than the CFS. The great majority of producers gave special care for the processes of production while the wholesale buyers, especially the retailers, expressed and valued the social capital created from engaging in local AFN in this region. This may be a sign that even if great challenges are faced, there is a degree of individual and community drive for change of how local food systems are designed and managed by groups of influence.

Recommendations for further research

To form an initiative or organisation that contributes to a sustainable development of local food systems and simultaneously aligns with the regional and national food strategies, there is a need for more multidisciplinary knowledge. If Food Hubs are further explored in the region, we have a few suggestions for types of research that may be useful.

This study showed some signs by producers that they would like to manage transactions if they joined a FH. This opens the doors for finding out how food actors feel about their attitudes regarding their involvement in the formation of a FH. Not only producers, food service and retail, but also final consumers, government agencies, civic society and NGOs who could collaborate and start the initiative together. Are there resources, social, environmental, and economic interest in joining efforts for the increase of local transactions of food through the formation of a farmer to wholesale Food Hub? Do they align with the national and regional strategies? The same type of research could be done to a Food Hub that is not necessarily strictly selling to wholesalers. Given the high interest of producers to sell directly to consumers because of the closer social proximity and the increased margins received, the Food Hub could offer services that do not interrupt these beneficial aspects.

Another type of research that is worth considering would be to find out what type of foods are the most interesting for wholesale buyers. And combine it with life cycle analysis of them to find out if they contribute to a more sustainable food system in the long term. This could be done by comparing the impacts of what the buyers purchase today with the impacts if they would source it locally.

The producers were not able to give very accurate amounts of products they produced, which made it difficult to represent an accurate picture of what is available in the region. In the future, proper monitored quantification could be done to get a clear idea of what producers have and can provide to the wholesale buyers. This way, a proper mapping opportunity is feasible, hence restaurants and producers can connect even better through such research.

Moreover, there is a need for clearer context-specific advantages that the FH can bring along. For people intending to start a FH, they should be innovative and gather enough information and resources to provide differentiated services that add value in economic and socioenvironmental terms, otherwise the actors see it pointless to join when they already can manage without the FH. Researchers could try to get closer to the actors to create relationships and closer bonds. This could make the participants a little bit more interested in contributing or partaking in AFN initiatives. By building some form of trust and thus make more efforts to support each other, for example simply giving effortful answers during interviews than just general conceptions.

Another recommendation for future studies in the field is that the researcher scopes the study on one specific type of wholesale buyer or a specific type of food. This way, the specific needs of the wholesaler or of the type of food can be investigated in depth. Following our points of discussion, the study could focus on wholesalers that are interested in grain, animal foodstuffs or vegetables and fruits (in the spring/ summer) since it is what is produced the most in the area.

6. Conclusion

With HIC countries being at the forefront of industrialization over the years, most, if not all their food systems are dependent on long food supply chains. The CFS has shown to underestimate other systems while often contributing to environmental negative externalities. AFNs have been developed as an alternative and have proven to open opportunities for microenterprise businesses to thrive and meet demand in the community around them. In Sweden, these AFNs are still underdeveloped compared to other countries like the US, which prompted us to investigate the opportunities for the development of such networks in the Uppsala Region and how the idea could be received by the corresponding actors. Our focus was on one type of AFNs called FHs, with a bid to try and promote SFSCs and at the same time strengthen the local food economy. In summary, the identified gap in literature is the lack of sufficient knowledge regarding the conditions and attitudes towards the development of a concrete type of AFN organisation, farmer-to-wholesale FH in Uppsala. The findings can be used to get further insights into the reality of small-scale farmers and wholesale buyers to continue looking for viable initiatives while contributing to the Uppsala regional policy. Moreover, this could enhance the achievement of a sustainable future food system.

From our findings, the type of food being produced the most in the Uppland region is animal foodstuffs. Some producers practise entirely livestock farming, while others mix livestock and grain/vegetable farming then a few of them do only vegetables/grain produce. In our literature review, we found out that Uppsala has good pasture lands for grazing livestock. This was also evidenced by these results we gathered. However, when asked if they would increase production when given a chance, the farmers expressed little interest to a greater extent. They were satisfied with their current models and at the same time they were worried about the costs that this development would bring. producers expressed a more negative attitude towards the idea of a FH compared to the wholesale buyers. The only reason they emphasised they could join a FH was for business support. Besides that, they thought this kind of organisation would not be economically viable and they had fears about joining new partnerships.

On the other hand, wholesale buyers thought it was a good idea to join a FH that would genuinely support local actors and local food systems. They also saw themselves gaining some logistical advantage if the FH would come in place and take over the responsibility of aggregating produce for them. Nonetheless, they also thought this organisation could be economically not viable since partnering with them would mean increasing the prices of their products to cater for the services of the hub, hence this would disturb their relationships with their loyal customers. All the actors interviewed collectively concluded by giving pointers of the characteristics or services they would expect from such an organisation if they were to join. They mainly expressed that a FH should be as transparent as possible, provide them with logistical services at minimal costs, and at the same time be

reliable and add value to their businesses. Conclusively, the idea of a FH seems difficult but feasible to a certain extent. There is a need for more knowledge and incentives to educate and materialise the advantages of such developments.

References

Aggestam, V., Fleiß, E. & Posch, A. (2017). Scaling-up short food supply chains? A survey study on the drivers behind the intention of food producers. *Journal of rural studies*, 51, 64–72

Andrée, P., Clark, J.K., Levkoe, C.Z. & Lowitt, K. (2019). Introduction--Traversing theory and practice: Social movement engagement in food systems governance for sustainability, justice, and democracy. *Civil Society and Social Movements in Food System Governance*. Routledge, 1–18

Barbera, F. & Dagnes, J. (2016). Building Alternatives from the Bottom-up: The Case of Alternative Food Networks. *Agriculture and Agricultural Science Procedia*, 8, 324–331

Barham, J., Tropp, D., Enterline, K., Farbman, J., Fisk, J. & Kiraly, S. (2012). *Regional Food Hub Resource Guide: Food Hub Impacts on Regional Food Systems, and the Resources Available to Support Their Growth and Development*. United States Department of Agriculture (USDA). https://books.google.com/books/about/Regional_Food_Hub_Resource_Guide.html?hl=&id=zCkjngEACAAJ

Björklund, H., Cardoso, M., Gebresenbet, G., Gossas, C., Hallberg, I., Ljungberg, D. & Strömblad, F. (2008). De lokala matproducenterna och dagligvaruhandeln. 93. [2022-02-25]

Blum-Evitts, S. (2009). *Designing a Foodshed Assessment Model: Guidance for Local and Regional Planners in Understanding Local Farm Capacity in Comparison to Local Food Needs*.

Bowen, G.A. (2006). Grounded Theory and Sensitizing Concepts. *International Journal of Qualitative Methods*, 5 (3), 12–23

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3 (2), 77–101

Brown, G., Strickland-Munro, J., Kobryn, H. & Moore, S.A. (2017). Mixed methods participatory GIS: An evaluation of the validity of qualitative and quantitative mapping methods. *Applied geography* , 79, 153–166

Bui, S., Cardona, A., Lamine, C. & Cerf, M. (2016). Sustainability transitions: Insights on processes of niche-regime interaction and regime reconfiguration in agri-food systems. *Journal of rural studies*, 48, 92–103

Byerlee, D., de Janvry, A. & Sadoulet, E. (2019). Agriculture for development: Toward a new paradigm. *Annual Review of Resource Economics*,. https://www.annualreviews.org/doi/full/10.1146/annurev.resource.050708.144239 [2022-02-01]

Cappelli, A. & Cini, E. (2020). Will the COVID-19 pandemic make us reconsider the relevance of short food supply chains and local productions? *Trends in Food Science & Technology*, 99, 566–567

Charatsari, C., Kitsios, F. & Lioutas, E.D. (2020). Short food supply chains: the link between participation and farmers' competencies. *Renewable Agriculture and Food Systems*, 35 (6), 643–652. [2022-02-20]

Clapp, J. (2020). *Food*. John Wiley & Sons.

Cleveland, D.A., Müller, N.M., Tranovich, A.C., Mazaroli, D.N. & Hinson, K. (2014). Local food hubs for alternative food systems: A case study from Santa Barbara County, California. *Journal of rural studies*, 35, 26–36

Collis, J. & Hussey, R. (2013). *Business Research: A Practical Guide for Undergraduate and Postgraduate Students*. Macmillan International Higher Education.
Connelly, L.M. (2016). Trustworthiness in Qualitative Research. *Medsurg nursing: official journal of the Academy of Medical-Surgical Nurses*, 25 (6), 435–436
Cousin, G. (2005). Case Study Research. *Journal of Geography in Higher Education*, 29 (3), 421–427
Cretney, R. (2014). Resilience for Whom? Emerging Critical Geographies of Socio-ecological Resilience. *Geography Compass*. https://doi.org/10.1111/gec3.12154
EU (2013). *Short food supply chains and local food systems in the EU : a state of play of their socio-economic characteristics*. European Union. http://op.europa.eu/en/publication-detail/-/publication/d16f6eb5-2baa-4ed7-9ea4-c6dee7080acc/language-en [2022-02-24]
Eugenio, D., Anna, G. & Alberto, P. (2017). Farmers' motivation and perceived effects of participating in short food supply chains: evidence from a North Italian survey. *Agricultural economics* , 63 (5), 204–216
Fischer, M., Pirog, R. & Hamm, M.W. (2015). Food Hubs: Definitions, Expectations, and Realities. *Journal of Hunger & Environmental Nutrition*. https://doi.org/10.1080/19320248.2015.1004215
Galzki, J.C., Mulla, D.J. & Peters, C.J. (2015). Mapping the potential of local food capacity in Southeastern Minnesota. *Renewable Agriculture and Food Systems*, 30 (4), 364–372. [2022-02-23]
Giampietri, E., Finco, A. & Del Giudice, T. (2015). EXPLORING CONSUMERS'ATTITUDE TOWARDS PURCHASING IN SHORT FOOD SUPPLY CHAIN. *Calitatea*, 16 (S1), 135
Granvik, M., Joosse, S., Hunt, A. & Hallberg, I. (2017). Confusion and Misunderstanding—Interpretations and Definitions of Local Food. *Sustainability: Science Practice and Policy*, 9 (11), 1981. [2022-02-25]
Grauerholz, L. & Owens, N. (2015). Alternative food movements. *International encyclopedia of the social & behavioral sciences*, 1 (2), 566–572
Griffee, D.T. (2005). Research tips: Interview data collection. *Journal of developmental education*, 28 (3), 36–37. [2022-03-16]
Gruvaeus, A. & Dahlin, J. (2021). Revitalization of Food in Sweden—A Closer Look at the REKO Network. *Sustainability: Science Practice and Policy*, 13 (18), 10471. [2022-02-20]
Hammarberg, K., Kirkman, M. & de Lacey, S. (2016). Qualitative research methods: when to use them and how to judge them. *Human reproduction* , 31 (3), 498–501. [2022-03-07]
Holt Giménez, E. & Shattuck, A. (2011). Food crises, food regimes and food movements: rumblings of reform or tides of transformation? *The Journal of peasant studies*, 38 (1), 109–144
Horst, M., Ringstrom, E., Tyman, S., Ward, M., Werner, V. & Born, B. (2011). Toward a More Expansive Understanding of Food Hubs. *Journal of Agriculture, Food Systems, and Community Development*. https://doi.org/10.5304/jafscd.2011.021.017
Jarosz, L. (2008). The city in the country: Growing alternative food networks in Metropolitan areas. *Journal of Rural Studies*. https://doi.org/10.1016/j.jrurstud.2007.10.002
Joltreau, T. & Smith, A. (2020). Short Versus Long Supply Chains in Agri-Food Sectors: Peaceful Coexistence or Political Domination? The Case of foie gras in South-West Franc. *Sociologia Ruralis*,. https://doi.org/10.1111/soru.12305
Kalfagianni, A. & Skordili, S. (2018). *Localizing Global Food: Short Food Supply Chains as Responses to Agri-Food System Challenges*. Routledge.
Kelle, U. (2006). Combining qualitative and quantitative methods in research practice: purposes and advantages. *Qualitative research in psychology*, 3 (4), 293–311
Lönnerud, A. (2012). *Facing Peak Oil and Climate Change: A Pragmatic Approach to a Re-localized Food Production System in Uppsala, Sweden*. https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A578171&dswid=-2738 [2022-02-25]

Matson, J., Shaw, J. & Thayer, J. (2014). Food hubs: an evolution of the co-op business model: EBSCOhost. *Rural Cooperatives. Jan/Feb2014, Vol. 81 Issue 1, p4-37. 5p.,*. https://web.p.ebscohost.com/ehost/detail/detail?vid=0&sid=496b3888-cf91-4361-b2a8-f4d012744566%40redis&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=bth&AN=94488475 [2022-03-05]

Matson, J. & Thayer, J. (2013). The Role of Food Hubs in Food Supply Chains. *Journal of Agriculture, Food Systems, and Community Development*, 3 (4), 43–47. [2022-05-14]

Matson, P.A., Parton, W.J., Power, A.G. & Swift, M.J. (1997). Agricultural intensification and ecosystem properties. *Science*, 277 (5325), 504–509

McMichael, P. & Rogaly, B. (2005). *Global Development and the Corporate Food Regime*.

Michel-Villarreal, R., Hingley, M., Canavari, M. & Bregoli, I. (2019). Sustainability in Alternative Food Networks: A Systematic Literature Review. *Sustainability*. https://doi.org/10.3390/su11030859

Morgan, K. & Murdoch, J. (2000). Organic vs. conventional agriculture: knowledge, power and innovation in the food chain. *Geoforum; journal of physical, human, and regional geosciences*, 31 (2), 159–173

Morrison, K.T., Nelson, T.A. & Ostry, A.S. (2011). Methods for mapping local food production capacity from agricultural statistics. *Agricultural systems*, 104 (6), 491–499

Nancy, R.N., Denise, R.N., Alba, R.N. & MEd, M. (2014). The Use of Triangulation in Qualitative Research. *Oncology Nursing Forum; Pittsburgh volume*. search.proquest.com. https://search.proquest.com/openview/1904d067b227719a39567bba50c56328/1?pq-origsite=gscholar&cbl=37213

Nowell, L.S., Norris, J.M., White, D.E. & Moules, N.J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, 16 (1), 1609406917733847

von Oelreich, J. & Milestad, R. (2017). Sustainability transformations in the balance: exploring Swedish initiatives challenging the corporate food regime. *European Planning Studies*, 25 (7), 1129–1146

Pain, A. (2015). *New Challenges to Food Security: From Climate Change to Fragile States*. Routledge. [2022-04-25]

Peters, C.J., Bills, N.L., Wilkins, J.L. & Fick, G.W. (2009). Foodshed analysis and its relevance to sustainability. *Renewable Agriculture and Food Systems*. https://doi.org/10.1017/s1742170508002433

Polit, D. & Beck, C. (2014). Qualitative descriptive studies. *Essentials of nursing research: Appraising evidence for nursing practice*,

Pollan, M. (2007). *The Omnivore's Dilemma: A Natural History of Four Meals*. Penguin.

Reiter, B. (2017). Theory and methodology of exploratory social science research. 5 (4), 129–150. [2022-03-15]

Renting, H., Marsden, T.K. & Banks, J. (2003). Understanding Alternative Food Networks: Exploring the Role of Short Food Supply Chains in Rural Development. *Environment and Planning A: Economy and Space*. https://doi.org/10.1068/a3510

Rockström, J., Steffen, W., Noone, K., Persson, Å., Stuart III Chapin, F., Lambin, E., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H.J., Nykvist, B., de Wit, C.A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. & Foley, J. (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecology and Society*. https://doi.org/10.5751/es-03180-140232

Sage, C. (2003). Social embeddedness and relations of regard: alternative "good food"networks in south-west Ireland. *Journal of rural studies*, 19 (1), 47–60

Santini, F. & Gomez y Paloma, S. (2013). *Short Food Supply Chains and Local Food Systems in the EU: A State of Play of Their Socio-economic Characteristics*.

Sellberg, M.M., Norström, A.V., Peterson, G.D. & Gordon, L.J. (2020). Using local initiatives to envision sustainable and resilient food systems in the Stockholm city-region. *Global Food Security*. https://doi.org/10.1016/j.gfs.2019.100334

Sonnino, R. & Marsden, T. (2005). Beyond the divide: rethinking relationships between alternative and conventional food networks in Europe. *Journal of Economic Geography*, 6 (2), 181–199. [2022-02-04]

Steinfeld, H., Gerber, P., Wassenaar, T.D., Castel, V., Rosales, M., Rosales, M. and de Haan, C., 2006. *Livestock's long shadow: environmental issues and options*. Food & Agriculture Org.

Starman, A.B. (2013). The case study as a type of qualitative research. *Journal of Contemporary Educational Studies*,. https://www.researchgate.net/profile/A-Biba-Rebolj-2/publication/265682891_The_case_study_as_a_type_of_qualitative_research/links/54183f560cf25ebee988104c/The-case-study-as-a-type-of-qualitative-research.pdf

Stoate, C., Báldi, A., Beja, P., Boatman, N.D., Herzon, I., van Doorn, A., de Snoo, G.R., Rakosy, L. & Ramwell, C. (2009). Ecological impacts of early 21st century agricultural change in Europe--a review. *Journal of environmental management*, 91 (1), 22–46

Stover, A., Zoonnekindt, K. & Korcekova, K. (2021). *BRAMATEN RESEARCH PROJECT: SOCIO-ECONOMIC ANALYSIS OF LOCAL FOOD NETWORKS IN THE UPPLAND REGION*. European Union & Jordbruksverket.

Stroink, M.L. & Nelson, C.H. (2013). Complexity and food hubs: five case studies from Northern Ontario. *Local Environment*. https://doi.org/10.1080/13549839.2013.798635

Svenska Näringsdepartamentet (2017). *A National Food Strategy for Sweden: More Jobs and Sustainable Growth Throughout the Country : Short Version of Government Bill 2016/17:104*. Ministry of enterprise and innovation. https://books.google.com/books/about/A_National_Food_Strategy_for_Sweden.html?hl=&id=t4LmtAEACAAJ

Swedberg, R. (2020). Exploratory research. *The production of knowledge: Enhancing progress in social science*, 17–41

Tietz, V. (2021). An ecosystem for alternative food networks in Uppsala. 2021:39, 61. [2022-02-20]

Trobe, H.L.L., La Trobe, H.L. & Acott, T.G. (2000). Localising the global food system. *International Journal of Sustainable Development & World Ecology*. https://doi.org/10.1080/13504500009470050

Uppsala-Länstyrelsen (2021). *Ät Uppsala län - Handlingsplan för livsmedel*. Länstyrelsen Uppsala Län. https://www.lansstyrelsen.se/uppsala/natur-och-landsbygd/stod-for-landsbygdsutveckling/at-uppsala-lan.html [2022-04-03]

USDA (n.d.). *Cooperatives and food hubs. United States Department of Agriculture. The National Agricultural Library (NAL)*. https://www.nal.usda.gov/legacy/afsic/cooperatives-and-food-hubs [2022-02-17]

Vermeulen, S.J., Campbell, B.M. & Ingram, J.S.I. (2012). Climate Change and Food Systems. *Annual Review of Environment and Resources*,. https://www.annualreviews.org/doi/abs/10.1146/annurev-environ-020411-130608 [2022-02-21]

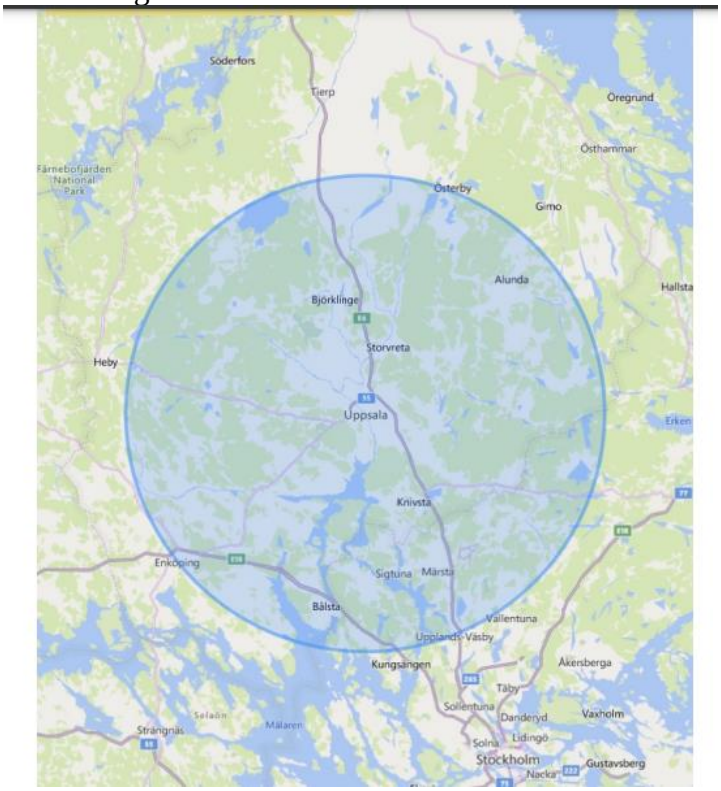
Wästfelt, A. & Eriksson, C. (2017). *Det svenska lantbrukets omvandling 1990-2014: Exemplet Uppsala län*. Uppsala: Institutionen för stad och land. https://pub.epsilon.slu.se/14589/ [2022-03-23]

Worldbank (2022). *Agriculture, forestry, and fishing, value added (% of GDP) - Sweden. Worldbank.org*. https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?end=2020&locations=SE&start=1980 [2022-02-01]

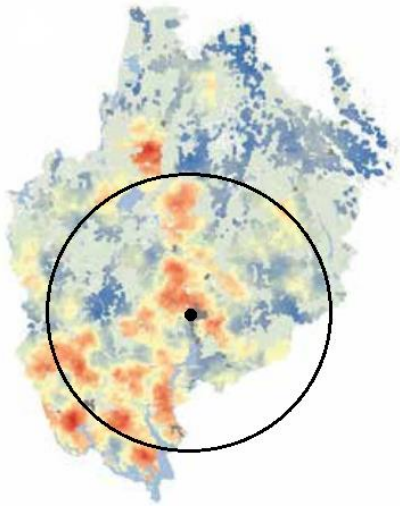
Appendices

Appendix A: Maps

a) Studied region



b) Map over Uppsala County showing the selected for the study. 40m radius from Uppsala Central



c) Map over Uppsala County showing the areas used for crop cultivation

Red color shows where the concentration is. The blue color shows where there is none land use of the type in question and intermediate colors means that the concentration is lower.

Appendix B: Interview Guides

Interview Guide for producers

"First, we would like to ask for permission for recording the audio of this interview. Secondly, you can remain anonymous in this study if you like. You can tell us once you answer the questions. Thirdly, we offer the possibility to send you the data you shared for confirmability once we have transcribed it."

A brief explanation of the general aim of the study

"Our study explores the opportunities and challenges of local food producers and wholesale buyers to help develop Uppsalas local food system. We aim to collect information from you regarding two things; What and how much is sold/bought in your business. And the attitudes toward the formation of an organisation that facilitates aims to strengthen the local food system by enabling local food transactions for wholesale buyers such as food service and retail"

<Opening Questions>

Is farming your main income? If not, what is?
How long have you been farming?
Shortly define your type of farming
How long is your harvest season?

What are the main types of products that you commercialise?
What average volumes are you producing eg (kg/tonnes per week/ month/ season)?

- Product: …….. Quantity: ……

What kind of buyers do you have?
Are you satisfied with your received prices in your current sales channels?
Satisfied with volumes sold? (Are you successful in selling all that you produce?)
What is the maximum you can produce without significant changes in your business?

- Product: …….. % increase: ……

Give Definition of Regional Food Hub

"To answer the following questions, you have to imagine that there is a new type of organisation or initiative in Uppsala that we call "Regional Food Hub". It is a local actor whose main purpose is to enable more sale channels for small scale farming by focusing on creating links with wholesale buyers such as restaurants or retail stores. Another key characteristic is that it purposely aims to contribute to the thriving of the regional food system or the effort to be more sustainable. Depending on its form, an FH can range from being a private organisation that takes membership fees to a cooperative that runs purely on the efforts of the food actors and civil society. The type of services are various;

developing a viable and sustainable business model, (producers, restaurants or retail) while maximising benefits for society and the environment.

What's your attitude towards the idea of being part of a FH by selling wholesale considering that you will maintain or increase profits in the long term?
Reason for why you would or wouldn't?
What would be the conditions?

Given that in the future, things change, and a FH comes handy:
What type of services should the regional food hub provided

Suggestions if they didn't answer:

Distribution — Aggregation – Brokering — Market promotion — Packaging – Light processing — Product storage — Active linking of producers and buyers – Business management services and guidance – Liability insurance – Value-added product development.

Others

Interview Guide for restaurants and retailers

"First, we would like to ask for permission for recording the audio of this interview. Secondly, you can remain anonymous in this study if you like. You can tell us once you answer the questions. Thirdly, we offer the possibility to send you the data you shared for confirmability once we have transcribed it."

A brief explanation of the general aim of the study

"Our study explores the opportunities and challenges of local food producers and wholesale buyers to help develop Uppsalas local food system. We aim to collect information from you regarding two things; What and how much is sold/bought in your business. And the attitudes toward the formation of an organisation that facilitates aims to strengthen the local food system by enabling local food transactions for wholesale buyers such as food service and retail"

<Opening Questions>

restaurants

- What is the approximate amount of people served per day?

<Opening Questions>

Retail

- Can you briefly describe your category? What kind of retailer are you?
- What is your revenue per year?
- What are your kind of customers?

Both

- Do you currently purchase (both) and/or sell (retailers) any locally produced foods (Uppland or Sweden)?

1. What?
   Product: ... Quantity: ……

b. Where do you buy the local foods?

1. Would you diversify with new local suppliers? Meaning not changing suppliers but buying local produce when available and importing otherwise.
. Why/why not?

Suggestions if they didn't answer: Price, Costs, Quality, Information availability, Trust, Contribute to the local economy

2. Do you purchase food according to seasons? If not, do you think it would be interesting to do that if you got the opportunity to buy more locally in the future?

Give Definition of Regional Food Hub

"To answer the following questions, you have to imagine that there is a new type of organisation or initiative in Uppsala that we call "Regional Food Hub". It is a local actor whose main purpose is to enable more sale channels for small scale farming by focusing on creating links with wholesale buyers such as restaurants or retail stores. Another key characteristic is that it purposely aims to contribute to the thriving of the regional food system or the effort to be more sustainable. Depending on its form, an FH can range from being a private organisation that takes membership fees to a cooperative that runs purely on the efforts of the food actors and civil society. The type of services is various; developing a viable and sustainable business model, (producers, restaurants or retail) while maximising benefits for society and the environment.

3. Would you be willing to buy from a food hub, if the prices offered were the same or lower than your current channel?

Why/why not?
Would you be willing to buy from a food hub if the prices offered were higher than your current channel?

4. How many deliveries do you expect a week from the products available locally?
Product:

- Once a week
- Twice a week
- 3-5 times a week

5. What services should a local F2B food hub provide?

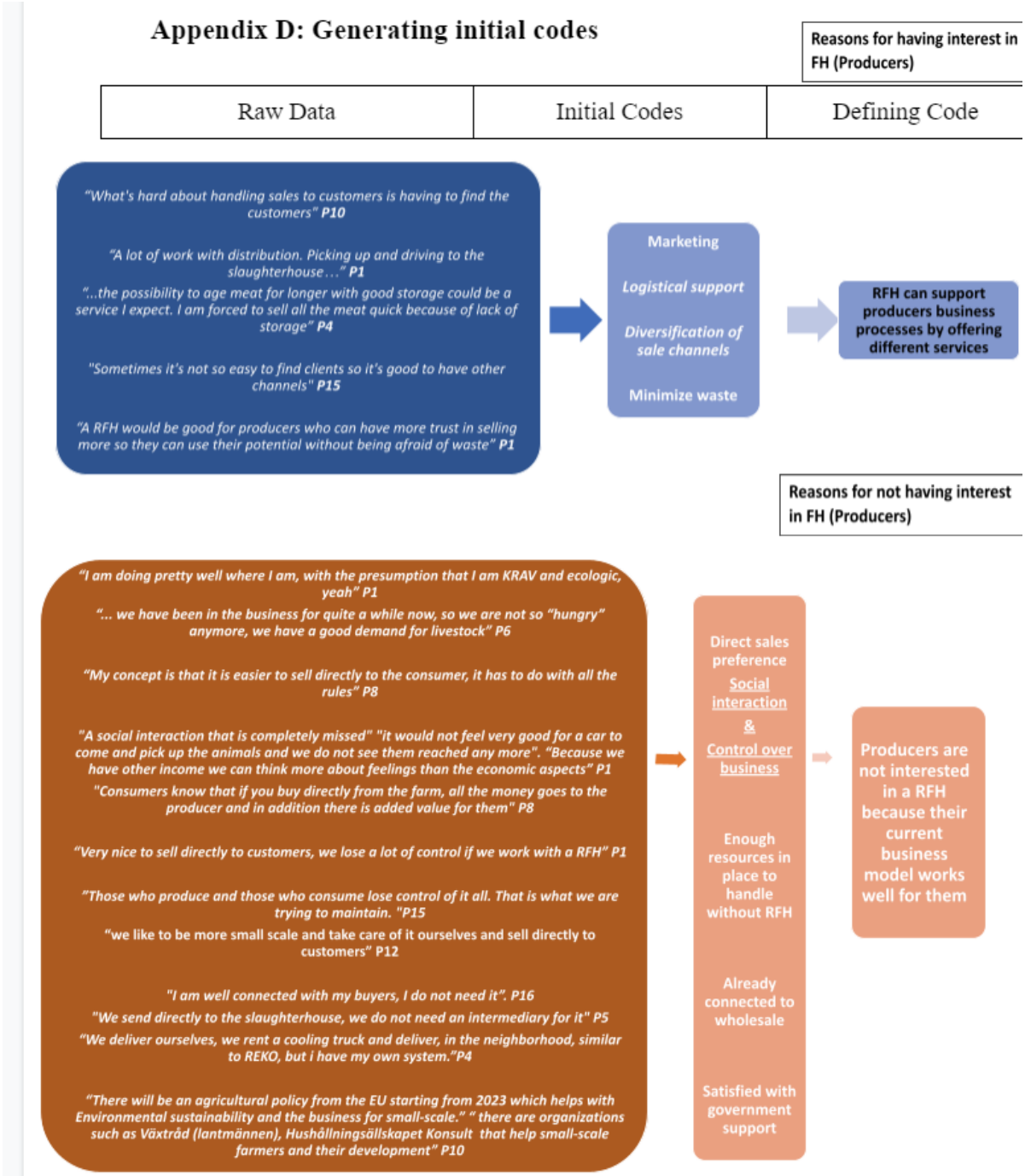
Online ordering service – Dropoff warehouse where you pick up orders from individual farmers — Drop off warehouse where you pick up "aggregated" orders from multiple farmers — service that will be delivered to you from farmers of your choice….

6. What benefits do you expect from joining a FH?

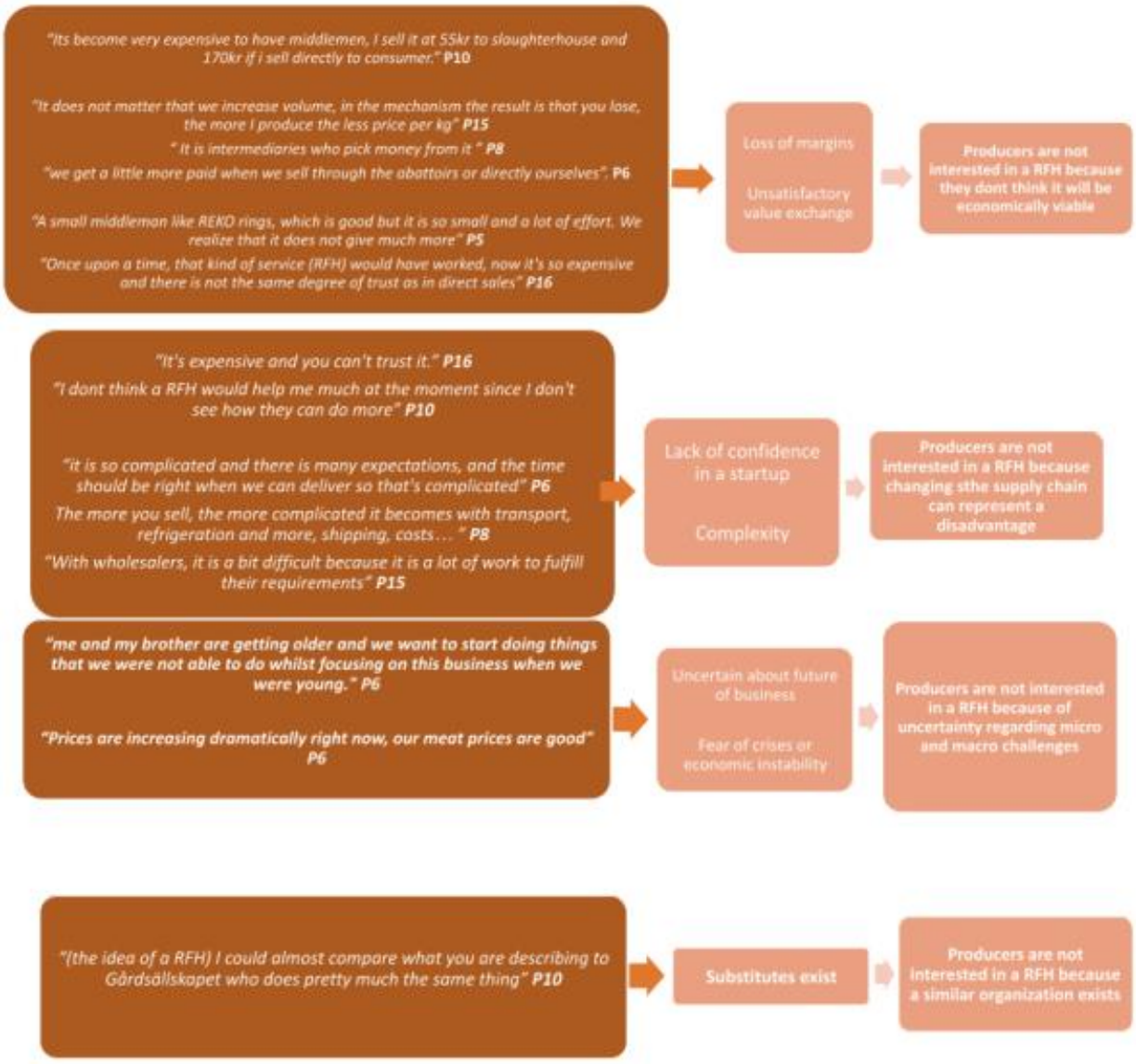
Suggestions if they didn't answer: Certifications, Price premium, Transportation benefits, Fresh produce, Information flow, Social networking, Light processing

7. What else would motivate/discourage you to join a regional food hub? Why/Why not?

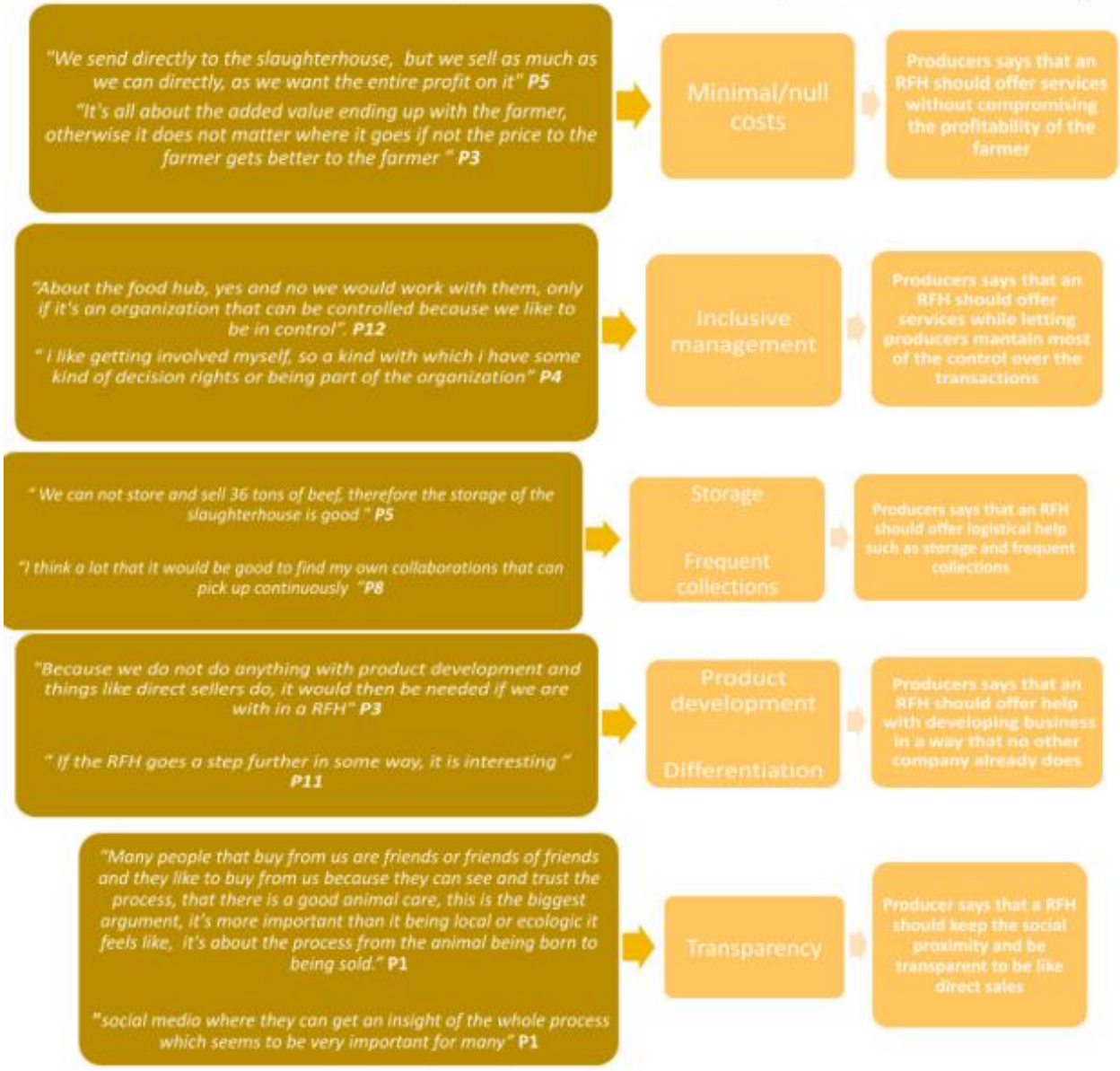
Appendix C: Coding process



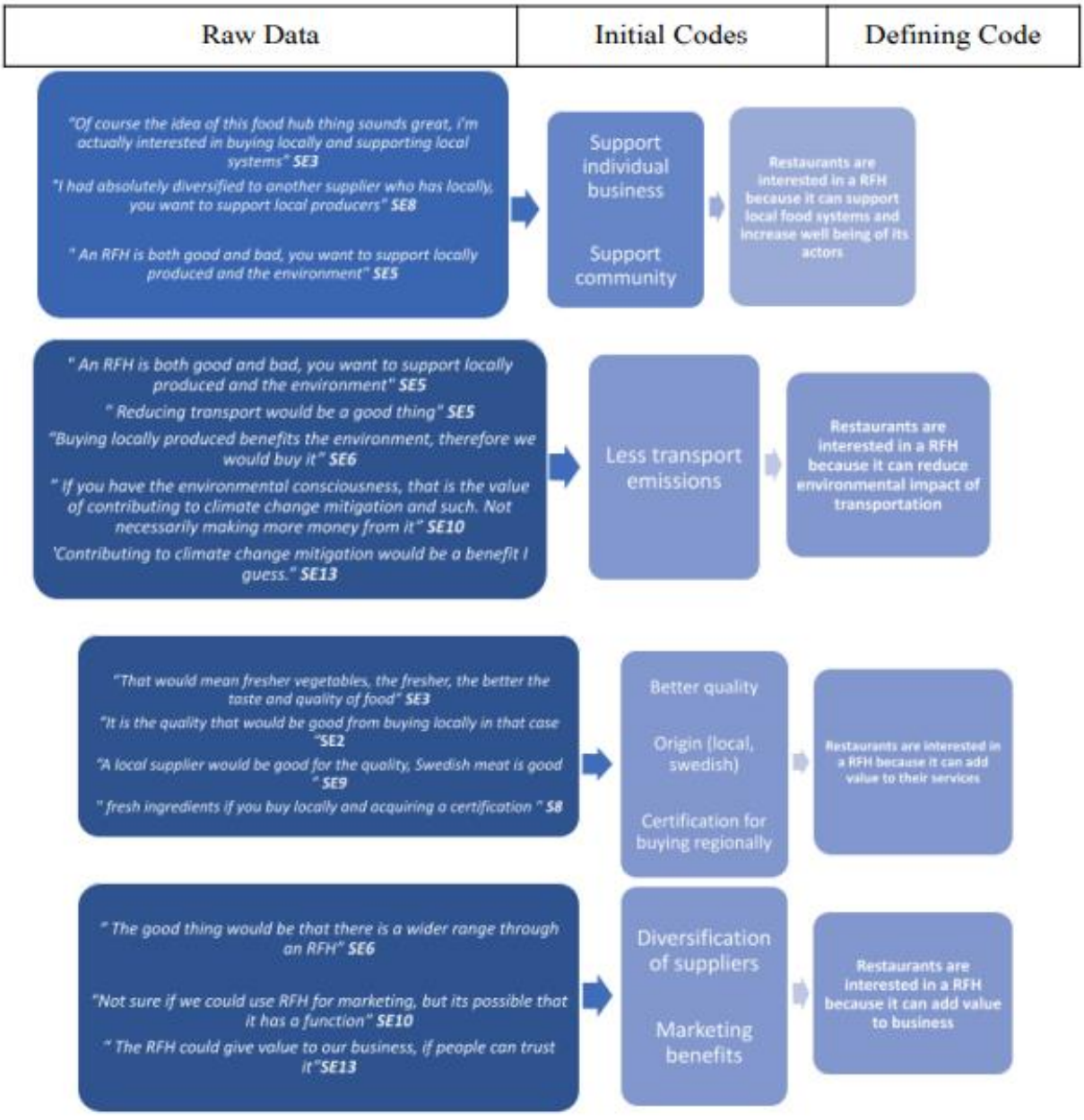
Appendix D: Generated themes



The characteristics of a potential FH (Producer)

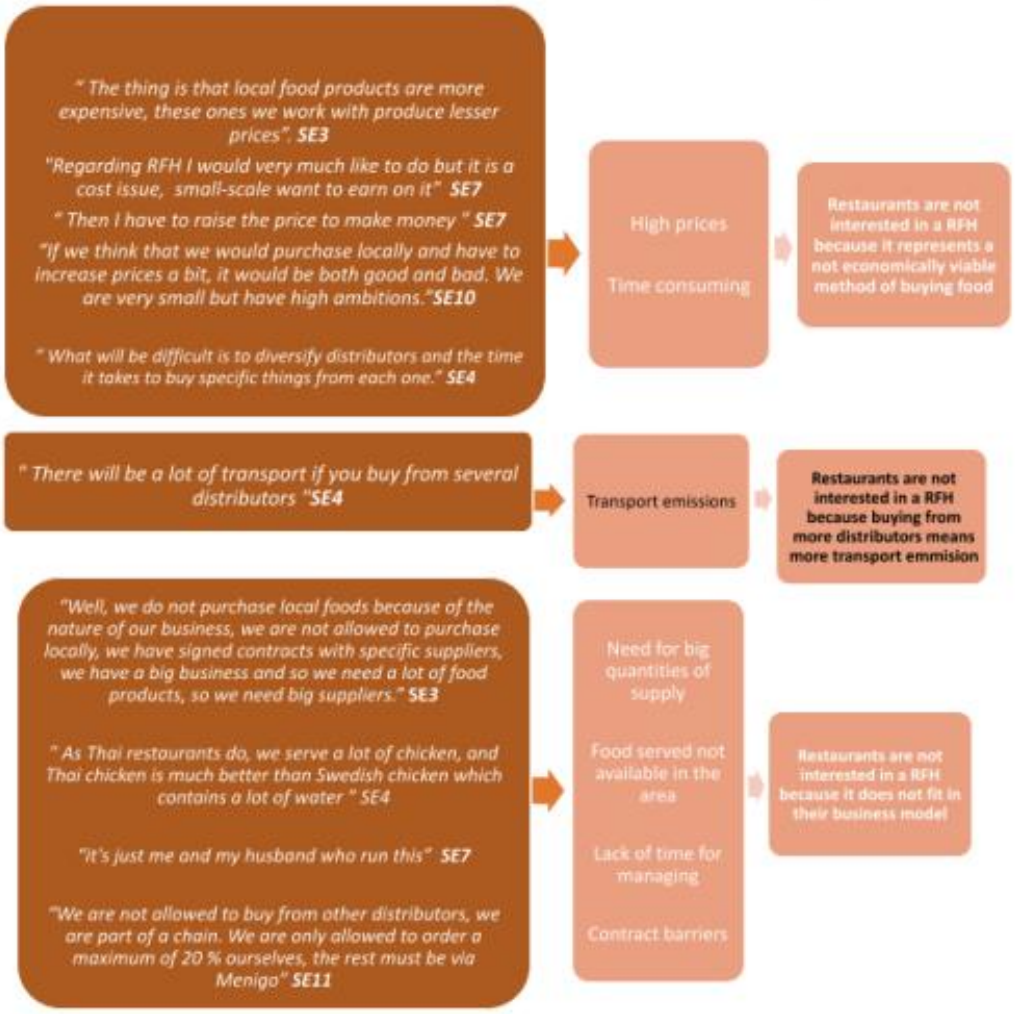


Reasons for having interest in FH (Food Service)

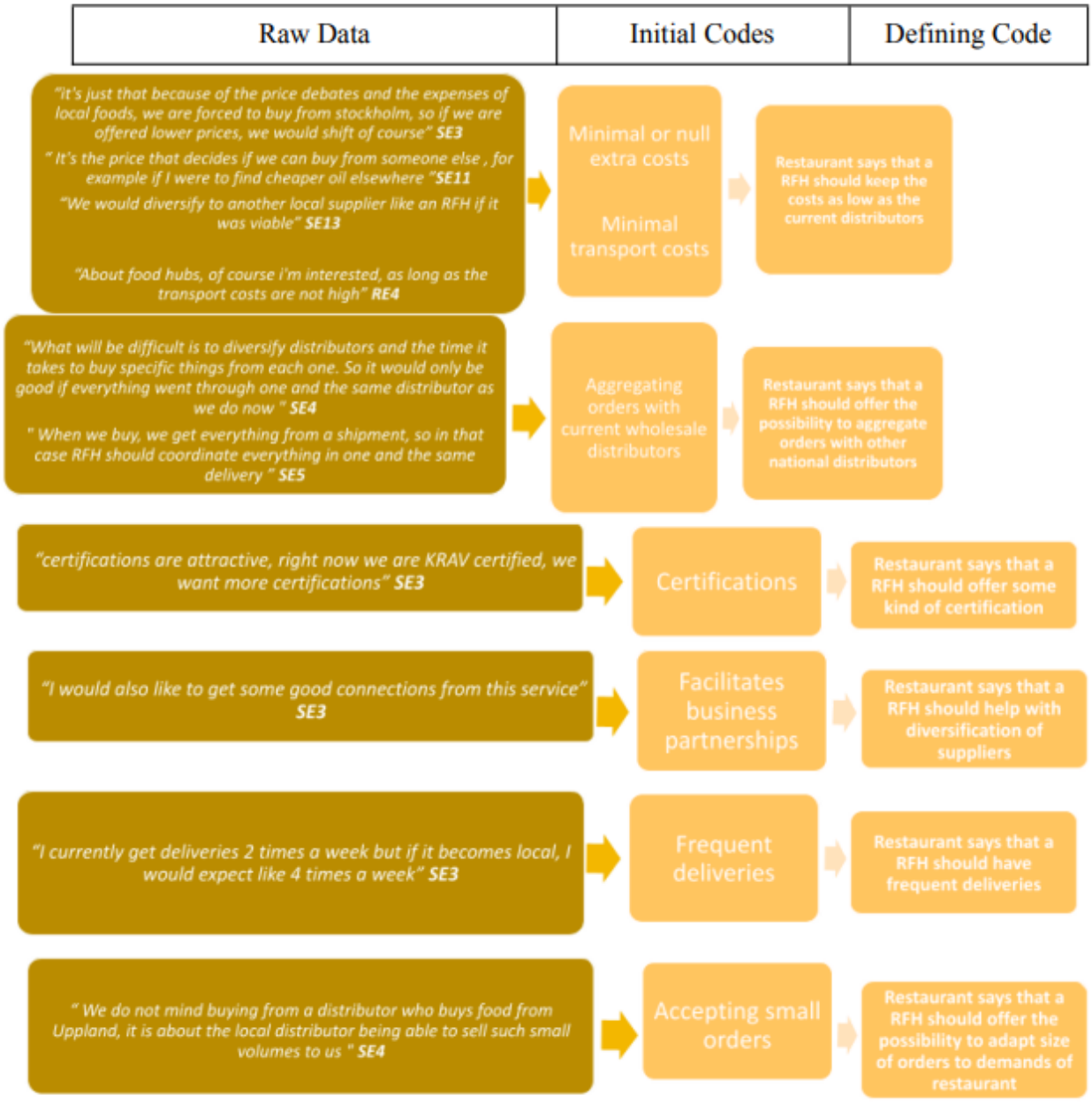


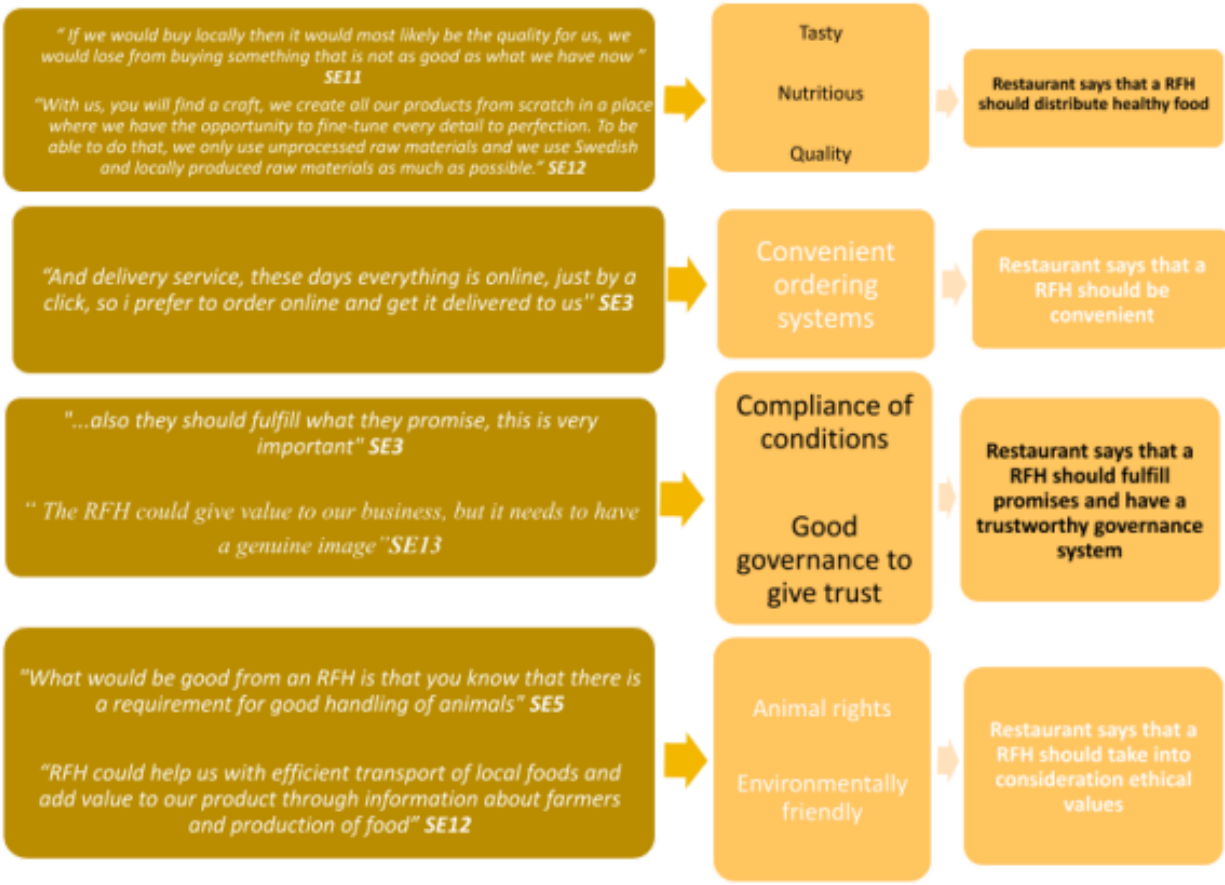
Reasons for not having interest in FH (Food Service)

Raw Data	Initial Codes	Defining Code



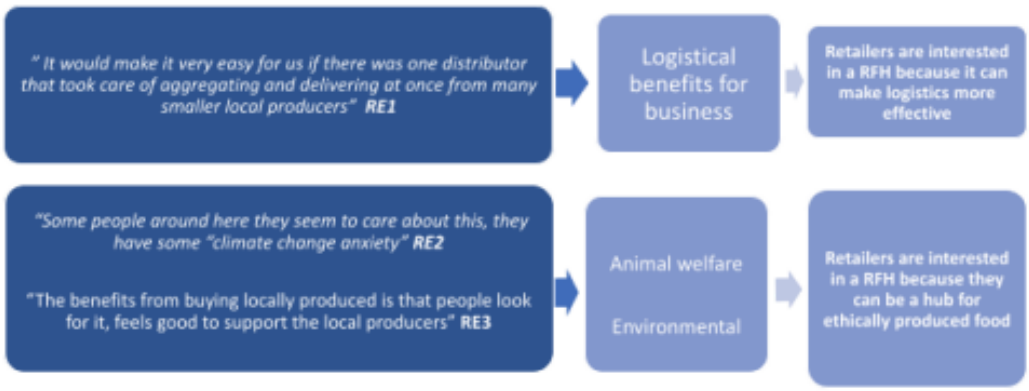
Preferred characteristics of a potential FH (Food Service)





Reasons for having interest in FH (Retailers)

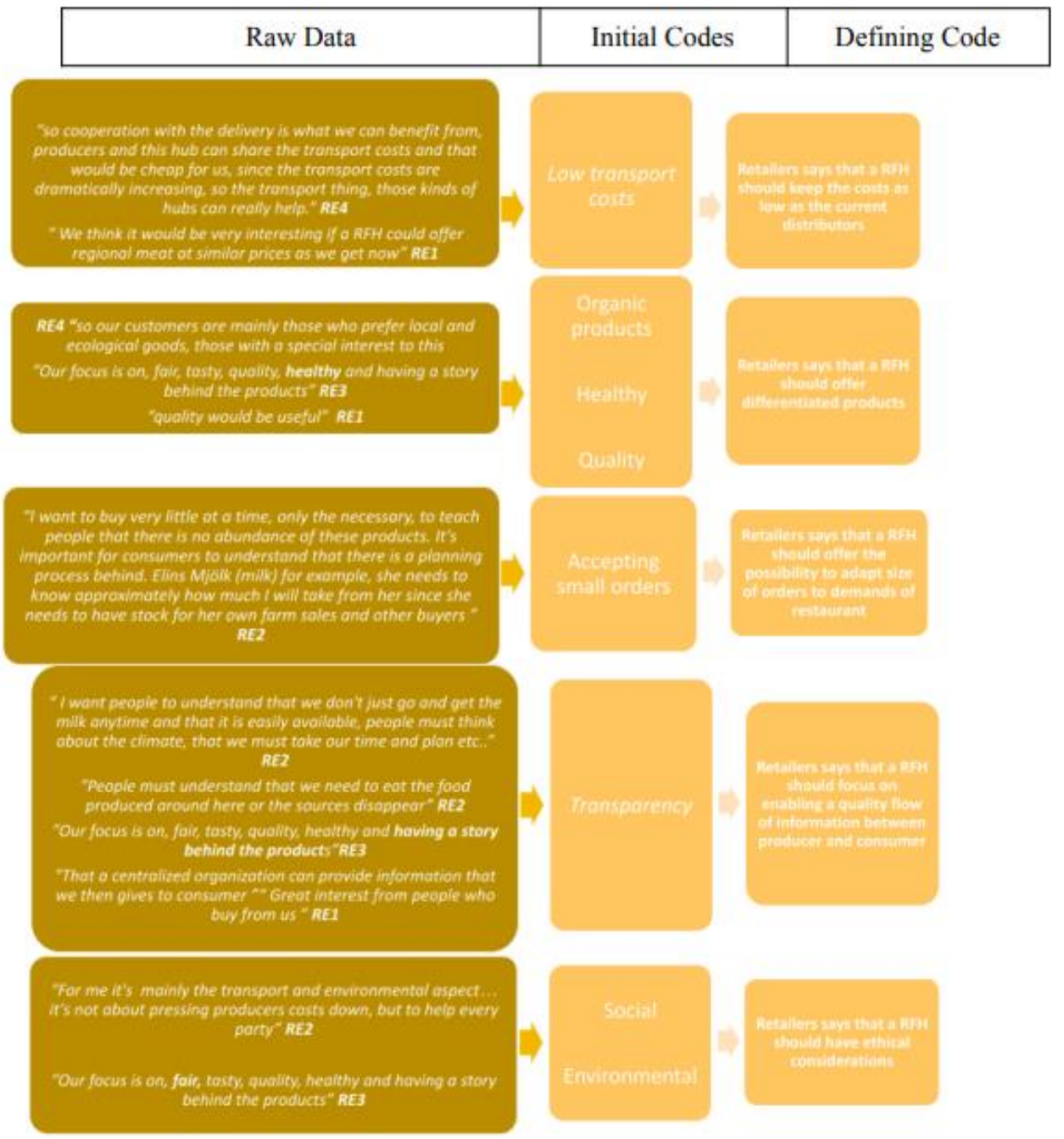
Raw Data	Initial Codes	Defining Code

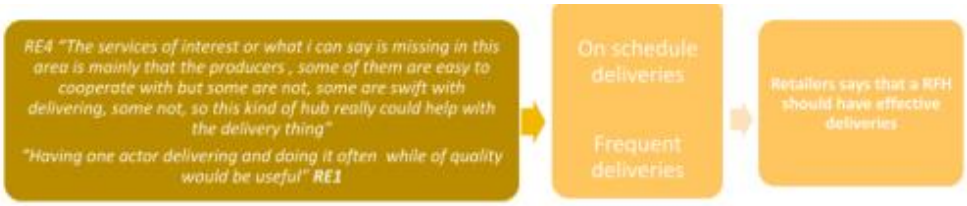


Reasons for not having interest in FH (Retailers)

Raw Data	Initial Codes	Defining Code

Preferred characteristics of a potential FH (Retailers)



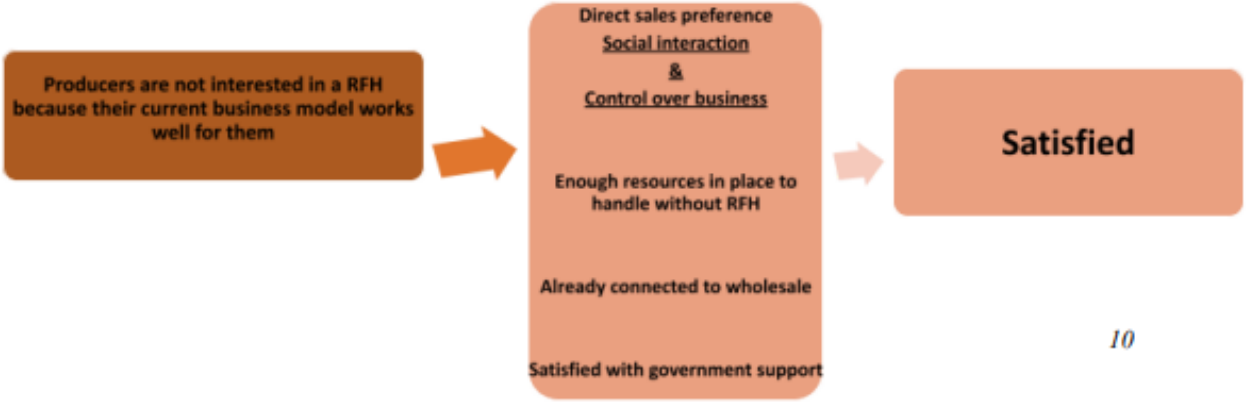


Reasons for having interest in FH (Producers)

Raw Data	Initial Codes	Theme

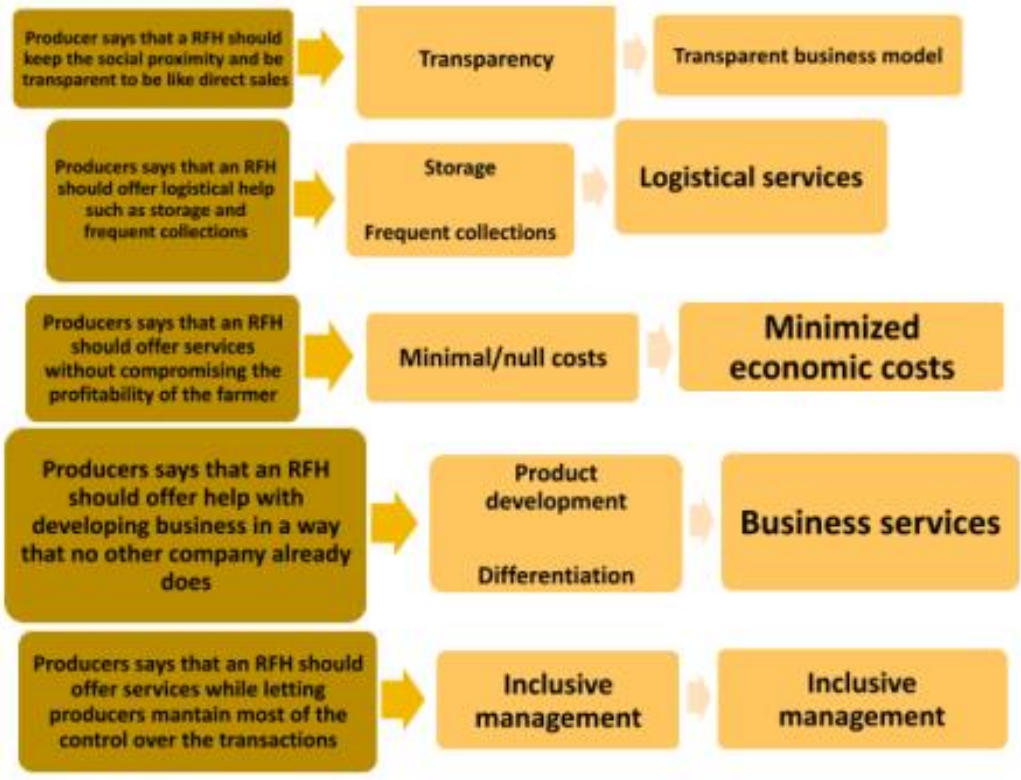
Reasons for not having interest in FH (Producers)

Raw Data	Initial Codes	Theme



Preferred characteristics of a potential FH (Producers)

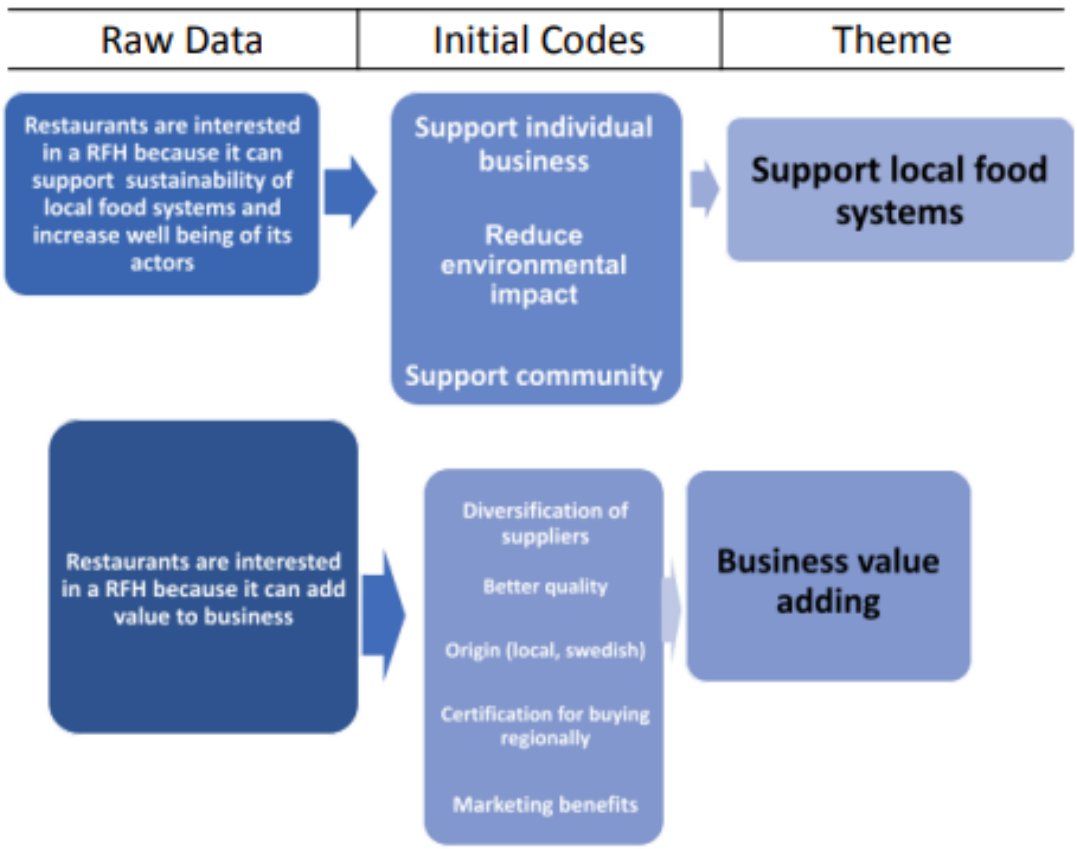
Raw Data	Initial Codes	Theme

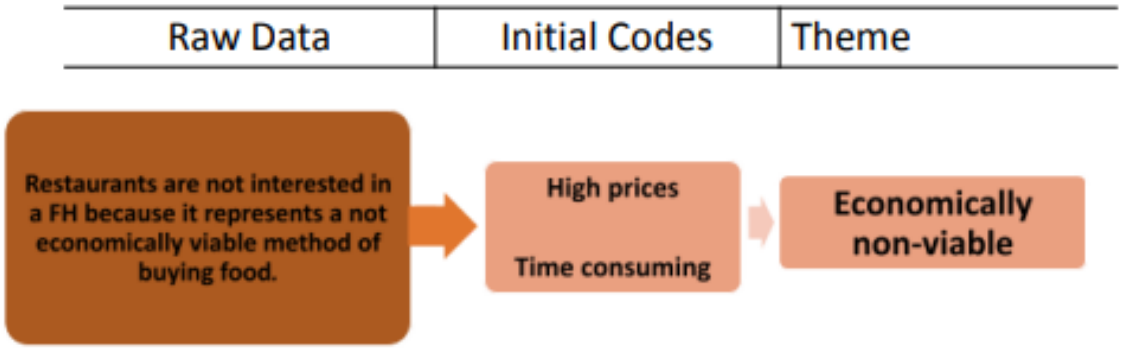


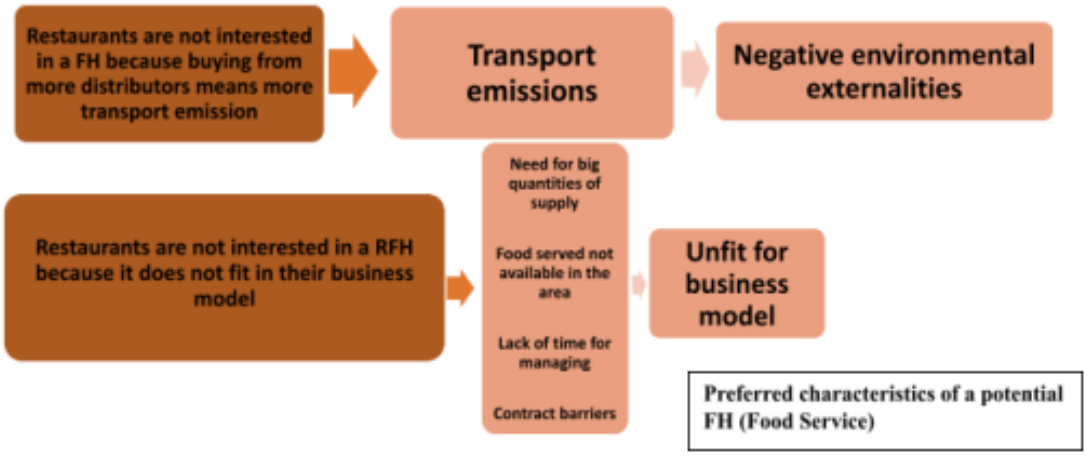
General

"If they buy the animals at the right price, it's good, we are fully dedicated to the production so all other services must be taken care of by the food hub in that case" ***P11***

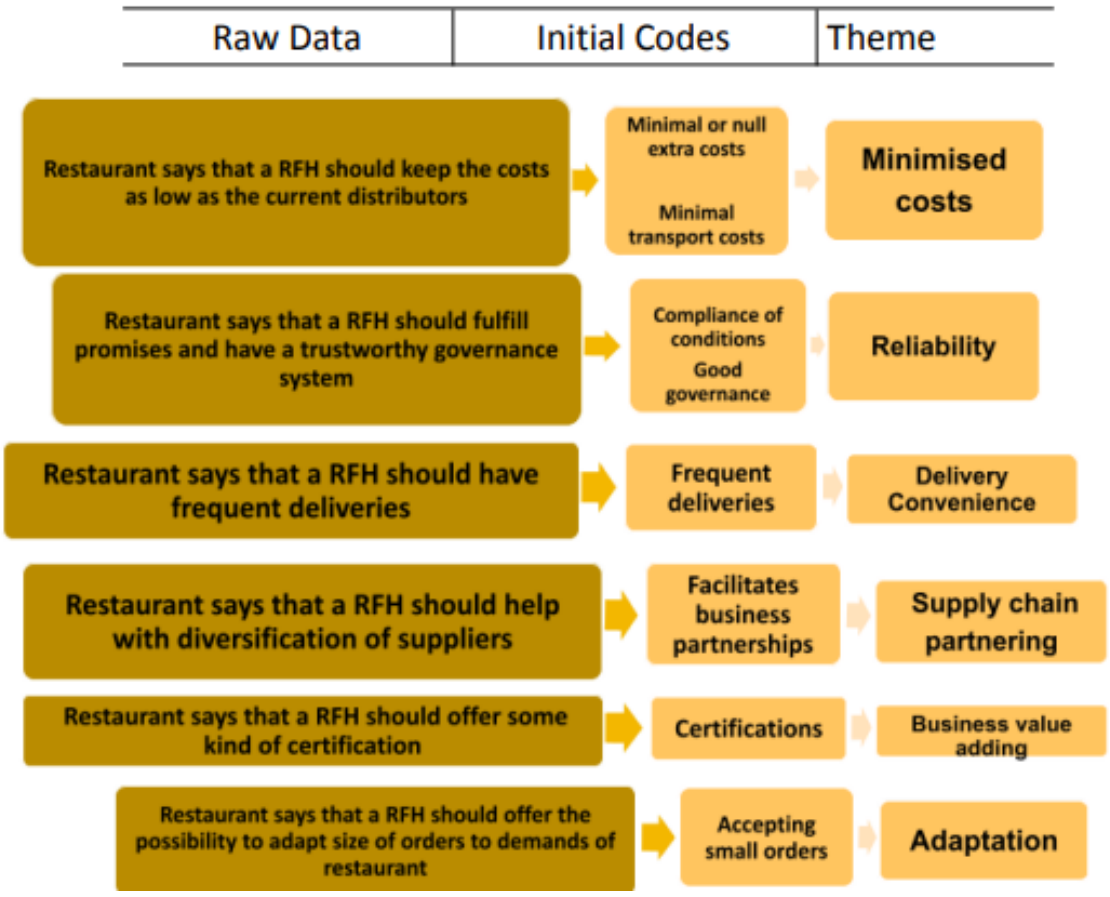
Reasons for having interest in FH (Food Service)

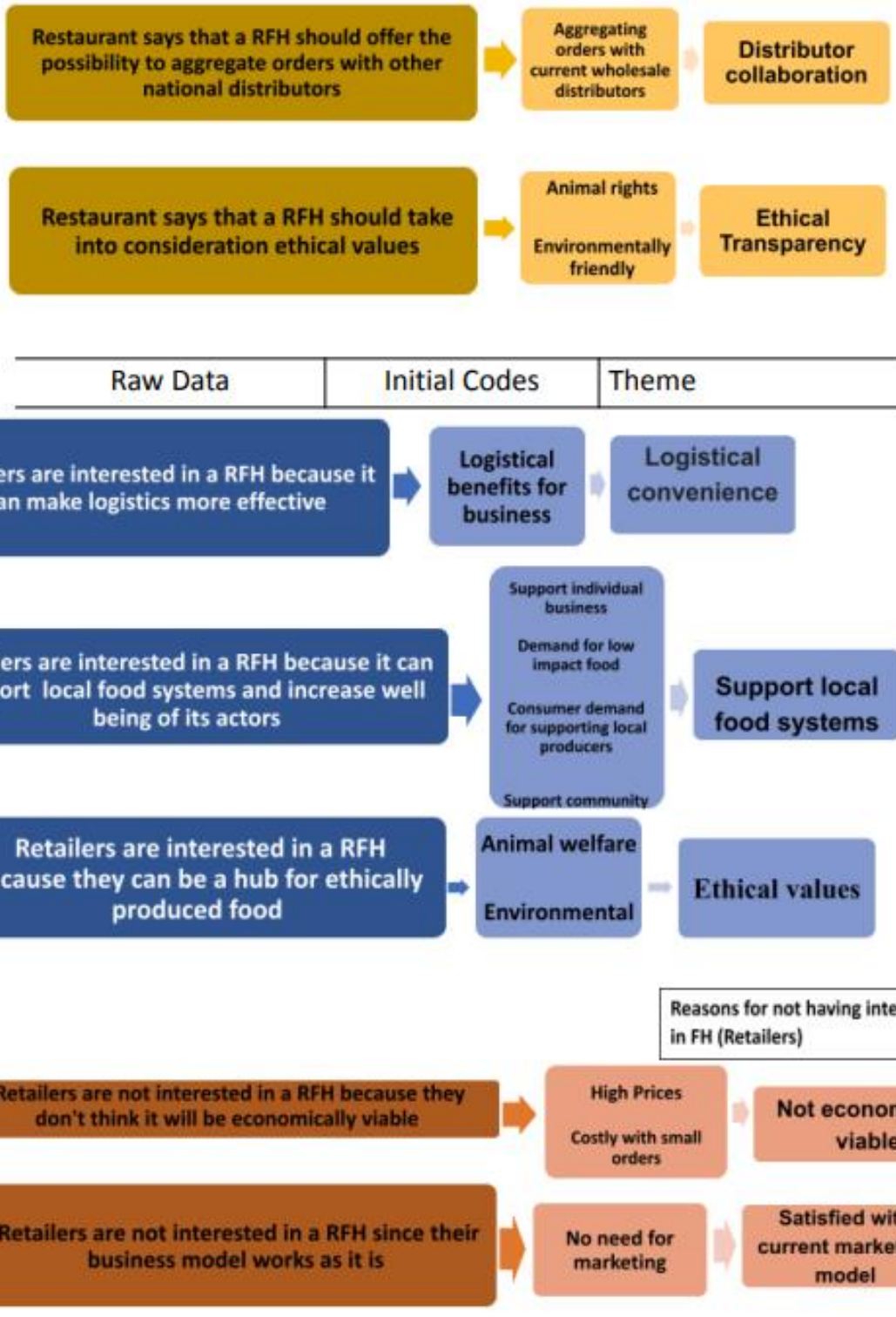




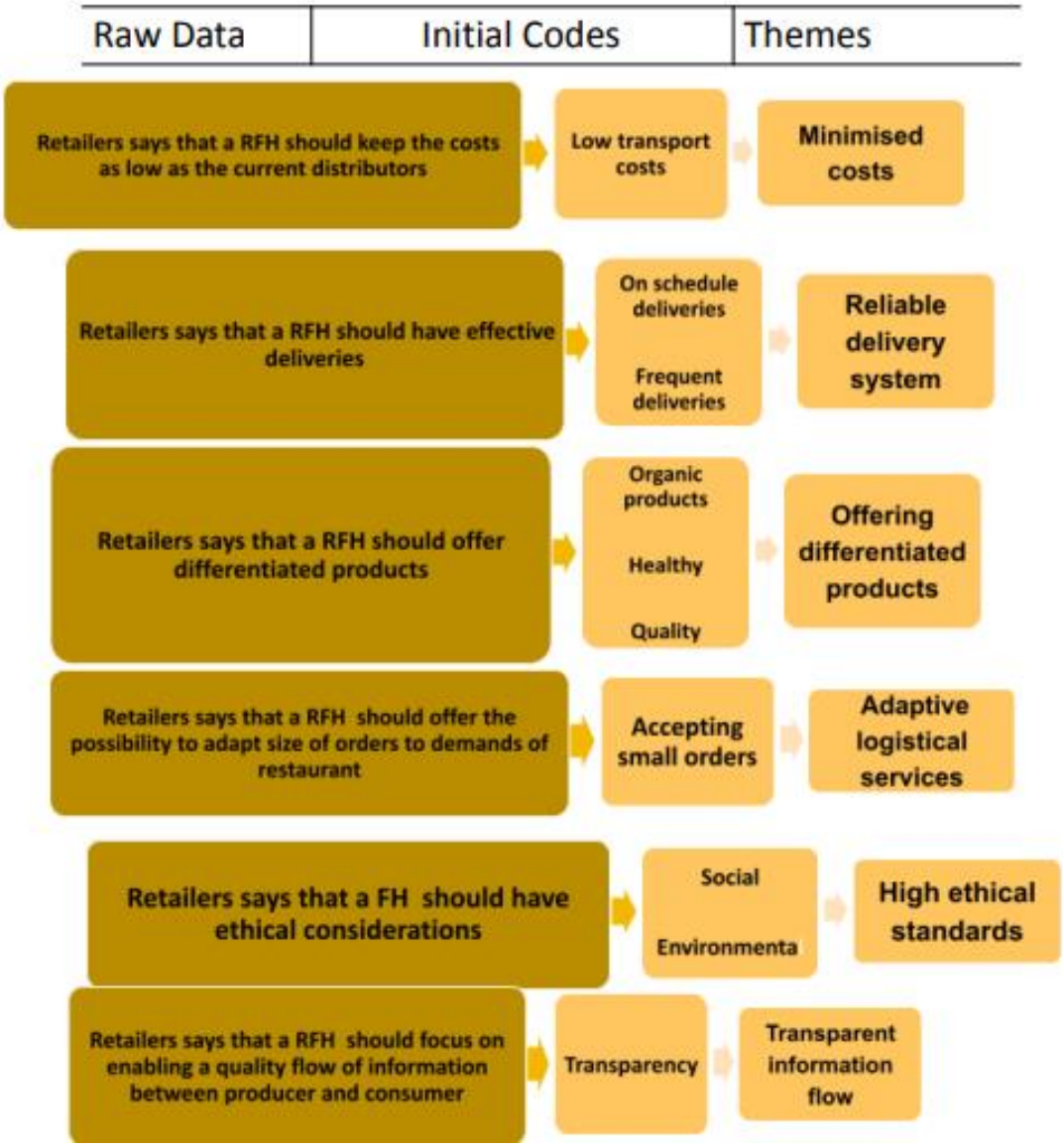


Preferred characteristics of a potential FH (Food Service)




Restaurant says that a RFH should offer the possibility to aggregate orders with other national distributors
Aggregating orders with current wholesale distributors
Distributor collaboration
Restaurant says that a RFH should take into consideration ethical values
Animal rights
Environmentally friendly
Ethical Transparency
Raw Data
Initial Codes
Theme
Retailers are interested in a RFH because it can make logistics more effective
Logistical benefits for business
Logistical convenience
Retailers are interested in a RFH because it can support local food systems and increase well being of its actors
Support individual business
Demand for low impact food
Consumer demand for supporting local producers
Support community
Support local food systems
Retailers are interested in a RFH because they can be a hub for ethically produced food
Animal welfare
Environmental
Ethical values
Reasons for not having interest in FH (Retailers)
Retailers are not interested in a RFH because they don't think it will be economically viable
High Prices
Costly with small orders
Not economically viable
Retailers are not interested in a RFH since their business model works as it is
No need for marketing
Satisfied with current marketing model

Preferred characteristics of a potential FH (Retailers)



Appendix E: Characteristics of microenterprise producers and quantities produced

Code	Time as active sellers	Products sold	Quantities	Quantity Animals (weight)
P1	All year around (surplus demand)	Lamb	~0,6 tonnes	30 (20kg)
P2	All year around	Pork (Bacon, sausages, ham, smoked meat, falukorv, Christmas pork…)	6 -12 tonnes	100 (60-120kg)
P3	Active seller all year around	Pork	107,5 tonnes	1200-1300 (86kg)
P4	Pre Bookings All year around	Beef	3,3 tonnes	10 (325kg)
P5	All year around	a. Beef b. Lamb	a. 36 tonnes b. 6 tonnes	
P6	All year round	Beef	8 tonnes	24 (325kg)
P7	All year round About half grain and half meat in terms of income.	Beef a. fava bean b. Oat d. autumn wheat c. autumn rye e. Rapeseed	14,4 tonnes a. 20 tonnes b. 60 tonnes d. 60 tonnes c. 20 tonnes e. 30 tonnes	45 (320kg)
P8	All year around	a. Milk b. Beef	a. 7050 L every two days b. 3,85 tonnes	25 milk cows 12-15 (250- 300kg)
P9	All year around Meat: winter and spring.	a. Honey b. Lamb c. Beef	a. 1-2 tonnes b. 1,6 tonnes c. 1,25 tonnes	b. 80 sheep (20kg) c. 4 cows (320kg)
P10	All year around (grow seasonally)	a. Beef b. Oat c. Barley d. Rapeseed	a. 10,38 c. 4 - 5 (Tonnes) c. 4 d. 1,5 - 2	a. 30 (346kg)
P11	(grow seasonally)	a. Beef b. Grains	a. 13 tonnes b. 390 tonnes	a. 40 (300-350kg) b. 60-70 hectares (6-7 tonnes per hectare)
P12	Hunting period (September to January)	a. Game meat (red deer, fallow deer, reindeer, moose/elk and roe deer/western roe deer) b. Wheat	a. 500 - 700kg b. 1000 ha	
P13	Active seller all year around. (Seasonally)	Vegetables (Salad, cauliflower, chili, ruccola, spinach…) Fruit (strawberry, apples…) Beef Nuts	Mainly Asparagus (40.000kr)	(kg price varies)
P14	Seasonal Greenhouse and exterior agriculture	Chili, Potatoes, Peppers, Kale, Tomatoes, cucumbers, celery, beans, onions, spices, cucumbers, Brussels sprouts, cabbage, sour beard juice, pickled red cabbage, pickled yellow carrot and carrot, pickles, and sauerkraut	1 or 1,5 hectares. They don't weigh it.	
P15 CSA	Grow Seasonally Active year around	Potatoes, carrots, tomatoes, cabbage, eggplant, beets, grass, cereals, iceberg lettuce, broccoli…	*No info* *(Do not put a price on KG)*	
P16		Honey	80 tonnes	

SE9	All day dine-in restaurant	250 000 KR	Swedish restaurant wholesale (4)	30-40		
SE10	A la carte dinner	1 250 000 KR (2020)	- Swedish restaurant wholesale distributors (1) - Swedish midscale restaurant wholesale(2)	40	Sometimes, when price allows it	Yes. Some seasonality
SE11	Franchise casual cultural	31 275 000KR (2021) *Franchise of 30 restaurants in sweden*	- Swedish restaurant wholesale distributors (1) -Up to 20% from other suppliers if owner wants,	100-120	No	No
SE12	Bakery franchise (2)	14 862 000KR (2020)	- Swedish food service wholesale distributors (2) - Direct from farmers through AFNs	250	Flour, eggs, berries and some vegetables when season	No
SE13	Bakery	30 168 000 KR (2020)	- Swedish food service wholesale distributors (2)	200	Some flour and sometimes berries when season	No

Appendix F: Estimated increase in production and quantities

Code	Attitude towards increase Positive (Potentially willing to increase production) Negative (Satisfied with current production, not willing to increase production)	Potential increase by availability of current infrastructure (how much) Yes No
P1	- Satisfied given that they cannot expand (limited labor and time) - They are getting old and they don't have the time.	They can easily double production
P2	- Satisfied with prices in direct sales - Cannot increase quantity (he does processing himself)	Capacity to produce more if they didn't have to process it (1000 pigs a year)
P3	Satisfied	- Good balance between feed and animals - No demand
P4	- Satisfied, selling at high prices - Don't want to work more, keep it as a part time job With more storage space she maybe would	- Lack of storage space to expand - Lack of manpower - Farm is a side income
P5	Satisfied because of limited options available. If value was higher there would be interest in expanding	They could produce more *(increase not specified)*
P6	-Insecurity about the future of the farm, no family members to pass it on to. -Costs and prices force them to stay where they are now in terms of Q and P.	Yes *(increase not specified)*
P7	Need a balance between animals and plant cultivation on the farm Expanding in a year. About 30-40% increase in both meat and crops.	They are expanding next year. (About ⅓ more of beef and ⅓ more of the plant products.)
P8	- She is satisfied with the price and quantities. Does not increase the price of milk since 6 years back. - Satisfied with the smaller scale	They cannot increase more

P9	- Satisfied with prices and volumes sold. - Cannot increase lamb and beef (not enough labor force and feed)	Honey production *Possibility to increase if more buyers and more labor force.*
P10	Interested in expanding in the future if he invests in more space.	They cannot increase as of now. Their ecological production does not allow it.
P11	Satisfied because there are no better options he is aware of.	No more space for animals. They would have to invest in expanding his animal "house"
P12	Likes to be small scale to increase interactions and direct sales with customers (No information on grains)	They have no control over it, they just hunt and see how much they catch then sell that.
P13	Not about how much demand but available time and energy I could increase my amounts towards the right buyer.	Hard to say how much Double production is easy.
P14	- Satisfied with the amount of production. - He is getting old.	Small capacity to intensify and produce more
P15	Not valuable to increase production since price drops.	Yes, there can be some increase
P16	Satisfied with quantities since he manages to sell them all.	He claims that there is always room to increase

Appendix G: Attitudes of producers towards increasing production

Code	Products category	Employment	Sales channels	Type of farming
P1	Meat (lamb)	Part time farming	Direct sales at the farm and deliveries to households	Organic
P2	Meat (pork)	*Not specified*	Direct to consumers through REKO in different towns Selling through retail "lingongården" when its opened	Conventional
P3	Meat (pork)	*Not specified*	No direct sales Sells through a contract with slaughterhouse	Organic
P4	Meat (beef)	Part time farming	Direct sales locally (neighbors, Uppsala, and Stockholm) Delivers straight to consumers/customers with pre orders Uses a system similar to REKO	Grass fed
P5	Meat (beef and lamb)	*Not specified*	Most sold at fixed price to the slaughterhouse A little is sold towards farm shops or if people preorder from them	KRAV certified
P6	Meat (beef)	Farming is the main source of income	Local (direct to customers since 2001) Sells to local slaughterhouse	Organic Grass fed
P7	Meat (beef)	Farming is the main source of income	Upplandsbonden cooperative which sends to slaughter who sells to wholesale supermarkets like ICA and Willys	Grass Fed KRAV certified
P8	Meat (beef) Dairy (milk and cream)	*Not specified*	10% Direct milk sales to the consumer through a milk vending machine 90% of milk sold every 2 days to ARLA	KRAV certified Grass fed
P9	Meat (beef and lamb) Honey	*Not specified*	Reko Ring, once a week On-farm sale for honey	KRAV certified Grass fed

P10	Meat (beef) Cereals (barley, oats) Raps	*Not specified*	Gårdssällskapet, slaughterhouse and direct sales (2076kg) for meat Lantmännen for the grains	KRAVcertified Grass fed
P11	Grains Beef	Part time farming	Grains: around 50% directly to consumer and 50% to lantmännen Beef: Most through Upplandsbonden and some direct to consumer through meat boxes (mouth to mouth marketing)	Grass fed beef Organic
P12	Game meat Cereals (corn and wheat)	*Not specified*	Local, at the farm shop, and in Uppsala till Stockholm Direct to customers/consumers	Wild meat
P13	Vegetables Fruits Beef Nut varieties	Part time farming	Mainly directly to consumer on farm and through Reko ring	KRAVcertified
P14	Vegetables	*Not specified*	Direct sales through farmers' market in Stockholm	KRAVcertified
P15	Vegetables	Retired, agriculture is full time	*Not specified*	KRAVcertified
P16	Honey	Farming is the main source of income	⅔ of the product is sold directly to wholesalers (big supermarkets like ICA in Uppsala and Stockholm) ⅓ is sold on the farm to the local community	KRAVcertified

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