ENHANCING SECURITY OF FOOD SUPPLY: A QUALITATIVE ANALYSIS BRIDGING STAKEHOLDER PERSPECTIVES ON SWEDEN'S FOOD RESILIENCE

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Securing food supply for enhanced preparedness: A qualitative analysis bridging stakeholder perspectives on Sweden's food resilience

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Abstract
In the face of growing geopolitical uncertainty, climate change, and increasing reliance on complex global supply chains, the issue of food supply security has gained renewed urgency in Sweden. This thesis investigates how the national security of food supply can be enhanced by integrating the perspectives of stakeholders involved in the Swedish food system. Adopting a qualitative approach, the study draws on semi-structured interviews to identify existing capacities, perceived challenges, and opportunities for improvement to strengthen preparedness and build resilience. Diverging stakeholder perspectives were identified, particularly regarding priorities, responsibilities, and time-frame considerations, which hinder decision-making, coordinated action and a cohesive understanding. The analysis identifies key vulnerabilities within the current system, such as fragmented responsibilities, high dependency on imports and just-in-time logistics, and limited buffer capacities, while also revealing existing strengths and potential strategies for improvement. The thesis concludes that food supply security should be addressed as a 'wicked problem', underscoring the importance of integrating preparedness into regular operations. Key recommendations include adopting a holistic, multi-hazard approach, aligning time horizons across sectors, improving transparency, leveraging existing capacities and redistributing responsibilities and costs among public and private actors as well as consumers.

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Summary

In recent years, concerns about food supply security have attracted growing interest in public debate in Sweden, after gradually losing political urgency due to a reduced perception of military threats after the Cold War and increased trust in international markets following EU membership. Since then, open markets, global trade, and just-in-time logistics have come to define the Swedish food supply system. This transition has resulted in a food system vulnerable to a range of shocks, including geopolitical instabilities, supply chain disruptions and climate change. At the same time, recent crises such as the COVID-19 pandemic and the war in Ukraine have brought renewed attention to food supply security and the need for long-term preparedness strategies.

The challenge of securing food supply is not only technical or logistical but is shaped by complex institutional dynamics and competing social and economic priorities. Additional complexity arises from the involvement of a broad and diverse range of actors, including government agencies, county administrative boards, regions, municipalities, trade and industry, and voluntary organisations, each operating with distinct timeframes, objectives, and constraints. To bridge these perspectives, the issue of enhancing food supply security was explored through semi-structured interviews, examining perceived vulnerabilities, capacities, challenges, and opportunities for improvement within the current system.

The findings indicate that while there are notable areas of consensus, different actors' perspectives also vary, reflecting diverse understandings of the challenges and their implications. This divergence contributes to a fragmented landscape where efforts to strengthen food supply security are not always aligned. Nonetheless, certain recurring concerns emerge, such as financial strain on producers, regulatory limitations, and resource-related vulnerabilities. Alongside these, several positive aspects were noted, including a strong foundation of practical knowledge, a culture of collaboration, and a readiness among some actors to contribute more actively to resilience-building efforts.

In conclusion, framing food supply security as a 'wicked problem' provides a useful lens for navigating its inherent complexity, uncertainty, and the presence of multiple actors with diverging interests and values. As such, efforts to address this issue should rather be adaptive, inclusive, and grounded in dialogue, allowing preparedness and resilience to be structural elements built into the system rather than episodic responses to crises. To this end, key

recommendations include adopting a holistic, multi-hazard approach; aligning time frame differences; promoting transparency; utilising existing capacities within the system; absorbing costs across the supply chain; and prioritising actions that address structural vulnerabilities in production.

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1. Introduction

Over the past decades, Sweden's approach to the security of food supply has undergone significant change. Due to a reduced perception of military threats after the Cold War, alongside growing confidence in global trade networks following Sweden's EU accession, the institutional frameworks and strategic reserves that once supported national security of food supply were gradually dismantled (Eriksson, 2018; Swedish Food Federation, 2025). At the same time, the agricultural sector shifted from small-scale farms connected to local markets and resources to more centralised and specialised production systems (Eriksson, 2018). This shift has led to a growing reliance on imported agricultural inputs, such as fuel, fertilisers, pesticides, seeds, and animal feed, as well as a logistical system built on just-in-time deliveries, characterised by a frequent and rapid turnover of items (Eriksson et al., 2016; Lindström Månefjord & Johnsson; 2024). Consequently, the contemporary Swedish food system is strongly reliant on market mechanisms, with limited state capacity to secure food supplies in times of crisis, making it particularly vulnerable to supply chain disruptions (Eriksson, 2018; Gullstrand & Jörgensen, 2018).

In the context of rising geopolitical tensions, ongoing conflicts, and the escalating impacts of climate change, recent events such as the COVID-19 pandemic and Russia's invasion of Ukraine have exposed structural weaknesses within Sweden's food system (Albihn et al., 2021; Gren et al., 2024). Hence, security of food supply has emerged as a priority, reflected in the National Food Strategy (*Livsmedelsstrategi*) (Prop. 2016/17:104) adopted in 2017 and its recent reinforcement National Food Strategy 2.0 (LI2025/00646), signalling a renewed political commitment. Additionally, an agency reform for civil defence and crisis preparedness came into effect in 2022, establishing six civil area offices and 10 preparedness sectors (SOU, 2024:8; Swedish Civil Contingencies Agency, 2025). 'Food supply and drinking water' is one of the preparedness sectors, with the Swedish Food Agency (*Livsmedelsverket*) serving as the responsible agency within the sector to support national civil preparedness agencies and to ensure coordination and cooperation with other relevant actors (Swedish Civil Contingencies Agency, 2025; Swedish Food Agency & Swedish Board of Agriculture, 2023). This growing recognition of security of food supply as an integral part of national defence is a trend further underscored by Sweden's recent NATO membership and broader efforts to strengthen national security (SOU, 2024:8).

Yet, while political discussions emphasise the need to rebuild a system for the security of food supply, questions remain about how resilience can be practically enhanced in a highly privatised and fragmented food system. Previous research has explored specific vulnerabilities and proposed targeted improvements (see Eriksson, 2018; Neset et al., 2019; Swedish Food Agency & Swedish Board of Agriculture, 2023; Lindström Månefjord & Johnsson; 2024), however less attention has been paid to the perspectives of the numerous and various actors involved in securing the Swedish food supply system. Understanding how these stakeholders perceive challenges, risks, responsibilities, and needs is essential for developing coordinated and practical strategies to strengthen resilience.

1.1 Purpose and research question

This research project aims to integrate the perspectives of key stakeholders involved in Sweden's system for the security of food supply to provide a coherent understanding of strategies for improving national food resilience. Hence, the study will examine existing capacities, potential needs, vulnerabilities, and opportunities for improvement in order to answer the following research question:

- How can the national security of food supply be enhanced from the perspective of key stakeholders within the food system in Sweden?

The objective is to explore whether the perspectives of the actors involved are aligned or divergent. Identifying how different actors' capacities, needs, and vulnerabilities overlap or are undermined can contribute to a better understanding of collaboration opportunities. In addition, including diverse perspectives could provide valuable insight into which measures are considered most effective and robust.

1.2 Thesis outline

Following the introduction, outlining the background, purpose, and research question, the next section presents the theoretical concepts that form the foundation of the study and provides the analytical lens through which the empirical material is interpreted. Thereafter, the methodology chapter addresses the research design, data collection, analytical approach, and considerations related to ethics and limitations. The following results section presents the empirical findings, organised thematically around key patterns and insights that emerged from the data. These are

further interpreted in light of the theoretical concepts and existing research in the discussion. Finally, the conclusion summarises the main insights of the thesis and answers the research question. It also reflects on the contribution of the study, outlines its practical relevance, and suggests potential directions for future research.

2. Theoretical concepts

This section defines the key theoretical concepts that form the foundation of this research, ensuring a clear and consistent understanding of the notions used throughout the study. These theoretical concepts further provide an analytical lens guiding the interpretation of the collected empirical data. Hence, this chapter provides the necessary context for the following analysis and discussion.

2.1 Security of food supply

In this study, the notion of *security of food supply* is used in reference to the Swedish term *livsmedelsberedskap*, which encompasses ensuring access to food in times of peace and during various types of crises or war (Swedish Food Agency, 2023). Nevertheless, the authors are aware of the difficulties of directly translating the notion due to its comprehensiveness of different nuances and reflection of both proactive and reactive elements.

Predominantly, the related concept of food security is used, which, according to the Food Agricultural Organisation (FAO) (FAO, 2008, 2009), implies physical and economic access to sufficient and nutritious food that meets dietary needs, by relying on the four pillars: (1) availability, (2) accessibility, (3) utilisation and (4) stability. However, although the concepts of security of food supply and food security are strictly connected and overlap in certain aspects, Constas (2023) recognises that the notion of food security is frequently applied in development work and humanitarian assistance. Similarly, Horn et al. (2022) acknowledge that the concept is often associated with the Sustainable Development Goal 2: Zero Hunger. Building on these perspectives, the concept of food security may not be entirely applicable to the Swedish context. Moreover, it appears to represent an end goal or state, whereas, in the researchers' view, the security of food supply is considered to better reflect dynamic processes of change and the preparedness aspect of the Swedish notion.

The use of security of food supply can, therefore, be justified by drawing on Coppola's (2020) definition of preparedness, which focuses on minimising the effects of a disruption independently on the wide range of potential threats. This strategy is deemed particularly relevant in the context of the interdependent Swedish food system, given the aforementioned national efforts towards improving its ability to adapt, absorb, and maintain functionality,

regardless of the nature or scale of disturbances. Hence, the notion of security of food supply is considered more appropriate for this research project.

2.2 Food system

According to The High Level Panel of Experts on Food Security and Nutrition (HLPE, 2017), a food system includes all the elements, such as environment, people, inputs, processes, infrastructures, and institutions, along with the activities involved in the production, processing, distribution, preparation, and consumption of food, as well as their resulting outputs. Considering its numerous components and networks, the food system is highly dynamic, with transformations that affect society, the economy, and the environment on both local and global levels (Elechi et al., 2022). Reflecting this complexity, Béné et al. (2023) argue that the boundaries of food systems remain subject to debate.

2.3 Complexity

Complexity is a contemporary notion developed to grasp systems that can hardly be explained with a rigid logic or as a consequence of a cause-and-effect symmetry (Heylighen et al., 2007). Instead, complex systems depend on numerous components and networks whose nonlinear interactions form the system and unfold unpredictable outcomes (Becker, 2014; Heylighen et al., 2007). Thus, the system's macro behaviour emerges from interactions at the micro level, without any possibility of these individual parts to control the whole system, highlighting that the whole cannot be fully understood by analysing its components in isolation (Bergström & Dekker, 2014). Moreover, complex systems are characterised by continuous interactions with their environment, involving the exchange of inputs and outputs, making it difficult to draw system boundaries (Heylighen et al., 2007; Bergström & Dekker, 2014). However, establishing boundaries is required when studying the system to facilitate a contextual focused analysis while preserving the holistic perspective inherent in complexity (Heylighen et al., 2007).

2.4 Resilience

Acknowledging the numerous definitions of resilience, this research adopts Becker's (2014) definition as the capacity of a system to continuously develop regardless of disturbances. Drawing on Becker's (2014) perspective, resilience is determined by the interconnected functions of a system's ability to *anticipate*, *recognise*, *adapt*, and *learn*. These functions are

further operationalised through the following elements: (1) knowledge, skills, tools, and other resources; (2) organisation on different levels; (3) rules, regulations, and other formal institutions; and (4) norms, values, and informal institutions (Becker, 2014). In practice, this implies that resilience is determined by how effectively units at all levels of a system acquire knowledge, organise, and collaborate both proactively and reactively (Becker, 2014).

2.4.1 Adaptive capacity

Adaptive capacity, as described by Bergström & Dekker (2014), refers to the ability of a system to adjust prior to and following disturbance. This capacity is a critical aspect of resilience, requiring proactively *preventing*, *mitigating*, and *preparing* for change and reactively *responding* to and *recovering* from disruptions (Becker, 2014). In complex systems, however, no single entity can independently manage or adapt the system (Fabricius & Currie, 2015). Therefore, ensuring the stability and facilitating the transformation of these systems requires a collaborative approach to resilience (Green et al., 2015).

3. Methodology

This section outlines the procedures and activities involved in the selection, collection, and analysis of data, along with ethical considerations and limitations. The aim is to provide a clear and coherent explanation of the researchers' decisions and rationale, thereby ensuring transparency and methodological rigour.

3.1 Data collection method

This research adopts a qualitative approach, particularly suited to exploring social problems and uncovering their complexity (Creswell & Plano Clark, 2007). Therefore, to answer the research question, qualitative interviews were considered the most suitable method for data collection, as they are particularly effective in gaining insight into people's experiences and perceptions (Denscombe, 2010). Since this research project focuses on the perspective of key stakeholders, semi-structured interviews were deemed particularly appropriate, as they allow for follow-up questions and encourage respondents to expand on their answers (Creswell, 2014). As such, the method enables researchers to focus on relevant topics while also providing the opportunity to explore areas considered important by the respondent (Brinkmann, 2022). Semi-structured interviews are, therefore, flexible while still allowing researchers to standardise questions, which facilitates data analysis and provides comparable results (Denscombe, 2010). To ensure a degree of standardisation, an interview guide (Appendix A) was developed and structured around three themes. These themes were addressed through open-ended questions to provide a deeper understanding of the participants' perspectives and allowing them to elaborate on significant points of interest (Denscombe, 2010; Brinkmann, 2022). Participants were informed in advance about these themes to prepare and reflect on their responses and possibly obtain more focused answers during the time bounded interview.

All participants were contacted via email and provided with information about the research project, the consent form (Appendix B) in both Swedish and English, and a link to the booking system, Calendly, where they could choose their preferred time and decide whether the interview would be conducted in person or digitally. A total of 30 interviews, with a total of 31 participants, were conducted in February and March 2025, each lasting approximately 30-45 minutes. Participants were asked to answer the questions from the perspective of the organisations, associations, or companies they represented. All interviews were held in English, but when participants occasionally used Swedish terms, those were later translated. Seven

interviews were conducted in person, while 23 were conducted using Microsoft Teams. On the one hand, face-to-face interviews can be considered advantageous for reading non-verbal means of communication, such as body language (Salmons, 2014). On the other hand, digital interviews can be regarded as time- and resource-efficient due to the absence of travel costs and the availability of built-in transcription tools (Salmons, 2014).

With the written consent of all participants, the interviews were recorded on the researchers' mobile phones and their computers to facilitate transcription and analysis. According to Kaiser (2024), audio recordings are beneficial in interviews because they allow researchers to focus on asking questions and listening to the respondents without the need to take extensive notes or remember everything that was said, while also providing material to reassess. The interviews were transcribed either the same day or the following day. Brinkmann (2022) argues that it ensures a better recall of body language, atmosphere, and other non-verbal communication. Additionally, all interviews were summarised immediately after transcription, and any notes regarding underlying meanings or ideas that came to mind were written. This approach, according to Creswell (2014), provides an overview of topics that can be clustered and facilitate further analysis.

3.2 Data source selection

An information-oriented selection was adopted to identify relevant stakeholders for interviews. This method was chosen for its relevance in qualitative inquiry, as it allows for the purposeful selection of individuals who could best contribute to understanding the research problem (Brinkmann, 2022; Creswell, 2014). In particular, a non-probability sampling method was employed to ensure that participants were selected based on their expected experience in relation to the research question (Salmons, 2014).

Given the national scope of the research, the primary aim was to provide a comprehensive analysis of the various stakeholders involved in food supply preparedness within various levels of Swedish society. Therefore, a preliminary search on potential participants, divided according to the following categories: public authorities, private companies, divided into primary producers, suppliers, food industry, and consulting businesses, as well as associations and foundations, academia and voluntary organisations. Additionally, these stakeholders reflect the Swedish Contingency Agency's classification of civilian actors involved in civil preparedness (Fig.1).

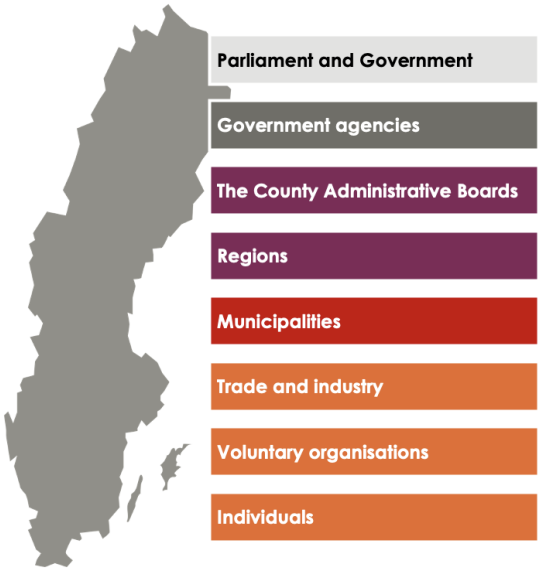

Figure 1. *Civilian actors involved in civil preparedness. (Swedish Civil Contingencies Agency, 2025)*

However, individuals, the parliament, and the government were excluded, as the analysis, guided by the research question, prioritised actors directly involved in operationalising security of food supply. Consequently, while the broader role of governmental institutions in setting national policy frameworks is acknowledged, they fall outside the scope of this investigation. Likewise, individuals were not considered, as the research adopts a national rather than household-level perspective. Some participants were identified through a bibliographic screening of national documents addressing food supply and crisis preparedness. Additionally, existing collaboration platforms focused on food resilience and national security were examined. Subsequently, the network of contacts was created mainly using a snowball sampling technique, where individuals referred to additional participants who could provide further insights (Blaikie, 2010). The stakeholders who were interviewed and the categories they were placed into are listed in a table below in alphabetical order:

Table 1. Participating Organisations and Categories

Category		Organisation
Public organisations		Jordbruksverket (The Swedish Board of Agriculture)
		Länsstyrelsen Skåne (County Administrative Board of Skåne)
		Livsmedelsverket (The Swedish Food Agency)
		Malmö Stad (Malmö Municipality)
		Myndigheten för Samhällsskydd och Beredskap (The Swedish Civil Contingencies Agency)
		Södra Civilområdet (Civil Defence Region South)
Private Companies	**Primary Producers**	Farmer
		Lantmännen
	Supplier	Axfood
		Coop
		Orkla
	Consulting Business	4C Strategy
		Combitech
	Food Industry	Max
		Solina
		Tetrapak
		The Green Dairy
Associations and Foundations		Lantbrukarnas Riksförbund (The Federation of Swedish Farmers)
		Livsmedelsföretagen (The Swedish Food Federation)
		Svensk Dagligvaruhandel (The Swedish Food Retailers Federation)
		Totalförsvarsstiftelsen (The Defence Foundation)
Academia		Agrifood LU
		Agrifood SLU
Voluntary Organisations		Svenska Lottakåren (Swedish Women's Voluntary Defence Organisation)

3.3 Data analysis

The collected data were analysed using an inductive research approach, which focuses on generating plausible explanations by identifying patterns within the data (Brinkmann, 2022). Inductive analysis involves observing empirical phenomena whose characteristics and associations are used to construct generalisations applicable in certain contexts (Blaikie, 2010). The strength of these generalisations depends on the quality, quantity, and diversity of the evidence collected (Becker, 2024). Accordingly, this study included a broad range of relevant stakeholders, providing diverse perspectives, thus enhancing the credibility of the findings.

An inductive strategy follows a bottom-up approach, where meaning is derived through continuously examining similarities within and across cases to develop conceptual ideas or theories (Brinkmann, 2023). While inductive reasoning can only produce provisional explanations, it is well suited to capturing the complexity of a situation and exploring new or understudied research problems and phenomena (Creswell, 2014; Becker, 2024). Moreover, as emphasised by Brinkmann (2022), coding plays a key role in inductive research by identifying emerging themes and categorising relationships. In this study, codes were derived from patterns that emerged from the data and were organised into a structured coding scheme (see example in Appendix C). Initially, the interview transcripts were coded using descriptive labels to capture the content of each extract. These descriptive codes were then colour-coded according to broader, top-level themes. Within each theme, codes were further organised into subcategories reflecting similar views while preserving nuances and acknowledging divergent perspectives.

3.4 Ethical considerations

This research project must consider that the strengths and vulnerabilities within the national food preparedness system may involve sensitive or confidential information. Therefore, all information in this study has been approved by the participants through explicit consent. Following the Social Research Association's (SRA) (2021) guidelines, in the consent form, which both the researchers and all participants have signed, the participants were informed about the purpose of the study, their role within it, and that their participation is entirely voluntary and can be discontinued at any time. Moreover, the guidelines emphasise researchers' responsibility to ensure participants' anonymity and confidentiality at all stages of the research process by removing details, preventing any possibility of identification, and restricting access

to personal information to the immediate research team (Blaike, 2010; SRA, 2021). Accordingly, the participants have been granted the highest level of confidentiality, with interview materials accessible only to the researchers conducting the study. Additionally, all information in the transcripts has been anonymised into categories determined by the researchers. Hence, neither the participants nor the companies they represent can be identified based on the information presented in this study.

3.5 Limitations

One limitation in analysing the vulnerabilities, capacities, and challenges within Sweden's complex and interdependent food supply system is that only a subset of relevant stakeholders was included, meaning the study does not fully capture all sectors involved. However, participants were selected from a diverse range of organisations to ensure a broad representation of perspectives.

Another limitation of this research concerns the language barrier, which hindered the non-Swedish-speaking researcher's ability to read and interpret official documents and other sources not available in English. Translating concepts and terminology specific to the Swedish context into English also presented some challenges. In some cases, language was also a challenge for participants due to their limited confidence or unfamiliarity with expressing these subject matters in English, which sometimes affected the quality of their verbal contributions. Additionally, explaining certain mechanisms and actors embedded in the Swedish context to a non-Swedish individual presented challenges since these elements might be considered implicit or self-evident to the Swedish researcher. Initially, this required some effort before fully understanding their interrelations and significance. However, these challenges also contributed to the depth of the analysis, as the diverse perspectives fostered continuous questioning and cross-checking of interpretations, leading to a more rigorous and critical approach to the research.

4. Results

The following section will present the results derived from the data collection, organised according to the themes identified during the coding phase.

4.1 Decision-making

Decision-making emerged as a theme in 17 interviews, with participants across all stakeholder categories expressing that, while planning remains important, there is now a need for concrete decisions to move forward. However, a notable difference also emerged between public authorities and private actors. For instance, representatives from public authorities described the challenge of communicating specific measures before decisions have been formally made, noting that a lot is ongoing at the national level, although not yet visible to the private sector. Moreover, a representative from the public sector noted that private actors are expected to take greater initiative while detailed frameworks are still under development. In contrast, several private companies described a lack of concrete guidance from national authorities, whereby one participant expressed frustration over the closed communication within the public sector. According to this participant, this lack of transparency creates a disconnection across society. This discrepancy is reflected in the following statements:

> *So, I know there's a lot of things going on at the national level, which is good, but it's taking a little bit too long. But I also understand why it's taking so long, because there are huge decisions to make. (...) but for the actual producers, or the trade and industry, it's very far away.*
>
> ID 8b

> *I think the government and the authorities are talking among themselves. They don't dare to go to the private sector yet and that is what we are waiting for. So, it's quite hard to listen to the Minister of Civil Defence telling us to act when we don't know what to act on. There's a bit of disconnection within society at the moment.*
>
> ID 12

Moreover, several participants highlighted specific obstacles that hinder the ability to move from planning to action. For example, some participants representing public authorities pointed to financial uncertainty as a key barrier, noting the difficulty in justifying long-term investments in preparedness, such as stockpiling, without a clear understanding of how resources should be allocated. Additionally, some participants reflected on the tension between long-term preparedness and short-term political demands, while some described the tendency to act reactively only after the situation becomes urgent. Similarly, a few participants explained the limited decision-making regarding the security of food supply due to a low perception of risk and the absence of near tangible threats. Lastly, two participants emphasised the challenge of allowing mistakes in decisions, particularly when choices must be made based on limited or evolving knowledge, which is illustrated in the following quote:

> *The lack of decision making is the biggest risk we have. We have not fostered a culture especially governmentally to have managers and GD* [general director] *and so forth that are taking risks. They have been hired for and sought for and asked for to do deep in depth analysis to be accurate, precise and I think our general in command for the armed forces said it best or the previous one actually said "we used to have all the time and no money and now we have all the money and no time" and to make the cultural shift and to help them with that to educate them, it's OK to make a decision, it could be the wrong decision, but it's the best based on the facts we have and write down which facts we do have, this is the decision we took based on these facts, tomorrow we might need to make a new one, because we have new facts. (...) So that is the biggest risk we have at the moment that we will come to a standstill because we will be shell shocked.*
>
> ID 6

4.2 Legislation and regulation

Legislation and regulation emerged as a prominent theme, mentioned in 24 interviews, highlighting its strong relevance across the various stakeholders. Multiple stakeholders from all categories emphasised the importance of legislation as a prerequisite for initiating actions aimed at improving preparedness. In particular, contracts and agreements between private companies

and the public sector were highlighted as a crucial measure for defining what is expected and required from private companies.

> *So, if you have a contract with a government, then you know what to expect from the government and what are your responsibilities and without the contract, you don't know*.
>
> ID 5

While the significance of legislation has been widely acknowledged, an equal number of participants have emphasised its limitations. In particular, several participants described how legislation can act as a barrier by imposing an administrative burden, especially in production. For instance, two participants mentioned that milk producers are required to comply with hundreds of different regulations. A few also highlighted that several of these regulations are monitored by multiple authorities, leading to overlapping controls and duplicated administrative tasks. Moreover, it was mentioned that the same high level of administrative demands is often applied uniformly, regardless of the size of the business. This was described as especially burdensome for small-scale producers, such as individual farmers, who may lack the resources to manage complicated compliance processes. In contrast, larger companies often have dedicated expert teams to handle administrative requirements, described by one participant as follows:

> *I think that it's good that we do have a large amount of administration in some sense with regards to food and food production in general, but sometimes I fear that you put way too large amounts of administration on the actual producers. I mean looking at a large company (...), they have a whole team that could work mainly in administration and be experts in handling administration. But a lot of food production companies, or a large part of the food production chain, are smaller companies and being smaller and handling this huge amount of administration.*
>
> ID 8b

In addition to bureaucratic burdens, legal constraints were also seen as limiting both innovation and flexibility in the food production sector. For example, some highlighted how current laws can prevent the adoption of alternative production methods, such as cultivated meat, thus hindering progress and adaptation in the sector. Additionally, several participants emphasised the impact of EU legislation on national crisis preparedness. Some of these noted that EU regulations aimed at ensuring fair competition within the internal market can restrict targeted support to specific sectors or companies, as such support may be perceived as creating an unfair advantage. As a result, state aid regulations were seen as limiting the national government's ability to provide targeted support for preparedness, particularly for resilience-building activities such as stockpiling or infrastructure investments in certain critical sectors.

From another perspective, some participants viewed the mutual recognition of product standards across EU member states as a facilitator of trade. However, others noted that although EU legislation aims to provide a shared baseline, Sweden tends to enforce stricter interpretations, resulting in a higher administrative burden than other member states, exemplified as following:

> *We could have the same rules within all of EU. Now we don't. In Sweden we do the EU rules a lot harder than, for example, the southern EU countries. So, I think there is a lot the government can do to increase production, nationally and locally*.
>
> ID 17

4.3 Mandates and directives

Another recurring theme mentioned in 15 interviews was mandates and directives. A common view across the various actors was the need for clearer, top-down directives to clarify responsibilities and ensure coordinated action. Furthermore, some participants discussed the use of soft power, referring to non-binding signals and informal guidance as a way to steer preparedness efforts without relying on formal mandates. A participant representing a public organisation highlighted the challenges of this approach, noting its ambiguity and openness to interpretation of terminology, creating gaps in the system where no actor holds a clearly defined mandate. Another participant representing a private company, however, suggested that soft power can still be effective in encouraging companies to take initiatives, although clearer mandates and formal directives would likely accelerate the process of preparedness development, as stated in the following quote:

> *There are reactions being done and they are positive. And those are, for now, built on the companies themselves, taking responsibility, not being forced. So, if there would be pressure, we would see the same kind of development, but at a much higher rate. But today it's actually being done by the companies themselves because they don't really need to do it.*
>
> ID 12

Another aspect of this theme concerns the legal structure whereby no authority holds the power to rule over another, which was described as both a strength and a limitation in establishing clear mandates and directives. This duality is illustrated in the following quotes:

> *There is no one with a direct mandate so that, I would argue, is one of the biggest issues or vulnerabilities. (...) It's a strength as well because should one authority actually have this and you would take that one out, you might make the entire system unavailable.*
>
> ID 8b

> *And that I think it's a problem in Sweden that it's not a hierarchy that people are at the same level. So, you can't say to another agency "you should do this, or you should do that". I think that's a good thing, but (...) I think it's good that someone can take the lead and say now we need to do this. So hopefully that will happen.*
>
> ID 29b

4.4 Collaboration

Collaboration emerged as a frequently discussed theme, raised in 26 interviews, though addressed with varying emphases. While some participants highlighted existing effective collaboration and strengths of existing alliances, others pointed to the need for improvements. Collaboration was also described as a key enabler of crisis preparedness, and several participants emphasised the general willingness among actors to support one another in times of need.

Effective collaboration, particularly between national authorities within the food sector, as well as in public-private partnerships, was noted by 11 participants, primarily representing public authorities. In contrast, 14 participants across all categories of stakeholders stressed the need for improvements in collaboration for preparedness, especially within and across various levels of government, the private sector, and other key stakeholders. Similarly, some participants underscored the importance of strengthening cooperation and communication of needs across different sectors, such as between food production and other critical sectors like energy, transport and healthcare, enabling more coordinated prioritisation of actions. Furthermore, the interviews revealed a widespread consensus on the need to involve the private sector more actively, as their engagement was recognised as essential to ensuring the security of food supply. However, a few participants expressed that the high number and diversity of stakeholders in the food sector make it difficult to approach and engage them effectively. Illustrating this point, one participant stated:

> *But when you go down to, at least on a regional level, what we have trouble with is how to approach the trade and industry because it's huge and it has a lot of different stakeholders, and a lot of different areas.*
>
> ID 8b

Regarding enabling factors, participants identified various aspects that support and strengthen collaboration in food preparedness. For instance, three participants emphasised the strength of the food industry being relatively small and having existing platforms for collaboration. Additionally, some participants recognised trust as an important element facilitating collaboration across different levels. Some of these reflections are illustrated as following:

> *I must say one thing that is the most important thing and I think the ones that make Sweden stand out in this total defence and involving the private and public sector is trust. We have a huge trust in this country. If a government says, or an agency says you should not, we tend to not do it.*
>
> ID 6

> *It's quite informal actually, but I think the strength is that Sweden is not just a big country, and the food industry is not that big, so it's really good that everybody can just know each other, so that's easy communication. So, if something would happen, we already have the communication channels. I think that's the biggest advantage.*
>
> ID 1a

Furthermore, ten participants across all stakeholder categories discussed a willingness to help and solve crises collectively as a key aspect of Sweden's collaborative capacity, not least among the private sector. Participants explained this phenomenon in various ways, mentioning cultural traits, a shared mindset, adherence to government directives, or a general Swedish characteristic. These perspectives are exemplified by the following statements:

> *But I think the biggest strength is the mindset because there's a huge willingness in Sweden to solve crises together, and I think that's the biggest asset for us.*
>
> ID 11

> *You know, I would say that is culture. I would say that even though Swedes haven't been working with preparedness for so long. In Sweden (. . .), we have a cooperation culture. And that culture is extremely important in these kinds of circumstances.*
>
> ID 10

The final key aspect discussed in relation to collaboration concerned alliances and various international networks. Among the 11 participants who elaborated on this theme, some highlighted Sweden's EU and NATO memberships as important safeguards, reducing the risk of being completely cut off from trade networks. A few also emphasised the EU's role as a stabilising force, facilitating common understanding and securing trade flows. At the same time, four participants underlined the importance of choosing reliable trade partners. In connection with this discussion, five participants considered the role of smaller trading networks. For instance, some suggested strengthening collaboration between Nordic countries, while others considered including additional neighbouring countries. The benefits of reliant trade partners are reflected in the following quotes:

I guess at least one answer is going back to this idea of you know, who do you trade with, and do you make sure that you have close relationships and infrastructure to trade with those allies so that you're not dependent on countries that could raise barriers.

ID 14c

I think we need to work in, for example, the NBA plus Poland. So, the Nordic Baltic countries plus Poland, I think that would be a sub region that could work and that could also be harmonised as a NATO sub region. (...) then this sub region would be a very good region to cooperate in this case, and we also can see that these countries differ a lot from each other, but they're very complementary to each other. Denmark has a lot of farming and a lot of pigs, and Norway has a lot of fish and you can make fun of it, but they're actually quite diverse, these countries. So, I think to improve that cooperation would be a good, good thing.

ID 21

4.5 System

When elaborated on how to develop a secure supply system, some participants considered the highly privatised nature of the food supply chain to be a hindrance to replicating the previously dismantled system. Three participants specifically argued that reintroducing the latter is no longer a viable option due to societal changes, decentralisation, and the need to comply with EU legislation. However, despite the difficulties of rebuilding a system, a few participants emphasised the opportunities to create a more flexible and adaptable one, also utilising opportunities arising from digital innovation. These participants, for example, drew comparisons to Finland, which never dismantled its system, and highlighted the challenges they face in restructuring or implementing changes within existing structures. Some of these arguments are illustrated in the following quotes:

And in the development of the new security of supply preparedness, the main issue is that we can't copy the system we had 30 years ago because that system was based on a stronger governmental ownership and also a less fragmented private sector. Since the new public management

doctrines in the 80s and 90s and deregulation and the privatisation of large facets of different sectors, from energy to telecommunication to other industries as well, together with the fact that we have seen a decrease in, for example, small farms that have been bought up and become larger, industrialised, centralised farm hubs, so we can't replicate what we had 30 years ago with a system of what you call war important companies and large stockpiles in barns placed on strategic places in Sweden.

ID 16a

Of course, we look at Finland. They never dismantled their system, and the interesting thing is that in Sweden we are now trying to create something, and Finland still has this. I think it's extremely fascinating because once you have structures, it's more difficult to make something new or reinvent them. So, we're both a little bit envious at the moment. We are looking at them as you know, they still have their grain supply in the silos, and they have these decision structures, and we dismantled all that. And they look at Sweden as oh, you can build a completely new system based on contracts and granular decision making, with the expertise of the companies, while we're stuck in this planned economy system with low flexibility.

ID 5

4.6 Complexity

During the interviews, several participants used the notion of complexity to describe various aspects of the food system. For example, some participants used the term when referring to the multitude and diversity of actors involved across the system. Several participants instead emphasised the interdependencies between the various actors and functions within the system. Moreover, several participants emphasised intersectoral dependencies, noting that agriculture relies heavily on transport and energy infrastructure to ensure the production and distribution of food. For example, some stressed that all functions within the food system have the same dependencies, while several participants highlighted how disruptions in one sector can ripple across others. The following quotes highlight these critical interdependencies between sectors:

Speaking of dependencies, of course we need to have food supplied throughout the chain, but I don't think that would be the biggest issue. The biggest issue is that we all share, no matter if you're a farmer or a producer or a logistic person, you have the exact same dependency more or less and that is energy. We all need electricity, we all need IT, we all need transport, whether it's fuel or lorries and we all need people and then when it comes to the retail part of it, we also need payments.

ID 6

How do we actually have this cross-sectoral thinking in place? How will an electricity outage actually impact transportation directly impacting food supply (...)

ID 16b

In light of dependencies, six participants stressed the importance of focusing on the whole picture when discussing the security of food supply. According to these participants, the entire supply chain needs to be considered when planning for preparedness, as raw materials like grains or meat are insufficient if there is no capacity to process them. Therefore, focusing too narrowly on early stages of the chain, may lead to shortages or limitations further down the line. The emphasis on the importance of a holistic view is illustrated in the following quotes:

We need to have a holistic view on the system and see that no part of the chain is more important than the other.

ID 11

You can't separate anything that you are producing that creates any value or that is of need for the society, these are all interconnected in some way. So, I mean you need energy to produce food and you need information to distribute food and you need so many things and it's also closely interrelated and so that is so important. (...) I mean it's sort of out above and around everything that we do. I met so many people that try to separate their specific interests and say this is the most important part and we have to focus on this and put a lot of resources into this, but it doesn't work like that.

ID 21

Another related theme mentioned by nine participants was the uncertainty regarding what the system should be prepared for, and the difficulty of anticipating the potential impacts of different events. While some highlighted the need for scenario-based planning to begin assessing vulnerabilities, and possible consequences, others argued that the unpredictable nature of unfolding events makes it difficult to rely on predefined scenarios. Similarly, one participant observed that while there is a tendency to simplify into extremes by considering either the best option or a catastrophe, the complexity of the system provides a range of possibilities. One participant also pointed out the tendency to plan for one crisis at a time, although multiple disruptions often coincide, requiring a more integrated approach. The following quotes exemplify how uncertainty was addressed:

> *But the most important thing is, what's the difference between the best option that you hope for or expecting and the second best option. When many people see the food system or the global situation, they do think about what happens if we cannot have the best option that is today and compare that to the total catastrophe. It's very rare that that is the actual situation. (...) And that is the most, I think, important lesson to see that there are more vulnerabilities in a complex system, but at the same time, the options are often good enough. It's not a binary situation where it's either on and off, or black and white, one or zero, but a scale.*
>
> ID 5

> *I mean that's the tricky part of course, because you don't know what you're preparing for. You don't know the situation, you don't know if you're going to have electricity. Maybe we will have it coming and going, maybe we'll not have a problem with electricity, maybe we'll have problems with something that we haven't foreseen.*
>
> ID 1c

4.7 Adaptation

The theme of adaptation emerged in 13 interviews, where participants highlighted various aspects of the abilities of the system to adjust in the face of disruptions. Among these, five participants explicitly said that although the system is imperfect, it can handle disruptions.

Within the discussion about the ability to adapt, several participants referred to past crises, such as the COVID-19 pandemic, as an indication that the system can adapt when necessary.

> *We did get through the pandemic. We will get through other crises as well. I think that what we need to focus on is the period from which the crisis occurs, so when we have adapted to a new reality, because we will adapt to that new reality, that's the Swedish way we will adapt, we will make it work. But if we can shorten the time of adaptation from a normal situation to a changed situation, that's the way that we can lessen the consequences for the Swedish people*.
>
> ID 11

Furthermore, several participants highlighted the strength of having numerous private companies within the food sector, emphasising their capability and interest in rapidly adapting to changing conditions. This flexibility was often attributed to the profit-oriented nature of these businesses, as the need to protect their business models and ensure survival compels them to respond swiftly and strategically to emerging challenges. In this context, some also pointed to business conversion, not only as a potential opportunity but also as a capacity demonstrated in previous crises where companies successfully adapted their production, as illustrated in the following quote:

> *It's not the authorities that are producing food, it's private companies. And then you could say, well, that's too bad because they are only capitalistic and they only store just in time and so on. And yes, that's a weakness, but they are also highly adjustable. So, when they sense in the market that there's some shift somewhere, they prepare, they change, and they adapt all the time. They do that constantly. (...) And also, if you look back, I mean we have had quite some big challenges on a global scale first with the Covid pandemic and then with the Russian invasion in Ukraine and the following price increases on supplies. And they have adjusted. No one has been hungry in Sweden and there have been quite some disturbances, so I think that also proves that they are very adjustable*.
>
> ID 1c

4.8 Terminology

Nine participants, representing various stakeholder categories, highlighted the importance of consistent terminology and expressed concern over confusion caused by unclear definitions. This confusion stemmed from the inconsistent use of terms such as ‘resilience’, ‘robustness’, and ‘crisis’ in the absence of shared standards to guide discussions. Most representatives from academia also highlighted the intertwined nature of the similar yet different terms of ‘security of food supply’ and ‘food security’ and their use in different contexts and levels. This general frustration was well described by one participant, who stated:

> *One thing I think is critical is the definition of words (...). We struggle with the same terminology in Sweden and Swedish (...). I think that confusion around all these words and what they actually mean slows down the process and people and companies are a little bit hesitant. (...) So, I think it does sound very academic to say definitions are critical, but I think we need to be sure that we talk about the same thing. That goes for a lot of things, but these need to be put down in writing.*
>
> ID 6

4.9 Farmers

A major theme that emerged in 14 interviews concerned farmers, highlighting the financial risks and challenges they face, the opportunities to strengthen the agricultural system, and their critical role as key stakeholders in the food supply chain. In terms of challenges, seven participants emphasised the declining workforce in the farming industry as one of the greatest concerns for national preparedness, particularly in maintaining current levels of production. A few participants further explained the loss of farmers due to the labour-intensive and hard-working nature of farming, alongside low business profitability. Additionally, two participants highlighted the uneven distribution of revenues along the supply chain, noting that the processing industry and retailers capture a significant portion of the final retail price rather than the primary producers. The issue of low profitability is described in the following quote:

> *The best thing to do is probably do things to increase the profitability. (...) it's a very hard job, long hours, big risks, big worries for very little return. So that's probably what's putting young people off (...). So better economic or financial conditions would probably be a big thing.*
>
> ID 11

The issue of loss of farmers was also addressed by a few participants concerning the challenge of finding workers for the farms, though some noted that this gap is currently being partially filled by foreign workers. Furthermore, several participants discussed the loss of farmers, particularly in combination with the absence of young farmers, which hinders a generational shift within the sector. For instance, one participant highlighted the difficulty for those without family-owned farms to start a business, while another emphasised the challenge of securing loans and investing in equipment. Nevertheless, economic risks are not only a concern for new generations of young farmers but also apply to those currently operating farms who face similar difficulties in accessing capital, as highlighted by several interview participants. The following quotes illustrate these issues:

> *Also, the salaries in food production are very low, which means that there is not a large interest to work in that area, and therefore it's also easier to have foreign personnel coming in.*
>
> ID 20

> *It's a very big threshold to get over for those young people to be able to, or to be willing to, risk taking the mortgages at the bank and investing in machinery. Whatever you need to be a strong competitor on today's market.*
>
> ID 11

Additionally, economic risk was mentioned in the context of shifting production for preparedness, which poses significant financial challenges for farmers. For example, a few highlighted that these investments require substantial amounts that farmers may struggle to secure, given their revenues depend on often unpredictable harvests. Another participant emphasised the rapidly changing regulations, noting that after investing significant resources, farmers may find these investments ineffective or undermined due to policy shifts, leaving them limited time or opportunity to adapt.

Several participants highlighted the importance of ensuring financial and advisory support to farmers to reduce these risks. In particular, one participant argued that governmental funding should be allocated when new regulations to adapt to climate change are introduced to clarify responsibilities and ensure that the economic burden is not solely placed on farmers. Moreover, another participant argued that farmers should be able to decide how to spend the received funding, autonomously identifying their weaknesses and how they can improve their preparedness. However, two participants pointed out that farmers, as business owners, don't want to live off governmental crisis support, as one participant emphasised:

> *And we don't want to work with crisis support. We want to have enough income over time, so we can handle crises by ourselves.*
>
> ID 2b

In terms of opportunities for improvement, several participants suggested making farming an attractive career and business choice. For instance, four people proposed increasing the attractiveness by enhancing agricultural business profitability and salaries, while two mentioned the potential role of schools and education in raising interest and knowledge. Additionally, one person highlighted the need for regional policies to make it more attractive and easier to live and work in remote areas by supporting rural communities with the necessary infrastructure. Lastly, one participant emphasised the importance of acknowledging farmers' proactive role in managing crises, stressing the need for society to better value their experience and resources:

> *Farmers feel a lot of responsibility in this question, farmers are used to crises, they act when something is happening, they have the machines, they have a lot of knowledge. And I think that society needs to take care of it better. (...) So you can see that the power of action from the farmers is really there.*
>
> ID 2a

4.10 Risks

When discussing the greatest risks and vulnerabilities threatening the security of food supply, four major elements emerged: climate change, geopolitical instability, supply chain disruptions and the increased digitalisation of the system. Notably, two participants chose not to respond to the question due to the sensitive nature of the information involved.

Climate change was pointed out by 13 participants as one of the greatest threats to Swedish production and supply, both in the short and long-term. Many of these acknowledged climate change as a threat already affecting Sweden. In particular, droughts and floods were the most mentioned climatic events. Others instead discussed climate change as a risk for future production, pushing the need to look into more efficient ways of working with agriculture and diversify production. Nevertheless, warmer weather was also described as an opportunity to increase production in Sweden. Lastly, three participants mentioned how climate change might impact crucial countries for Sweden's imports, raising the question of considering the reliability of sourcing countries. These latter perspectives are illustrated in the following quotes:

> *In this bad climate change there are also possibilities because we are now facing new climates and it means also that we can actually start to produce new things here, at least in Skåne for example, but also in northern parts of Sweden (...). Now it's a possibility.*
>
> ID 8a

> *I mean we import a lot of production from Spain, Italy, and Morocco for example, and they are getting shortage of water there. So that's going to be a problem in the near future.*
>
> ID 19

Three participants described the food supply system as dependent on technology and IT logistics in farming activities, orders and distribution. On one hand, this was praised for its efficiency, but on the other, it was recognised as a vulnerability. For example, a disruption affecting one of the major stakeholders could have serious consequences, highlighting the importance of enhancing digital security against cyberattacks disrupting communication, transportation and electricity. As one participant noted:

> [The Swedish system] *is effective, small waste and so on. But you have to secure it. It's very efficient and partly because it has a lot of information technology attached to it and so on, so there's a vulnerability according to that.*
>
> ID 14a

Participants consistently identified war and disrupted global supply chains as the most pressing risks to security of food supply, either as separate threats or with war acting as a catalyst that indirectly disrupts supply chains. For instance, one participant stressed that this realisation becomes urgent, particularly when authoritarian trends provoke geopolitical tensions in critical exporting regions. Moreover, three participants reflected on how the current geopolitical situation provokes unexpected scenarios that must be considered. The link between supply and security issues was exemplified as follows:

> *You can see the reasoning in the United States right now about, for example in one way or another, taking control over territory like Greenland or Panama. It's also very strongly related to supply chain challenges. I think entering this era where these frictions are going to become very, very real and very sort of high up on the agenda, that is what I think you have to have that approach to anything that has anything to do with supply chains.*
>
> ID 21

> *There was a really low probability that the US was going to just descend into protectionism and chaos and essentially dismantle democracy. But it happens now (...). And I guess that's an illustration of the fact that we're now in a period of time where unlikely things are starting to happen.*
>
> ID 14c

Supply chain disruptions are another major risk considered by several participants as potentially having a negative impact on the functioning of the food supply system, especially considering the import dependencies on inputs needed along the supply chain. The Suez Canal crisis, the COVID-19 pandemic, and the war in Ukraine were mentioned as examples of how relying heavily on imported inputs may impede availability and, hence, maintenance of production

levels in times of crisis. Others instead focused on supply chain disruption happening at a national level, given the presence of a few critical hubs on which the entire system rests. Contrarily, one participant also noted the strength of having these big nodes, providing alternatives across the country and establishing different kinds of connections via land and sea. Nevertheless, participants across different stakeholder categories emphasised the need to enhance preparedness measures to avoid delays and interruptions in the entire country.

Lastly, some participants did not focus on specific risks but instead mentioned the cascading effects of having multiple risks combined. Moreover, one participant discussed the need to balance different risks when attempting to decrease vulnerability, as decisions in one area may have spill-over effects in others, stated as follows:

> *We can do it on small transport, for example, we can electrify it to make it more sustainable with an option that makes it maybe less dependent on input imports internationally on fossil fuels. But then it becomes more vulnerable for electricity outages. So, it's always this trade-off between risks and where we want to go.*
>
> ID 16b

4.11 Market

Market dynamics emerged as a theme in 22 interviews. In particular, more than half of the participants described Swedish food production, supply, and delivery as a just-in-time system characterised by a frequent and rapid turnover of items with short expiration dates distributed according to demand. This system was often cited as a vulnerability in terms of lack of preparedness, as several participants explained:

> *We have, as a society, adapted to the just-in-time way of life, which means that we are very used to whatever we need, we can get from the stores, which in turn get it delivered by trucks every day if they need it.*
>
> ID 11

> *I mean in principle, what you do today in Sweden is that you produce just in time. So, basically there's nobody building up sort of a storage level.*
>
> ID 20

The second most frequently discussed topic within the market theme was the issue of prices. Participants widely acknowledged price as the driving factor for demand. Similarly, almost half of the participants observed that consumers are generally unwilling to pay for products that could enhance national preparedness in the long term, especially when cheaper alternatives are available. Several participants further emphasised that demand influences production and hence, shifting consumer preferences can motivate private-sector initiatives, enhancing national preparedness, as illustrated in the following quote:

> *There's always considerations to be done and after a while it changed because all of a sudden the end consumers, who buy the value chain, started to have different preferences. They wanted to have environmentally friendly products. So, a lot of these different efforts are not regulated in law, but they're regulated through the market force. So, could societal preparedness do the same thing (...)? So, all of a sudden you have a different kind of mechanism in place to drive it. So, I think that is also a very potential way for food preparedness to go because somewhere we need to absorb the cost of change even if we have the same cost of products. In the end, the change is costly. It takes attention, it takes money.*
>
> ID 12

Some participants mentioned financial support and regulatory measures from the EU or the government to overcome the gap between the cost of producing food and the prices consumers are willing to pay. Contrarily, others stressed the importance of exploiting market dynamics of demand driving production and allowing its self-regulation. Another aspect emphasised by a few participants is that short-sighted market demands do not align with preparedness needs, requiring a long-term perspective. Some participants, therefore, saw changing consumer behaviour as both a necessary and challenging step in adapting to shifting circumstances, safeguarding food availability, promoting Swedish-produced products, and acknowledging the impact of consumer choices on national preparedness. The emphasis on a self-regulating market and the importance of integrating preparedness thinking in consumer behaviour is illustrated in the following quotes:

So just ensuring that we have those kinds of market forces aspects into consideration we maybe do not need to regulate everything because the market will regulate itself. (...) Every private company will deliver on the market expectations. So maybe not looking at the political government, looking at the consumer, us, and saying, OK, are we ready to buy a different product tomorrow that will increase our future resilience? Then we will have everything regulated through market forces. No new laws are needed.

ID 12

We are on the demand side and that's customer behaviour that needs to change and I don't see a big customer response regarding food security. That's not a big thing for customers because they still believe that the government's going to sort that out. I mean, people aren't prepared to pay for it. People aren't prepared to change their habits for it. (...) So, I mean changing customer behaviour. We can't just do it on a full preparedness reason, but that should be one of the reasons. And then we have sustainability and then we have pricing and so on. But right now, it's all about the price, and that actually works with food preparedness and sustainability in a lot of cases. But we need to put those arguments together and we need to promote them not as a customer responsible for Swedish food preparedness.

ID 17

4.12 Imports

A central recurring theme discussed during 25 interviews was Sweden's import dependence on food and critical inputs, such as fertilisers, energy, and fuels. While multiple participants regarded this as a major vulnerability, others emphasised the importance of maintaining trade to secure Sweden's food supply, considering that certain products are too costly or impossible to produce domestically. In this regard, Sweden's EU and NATO memberships were seen as enhancing its access to essential goods. Moreover, while some participants claimed that up to 50% of all food items are imported, others viewed this as an exaggerated narrative. These quotes illustrate these perspectives:

> *It's too costly to do everything at home. I mean, if you try to just produce all your inputs and all your food at home (...) it would be extremely expensive, but on the other hand, if you're too reliant on, say, imports of food or imports of inputs, then you're very vulnerable to the vagaries of the market. (...) You need these functioning trade markets. But on the other hand, you don't want to be totally reliant on them. You want a balance.*
>
> ID 14b

> *There is a very, very common saying in Sweden that every other bite is imported, which is an accrued simplification and doesn't really mirror the reality. But going beyond those kinds of hyperbolic statements there is a fairly big consensus regarding the big importance of imports and the declining production rates in different food groups, meat, dairy and so forth.*
>
> ID 16a

When discussing strategies to reduce dependence on imports, some suggestions included convincing consumers and producers to buy Swedish products. However, two participants remarked that imported products are typically less expensive than those produced domestically, complicating efforts to prioritise local production. Furthermore, to reduce imports of feed, two participants mentioned the use of new technologies or the consideration of residuals and turn into ingredients for animal feed and biogas.

4.13 Businesses

The role of businesses as key stakeholders within the Swedish security of supply system was discussed in 22 interviews. Several participants, across all stakeholder categories but predominantly private companies, emphasised the need for businesses to make a profit. Within this discussion, multiple participants highlighted the issue of engaging them in costly preparedness activities, such as stockpiling or the production of long-lasting products. In these instances, participants called for government intervention, mainly through financial incentives, as exemplified by the quote below:

But do you incentivise for example private companies to do good for society and then basically maybe we have to spend money for them to produce something that maybe they wouldn't make money on, but is essential for society.

ID 16b

It should also be made economically profitable for companies because I mean, you always need to keep in mind that companies need to make money in order to survive. (...) And if it's not profitable, why should they? There is a level of humbleness that needs to be helped according to that, and also the fact that a more healthy company that has a good profit is also more likely to be able to invest in more robust systems.

ID 8b

4.14 Production

The relevance of examining the challenges, strengths, and opportunities within Swedish food production is underscored by the fact that 27 interviews addressed this theme. In terms of production levels, some participants argued that the current levels are sufficient to ensure the security of food supply. On the contrary, others stated that not enough food is produced in Sweden. Moreover, some participants focused on meat and dairy production, pointing to an insufficiency in meeting national demand. Consequently, the need to boost protein production was highlighted:

So, we need to get more food produced in Sweden and protein is important, so we need to produce more protein in Sweden. And if it's animal or plant based, I think the main thing is that it needs to be more of both of those.

ID 2a

Concerning production levels, some participants specifically talked about the production of calories, stating that existing production levels provide enough calories and proteins to sustain the Swedish population in peacetime and crises. Moreover, two participants highlighted that while sufficient calories are enough for survival, the nutritional quality of food and its

consequences on long-term health must be taken into consideration. This perspective is captured in the following statement:

> *We have wheat, we can have overnight oatmeals and all of that all day maybe, but will that be enough? So even if we just talk about calories in a way of sustaining the population in Sweden, we also need somewhere to say, well, we need quality in food, that will affect our long-term health and to be able to recover, right?*
>
> ID 12

Within the theme of production, numerous participants discussed various challenges. A primary challenge identified was the maintenance of current production levels, given a decline in knowledge and workforce as farmers are diminishing. Additionally, six participants pointed to the critical issue of having few processing facilities, while several noted that the number of primary producers is decreasing as only larger industrial hubs remain profitable compared to small-scale farms. Another addressed the lack of a diversified variety of crop production, which can lead to significant losses in the event of changing climatic conditions or pathogen outbreaks.

Considering the challenges of maintaining and increasing production levels, some participants indicated options for improvement. For instance, participants emphasised the need to protect agricultural land from being sold to building companies and ensure fellow land availability for future needs. Furthermore, participants generally agreed that it is the government's responsibility to support and promote national production. For example, some suggested prioritising critical companies or incentivising diversification of production, particularly promoting proteins and pulses.

> *It needs to be the government who points out which company is the most critical and also gives the resources to be able to actually produce food.*
>
> ID 2a

Another central theme emerging from the interviews related to self-sufficiency was mentioned by 19 participants. However, participants expressed divergent views regarding the current level and the extent to which Sweden should strive for greater self-sufficiency. On the one hand, some highlighted the self-sufficiency of certain products, such as wheat, carrots and sugar beets. On the other hand, several emphasised the lack of self-sufficiency for both food and critical inputs, with a few specifically arguing for the need to increase the national production of inputs.

Additionally, another argued that Sweden is not self-sufficient in anything. From another perspective, a few emphasised that self-sufficiency should not be the primary goal, arguing that Sweden's membership in the EU and NATO provides a broader trade network beneficial for national preparedness. Some of these perspectives are illustrated in the following quotes:

> *We can say we should increase Swedish production. I totally agree, I think we have a lot of unused potential, but we need to remember that I can't be our sole support. We are part of the EU, are part of NATO for a reason, and that is to be dependent on each other and help each other out.*
>
> ID 6

> *Is not only the lack of products that we are self-sufficient in, it's also the lack of self-sufficiency for the critical inputs.*
>
> ID 16a

Notably, one participant expressed a negative view of international trade, attributing the decline in meat production to Sweden's EU membership:

> *It's the economy that has been the problem since we became a part of the EU in 1996. Then a lot of cheap products came from Europe and that has made the production decrease. All animal production has decreased since 1996, and I think we have lost about 30% of the pig production and it's the same for all.*
>
> ID 2b

On a more positive note, a few participants emphasised the existence of some strengths within the current production system in Sweden. For example, a few participants discussed Sweden has a sound agricultural basis, while others mentioned the advanced level of innovation and knowledge within the sector. Moreover, others added the quality of soil and the availability of land, whose potential is currently not exploited.

Additionally, although not directly part of the food supply chain, the critical role of water in ensuring production and, hence, the security of food supply was highlighted in nine interviews across all stakeholder categories, despite differing perspectives on water availability. For instance, three participants from the industry and primary production stated that Sweden does

not face a shortage of clean water. At the same time, three others, two representing the public sector and one from industry, expressed a growing awareness of limited water availability. This divergence is exemplified in the following quotes:

> *And we have a lot of clean water. We don't have a water deficit, so that's very good.*
>
> ID 18

> *We take water for granted. (...).* [Producers] *need a lot more fresh water to produce products with a longer lasting date. And it's not just something you can say today that you need an endless supply of water.*
>
> ID 27

4.15 Financing

The issue of financing became a central element in the debate over securing food supply, emerging as a major theme in 15 interviews. In particular, a few participants highlighted the challenges of investing in long-term preparedness due to short-term funding available and a general context that is market-driven. Moreover, a few interviews emphasised the necessity to share the cost between all stakeholders in the supply chain for securing food supply and increasing preparedness. The argument was that single actors do not have the ability nor should have the responsibility to do so. The following quotation exemplifies this discussion:

> *But you know if you it all comes down to money because the consumer thinks right or wrong depends on who you are. Of course, your economic situation is that the food in Sweden is very expensive, but on the other hand, we have a lot of other stuff that is really, really not expensive now. And for food there is a cost in the production so if you want to make a change that will also cost so that's difficult, right? Because the farmer needs to be paid and all the layers need to be paid, and of course it should be a reasonable price for the consumer.*
>
> ID 9

Within the discussion about financing, predominantly representatives from public organisations reported increased budgetary allocations for security of food supply measures. Across various stakeholders, these investments indicate a clear significance of the issue. Despite the stated availability of resources, a few participants stressed the importance of ensuring that financial support is both efficiently distributed and strategically directed. For example, a few argued that this support needs to consider farmers as critical but vulnerable stakeholders in securing food supply, as stated by one participant:

> *I think it is a good idea, that instead of spending the money on building our structure and organisation at the authorities, trying to help them prepare as much as possible, the ones that actually need to produce if something happens.*
>
> ID 1c

4.16 Stockpiling

Stockpiling emerged as a major theme for securing food supply, mentioned by 17 participants, though with a different focus. For example, some stressed the importance of accounting for market dynamics to avoid increasing food prices. From a slightly different perspective, one participant highlighted the idea of integrating turnover stocks into the ordinary system to create a buffer. Others specifically emphasised the need to stockpile agricultural inputs to build redundancy in the system. However, despite the broad agreement on the necessity of stockpiling, different obstacles hindering its implementation were identified. In particular, a few participants considered the absence of official governmental requirements or agreements concerning stockpiling methods, as well as practical challenges such as the short expiration dates of many products, as remarked by one. Nevertheless, the vast majority noted that it is extremely costly, complicating efforts to finance such initiatives. Within this discussion, some participants argued that companies are hesitant to increase their capital costs and, therefore, the government should take responsibility, as illustrated in the following quote:

> *Right now, we don't have any stock. I mean, it's not profitable for any company or (...) any producer to have a big stock of them that costs money. So that is something that the government I think needs to really be the one that is there funding that.*
>
> ID 9

4.17 Sustainability

Sustainability and its relation to preparedness emerged as a recurring theme in 14 interviews. The primary connection, according to seven participants, is in the overlap between sustainability and preparedness, particularly emphasising that they are both long-term oriented. This alignment was particularly evident in discussions on the agricultural sector, where a few mentioned the potential of biogas production to reduce the use of fossil fuels and contribute to sustainable agriculture and crisis preparedness. Others highlighted the need to diversify and grow crops and breeding techniques that can buffer environmental changes. As one stated, this diversification would also entail moving away from conventional agriculture, which is intensive for the soil and highly dependent on fossil-fuels and fertilisers. Lastly, one participant argued that emphasising the overlap may also facilitate consensus among opposing political divides, as mentioned:

> *I think a positive thing is that a lot of things will be good both for preparedness, especially in the civil defence, and sustainability, but today we speak about it like they are two different things. I think a lot of them can be the same thing. (...) But if you can make people understand that those things are good for both, then then we can also have broader political agreements.*
>
> ID 29b

Finally, six participants discussed the potential of utilising residual streams to reduce food waste and upcycle products or activities. Suggestions included repurposing waste for animal feed, biogas, and fertilisers or redirecting heat and other spaces for secondary uses. As one participant summarised:

> *What people tend to call waste is just a resource that no one has thought of how to turn into something economically viable yet.*
>
> ID 5

5. Discussion

This section aims to discuss the key themes identified in the results and interpret them through the lens of relevant theoretical concepts and existing research. The objective is to address the research question and provide insights into how the security of food supply in Sweden can be enhanced from the perspectives of key stakeholders.

5.1 Pathways to strengthen preparedness in the food system

5.1.1 Adopt a holistic view and multi-hazard approach

The results highlighted that participants consistently identified war and disrupted global supply chains as the most pressing risks to security of food supply, either as separate threats or with war acting as a catalyst that indirectly disrupts supply chains. This concern appeared to be deeply embedded in the recognition of the current unstable geopolitical situation and shifting power dynamics, which are seen to provoke the emergence of previously unexpected and unpredictable events. In contrast, while climate change was also identified as a risk, partly for its potential to disrupt supply chains, participants expressed more divergent views. Some saw it as an immediate and escalating threat, while others regarded it as a long-term challenge or even a potential opportunity for agricultural production in Sweden. Hence, these differing perceptions reflect a less unified framing of climate change than war. Considering that contemporary geopolitical instability, ongoing conflicts, and war are highly visible in public discourses, the perception of war as an urgent risk reflects the idea that risk perception is strongly influenced by the amount of attention a threat receives (Sjöberg et al., 2005). Similarly, the dominance and unified view of war within the discussion of the security of food supply resonates with the view that risk perception is shaped by political agendas and social concerns (Kasperson et al., 1988).

While war was identified as a significant risk, the findings also pointed to the importance of recognising cascading effects and combinations of risks. Measures aimed at mitigating one threat were also noted to sometimes unintentionally increase exposure to others, underscoring the importance of acknowledging trade-offs between risks. Accordingly, a narrow focus on single risks was regarded as insufficient in an interconnected reality where multiple disruptions often coincide. On the one hand, these realisations can be interpreted as acknowledging that risk perception shapes risk management strategies. Consequently, a strong focus on specific

events may overlook broader complexity and unpredictability, making other threats insufficiently considered or addressed (Kasperson et al., 1988; Hochrainer-Stigler et al., 2023). On the other hand, the tendency to neglect complexity was addressed, noting the common simplification of risk by comparing the ideal scenario to a catastrophic outcome. Consequently, this binary thinking ignores the wide range of possibilities that fall between the extremes. This simplification can partly be understood through the lens of heuristics, described by Kasperson et al. (1988) as the tendency to simplify the multitude and complexity of risks to make them more manageable. Accordingly, this simplification may lead to misinterpretations, diverting attention from systemic vulnerabilities (Kasperson et al., 1988), such as supply chain fragilities stemming from reliance on a limited number of critical hubs, IT failures, or events that do not evoke the same immediate sense of urgency as war.

This oversimplification of risks was, however, contrasted by numerous participants who called for a more integrated and holistic view of the food system and its vulnerabilities. The results reflected a widespread awareness of the system's inherent complexity, characterised by the multitude of actors involved, their interdependencies, the uncertainty surrounding the future, and the difficulty of anticipating the full consequences of disruptive events. This recognition can be interpreted as reinforcing the importance of adopting a systemic, multi-hazard approach, in which factors are not studied in isolation but as interconnected elements within a dynamic and uncertain environment. A multi-hazard approach refers to the selection of multiple hazards that a country faces and the specific context in which hazardous events may occur in simultaneous, cascading or cumulative way over time, while considering the potential interrelated effects (United Nations Office for Disaster Risk Reduction, 2016). A multi-hazard and holistic risk management approach is widely supported in the literature, reflecting the reality that in today's interconnected world, hazards cross geographical, administrative, and sectoral boundaries (Hochrainer-Stigler et al., 2023; Simpson et al., 2021). Adopting a multi-hazard approach further resonates with complexity theory, highlighting that a system cannot be fully understood through simple, linear thinking (Heylighen et al., 2007).

Furthermore, the recognition of cascading effects in the food system, emphasised in the results, can be understood through the concept of emergence, which Heylighen et al. (2007) describe as outcomes arising at the system level that cannot be predicted solely by analysing individual components or local elements. Moreover, the food system can be understood as an open system due to its continuous exchange of inputs and outputs with its surroundings, making it difficult to define clear system boundaries (Bergström and Dekker, 2014). This understanding is further

consistent with research characterising food systems as complex, multi-stakeholder environments that require a holistic and multidisciplinary approach to risk assessment (Országh et al., 2024). Consequently, drawing from the results and based on this discussion, a holistic and multi-hazard approach becomes essential to reflect the interdependencies within the system and the interplay between multiple risks to support more adaptive and resilient strategies for ensuring security of food supply.

5.1.2 Acknowledge differences in time perspectives and goals

A central challenge for enhancing the security of food supply, addressed in the results, lies in the misalignment of timeframes and objectives between the various actors, systems, and structures that sustain it. For instance, as market dynamics are driven by short-term profitability and optimised just-in-time logistics, businesses are often left without the incentive to invest in preparedness measures that do not yield immediate returns, particularly when falling outside consumer demand. These results align with broader findings in the literature, which highlight that market-based systems often prioritise efficiency and short-term cost-effectiveness over long-term resilience (The Swedish Food Federation, 2025). Consequently, unless preparedness measures are compatible with market principles, such as consumer expectations or policy-driven incentives, private actors have limited motivation to incorporate them into their core operations (The Swedish Food Federation, 2025).

Similarly, political decision-making tied to election cycles was also mentioned as hindering long-term policy commitment to risk reduction and resilience-building due to shifting priorities and budgets. However, as agricultural production, in contrast, requires long-term investments in land, infrastructure, and equipment, farmers face considerable financial risk when required to invest in measures that may not provide immediate returns and are subject to shifting policies. The focus on short-term policy gains driven by electoral incentives, public opinion, and the influence of interest groups is an acknowledged tendency (MacKenzie, 2016), resulting in slow governmental action on long-term challenges (Ogami, 2024), including those related to resilience and risk reduction.

Overall, the misalignment of time frames of market-driven and political orientations addressed in the results indicates fragmentation, causing wasted resources and a lack of coherence in preparedness strategies across sectors. This challenge of alignment reflects existing research highlighting the importance of institutional fit as a foundation for collective capacity in

advancing food security, though discussed in the context of governments and external partners in Australia (Slade & Carter, 2016). Fragmented, siloed approaches have previously been argued to generate inconsistencies and gaps that hinder coordinated and effective action (Slade & Carter, 2016). Similarly, the capacity for resilience has been linked to the ability of various elements, such as knowledge, skills, tools, organisational structures, formal regulations, and informal norms, to interact and collaborate across levels and sectors (Becker, 2014). Drawing from this perspective, current misalignments in time frames and goals can be seen as critical constraints to effective coordination and long-term resilience building.

5.1.3 Promote transparency in communication and decision-making

As presented in the results, there are currently no official requirements for different stakeholders to build preparedness across the food supply system. Instead, the government relies on a soft power approach, providing indications and non-binding guidelines. On the one hand, this strategy could be seen as aligning with Sweden's consensus-oriented culture, mentioned by participants, where actors tend to follow government recommendations even when they lack legal force. For example, Sweden's culture of trust between citizens and authorities has been widely documented in the context of the recent COVID-19 pandemic, allowing the use of non-mandatory measures and nudges to steer behaviour, relying on voluntary compliance (S. Holmberg & Rothstein, Larsson, 2022; Pierre, 2020). On the other hand, participants criticised the absence of more structured and formal requirements, as the soft power approach leaves space for individual interpretation of terminology, provoking confusion and hindering coherent actions. Thus, this criticism may help explain why participants requested clear top-down directives and guidance, specifying stakeholders' expected roles and responsibilities and identifying priorities, especially for those critical companies and sectors with overlapping needs. A similar argument was emphasised by Wenander (2021), who explores the tension between formalism and pragmatism in Swedish public law and noted that while adherence to rules is not legally enforced, there remains a societal expectation that individuals will comply. Moreover, this reliance on soft power results in an ambiguous legal framework that raises concerns about accountability and supervision (Wenander, 2021).

Considering the results, the public authorities appear aware of these requests, yet several factors were used to explain their hesitation to issue binding directives. For instance, on a cultural level, participants described the absence of an environment that allows mistakes, delaying final decisions and commitment to actions until uncertainty is minimised. Further, the large number

of diverse stakeholders makes it reportedly difficult for the government to approach them effectively. Moreover, the legal structure where no authority holds the power to rule over another was noted as hindering clear mandates and directives. Lastly, a general uncertainty regarding what the system should be prepared for was noted, thus questioning if this hesitation suits a continuously evolving context more than perpetuating ambiguity and delaying the engagement of relevant actors. These findings are particularly interesting as they contrast with Sweden's low score on the Uncertainty Avoidance Index (UAI) (The Culture Factor Group Oy, 2025), reflecting one of the four cultural dimensions developed by Hofstede (1980). According to his research, a low UAI score would indicate a certain societal comfort with ambiguity (Hofstede, 1980). Similarly, the observation that mistakes are tacitly discouraged appears to diverge from other descriptions of Swedish organisational culture, which emphasise openness toward acknowledging errors. This is exemplified in recent research by Riahi and Islam (2025), who, in their study on IT awareness in the Swedish public sector, find a supportive environment for reporting mistakes. Furthermore, the tendency to delay final decisions can be understood through Sweden's broader cultural inclination to avoid open conflict and ensure that all perspectives are considered. In this context, reaching consensus often takes precedence over addressing the substantive issue at hand (Holmberg and Åkerblom, 2001). However, this approach facilitates broad mobilisation of support behind decisions, ensuring that once consensus is achieved, actions are widely endorsed (Holmberg & Åkerblom, 2001).

In summary, different stakeholders observed a disconnection created by the lack of straightforward communication since public authorities continue the internal discussion to reach a consensus, while the private sector stands largely excluded and left to independently interpret the government's indications. Arguably, promoting transparency by clearly communicating decisions and their underlying evidence and reasoning could strengthen the security of food supply. Transparent communication could create a shared understanding of direction and allow the integration of diverse perspectives, thereby facilitating the identification of the system's needs, challenges, and capacities. This perspective aligns with the findings of Wood et al. (2023), who propose a resilience-oriented reframing of food systems. Among their key points, they emphasise that consolidating actors and decision-making processes within food systems can foster efficiency-oriented value chains. They suggest that a crucial means of achieving this is through wider participation in governance structures, ensuring that diverse actors from various sectors are effectively represented and engaged in decision-making (Wood et al., 2023).

5.1.4 Utilise existing capacities within the system

While participants acknowledged the challenges of rebuilding previously dismantled systems, particularly in light of decentralisation, privatisation, and EU-level constraints, the results also pointed to a future-oriented perspective. Rather than attempting to replicate past models, the findings suggest that Sweden has an opportunity to shape a food supply system that is not only secure but also flexible and adaptable to contemporary conditions. In this context, the highly privatised nature of the supply chain emerged as a potential strength as the results highlighted the significant role private actors play in ensuring the food system's functionality and stability. Notably, stakeholders across all categories acknowledged the benefits of having a diverse range of private actors embedded in the system, particularly in light of their demonstrated ability to respond effectively to disruptions, as seen during past crises. Accordingly, the ability of companies to rapidly adjust production, purchasing, and delivery processes has been noted as a key factor in ensuring that the recent crises have had minimal impact on food availability for Swedish consumers (Swedish Food Federation, 2025). Thus, it can be argued that private companies already possess the functions of anticipating, recognising, adapting, and learning, which, according to Becker (2014), determine the resilience that the system for security of food supply should strive for. Moreover, in light of Bergström and Dekker's (2014) definition, private companies demonstrate characteristics reflecting adaptive capacity.

Additionally, the results highlighted numerous other benefits present in the Swedish system. Firstly, Sweden exhibits a solid agricultural foundation, marked by both innovative practices and a high level of sectoral expertise. Likewise, the quality of soil and the availability of land were mentioned as other underutilised assets, suggesting that with targeted efforts, Sweden could optimise its agricultural capacity and better meet domestic needs. Moreover, mutual trust between the public and private sectors, along with private companies' willingness to help, were addressed as key elements within the system that could be leveraged to facilitate collaboration across different levels. Lastly, the small size of the industry, where everyone knows each other, was seen to further strengthen informal networks and foster a collaborative climate. Trust has been shown to promote the dissemination of information and is, therefore, a fundamental prerequisite for effective collaboration (Ahnquist et al., 2008). Institutional trust is further considered crucial for encouraging private sector engagement and responsibility in matters of national security (Bengtsson & Brommesson, 2022).

The question is, then, how these capabilities can be meaningfully integrated into a more formalised preparedness framework. From the results, the importance of contracts emerged as a necessary prerequisite for leveraging private actors, where their capacities are not only utilised during isolated events but also integrated into the system. Contracts clarifying expectations and roles are crucial for maintaining institutional trust, as governmental ambiguity regarding task implementation may result in gaps between expectations and actual responsibilities (Bengtsson & Brommesson, 2022).

In discussing how best to leverage private actors' willingness and capacity, the balance between regulatory constraints and operational innovation also requires consideration. For instance, the results highlighted not only the potential but also the existing presence of companies working with residual streams, thus holding valuable capacities to enhance preparedness. Specifically, residual streams were perceived as an opportunity to reduce import dependence while simultaneously fostering alignment between sustainability and preparedness objectives, thereby offering a potential point of convergence across divergent political agendas. However, these resources remain largely underutilised due to restrictive legislation, as also addressed by van Selm et al. (2025). This observation further aligns with findings in the literature highlighting how regulatory barriers can hinder the adoption of innovative crop and food technologies that have the potential to enhance food security (Smyth, 2020). Consequently, this underscores the importance of reviewing relevant regulatory frameworks to facilitate the development of alternative production methods, enable upcycling practices, and promote circular systems. This issue connects to the elements that determine resilience, namely the alignment and coordination between the existing regulations, societal values, as well as knowledge, skills and resources (Becker, 2014). Arguably, in the context described in the results, where the innovative knowledge and skills offered by companies are constrained by a restrictive Swedish regulatory framework, this misaligned organisation ultimately hinders resilience. In this light, strengthening resilience calls not only for collaboration but also for removing structural barriers and creating incentives that enable existing capacities to be more effectively utilised. This discussion highlights that while the political discourse often focuses on what needs to be changed or built, it is equally important to recognise and use what already works. In this context, identifying and utilising existing capacities becomes a key aspect of strengthening Sweden's security of food supply.

5.1.5 Absorb costs across the value chain

The results of this study highlighted the financial challenges of securing the food supply due to the misalignment between market interests and preparedness needs. As the activities required to build preparedness would demand substantial yet not necessarily profitable investments, the question of how and by whom these costs should be absorbed is raised. Accordingly, Hobbs and Hadachek (2024), although not focusing specifically on Sweden, emphasise that certain structural characteristics of the supply chain, such as product perishability, reliance on labour-intensive processes, and the growing geographic and corporate concentration of production, increase market vulnerability and make preparedness investments essential. Yet, in the absence of objective frameworks for assessing the cost-effectiveness of resilience strategies, businesses face significant uncertainty in prioritising measures and might, therefore, adopt resilience strategies that are either expensive or ineffective (Dormady et al., 2022).

Drawing from the results, the motivation behind private companies' unwillingness to invest resources in preparedness lies in their need to maintain profits. In a demand-driven market, consumer preferences shape production patterns, leading companies to supply only those goods for which there is demand. Accordingly, this study's results indicated that, as consumers currently do not drive demand for preparedness features, any investment in resilience remains financially unattractive. Notably, companies generally transform their capabilities only when the expected financial gains surpass those associated with continuing current operations (Bocken & Geradts, 2020). This principle resonates with the notion of consumer sovereignty, developed in the late 19th century to describe the dynamics between buyers and sellers, recognising consumers as the primary drivers of economic activity, with both production and consumption oriented toward meeting their preferences and demands (Borna et al., 2024).

In addition, participants noted that if preparedness requirements were imposed on businesses through regulation, food prices would likely rise. Such an increase would probably face consumer opposition, as it was observed that they are generally unwilling to pay higher costs for products that enhance national preparedness in the long term, particularly when cheaper alternatives exist. Consequently, by recognising that production follows consumption, the government could nudge consumers to enhance the demand for products that are beneficial for preparedness. Moreover, as demand rises, companies will naturally respond by supplying these products without government intervention. Therefore, the results suggest that consumers could be a key factor in the absorption of costs. In this context, nudging could play a significant role,

as defined by Stoker (2014), as interventions that influence people's choices by drawing attention to specific issues or enhancing the visibility of relevant information within the decision-making process. The underlying idea is that individuals can be encouraged to make choices that are not only in their own interest but also beneficial for society if considering the context in which these choices are made (Stoker, 2014). Drawing on the work of Leonard (2008), Stoker (2014) further notes that replacing traditional regulatory approaches, such as mandates and prohibitions, with incentives and nudges can lead to less intrusive government intervention. From another perspective, barriers to green product consumption include the tendency of consumers to favour conventional alternatives due to lower prices, even when they recognise the superior quality of sustainable products (Gleim et al., 2013). Building on these premises, Wilken et al. (2024) acknowledge the strength of displaying actual production costs to nudge consumers. Still, they underscored that the most efficacious way to promote sustainable consumption lies in enhancing the affordability of sustainable goods compared to conventional ones (Wilken et al., 2024).

However, participants highlighted that not all aspects of preparedness can be delivered through market demand, as some activities, despite the social benefits they generate, extend beyond the individual consumer's willingness to pay. In this case, the government has to incentivise businesses and provide support. Comparable conclusions have been drawn in the analysis of energy supply security, suggesting that in contexts where the reliability of supply is critical, such as during crises, market mechanisms alone are insufficient to ensure an adequate supply of public goods (Fabra et al., 2022). Therefore, a stronger role of the state is advocated, either through direct provision or regulatory frameworks that compel or support private actors to maintain supply continuity during emergencies (Fabra et al., 2022).

Within the discussion on incentives, the results indicated that primary producers particularly bear the greatest burden when called upon to enhance the security of supply, yet they too often receive inadequate support. Therefore, the government should provide incentives to ensure preparedness costs are equitably distributed across the supply chain rather than overburden specific actors. Similarly, a study by the Organisation for Economic Co-operation and Development (OECD) (2018) observes that expecting continuous improvements in efficiency and productivity without ensuring stable and sufficient profitability places excessive pressure on agricultural producers. Further, the report emphasises the sector's considerable reliance on financial support, noting that a substantial share of subsidies in total farm income tends to negatively affect efficiency (OECD, 2018). However, while such support is necessary, it is also

complicated by the EU's internal market regulations, which limit the extent to which governments can favour individual sectors without distorting competition. Consequently, this creates tension between national priorities for crisis preparedness and the requirements of maintaining fair competition within the EU.

This discussion indicates that a viable model for securing the food supply system involves a strategic redistribution of responsibilities across the state, the market, and consumers. Hence, it is plausible to suggest that actively involving consumers and providing targeted incentives to businesses makes it possible to mobilise market actors without undermining profitability. Such a configuration would enhance resilience and ensure that preparedness is not treated as an exceptional concern but rather as a shared societal goal embedded within routine economic activity.

5.1.6 Prioritise actions to support production

Considering the divergence from the results concerning self-sufficiency, this study acknowledges the need to distinguish between the degree and the ability of self-sufficiency. According to the FAO (1999), food self-sufficiency is defined as a country's *ability* to fulfil its food needs entirely through domestic production. However, Wassénius et al. (2023) additionally reflect on the actual *degree* to which those needs are met without external support and dependency on imports. When interpreting the results in light of the distinction between degree and ability, a lack of clarity among stakeholders regarding the goals and feasibility of self-sufficiency was observed.

On one side, some participants noted that certain components or sectors of the Swedish food supply chain have the capacity to maintain production and operations, indicating an ability for self-sufficiency. However, the foundations of these claims rest on inconsistent metrics, as some stakeholders referred to either the absolute levels of production or the production of calories, while others considered proteins. This discrepancy highlights the importance of distinguishing between different nutritional components, as meeting caloric needs alone does not address the full spectrum of dietary requirements. For instance, the population may consume sufficient energy entirely from domestically grown products but still experience protein deficiencies, which could pose health risks over time. A similar concern was raised in a study on food security in Togo, criticising the reliance on caloric intake as a sole indicator of food security, arguing that it fails to capture the broader and more complex aspects of human nutrition

(Novotny et al., 2023). This issue is partly rooted in the widespread use of the FAO's self-sufficiency ratio (SSR), which frames self-sufficiency as a measurable proportion between the domestic available food supply and national consumption (FAO, 2012). SSR is widely used as a standard measure of national food capacity, which is commonly expressed either in caloric terms, by volume of production, or in monetary value for specific commodities (Clapp, 2017). Notably, as the FAO (2012) points out, relying on this measure alone can hide important gaps, particularly when a country produces an abundance of certain foods while remaining dependent on imports for others. As a result, countries may appear self-sufficient according to this metric while still lacking the diversity of food products required to ensure adequate nutrition, producing enough of some crops but insufficient quantities of others essential for a healthy diet (Clapp, 2017).

In contrast to this perspective, some stakeholders argued that Sweden's just-in-time logistics model would constrain the national production and distribution system's ability to sustain domestic demand beyond a short period. Consequently, they acknowledged Sweden's reliance on imported inputs essential for maintaining production. Moreover, the low number of processing facilities within the national borders constrains national production, compelling Sweden to rely on external support. This recognition can arguably be interpreted as relating to a low degree of self-sufficiency. Lindström Månefjord and Johansson (2024), in their examination of interdependencies and resilience within Sweden during the COVID-19 pandemic, highlighted various vulnerabilities in Swedish society, including heightened reliance on imports, slimmed production processes, reduced preparedness measures and limited flexibility within production and transport systems. In their analysis, the emphasis on efficiency, global supply networks, and just-in-time logistics is observed to significantly weaken preparedness (Lindström Månefjord & Johansson, 2024).

Regardless of whether the focus is on degree or ability, the results indicate that complete self-sufficiency in Sweden is unattainable, as domestic production of essential inputs is either environmentally unfeasible or economically impractical due to high costs. Hence, international trade was recognised as an essential and strategic component of Swedish security of food supply. Nevertheless, the dependence on external sources underscored the need to assess the reliability of supplying countries and to enhance cooperation strategies with nations that plan similar development trajectories. Hence, these results support the argument that food self-sufficiency should not be understood as a simple dichotomy between full domestic reliance and complete dependence on global markets but instead requires a complex and context-dependent

balance between these approaches (Clapp, 2017). For example, global trade has been shown to play a crucial role in supporting food supply security by helping countries overcome natural resource limitations that constrain domestic production (Porkka et al., 2017). Moreover, the concept of friend-shoring, which involves situating production networks within countries that share geopolitical alignments, has been proposed as a solution balancing the trade-offs between cost-efficiency on one side and resilience and security on the other (Kalvelage & Tups, 2024).

Based on this discussion, debates around self-sufficiency might lose relevance if the foundational conditions needed to sustain current production levels continue to deteriorate and are not actively secured. Consequently, rather than pursuing the potential ideal of complete self-sufficiency, a more productive focus would be on addressing the factors that currently undermine national food production. This finding related to the argument expressed by the Swedish Food Federation (2025), who emphasise that the concept of 'supply capacity' (*försörjningsförmåga*) is more relevant than the degree of self-sufficiency (*självförsörjningsgrad*) as the former encompasses the entire supply chain, and includes, in addition to input goods, the necessary transport and supporting services. In response to the factors currently undermining national food production, the results emphasised targeted actions to prioritise the maintenance of production levels. Among others, the priorities included: improving profitability and reducing financial risk for farmers, promoting fairer income distribution, diversifying production, securing water availability and revising burdensome regulations and administration to attract and retain producers. The OECD Review (2018) offers corresponding insights that outline several structural challenges facing Swedish agricultural productivity, including geographic and climatic constraints, high labour costs, and strict environmental and welfare regulations. These factors, alongside ongoing structural shifts toward fewer, larger farms, have contributed to a declining farming population and an ageing rural workforce, limiting future growth (OECD, 2018). To address these concerns, the OECD recommends improving access to basic services in remote areas and easing regulatory burdens on farmers (OECD, 2018).

5.2 Overarching considerations

The overall results emphasised that the security of food supply is shaped by considerable uncertainty regarding how the problem is framed and the confidence in the available resources. Indeed, diverging interpretations of the issue reflect the involvement of a wide range of actors,

reflecting differing stakeholder perceptions and values, leading to varied understandings of the needs, challenges, and potential solutions. Additionally, the high degree of interconnection between elements, actors, and processes across Swedish society and supply chains adds to the complexity, making food supply security part of wider systemic issues. These factors combined contribute to the challenge of identifying and implementing optimal solutions. Accordingly, the security of food supply can be understood as a wicked problem, explained by Rittel and Webber (1973) as complex and multi-dimensional issues that are difficult to define and lack a clear resolution. Thus, wicked problems do not present a fixed set of solutions or standardised methods for addressing them. They are often linked to deeper systemic concerns as symptoms of broader, interconnected challenges (Rittel & Webber, 1973). The way a wicked problem is framed significantly influences both the understanding of the issue and the strategies pursued, with any potential solution judged only in relative terms within specific contexts and likely to have long-lasting effects (Rittel & Webber, 1973). Considering these elements, decision-makers would need to first reach a shared understanding of the problem they seek to address by setting clear boundaries to define what is included within the scope of the issue, identifying relevant stakeholders, and clarifying their values and interests. Similarly, differing assumptions, values, and priorities among stakeholders might significantly influence policy decisions and their implementation (Head, 2022). Therefore, a highly adaptive and iterative approach, built on ongoing dialogue and feedback among stakeholders and experts, is essential to manage uncertainties and enhance decision-making processes (Balint et al., 2011; Head, 2022).

On a second level, the results emphasised the importance of integrating the security of food supply into the ongoing functioning of the system rather than treating it as a separate measure activated only during crises. This approach would suggest that preparedness should be viewed as a continuous process incorporated within regular planning and operations to support and sustain resilience over time. Correspondingly, there is a problematic tendency to distinguish between preparedness as an episodic phase preceding response and recovery rather than an ongoing capacity for optimising resilience (Madrigano et al., 2017). Similarly, resilience is described as an ongoing process that involves the continuous interplay of four key functions: anticipation, recognition, adaptation, and learning (Becker, 2014). Building on Becker's (2014) perspective, where preparedness is a component of adaptation, it follows that, in parallel with the other functions, preparedness should be continuously applied to sustain resilience.

6. Conclusion

This research has integrated the perspectives of key stakeholders within Sweden's food preparedness system to enhance the understanding of how national food resilience can be improved. Through semi-structured interviews, existing capacities, vulnerabilities, potential needs and opportunities for improvement have been examined. These insights contribute to answering the core research question: *How can the national security of food supply be enhanced from the perspective of key stakeholders within the food system in Sweden?*

The findings highlight the importance of adopting a holistic, multi-hazard approach reflecting the interdependencies within the system and the interactions between multiple overlapping risks. Moreover, the misalignment between stakeholders, particularly regarding time horizons, priorities, and institutional goals, was identified as a central barrier to effective coordination. This fragmentation limits the system's ability to act cohesively, highlighting the need to harmonise conflicting temporal logics and create conditions that support sustained investment and long-term collaboration. Furthermore, while political discourse often emphasises what needs to change or be built, the discussion underscores the value of recognising and building on existing strengths and capacities within the system. The research also suggests that the security of food supply may be supported through a strategic redistribution of responsibilities among the state, market actors, and consumers. By involving consumers more actively and incentivising private-sector engagement without compromising profitability, preparedness can become a shared societal objective. Finally, this research challenges the relevance of discussing national self-sufficiency when the conditions for maintaining current production levels lack long-term stability. Consequently, it may be more constructive to address the root causes of declining national food production.

To answer the research question, these considerations should be understood as practical steps to integrate preparedness within the system while acknowledging the wicked nature of the issue and the absence of definitive solutions. In this way, preparedness could potentially become an integral component of daily food supply operations both in peacetimes and during crises, making resilience and security inherent features of the system rather than an objective to achieve.

These findings could contribute to ongoing national discussions by offering a clearer understanding of stakeholders' perspectives, serving as a basis for bridging the gaps between their expectations, capacities, and needs. Although it is not feasible to engage with all relevant stakeholders, this study provides a solid foundation for future policies aimed at moving beyond a sectoral approach towards a more comprehensive and inclusive strategy. Additionally, this research highlights the wicked and multifaceted nature of food supply security, offering further insight into the academic debate, with a particular emphasis on the distinctive Swedish context.

Several topics emerged during the research that could not be fully addressed in this study, although representing interesting inputs for future investigation. One example is the potential role of waste management and the more efficient use of residual streams as viable solutions for enhancing preparedness and reducing import dependence. Another area for future research could be the examination of successful strategies for shifting consumer preferences towards products that support the security of food supply. Additionally, more focused studies could explore whether promoting plant-based food systems might offer a more effective path for enhancing preparedness than traditional approaches. Lastly, further research could explore the role of alternative production methods in improving the security of food supply.

Moving forward, it will be crucial to bridge gaps between stakeholders' expectations, capacities, and needs, ensuring that Sweden's food supply system is better equipped to adapt to continuously evolving uncertainties and circumstances, now and in the future.

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8. Appendices

Appendix A: Interview Guide

Presentation

Can you please introduce yourself and tell us briefly about your position at [company] and [company]'s role within the food supply preparedness system?

Description of the system

1) Can you provide us with a brief description of the functioning of the Swedish system for the security of food supply including key actors, processes and dependencies?
    a) *processes and key actors, North vs South*
    b) *dependencies and competition*
    c) *responsibility*
    d) *[company] role*
    e) *existing strengths and important factors supporting the system*

Challenges

2) What do you think are the vulnerabilities and challenges of the current state of food supply preparedness in Sweden?
    a) *greatest risk in the near and distant future*
    b) *sufficiently prepared?*
    c) *financing and accountability*

Improvement opportunities

3) In your view, how could the food preparedness system be improved?
    a) *critical measures in short/long-term*
    b) *additional resources needed*
    c) *areas to be prioritised for improvement*

Is there anything you would like to add that has not yet been addressed in this discussion?

Optional questions:

- How effectively do you think Sweden's food preparedness system integrates with other national emergency preparedness systems? Are there gaps in coordination?
- How is the private sector involved in Sweden's food supply preparedness?
- Are there examples of best practices or lessons learned from other countries that Sweden has adopted or could adopt to enhance its food resilience?
- What role do you believe technology plays in enhancing food supply resilience in Sweden? Are there specific technologies that have shown promise in improving preparedness? Are there any barriers for their adoption related to infrastructure, funding, or regulatory frameworks?

Appendix B1: Consent form (English)

Consent form

Please read the following information and sign this form to certify that you are fully aware of and approve the conditions of your participation, the scope and the procedure of this research.

Our research project aims to integrate the perspectives of key stakeholders involved in Sweden's food preparedness system to provide a coherent understanding of strategies for improving food supply preparedness (*livsmedelsberedskap*). Hence, the study will examine existing capacities, potential needs, vulnerabilities, and anticipated future projections through qualitative interviews.

The interview will take approximately 30-45 minutes and will be recorded and transcribed. All the information shared during the interviews will be anonymised to avoid possibility of identification and will be coded for analysis by the researchers. The data will be processed in accordance with the EU's General Data Protection Regulation (GDPR) and the Swedish Data Protection Act, and it will be securely stored for 5 years. Nothing of the above will be modified without your explicit permission.

By signing this form, I confirm that:

- I have read and understood the information.
- I am voluntarily participating for these research purposes and I understand that I can withdraw at any time without the need of providing any reason and with the assurance that my data will not be used.
- I understand that all the information shared during the interviews can be used for research only and that I will be completely anonymous and unable to be identified.
- I approve that the interview will be recorded and its transcription will be safely stored for 5 years.
- I understand that I will not receive any benefits or compensation for my participation.
- I understand that I am free to contact the researcher with any questions I may have during the research.
- I agree to take part in this interview.

_____ _____

Participants Signature Date

_____ _____

Researchers Signature Date

_____ _____

Researchers Signature Date

Contact Information

If you have any further questions or concerns about this study, please contact:

- JoAnna Persson, E-mail: jo4535pe-s@student.lu.se
- Nicoletta Bozzo, E-mail: ni5023bo-s@student.lu.se

You can also contact our supervisor Per Becker, E-mail: per.becker@risk.lth.se or our co-supervisor Cecilia Tullberg, E-mail: cecilia.tullberg@ple.lth.se

Appendix B2: Consent form (Swedish)

Samtyckesblankett

Vänligen läs följande information och skriv under detta formulär för att bekräfta att du är fullt medveten om och godkänner villkoren för ditt deltagande samt omfattningen av denna studie.

Vårt forskningsprojekt ämnar studera hur det nationella livsmedelsberedskapssystemet kan stärkas utifrån viktiga aktörers perspektiv. Studien kommer därför att undersöka befintlig kapacitet, potentiella behov och sårbarheter genom kvalitativa intervjuer.

Intervjun beräknas ta cirka 30-45 minuter och kommer att spelas in, transkriberas och kodas för att analyseras av forskarna. All information som delas under intervjuerna kommer att anonymiseras för att undvika möjlighet till identifiering. Alla uppgifter kommer att behandlas konfidentiellt i enlighet med EU:s allmänna dataskyddsförordning (GDPR) och den svenska dataskyddslagen och lagras på ett säkert sätt i 5 år. Inget av ovanstående kommer att ändras utan ditt uttryckliga tillstånd.

Genom att underteckna detta formulär bekräftar jag att:

- Jag har läst och förstått informationen.
- Jag deltar frivilligt och jag förstår att jag när som helst kan dra tillbaka mitt deltagande utan att ange något skäl, med försäkran om att mina uppgifter inte kommer att användas.
- Jag förstår att all information som delas under intervjuerna enbart kommer att användas för forskning och att jag kommer att vara helt anonym och inte kunna identifieras.
- Jag godkänner att intervjun spelas in och att transkriberingen lagras på ett säkert sätt i 5 år.
- Jag förstår att jag inte kommer att få några förmåner eller ersättning för mitt deltagande.
- Jag förstår att jag kan kontakta forskarna om jag har några frågor under forskningen.
- Jag samtycker till att delta i denna intervju.

_____	_____
Deltagares underskrift	Datum
_____	_____
Forskares underskrift	Datum
_____	_____
Forskares underskrift	Datum

Kontaktinformation

Om du har några ytterligare frågor eller funderingar kring denna studie, vänligen kontakta:

- JoAnna Persson, E-post: jo4535pe-s@student.lu.se
- Nicoletta Bozzo, E-post: ni5023bo-s@student.lu.se

Du kan även kontakta vår handledare Per Becker, E-post: per.becker@risk.lth.se eller vår biträdande handledare Cecilia Tullberg, E-post: cecilia.tullberg@ple.lth.se

Appendix C: Coding scheme

Theme	Subcategory	Code
Business	Engagement	Involve business, but they need to get something back
		Private companies positively reacting to gov indications, but slow process and only at companies' level
		Variety of trade and industry - strength + very active, strong and engaged
	Profit orientation	Business solution and profit oriented
		Companies don't want to buy more than what they sell
		Private companies need to earn money
		Producers of long-lasting food do not make any money from it
	Requirements to Invest in Preparedness	Good profit for companies increases likelihood to invest in robust systems
		Strong foundations where private companies are profitable and competitive needed to invest in preparedness measures