Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Master's Thesis

Food Security in Sweden and the Czech Republic

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Thesis title

Food Security in Sweden and the Czech Republic

Objectives of thesis

In the given diploma thesis the author has a goal to properly assess food security in Sweden and the Czech Republic based on the four essential pillars: availability, access, utilisation and stability. The aim is to identify the reasons and factors of higher food security index in Sweden compared to the Czech Republic. The author aims to develop a questionnaire that could fairly evaluate food security in the country from citizens' view covering its four main pillars.
The sub-goal is to compare food security in Sweden and Czechia in order to reveal differences and similarities by employing comparative analysis and conducting the developed questionnaire among students in both countries to compare food security situations, and to be able to formulate the final recommendations for achieving and maintaining high food security in the country.

Methodology

The thesis consists of two main parts, they are theoretical and analytical. There are quantitative and qualitative approaches employed in the following diploma as a part of data triangulation strategy.

In the first part of the diploma thesis, there is a literature review presented with the collection of the data. There is an overview of food security in Sweden and Czechia, its specifics and challenges in both countries. The data is gathered mainly from the World Bank and the national websites of Sweden and Czechia for its further analysis and process. Academic and scholarly articles and specialised books focused on food security are used by the author for the solid background.

The qualitative method is used in the practical part of the diploma thesis where is presented comparative research of Sweden's and Czechia's profiles in terms of food security. Data visualisation method is applied by the author using Microsoft Excel Program 2021 to examine trends and patterns of food security indicators and development of GFSI (Global Food Security Index) within 2012-2023 in both countries. There is a suite of food security indicators analysed, stated by FAO in 2013. The most essential part is developing a questionnaire to evaluate food security from four main perspectives based on HFIAS (Household Food Insecurity Assess Scale) and HDDS (Household Dietary Diversity Score), conduct the questionnaire in Sweden and Czechia among students and examine outcomes using thematic analysis for both countries to see the difference, patterns, and gain insights that is essential part for brainstorming method used for final recommendations.

The proposed extent of the thesis

70 – 90 pages

Keywords

Food security, Food Access, Food Availability, Food Utilisation, Food Stability, Food Sustainability, Inequality

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Recommended information sources

Food and Agriculture Organization of the United Nations (2019) The State of Food Security and Nutrition in the World. Food and Agriculture Organization of the United Nations. ISBN 978-92-5-131570-5

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William, K. (2023) Food Security Availability, Income and Productivity. ISBN: 978-10-35312719

Expected date of thesis defence

2024/25 SS – PEF

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Declaration

I declare that I have worked on my master's thesis titled "Food Security in Sweden and the Czech Republic" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 19.03.2025 _____

Acknowledgement

I would like to thank Ing. Pavel Kotyza, Ph.D. for his advice and support during my work on this thesis.

Food Security in Sweden and the Czech Republic

Abstract

In the given diploma thesis, the author has a goal to properly assess food security in Sweden and the Czech Republic based on its four essential pillars: availability, access, utilization and stability. The aim is to identify the reasons and factors of higher food security index in Sweden compared to the Czech Republic, develop a questionnaire that could fairly evaluate the perception food security in the country and conduct it in both countries to formulate the final recommendations for achieving and maintaining high food security.

In the first part of the diploma thesis, there is a literature review presented with the collection of the data which is a part of qualitative method. There is an overview of food security in Sweden and Czechia, its specifics and challenges in both countries.

In the practical part the quantitative and qualitative methods used to present comparative research of Sweden's and Czechia's profiles in terms of food security. Data visualisation method is employed to examine trends and patterns of a suite of food security indicators and development of GFSI (Global Food Security Index) within 2012-2023 in both countries. There is a development and conduction of a questionnaire to evaluate food security situation in Sweden and Czechia from four main perspectives (availability, access, utilization and stability). The final food security score is calculated for each country based on the respondents' answers. A thematic analysis is used to examine the outcomes.

As a result, it was discovered by the author that food security in Sweden has a slightly better condition according to the analyzes in terms of the suite of food security indicators which are compared between Sweden and Czechia. In Sweden there are higher outcomes obtained in the main criteria needed to be assessed for food security. Furthermore, the respondents chosen for the questionnaire are students from capital cities in Sweden and Czechia whose food security perception turned out to result in better findings in Sweden, than in Czechia.

Keywords: Food Security, Food Access, Food Availability, Food Utilization, Food Stability, Sweden, Czechia

Potravinová bezpečnost ve Švédsku a České republice

Abstrakt

V této diplomové práci si autor klade za cíl řádně posoudit potravinovou bezpečnost ve Švédsku a České republice na základě jejích čtyř základních pilířů: dostupnosti, přístupu, využití a stability. Cílem je identifikovat důvody a faktory vyššího indexu potravinové bezpečnosti ve Švédsku ve srovnání s Českou republikou, vypracovat dotazník, který by spravedlivě hodnotil vnímání potravinové bezpečnosti v zemi a provést ho v obou zemích za účelem formulace konečných doporučení pro dosažení a udržení vysoké potravinové bezpečnosti.

V první části diplomové práce je představena literární rešerše spolu se sběrem dat, což je součást kvalitativní metody. Je zde přehled potravinové bezpečnosti ve Švédsku a Česku, její specifika a výzvy v obou zemích.

V praktické části jsou použity kvantitativní a kvalitativní metody k provedení srovnávacího výzkumu profilů Švédska a Česka z hlediska potravinové bezpečnosti. Metoda vizualizace dat je využita k analýze trendů a vzorců souboru indikátorů potravinové bezpečnosti a vývoje GFSI (Globálního indexu potravinové bezpečnosti) v letech 2012–2023 v obou zemích. Dále je vyvinut a realizován dotazník k hodnocení situace potravinové bezpečnosti ve Švédsku a Česku ze čtyř hlavních perspektiv (dostupnost, přístup, využití a stabilita). Konečné skóre potravinové bezpečnosti je vypočítáno pro každou zemi na základě odpovědí respondentů. Pro analýzu výsledků je použita tematická analýza.

Výsledkem je zjištění, že potravinová bezpečnost ve Švédsku je podle provedených analýz v mírně lepším stavu, pokud jde o soubor indikátorů potravinové bezpečnosti, které jsou porovnávány mezi Švédskem a Českem. Ve Švédsku byly dosaženy vyšší hodnoty v hlavních kritériích potřebných k posouzení potravinové bezpečnosti. Navíc respondenti vybraní pro dotazník, kteří jsou studenty hlavních měst Švédska a Česka, vnímali potravinovou bezpečnost lépe ve Švédsku než v Česku.

Klíčová slova: Potravinová bezpečnost, Přístup k potravinám, Dostupnost potravin, Využití potravin, Stabilita potravin, Švédsko, Česko

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Abbreviations

FAOSTAT - Food and Agriculture Organization Statistical Database

GFSI - Global Food Security Index

GDP - Gross Domestic Product

PPP - purchasing power parity

FAO - Food and Agriculture Organization

HFIAS - Household Food Insecurity Assess Scale

HDDS - Household Dietary Diversity Score

IDDS - Individual Dietary Diversity Score

HHS - Household Hunger Scale

SAFS - Sustainable Agriculture and Food Systems

CSI - Coping Strategies Index

rCSI - Reduced Coping Strategies Index

GHI - Global Hunger Index

FCS - Food Consumption Score

FIES - Food Insecurity Experience Scale

FANTA - Food and Nutrition Technical Assistance Project

SUA - Supply utilization accounts

MAHFP - months of adequate household food provisioning

CPI - Consumer Price Index

SDGs - sustainable development goals

USA - the United States of America

EU - the European Union

NCD - non-communicable disease

OECD - Organisation for Economic Co-operation and Development

IMD - Institute for Management Development

1 Introduction

Food security is known as controversial and multifaceted problem that affects every country, business and individual in the world. Even though it can be described using four main pillars which are availability, accessibility, utilization and stability, the topic goes much beyond of these dimensions and intersects with environmental aspects, international trade, political domains on the country and international levels. It is linked to food education of people, as well as to production and distribution processes and overall food system that should be carefully examined to assess food security situation in the country. Hence, it is an issue that is hard to measure and explain within few words.

This phenomenon is defined by the Food and Agriculture Organization (FAO) of the United Nations as a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2008, p. 1). The most common method to measure and compare food security between different countries is GFSI (Global Food Security Index) that is calculated for 113 countries each year by Economist Impact Group with support of Corteva Agriscience using normalization technique and weights that help to create a composite index.

Understanding of food security is necessary and important for all countries in the world to ensure national food security within each country. It affects the global food supply chain that connects the states among the world. That is why the issue of food insecurity is highly addressed nowadays in Sweden and the Czech Republic. These two European states with developed economies, similar population sizes and prevalence of undernourishment scores are almost the top-ranked countries, however, in the overall score a country needs to reach at least 80 to be officially considered as a state with high food security. Sweden is required to have less then 1 point to change its food security status but it is already defined as a country with robust and high food security index, while Czechia needs 2.2 points to gain a higher rank.

These countries have different approaches to address food security issue, their policies and economic systems highlight distinct aspects because climate conditions, country sizes and

economic situations have more differences rather than similarities to be highlighted. However, they manage to maintain a relatively high level of food security, and the goal of the diploma thesis is to find out and examine various challenges, perspectives and benefits that Sweden and Czechia have while undergoing the common problems, such as global food chain difficulties and disruptions, world crises and climate change obstacles that impact food security index.

Due to the interconnection of countries in terms of food security in our world, the recommendations of increasing GFSI and suggestions of other ways of analyzing food security in the countries should be reached by taking into consideration problems that might prevail in some states, while be less noticeable in others. Food security is the phenomenon that has to be solved on the global level due it is complexity and numerous dimensions that it covers.

2 Objectives and Methodology

2.1 Objectives

In the given diploma thesis, the author has a goal to properly assess food security in Sweden and the Czech Republic based on four essential pillars: availability, access, utilization and stability. The aim is to identify the reasons and factors of higher food security index in Sweden compared to the Czech Republic. The author aims to develop a new questionnaire that could fairly evaluate perception of food security in the country from citizens' view covering its four main pillars.

The sub-goal is to compare food security in Sweden and Czechia in order to reveal differences and similarities by employing comparative analysis and conducting the developed questionnaire among students from capital cities in both countries to compare food security situations, and to be able to formulate the final recommendations for achieving and maintaining high food security in the country. The final food security score is constructed based on respondents' perception of food security situation in the country.

Hence, the research questions are:

1. What does play the crucial role in contributing to the high food security index in Sweden in terms of four main pillars which are availability, access, utilization and stability within 2012-2023?
2. What are the main differences and similarities between food security indicators in the Czech Republic and Sweden within 2012-2023?
3. How do students from capital cities in Sweden and Czechia perceive food security with a reference period of 12 months in 2024 with a questionnaire conducted in January and February in 2025?

2.2 Methodology

The thesis consists of two main parts, they are theoretical and analytical. There are quantitative and qualitative approaches employed in the following diploma as a part of data triangulation strategy.

In the first part of the diploma thesis, there is a literature review presented with the collection of the data from primary and secondary sources. There is an overview of food security in Sweden and Czechia, possible methods of food security measurements, food security specifics and challenges in both countries in terms of four main domains of food security within 2012-2023. This time range is chosen due to environmental and global changes that caused fluctuations in food security, and the invention of GFSI by Economist Impact with the support of FAO of United Nations in 2012. The detailed data on the suite of food security indicators for the comparative research is currently available until 2023.

The data is gathered mainly from the World Bank Group, FAOSTAT database and the national websites of Sweden and Czechia for its further analysis and process. Academic and scholarly articles and specialised books focused on food security are used by the author for the solid background and understanding of the specifics of food security. The suite of food security indicators includes: Average dietary energy supply adequacy (percent) (3-year average), Average protein supply (g/cap/day), Crop yield in kg per hectare (Cereals primary, Wheat and Sugar crops primary), Total Livestock production figures (Metric Tons for total meat production) (Meat total: beef, pork and poultry), Prevalence of Undernourishment, Consumer Price level index for Food (the index is normalized to a common scale (with the base year set to 100)) and Food Imports (% of merchandise imports), GDP per capita at

purchasing power parity (PPP) (in current US Dollars), Prevalence of Underweight, weight for age (% of children under 5 years old), Prevalence of Stunting, height for age (% of children under 5 years old), Cost of a healthy diet (average PPP Dollars per capita per year), Percentage of Overweight or Obese population aged 15+, Percentage of population unable to afford a healthy diet, Food Price Inflation, Cereal import dependency ratio expressed in percentages, Per capita food production variability (constant 2014-2016 thousand int. $ per capita), Per capita food supply variability (kcal/cap/day) and Political stability and absence of violence/terrorism (index) in both countries respectively. The data on them to carry out the comparative research is obtained from the sources mentioned above.

The quantitative method is used in the practical part of the diploma thesis where is presented comparative research of Sweden's and Czechia's profiles in terms of food security. Data visualisation method is applied by the author using Microsoft Excel Program 2021 to examine trends and patterns of the suite of food security indicators, which was developed by FAO in 2013, and development of GFSI (Global Food Security Index) within 2012-2023 in both countries. It is one of the approaches measuring food security based on the Suite of Indicators presented in FAO Reports and methodology on food security measurement. The most essential part is the development of a questionnaire to evaluate food security perception from population's view from four main perspectives based on HFIAS (Household Food Insecurity Assess Scale) and HDDS (Household Dietary Diversity Score) but with more questions and wider spectrum of analysis which can capture more details on food security situation in a country from people's perspective, conduct the questionnaire in Sweden and Czechia among students and examine its outcomes using thematic analysis for both countries to see the difference and patterns. The final result is a construction of food security indices for Sweden and Czechia based on the data obtained from the questionnaire developed by the author. The anonymous questionnaire is constructed with a possibility of 5 answers (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) with 1 option to be chosen. The reference period is 2024 year from January to December which corresponds to 12-month time range. The results are evaluated by finding weighted mean scores for each pillar of food security (availability, utilization, access and stability) by multiplying a number of respondents by the value of the response, such as 1, 2, 3, 4 or 5, and making a sum for each section of 5 questions, then dividing it by the total number of respondents in the questionnaire. To get the final total score of food security in Sweden and Czechia it is needed

to make a sum of total final scores for each section and divide it by 4 which is the number of total sections in the questionnaire. The range of scores is from 1 to 5. The lower number is a better score due to logically constructed questions showing the best food security situation in the country with answers indicating 1, worse results are higher numbers, while the worst index is close to 5. There are two same questionnaires developed for better evaluation of results for Czechia and Sweden to assess food security separately in both countries. As a method of survey analysis there is an online questionnaire chosen by the author to be distributed via the link in Google forms in Sweden and Czechia. There is a snowball sampling method is applied to reach more people in Sweden, so that they can refer to their friends or use their networking connections to share the questionnaire. The social media and messengers, such as Facebook, Instagram, Telegram and LinkedIn are used to spread the questionnaire and find specific group of respondents. There are approximately 120 students questioned in Sweden and in Czechia to compare the results and evaluate food security in both countries from personal experience of population, as well as their perception of food security in these countries. Students asked to proceed with a questionnaire only if they are from capital cities, live in Sweden or Czechia for more than a year to be able to perceive food security in a country. Respondents are chosen from capital cities, so that they live in urban area, have free and easy access to public transport, online deliveries of groceries and have variety of grocery shops in their blocks or districts. It is needed to analyse the relatively vulnerable segment of population due to the usual budget limitations that students have, their reliance on either part-time jobs or scholarships from universities that makes it harder for this sampling group to afford healthy and nutritious meals on a daily basis. The age range is 19-25 years old; they answer on behalf of individuals who cook food home themselves in most cases, rather than as households or people who order prepared food. It decreases the variability of socioeconomic factors because of respondents' similar educational status, age and they prepare food themselves and are responsible for their meals and food that they consume. The goal is to have the most possibly equal share of men and women in both countries, as well as the relatively same number of men and women to get fair results for the evaluation. That is why the first zero question is about the gender of a respondent. The questionnaire and development of food security score is crucial for gaining insights that are essential part of brainstorming method used for final recommendations stated by the author and identification of strengths that Sweden has that help to maintain relatively high level of food security, as well as to gain insights regarding quantitative results.

There are underlying causes and reasons of downturns, peaks or unpredicted results from comparative research revealed that can be better understood by the questionnaire results.

3 Literature review

3.1 Methods of Food Security Assessment

There are multiple methods that can be used to assess food security in the country. It is possible to compare states' food security situations by using GFSI (Global Food Security Index) as it is stated by (Economist Impact, 2022) which is the only single and commonly used index that allows comparison between countries and published annually. The first peer panel meeting was designed to engage a panel of experts from the academic, non-profit, and government sectors to help select and prioritise food security indicators through a transparent and robust methodology (Economist Impact, 2022, p. 32). The group of experts constructed the index in Washington DC in 2012, in total there are 11 iterations of the GFSI, the most recent and up-to-date is from 2022. Using the definition adapted from the 1996 World Food Summit on food security mentioned above, the Global Food Security Index considers the core issues of affordability, availability, and quality across a set of 113 countries. The index is a dynamic quantitative and qualitative scoring model, constructed from 28 unique indicators, that measures these drivers of food security across both developing and developed countries (United Nations, 2024). It is calculated every year with reviews and modifications from experts from 2012 for 113 countries. the main focus is on the impact that indicators of food security can have on the final outcomes. Indicator scores are normalized (min-max rescaling) and are scaled from 0 to 100, with 100 corresponding to the most favorable situation. The scores at the dimension level correspond to the weighted mean of underlying indicators. The overall GFSI score is a weighted average of the dimension scores (A. Thomas et al., 2017, p. 8). In total there are 28 indicators included but 9 of them are measured using qualitative approach.

HDDS or IDDS (Household or Individual Dietary Diversity Score), HHS (Household Hunger Scale), HFIAS (Household Food Insecurity Access Scale) as it is suggested by (Food Security Cluster, 2020) are also commonly globally known and recognized indicators of food security. According to (Vhurumuku, 2014), there are also Coping or reduced Coping Strategies Index (CSI or rCSI), SAFS (Self-Assessed Measure of Food Security) which

consists of self-assessments of current food security status in the most recent recall period and the change in livelihood status over a longer period of time but it is quite subjective in nature, GHI (Global Hunger Index) and FCS (Food Consumption Score). They are considered as first level food security outcome indicators. Unfortunately, each of the indicators mentioned above do not fully evaluate food security in the country and has to be either combined or used for examining the specific fields of food security. HFIAS mainly focuses on the "access" aspect of food insecurity (i.e. not on food utilization). It is based on respondents' perceptions of their households' food vulnerability and on their behavioural responses to food insecurity (Food Security Cluster, 2020). While HDDS or IDDS also generally focus on food access, they had different techniques applied. HDDS is a proxy measure of household food access and IDDS of individual food access. They are calculated based on questions on household or individual consumption of food items from 12 different food groups in previous 24 hours. The interviews with a representative sample of households or individuals are conducted (Food Security Cluster, 2020). It is usually combined with other indicators, such as Food Consumption Score (FCS) or Household Hunger Scale (HHS). HHS and rCSI are typically recognized as proxies for food quantity; best used to measure the quantity of food consumed but does not provide insight into the nutrition value of the food consumed and the FCS is a composite indicator that measures dietary diversity, food frequency and the relative nutritional importance of food groups based on a seven day recall of food consumed at household level (Food Security Cluster, 2020). Global hunger index (GHI) - uses undernourishment, child underweight, and child mortality to calculate hunger according to (Vhurumuku, 2014).

However, food security before 2012, when GFSI was invented, was measured by Prevalence of Undernourishment, even though it cannot capture all or at least the majority of the dimensions of food security. A step-by-step guide for assessing food security in National Societies in Africa (International Federation of Red Cross and Red Crescent Societies, 2005), states that the best way to evaluate the current situation of food security in the country is to conduct interviews, prepare checklists or questionnaires to find out the level of food insecurity. As it is given by the report, the questionnaires may be controversial, that is the reason to focus more on interviews with individuals or groups and collect information through observation. The goal is to walk and drive through different areas and communities to observe transport, condition of infrastructure, general situation, presence of aid agencies,

security, environment, people's activities and their homes (International Federation of Red Cross and Red Crescent Societies, 2005). Interviews can be conducted in small 6-12 focus groups, with households (a group of family members) or key-informants, such as traders, market-people, school teachers, religious leaders etc. These people obtain the data on food economy and specific knowledge. After that the team meeting is needed to analyze the gathered information and draw conclusions. However, this method might be difficult in more urban cities and developed countries due to the complexity of observations.

Last but not the least approaches stated by (FAO, 2013), are based on the suite of food security indicators that is used by the author in the current diploma thesis. It consists of different variables used to measure each of the pillars of food security (availability, access, utilization and stability). The weights and normalization techniques are applied to compute the final index. Experience-based food security scale is used to gather the information from people regarding the food insecurity. Approach is to summarize information from survey questions in a single synthetic index covering a range of severity of the food insecurity condition along a continuum (scale) (FAO, 2013). FIES (Food Insecurity Experience Scale) that combines 8 questions related to the past 12 months to gather general information on food security situation in the country and can be used worldwide. Unfortunately, as it is stated in the reports, (FAO, 2013) and (Vhurumuku, 2014), most of these measures are used to evaluate some parts of food security but not all its aspects or they are not considering all the details of the dimensions needed to be evaluated.

3.1.1 HFIAS and HDDS Methods

In the current diploma thesis there are used HFIAS and HDDS methods in a combination with the suite of food security indicators (FAO, 2013). The chosen methods of food security assessment are the most precise and broad as it was analyzed and stated by academic community by examining various articles and reports. By adding more detailed questions and changing the way of conducting the questionnaire, their recalls, and combining both techniques of evaluation of final results it is possible to get a questionnaire that can capture four food security aspects.

As it is stated in this article (Vhurumuku, 2014), HFIAS - captures a mix of sufficiency and psychological factors (anxiety and uncertainty over household insecure access or food

supply). It measures insufficient quality, which includes variety and preferences of the type of food, and insufficient food intake and its physical consequences that people have, e.g. NCDs (non-communicable diseases), mortality rates, malnutrition disorders etc. The HFIAS was developed between 2001 and 2006 by the USAID-funded Food and Nutrition Technical Assistance II (FANTA) project (Data4diets, 2023b). The HFIAS was designed to capture household behaviours signifying insufficient quality and quantity, as well as anxiety and uncertainity over household insecure access or food supply (Vhurumuku, 2014). There are nine questions that have to be asked. It measures the degree of food insecurity within the last 30 days. In the end there is a sum of the codes for each frequency-of-occurrence question to get a HFIAS score variable. The range varies from 0 to 27, the lower the number, the less food insecurity, access particularly, a household experience. The sum of all household can be divided by the number of respondents. According to the results of the research (Salman et al., 2023), there is a satisfying outcome from HFIAS questionnaire for the assessment of food security in Bangladesh using four main groups: conditions, domains, scale score and prevalence. The obtained data was categorized and quantified in accordance with the answers from 0 to 3 (from "not experienced" to "often"). The final results were presented using a statistical software to draw graphs and depict the trends. One of the crucial outcomes of the research was the examination and determination of risk factors of households' food insecurity. In HFIAS (Household Food Insecurity Assess Scale) questionnaire there are used occurrence questions with three domains: Anxiety and uncertainty about the household food supply, Insufficient Quality (includes variety and preferences of the type of food) and Insufficient food intake and its physical consequences (Coates et al., 2007), and HDDS (Household Dietary Diversity Score) is also divided according to the scores received to three groups that usually varies from 0 to 12 (all food groups were consumer within the last 24 hours) which are 5-12 (Phases 1-2), 3-4 (Phase 3), 0-2 (Phases 4 and 5) (Day et al., 2023).

The Household Dietary Diversity Score (HDDS) was released in 2006 as part of the FANTA II Project as a population-level indicator of household food access (Data4diets, 2023). HDDS (Household Dietary Diversity Score) - captures quality and diversity within a specific reference period of time and analyzes number of foods or food groups (7 to 16) with the target audience being household. Usually it has a 24-hour recall period without frequency information or weighted categorical cut-offs (Vhurumuku, 2014). In general, it measures food access. The steps are to group food into 7 or more groups that are used in FCS (Food

Consumption Score) by adding frequencies, assign a binominal variable with the answer's possibility "yes" - 1 and "no" – 0, make a sum of the binominal variables to get a HDDS. This variable is in the range 0 to 7 or more. Mean or distribution scores are recommended to use to analyze and compare the outcomes, there are three thresholds suggested: >6 (good), 4.5-6 (medium) and <4.5 (low) dietary diversity. It works great when monitoring changes.

3.1.2 Challenges and Limitations

HDDS has disadvantages, such as lack of information provided on quantity used or frequency of consumption of food groups and it does not have assigned weights to food groups on nutritional value. Sugar, sweet, spices and condiments are not considered in this analysis that might lead to inaccurate results (Vhurumuku, 2014).

HFIAS measures only food access and relies on relatively low number of questions. Even though it can be used in stable or emergency situations, it cannot provide the whole view of food security in the country and might not reflect cultural or regional differences. Furthermore, the time period is only a month and it does not capture seasonal changes.

In both cases it is hard to say if food security is the main reason of malnutrition or there are other factors that contribute more. There is a lack of final information received in both methods and none of them can provide a full picture of food security in the country. Seasonal changes are not counted for, as well as nutritional adequacy of the diets. That is why it has been decided to combine HFIAS and HDDS questionnaires to conduct and develop a new version of more diversified, detailed and precise perception of food security but with a solid base retrieved from two mentioned above approaches.

Moreover, there are more limitations applied to the current diploma thesis. Due to a multi-faceted nature of food security, it is hard to examine it with confidence that the analysis is covering all of its four dimensions (availability, access, utilization and stability) fully and is capturing all details because of national and cultural differences, lack of data needed and possible mistakes or false data available for examination. The data needed to be analyzed to evaluate food security situation is not publicly accessible or not available at all for Sweden and Czechia. There are restrictions in analyzing food security because of low availability of data for the whole period 2012-2023. Some of the reports and statistics are still not published

for the year 2023 that can show outdated information. For instance, data for political stability and the absence of violence/terrorism, per capita food supply variability (kcal/cap/day), per capita food production variability are available until 2021. Plus, some of the variables needed to be analyzed from the suite of food security indicators stated by (FAO, 2013) in 2013 are either not published anymore at all or published inconsistently. That is why there are some graphs that have final year as 2021 or 2022. Cost of a healthy diet per capita (PPP $/cap/day) and percentage of population that cannot afford a healthy diet are available only from 2017 to 2022. Even last GFSI (global food security index) report was published in 2022. One more limitation that can affect the data clarity and reliability is that for some analyzes the data is gathered from different sources by the author two combine two statistical sources to fill the gaps in figures for proper examination of the indicators. For example, the data for yields of sugar crops and total production of meat in tons was combined from World Bank Group and FAOSTAT databases. In the conduction of the questionnaire there is a risk of a biased or subjective answers of respondents and there is a chance of misunderstanding of the questions that may lead to not fully reliable answers.

3.2 Food Security Components

3.2.1 Food Availability

In the following parts of the diploma thesis, there is an overview of the main sectors of the Food Security. They are food availability, food access, food utilization and stability. Each of them has an impact on the food security index in each country.

Food availability means that sufficient quantities of appropriate and quality food is available from domestic production, commercial imports, food assistance or food reserves on a consistent base (S. Gunaratne et al., 2021, p. 2). The food availability might be highly related to the water resources and land that a country has, agricultural productivity and the extent to which the land is used. Climate conditions of the region has in impact on this dimension. This may be any kind of food, irrespective of its provenance, including local production, imports (international or from other areas of the same country) and food aid (Day et al., 2023). The investment and improvement of the agricultural infrastructure, as well as the increase of the qualification of the farmers that can be achieved by special training programs and conferences would rise the food production. Furthermore, better provision of the agricultural supplies, for instance, seeds and tools, government policies that assist farmers,

benefits and lowered taxes or tariffs might be a good choice to improve the food availability level in the country. Public policies in developing countries also harm poor farmers and producers, who often lack the basic conditions for prosperity: health, education, land, capital, information, and the marketing infrastructure needed to take advantage of export opportunities. Developing-country governments can and must change domestic policies on markets, land tenure, research and extension, and credit to enable smallholder farmers to compete (International Food Policy Research Institute, 2003, p. 2).

Even though there are specific indicators that help to assess the availability in the country and contribute to the final composite index of food security, there are other ways of its assessment. The measurement of food availability in the country can be carried out by modelling food availability in the current year based on availability levels in the previous year, but by making adjustments for changes in income, population and the overall trend in food availability (Food and Agriculture Organization of the United Nations, 2017, p. 12). There is a linear equation for food availability shown below.

$$Food_t = \frac{Population_t}{Population_{t-1}} * Food_{t-1} * (1 + \phi) \qquad (1)$$

The φ sign is the historical trend in food availability (e.g., growth rate). It should be estimated from a regression on the historical data series (Food and Agriculture Organization of the United Nations, 2017, p. 2).

With the additional information there is a semi-log equation for food availability measurement provided. As it is mentioned, it is possible to interchange income to GDP.

$$Food_t = \frac{Population_t}{Population_{t-1}} * Food_{t-1} * \left[1 + \epsilon + \log(\frac{Income\ per\ capita}{Income\ per\ capita_{t-1}}) + \phi\right] \qquad (2)$$

Another approach suggested is to calculate the food availability as the balance of production minus net trade.

As it is stated by (FAO, 2013), the food availability can be also measured using number of specific indicators, such as: Average Dietary Energy Supply Adequacy, Average Value of Food Production, Average Protein Supply, Food Self-sufficiency, Crop yield per hectare (kg

per hectare), Total Livestock production figures (Metric Tons for total meat production: beef, pork, poultry). By gathering data on the above-mentioned indices and comparing it among Sweden and Czechia, it is possible to examine strengths and weaknesses of two countries and suggest recommendations of emphasizing the particular domain that can improve food security situation.

3.2.2 Food Access

The second pillar is the food access that relates to the ability of households to regularly acquire adequate amounts of appropriate and desired food for a nutritious diet (Day et al., 2023). In other words, it is strongly correlated with the economic and physical access of the country to the food supplies that can be influenced by the volatility of the food prices, average income of the households and the level of urbanization, as it is connected to the infrastructure of the country and contributes to food security, as the better and easier transportation is the key to the sufficient index of food security. It involves the number of ways of transportation and its means, roads and sea access. Plus, it means that, as it is mentioned by (Gunaratne et al., 2021, p. 2), people have adequate income or other resources to access appropriate food domestically through home production, buying in local markets or as exchange, gifts, borrowing or as food aid. This sector covers such areas, as equal acquisition of the food, purchasing power of the households, physical access of the population from various regions of the country to the food, the prices that are presented for the food supplies and timing within people can receive it.

Food access, according to the article (Meade, 2002, p. 4), can be measured by calculating the cost of a food basket which can reflect seasonal and local differences provided. The "cost of a food basket" approach to monitoring food insecurity has more flexibility to target vulnerable regions and populations on a timely basis. It is suggested to compare this cost to the average income, meaning that there has to be a good quality information in the country provided on the income and prices of the goods. With the estimation of the gap between per capita income and the cost of a basket of food as well as other basic necessities and it is possible to determine the number of people who lack the purchasing power to satisfy their basic needs (Meade, 2002, p. 4). This method of GDP per capita at purchasing power parity (PPP) (in current US Dollars) can be used to analyze food access in Sweden and Czechia by

examining the real prices because in this case there is no need of exchange rates and there is a higher chance of reliable data that can be compared between countries.

The household food insecurity access scale (HFIAS) is also a common measure of the food access. A HFIAS score variable is calculated for each household by summing the codes for each frequency-of-occurrence question. The lower the score (0-27), the less food insecurity (access) a household experienced. Determine the indicator's value by summing up the scores of all households and then dividing the result by the number of interviewed households (Food Security Cluster, 2020, p. 47). This questionnaire is concerned about the opinions of the households regarding their food vulnerability and it evaluates the actions towards the given issue of food insecurity.

Based on the suite of food security indicators, there are prevalence of undernourishment and consumer price level index for food and non-alcoholic beverages (the index is normalized to a common scale (with the base year set to 100)) and Absolute Value of Food Imports per capita (in US Dollars) can be analyzed to evaluate food security from the perspective of food access.

3.2.3 Food Utilization

The third dimension is food utilization. People utilize food properly through food storing and processing practices while have sufficient knowledge where they apply nutritional, health, sanitation, socio-cultural as well spiritual parameters of food (Gunaratne et al., 2021). It can be referred to the proper diet that people can have to receive the sufficient amount of nutrients and, what is the most important, is to be able to absorb it. In that way it is possible to decrease the number of diseases and raise the energy levels among the society. Food utilization depends on the ways in which food is stored, processed, and prepared (including the quality of water and cooking fuel available, and hygiene practices); both at manufacturer and household level (Day et al., 2023). In addition, different population groups need to receive the needed products to recover or maintain the energetic and healthy lifestyle, for example, it can be related to the pregnant women, the elderly segment of the population, people with disorders or disabled people, young children that require more nutrient-rich products. Sufficient energy and nutrient intake by individuals is the result of good care and feeding practices, food preparation, diversity of the diet and intrahousehold distribution of

food (Food Security Cluster, 2020). It involves the ability of the country to sustain the diet for everyone's need and provide at least the minimum amount of nutrients. To raise the awareness of the hygiene and importance of following the diets, there are might be programs and practices provided to the society to increase the level of the food utilization and decrease the healthcare costs.

To evaluate the food security index, there is a need for calculation of the food utilization. There is no a universal or single food utilization index or measure, however, there are two ways how to proceed with the evaluation of food utilization pillar. The first approach is using SUA (Supply utilization accounts) that can help. They are time series data dealing with statistics on supply (production, imports and stock changes) and utilization (exports, seed, feed, waste, industrial use, food, and other use) which are kept physically together to allow the matching of food availability with food use (FAO, 2024). As it is stated in the report, there are two equations that might be applied to measure the food utilization. It should be mentioned that the problem of the missing data should be solved to achieve the reliable and accurate results. The equations are:

1) from stocks + production + imports = exports + feed + seed + waste + processing for food + food + other utilization;

2) production + imports = exports + feed + seed + waste + processing for food + food + other utilization + to stocks (FAO, 2024).

Another approach is to use these indicators: Prevalence of Underweight, weight for age (% of children under 5 years old), Prevalence of Stunting, height for age (% of children under 5 years old), Cost of a healthy diet (average PPP Dollars per capita per year), Percentage of population unable to afford a healthy diet, Percentage of overweight individuals and Processed food consumption (per capita, per year in kg) (FAO, 2013). Afterwards, using weights and normalization the final utilization index can be computed. It can help to assess food utilization based on the method of the suite of indicators used in the diploma thesis by the author.

3.2.4 Food Stability

The last pillar of the Food Security is the stability. Stability refers to the constancy of the other three dimensions i.e. the consistency and reliability in food supplies/availability, access, and utilization: households should not risk losing access to food as a consequence of sudden shocks or cyclical events (Day et al., 2023). In other words, sustainable food systems must be achieved, when the food is available at all the time. To reach that goal the country has to be able to address the price volatilities, unexpected crises. It has to be food sufficient to some extent and already have mechanisms working that reduce the risks of the Food Insecurity. Even in case of achieving the great results, as it is known from (Food Security Cluster, 2020), adverse weather conditions, political instability, or economic factors (unemployment, rising food prices) may have an impact on your food security status. The stability in this case relates to the stable policies and political situation, stable prices in the country and general economic conditions, constant physical access to the food that was mentioned above.

To improve the stability, policymakers should monitor the policies and apply changes if needed, imply policies that protect natural resources and support households, maintain income equality in the country and stable relationship with other countries, for example, the boarders are open and there are sufficient food supplies coming to and leaving from the country. Stable governance refers to an end state where the state provides essential services and serves as a responsible steward of state resources; government officials are held accountable through political and legal processes; and the population can participate in governance through civil society organizations, an independent media, and political parties (Institute of Peace, 2024).

The HFIAS method, mentioned before, can assist in measuring the stability component of the food security index. The second indicator is months of adequate household food provisioning (MAHFP). It can capture changes in the household's ability to address vulnerability in such a way as to ensure that food is available above a minimum level the year round. The advantage is capturing the combined effects of a range of interventions and strategies, such as improved agricultural production, storage and interventions that increase the household's purchasing power (Food and Nutrition Technical Assistance, 2010, p. 6). At first it is needed to calculate this index for each household and then the average MAHFP by

dividing the number of the households in the sample by all households. To calculate it for each household, it is required to follow these steps provided in the report: twelve months minus the total number of months out of the previous 12 months that the household was unable to meet their food needs. Values for A through L will be either "0" or "1" (Food and Nutrition Technical Assistance, 2010, p. 9).

To assess food stability and carry out comparative research of Sweden and Czechia, it is needed to examine stability of food prices and supply according to the report of (Masters, 2015) on food security indicators. The following indicators should be analyzed: Political Stability and Absence of violence/terrorism (index), Consumer Price Index (CPI) in percentages that is referred to food price volatility changes and shows the situation on the food markets if people can afford food on a constant basis, Cereal import dependency ratio expressed in percentages that is the main measure of food stability as it examines dependency on imports which highlights future risks of disruptions on the global food supply chains which impact food prices, Per Capita Food Production/Supply Variability shows if the country supplies and production are reliable as it is one of the keys to the food stability.

3.3 Overview of Food Security

The following chapter provides the background for food security, for better understanding of the concept and further analyzes of the mentioned phenomenon.

Food security occurs when all people, all of the time, have access to sufficient, safe, affordable, and nutritious food for a healthy diet (B. Thomas et al., 2017, p. 107). Food Insecurity it is one of the global challenges that every country faces. According to (De Muro & Mazziotta, 2011), the Food Security index highly varies among the world. It happens due to the influence of the factors that differ from country to country, for example, population growth, political situation in the country, income inequality, climate etc. The concept consists of the four main components that are described by the author further in the diploma thesis.

3.3.1 Global causes of Food Insecurity

First of all, there are multiple of causes of food insecurity that have to be mentioned. Food insecurity may be long term or temporary. It may be influenced by a number of factors,

including income, employment, race/ethnicity, and disability. The risk for food insecurity increases when money to buy food is limited or not available (Office of Disease Prevention and Health Promotion, 2024). As it is reported by (Feeding America, 2024), in some countries, for example, in the USA, people lack of money and savings, so that they can either afford housing or the nutrient-rich products. Usually, the problem of hunger occurs and there is a chance of being homeless or hungry, as for low-income segment of the population it is hard to afford both options. Plus, it is a problem of the high unemployment levels that lead to the poverty and result in the inability of buying food regularly, not saying about affording the nutritious and vitamin-dense food. As a result, it can cause chronic health conditions among population and decrease the workers' efficiency and the level of citizens income. It is obvious that it leads to frequent need of pills and vitamins to support the immune system and, without a doubt, it worsens the financial abilities of people in the country. In addition, the last main cause mentioned is discrimination and racism. Marginalized communities, including people of color, LGTBQ individuals, and those with disabilities, are at higher risk of food insecurity due to systemic discrimination and poverty (Feeding America, 2024).

All these problems and factors contribute to food insecurity. However, there are more general issues that affect each country in the world despite its government, gender and income equality, as well as health systems.

To begin with, the biggest challenge for the modern world is global climate changes that lead to food insecurity, as it affects weather that might be noticed by increased or decreased unexpected temperatures in many countries and their severity. Climate change is likely to diminish continued progress on global food security through production disruptions that lead to local availability limitations and price increases, interrupted transport conduits, and diminished food safety, among other causes (USDA, 2024). In addition, natural disasters are frequent events in the last decades and they directly affect the agriculture sector and food availability. As it is known, those issues are interconnected. Changes in climate conditions, especially the warming of global temperatures increases the likelihood of weather-related natural disasters. Hotter global temperatures increase the risk of droughts as well as increase the intensity of storms and create wetter monsoons (Vision of Humanity, 2020). Without a doubt the situation is worsening and natural disasters are one of the most obvious affects that people cause with their everyday activities that lead to the poor food security indices in the world. Humans impact the physical environment in many ways: overpopulation, pollution,

burning fossil fuels, and deforestation. Changes like these have triggered climate change, soil erosion, poor air quality, and undrinkable water (National Geographic, 2023). Human activities are primary reasons of environmental losses, degradation and depletion of natural resources.

Moreover, global market speculation and policies that have impact on the world and usually negatively affect food supplies and result in high food prices and inability of low-income sectors of the society to afford nutritious products. According to the book written by (World Bank, 2019), the international community's SDGs (sustainable development goals) are strongly interconnected: food, agriculture and nutrition play an important role in SDGs on ending poverty, improving health, fostering sustainable consumption and production, and encouraging climate change adaptation and mitigation. Governments' fiscal policy constraints, interventions to reduce food price shocks and other policy measures are key tools of the countries to improve the food security level among the world. However, some countries' tariffs, subsidies and trade policies still cause unstable food supplies among the world which require constant improvements.

Food insecurity is a common problem all over the world. Household food insecurity is a serious public health concern in rich countries with developed economies. For example, in Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States of America (US), improving household food and nutrition security is a public health priority (Booth & Pollard, 2019, p. 1). Housing costs are one of the key reasons that lead people to food banks. High costs for healthcare and income inequality in rich countries are causes of food poverty and food insecurity as well.

Regarding the causes and state of food insecurity in EU according to the annual report (European Comission, 2024) done by the EU commission on the basis of surveys among representatives of member states and various stakeholders' organisations along the EU food chains, there are same problems and challenges that had an impact on food security in the European Union in 2023 and 2024. They were extreme weather events, need to import, logistical and transport bottlenecks, input prices volatility, high input costs, commodity prices volatility, high commodity prices and existence/potential to find substitutes. However, in February 2024 there were three main problems highlighted by state authorities with higher future possible risks which were extreme weather events, high input costs and

commodity prices. While stakeholders' organisations were more concerned about logistical and transport challenges comparing to the second half of 2023. Food supply and profitability of some farms are at risk due to input prices remaining high compared to previous periods, as well as operating costs, with some additional costs generated also due to lower capacity of storage and negative weather conditions (European Comission, 2024). Food inflation is one of the most important aspects on the agenda in 2024 that could deteriorate food security in the EU. There is always a risk from a political situation in the world, such as electoral processes in the EU and other countries, that can highly influence not only food security but overall global trade environment.

3.3.2 Food Insecurity in EU

Food insecurity has grown globally since 2016. In the context of rising global commodity prices, Russia's war against Ukraine and its use of food as a weapon of war have strongly impacted food markets (European Council, 2024). Nowadays, the European countries do their best to improve the exports from Ukraine and help it to export agricultural products, as it significantly impacts the EU itself and every person directly. While the majority of EU households have sufficient access to food at all times, in terms of food availability the negative impacts of food production and effects of climate change and biodiversity loss on agricultural production and agro-ecosystems are considered to be the single greatest challenge for maintaining European food security (IFOAM, 2024). It can be said the food security indices in the European Union are at a good level but there are some challenges that the EU still has to address.

According to (European Comission, 2024d, p. 5) report from the autumn of 2023, the main causes of the food security are extreme weather conditions, high input prices and production costs, food inflation that results in concerns regarding the food availability. However, it is stated that price volatility and search for alternatives are potential constraints for food supply. Before the war, 90% of Ukrainian grain was exported via the Black Sea. Since Russia's invasion, only half of the grain is transported via sea, with 55% being exported via the solidarity lanes (European Council, 2024). That is why the first and the most important issue that the EU is solving are agro-exports from Ukraine. Fortunately, the high level of EU self-sufficiency rates across agricultural products derives from favourable natural conditions, diversity of territories and climate, and a competitive EU position relative to

other global suppliers (European Comission, 2024d, p. 5). It means that the high risk is absent at the moment and the EU is able to survive under the crisis and extreme world conditions, even though the population can undergo the difficulties that the causes mentioned above provoke. As there are higher prices for utilities, fertilizers, less access to inputs needed for farmers. The food prices went up and the access to some of the nutritious products became restricted due to the inability of some segments of society to afford it. The inflation caused higher income inequality and led to the high price instability. It might be hard for people, but the EU countries have policies and tools that do not allow the food security indices to fall below the threshold. Even though the energy prices rocketed few years ago and it affected farmers and agricultural industry in general, the situation is becoming better.

Without a doubt, the Food Security is under higher pressure, then it was before Covid-19 pandemic and the Russian invasion of Ukraine. The disruptions felt across the world also hit the EU. In January 2022, annual inflation in the euro area reached 5.1% (3.5 % for food, alcohol and tobacco), up from 0.9% in January 2021 (1.5 % for food, alcohol and tobacco), and basic products such as bread became more expensive for EU consumers (7.3 % year-on-year increase in January 2022, up from 1.7 % in January 2021) (Members' Research Service, 2023). The prices are becoming more stable nowadays, but it is still possible to notice the food inflation in many countries. As it is mentioned by (Members' Research Service, 2023), it is 14.1% in the euro area as for January 2023. Plus, the decreased number of crops yields in the EU was experienced few times in the last years because of the severe weather conditions, such as drought and heat. Luckily, most of the European countries are able to achieve and maintain stability in the Food Security. They have managed to recover after the peak of the crisis and find new ways to sustain the agriculture in the euro zone, even though it still requires a lot of efforts to increase the food security indices, so that all people can have an access to any kind of food at any time at the reasonable prices.

Nowadays there are many countries from the European Union that have high Food Security index and they have high ranks compared to the other countries (Economist Impact, 2022). France is one the 4th position among the world, Sweden is on the 7th position together with Canada. Portugal, Switzerland, Austria, Denmark and Czechia, as well as many other countries show their ability to provide people with nutritious food at the affordable for the majority's prices.

3.3.3 GFSI in Sweden and Czechia

GFSI (global food security index) is the composite index that is used to interpret food security in the country and evaluate its performance in terms of it. When interpreting the GFSI, it should be remembered that it is measuring the conditions able to lead to food security but not the results in terms of food consumption or nutritional status of the population. The final score tends to measure the conditions for food security, or an enabling environment for food security instead of actual food security level (A. Thomas et al., 2017).

From the report mentioned above (A. Thomas et al., 2017), it follows that it does not mean that every person in Sweden or Czechia is food secure considering their high rankings, some citizens might face food insecurity conditions, however, this composite index proves that the country has all the conditions for being food secure for the majority of people and it has high potential to be able to secure everyone with a nutritious diet. To know the reality about people in both states, there should be more measures applied to view the actual picture in the countries that are provided by the author below using the developed questionnaire to assess the perception of food security from population view.

It is possible to state according to (Economist Impact, 2022), that Sweden is on the 7th position among 113 countries as it is by 2022, and the overall score is 79.1, while Czechia in 2022 is one the 16th position with a total score of 77.7. That means that on the scale from 0 to 100, the performance of Sweden and Czechia, taking into account different realms, such as food availability, affordability, quality and safety, is among the highest in the world. It leads to the conclusion that there are some improvements that can be done to increase these scores and raise the food security indices for better well-being of the population. It is obvious that it is a good example of countries comparison, as they both are considered to be relatively high food self-sufficient, developed and economically stable with free trade abilities and good positions on the global market. Difference in Sweden might happen because of effective policies that the government implements facing the problem of food security according to (Economist Impact, 2022). The other reason is the productivity of the agricultural sector and healthy diets that people follow. Moreover, it reflects the effective strategies applied in Sweden to deal with other matters which are mentioned below, such as food availability, accessibility, utilization and stability.

From the graph below it is seen that Canada has the same GFSI as Sweden, while only 6 countries exceed this number which are considered to be in the top-ranked countries in terms of food security as their scores are more than or equal to 80. Finland shows the highest GFSI, it is 83.7 but the gap it has with Sweden is less than 4 points that makes Sweden one of the best performing countries in the world.

Rank (113 countries)		Overall score	Affordability	Availability	Quality and Safety	Sustainability and Adaptation
1st	Finland	83.7	91.9	70.5	88.4	82.6
2nd	Ireland	81.7	92.6	70.5	86.1	75.1
3rd	Norway	80.5	87.2	60.4	86.8	87.4
4th	France	80.2	91.3	69.0	87.7	70.3
5th	Netherlands	80.1	92.7	70.7	84.7	69.2
6th	Japan	79.5	89.8	81.2	77.4	66.1
=7th	Sweden	79.1	91.9	68.3	85.0	68.3
=7th	Canada	79.1	88.3	75.7	89.5	60.1
9th	United Kingdom	78.8	91.5	71.6	77.6	71.1
10th	Portugal	78.7	90.0	77.0	79.8	64.5
11th	Switzerland	78.2	89.2	76.8	73.5	69.5
12th	Austria	78.1	91.3	67.1	81.2	69.7
13th	United States	78.0	87.1	65.1	88.8	69.4
=14th	Denmark	77.8	92.1	63.2	89.1	63.8
=14th	New Zealand	77.8	91.6	67.7	73.1	75.1
16th	Czech Republic	77.7	91.3	69.4	76.3	70.3
17th	Belgium	77.5	92.6	64.6	88.4	61.0

Figure 1. Overall Food Security Environment
Source: (Economist Impact, 2022)

The Czech Republic, being at the top of the list of the countries compared, is not far from the top-ranked countries due to the difference in only 2.3 points from the score 80. It means that the performance of the country is on a well-recognized level and its efforts are noticeable. The total situation in the country can be improved by revealing the domains of food security that should be addressed in the nearest future by policymakers and individuals.

3.3.4 Availability

As it was mentioned before, food availability is one of the key metrics in food security. Sweden has a potential to increase food production and food export (e.g. through increased agriculture and aquaculture production) due to good agricultural conditions with

good availability of freshwater, low disease pressure due to cold winters, and large areas of fertile lands which today are used in a less extensive manner, some being converted into forest area (Kuylenstierna et al., 2019). However, it is not possible to say that Sweden relies a lot on the agricultural sector, as it is definitely not the major driver for the country, according to (European Comission, 2024a), the primary sector accounts for less than 1% of Sweden's total GDP. Dairy and bovine meat account for one-third of the production value of the agriculture sector; crop production about 40%; and pig, poultry and horticulture around 30%. Less than 10% of Sweden's area is used for agriculture and approximately half of the agricultural area has natural or other area-specific constraints. In 2023, the share of agriculture in Czechia's gross domestic product was 1.61 percent, industry contributed approximately 30.16 percent and the services sector contributed about 59.75 percent (O'Neill, 2024). Wages have also grown by 2–3% annually in recent years, aligning with the central bank's 2% inflation target. This trend indicates continued wage growth, contributing to overall economic stability (Cardi, 2024). The average salary in Sweden within the recent years is enough for food basics that can provide nutritious value and help citizens to maintain their health. Basic subsectors of the food industry in the Czech Republic include processing and preservation of meat and meat products, also processing of fruits and vegetables, moreover production of dairy products and the production of mill and starch products (Embassy of the Czech Republic in Riyadh, 2023). This country has an emphasis on agriculture to maintain and improve self-sufficiency, stay strong on the global market as it allows Czechia to be less sensitive to global supply chain disruptions. Also, because around 78% of population lives in rural parts. However, at the same time the area under crops has decreased within last few years and there is less proportion of population is willing to work in this sector. Czechia's agricultural production predominantly focuses on crops, including cereals and oilseeds, as well as grains, potatoes, sugar beet, hops, fruit, vegetables, and grapevines. Livestock production is largely focused on bovine animals, pigs, poultry, sheep, and goats (European Comission, 2024b). In Czechia self-sufficiency in milk production and in beef production stayed above the 100%, but there was a decline in the production of butter, cheese and curd, apples, or pig meat from values of above 100% in 1993 to below this level in 2019 according to (Macova, 2021).

The availability of products in Sweden and Czechia is also guaranteed by imports, as it helps to keep the citizens' diets diverse and be able to maintain a high variety of different fresh

products. However, Sweden imports mainly machinery, petroleum and petroleum products, chemicals, motor vehicles, iron and steel; foodstuffs and clothing. Its principal import partners are European Union countries (Germany, Denmark, Netherlands, Finland), Norway and China (Trading Economics, 2024). For Czechia the 5 biggest import partners in 2022 were Germany, China, Poland, Slovak Republic and Italy (Workman, 2024).

To have a thorough look at the imports by product categories in Sweden in 2022, there is a table below, where different categories of food are presented in billions of SEK. It is seen that the biggest part of imports is fish, seafood and products thereof, it is shown as 62.6, while fruit and vegetables are 28.3, meat and meat products are 17.3. The least contribution is from live animals, it is only 0.4 billion SEK.

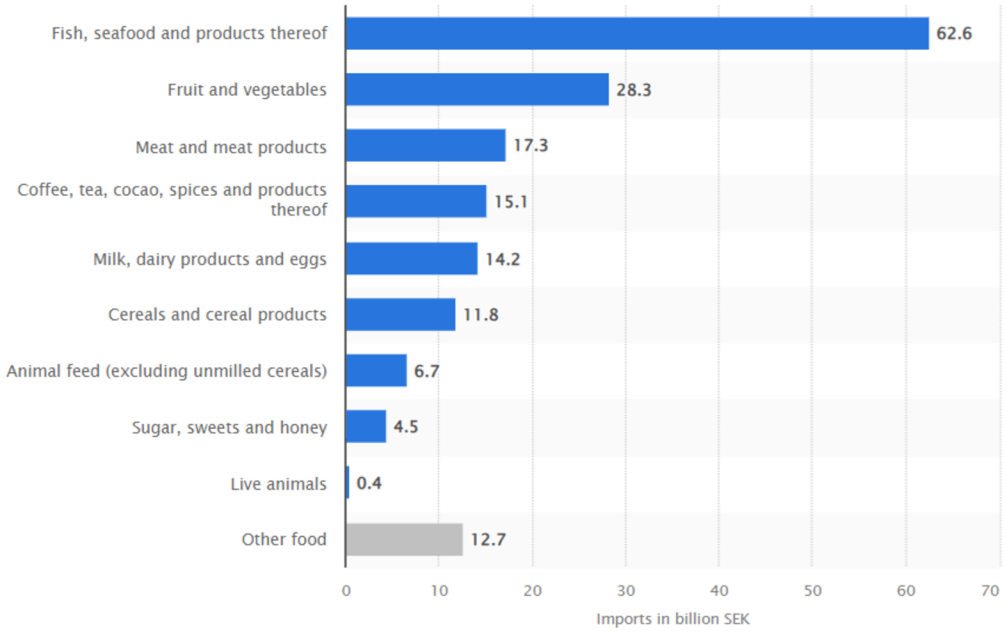

Figure 2. Import of food and live animals into Sweden in 2022, by product category
Source: (Ridder, 2023)

In Czechia since 2012 to 2023 there has not been a big change in food imports of percentage of merchandise imports. It is on average of 6% of total merchandise imports. In 2022 imports of agriculture and related products from the United States totaled $120.5 million, with consumer-oriented products accounting for $85 million. Meat (especially beef) and meat products, dried nuts and fruits, chocolate snacks, coffee and cocoa, wine and spirits, and frozen fish are the most widely imported consumer-oriented products from the USA to the Czech Republic (International Trade Administartion, 2023).

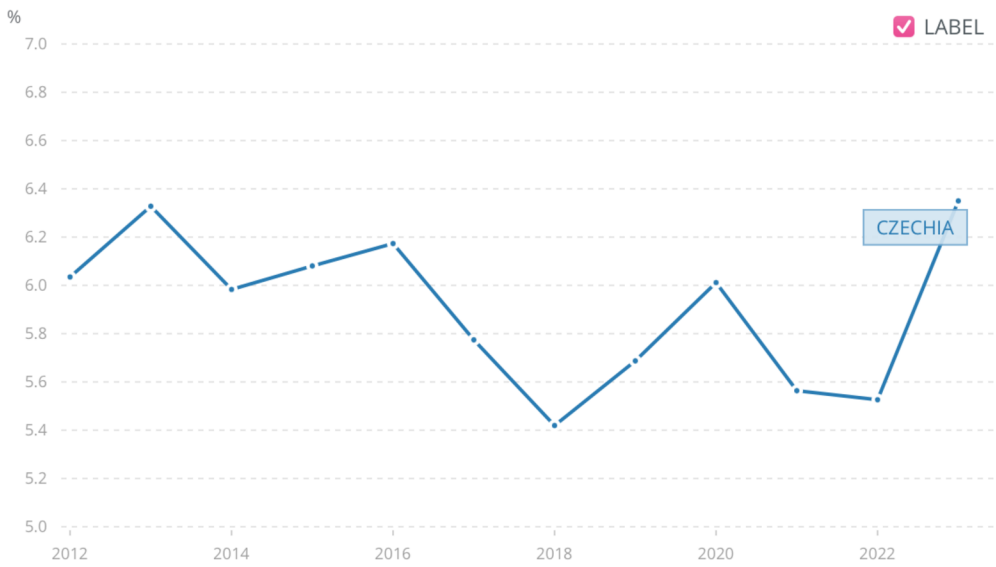

Figure 3. Food imports (% of merchandise imports) - Czechia.
Source: (World Bank Group, 2024)

In total food and beverage production contributes as 7% of GDP as per 2023 and it is one of the important industries in the country. Food availability in the country is also ensured by various online food retailers who provide quick delivery, different hot deals and large variety of food products.

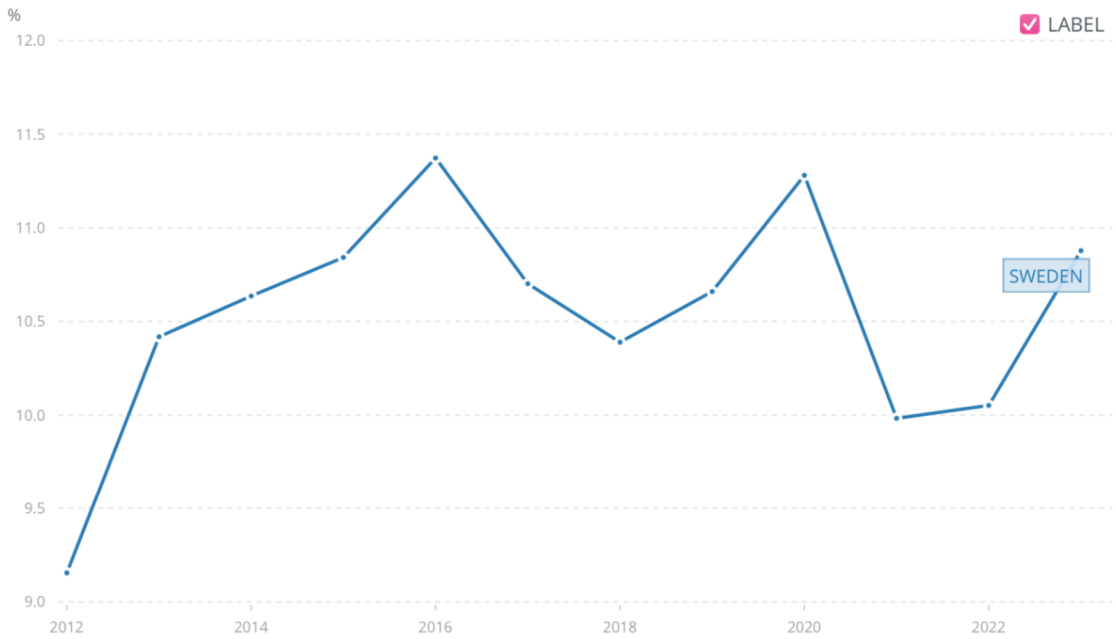

Figure 4. Food imports (% of merchandise imports) - Sweden
Source: (World Bank Group, 2023)

As it can be seen from the graph above, the trend in Sweden is quite similar, however, with higher percentage contribution, which is 10% in average, while for Czechia it is about 5,5%.

The data on the graph above is available until 2023 and presented in percentages. Food, beverages and tobacco (% of value added in manufacturing) in Sweden was reported at 7.505 % in 2022, according to the World Bank collection of development indicators, compiled from officially recognized sources (Trading Economics, 2022).

3.3.5 Accessibility

Food poverty is a term not traditionally associated with Sweden or the Czech Republic. Physical and economic access to food among citizens are on good levels due to economic, political and social stability. Sweden is considered as a welfare state should have an equal access to nutritious, balanced and safe diets (Rost & Lundalv, 2022). Even though Czechia currently cannot have the same status, it is still can be viewed based on many facts as a welfare country.

Regarding the physical access to food. In Sweden there are multiple grocery stores all over the country, so that there is an equal accessibility to food in all the regions of Sweden. According to the Swedish National Competition Authority, the market concentration in Sweden is higher than many other European countries but equal to other Nordic countries (Oslomet, 2018, p. 2). As it is stated in the report, there are few reasons that can explain such a situation. Firstly, the population of Sweden is not high, especially considering the territory of a country. As a result, citizens are scattered over Sweden. Plus, it is said that during the 1950's the supermarket format was introduced in Sweden and new requirements of extensive transport of goods made an effective distribution system a key business factor (Oslomet, 2018). All in all, there are large actors that dominate the market, but at the same time there are corner shops, such as local independent businesses selling foods and other consumables or there are retail chains, food markets and halls, farmer shops and food banks. Czechia has number of food cooperatives, farmer markets and supermarkets which are allocated all over the country, it gives relatively equal access to food for citizens in each city considering country's good infrastructure and transport connection which have an influence on food access. There is an expected growth of supermarkets and grocery stores industry within the next five years (IBIS World, 2024). In 2023 25.45% of people in Czechia lived in rural areas

that allowed them to grow vegetables and fruits themselves, thanks to it they can be self-sufficient to some extent. Plus, people in rural areas have physical access to grocery stores due to short distances between rural and urban areas, possibility of using bikes and other types of transport without any problems due to normal climate conditions in the country during the whole year and variety of roads (Hruskova, 2010).

According to (Global Nutrition Report, 2024), in 2022 Sweden has shown limited progress towards achieving the diet-related non-communicable disease (NCD) targets. 19.8% of adult (aged 18 years and over) women and 25.8% of adult men are living with obesity. Sweden's obesity prevalence is lower than the regional average of 25.3% for women but is higher than the regional average of 24.9% for men. Without a doubt, there is a need to enhance the eating habits, as there are many issues that arise due to malnutrition. In Czechia the situation is very similar. There is a small progress to decrease number of NCDs. 27.3% of adult (aged 18 years and over) women and 28.9% of adult men are living with obesity. The Czech Republic's obesity prevalence is higher than the regional average of 25.3% for women and 24.9% for men. Diabetes is estimated to affect 6.9% of adult women and 9.4% of adult men (Global Nutrition Report, 2024). The causes and reasons behind the weight gain, as it is stated by (Spillerová, 2022), are changing eating habits, new eating trends and adjustments to Czech cuisine. Czech people use online deliveries on a constant basis that have an increasing popularity these days, frequently eat out, consume processed food, and also there is overconsumption of food and drinks due to numerous festivals and celebrations in the Czech Republic during the year. The variety of snacks on the market that are high in calories but cause addiction because of multiple flavours and interesting tastes negatively impacts weight gain of people. One more reason highlighted is imbalance of energy intake, nutrients consumption and physical activity, due to energy surplus Czech people may suffer from obesity.

When it comes to the economic access of food in the country, in Sweden the situation is better than in other regions in Europe. The average household net-adjusted disposable income per capita is USD 33 730 a year, more than the OECD average of USD 30 490 a year (OECD, 2024). In the Czechia, the average household net-adjusted disposable income per capita is USD 26 664 a year, less than the OECD average of USD 30 490 a year (OECD, 2024). According to official data from the Czech Statistical Office, the average salary in the

Czech Republic in 2023 is CZK 40,135 per month before taxes equivalent to €1,610 at current exchange rates. Compared to last year, an increase of 1,551 crowns or 4% was recorded (Prague Education Center, 2023). Same as in Sweden, this salary amount should be enough to have a healthy lifestyle and afford nutritious diet.

In terms of employment, about 75% of people aged 15 to 64 in Sweden have a paid job, above the OECD employment average of 66% (OECD, 2024b). It is an indicator of a good and high-quality education, broad skills that people obtain and it is possible to conclude that the food access is higher due to the ability to buy a variety of products. The prices for some goods can be higher than in other countries in the world, but it is crucial to relate them to the income that people have. As it is seen, it exceeds the average level among all 38 countries in the OECD group. According to (OECD, 2023), the unemployment rate in Czechia has grown since 2022 from 2.3% to 2.6% in 2023 and 2.8% in 2024. At the same time private consumption should be decreased due to constant growth of energy prices, depreciation of local currency and expected inflation growth. As it is stated, the government managed to address the main issues occurred during the Covid-19 and kept the inflation stable afterwards, it has still risen to a high level, however, the situation is under control which helps to ensure food access stable. Czech Republic inflation rate for 2023 was 10.66%, a 4.44% decline from 2022 (Macrotrends, 2024).

Overall, the conclusion about the food access might be optimistic and pretty prosperous in both countries taking into account all the points and it is already on a relatively good level in the world. Both physical and economic accesses can be improved and there are some advantages that Czechia can examine in Sweden and implement the same strategies to improve food security in the country as there is a noticeable difference between these two countries and Sweden outperforms Czechia in NCD statistics, food habits and economic access.

3.3.6 Utilization

Another crucial component of food security is food utilization which is generally well-managed in Sweden. As it was mentioned in the previous sections by the author, food utilization is commonly understood as the way the body makes the most of various nutrients in the food. Sufficient energy and nutrient intake by individuals are the result of good care

and feeding practices, food preparation, diversity of the diet and intra-household distribution of food (World Bank, 2024). It has a direct impact on health which in turn at the same time indicates the level of food education among people and their willingness to follow healthy eating habits.

In addition, the diets of Swedish people are healthier and more nutritious and the region they come from does not affect their eating habits which can be considered as a great achievement. Studies of food habits in Sweden indicate that the population eats healthier today, at least on an aggregate level. Swedes now generally eat more fruit and vegetables, fibers and wholegrain and less sugar and fat. But there are also strong indications that food habits vary in relation to, for example, age, gender, and whether you live in an urban or rural area (Oslomet, 2018, p. 3). Unfortunately, even though there was an improvement in diets, it is still on the agenda and policymakers try to address this issue in many ways. The eating habits among adults in Sweden have improved in many ways since 1990s, but the intake of vegetables, fruit, whole grains and vegetable oils, as well as seafood, is still too low. At the same time, intake of sweet drinks, pastries, fat dairy and salt is too high, as well as consumption of red meat (European Comission, 2024). Unfortunately, when it comes to eating habits and food diets in Czechia, there are not so many pros among Czech people. Czechs consume less fruit and vegetables, have less frequent breakfasts than recommended, and astonishingly, every hundredth Czech drinks beer for breakfast. These habits indicate that Czechs still lag behind the European average regarding healthy eating (Cdaily, 2023). Nevertheless, there is an increase in the number of Czech people withing the last 15 years who have started to drink less beer for lunch, started to prioritize their healthy meals and pay less attention to Czech traditional cuisine that has a focus on dumplings, and decreased number of their cold-meals. Even though the country is not scored as one of the best European countries within eating habits and it has one of the worst food diets in Europe, Czech people started to pay more attention to their eating preferences and show a slight improvement in recent years.

In Sweden, life expectancy at birth (years) has improved over recent decades by 3.09 years from 79.6 years in 2000 to 82.7 years in 2021 (WHO, 2024). For better understanding of the numbers, it is possible to compare it with Europe where life expectancy at birth (years) has improved by 3.78 years from 72.5 years in 2000 to 76.3 years in 2021 (WHO, 2024). In the Czech Republic there are some improvements, however, the indices are lower than in

Sweden, life expectancy at birth expressed in years has improved by 2.05 years from 75 years in 2000 to 77.1 years in 2021 (WHO, 2023).

Hence, it is obvious that both countries have better results than Europe due to balanced diets, affordable and high-quality healthcare and a good level of food education which is common subject to learn about while Sweden has better result than Czechia.

According to the same source, life expectancy at birth refers to the years that a newborn is expected to live which differs from the other term "life expectancy" that signifies a length of person's life. Without a doubt, it is one of the crucial indicators of health conditions, as it takes into account diseases that people might have during their lives, diets that they follow, the quality of food they eat and the amount of nutrients that the income of population allows them to intake. All of the mentioned reasons of a high life expectancy at birth have a connection to a food security, even though there are much more causes of it.
Moreover, in a global comparison, Swedish dairy production is characterized by efficient nutrient management, low use of inputs such as chemical fertilizers, crop-protection and antibiotics (Krizsan et al., 2021). Czech government currently supports innovative agriculture, with low chemicals use and high nutrient outcomes. It means that farmers in both countries try to supply high-quality and healthy products, try to pursue people's health by impacting nutrient intake, and not thinking of an income as of the only reason to have a prosperous farm and that kind of business.

A lot of efforts and steps are aimed at food waste in Sweden and Czechia. Swedish Environmental Protection Agency does constant audits of policies addressing food loss, targets for higher reduction of food waste every few years and improves the food security in the country. It's official: in 2020 Czech mainstream households produced 40.1% (37.4 kg per person per year) of the average European Union household food waste (91.7 kg; calculated as 53% of the overall food waste of 173 kg per person per annum) (Jehlicka, 2021). Food waste is closely related to food security because it ensures that food, during all the stages of the supply chain, is mostly consumed and used, rather than lost, as better utilization of food resources is a key to high food security. As it is mentioned in the article, the main reason lies in habits and limited knowledge of Czech people, that shows the lack of food security and food waste education. Nowadays Czechia cannot achieve the EU target on waste reduction. In some schools there are different educational programs implemented

to increase students' awareness. In Sweden many initiatives have been recently undertaken to address this issue. According to (Swedish Environmental Protection Agency, 2020), there is a handbook for reducing food waste that helps to measure food waste. The national method makes it easier for kitchens and it is applicable for different size companies which is a great advantage for public institutions as they can manage their resources in a more efficient way. Furthermore, people are encouraged to bring their boxes or doggy bags to the restaurant in case they do not finish their meal to avoid the food waste. It is also stated that several dairy companies in Sweden (Arla, Norrmejerier och Skåne-mejerier) took on the task and have written "Best before, often good after" on their products which has resulted in an extensive information spread, as it has made people aware of the date of products when it is still safe to consume them. Plus, in Czechia and Sweden some of the products in the supermarkets and grocery stores are discounted due to the fact that they are close to the expiry date and it saves food, reduces waste, makes nutritious food more affordable to a population and even positively affect the people's savings.

One more important factor of food utilization that has to be considered is food safety. When people get sick from food, there are many reasons that can lead to this outcome, but most common ones are food contamination and low level of hygiene in the kitchen. As a result, person can have serious health consequences and it contributes to the poor absorption of nutrients. There's always a chance that you could get food poisoning when travelling in Sweden but compared with many countries, the risk of it happening is extremely small. Swedish restaurants and takeaway shops have to meet strict health and safety criteria in order to serve food, and even then they're subject to regular checks (Routes North, 2023). There are regular checks of products in grocery store in Czechia, all food and beverages are subjects to the check, that is why in case any kind of product is not considered safe there are immediate actions implemented and products are removed from shops (Ministry of Agriculture, 2024). There are laboratory analyzes performed to ensure food safety, the supervision of quality and labels make people ensured in what they consume. Luckily, as it is mentioned in the article, there is no such a problem as limited sanitation in Sweden and water cannot provoke any disease. Even tap water in Sweden and Czechia is safe for drinking and does not have any negative effects on health. These high standards of food safety enhance food utilization practices in the countries.

3.3.7 Stability

Food stability in the country is ensured by many factors. As it was mentioned by the author in the previous chapter, self-sufficiency in food, effective policies and constant revisions of them, stable political situation in the country and ability of citizens to participate in governance ensure better outcomes in overall stability. Low level of income inequality and stable position on the global market, good relationship with other countries and different methods that have been already implemented and introduced by countries to address food insecurity can signify of their stability. It can be highly related to Sweden and Czechia. Both countries have good Gini indices. The Gini coefficient measures inequality on a scale from 0 to 1. Higher values indicate higher inequality (World Bank, 2023). Sweden has 0.3 and Czechia has 0.26 in 2022, both countries are in low inequality range from 0.20-0.35. it shows low-income disparities. However, the difference between Sweden and Czechia can be explained by high-income possibilities that make gaps between low-income people and high-earners. Sweden and Czechia are both self-sufficient in food and can stand against crises or unexpected challenges and disruptions on the global markets (World Population Review, 2024). Short-term shocks are manageable in both states due to stability in politics while strong dependency on EU trade and global food systems might cause challenges. According to (The Global Economy, 2024), political stability index, that captures few other indicators and calculated by the Economist Intelligence Unit, varies from -2.5 to +2.5. In Sweden in 2022 it is 0.90 with the average 1.16 within 1996–2022 time range, while in Czechia it is 0.82 with the average of 0.95. The average value in Europe in 2022 is 0.45. Sweden and Czechia indices exceed this score and show that their governments cannot be destabilized by violent means indicating high stability, which is within the range +0.5 to +1.5. Transportation infrastructure, various trade partners and strong relationship with their import and export partners highlight stability in both states. In the World Competitiveness Ranking in 2022 Sweden secured its 8th position, Czechia has shown a better result than in the previous years, it was on 26th position out of 67 global economies. The IMD World Competitiveness Ranking was created to provide actionable data analysis on economies, regions and sub-regions according to how they optimize their individual competencies in order to achieve long-term value creation for their people. It provides benchmarking and exposes trends, using both statistics and real-world survey data (IMD, 2023). Sweden and

Czechia have fully convertible currencies, they both attract high amount of FDI (foreign direct investment) and all international transfers can be made freely with no difficulties.

Capturing all the factors provided above, it should be concluded that Czechia and Sweden are countries with higher than moderate stability, even though they have different indices and score values. They have possibilities to improve the situations in the countries but the overall results are on a good level compared to the rest of the world. Effective implementation of policies and alignment with the EU requirements contribute to the overall stability in Sweden and Czechia.

4 Practical part

The practical part of the given Master's thesis consists of two analyses – the comparison analysis of Czechia and Sweden profiles; design and conduction of food security questionnaire in Sweden and Czechia, and construction of food security score based on respondents' perception of food security in both countries.

4.1 Comparison Analysis of Sweden and Czechia

The first chapter examines the trends from the perspective of four pillars of food security (availability, access, utilization and stability) in both countries within 2012-2023 time period and gives the essential overview of the situations in both countries. The indicators presented analyzed below are from these reports: (Vhurumuku, 2014) and (FAO, 2013).

4.1.1 Food Security in Sweden and Czechia

First of all, there is a comparison of GFSI presented below to examine the difference between Czechia and Sweden among 113 countries ranked accordingly. It is a single index that shows the food security state in the country by evaluating it from multiple perspectives, taking into account four main pillars of food security (availability, access, utilization and stability). Unfortunately, the annual report with GFSI ranking was lastly published in 2022 as the latest report until 2025, however, the following data is enough to examine the trends in both countries.

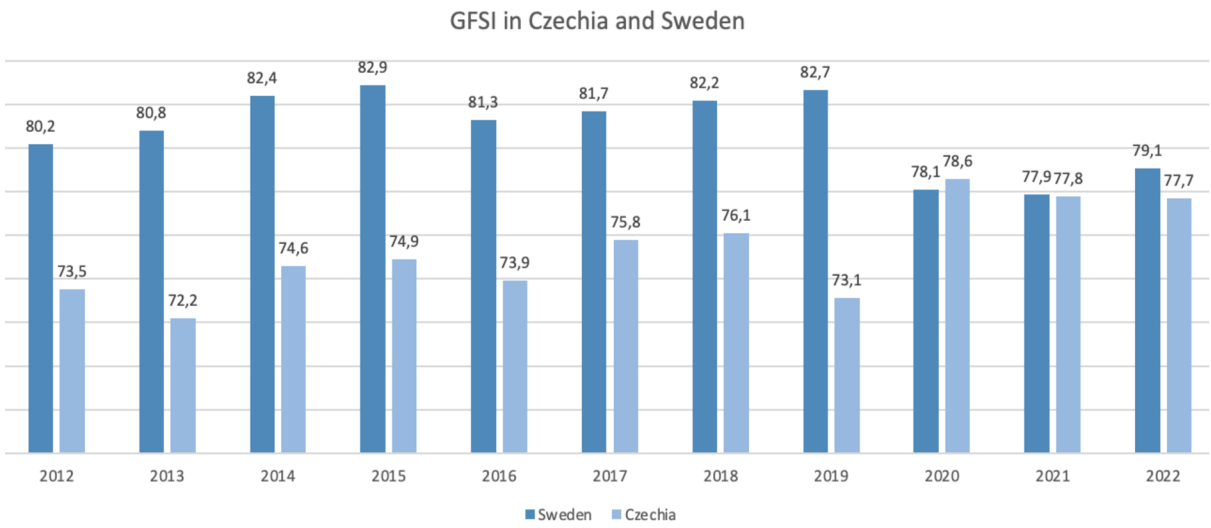

Figure 5. Global Food Security Index comparison in Sweden and Czechia (2012-2022)
Source: own creation based on data from Economic Intelligence Unit Annual Reports

As it is seen from the graph, these countries do not have much difference according to global food security indicator, even though Sweden outperforms Czechia since the index was created in 2012 with the only one exception in 2020. However, even a small distinction matters due to high competitiveness and outstanding performance of other countries because food security improvement is crucial for all countries in the world by assessing not only individual or household access and availability of food, but economic and political stability in the country, as well as food supply dependency on imports and global market disruptions.

The highest number in Czechia was in 2020 and it was 78.6. Czechia was ranked as 5th country out of 113 countries examined. It is the best result this country has had until these days but since Czechia started from 73.5 and achieved gradual higher and better results within 10 years, it can be stated that Czechia is intended to increase the index number within the next decade according to its trend and tendency to improve the index. However, the fluctuations are higher than in Sweden because GFSI varies from higher to lower within the last decade, from 72.2 to 78.6. The biggest decline was in 2019, when it was 76.1 in 2018 and the figure decreased to 73.1, which shows the difference in 3 points. Nevertheless, for Sweden the highest decrease was 4,6 points from 2019 to 2020 from 82.7 to 78.1 accordingly. It can be related to the pandemic situation in the world that caused challenges and difficulties globally. This country manages to get from 17th position to 7th within 10 year period and shows its consistency in developing the GFSI score, as the main trend that can be examined is that Sweden improves the global food security score on a yearly basis. From

80.8 in 2012 the country was improving the number that led to the highest result in 2015, which is 82.9. It is noticed that there was a gradual increase from 2013 up to 2019 but due to Covid-19 there was a sharp decline in the score. However, Sweden shows the tendency to improve the index value and continues to outperform Czechia, as well as keeping its 7th position in the ranking.

In conclusion, Sweden depicts better overall results and trend but shows a weak system addressed on critical or unexpected global and national situations, such as Covid-19, due to poorly organized government policies that could lead to financial difficulties of the population and problems with affording essential food with nutrients that resulted in the decreased GFSI score. Probable high dependency on imports from other countries or high dependency on global challenges in the food supply chains might have contributed to the extreme decrease. Sweden was able to recover in 2021 despite the difficult 2020 year and it showed the country's hard work on the improvement of the situation and excluding the fact of its repeat. At the same time Czechia managed to succeed in 2020 and increased its global food security score despite all the challenges from 73.1 to 78.6 in a year from 2019 to 2020. It indicates the ability of the country to face challenges and keep developing due to its economic stability and effective policies aimed at supporting population in tough conditions and times. Czechia's fluctuations in index scores lead to the conclusion that Czechia should have more stable food security control and needs long-term plans addressed at the achievement of one of the highest food security scores to be in the section of the top-ranked countries which have a score higher than 80 that show constant work on all domains and fields in the country, as well as on its international relationships with other states that can affect food security.

4.1.2 Availability

To analyze the food security profiles of Sweden and Czechia, there are Average dietary energy supply adequacy (percent) (3-year average), Average protein supply (g/cap/day), Crop yield in kg per hectare (Cereals primary, Wheat and Sugar crops primary) comparison, as well as Total Livestock production figures (Metric Tons for total meat production) (Meat total: beef, pork and poultry) evaluation.

On the graph below there is a representation of average dietary energy supply adequacy, which is shown in percentages with a three-year average. National availability of food can be described using the table below as it indicates weather the population follows the dietary energy requirements or not. 100% is a minimum need that corresponds to basic energy supply, while numbers above 140 and less than 120 show ether surplus or insufficiency of energy supply.

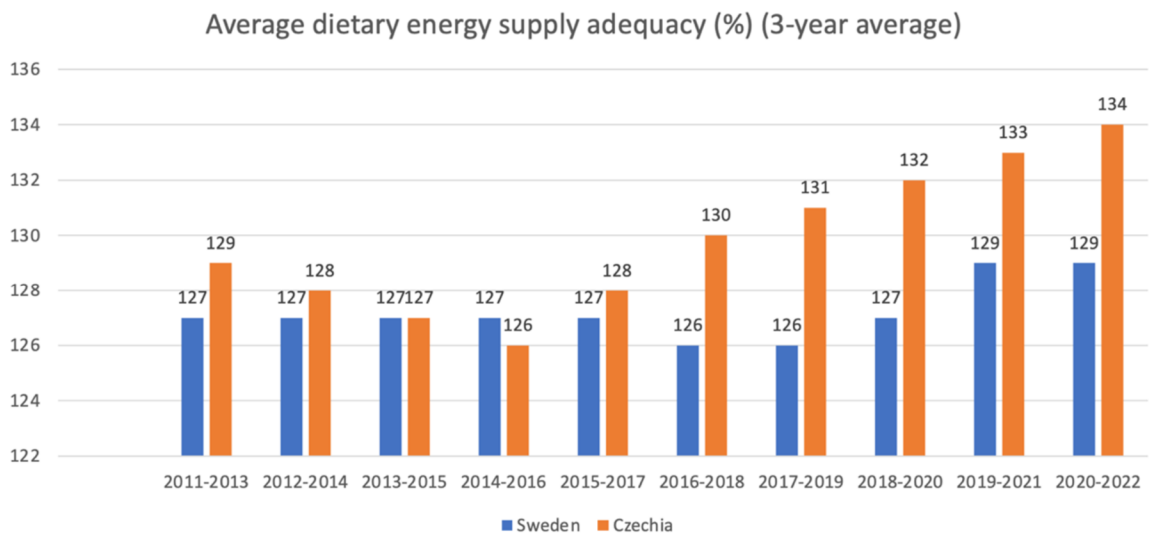

Figure 6. Average dietary energy supply adequacy (%)
Source: own creation based on data from FAOSTAT

From the table above, it is seen that the Czech Republic has an upward overall trend and higher figures than in Sweden. Only in the period from 2013 to 2015 Sweden has the same index as Czechia and in 2014 to 2016 the percentage is one percent higher. In 2011 to 2013, Czechia has 129% in average dietary energy supply adequacy, exceeding the minimum threshold by 29% and being in the range of adequate energy supply as Sweden with 127%. In 2020 to 2022 period Czechia has 134% while Sweden has relatively the same index as before which is 129% that shows the increase by only 2% within the decade. The result of the Czech Republic is worse as the increase is by 6% with a gradual upscale trend and the decrease from 2012 to 2016 that might have been due to poor harvests, production challenges caused by changes in CAP (common agricultural policy) or extreme weather conditions, such as droughts and floods. At the same time, lower figures in that period could be a reason of better diets and healthy lifestyle of population. Also, the consistent increase in average dietary energy supply adequacy can be a result of efficient agricultural policy, government's subsidies supporting farmers and self-sufficiency of this country, so that people have

availability of food. Nevertheless, the percentages up to 140 are in a normal range, while more than 140% is above the required range of energy supply. The more consistent numbers and approximately same percentages in Sweden within 2011-2022 time period can be a sign of high dependency of this country on imports and global supply chains which limit availability of food for people but as the numbers are in a range from 120 to 140, they rather present awareness of people of their normal energy supply adequacy and show conscious food behavior. In general, Swedish people have less caloric diets than the Czech people have. Czechia should try to keep the percentages in the range up to 140% and, considering it is upscale trend, there should be different educational programs developed to stop the increase in energy supply and increase population's awareness and knowledge. Otherwise, there is a high chance of increased number of obese people and non-communicable diseases in the country. Sweden should keep the tendency to be in a middle of the range from 120% to 140%.

The data below is presented from 2012 to 2022.

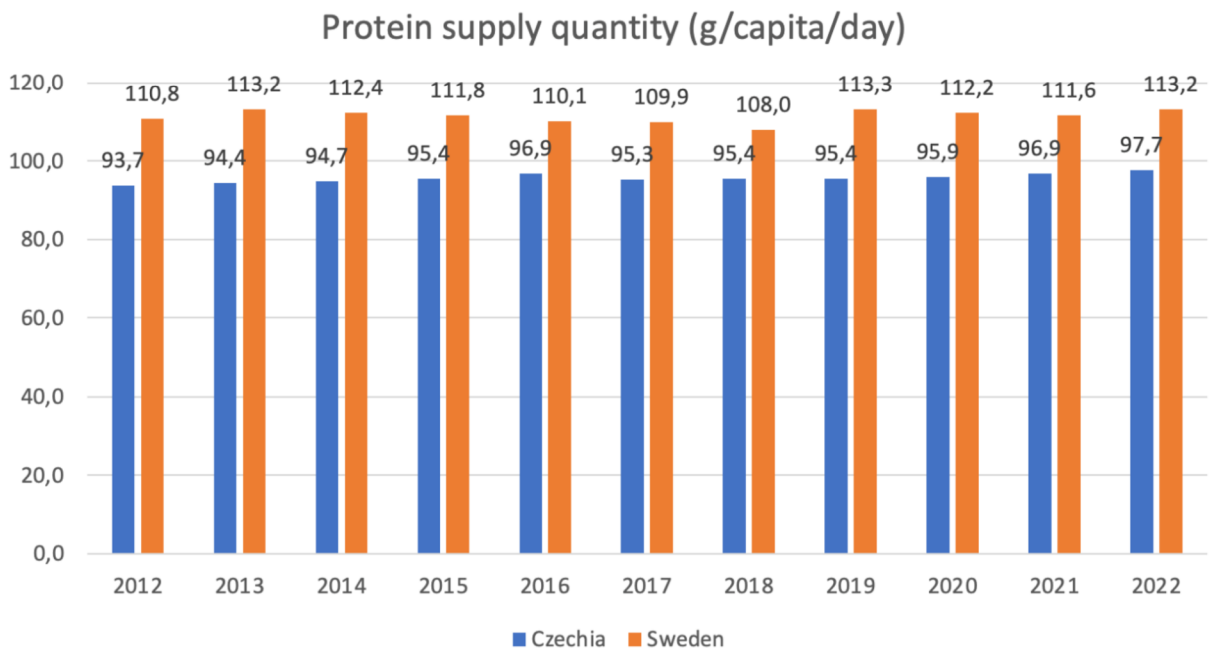

Figure 7. Protein Supply Quantity (g/cap/day)
Source: own creation based on data from FAOSTAT

High protein supply is in the range from 75 to 100 (g/capita/day), while very high protein supply is above 100 that usually related to wealthy countries and nations. As it is evident from the graph, Czechia and Sweden has high protein supply quantity, however, Sweden shows better results with numbers exceeding 100 (g/capita/day) for the period from 2012

to 2022. Czechia has a positive trend with gradual increase from 93.7 to 97.7 in 2022, when Swedish indices from 2012 to 2022 increased by 2.4. Within this decade there are fluctuations in Sweden protein supply in grams per capita per day with the highest index in 2019, which is 113.3, and the lowest number in 2018, which is 108. In Czechia the worst index is 93.7 and the highest, as it was mentioned above, in 2022. In conclusion, Czechia shows good results and improvements in protein supply quantity within the last 10 years that highlights better government policies, better agricultural results and people's healthier habits. Even though Sweden has not increased much the protein supply quantity, it presents stability and there is no need to increase the figures due to already sufficient numbers for health.

The following graph analyzes the primary cereals yield in Czechia and Sweden in kg/ha.

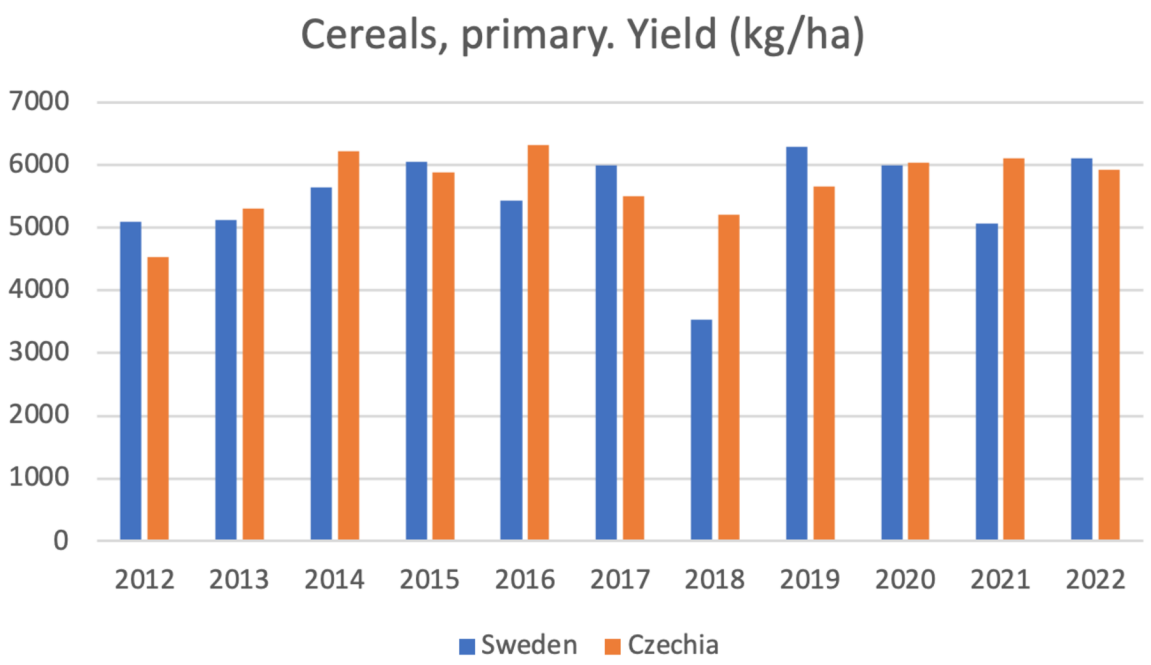

Figure 8. Cereals, primary. Yield (kg/ha)
Source: own creation based on data from FAOSTAT

The primary cereals are barley, wheat, rice, maize, rye and oats. As it seen from the table above, the trends in Sweden and Czechia in most of the years differ from each other. The only years with similar figures are 2013, 2020 and 2022. While in 2013 it is slightly above 5000 (kg/ha), in 2020 and 2022 it is approximately 6000 (kg/ha). However, there are inconsistent trends in both countries shown on the graph. In Sweden there is the lowest number in 2018 which is 3535.5, it is lower than in Czechia by 1671.4 which is 5206.9 accordingly. It might be due to severe weather conditions in Sweden, for example, cold

weather or late frosts. Czechia's yields are higher than in Sweden in the following years: 2013, 2014, 2016, 2018, 2020 and 2021. The reasons behind can be better climate conditions for cereal yields, longer growing seasons, fertile soils. Another reason of different numbers in these countries may be because of distinct preferences in primary cereals that lead to different yields. Overall, Czechia shows better outcomes in cereals yields, when Sweden present more dramatically changes and fluctuations with lower numbers.

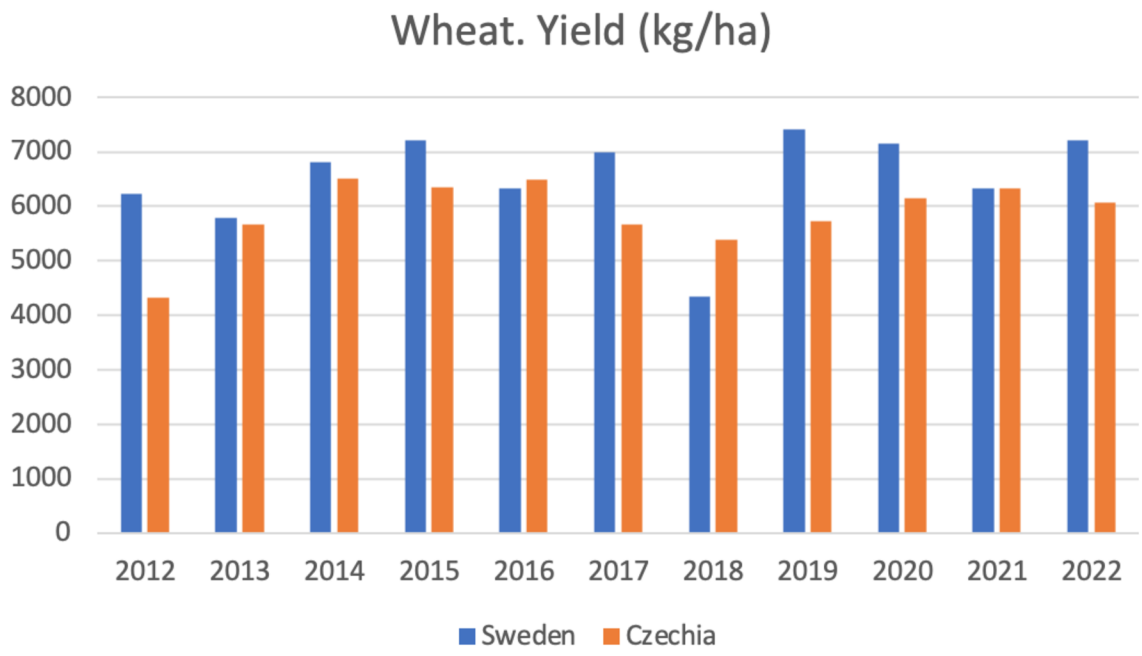

Figure 9. Wheat. Yield (kg/ha)
Source: own creation based on data from FAOSTAT

The table above considers wheat yields in Sweden and Czechia in kilograms per hectare within 2012-2022 period. Despite the higher yields in primary cereals in Czechia, Sweden exceeds Czech wheat yield within the last decade except for 2018. As it was said previously, the reason that caused such decrease in crops might be severe weather impacts, changes in agricultural policies that led to decreased productivity of farmers and higher prices for fertilizers. In 2021 the figures are almost the same. It is around 6300 (kg/ha), however, Sweden showed an increase by 900 (kg/ha), while Czechia experienced a decline to 6070 (kg/ha). The rapid increased in Sweden may be a result of technological advancement, higher promotion of farming with subsidies support compared to previous years and better weather conditions. In Czechia the temporary declines can indicate limitations in access to needed fertilizers or seeds, as well as decreased government support.

Primary sugar crops yield expressed in kilograms per hectare also helps to examine the food availability in Sweden and Czechia.

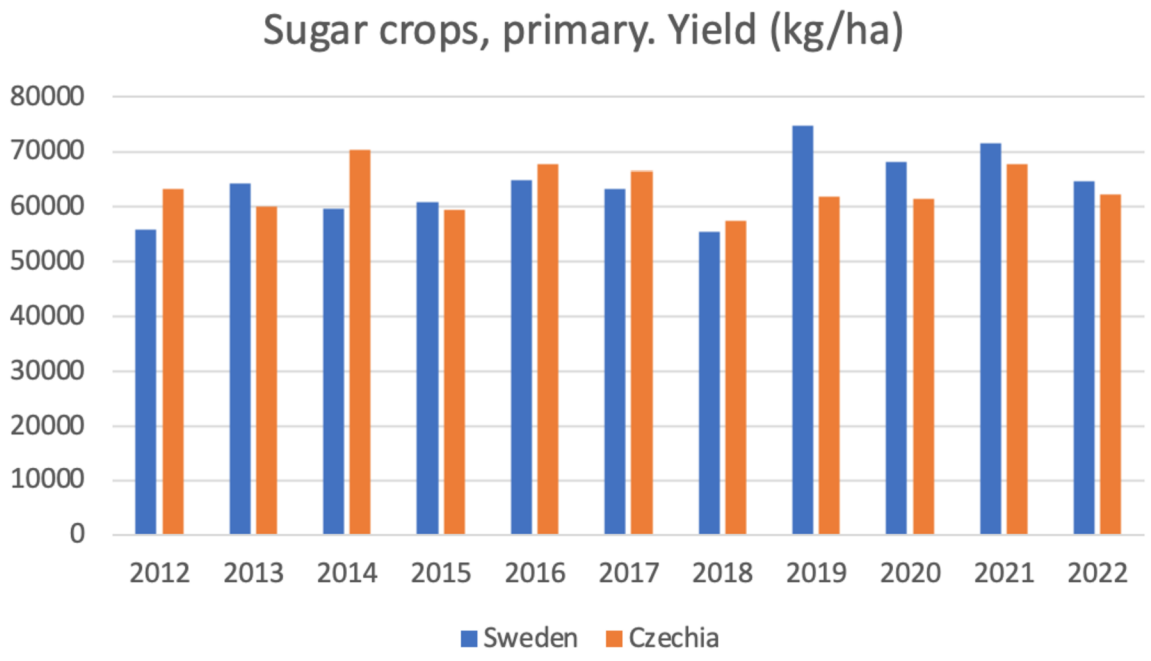

Figure 10. Sugar crops, primary. Yield (kg/ha)
Source: own creation based on data from World Bank Group and FAOSTAT

As it can be seen, there are no consistent trends or gradual increases. There are no sharp fluctuations, but there are ups and downs that Sweden and Czechia experience within the period from 2012 to 2022. The lowest numbers for Sweden are in 2012, 2014 and 2018, while during all other years the numbers are higher than 60000 (kg/ha). The highest yield is in 2019, it is 74701.8. For Czechia the situation is slightly different, however, the lowest number of yields is in 2018 too, which is 57509.4 (kg/ha). The highest yield is 70277.8 in 2014. After that there are challenges that Czechia face due to high decline by 10896 (kg/ha) in 2015. As it is seen from the graphs above, there is a decrease for all crops mentioned by the author. The reason might be due to weather conditions or policy changes that affect agriculture and market prices for goods needed for farmers. Within the last few years from 201, Czechia shows good outcomes by having sugar crops yields higher than 60000 (kg/ha), even though Sweden succeeds in yields of sugar crops from 2019.

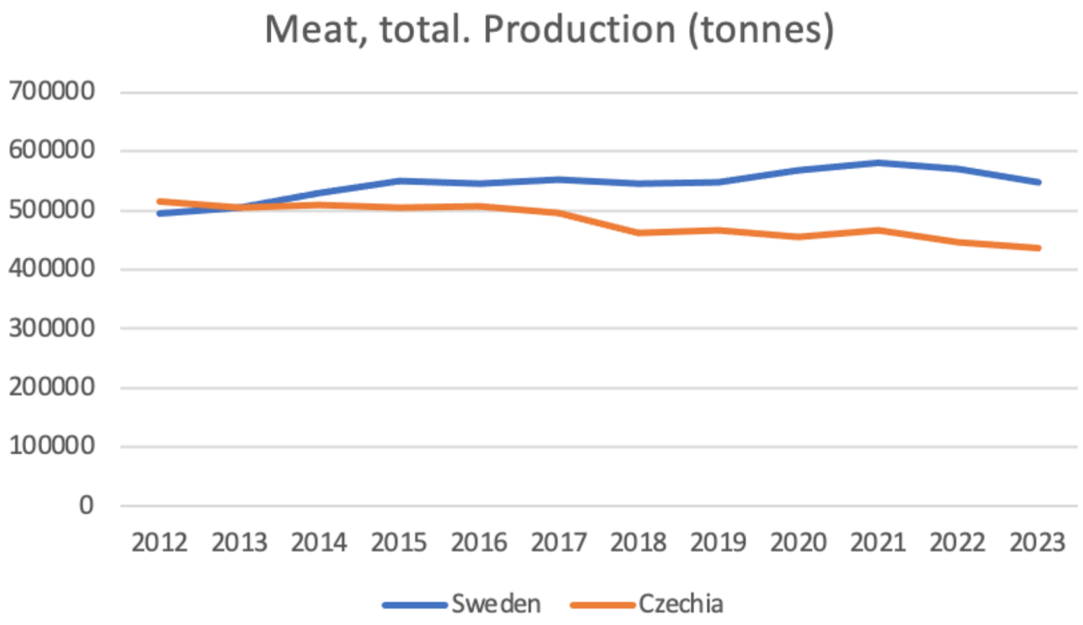

Figure 11. Meat, total production in tons.
Source: own creation based on data from World Bank Group and FAOSTAT

The last graph presented for the analysis of food availability in Sweden and Czechia is total meat production which is expressed in tons and covers poultry, beef and pork meat. There is a similar decline in meat production in both countries from 2021 to 2023. Relatively stable total meat production is in the period from 2014 to 2017. Czechia has a decline trend, while Sweden shows an onward trend up to 2021 when there is a peak in total meat production for Sweden, it is 581060 tons. Czechia's highest number is 508850.22 in 2014, while in 2023 the production fell up to 435970 tons. It can be a result of global challenges started in 2019, such as Covid-19. Economic difficulties on a global scale that decreased meat demand, rose cost of production and changes in subsidies led to a gradual decrease of total meat production. The decrease in the total output can be connected to global warming and worse climate and environmental conditions. The current problems with the global supply chains, changes in main exporting and importing countries and in the quantity of trade flows result in decrease numbers of pork, beef and poultry production in Czechia and Sweden.

4.1.3 Accessibility

To proceed with the analysis of accessibility pillar in Czechia and Sweden, it is needed to examine prevalence of undernourishment, consumer price level index for food (the index is normalized to a common scale (with the base year set to 100)) and Food Imports (% of

merchandise imports), GDP per capita at purchasing power parity (PPP) (in current US Dollars).

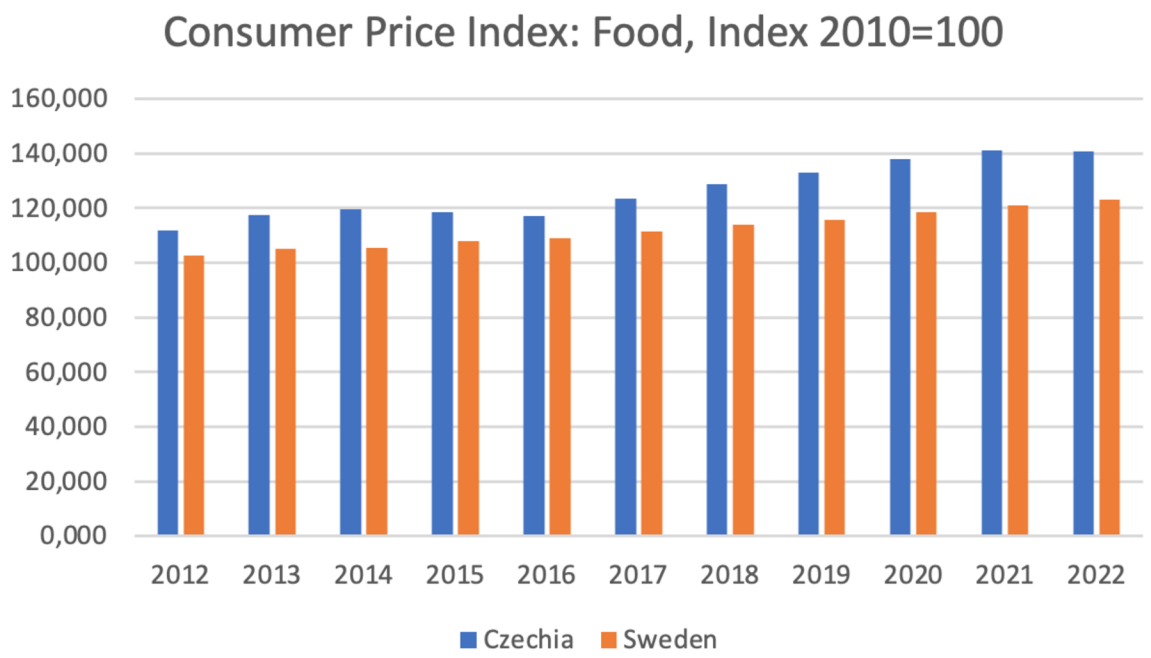

Figure 12. Consumer Price Index: Food, 2010=100, Annual, Not Seasonally Adjusted
Source: own creation based on data from Country Economy and FAOSTAT

Consumer price index that covers only food products in Sweden and Czechia shows relatively the same trend in both countries. it has to be said that it is not seasonally adjusted and the base year taken is 2010 that corresponds to 100. There is an incline in both countries from 2015 to 2021, while in 2022 there is a slight decrease in Czechia by 0.282 from 141.016 to 140.734 and Sweden presents the increase by 2.297 from 120.907 to 123.204. The CPI is a subject of inflation that is seen from the gradual increase on the graph above, but Czechia experiences higher fluctuations and increases within 2012 to 2022 comparing to Sweden which shows better economic and political stability in the country ensuring population's equal and stable access to food. Due to global food prices increase and disruptions in the global supply chains, there are impacts on both countries since Covid-19 in 2019 and further worldwide issues that affect each country in the world. More vulnerable political situation all over the world causes consumer price index increases and the graph shows the ability of a country to face challenges. Czechia, despite its heavily increased CPI from 111.862 in 2012 to 140.734 in 2022 showing difference by 28.872, manages to decrease CPI in 2022 and indicates a good sign for consumers affected by inflation. Sweden shows CPI on a level of 102.782 in 2012 and increase by 20.422 by 2022 which is 8.45 point lower than in

Czechia. As consumer price index does not provide any global range, it measures only food prices' increase on a national level in Sweden and Czechia, and observes inflation rates. Sweden shows better overall results.

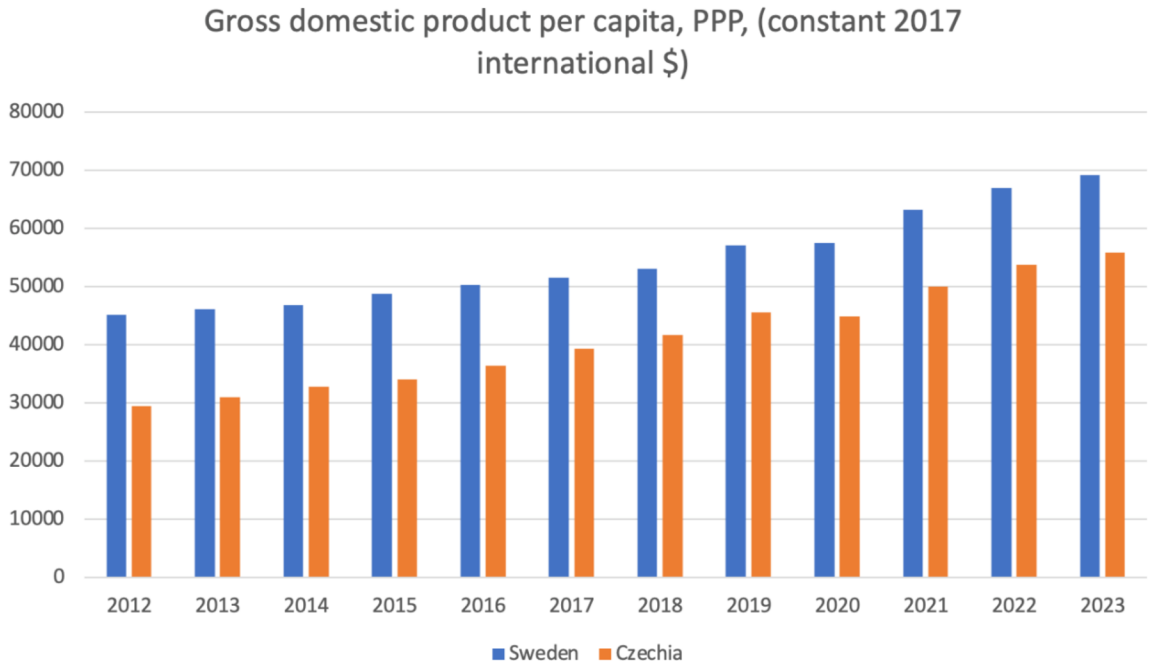

Figure 13. Gross domestic product per capita, PPP, (constant 2017 international $)
Source: own creation based on data from World Bank Group

The table above evaluates gross domestic product (GDP) at purchasing power parity (PPP) expressed in international dollars. It allows Sweden's and Czechia's comparison without any difficulty by comparing adjusted for differences in price levels values and shows similar ongoing trend in both countries with gradual increase. The only year with a decline in Czechia and significantly less increase in Sweden is 2020 which indicates a Covid-19 impact on a global scale. The sharp decrease by -774.6$ in Czechia shows its worse ability to cope with global disruptions in supply chains and overall global challenges that affect all aspects in the country, such as social, political and economic. Sweden manages to show an increase but only by 442.8$ which is a better indicator of a country's effective policies. Sweden shows much higher GDP at PPP within the whole decade that aligns with the fact of its more developed economy in comparison with Czechia, stronger currency and higher incomes. Starting from 45207$ in 2012, there is an increase by 24016.6$ in 2023 which is 69223.6$ in total. However, Czechia is a less welfare state but with good economic and political policies represents improvements and increase in GDP at PPP with an increase by 26409.5$

which is quite good comparing to the GDP at PPP in 2012 which is 29465.6$. Its highest number is in 2023, it is 55875.1$. both countries show great results and ability to stand against global challenges.

In the table below there is an overview of food imports in percentages of merchandise imports in Sweden and Czechia from 2012 to 2023. These countries can be compared due to relatively the same size of population. The trends on the graph are the same with only one discrepancy in 2022 when Czechia has a slight decrease in food imports, while Sweden has an increase showing its consistent increase in the reliance on food imports.

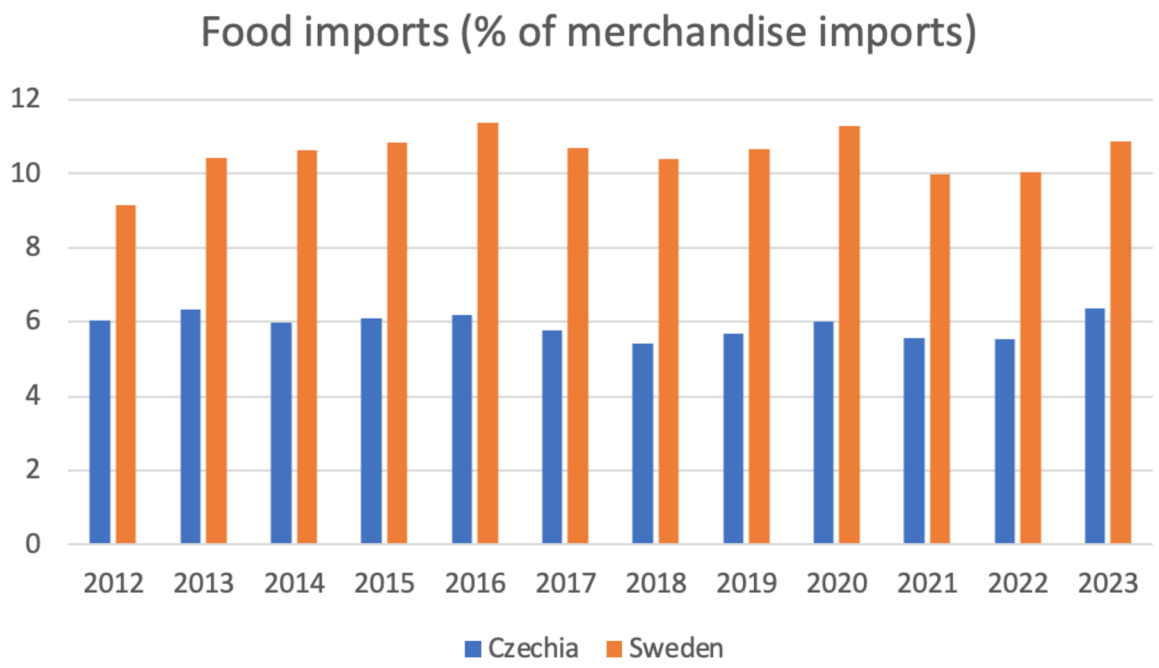

Figure 14. Food Imports (% of merchandise imports)
Source: own creation based on data from Trading Economics

The general trend in food imports is the same, but as it is seen, Sweden represents much higher percentages of food imports out of merchandise imports that can indicate its high reliance on food imports, but at the same time due to its high-income consumers, there might be higher demand for a variety of food products comparing to Czechia which is considered middle-income country. Czechia also shows its advantage over Sweden in its strong agricultural sector that decreases the amount of food imports. In 2012 in Czechia, it is 6% of food imports out of total merchandise imports, while in Sweden it is 9%. Considering this discrepancy and overall upscale trend, the situations in both countries do not show much difference. In 2023 it is 6.4% in Czechia and 10.9% in Sweden. However, it is obvious that

Sweden has higher increase by 1.9% while Czechia has only 0.4% increase. It can be a good sign of Czech food self-sufficiency and the need of Sweden to rely more on its domestic food sector by developing and supporting the national food markets.

While prevalence of undernourishment is one of the required indicators for food access analysis, it cannot be taken into account due to the index equal to 2.5% in both countries within the last decade, from 2012 to 2023. Nevertheless, it presents the equal situation in both countries and their ability to keep this rate stable despite all global and national challenges. Sweden and Czechia show a success in managing food access for the population and have good global ranking with 2.5% considering only this percentage of population having less caloric and energy intake than required.

4.1.4 Utilization

To have the analysis of utilization in Czechia and Sweden, there has to be an examination of Prevalence of Underweight, weight for age (% of children under 5 years old), Prevalence of Stunting, height for age (% of children under 5 years old), Cost of a healthy diet (average PPP Dollars per capita per year), Percentage of Overweight or Obese population aged 15+ and Percentage of population unable to afford a healthy diet according to the suite of food security indicators.

One of the needed indicators to be examined is a cost of healthy diet per capita in purchasing power parity in international dollars per capita per day. On the graph below it is seen the consistent and gradual increase in Sweden and Czechia from 2017 to 2022 in the cost of a healthy diet per capita. The gradual increase is affected by global food price changes, climate changes that impact food supplies and price volatility, as well as the efficiency of agricultural systems. In 2020 there is the same level of cost of a healthy diet per capita (PPP/capita/day), it is 3, that indicates the similarity in food utilization and affordability. The difference between 2017 and 2022 in Czechia is 0.82, and 0.85 in Sweden, which are approximately the same figures showing similar situations in both countries. The lowest number for Sweden is 2.71, while the highest index is 3.56. For Czechia the situation is very close, it is 2.81 and 3.63 respectively. Despite the fact of high living standards in Sweden, there are slightly lower numbers presented within this period of time. It might be due to different levels of inflations and challenges in local food markets that can cause this small discrepancy between

countries. Sweden's higher emphasis on healthy eating, balanced diets and sustainability, rather than in Czechia, can be a reason of lower numbers on the graph.

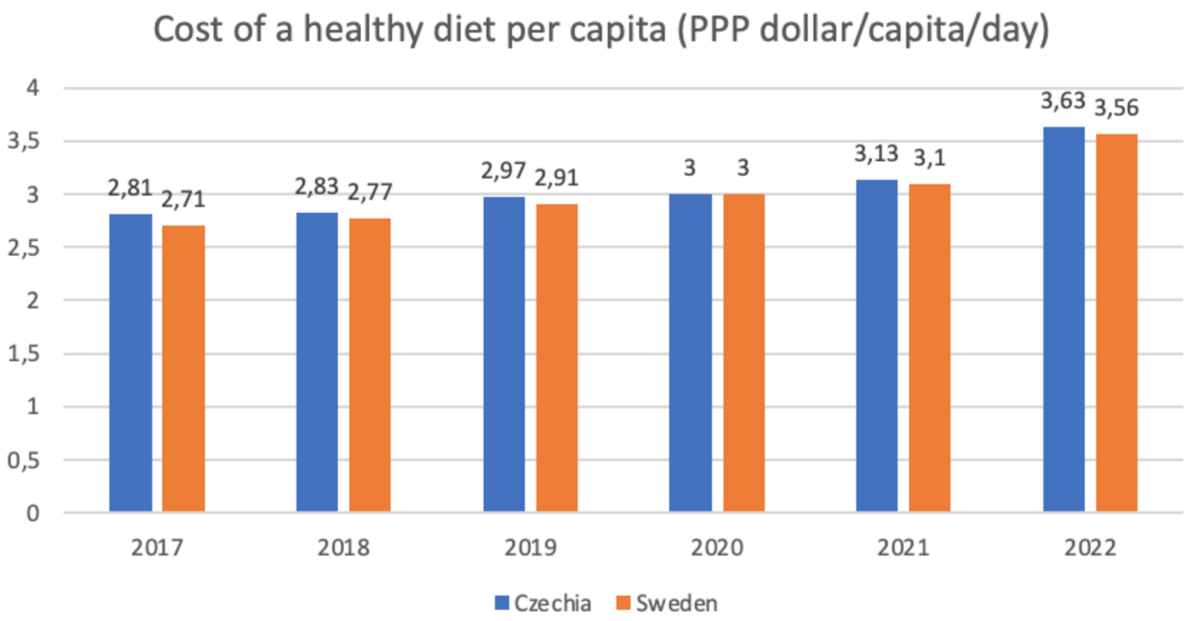

Figure 15. Cost of a healthy diet per capita (PPP dollar/cap/day)
Source: own creation based on data from FAOSTAT and Food Systems Countdown Initiative Data

The graph below shows the percentage of population older than 15 years old who are considered overweight or obese in Czechia and Sweden. In Czechia there is a consistent increase in the percentage of overweight or obese population from 2012 to 2021 with a small decline in 2022 by 0.3% from 60% to 59.7%. in Sweden there is a difference in the trend, as there are fluctuations shown on the graph. There are declines in percentages in 2013, 2014, 2017 and 2019 which indicate good strategies and policies on addressing obesity in the country. The educational programs, effective government tools and promotion of healthy diets present better results than in Czechia. However, in 2012 it is 47.1% of overweight or obese people aged 15+ out of total population and 6.6% increase by 2022. It indicates the urgent need to increase awareness among people, change the tactics of addressing this issue and implement more policies that can reduce the number of obese people in the country. Sweden has only 5% increase. Nevertheless, its index closer to 50%, rather than 60% that Czechia shows, meaning more than half population in Czechia is considered overweight or obese. The peak in the percentage for Czechia is 60% in 2021 and 52.1% in Sweden in 2022. There are more weight-related health risks in Czechia than in Sweden. Education on nutrition is needed in both countries considering the onward trend but with urgence in Czechia. From one side it is a sign of good incomes in the countries and people's ability to afford food. Bu

from the utilization perspective people do not follow nutritious instructions and do not have balanced diets.

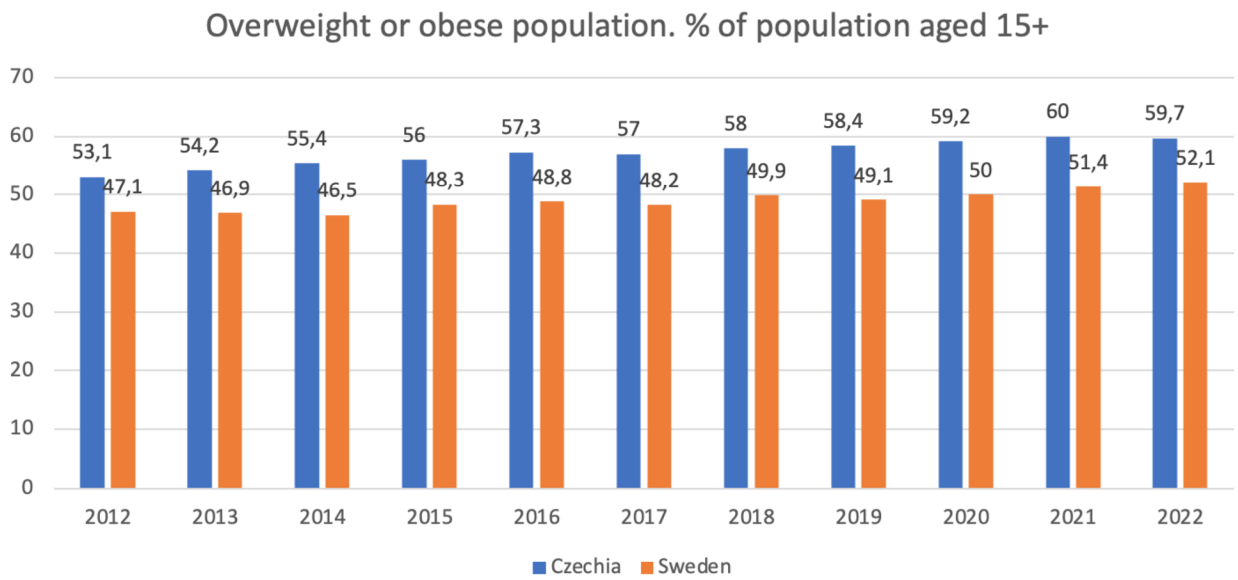

Figure 16. Overweight or obese population. % of population aged 15+
Source: own creation based on data from OECD and CEIC

The table below shows the percentages of the population that cannot afford a healthy diet.

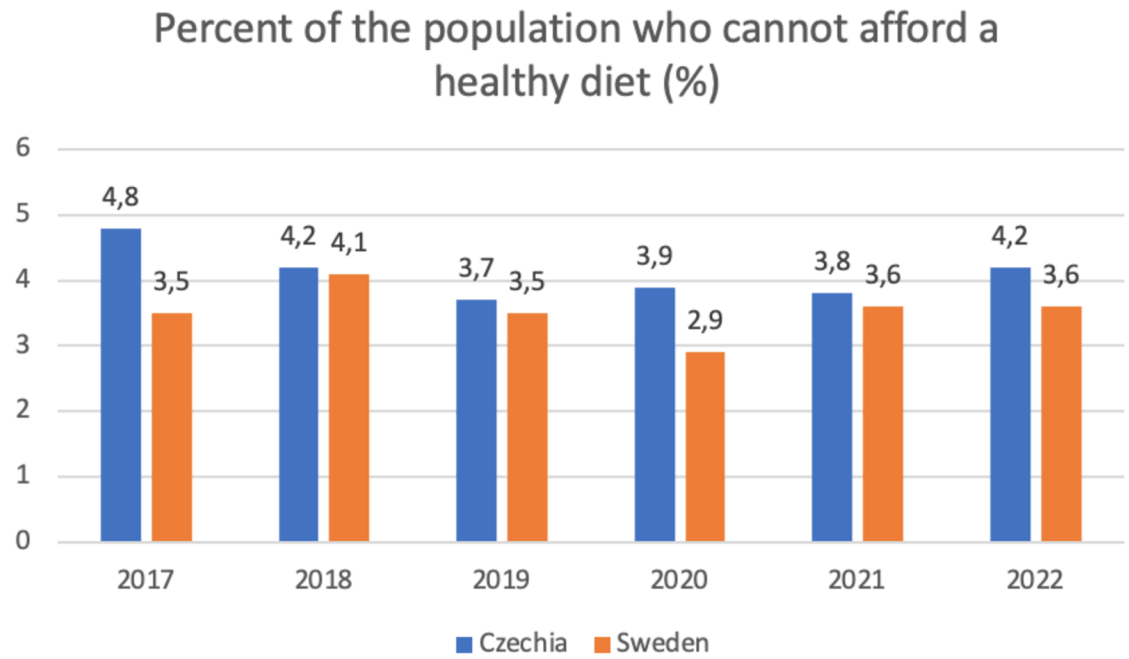

Figure 17. Percent of the population who cannot afford a healthy diet (%)
Source: own creation based on data from FAOSTAT and Food Systems Dashboard

The numbers are given in percentages in Sweden and Czechia from 2017 to 2022. The situations are different but with relatively similar numbers. Overall trends do not show similarities. In 2017 Sweden has 3.5% of people that cannot afford the cost of a healthy diet and Czechia has 4.8%. It is seen that Czechia has worse figures within all years but it has a decline in the percentage to 4.2% in 2022 which refers to better economic conditions in the country, it can be a sign of better salaries and policies that government applies. Sweden, despite its increase in 2022, shows the ability to keep the index on the same level as the increase within 5 years is only by 0.1%. In 2018 Sweden has the highest percentage of people who had difficulties with healthy diets affordability, it is 4.1%. For Czechia it is 4.8% in 2017 and the lowest value is 3.8% in 2021 which is still higher by 0.9%, than the least number that Sweden has in 2020. In 2020, in terms of economic crises and global challenges, food supply disruptions, Sweden manages to keep the percentage of people able to afford the healthy diet and even decreases its number by 0.6% comparing to 2019. It might indicate government subsidies and support of population in difficult times. Both countries keep the range of a relatively good number of people that face challenges with healthy diets.

Prevalence of Stunting, height for age (% of children under 5 years old) and Prevalence of Underweight, weight for age (% of children under 5 years old are 2,5% in both countries within the last decade or even last few years are not subjects of comparison between countries due to unavailable or unchanged data with huge gaps not allowing to run the analysis, as of FAOSTAT and World Data Bank sources, as well as according to national statistical and healthy offices in Sweden and Czechia.

4.1.5 Stability

To fairly assess food stability, it is needed to examine Food Price Inflation, Cereal import dependency ratio expressed in percentages, Per capita food production variability (constant 2014-2016 thousand int. $ per capita), Per capita food supply variability (kcal/cap/day) and Political stability and absence of violence/terrorism (index) in both countries respectively.

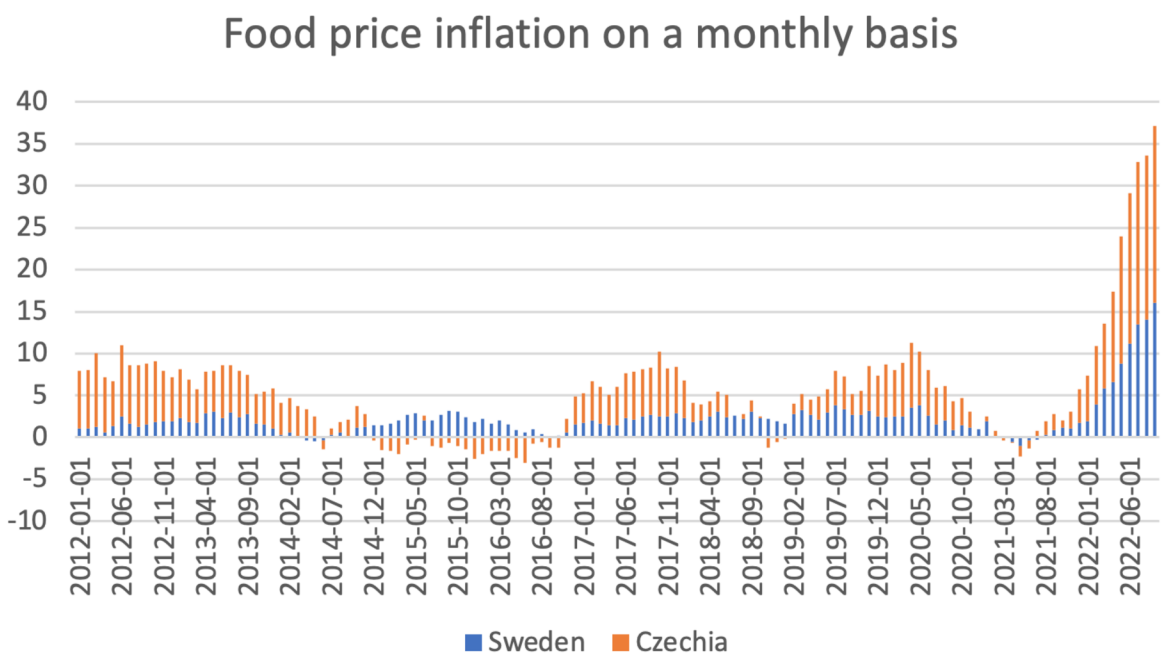

Figure 18. Food price inflation on a monthly basis
Source: own creation based on data from FAOSTAT

Food price inflation on a monthly basis presented above shows mainly tendency to increase from January 2012 to June 2022 for both countries, however, there are overall higher values in Czechia as it is seen from the graph. The downturns in Czechia are from July 2014 to August 2016, when the country reaches even negative values meaning that the prices for food are going down compared to previous years. The lowest value is -1.29 which shows the efforts of a country to keep the inflation rate stable and shows policies effectiveness addressed to price volatilities presenting deflation trend. However, there is an increase from 2017 with further decline in 2018 that can be a reason of higher costs of imports and production, decrease in government subsidies and external conditions, such as economic and political, that could affect the country's prices. Another decline is in 2021 until August, that can be referred to pandemic situation, with further sharp incline. Both countries experience inclines with peaks in food prices from August 2021 to June 2022 due to global economic instability. Sweden and Czechia have the highest values within the last decade in 2022 that is the consequence of global price changes and global challenges that countries all over the world face. The global supply chains affected both countries but with higher impact on Czechia as it is evident from the table above. Sweden has approximately 16, while Czechia reaches a record high of 21. In comparison to January 2012, it is a huge difference in both countries as inflation for food prices is around 1 for Sweden and 7 for Czechia. Furthermore, it is seen that Sweden has relatively same fluctuations within 10 year-period until 2022. The

inflation for food prices does not exceed 5 and usually is at the level of 2.5. Unfortunately, the global problems influenced the whole world that is proved by onward tendency of inflation in 2022. Sweden presents better ability to cope and manage external challenges than Czechia, as well as overall stability in food inflation.

On the table below there is a cereal import dependency ratio expressed in percentages from 2012 to 2022 in Czechia and Sweden. As it is seen there are mainly negative values for both countries within the last decade, where the higher negative figures show greater dependency on cereal imports.

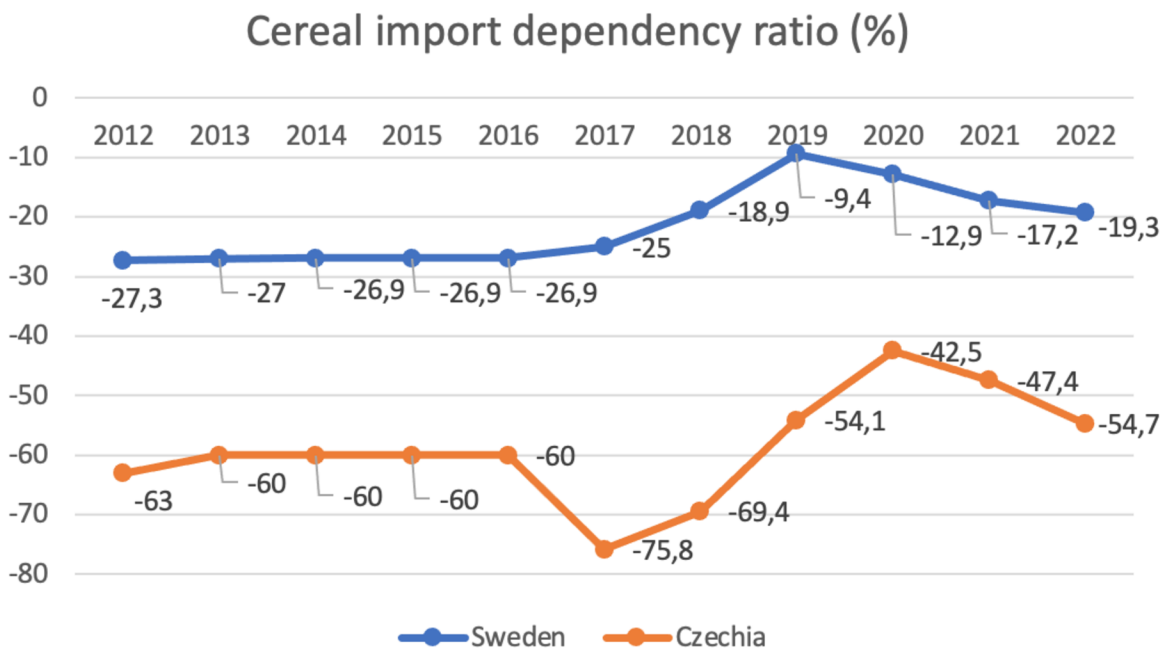

Figure 19. Cereal import dependency ratio (percent)
Source: own creation based on data from Food Systems Dashboard

From the graph above, it can be concluded that Sweden is more self-sufficient in cereal production and does not rely as much as Czechia on import of cereals. The similarity in trends of these two countries shown from 2018 when there is a gradual increase with further downward trend up to 2022. However, there is a difference incorporated as the lowest number for Sweden is 2019, it is -9.4%, while for Czechia it is -42.5% in 2020 with further decline. Czechia's values at this period indicates better domestic cereal production, decreased demand that leads to decreased imports and possible greater government interventions. Czechia represents its ability to stabilize cereal imports dependency from 2012 to 2016 as it is on approximately same level of 60%. Unfortunately, in 2017 there is a decrease by 15.8% that causes the worst situation and the greatest reliance on cereal imports

with -75.8%. In Sweden the situation is different as it presents its consistent reduction in dependency from 2012 to 2019 with stagnation period from 2014 to 2016 at the value of -26.9% but it suggests the stability as the dependency does not exacerbate. From 2020 the cereal import dependency in both countries becomes higher, as the trend is downward. The reason behind it might be climatic conditions, pandemic affect that caused supply chain disruptions and political instability in their main exporters and importers partner-countries. overall, Sweden is less dependent on cereal imports than Czechia.

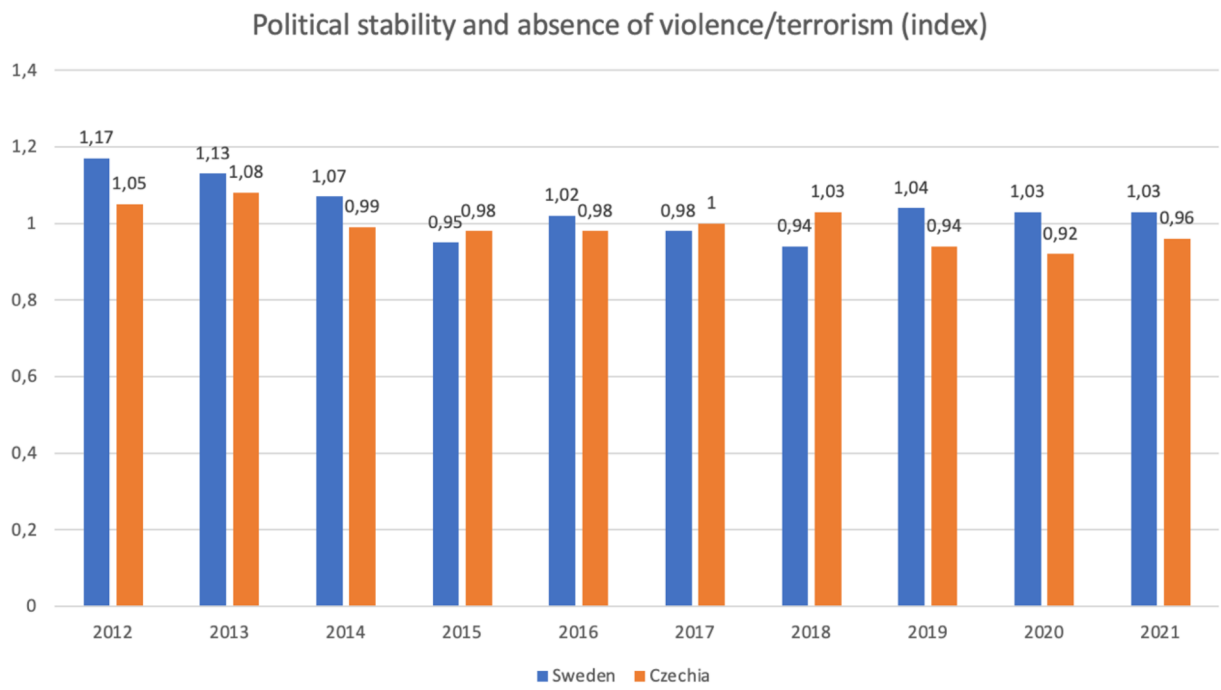

Figure 20. Political stability and absence of violence/terrorism (index)
Source: own creation based on data from FAOSTAT

The graph above represents political stability and absence of violence or terrorism index in Sweden and Czechia from 2012 to 2021. As the range represents -2.5 to 2.5, it is evident from the graph that both countries are at the level of 1, indicating good political stability. However, there are better indices over the period of 10-year period that Swede has. While Czechia's highest index is 1.08 in 2013, Sweden has 1.17 in 2012. Regarding the instability, the lowest number is 0.92 for Czechia in 2020 and 0.94 for Sweden in 2018 respectively. Nevertheless, these values are still higher than actual instability outcomes, which could be seen as negative values, and there is no evidence of political instability or violence in none of these countries. Pandemic situation might have affected Czechia's index in 2020, but Sweden showed its stability as the decrease is insignificant, it is by 0.01 compared to 2019. Both countries have decline trends from 2012 to 2018 that can occur because of global

political challenges that could lead to migration and higher security risks all over the world. Both countries experience fluctuations without sharp changes, while Sweden in general has higher indices showing better political stability, Czechia represents its stable indices within the presented period of time and higher than average political stability that is a good outcome.

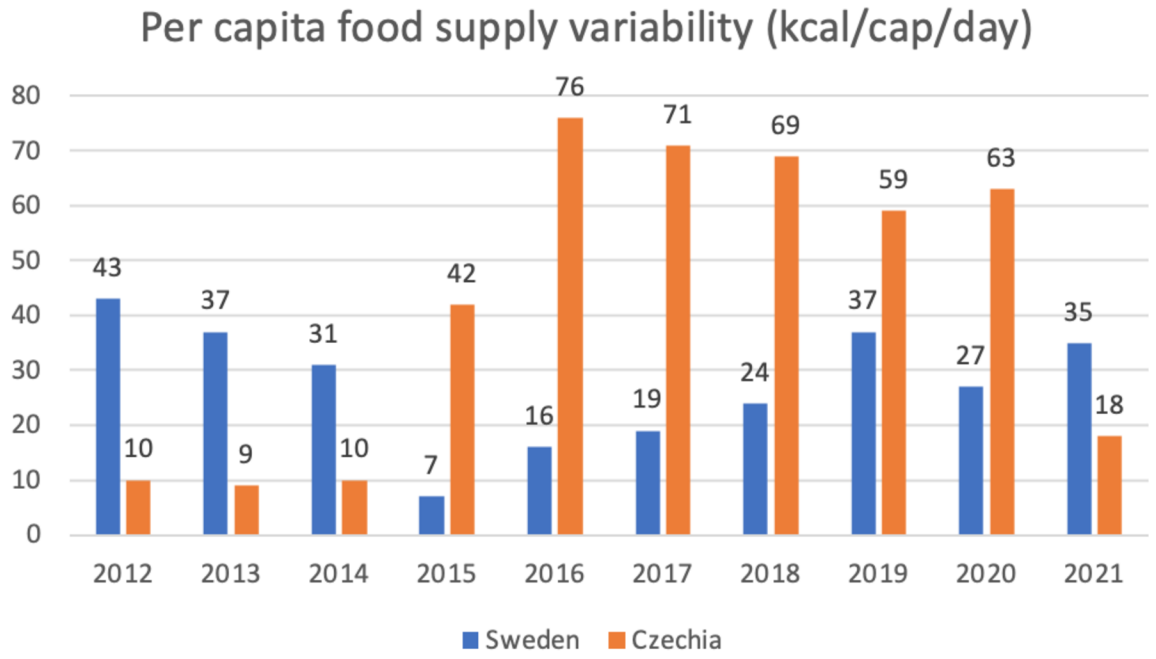

Figure 21. Per capita food supply variability (kcal/cap/day)
Source: own creation based on data from FAOSTAT

Per capita food supply variability is expressed in kcal/capita/day and presents indices from 2012 to 2021 in Sweden and Czechia. On the graph it is seen high fluctuations in Czechia and relatively stable situation in Sweden with dramatic changes only in 2015 with a decrease from 31 in 2014 to 7 (kcal/cap/day) in 2015 that it a good sign due to low figure suggesting lower food supply variability. In Czechia there are higher values that indicate less stable situation and greater fluctuations in the food supply per person per day. The highest difference in Czechia between the values is 45 (kcal/cap/day) from 63 (kcal/cap/day) to 18 (kcal/cap/day) in 2020 to 2021. While in Sweden it is only 24 (kcal/cap/day) which is almost 1.9 times less, highlighting the stability in food supply variability. From 2012 to 2015 there is a gradual decrease in numbers in Sweden, it is an indicator of improvement of food stability but afterwards there is an incline again that shows consistent increase up to 2019 with further downward trend. From 2012 to 2021, Sweden managed to stabilize the food supply variability by 8 (kcal/cap/day). Czechia showed an increase by 8 (kcal/cap/day) from

10 (kcal/cap/day) to 18 (kcal/cap/day) within the same period of time. The peaks in Czechia in 2016 to 2020 can be a result of unstable imports or agricultural production, changes in trade policies or supply inconsistencies that represents highly unstable overall trend from 2012 to 2021. Sweden has more stable food system according to the graph above and does not face such food supply challenges while Czechia does.

On the graph below there is a per capita food production variability expressed in thousands of international dollars from 2012 to 2021. Czechia shows higher values that can be referred to the previous graph with similar results. Sweden shows better stability with higher values from 2019 that can be again explained by the graph presented before.

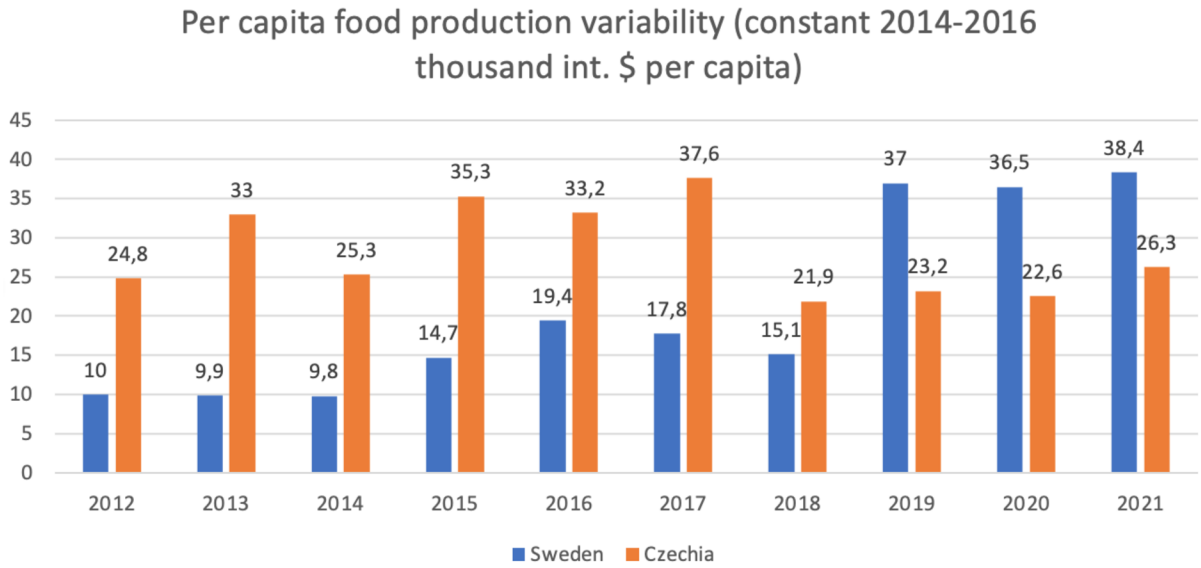

Figure 22. Per capita food production variability (constant 2014-2016 thousand int. $ per capita)
Source: own creation based on data from FAOSTAT

While both countries show fluctuations on the graph, Czechia has more significant changes from year to year that affect per capita food supply variability shown by the author before. There is 1.5 thousands of international dollars from 2012 to 2021 that is 24.8 thousands of dollars and 26.3 thousands of dollars accordingly. However, in 2017 it reached 37.6 thousands of dollars per capita production food variability that showed difficulties with strategies implemented that address food production or agricultural policies. Nevertheless, the improvement is seen in 2018 showing the ability of Czechia to stabilize the situation and reduce the volatility as there are no more spikes seen from 2018 to 2021. In Sweden the volatility exceeds Czechia from 2019 showing its difficulties with managing with global political challenges, external shocks and climatic differences in recent years. From this graph

it follows that Czechia represents better outcomes and stability rather than Sweden with its surged food production variability. However, within 2012-2018 time range the situation is opposite, it is more stable than in Czechia with only small changes. Notable increase occurred in 2019 when Sweden's food production variability increased by 14.9 thousands of international dollars from 15.1 up to 37 thousands of dollars with consistent increases in following years. Trade adjustments might be the main cause of it. resilience in food systems in Czechia might have improved the situation in variability in food production in 2018 indicating its effectiveness.

4.1.6 Key Differences and Similarities

As it is analyzed by the author, food security is relatively the same in both countries with slightly better results in Sweden when assessing food availability, food utilization, food accessibility and stability. However, there are main key points revealed:

- The GFSI (global food security index) is approximately the same between Czechia and Sweden from 2020 to 2022.
- While both countries have developed economies, Sweden has better food educational programs and healthy results, as average dietary energy supply adequacy and protein supply quantity (grams/capita/day) indicate better overall trend and results from 2012 to 2022.
- The primary cereals yield is better in Czechia, but meat total production (pork, beef, poultry), primary sugar crops yield and wheat yield present better outcomes in Sweden rather than in Czechia, even though the main trends are the same. It shows better overall food availability in Sweden.
- Consumer price index (CPI) for food is lower in general in Sweden, but these countries have the same upward trend from 2012 to 2022.
- Gross domestic product (GDP) at purchasing power parity (PPP) expressed in international dollars shows much higher values in Sweden compared to Czechia that highly affects food access in the country.
- However, food imports as percentage of merchandise imports are significatnly lower in Czechia that proves its higher self-sufficiency.
- Czechia and Sweden has same results in prevalence of undernourishment within 2012-2023 period.

- In Sweden there are more people who can afford a healthy diet compared to Czechia from 2017 to 2022, even though the cost of a healthy diet per capita in purchasing power parity in international dollars per capita per day is almost the same.
- Czechia's share of obese or overweight population highly exceeds Sweden's percentage from 2012 to 2022.
- Food price inflation indicates weaker Czechia's ability to manage with external political and economic shocks.
- The similarity is given by political stability and absence of violence or terrorism index in Sweden and Czechia from 2012 to 2021 as it is on a constant level around 1.
- The key difference in stability between Sweden and Czechia is in per capita food supply variability is expressed in kcal/capita/day from 2012 to 2021. Czechia has dramatically higher volatility and changes, as well as indices.
- Per capita food production variability expressed in thousands of international dollars from 2012 to 2021 shows uneven result between countries indicating better and stronger position of Czechia since 2019 but better situation in Sweden from 2012 up to 2018.

GFSI (global food security index) and stability can be assessed as similar in Sweden and Czechia within the time range of 2012-2023. Food access, utilization and affordability are in general better in Sweden examining the key variables and aspects.

4.2 Food Security Questionnaire

The second part of the practical part includes the steps of questionnaire design and its implementation in Sweden for further analysis of the outcomes and formulation of the food security score in both countries. The questionnaire structure and guidelines are based on (International Federation of Red Cross and Red Crescent Societies, 2005) and (Coates et al., 2007) reports with relevant methodology on food security questionnaires conduction and creation, as well as the analysis of results.

4.2.1 Design

The steps of the questionnaire creation are based on (International Federation of Red Cross and Red Crescent Societies, 2005) and (Coates et al., 2007). First of all, there is a Likert scale presented in the questionnaire which evaluate answers on a scale from 1 to 5 (Strongly

Disagree, Disagree, Neutral, Agree, Strongly Agree). Each answer refers to 1, 2, 3, 4 or 5 points for further better analysis of the data received. The questionnaire has a multiple-choice option and has 20 questions in total with the zero question that asks the gender where 0=female and 1=male. Twenty questions are grouped into four key categories that address availability, utilization, accessibility and stability. The food security in this case is assessed from four main domains and the final results provide more informative results. There are five questions asked in each part with five possible answers to keep the questionnaire not time-consuming but allowing to get the data needed for the evaluation of food security situation in the country.

The results are evaluated and compared by finding weighted mean scores for each pillar of food security, each section of a questionnaire (availability, utilization, access and stability), by multiplying a number of respondents by the value of the response, such as 1, 2, 3, 4 or 5, making a sum for each section of 5 questions and dividing it by 110, the total number of respondents in the questionnaire. To get the final total score of food security in Sweden and Czechia it is needed to make a sum of total final scores for each section and divide by 4, which is the number of total sections in the questionnaire. The range of the scores is from 1 to 5. The lower number is a better score due to logically constructed questions showing the best food security situation in the country with answers indicating 1 and the worst scenario is with answers indicating 5. There are two same questionnaires developed for better evaluation of results for Czechia and Sweden accordingly to assess food security separately in Sweden and Czechia.

The questionnaire is constructed as follows with a possibility of 5 answers (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) with a multiple-choice option with one answer for each question:

Q. 0	What is you gender?
	Food Availability
Q. 1	In the past 12 months (from January to December in 2024), did you experience any disruptions in food availability in the markets/stores/online deliveries etc.?
Q. 2	Did you have problems with finding all food types that you wanted in the local grocery store?
Q. 3	Was food essentials (meat, fruit, vegetables, fish, cereals) availability affected by seasonal challenges during the year?
Q. 4	Did you have problems with access to food in in the markets/stores/online deliveries etc.?
Q. 5	Did you have difficulties with finding fresh and nutritious food?
	Food Access
Q. 6	In the past 12 months, did you have days when you could not afford a meal?
Q. 7	Did you have difficulties with affording fresh fish (min. twice per week), meat (min. twice per week), fruit and vegetables (daily)?
Q. 8	Did you have financial problems that led to significant restrictions in your diet?
Q. 9	Do you think the prices for food was high compared to your monthly budget?
Q. 10	Did you have problems with access to the means that could increase your financial resources if you had a food need (part-time jobs, government and social aid etc.) within the last year?
	Food Utilization
Q. 11	In the past 12 months, did you have problems with following balanced diet (carbs, fat, protein, vitamins)?
Q. 12	Did you eat processed food more than twice per week?
Q. 13	Did you choose junk and processed food over more nutritious and healthy food in majority of cases?
Q. 14	Did you have any problems with health due to low nutrient or energy intake?
Q. 15	Did you have less than 3 meals per day during the last year in majority of cases?
	Food Stability
Q. 16	In the last 12 months were there any challenges with food due to political or economic problems in the country?
Q. 17	Did you worry about your food security due to external factors or unexpected expenses (sickness, got fired, vulnerable situation in the country or city)?
Q. 18	Did global supplies affect your diet?
Q. 19	Did you experience problems with healthy diet due to food price volatility?
Q. 20	Did you worry that you cannot be food secure and maintain stable diet in a long-term perspective (more than 6 months)?

Table 1. Food Security questionnaire
Source: own creation based on survey examples from (International Federation of Red Cross and Red Crescent Societies, 2005) and (Coates et al., 2007)

4.2.2 Distribution and Sampling

In the current diploma thesis, the sampling population is chosen in Sweden and Czechia in a number of 110 people in each country, however, taking into consideration probable difficulties, incorrect or incomplete answers, there are 120 respondents asked to finish the questionnaire in case of unexpected troubles. The final number of respondents in Sweden is 112 and in Czechia it is 116, that is why the number of 110 total replies is chosen by the author to proceed. The respondents are Swedish and Czech students whose age varies from 19-25 years which significantly decreases the variability of socioeconomic factors because of their similar educational status, age and most of them live alone which means they prepare food themselves and are responsible for their meals and food that they consume. The number of men and women is not the same but is relatively similar in both countries to keep the share of both genders and get fair results for the evaluation. It allows to assess relatively equal and similar groups of people in both countries, even though the questionnaire is anonymous and only requires to specify the gender if a person agrees with this condition. The students are asked to proceed with the questionnaire via the online shared link created via Google Forms which is cost-effective and convenient way in terms of the distance between Czechia and Sweden. The snowball sampling technique is used to reach more people in Sweden. Facebook, Instagram, Telegram and LinkedIn are used to share the questionnaire with people and find specific group of respondents. The students permanently live in these countries for at least a year or more as the questionnaire cannot be completed by Erasmus students due to their unfamiliarity with a country they live in, limited knowledge about country's political and economic status, and short level of engagement with the food local systems and supply chains. The students are chosen from capital cities in Sweden and Czechia, so that they live in urban area, have free and easy access to public transport, various online deliveries of food and groceries and have variety of grocery shops in their blocks or districts. It is needed to analyse the relatively vulnerable segment of population due to the usual budget limitations that students have, their reliance on either part-time jobs or scholarships from universities that makes it harder for this sampling group to afford healthy and nutritious meals on a daily basis. It can show actual situation of food security in Sweden and Czechia.

4.2.3 Collecting the data

The data for the questionnaire is collected in January and February in 2025 for the reference period of past 12 months, which are from January to December in 2024. The respondents are asked to think about the previous 12 months (2024) as of individuals who prepare food and cook or order food on a regular basis, but not as households. The questionnaire can help to find out if food access is impacted by seasonal changes, if availability and utilization are on a good level, food stability is assessed overall within a year period taking into consideration political and economic situation. Students are asked to accurately define food access and availability with the proper order and placement of questions that are needed to be answered and assist in the easier and faster filling of a questionnaire.

4.2.4 Thematic Analysis of Results

Descriptive statistics of a sample group is presented in a table below. There are total number of respondents obtained in both countries, the final number of responses chosen to be analysed, share of men and women participated in the questionnaire in both countries. Unfortunately, due to difficulties in obtaining questionnaire answers in both countries the share of men and women is not the same as it was expected by the author and it is not equal to 55 in each country but it is considered acceptable difference in number of females and males in Sweden and Czechia.

	Sweden	Czechia
Total Number of Respondents	112	116
Final Number Analyzed	110	110
Total Number of Female	69	73
Total Number of Male	41	37

Table 2. Descriptive statistics of the sample group
Source: own creation based on questionnaire data

From the conducted questionnaire, it is seen below on the diagram that the best sectors of food security in Sweden are food utilization and food stability with 2.187 and 2.427 points accordingly. Higher values are in food access which is 2.615 and can be evaluated as the highest index, and food availability which is 2.527.

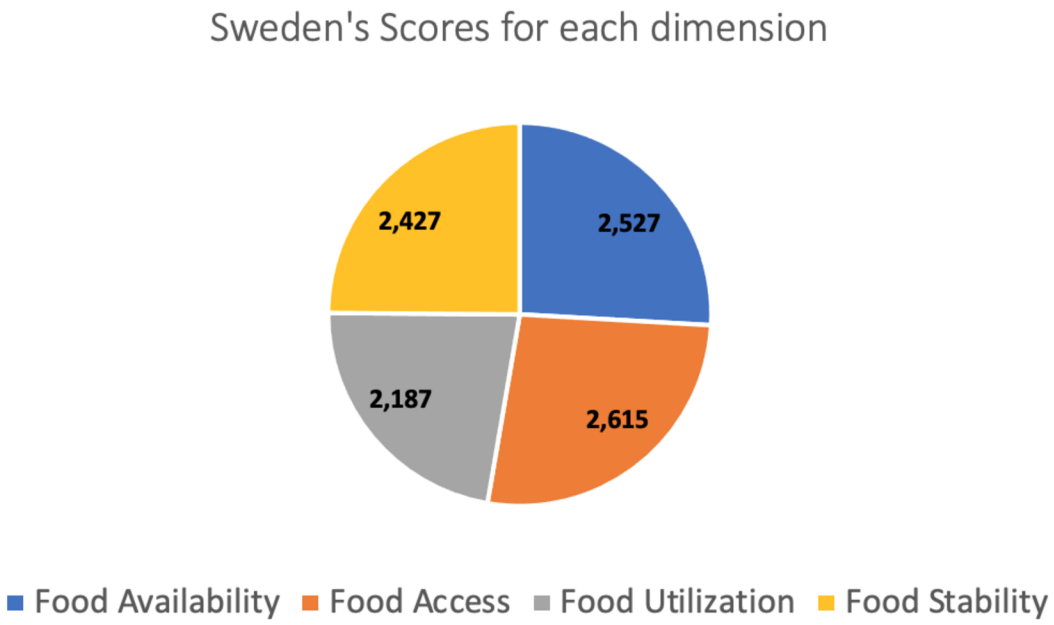

Figure 23. Sweden's Scores for each dimension of food security.
Source: own creation based on questionnaire data

The given results can suggest that there is no extreme food insecurity and the situation in the country can be assessed as satisfied, at least from students' perspective. Respondents are mainly positive about food security in the country, however, food access that covers financial aspects and ability to afford nutritious and fresh food has to be improved as the record high sector on the graph. Students in Sweden marked food availability as pleasant but relatively high compared to food utilization that also requires some actions from health and food offices, government and social organizations. due to global difficulties with imports and exports, global inflation and political instability there are global food supply chain disruptions that could affect respondents' opinion in 2024. Nevertheless, the situation is good and shows Sweden capability to cope with difficulties in times of global challenges.

On the graph below it is seen Czechia's results for each dimension of food security. There are a bit higher scores gained than in Sweden which is considered as higher food insecurity.

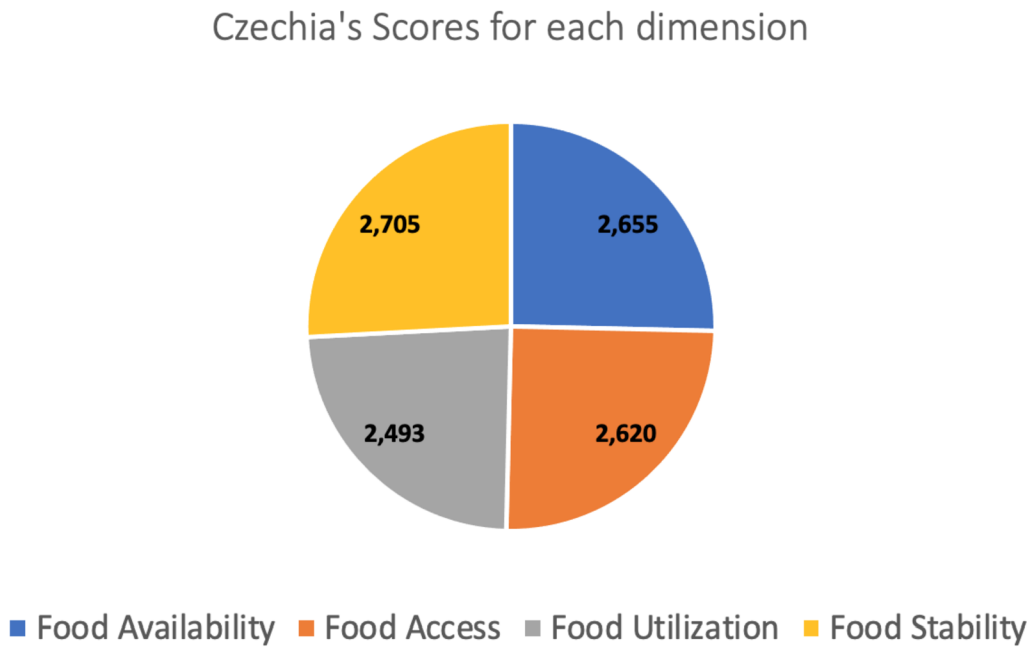

Figure 24. Czechia's Scores for each dimension of food security
Source: own creation based on questionnaire data

The highest score is 2.705 for food stability, then it is 2.655 for food availability, on the third place it is 2.620 for food access and the winner with the lowest score is food utilization, it is 2.493. While the results are expected to be lower in this country compared to Sweden, it is surprising that food utilization has better score than food stability according to the analysis of food security in Czechia mentioned in the previous chapter. The political situation that is measured by the index of terrorism or violence, food production and supply variability might show different outcome, rather than respondents' opinion on political and economic problem in the country. It might be said that Czech students evaluate overall stability in 2024 a bit worse than it is given on the analysed graphs before. It might be subjective opinion, but at the same time it is real-based result that suggest improvements in stability of the country that affect food stability and food security. Food availability also requires better approach that address its dimension to decrease its score. In general, as it is seen, all dimensions are assessed as good and food security is evaluated in Czechia as satisfying.

In comparison between Czechia and Sweden it can said that food access has the most similar score, as it is 2.616 in Sweden and 2.620 in Czechia. The biggest gap is noticed in food utilization as it is 0.306. In Sweden it is 2.2 and in Czechia it is measured as 2.5. It is expected difference due to better population awareness in Sweden and more effective policies on

healthy lifestyle, more balanced and nutritious diets, better educational emphasis on energy and calorie intake. Considering all other pillars, there is no much difference between food access due to developed economies, relatively high incomes among European countries and good relationships with the rest of the world that affect trade flows and food supply chains in the countries. Food availability has smaller gap than food stability that can show better government support of citizens in Sweden, as respondents feel food secure more in Sweden and it is proven by the answers on food price volatility that affected their health and their anxiety on being food secure in case of unexpected expenses.

4.2.5 Comparison of Results in Sweden and Czechia

From the figure below it can be seen the difference in number of answers in each category: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree, which correspond to 1, 2, 3, 4 and 5.

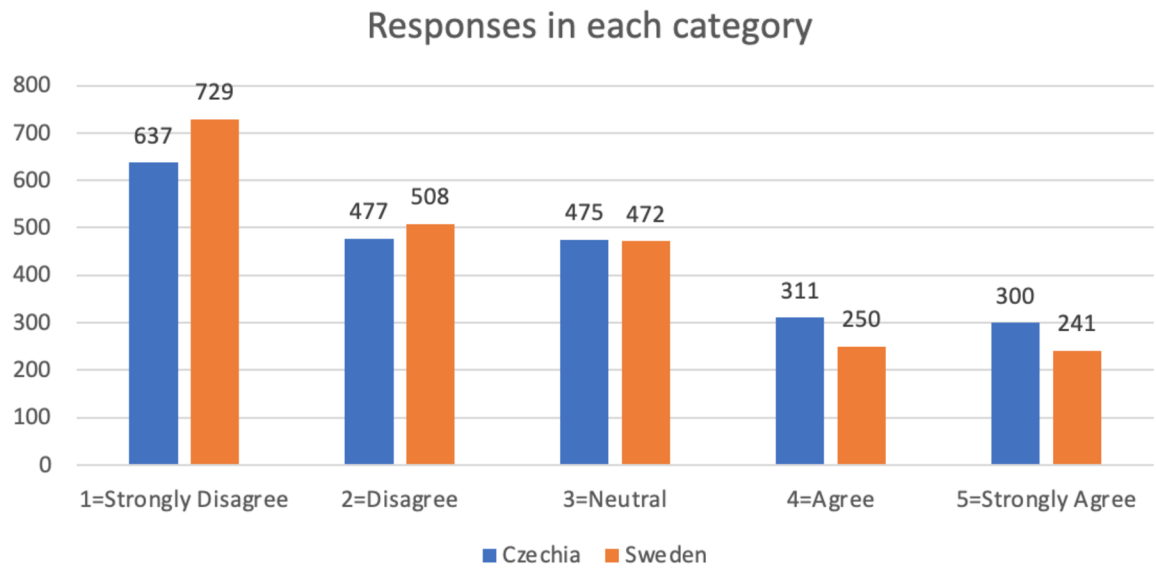

Figure 25. Total number of responses in each category
Source: own creation based on questionnaire data

The total number of responses in each country is 2200. Out of 2200 it is evident from the table above that most of the respondents chose "Strongly Disagree" answer which is the best answer for the question. 729 times is chosen this answer in Sweden and 637 times in Czechia. The second answer "Disagree" is chosen 477 times in Czechia and 508 in Sweden which is 31 responses higher which is a bit better result. "Neutral" is chosen almost with the same number of answers gained in both countries with only 3 answers difference, at this time Czechia shows better outcome. "Agree" is chosen by 61 responses more in Czechia which

is 311 in total and in Sweden it is 250. The least pleasant answer which shows the worst answer is “Strongly Agree”. In Sweden the number of responses is better, it is 241, while in Czechia it is by 59 responses higher, totaling 300 answers. From the table above it is concluded that the share of people answering in favor of food secure situation in the country is the highest among other segments and the least satisfying answer showing food insecure situation in the country is chosen the least number of times which is a good indicator for both countries. However, Czechia has much worse result than Sweden in negative answers, such as “Agree” and “Strongly Agree” that has to be improved.

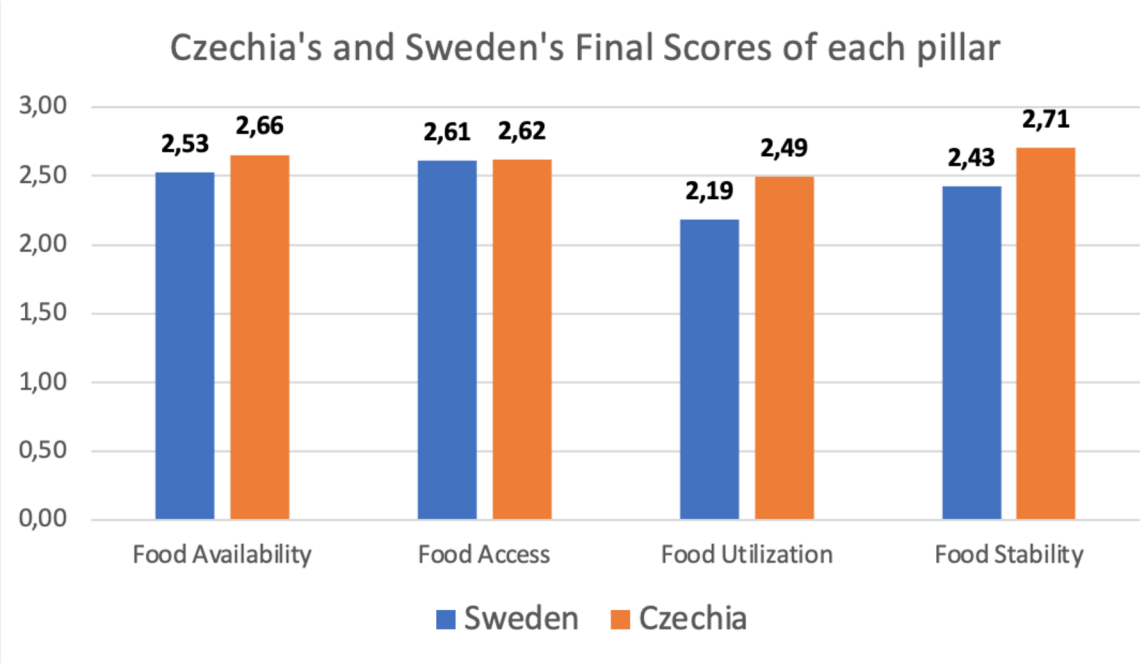

Figure 26. Czechia's and Sweden's Final Scores for each pillar of Food Security
Source: own creation based on questionnaire data

On the graph above there is a comparison of final scores of food security pillars which are availability, utilization, access and stability. As it seen on the graph, Sweden outperforms Czechia with each dimension, however, the lowest difference in final scores is in food access which is 0.01 point that can be considered being almost on the same level. In food availability the difference is also small which is 0.13 lower in Sweden. Food utilization in Sweden is 0.3 points better than in Czechia, as well as food stability which is 0.28 lower.

On the table below there are final food security scores presented for Sweden and Czechia as per perception of students from Stockholm and Prague. As it is seen, Sweden has 2.44 and Czechia has 2.62. The difference in total is 0.179 which is a small distinction and it proves

the possibility of Czechia to become soon one of the top-leading food secure countries in the world if it keeps the pace of improving food security from all four pillars in Czechia. Moreover, it states again that Sweden has a better food security score in comparison with Czechia. The score is calculated by the author by making a sum of scores estimated for each pillar in Czechia and Sweden respectively.

Sweden's Total Final Score	**2,439**
Czechia's Total Final Score	**2,618**

Table 3. Final Food Security Scores for Sweden and Czechia
Source: based on students' responses participated in the questionnaire

Despite the minor differences between these two countries shown on the graph above representing 2024 year, it can be concluded from the questionnaire data evaluation that respondents value Czechia's food security situation almost the same as people in Sweden that proves that GFSI (global food security index) only slightly exceeds Czechia's within the last years. It can be also proved by the analyses of the base suite of food security indicators done by the author, even though there are no dramatic differences found between Sweden and Czechia, Sweden outperforms Czechia in food security in the time range of 2012-2023 in food security state.

5 Results and Discussion

5.1 Food security index

As a result, the author can state that Sweden has better food security index within 2012-2023 than Czechia due to more effective government policies implemented to address food insecurity issues. The higher income in Sweden decreases food security risks, while political and economic stability increases the chances of population to have equal access to nutritious and fresh food all over the country. Furthermore, as it is stated by (European Commission, 2023, p. 55), the social situation in Sweden is improving, reversing the long-term negative trends in poverty and income inequality, confirming the author's positive results regarding food security in this country. It ensures accessibility to a wide variety of food products needed to maintain balanced diet and stay healthy, as well as its availability. People feel food secure and are less worried than in Czechia to face challenges because of quick response of government to any difficulties that Sweden can have, for example, global instability and

crises that are easily overcome thanks to high-efficient government system. People in Sweden are more educated in terms of food, diets and non-communicable diseases that could rise from poor meals. Educational programs and high awareness of citizens in the country help to achieve better food security goals. For instance, Food Agency in Sweden provides citizens with free publicly accessible online programs aimed at increasing knowledge about food security, food safety and healthy habits in general (Food Safety Magazine, 2024).

Czechia has improved its food security situation within the last years due to better policies addressed on support of farmers to become more self-sufficient in food and due to increased awareness in the country because of significant problems with health that affect population's lives. According to (European Comission, 2024), Czechia is applying strengthened good agricultural and environmental conditions (GAECs), which farmers need to meet in order to benefit from the entire income support. It also gives incentives to local farmers to support biodiversity, promote organic production and improve animal welfare. It proves Czechia's attempts to reduce food insecurity in the country as it was stated by the author before. The worsened indices of obesity and poor results of people who follow healthy diets in recent years lead to increased attention from government side. The improvements are also needed in relation to political stability in the country. For example, more effective policies are needed to address the issue of rising inflation – as it is claimed by (Statista Research Department, 2025), in December 2024, the inflation rate for food in Czechia amounted to a positive value of 1.7 percent that indicates increase by two percentage points comparing to the previous year. It is one of the reasons for citizens to feel food insecure if referring to future. The questionnaire results also revealed that Czech people are more worried about stable diets in the future, rather than Swedish people. While Czechia is considered as a country with stable economy and government, there is high dependence on other European countries, such as imports, political decisions, policies implemented and actions run, that have more impact on Czechia and its citizens than in Sweden. As it mentioned by (Office of the Government of the Czech Republic, 2021), the impact of EU programmes on the Czech economy was identified and there was a direct link established between the use of EU programme funding and positive changes in GDP and overall employment. It proves Czechia's dependence on the EU that should be decreased in order to improve its food security and become more independent country to face external shocks with better stability.

Overall, after reviewing the articles and conducting various data analyses, it can be stated that even though the problem of food security exists in both countries, the author can claim that it is not the first thing on the agenda that needs immediate and urgent actions in Sweden and in Czechia, but the approach of the countries' governments has to be appreciated, as seeing the issue arising, there are already some actions taken that can help to prevent the further acceleration of the food insecurity issue in the states. There is a variety of food suppliers, food producers and food markets in both countries. That is why there is no risk of food shortages that would cause extreme hunger in Sweden or Czechia that could not be solved eventually.

However, as it is stated by (European Commission, 2023, p. 4), Sweden is on track to achieving the Sustainable Development Goals (SDGs), but it could do more to reduce inequalities. While Czechia has lower GFSI (global food security index), Sweden has worse Gini coefficient that has to be improved to increase food security situation. As it is proposed by literature, one of the main Sweden's problems is income inequality that can lead to worsening of food security score and undermine stability in a country. Even though Sweden shows a great example of a country that is able to face challenges and quickly recover after internal or external difficulties, Czechia is able to keep better income equality, which is 0.26, while Sweden has 0.3 (World Bank, 2023). Sweden has dropped ten places in the global Commitment to Reducing Inequality Index in 2022, and has plummeted to 20th place—the lowest rank among the Nordic countries, while Norway tops the list (The Lancet Regional Health – Europe, 2023). Even though Sweden presents close to ideal results and achievements in the modern world, there is a problem that has to be addressed until it causes a bigger negative effect on social, political and economic realms in the country. Global food security score is one of the highest in the world in Czechia, but in 2022 Czechia has shown less than EU average ability to afford a proper meal that is suggested to be connected with financial difficulties from Covid-19 despite its efforts to improve the food security situation in a country in recent years (European Comission, 2024d). While Sweden's results present its ability to cope effectively with crises and external shocks during 2012-2023 that contributes to the idea of Sweden been more politically, economically and socially stable, effective and flexible to resist and adjust to challenges, and keep one of the top food security scores in the world that is proven by comparative analysis between Czechia and Sweden and

respondents' perception of food security with a reference period of 2024 been better in Sweden in the given diploma.

5.2 Questionnaire outcome

As per the questionnaire conducted in Sweden and Czechia in 2024 with a reference period of 2024, there is a conclusion that students are less affected by food security issues in Sweden despite its overall higher prices, at least by their perception. The wealthier economy, higher salaries and more sustainable practices used for the last decades have advantages over Czech system as students in Sweden feel more food secure and are not worried to have extreme problems in the nearest future with food due to support from government, various job opportunities and food agencies that work effectively to assist people in need. Sweden effectively reaches food security goals every year and maintains stability in society despite external problems as it is stated in its annual report (European Commission, 2023). However, despite worse food security index in Czechia developed from the questionnaire, students have good conditions to stay food secure and be able to afford essentials during the year, that is also proven by high number of Czech policies addressed at food insecurity, especially by supporting local farmers (European Comission, 2024). The political stability, high inflation on food products, high dependency on its export and import partners, as well as slow response to global difficulties affect students due to their higher vulnerability and risks of further financial instability that directly impact their diets that is also suggested by high inflation for food products in Czechia in recent years (Statista Research Department, 2025).

In general, the final results are expected due to a bit lower GFSI (global food security index) in Czechia than in Sweden. Better consumer price index can be connected to better perception of food security in Sweden, as well as relatively high food self-sufficiency can be explained by only a small variability between final food security scores in Czechia and Sweden. The final scores of food security in Sweden and Czechia calculated from the questionnaire developed by the author prove better Sweden's situation at food security and it is also supported by the comparative analysis of the suite of food security indicators in both countries between 2012-2023. However, development of sustainable programs, rise of education on food security and balanced diets, better promotion and support of local markets and improved political and economic stability in Czechia can improve students' situation in the country.

6 Conclusion

In the given diploma thesis, the literature review is used by the author for the solid background to proceed with further practical part in the given diploma thesis. The author's goal is to overview food security in Sweden and Czechia, after that prove that Sweden has a better food security score in 2012-2023 and formulate the main reasons behind it. The goal is reached due to various scientific articles and books analysed. There are macro and micro analyses done by the author. There are used respondents' perception of food security in Sweden and Czechia as a micro analysis. At the same time there are global trends, aggregate data and external and internal factors affecting food security examined as a part of macro analysis. It includes GFSI (global food security index) comparison. A part of macro examination is detailed comparison analysis between Sweden and Czechia performed based on the suite of food security indicators. The questionnaire development for both countries, 110 answers received and further examination of responses of students from capital cities. Calculation of food security final scores for each country by the author and their comparison proves the idea of Sweden's higher food security score in comparison to Czechia.

In conclusion, it can be said that Sweden has overall higher GFSI (global food security index) during 2012-2022, which is one of the main indices used to evaluate food security. In comparison to Czechia, Sweden has more developed food educational programs in universities and schools that result in better healthy results in the country and better diets.
High food security index in Sweden is achieved by the help of society that follow healthy habits, as well as effective government policies and efforts to maintain and increase food security index. Sweden and Czechia are almost on the same level in food availability, but consumer price index is lower in Sweden which corresponds to efficient use of government tools and leverage to succeed in food security in this country. Food access also shows better outcomes in Sweden due to higher figures of gross domestic product (GDP) at purchasing power parity (PPP) expressed in international dollars compared to Czechia within 2012-2023. Due to higher average incomes, better social benefits, allowances and support, relatively equal income distribution among citizens and better eating culture in Sweden than in Czechia, there are more people able to afford a healthy diet according to the data availability from 2017 to 2022. At the same time better health-consciousness shows lower

overweight and obesity rates in Sweden in comparison to Czechia that is a result of a combination of factors mentioned before. Sweden, as it is seen from the analysis of food price inflation from 2012-2022, better manages with external political and economic shocks that can heavily affect food security condition in the country. Political and economic stability, absence of violence in Sweden, that is proved by the analysis of terrorism index, is a great contribution to high food security index that positively influence each pillar of food security: availability, access, utilization and stability.

In terms of main differences and similarities between Sweden and Czechia, it is concluded by the author that Sweden has better food educational system, overall healthy results, which is supported by better results in average dietary energy supply adequacy and protein supply quantity (grams/capita/day) from 2012 to 2022. Consumer price index (CPI) for food, meat total production (pork, beef, poultry), primary sugar crops yield and wheat yield, gross domestic product (GDP) at purchasing power parity (PPP) expressed in international dollars, affordability of a healthy diet, share of obese or overweight population, food price inflation and per capita food supply variability indicate better outcomes in Sweden rather than in Czechia. However, the primary cereals yield and food imports as percentage of merchandise imports in Czechia indices outperform Sweden's results. The similarities are seen in prevalence of undernourishment within 2012-2023 period, the cost of a healthy diet per capita in purchasing power parity in international dollars per capita per day, political stability and absence of violence or terrorism index in Sweden and Czechia from 2012 to 2021. As it is analyzed, Sweden has better food security pillars (availability, access, utilization and stability) results according to the analyzes conducted.

As per the questionnaire outcome, in comparison of the students' responses from Stockholm in Sweden and from Prague in Czechia in a number of 110 replies from each country, there is a better perception of food security in Sweden in terms of all four pillars: availability, accessability, utilization and stability in the reference period of 12 months from January to December in 2024, while the results are only slightly lower in Czechia than in Sweden. 120 students in Sweden and Czechia have been asked to fulfil the questionnaire to analyze the results and either support the results from the analysis of food security indicators or counterargument the obtained data from people's perception view point. The final number of 110 students showed better perception of food security in Sweden due to better inflation

rates, better political and food production stability. The final scores obtained from Sweden and Czechia are 2.44 and 2.62 respectively.

The overall results received support each other, as findings from the analysis of the suite of food security indicators is proven by the students' perception of food security in Czechia and Sweden, that is also supported by previously analyzed scientific articles, reports and books that state that Sweden has one the best food security indices in the world and it is a little bit higher than in Czechia. However, Sweden also shows great results in maintaining the high rate of food security and keeps increasing it. At the same time Czechia indicates huge efforts to improve food security situation in the country within the recent years that is also analyzed and seen from the graphs, as well as small difference between GFSI (global food security index) in recent years and slightly different results in the perception of food security from people's perspective obtained from the questionnaire constructed.

While Sweden has to pay more attention to improve and address food access mainly with slight improvement in other dimensions of food security, as well as keeping the rates in each pillar stable, Czechia has to continue its effective policies, strategies development, population education and financial support of those in need to rise food security index and become one of the high-ranked food secure countries as it is very close to reach its goal in the nearest future. There is an education on food security and waste at schools and there are various attempts implemented especially in recent years to increase the awareness of the issue of food security, for example, in Czechia, Ministry of Agriculture invests significant amounts of money in research and development of the agrarian sector that contributes to food security level in the country.

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8 Appendix

Section 1 of 5

Food Security

Thank you for your participation! This questionnaire is a part of a study research on Food Security. It covers 4 pillars of Food Security: availability, utilization, accessibility and stability. It leads to 4 categories with 5 questions each. It is **anonymous research** which provides valuable insights into **individual food experiences over the past 12 months from January to December 2024**. It is a multiple-choice questionnaire with a Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). Please, **rely on your personal data**, NOT on a household based.

What is you gender? 0=female and 1=male. Please, mark the last answer if you prefer not to specify your gender. *

- 0
- 1
- I prefer not to answer

After section 1 Continue to next section

Section 2 of 5

Food Availability

Description (optional)

In the past 12 months (from January to December in 2024), did you experience any disruptions in food availability in the markets/stores/online deliveries etc.?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have problems with finding all food types that you wanted in the local grocery store?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Was food essentials (meat, fruit, vegetables, fish, cereals) availability affected by seasonal challenges during the year?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have problems with access to food in the markets/stores/online deliveries etc.?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have difficulties with finding fresh and nutritious food?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

After section 2 Continue to next section

Section 3 of 5

Food Access

Description (optional)

In the past 12 months (from January to December in 2024), did you have days when you could not afford a meal?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have difficulties with affording fresh fish (min. twice per week), meat (min. twice per week), fruit and vegetables (daily)?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have financial problems that led to significant restrictions in your diet?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Do you think the prices for food was high compared to your monthly budget?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have problems with access to the means that could increase your financial resources if you had a food need (part-time jobs, government and social aid etc.) within the last year?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

After section 3 Continue to next section

Section 4 of 5

Food Utilization

Description (optional)

In the past 12 months, did you have problems with following balanced diet (carbs, fat, protein, vitamins)?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you eat processed food more than twice per week?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you choose junk and processed food over more nutritious and healthy food in majority of cases?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have any problems with health due to low nutrient or energy intake?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you have less than 3 meals per day during the last year in majority of cases?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

After section 4 Continue to next section

Section 5 of 5

Food Stability

Description (optional)

In the last 12 months, were there any challenges with food due to political or economic problems in the country?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you worry about you food security due to external factors or unexpected expenses (sickness, got fired, vulnerable situation in the country or city)?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did global supplies affect your diet?

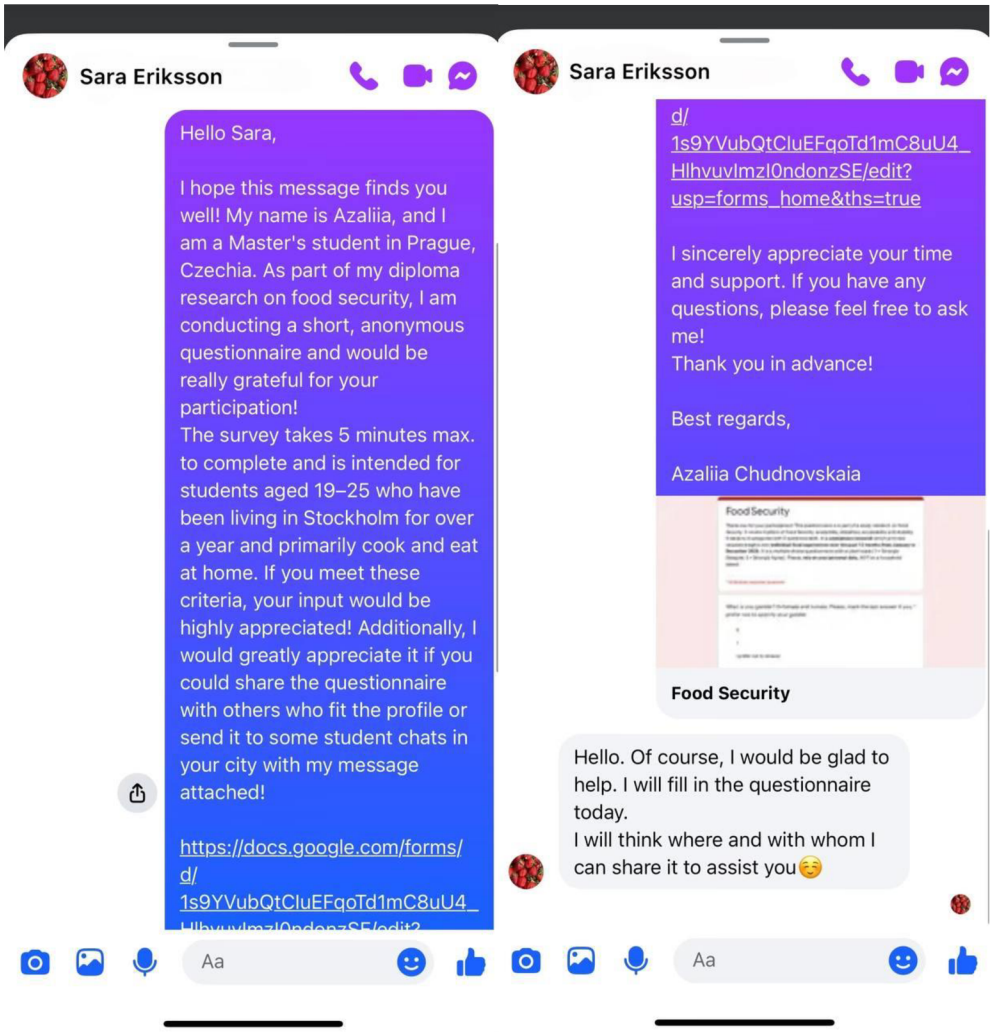
- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

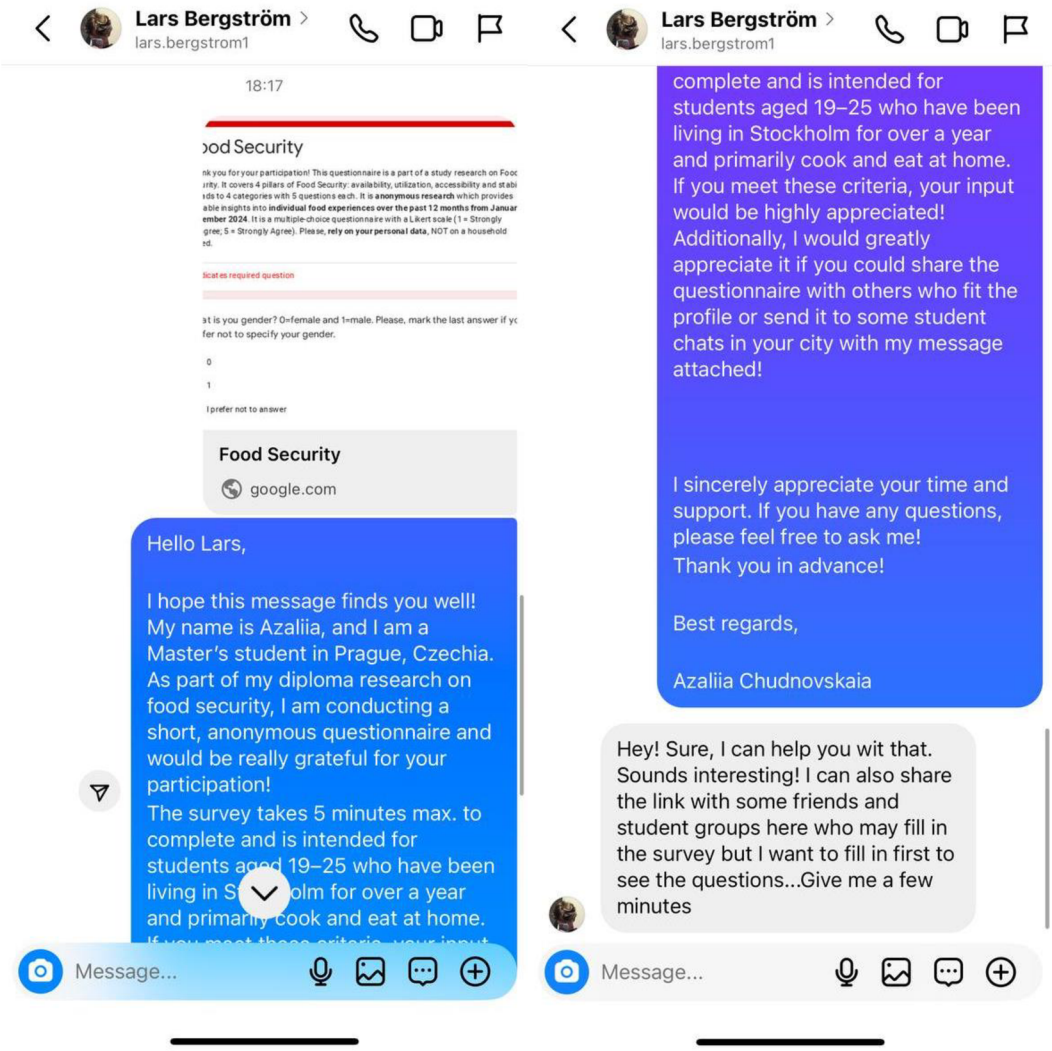
Did you experience problems with healthy diet due to food price volatility?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree

Did you worry that you cannot be food secure and maintain stable diet in a long-term perspective (more than 6 months)?

- 1=Strongly Disagree
- 2=Disagree
- 3=Neutral
- 4=Agree
- 5=Strongly Agree




Lars Bergström
lars.bergstrom1
18:17
ood Security
Food Security
google.com
Hello Lars,
I hope this message finds you well!
My name is Azaliia, and I am a Master's student in Prague, Czechia.
As part of my diploma research on food security, I am conducting a short, anonymous questionnaire and would be really grateful for your participation!
The survey takes 5 minutes max. to complete and is intended for students aged 19–25 who have been living in Stockholm for over a year and primarily cook and eat at home.
Message...
Lars Bergström
lars.bergstrom1
complete and is intended for students aged 19–25 who have been living in Stockholm for over a year and primarily cook and eat at home.
If you meet these criteria, your input would be highly appreciated!
Additionally, I would greatly appreciate it if you could share the questionnaire with others who fit the profile or send it to some student chats in your city with my message attached!
I sincerely appreciate your time and support. If you have any questions, please feel free to ask me!
Thank you in advance!
Best regards,
Azaliia Chudnovskaia
Hey! Sure, I can help you wit that. Sounds interesting! I can also share the link with some friends and student groups here who may fill in the survey but I want to fill in first to see the questions...Give me a few minutes
Message...