Food Security in Iceland
Present Vulnerabilities, Possible Solutions

Orri Jóhannsson

Lokaverkefni til MA-gráðu í almýðisamshópum

Félagsvíslasvið
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Ritgerð þessi er lokaverkefni til MA-gráðu í alþjóðasamskiptum og er óheimilt að afrita ritgerðina á nokkurn hátt nema með leyfi réðhafar.

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Reykjavík, Ísland 2011
Abstract

Food insecurity is a major worldwide problem. This problem is only likely to grow as food prices increase and resources get scarcer. Numerous international institutions and experts predict that conflicts over food will become more common as water and food resources become more valuable. Iceland’s small and import-oriented economy is not immune from this development and the influence of this global trend can already be felt in Iceland. Higher global food and resource prices combined with the devaluation of the Icelandic Króna have already made food imports more difficult for Iceland. This has prompted debate on the subject of food security and the value of strong domestic food production, although this discussion has not yet spread through society as a whole.

Based on extensive research into economic data, consultation with experts and conducting a questionnaire among the public, this thesis attempts to shed light on the country’s food situation, its vulnerabilities, and its strengths. Questions are asked about how Iceland stands in this regard and what threats and risks potentially endanger the food security of the nation. The state of preparedness (or lack thereof) within the administration is examined and questions are asked about what Iceland could do to improve in this area. The general findings are that the Icelandic authorities have no comprehensive contingency plans for food security and no plans for emergency food reserves. Finally, suggestions are made about areas for improvement so that food security can be safeguarded.
Útdráttur

Fæduóöryggi er mikið vandamál í heiminum. Umfang vandans á aðeins eftir að aukast þar sem matvælaverð fer hækkandi og öll aðföng verða stöðugt erfiðari. Fjöldi allhjóðastofnana og sérfræðinga spá því að vopnuð átök vegna deilna um vatn og matvæli eigi eftir að verða algengari þar sem slikur varningur verður sifellt verðmætari. Smár og innflutningsmiðaður efnahagur Íslands er ekki önnurður fyrir þessari hnaattrénu þróun og áhrif hennar má þegar finna á Íslandi.

Hærra matvæla- og aðfangaverð á heimsmarkaði ásamt falli krónunnar hafa þegar gert innflutningi erfitt um vík. Þessi þróun hefur vakið upp umræðu um fæduóörgginni þjóðarinnar og þýdingu þess að búa yfir sterkri innlendri matvælaframleiðslu.

Með því að framkvæma viðamikla rannsókn á hagtölum, leita álits hjá sérfræðingum og með því að leggja fyrir spurningalista meðal almenningar reynir þessi ritgerð að varpa ljósi á ástand matvælagerðar heimins, veikleika hans og styrk. Spurt er hvernig Ísland standi í þessu tilliti og hvaða ógnir og hættur steðji hugsaðlega að fæduóörgginni í landinu. Viðbúnaður (eða skortur á honum) innan stjórnóðsins er skoðaður og spurningar lagðar fram um hvað Ísland geti gert til að bæta sig í því tilliti. Helstu niðurstöðvar eru þær að íslensk stjórnvöld hafa hvert gert neinar viðtækar viðbúnaðaráætlanir fyrir fæduóörgginni né neyðaráætlanir varðandi matvælabirgðir. Því eru í ritgerðinni gerðar tillögur um úrbætur svo fæduóörgginni verði tryggt.
Preface

The idea of writing about food security came to me during the financial crisis in autumn of 2008. The uncertainty at the time surrounding reliability of imports and credit facilities for Icelandic importers abroad, along with newspaper and television reports of people hoarding food, evoked thoughts of ‘what if’ scenarios. I asked myself what would happen if the country were totally closed off from the outside world. Could Icelanders gather their own food without outside help? Most of the people I approached with this subject idea were convinced that Iceland would easily manage and hinted that there was in fact no point in looking further into this. Of course, they could only rely on their common sense (combined with patriotism) to reach this conclusion, because little if any research had been done on food security before. This egged me on to look at this myself and do my own research, not to prove anybody wrong, but to see if the situation was really so simple and clear cut.

During my work on this thesis I have benefited from the great support and help of friends and family. I would especially like to thank Valgerður Guðrún Bjarkadóttir for immense patience and help during the writing and my children Markús Einar and Elín Birna for not being too cross over limited playtime with their father. I would also like to thank Jón Kristinn Ragnarsson for good suggestions, encouragement, and weird attempts at reverse psychology to spur me on. He and Anna Hugadóttir get credit for invaluable help with proofing the thesis. Special thanks must also go out to all of the one hundred and twelve accommodating individuals who took time out of their lives to answer my questionnaire. Finally yet importantly, I would like to thank Alyson Bailes for excellent guidance, well-considered comments, and interest in the well-being of this project.

This thesis is the final assignment in the MA studies of International Relations at the University of Iceland. It accounts for 30 ECTS credits and the instructor was Alyson Bailes, Adjunct Professor at the University of Iceland.

Orri Jóhannsson
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<th>English Name</th>
<th>Icelandic Name</th>
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<tbody>
<tr>
<td>CA</td>
<td>The Competition Authority</td>
<td>Samkeppnisefirlitíð</td>
</tr>
<tr>
<td>CDSAC</td>
<td>Civil Defence and Security Affairs Council</td>
<td>Almannavarna- og öryggismálaráð</td>
</tr>
<tr>
<td>CPD</td>
<td>Civil Protection Department of the National Commissioner of the Icelandic Police</td>
<td>Almannavarnadeild Ríkislögreglustjóra</td>
</tr>
<tr>
<td>EDC</td>
<td>Economic Defence Council</td>
<td>Hagvannarráð</td>
</tr>
<tr>
<td>FAI</td>
<td>The Farmers Association of Iceland</td>
<td>Bændasamtökin</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
<td>Matvæla- og landbúnaðarstofnun Sþ</td>
</tr>
<tr>
<td>FME</td>
<td>The Financial Supervisory Authority</td>
<td>Fjármálaufirlitíð</td>
</tr>
<tr>
<td>GSA</td>
<td>Gardeners Sales Association</td>
<td>Sólufélag Gardýrkjumanna</td>
</tr>
<tr>
<td>HFA</td>
<td>The Horticulture Farmers Association</td>
<td>Samband garðyrkjubænda</td>
</tr>
<tr>
<td>ICERA</td>
<td>Icelandic Road Administration</td>
<td>Vegagerðin</td>
</tr>
<tr>
<td>IMA</td>
<td>Icelandic Maritime Administration</td>
<td>Siglingastofnun</td>
</tr>
<tr>
<td>IRAR</td>
<td>The Icelandic Risk Assessment Report</td>
<td>Áhættumatsskýrsla fyrir Ísland</td>
</tr>
<tr>
<td>IRSA</td>
<td>Icelandic Radiation Safety Authority</td>
<td>Geislavarnir Ríkissins</td>
</tr>
<tr>
<td>MAST</td>
<td>The Icelandic Food and Veterinary Authority</td>
<td>Matvælastofnun</td>
</tr>
<tr>
<td>NCIP</td>
<td>National Commissioner of the Icelandic Police</td>
<td>Ríkislögreglustjóri</td>
</tr>
<tr>
<td>NEA</td>
<td>National Energy Authority</td>
<td>Orkustofnun</td>
</tr>
<tr>
<td>PHII</td>
<td>The Public Health Institute of Iceland</td>
<td>Lýðheilsustöð</td>
</tr>
<tr>
<td>VSS</td>
<td>Vessel Reporting Centre</td>
<td>Vaktstöð siglinga</td>
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1 Introduction

Safe access to food is one of the basic essentials of life for everyone and is of great concern for policymakers, politicians, farmers, international organisations, and consumers. Increasing global food prices, climate change, crop failures, energy shortages, rising sea levels, conflicts, deforestation, population increase, oil prices, water shortages, competition from biodiesel production, poverty, droughts, desertification, urbanisation, and so on are only some of the seemingly endless problems that face the population on this planet and threatens its survival and food security. It is no coincidence that countless organisations and institutions are fighting each day to alleviate these dangers. Food insecurity and all the problems and conflicts associated with it are one of the great dangers the world faces at the start of the twenty-first century.

Iceland is far from immune to these developments. Many of the problems facing the world today also hold good in Iceland. As a small import oriented island state, Iceland is especially susceptible to changes in supply and demand on the world market. Since the start of the financial uncertainty in 2008, Icelanders have had to face up to the reality that they can no longer rely on financial superiority to safeguard their food security. A combination of high global food prices and the devaluation of the Icelandic Króna weakened food security in the country and the affordability of diverse food. This development has opened the eyes of many to the importance of sustainability and self-sufficiency when it comes to food. People are beginning to see that there are many challenges to food security looming in the near future and that the secure supply of food in Iceland is not a foregone conclusion. The question is whether Iceland has what it takes to ward off these threats to the country’s food security and if it is realistic for Iceland to be sustainable and self-sufficient in terms of food.

There are four main questions this thesis tries to answer relating to food security: What is Iceland’s food situation? Which are the threats to Icelandic food security? Are there any plans for protecting food security in Iceland? And what can Iceland do to improve in this area? Being a small island state with rich fishing grounds, plenty of renewable energy sources, but at the same time possessing limited agricultural resources, Iceland is in an interesting situation with
reference to food production. Changing consumer patterns in recent years also add to the forces for change and development in food production. This thesis examines this food situation and tries to answer the questions that arise about Iceland’s strengths and weaknesses. The thesis also tries to map the threats that can potentially damage food security in the country and tries to suggest ways to alleviate these threats or to neutralize them. Regarding the third question, the thesis tries to assess Iceland’s plans – if there are any – concerning food security, safe supply and production. The thesis looks at the administration and various public institutions to attempt to judge their preparedness level. The fourth question is answered by drawing conclusions and offering suggestions as to what Iceland can do to improve on various points and thus to make the country more food secure.

A great deal of the analysis in this thesis is based on previously published written material on the issues at hand. Written material on the Icelandic food situation is however scarce and in many instances the sources used were not originally intended to serve the purpose of food security research. Nevertheless, the diverse sources cast light on factors that relate directly or indirectly to food security. Similarly, the findings of various working groups and reports that have been commissioned to examine some issue originally unrelated to food security can illuminate various angles of the latter, even when that was not the intention. In this context, the findings in the so-called influenza report have proved invaluable to this thesis. Additionally, the thesis rests heavily on figures published by Statistics Iceland and the conclusions that can be drawn from various economic data. To be able to evaluate food behaviour, food consumption, and attitudes towards food security among Icelanders, this thesis publishes results from a questionnaire executed exclusively for this research. The findings in this thesis are also supplemented and supported with opinions and counsel of experts in the field, acquired through personal communication.

The thesis starts by defining food security. This is necessary as the term is often vague, and may pertain to the safety (quality, purity) of food as well as to secure food supply. Having established that the latter meaning applies in the context of this thesis, the term is defined further in the perspective of global development, especially concerning food insecurity in the world. After this conceptual definition, the thesis looks into the theoretical background of the research topic
and its structural terms. The theoretical framework of realism is used to throw light on how states use their strengths and powers to secure their food supply and gain leverage against possible competitors or enemies. Next, the concept of human security is introduced to go beyond the state-centric theory of realism and look at food as an independent security issue concerned with the well-being of individuals, rather than just an issue for the state. Lastly, the theory of securitisation is used to try to explain how and why an issue like food becomes recognized as a security issue and why this matters.

In the third chapter, the thesis looks at the food situation in Iceland. First, the thesis examines what has prompted the food security dialogue that started to emerge in Iceland in the last few years and what direction this debate has taken. Next, the food situation in Iceland is analysed and a closer look is taken at consumption, production, and imports of food and what the state of each has to say about food security. Finally, the status of food stocks and reserves is researched at the state level, at private businesses, and at private households.

Potential threats to food security in Iceland are the subject of the fourth chapter. Threats and risks to food security are grouped into external threats that are controlled by outside factors and internal threats that are controlled by domestic factors. The thesis looks into each threat and tries to analyse what influence they might have on food supply and where the weak points of the Icelandic system lie.

In chapter five the Icelandic administration is examined and its ability to tackle food insecurity and failure in food supply is assessed. Various public institutions, the legal basis of the civil defence system, and various ad-hoc groups are examined to shed light on the administration’s food security-related work and what has hitherto been done to strengthen food security.

In the sixth and final chapter, the thesis looks at what is needed to improve food security. The importance of a clear direction in the field is stressed and suggestions are made on how to improve general features of food supply in Iceland. Finally, each potential threat is analysed and suggestions offered on how to improve the related vulnerabilities. The thesis ends with conclusions, bibliography and appendices.
2 Concepts

2.1 Food Security – A Definition

The concept of food security strictly speaking does not refer to the actual safety or quality of food as such, but to the security of people.\(^1\) A household or a society is considered ‘food secure’ when all the subjects live without hunger or fear of starvation. Both aspects – food security and food safety – are incontrovertibly interconnected; food has to be both edible and accessible, otherwise societies face starvation. The analysis in this thesis will concentrate solely on the traditional definition of food security.

The concept of food security was officially defined for the first time at the 1996 World Food Summit in Rome, held by the Food and Agriculture Organization of the United Nations (FAO). The unambiguous definition of food security is one of the most interesting aspects of the summit outcome. Food security was said to exist “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” (FAO, 1996, para. 1). To achieve this, combined action was needed at all levels: each nation was to adopt a policy, based on its own capabilities, and to cooperate with other nations in working out ways to handle threats to food security worldwide. The Rome Declaration, adopted at the summit, was abundant with ambitious and positive goals. Important factors named for achieving the goal of food security included things like equal participation of sexes, democracy, promotion and protection of human rights, and the right to development. The specific desiderata were to reduce poverty, increase sustainable food production, stabilise population changes, revitalise rural areas, promote gender equality and investment in human resource development, and combat pests, drought, and desertification (FAO, 1996).

All in all, this was a very tall order: and when these ambitious goals were reiterated (with some change in aims and execution) during the so-called World Food Summit: five years later, the leaders at that summit acknowledged that the progress had not been adequate, while the goal set in 1996 – to halve the level of undernourished people by 2015 – was still far, far away (FAO, 2002b). Today, the

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\(^1\) In some areas however, most notably in the US, the term covers both food quality and safe access to food, including protection against bio-terrorism.
outlook is still bleak in this regard and in its newest report, *The State of Food Insecurity in the World 2009*, the FAO has estimated that the number of undernourished will soon break the 1 billion barrier. It is therefore obvious that the target of halving hunger before 2015 is still not progressing as it should and must be considered a distant dream. This, according to the report, is especially disappointing in the light of the good progress made in the 1980s and early 1990s (FAO, 2009).

For practical purposes, food security can be approached at three different levels; at the world level; at country level; and at household level (FAO, 2002a). In this thesis, the focus is on the two latter levels: Icelandic households and society as a whole. Nonetheless, it must be noted that both these levels are closely interrelated with trends and developments at the world level, and it will be seen later in the thesis that developments abroad affect Iceland as well. By definition, food security at country level means enough food supplies available to meet all consumption requirements in the country. This is achieved either with domestic production or food imports, or with both, as we shall see in the case of Iceland. Just as in the individual household, purchasing power (foreign currency available) is a determinant of the food security of nations (FAO, 2002a).

The antithesis of food security is food insecurity. Food insecurity can be transitory, seasonal, or chronic. Transitory food insecurity is, as the name indicates, a short-term state of vulnerability. It is important to keep in mind that even though people can be vulnerable to hunger it does not mean they are hungry per se. A case in point of transitory problems is provided by Iceland in the autumn of 2008 when, due to currency shortages resulting from the financial crisis, the nation became vulnerable to food insecurity for a short period. It is however difficult to argue that Icelanders were actually starving at the time. The second type of food insecurity is seasonal insecurity. Weather related crop failures or short cultivating periods due to geographical position are examples of this. The third type, chronic food insecurity, is the largest problem worldwide of them all. The majority of the chronically food insecure live in low income areas such as sub-Saharan Africa or South Asia, and it has proven to be a colossal challenge to eradicate hunger in these regions (FAO, 2002a; Halldórsson et al, 2010; FAO, 2009).
The worldwide food insecurity problem is a complex issue that has been aggravated in recent years by two major factors; the surge in global food prices and the international financial crisis. Recent increases in food prices and signs of possible problems with food production have stimulated a general debate about food security, both in Iceland and elsewhere. The global price of food commodities peaked in 2008 but has decreased slightly since then. Recent grain harvest failures have however introduced new concerns and it is estimated that prices will be the same or higher in the next ten years than they were in the decade before 2008 (OECD & FAO, 2009). As will be discussed later, these increases in prices can be traced to various socio-economic and environmental factors such as population increase, changed consumer habits, higher energy prices, increased biofuel production, and climate change. In addition, the onset of the global financial crisis increased the strain on farmers and poor people and is set to deepen food insecurity further. An increasingly difficult economic environment has had huge effects on food security in poorer countries, since trade liberalisation and better global transport in recent years had led many of them to become ever more dependent on grain imports. As is the nature of any financial crisis, export earnings, capital inflows (such as foreign direct investment (FDI)), remittances, and foreign aid tend to diminish, and force national cutbacks in food importation due to lack of finance - which in turn jeopardises food security (FAO, 2009).

Having defined food security/insecurity, and before turning to the food situation in Iceland, the remainder of this chapter will present other concepts and theories utilised in this thesis, starting with realism.

2.2 Realism

The basis of the realist theory is the view that individuals are not inherently benevolent but self-centred, competitive, and power-seeking. These imperfect individuals are then organised into sovereign states that behave in the same egotistical manner. Realists believe that the state is the primary actor in an anarchic international system. In the absence of any higher power or hierarchical structure, the state – a rational unitary actor – can only rely on itself, managing its insecurity and distrust towards other states by relying on balance of power tactics and deterrence. These tactics, according to realists, are the only effective tools to keep the international system stable and peaceful.
Thus in terms of security, realism places the focus on control and territory, military strength, and other power tools. In this context, food is an important component of state security; self-sufficiency and control of food assets, such as water, fishing grounds, and farmlands is paramount for the survival of the state and is, in addition, a handy tool as leverage against possible competitors or enemies. For instance, many have predicted that states with abundant and ready access to water in the future will have massive leverage against those that do not. It is very likely that balance of power tactics will be played out over resources like water and food; this can already be seen in instances where big states like China and India have been securing cultivatable land from poor African countries.

2.2.1 Historical Roots

The outset of traditional realist writing has usually been traced back to Thucydides’ treatise on the Peloponnesian War. During the war, two powers, Athens and Lacedæmon (Sparta), fought for dominance in the Greek world. Fearing each other’s hegemonic tendencies, this lead to a delicate balance of power tactics where both powers tried to force smaller states to choose sides. In *The Melian Dialogue*, Thucydides describes how the Athenians try to convince the small island state of Melos to ally with them or otherwise face annihilation. The dialogue, often quoted by academics as the origin of realist writing, gives clear expression to power politics: for instance in the speech the Athenian representative gives when he warns that justice is only possible between two equals, because, “... the strong do what they have the power to do and the weak accept what they have to accept.” (Thucydides, 1954, p. 402).

In fact, at least four basic premises of realism can be discerned in Thucydides’ writing about the Peloponnesian War. First, everything revolves around Athens and Sparta. They – as states – are the main actors: others can participate, and often do, but are not essential for the proceedings of the war. Second, the state is a unitary actor and acts in a uniform way, even though there are debates within the state. Third, state leaders and other representatives are rational beings, making decisions by weighting the pros and cons of available options. Fourth, the state is concerned with security, namely with protecting itself from enemies within and without. In Thucydides’ writings the state increases its security by strengthening its own infrastructure and economic capabilities, and by making alliances with
other states, just as modern day realists prescribe (Mingst, 2004; Thucydides, 1954).

Another important tenet of the realist school is the concept of anarchy in the international system. There are different opinions among realists about the status of states within the international system; traditional realists claim that states control and mould the system whereas neorealists, as will be seen later, believe states are constrained by the structure of the system. The English philosopher Thomas Hobbes (1588-1679) is often credited with being first to put the concept of anarchy (in this context) on paper. Hobbes argued that without some sort of authority or government to control them, humans would be in constant state of war with each other in order to survive. Likewise, every state has the right and duty to fight for its survival in the international system; it is normal for kings and other power holders to be “... in continual jealousies and in the state and posture of gladiators, having their weapons pointing and their eyes fixed on one another ...” (Hobbes, 1994, p. 78).

Modern realists do not believe that an overarching authority above the state is possible in the current state system, and claim that few rules or norms are present to restrain the state. Nevertheless, while realists are generally doubtful about the value of both international law and international organisations, they accept that they have their (limited) uses. Realists are, however, quick to point out that states only comply with such rulings/resolutions because it suits their national interests – not out of some sense of justice or camaraderie. They concede that international law stores some order and generates standards, and that it is economically and psychologically useful for states to abide by these international laws and standards as constant territorial threat can be both costly and psychologically difficult both for rulers and for citizens. Yet despite this, realists warn that there is a certain amount of mistrust towards international organisations and states feel they cannot always count on them working as they should (Mingst, 2004).

2.2.2 Modern Political Realism and Neorealism

Modern political realism, as it is practised today, was thrust to the fore in the aftermath of World War II by Hans Morgenthau, who wrote his seminal book on modern political realism, Politics Among Nations, in 1948. Morgenthau’s basic argument is that, “international politics, like all politics, is a struggle for power.
Whatever the ultimate aims of international politics, power is always the immediate aim.” (Morgenthau, 1948, p. 27). The state is therefore constantly battling for this power, trying to balance its power with that of other states and protecting its own interests. And as there is no higher international actor in place that can end this struggle between the states, it goes on eternally (Morgenthau, 1948). The timing and nature of Morgenthau’s book coincided perfectly with the advent of the Cold War, and during that era, Morgenthau’s work became some sort of policy bible. The mantra of the Cold War: ‘To manage power with balance of power’, came straight from realist discourse. George Kennan and Henry Kissinger, both very influential in US foreign policy during the period, based their policy advice on realist theory. Kennan’s legacy, the so-called ‘containment policy’ that aimed at preventing the ‘domino effect’ of the spread of communism, was basically a translation into practice of the balance of power doctrine. Kissinger also practised balance of power tactics by inciting weaker powers like China and Pakistan to stand up against the Soviet Union (Mingst, 2004).

As in all other fields of study, not all proponents of realism agree in all details, and there have been long debates on the many facets of the theory carried on between large groups of scholars. There are many different interpretations and new sub-theories under the realism discipline, albeit always with the same fundamental assumptions. The most influential of these is neorealism. First expounded by Kenneth Waltz in his book, Theory of International Politics (1979), the purpose of the theory is to simplify traditional realist explanations of behaviour with a view to better explaining the past and predicting the future. In fact, neorealism is often called ‘structural realism’ because neorealists look to the structure of the international system and examine how the structure can explain events and trends, as opposed to classical realism that looks to individual states. Balance of power is determined by the structure of the system and as such, the possibility of cooperation between states is very small.

In this context, neorealists, and their opponents (neoliberalists), have debated long and hard about the concept of absolute gains versus relative gains. A passage from Kenneth Waltz is usually considered the epitome of this debate:

When faced with the possibility of cooperating for mutual gain, states that feel insecure must ask how the gain will be divided. They are compelled to ask not “Will both of us gain?” but “Who will gain more?” If an expected gain is to be divided, say, in the ratio of two to one, one state may use its disproportionate gain to implement a policy intended to damage or destroy the other. Even the prospect of
large absolute gains for both parties does not elicit their cooperation so long as each fears how the other will use its increased capabilities (Waltz, 1979, p. 105).

Waltz points out that the obstacle to cooperation may not lie in the character or the intention of either state, but rather in insecurity and uncertainty about the future intentions and actions of the other state. As a result, states are driven by a need to maximise their power relative to other states; they do not want to enter into cooperation if there is any possibility of the other partner gaining relatively more from that cooperation (Grieco, 1988; Mearsheimer, 2005). In contrast, neoliberalists argue that self-interest of states with common interest is best served if they try to maximise their absolute gains in cooperation (Stein, 1993). There is another issue related to this debate that neorealists worry about and have consequently written extensively on, and that is cheating in the international system (Mearsheimer, 2005). Cheating on agreements is tempting for states that want to increase their relative gains. Cheating inhibits cooperation simply because most states fear cheaters, and this fear of other state’s integrity instils paranoia and distrust.

### 2.2.3 Realism and food security

As we have seen in the summary above, realism is mainly a theory for explaining interactions between states concerning their military and economic issues. Food security is probably not what the pioneers of realist thought were contemplating when they first put forward their ideas. That does however not imply that the concept of food security is incompatible with realist theory. Realism can be of great use when analysing food security and can help in obtaining a broader perspective on the issue.

At first sight, the balance of power or any similar key tenet of realism has nothing to do with food security. However, when inspected more closely, it is clear that the state is heavily involved in the whole food process: facilitating normal commerce in food products, keeping up avenues for import and export, securing transportation, partaking in international efforts to regulate tariffs and trade barriers, and so on. In industries like agriculture and horticulture, it even seems impossible to produce food unless the state enables this with subsidies and special dispensations. The state is therefore an important actor and facilitator in
both food security and production, and the basic concept of realism is needed for analysing these issues.

The hard competitive side of realism is clearly discernable when famine or some sort of food security crisis strikes. When this happens, states have shown tendencies to increase tariffs or put import/export restrictions in place to protect their own citizens and production. The most notable instance of this occurred in the aftermath of the Great Depression. And although trade barriers and import restrictions have been gradually disappearing during the latter part of the twentieth century, hindrances to free and equal trade are still in place, mostly put there to protect domestic production. The agricultural policies of both the European Union and Iceland are a prime example of this. As will be shown later, representatives of Icelandic agriculture have (hypocritically) complained of obstacles to trade created by other countries during the recent financial crisis. All of this shows that narrow state interest lives on in food security, just as realists proclaim.

Another facet of this argument concerns the legion of food organisations operating worldwide, both nongovernmental (NGOs) and intergovernmental (IGOs). As we have seen, realism dictates that international cooperation is difficult or even impossible, but all these food organisations seem to contradict that view. However, from a realist stance, it can be argued that existence of these organisations only reflects state interest, and in the end states always determine their fate since they can withdraw funding, stop participation, ignore resolutions, or ban the operation altogether. The FAO is an example of a state controlled food organisation where states, or their representatives and leaders, have the final word on policy. As realism dictates, the state, it seems, is always in the driving seat controlling procedures.

Additionally, in the near future state security might be endangered over access to food, especially water resources. Realists claim that international relations are a struggle for power, and a state without access to food is quite powerless. No state wants to lose out in this kind of power struggle and potential conflicts and wars cannot be ruled out. This problem is already considered a possible security threat by certain states; one need only note all the purchases of cultivable land that big states are making in Africa and South America. This concern is of course not only tied to developing regions but could turn into an Icelandic food security problem.
as well. It is not inconceivable that large and rich states would see it as an interesting option to buy land or agricultural products from Icelandic farmers by overbidding the domestic market.

Although the state seems to be an all-powerful actor in the international system, just as realism maintains, there are certain issues that traditional state-centred security fails to handle properly. For that reason, it is necessary to go beyond the realist framework and look at the concept of human security as a further analytical tool for food security concerns.

2.3 Human Security
The concept of human security makes it possible to expand on the theory of realism and look at food as an independent security issue concerned with the well-being of individuals, rather than just a state issue and a point of leverage in the ongoing power battle fought in the international system. Instead of just looking at how food and food production influence state interests, the concept of human security may be used to explore how food insecurity, economic instability, and other factors influence the interests and fate of the individual. Instead of just asking how crop failure influences the export or import revenue of a particular state, this approach asks how the crop failure influenced the farmer or the consumers. Applying the concept of human security is also a way of recognising that a state-centred security approach is not capable of handling all security issues on its own. As such, the human security concept is an excellent additional analytical tool to explore food security and the human insecurity that follows precarious food situations.

2.3.1 What is Human Security?
For a school teacher in Jalalabad security was the fact that he could properly clothe and educate his children and invest in the construction of his house, confident that the little he had today would not be taken away from him tomorrow. His security was quite a different matter from that of the coalition troops in Paktika, fearful of a suicide attack or a renewal of insurgency by the Taliban or Al Qaeda (Tadjbakhsh, 2005, p. 4).

This passage, depicting life and concerns in modern day Afghanistan, is a great description of the difference between ‘human security’ on one hand and ‘traditional security’ on the other. The former challenges the latter by asserting that the ultimate referent of security should be the individual rather than the state.
(Amouyel, 2006). However, this does not mean that human security deems traditional security irrelevant or unnecessary, only that it considers it insufficient to explain and deal with all human insecurities on its own. People can be safe in the traditional sense while they are vulnerable in the human security sense. For example, citizens can be secure from invasion at the same time as they are vulnerable to attacks from domestic security forces or find it impossible to access food. Therefore, human security tries to focus on an approach that is more humanitarian by reorienting security references and redressing the ‘asymmetry of attention’ found in traditional security analysis (Newman, 2001).

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<tr>
<th>Security Referent</th>
<th>Traditional Security</th>
<th>Human security</th>
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<td></td>
<td>The state.</td>
<td>The individual.</td>
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<table>
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<tr>
<th>Security Scope</th>
<th>Protecting sovereignty, territorial integrity, and infrastructure.</th>
<th>Safeguarding personal safety, freedom, well-being, and human and social rights. Protecting from natural disasters, diseases, economic deprivation, and external aggression.</th>
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<tr>
<th>Security Threats</th>
<th>Direct organised violence and coercion from other states.</th>
<th>Threats from states, non-state actors, and the global economy. Threat types: death, drugs, discrimination, international disputes, WMD, dehumanisation, deprivation, natural disasters, disease, underdevelopment, environmental degradation, poverty, inequality, population displacement.</th>
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<tr>
<th>Security Actors</th>
<th>The state.</th>
<th>The state, international, regional, and non-governmental organisations, local entities and communities.</th>
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| By What Means      | Military power, armament races, deterrence strategies, alliances, strategic boundaries, economic might, and balance of power. Little or no attention paid to respecting laws or institutions. | Protecting and empowering individuals and societies. Promoting human and political development, basic needs, democratisation, sustainability, equality, norms, cooperation between states, and reliance on international organisations, institutions, networks and coalitions. Using force and sanctions collectively if need be. Individuals contribute at all levels. |

Source: The basic framework taken from Tadjbakhsh, 2005.

The range of security dimensions under the human security perspective is considerably extended from that of realism (see table 1), covering such diverse issues as non-governmental conflict, crime, terrorism, political repression, human rights, quality of governance, hunger, unemployment, disease, and natural disasters, along with basic necessities of life like access to shelter, healthcare and food. Consequently, human security is a very wide paradigm that covers a vast number of research fields, including international relations, security studies,

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2 Other groups (the community, the nation etc.) are also referents of security but the individual is the ultimate one and once the security of the individual is assured the security of all other referents is also secured (Amouyel, 2006).
development studies, and anthropology, as well as certain aspects of human rights studies. Because of its wide scope, there is no single definition of human security available and the concept is variously referred to either as a new theory, a starting point of analysis, a worldview, a policy framework, or a political agenda (Tadjbakhsh, 2005). As will be shown later, this lack of explicit definition is the greatest point of contention among academics discussing the concept.

The human security paradigm started to emerge during the aftermath of the Cold War in the early 1990s. This happened mainly because many felt that the traditional security framework had failed in its objective, namely to protect people. Today, millions of people are killed each year because of events or situations that do not fall within the ambit of traditional state security (Owen, 2004). The modern model of the state and state security is conventionally traced back to the Peace Treaties at Westphalia in 1648, where security was seen as the prerogative of the state; the state entered into a ‘Hobbesian’ bargain with its subjects who traded off certain rights in exchange for protection. However, when both parties entered into this trade-off they did not foresee sets of insecurities where the state was incapable or disinclined to protect its citizens. Nowadays, states with these characteristics are all too common and known either as failed, rogue, or collapsed states (Amouyel, 2006; Tadjbakhsh, 2005).

Many examples have been seen in the post Cold War era where the states themselves have become causes of insecurity, both by failing in their protective capacity and/or threatening the existence of their subjects. The end of the bipolar competition between the two Cold War superpowers and the resultant change in balance of power has had many consequences. Among other things, it has raised the level of international concern about threats and insecurities that had not been given such strategic priority before, such as intra-state conflicts (often ethnic in nature), terrorism, HIV/AIDS, poverty, displacement, human rights violations, and organised crime. All of these threats share a certain overarching commonality; they are both borderless and beyond the scope of traditional state-based security. While many of them are caused or aggravated by various breeds of non-Westphalian, non-state actors (rebels, terrorists, criminal networks etc.), they have also triggered increased activism by existing and new players such as international institutions, non-governmental organisations (NGOs) and other non-state entities pursuing humanitarian concerns. All these new challenges and changes have
added to the pressure for adjustment of prevailing security concepts, and the answer came in part in the form of a report from the United Nations.

### 2.3.2 The 1994 Human Development Report

The genesis of the theoretical concept of human security is usually traced back to the release of the Human Development Report in 1994, published by The United Nations Development Programme (UNDP) under the leadership of the late Dr. Mahbub ul Haq. The theoretical foundation but forward in the report is the fundamental basis of the human security concept. The report complained that security had been interpreted too narrowly through the years and that it had only been concerned with territorial security, national interest and the threat of nuclear holocaust. Security had thus been associated with states rather than individuals and the concerns and insecurities of ordinary people had often been forgotten.

There are four essential characteristics of the new human security concept that the report advocated instead. First, the concept is universal, as many human insecurities are common to all humanity. Second, human security threats are interdependent, and many of them, such as famine, disease, or ethnic disputes, are not confined within the borders of any particular state. This is especially true when it comes to food security: crop failure amongst farmers in Asia can for instance influence prices and availability in Iceland. Third, human security is best tackled with early prevention. According to the report, early investment in health care and education would have better contained the spread of HIV than the billions put into intervention now. Fourth, human security is people-centred and as such is concerned with how people live in society, whether they live in a conflict-free environment, and whether they have access to market and social opportunities (UNDP, 1994).

Furthermore, the report groups human security issues into seven main categories. Since the publication of the report, these categories (see table 2) have been used as a general outline for human security studies and related debates. For the present purpose, the category of food security is the most obviously relevant. However, the concept stresses that it is a mistake to focus too much on individual categories, as all of them are interconnected and many issues overlap. Economic

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3 However, there is no general consensus on this; not all academics agree on what should be categorised as ‘security’.
and environmental securities are for instance heavily linked with food security and vice versa.

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<th>Table 2: Categories of Human Security</th>
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<tr>
<td><strong>Category</strong></td>
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<tr>
<td>1. Economic Security</td>
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<tr>
<td>2. Food Security</td>
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<tr>
<td>3. Health Security</td>
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<tr>
<td>4. Environmental security</td>
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<td>5. Personal security</td>
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<tr>
<td>6. Community security</td>
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<tr>
<td>7. Political security</td>
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Even though the Human Development Report has won widespread support, it also has its critics. In his much quoted article, *Human Security: Paradigm Shift or Hot Air?*, Roland Paris (2001) argues that the report’s proposal for a new concept of security is lacking in precision and is too vast: “Virtually any kind of unexpected or irregular discomfort could conceivably constitute a threat to one’s human security.” (p. 89). Paris also criticises the seven categories for being so broad that it is difficult to pinpoint what, if anything, can be excluded from the definition of human security. He simply asks, “if human security is all these things, what is it not?” (p. 92). This criticism is a key point in the academic discussion about the concept; how broadly are we to define the concept and what is to be considered a security issue? Next, two schools of thought will be introduced that have developed among proponents of human security in response to these questions.

### 2.3.3. Two main theoretical schools of human security

Attempts to implement the human security agenda have led to the emergence of two main schools of thought on how to practice human security: summarized as freedom from fear and freedom from want. Although the authors of the Human Development Report called for an ‘all-encompassing’ concept of human security that included both freedom from want and freedom from fear, separate schools of
thought emerged over what threats people should be protected from and how that protection should be put in place. Each approach will now be examined in turn.

2.3.3.1 Freedom from Fear

The freedom from fear approach is also commonly known as the narrow approach to human security. Proponents of this approach seek to limit the practice of human security to protecting individuals from violent conflicts and closely related forms of lethal violence. The reason why proponents of freedom from fear put such an emphasis on narrowing the security scope is that the broad approach (freedom from want) is not practical enough in their view. By limiting the focus to large-scale physical violence, scholars feel they get a more practical and clearer approach to human security. One of these scholars, Keith Krause (2004), has named two reasons why security ought to be narrowly defined. First, he argues that the broad approach to human security is nothing more than a “shopping list” where the label ‘human security’ is put on a wide range of issues that are not necessarily linked together. This way, “human security becomes a loose synonym for ‘bad things that can happen’” (p. 367) and consequently has no usefulness for policymakers. Second, he points out that nothing is gained by making issues like education, trade practices, or public health a security concern. He seriously doubts whether it facilitates practical solutions to describe illiteracy as a threat to security.

Andrew Mack (2004), on the other hand, admits that there might be some “advocacy value” in expanding the human security agenda, but this would come at an analytic cost. He argues that if the concept of insecurity covers nearly all forms of harms to individuals it loses its descriptive power since “a concept that aspires to explain almost everything in reality explains nothing.” (p. 367). Neil MacFarlane (2004) adds that the merit of the two approaches should be judged on what conceptual value they add and what policy consequences they have. He argues that there is no evidence that wider labelling of concepts as a human security threats has offered additional analytical or normative traction. On the other hand, the narrow approach has spurred normative and practical change in security practice. Furthermore, he claims that widening the human security concept makes policy prioritising difficult; the more comprehensive the human security concept gets, the less likely it is to reach its goal as “diluting the concept
diminishes its political salience.” (p. 369). Sabina Alkire (2003) similarly advocates the narrow approach, arguing that the conceptual difference between human development and human security is vague and that the latter seems to embrace the entire human development agenda. She argues like other critics of the broad agenda that “if human security is to be a feasible agenda it must be narrower.” (p. 14).

2.3.3.2 Freedom from Want

Freedom from want is a broad approach to human security, calling for a wider definition of human security to do justice to the various and complex insecurities facing people each day. Proponents of this approach insist that the concept of human security includes diverse threats such as food shortages, natural disasters, and disease, since these threats are no less dangerous than violent conflicts; in fact, they kill far more people than war, genocide and terrorism combined (Human Security Centre, 2005). One such author, Jennifer Leaning (2004), includes social, psychological, political, and economic aspects of insecurity in her conception of human security. She claims that in order to attain some base of human security individuals must be able to access food, water, and shelter and feel a sense of safety from life threats as well. Psychosocial needs for identity, participation, recognition, and autonomy are also a vital part of human security in her opinion. Lloyd Axworthy (2004), academic and former Canadian Minister of Foreign Affairs, is another proponent of the broad approach. In his view, human rights – not just absence of war between states – is fundamental to stability. He calls for a serious rethinking and recalibration amongst officials and policymakers concerning human security so they will be able to deal with this broader sphere of threats.

The main criticism levelled against the freedom from want approach is that it names too many possible threats to security. As noted above, critics claim that trying to prioritise everything in fact prioritises nothing and leads to inaction, given the difficulty for policymakers in choosing between so many competing goals (Paris, 2001; Tadjbakhsh, 2005). Ramesh Thakur (2004), an advocate of the broad approach, tries to meet this criticism by attempting to bridge the definitional differences between the broad and the narrow schools. His proposal is to limit the broad approach: instead of labelling all harms as a human security issue, security
definitions should be restricted to crisis scenarios only. Crises like massive floods, threats of complete collapse of state structures, massive refugee flows that destroy the basic identity of the host society, or great famines are in his view important enough to be included under this limited ‘security’ label. This solution can of course in turn be criticised for diverting attention from the possibility of precautionary action on ‘creeping’ or gradually emergent threats; and for the present there is no foreseeable solution to this debate of broad vs. narrow.

Looking at the literature on this subject, it is evident that the broad approach has many supporters and has made considerable headway in the last fifteen years, especially in institutional discourse and policy practice. The reason for this is obvious: the fight against hunger, disease, and disasters is a good and morally sound fight, and few – if anyone – would dispute the desirability of protecting people from these evils. The popularity of the concept in Western democratic societies can also be traced to the fact that it looks good on paper and sounds even better in political speeches.

2.3.4 In Practice

In recent years, various states, development agencies, and international organisations have taken up the human security agenda, with middle-sized powers such as Norway, Japan, and Canada leading the way. Iceland has not been immune to this trend, with the country’s foreign policy leaning towards the human security agenda in recent years, culminating in Iceland’s candidature for the UN Security Council, where Iceland’s main emphasis was on “… the importance of meeting threats to security in the broadest sense, especially regarding human security and integration of security and development …” (Ministry of Foreign Affairs, 2008, p. 15). Critics of the human security concept have noticed this trend. Alexandra Amouyel (2006) argues that the reason for the popularity of the concept among middle-sized and smaller powers is that it gives them an opportunity to reinforce their own position in the international system, something they cannot do with hard power. This embrace of human security therefore reflects self-interest rather than interest in human beings and their problems. Evidence of this, according to Amouyel, is that major proponents of human

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4 In the original language: “... mikilvægi þess að mæta ógnum við öryggi í viðasta samhengi, sérstaklega með tilliti til mannöryggis og samþættingu öryggismála og þróunarstarfs ..."
security, like Canada and Japan, only promote human security as their foreign policy – not their internal policy.\(^5\) It is difficult to determine whether the intentions of said states are opportunistic, but one can imagine that marking their unique position is what all states are trying to do, and it is not necessarily a bad thing, unless they try to do it with nuclear proliferation.

Despite all the critiques, the concept of human security has many powerful proponents and is nowadays nearly commonplace in the statements of politicians, policymakers, and key global development organisations like the World Bank – as well as many regional organizations (European Union, African Union and others). The coalition of states and organisations that use human security as their modus operandi has made considerable progress; the banning of anti-personnel land mines at the Ottawa Convention, increase in humanitarian intervention, and the creation of the International Criminal Court are all cases in point. The emergence of the concept of human security has to a degree changed the whole landscape of international politics from realist power politics of the Cold War to a ‘softer’ and more human type of security emphasis; security within states and societies, rather than security between states. The emergence of food security is definitely one of the by-products of this change. The question is: who decides that food is a security threat and how does it become one? That is the next and final issue to be explored in this chapter.

2.4 Securitisation

2.4.1 What is Securitisation?

Ole Wæver, a professor at the University of Copenhagen, developed the notion of ‘securitisation’ in the 1990’s. Wæver, along with academics like Barry Buzan, form the so-called ‘Copenhagen School’ in international security studies, and the theory of securitisation is one of the main products of this school of thought. In essence, securitisation is a constructivist approach that deals with one main question: Who decides what is a security issue? Therefore, the objective of securitisation studies is to understand “who securitizes, on what issues (threats),

\(^5\) It can be argued however that this critique does not apply to the Nordic countries. In the Nordic context, the ‘societal security’ doctrine is used as a functional internal policy equivalent to human security. There the doctrine is used to coordinate policy and action on all non-military emergencies whether they are natural or man-made (Bailes & Gylfason).
for whom (referent objects), why, with what results, and, not least, under what conditions (i.e., what explains when securitization is successful)” (Buzan, Wæver, & de Wilde, 1998, p. 32). Similarly, this thesis will ask who decides that food is a security issue, what is gained by making it a security problem, and for whom; why is food securitized, and what have been the conditions to prompt it to be considered a security issue in the first place?

The basic premise of securitisation theory is that security is a linguistic act – an outcome of a specific social process. Wæver argues that the goal of securitisation analysis is not to evaluate ‘real-life’ threats that are endangering some object or other; it is rather an attempt to grasp the process behind constructing a shared understanding of what is to be considered as a threat. This process does not include asking people what they think security is or asking scholars what its logical definition is: rather it is about analysing linguistic principles to find what regulates the discourse (Wæver, 2004). By using language theory Wæver proclaims that security is a speech act: “In this usage, security is not of interest as a sign that refers to something more real; the utterance itself is the act. By saying it, something is done ...” (Wæver, 1995, p. 55). In short, just by talking about something as a security issue, it becomes one.

Moreover, Wæver argues that by uttering the phrase ‘security’, “... a state-representative moves a particular development into a specific area, and thereby claims a special right to use whatever means are necessary to block it.” (Wæver, 1995, p. 55). This means that once an issue is securitised it is raised out of the reach of normal politics and into the security realm. Once there, it is considered as a threat to the state and/or to society and this legitimates the use of extraordinary means to handle it. The results could include steps such as declaring a state of emergency, enforcing martial law, mobilising the military, attacking another country, using conscription, secrecy, or other means that are only legitimate when dealing with security matters. This inevitably means that normal democratic rules, policy conventions, or public political and academic discourses are sidestepped when dealing with these issues (Wæver, 1995; Wæver, 2004; Taureck, 2006).

2.4.2 Who has the Power to Securitise?

In 1995 when Ole Wæver wrote his article, Securitization and Desecuritization, he anticipated that only the state, the state elite or other representatives within the
state could securitise issues (Wæver, 1995). Since then, proponents of the theory have broadened the spectrum and nowadays the consensus is that anyone in the political sphere can construct a security issue through the speech act. But, there are, in the view of securitisation theorists, certain limits to this; the ability and power to securitise is dependent on certain factors. First, the capacity and the status of the securitising actor need to be of sufficient calibre. Second, how securitising claims are put forward to be recognised and accepted by an appropriate audience is important. Third, there need to be some empirical factors or circumstances that the securitising actor can refer to, e.g. if there are any similar problems or issues that are already commonly acknowledged as security threats (Williams, 2003). In addition, Williams (2003) points out that effective securitisation acts are usually rhetorically, culturally, and institutionally rooted in society and structured in such a way that the securitisation process is in reality a fairly predictable process, not open for everyone or extendable to every issue possible. Rita Taureck (2006) concurs with this assessment and states that while the study of security remains broad, it places restrictions on who can securitise. Securitisation is in fact a closed affair and one needs to have the right qualifications to be heard. The fact is that not all securitisation claims are effective and not all actors are powerful enough to make them stick.

However, the argument can be made that this does not only apply to the political sphere alone: an issue does not necessarily need to be in the political arena to be suitable for securitisation, nor need there be a real existential threat for an issue to become a security issue. For example, in his thesis about cyber-security, Jón Kristinn Ragnarsson (2010) points out that threats can be easily fabricated or exaggerated through the media, pop-culture or even through a Hollywood production. In his view, an issue needs only to be effectively presented with appropriate locution, designed to arouse response from the public, to be successfully securitised. The ongoing dialogue of climate change is another example of this. Some claim that climate change is not an existential security threat and that it has only been securitised through the media and interested parties. Others claim that climate change is a real threat but is constantly being undermined with the de-securitisation attempts of sceptics. This, and other similar examples, shows that securitisation can be manipulated by entities that do not have formal political securitisation powers as defined by securitisation theorists.
But who is the most suitable securitisation actor? As has been discussed above, Wæver claimed that the state and its elites were the only securitisation actors, mainly because he saw the state as the only proper security referent. However, there is a slight problem with that norm, and one that Wæver himself concedes: since something becomes a security concern whenever it is so defined by the state, power holders could use the instrument of securitisation to extend their control over certain aspects of public life. Consequently, it is difficult to prevent power holders from using the power of securitisation for a self-serving purpose (Wæver, 1995). This leaves us with a question: are the state, and its representatives and elites, always appropriate securitisation actors? Examples have been seen in the past, most notably after the terrorist attacks of September 11, 2001, of new securitisations by the state leading to unwanted consequences, such as militarisation, loss of individual liberties, extra costs to taxpayers, and in some cases, inefficiency in governance.

On the other hand, it could be problematic to hand the power of securitisation over to non-state actors or individuals, as this could, in Wæver’s opinion, lead to securitisation of personal matters, or even to xenophobia and racism (Wæver, 1995). It is easy to see that if individuals or non-state actors were able to securitise at will, the result could be biased and/or prejudiced, and this would in all probability lead to excessive state action to boot. Market companies would securitise problems and then sell their products offering the solution, institutions and interest groups would securitise their problems to get more subsidies from the government, and individuals would securitise their narrow personal interests. From this, it is clear that all potential securitisation actors have both positive aspects and drawbacks, and it can be difficult to spot ulterior motives or the future consequences of their actions. The best solution is probably to look at each case in turn and try to analyse the situation. That is exactly what the next section will attempt.

2.4.3 Securitisation of the Icelandic Food Issue

When looking at the theoretical discussion above, it is possible to discern three key components within the securitisation process. All three components are requisite for successful securitisation. First, there is need of a referent object – the element that is under threat and needs protection. Second, the process needs a
securitisation actor – someone who turns an issue into a security concern by uttering the word ‘security’. Third, there needs to be an audience – someone who accepts the securitisation claims made by the securitisation actor. Let us now look shortly at each component in turn.

Food, quite obviously, is the referent object in food security. The main aim of food security is to prevent food insecurities or shortages. Ole Wæver offers an interesting theoretical viewpoint on why objects are thrust into the securitisation process at all. In his frequently cited article from 1995, Wæver examined, amongst other things, the emergence of the then new concept of environmental security. Wæver claimed that the central reason for the theoretical innovation of the concept ‘environmental security’ was the possible mobilisation potential connected with the security concept. He argued that by moving the environmental issue into the security sphere, environmental supporters were trying to tap into some of the social and political mobilisation power that traditional security enjoys (Wæver, 1995). In this thesis, the same hypothesis will be raised regarding food security in Iceland: elevating food issues into the security sphere lends them more weight. In simple terms, by adding the suffix ‘security’ to an issue its meaning is automatically accentuated. A securitised issue simply receives more attention from policymakers and the authorities are bound to channel more money and energy into keeping the problem ‘safe’. Food, or any issue for that matter, gains from the security label.

This brings us to the second component, the securitisation actor. In 2008, the issue of food security was thrust into the spotlight at the Farmers Association of Iceland’s (hereafter referred to as FAI) yearly convention called Búnaðarþing. As will be further explained later, this convention was the turning-point (along with the bad economic situation and Eyjafjallajökull eruption) in raising food security awareness in Iceland. Since then, the FAI has kept this issue alive through the media and with its own publications and conventions. The FAI has been arguing at every opportunity that factors such as possible fodder shortages, higher prices of imports, and higher operational costs should be labelled as security threats, rather than just agricultural or economical issues, and should be taken more seriously or, in Iceland’s case, talked about at all. It could therefore be argued that the FAI is the securitisation actor in this instance.
This begs another question: Why is such a group securitising food? There are in fact several possible answers to this: unwillingness to suffer hunger, general care for the well-being of Icelanders, the ideology of a strong national agricultural sector, better access to power holders, more influence and importance in society, or the more cynical motive of painting a bad picture to get more subsidies for the sector. These possibilities are not mutually exclusive; the real reason is probably a little of all of the above.

It could also be argued that this securitisation attempt by the FAI is a typical case of securitisation by a non-state actor. The FAI has long advocated a containment policy in agriculture, whereby the aim is to limit imports and produce as much as possible domestically. This, in turn, renders the ‘good and healthy’ Icelandic production important, even irreplaceable, as opposed to the unreliable, expensive, and supposedly low-quality foreign production. The basic idea is that if Iceland is both self-reliant and closed off from unhealthy imports, the agricultural sector will not have to contend with difficult and ‘dangerous’ foreign competition, and better still, there is no visible need for the cold and impertinent clutches of the dreaded European Union.

It could therefore be argued that this FAI tactic illustrates the pitfalls of securitisation by a non-state actor (as discussed before), being both prejudiced against foreign production and biased toward private interests of the domestic agricultural sector. It is in essence, if one is to be harsh, securitisation out of self-interest. In addition, a securitisation act by a non-state actor like FAI could, as discussed before, lead to excessive state action (i.e. disproportionate subsidises) – if indeed it has not already. In fact, a prominent professor of economics at the University of Iceland recently voiced these same concerns and claimed that the concept of food security is only a “false argument” to get more money into the agricultural sector (“Fæðuöryggi falsrök”, 2010). The counter-argument against all this is that food insecurity is a real worldwide problem, not just something that the FAI invented. It could be argued that food insecurity is a real existential threat, and if the FAI had not securitised it, someone else would. Important securitisation actor or not, it is easy to see why it is beneficial for the FAI to keep the issue going – making their industry important and keeping the power elites on the hop (and willing to contribute financially).
Nevertheless, despite all the efforts devoted to it by the FAI, securitisation cannot happen without the third component – an audience. This is exactly what has arguably been missing in Iceland, at least until the financial crisis of 2008. By definition, an audience is the target of the securitisation act and it needs to be persuaded that a certain issue is indeed a security problem for it to be moved to the security realm. In the case of Iceland and food security the most important audience to persuade is the government and, to an extent, the public. However, it is safe to say that until the financial crisis of 2008 both Icelandic politicians and the public showed little interest in the issue and were not concerned about possible food shortages. This audience was therefore not susceptible to discussion about food as a security issue. After the collapse of the Icelandic Króna and the temporary threat of food shortage in fall of 2008, the public (and then consequently politicians) woke up to the stark reality of the situation: food shortage was a possibility. After that, the audience – or at least certain sections of it – was ready to listen to the likes of the FAI and accept that food is a security issue.

The next chapter will address in detail the food situation in Iceland, national debates on the issue in recent times, the security situation in private households, in companies, and at the state level, and will finally look at possible threats to food security in Iceland.
3 Iceland’s Situation

The aim of this chapter is to try to shed a light on the food security situation in Iceland and analyse potential threats to it. The chapter starts with a review of the Icelandic food security dialogue and how it has developed since the financial crisis started in 2008. Next, the thesis focuses on consumption, production and importation of food in Iceland with the aim of identifying patterns in consumption habits and capabilities in production. The third section of the chapter centres on stocks and reserves available in the country, concentrating on three entities in this regard: the state, private companies, and individual households.

3.1 The Icelandic Food Security Dialogue

On October 29 2007, former Minister for Foreign Affairs Ingibjörg Sólrún Gísladóttir commissioned a risk assessment report for Iceland. An interdisciplinary committee, chaired by Professor Valur Ingimundarson at the University of Iceland, was set up to work on the report, delivering its findings in March 2009. The mandate was to re-evaluate the security and defence needs of Iceland after the departure of the US-operated Iceland Defence Force from Keflavík’s Naval Air Station in 2006. A major aim of this re-evaluation was to examine various non-military threats to security, ranging from natural disasters and climate change to financial crisis, terrorism, and food security (Ministry for Foreign Affairs, 2009).

According to the report, discussion about food security has been at a minimum in Iceland in recent times (Ministry for Foreign Affairs, 2009). In fact, it can be said that proper dialogue on this issue has been nonexistent. However, it is postulated here that three relatively recent events have encouraged dialogue on the subject: the publication of the Icelandic Risk Assessment Report itself (hereafter referred to as IRAR) in March 2009; the financial meltdown in Iceland starting in autumn 2008 and its subsequent currency crisis; and the sub-glacier volcanic eruption in Eyjafjallajökull glacier in April 2010. In subsequent sections, each influencing event will be examined in turn and an attempt will be made to delve into the dialogue about food security and analyse how it has evolved.
3.1.1 Three Influential Events

The IRAR is the first Icelandic government-sanctioned report that deals with the issue of food security and is for that reason a much-needed contribution to the food security dialogue. The report offers an excellent synopsis of the food security status in Iceland and points out that the position regarding food security is weaker in Iceland than in neighbouring countries. The report claims this is because the country is an island and has limited capacity for diverse food production. Consequently, Icelanders are very dependent on imports of both food and resources for food production. On the other hand, the report claims that the biggest strength of Icelandic food security is the country’s good access to clean, healthy water, and low danger of water contamination.

The report warns that although food security has been secure in the last few decades the financial crisis in 2008 showed that things can change abruptly. When the crisis struck, there were only grain stocks for few weeks in the country and if importation had stopped for long periods, it would have affected food security directly. In the estimation of the report, this underlines the importance of food security emergency plans, something that Iceland has hitherto not considered. The assessment of the report is that domestic production would soon diminish if international markets would close down, but a certain minimum production would continue. The report’s overview of food security ends with suggestions for improvements concerning stocks and reserves, strategies, contingency plans, and general preparedness, along with the suggestion of an overall review of food security status in Iceland (Ministry for Foreign Affairs, 2009). Although it is clear that in-depth research is needed on the subject of food security, and the report is far from exhaustive, it constituted a good overview of the situation and a fine starting point for further dialogue and analysis of the food security problem.

In 2008, Iceland was hit hard by a global and local financial crisis. The collapse of the country’s main banks in October that year led to sudden and unexpected currency shortage, and during a brief period that autumn, it looked as though all food importation would cease. One managing director at a large supermarket chain encouraged people to hoard food (Halldórsson, 2008), another complained that his company could not pay foreign suppliers due to shortage of currency ("Hagar fengu", 2008), and others described how suppliers abroad were withdrawing all credit and demanding straight cash deposits for their goods
(Björnsson, 2008; Ásgeirsdóttir, 2008; Ómarsdóttir, 2008). Media reports from this time reflect the general concern of possible food shortages among people, and stories were told of people hoarding food, gasoline, and even cancelling upcoming travel plans (“Matur hamstraður”, 2008; “Hamstra innfluttar”, 2008). All of this was followed up with news of people buying larger refrigerators, freezers, mincing machines, and other similar equipment, as many seemed to be preparing for a long winter of traditional home-produced fare (“Íslendingar rífa”, 2008; Pálmason, 2008). In hindsight, the situation was a momentary nervousness, created by uncertainty regarding the financial survival of the country. However, even though there was in all probability never any serious or lasting danger, this unexpected situation was a spark that ignited dialogue on the possibility of food insecurity in a country that had not had to deal with food shortages in recent memory.

The volcanic eruption in Eyjafjallajökull glacier in April 2010 is the third major event that stirred awareness of the food security issue. After the first days of the eruption it became clear that ash had caused lot of problems for farmers in the area, and some of them considered taking a break from farming, or quitting altogether (“Neyðist til að bregða búi”, 2010; “Gerir hlé á ræktun”, 2010). Given that the endangered area is one of the finest agricultural regions in the country, there was a flurry of discussion about the meaning of the eruption for the danger area, as well as for the food security of the nation. This discussion soon reached the top echelons of society and on April 16, 2010, Jón Bjarnason, Minister for Fisheries and Agriculture, called a meeting of parties with a stake in the unfolding events. The purpose of the meeting was, among other things, to discuss the consequences of the eruption for agriculture, husbandry, livestock, and food security. Furthermore, the Minister decided to appoint a task force with a mandate to monitor the coordinated activities of concerned institutions and to shape both short- and long-term actions regarding these issues (Ministry for Fisheries and Agriculture, 2010). It remains to be seen if this ad hoc task force will formalise some long-term action plan regarding food security, but the volcanic eruption managed at least to bring about increased dialogue and action from the authorities on the issue.
3.1.2 Búnaðarþing 2008: The Start of a Dialogue

Large-scale dialogue on the subject of food security begun in earnest in March 2008 during the FAI’s yearly convention, called Búnaðarþing. Naturally, the topic had been discussed before, either in articles, at conventions, or on other platforms. However, food security had not motivated such a general dialogue before. It was the peaking of global food prices along with steady weakening of the Króna that played the main role in raising the profile of food security in early 2008; while the financial crisis later that year and the ensuing currency problems only highlighted the importance of the issue. This was by no means a national frenzy; most Icelanders were probably still not thinking that much about the issue, but it did stimulate discussion between and within the ranks of food producers and authorities. It is therefore not entirely surprising that all three speeches at the opening ceremony of Búnaðarþing in March 2008 were chiefly about food security and related international developments even though the topic was not predefined.

In the first speech, Haraldur Benediktsson (2008) chairman of the FAI, discussed Icelandic food security in context of international developments and market changes. He expressed his worries over the global development in food production; instead of dealing with surpluses and lowering prices it seemed that it would now be difficult to supply people worldwide with enough food. He claimed that this had turned the spotlight on growing economies like China, India, and Russia where growing middle classes and stronger consumer markets allowed larger proportions of the public in these nations to buy quality food. This development, coupled with worldwide population increase, left doubt whether there was enough for everyone. Added to this was the fact that many farmers worldwide were now increasingly growing corn for fuel production.

These international market changes were of concern for Icelandic farmers as well according to Benediktsson. He said that the steep rise in grain and fertiliser prices had put heavy burdens on Icelandic farmers and as such were a threat to domestic agriculture. Strong domestic agriculture was vital because money would not always buy food security for Iceland. He added that companies with high demand for their products tended to feel Iceland’s small market was hardly worth

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6 This sentiment is reinforced by the outcome of the questionnare done for this thesis. See chapter 3.1.4.
the effort: this could make importation difficult and it would not matter if Iceland offered more money. Benediktsson also pointed to the realist aspect of food security; nations always try to protect their own interests and if something happens, they are quick to put export bans in place to make sure the food stays in their own country. A country that relies too much on imports would suffer in such scenario, however rich might be. Furthermore, Benediktsson warned in his speech that Iceland did not have enough stocks of hay or grain to handle serious setbacks. It was therefore important to evaluate how much food or fodder the nation should have access to at any given time. He was also worried that there was not enough forward-looking organisation regarding land use and distribution: it had for example been too common in Iceland to use potentially good farmland for summerhouses and leisure areas.

The second speech was made by Einar K. Guðfinnsson (2008), Minister for Fisheries and Agriculture at the time. He too spoke of food security and warned that international development might catch up with Icelanders and influence the domestic market. However, the speech that attracted the greatest attention of the three and really brought the food security dialogue to life was the honorary speech given by the President of Iceland, Ólafur Ragnar Grimsson. The speech got attention primarily because of two things: in the first place, the head of state showed an interest and took the initiative on an issue that had previously not been high on the agenda, and secondly, in his speech he called for a national food security covenant. President Grimsson put great emphasis on the latter point, claiming that a covenant should be a common project of all Icelanders, just as the expansion of the fishing limits had been in the past.

Furthermore, the President added that by talking as he did about Icelandic food security in context of international developments he was trying to direct the attention of the Búnaðarþing, and of the Icelandic nation, to an issue that was of concern all over the world. In his opinion, food security would change the face of national security and it would change priorities. The problems Icelandic farmers had with procuring fertilisers and an attempt by a Chinese delegation to strike a deal with farmers about food purchasing had already illustrated this. Foreign countries like China could endanger future food security by offering higher prices to Icelandic farmers than the domestic market. Because of this, Grimsson urged Icelanders to re-evaluate the importance of agriculture and follow the newest
international developments. Each nation must protect itself against setbacks and
must realise that the concept of national security was evolving (Grimsson, 2008b).
President Grímsson even considered the issue so important that he incorporated it
into his inaugural speech after re-election in August later that year (Grimsson,
2008a). In both speeches, the President used his influence and broad audience to
attract attention to the food security dialogue; one could even say he contributed
to a securitisation attempt regarding the issue.

3.1.3 Beyond the 2008 Búnaðarþing
These speeches at the Búnaðarþing in 2008, particularly the one made by the
President, received considerable attention and sparked discussion, especially in
the ranks of farmers and politicians. The dialogue on this issue has been
particularly lively within the farming industry, as evident in the volume of articles
and opinion pieces written in the biweekly farmers’ paper Bændablaðið. Moreover, Iceland’s member application into the EU in July 2009 has done
nothing to quell this dialogue: if anything, it has invigorated it.

The topic of food security continued to loom large in the minds of farmers all
through 2008, and during the FAI convention (Búnaðarþing) in early 2009, food
security was one of the key issues on the official agenda. The result was the
adoption of a resolution, where it was recommended that the board of the FAI
should seek cooperation with the government to create a strategy for food
security, and to assess Iceland’s capacity for handling emergencies and setbacks.
The resolution stated that it was imperative to secure Iceland’s food supply, as it
was not certain that Iceland would always be able to import food from abroad,
especially if foreign states discontinued their exports in crises. The lack of a
general policy plan for food security within Iceland’s administration was lamented
as well, and it was stipulated that this should be put right (Búnaðarþing, 2009)7.
The issue of food security was not only placed on the formal programme of the
convention, it was also an important element in the speeches made at the opening
ceremony. In his speech, the chairman of the FAI, Haraldur Benediktsson (2009),
gave a speech on food security, just as he did the year before, but this time with

7 In accordance with this resolution, a committee was established and its work ended by producing
a letter to the Minister of Fisheries and Agriculture where suggestions were made for continued
work in this field (Dýrmundsson, personal communication, February 2, 2011).
the added weight of events in between, i.e. the financial crisis and consequent currency problems in winter 2008-9. The turn of events had only deepened Benediktsson’s worries about food security and he reiterated what he said the year before: there was no guarantee that Iceland would always be able to rely on imports and secure its food supply by bidding higher than others. Because of the good economic situation in previous years, people had not taken this threat seriously. Apathy towards the issue was however no longer an option in his view.

The role of the market in food security is another interesting issue that Benediktsson touched on in his speech. In his opinion, free market and free trade with agricultural products do not always guarantee increased supply of food; the food industry needs stringent management and supervision. This point opens up a highly contentious and fascinating debate about the powers of the market and the appropriate (or actual) strength of the regulatory establishment. Does the market take care of everything automatically? Is the state necessary to secure food security? How involved should the state be? Of course, most farmers, with Benediktsson primus inter pares, are of the opinion that the state should be heavily involved in agriculture. Benediktsson claimed in his speech that it is the responsibility of the government to guarantee the necessary working capital and long-term financing so that domestic production can be secured. Furthermore, he asserted that the state has to make sure that resource materials reach the farms so that production and the welfare of livestock are safeguarded. As with President Grímsson’s speeches mentioned earlier, both of Benediktsson's speeches on the topic show signs of a securitisation attempt. In them the securitising actor is reaching out to the audience (government/public opinion), trying to get an acknowledgement of the issue as a security threat – thus elevating it to a priority position within the administration.

Another sign of the increased emphasis placed by the FAI on the food security dialogue was their brochure on agriculture published in 2009. The brochure was called Agriculture Matters and its stated goal was to enlighten the public about the status of Icelandic agriculture and future possibilities for food production in Iceland (Bjarnason, 2009). The brochure, as often happens with promotional publications, is rather superficial and does not add any valuable information to the

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8 Icelandic: Landbúnaður skiptir máli.
dialogue: but the fact that it was published at all is indicative of the FAI’s intentions to keep the food security dialogue going. In the brochure, the FAI further emphasises the security role of agriculture and politicians are urged to put food security high on their agenda. The FAI warns for example that agricultural goods have a very long production process and it is therefore necessary to keep production in full swing at all times. It might be too late to increase production after a crisis starts. President Grímsson’s idea of a food security covenant is mentioned in the brochure as an example of a possible solution (Bjarnason, 2009). This shows that the FAI at the time was clearly courting the government and hoping for its input to make some sort of sectoral compact guaranteeing food security. At the least, the framers were hoping for recognition of the importance of the issue. By underlining the importance of food security and agriculture in the brochure, the FAI was clearly trying to securitise the issue and raise it to the next level of strategic governance.

At the beginning of 2010, the financial situation did not look as bleak as it did in 2008 and 2009, and it seemed as if worries about food shortages had subsided somewhat. For instance, at the Búnaðarþing in 2010 food security was not one of the 39 issues on the agenda and none of the main speakers at the opening ceremony put any emphasis on the issue. All of a sudden, the problem of food security did not seem as pressing. Had the hyperbole around the issue burst, and was complacency creeping in? Did the securitisation of the issue fail?

This apparent omission from the convention would have been worrying, had it not been for the publication of a report about land use few days earlier. This report showed that the issue had not been entirely forgotten. A five-person committee had been appointed by the Minister for Fisheries and Agriculture to evaluate the need for revision of laws concerning land use with the aim to ensure that land eligible for agriculture would not be used for other purposes. The report, published in February 2010, goes in detail into food security and in its final analysis, the committee agrees with the sentiments expressed at the Búnaðarþing: the authorities should use a risk assessment to look closer into the foundations of food security in Iceland and assess the case for having permanent stocks of vital materials available at all times. However, this should only be done on a basis that is economically sustainable for the national economy (Halldórsson et al, 2010).
There is a valid point here; nobody gains if security measures drain the economical welfare of the nation.

Another interesting aspect of this dialogue is the fact that although most political parties had food security, or at least agriculture, on their manifestos before the general elections in 2009, the issue has not been prominent during parliamentary discussions since that time. The only instance of the topic of food security being discussed in its own right in the parliament was in March 2010 when Sigurgeir Sindri Sigurgeirsson, a parliamentarian for the Progressive Party, directed an enquiry to Jón Bjarnason, Minister for Fisheries and Agriculture, asking him if there was any public policy in place regarding food security and if there were any guidelines to how much food needed to be in the country at any given time. The Minister did not answer the question directly, but pointed out he had already established a working group with the task of defining food security and determining which laws and rules should be passed to protect land that could potentially be used for agricultural production in the future. After the minister’s answer, there was a short discussion about the issue (Þingskjal 682, 2009-2010). What is interesting is that only four parliamentarians out of sixty-three (the enquirer and the minister included) deemed the issue important enough to enter the debate and ask questions. This might be construed as a sign of personal disinterest among politicians regarding this issue, despite the fact that it was proclaimed vital for society in the manifestos of all the major parties before the 2009 elections.

The food security dialogue has not been as lively in the fishing sector as in agriculture. Nearly all the debate in the fishing industry revolves around speculation regarding the potential EU accession, what catch management system should be used, or who gains financially from the industry. Discussion about private interests and the sovereignty of the nation is interwoven into this debate as well. It is difficult to spot any serious debate or risk assessment on the subject of possible threats to food security in the area of fish supplies. Nobody seems to be asking the necessary and practical ‘what if’ questions: what if there is no oil to power the ships? What if export routes are closed off? Consequently, the discussion has not taken off in the fish industry as in agricultural circles; the industry has not yet felt the need to call for special policy planning regarding food security, even though it would probably benefit from it.
3.1.4 The Public View

It is difficult to discern how the public views the dialogue on food security. To be able to obtain a suitable insight into common knowledge and notions of the issue, a questionnaire was put to a select group of people. In it, the participants answered twenty questions regarding food security over the Internet\(^9\). In all, 112 people answered the questionnaire, 38 males and 74 females. Of those, 88 percent live in urban areas, but 12 percent come from rural areas and are mostly farmers. Most participants, or 78 percent, were in the age group 20 to 39. Other participants were either aged 40 to 59 (18 percent) or 60 to 79 (4 percent)\(^10\).

Interestingly, only 54 percent of the participants had ever heard of the concept food security (see figure 1). Men seem to be slightly better informed in this regard, as 61 percent of them had heard of food security while 51 percent of women had heard of the concept. When asked to describe in one sentence what the concept meant, the majority of participants (55 percent) defined food security as it is defined in this thesis. A good number (28 percent) thought the concept meant safety of food while others (11 percent) thought it meant both food safety and security. The rest (6 percent) wrote something else entirely (see figure 2). It is also interesting to note that participants in rural areas seemed to be more knowledgeable on the issue as 67 percent of

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\(^9\) The questionnaire was open to select group of invited people, it was not made public or advertised anywhere on the Internet. The participants consisted mostly of fellow students, co-workers, family, friends, and other acquaintances of the author. The questionnaire is therefore only a survey among set of acquaintances, not a strictly scientific random sample research. However, the group of people that answered the questionnaire come from various walks of society and should therefore offer some insight into public opinion.

\(^10\) All questions and their results are published in Appendix 2.
them caught the meaning of the concept in their description while only 53 percent in urban areas were able to do so.

After being asked to define food security, participants were given the definition of the term and asked to answer the remainder of the questionnaire according to the definition they had received. Participants were then asked if they had thought about the food security of the nation. A staggering 88 percent admitted they had seldom, very seldom, or never before thought of the issue (see figure 3). There is a clear division on this issue depending on residence, as people in rural areas seem to think more about the issue. Of them, 31 percent had thought fairly often or often of the nation’s food security while only 10 percent of people in urban areas had done so.

Overall, participants in the questionnaire seem to be rather positive when it comes to the nation’s food security. When asked if they thought the nation is generally food secure, 61 percent believed it is fairly or very secure, while only 17 percent thought Iceland fairly or very insecure, and 14 percent claimed it was neither secure nor insecure (see figure 4). Women are also more positive in this regard, with 66 percent of them believing the country is being fairly or very secure, while only 50 percent of men share their sentiment.

Similarly, a majority of participants (61 percent) believe the nation would manage on its own if disaster should strike and the country would be closed off from the outside world. A little less than 20 percent of participants, however, consider that the nation would not cope. This belief in the capability of the nation seems to be stronger in rural areas (77 percent compared to 58 percent) and among the oldest participants (80 percent among 60 to 79 year olds compared to
70 percent in 40 to 59 year olds and 57 percent among 20 to 39 year olds). In addition, men (66 percent) are more positive than women (58 percent) are.

Interestingly, only 26 percent of participants trust the authorities to safeguard food security of the nation. While many do not trust the authorities (42 percent) several participants are also unable decide if they trust them or not (32 percent) (see figure 5). The distrust towards the authorities is strongest among men (53 percent), in rural areas (54 percent), and among the youngest people (44 percent).

Finally, participants were asked to choose four factors (of eight possible) they consider most important in safeguarding food security. The result is that participants clearly consider domestic food production and good distribution of food as the most important factors of food security (see figure 6). This is obvious from the fact that 79 percent of all participants ticked the ‘as much domestic food production as possible’ box and 59 percent chose a ‘good domestic distribution system’. In addition, 56 percent consider reliable transport in and out of the country as most important and 52 percent consider support for agriculture as important. This clearly indicates that people think that domestic production and distribution need to be in good order for the country to be food secure.

Unsurprisingly, 92 percent of participants living in rural areas, nearly all of them farmers, consider domestic production as important. They also consider subsidies for agriculture (85 percent) to be an important part of food security while only 47 percent of participant living in urban areas consider this an important factor. It is also telling that not even one single participant in rural areas
considered a wide variety of imported goods as important for food security. By the same token, participants in urban areas consider transport in and out of the country more important than people in rural areas (61 percent compared to 31 percent) and they consider a good variety of imported goods more important than their counterparts in rural areas do (28 percent compared to 0 percent). This shows that while people in urban areas also consider domestic production important (77 percent), they are not as dogmatic about it and they are more open to the importance of food imports (see total result of the questionnaire in Appendix 2).

The most obvious conclusion one can draw from the results of this questionnaire is that any attempt by the food sector to securitise the issue of food supply among the public has failed, at least so far. This is reflected in the fact that only 54 percent of the participants have heard of food security, only 55 percent can describe the meaning of the concept correctly, 88 percent have seldom, very seldom, or never thought of the issue, 61 percent think the nation is food secure, and 61 percent believe the nation can cope if the country is closed off. Therefore, it is safe to conclude that participants in the questionnaire are not too worried about food security.

### 3.2 Food in Iceland

After looking at political discourse and public opinion, it is time to probe further into the objective features of Iceland’s ‘food situation’. First, it is necessary to examine consumption habits and how they have changed through the years in order to grasp the basic evolution in food behaviour. Understanding changing dietary habits and the population's ever-increasing reliance on imported goods has, for example, a huge bearing on any analysis of food security. Second, it is useful to look at food production, what is produced, under what conditions, and what may need to be done on objective grounds to improve food security. This leads to the final point: what has to be imported to supplement the domestic production. The analysis starts with an examination of consumption in Iceland.

#### 3.2.1 Consumption

Icelanders have lived in relative food security for the last few decades and worries about food access have not burdened them too much. Improved economic prosperity in the latter half of the twentieth century contributed greatly to this
development. One of the criteria used to measure prosperity is the ratio between food and household expenditure; the less each household has to fork out for food, in ratio to its total spending, the more luxury items it can purchase. This has certainly been true for Iceland in the last few decades and Icelanders have not had to worry about using all their resources on food. For instance, Icelanders spent only 11.8 percent of their total household expenditure on food and non-alcoholic beverages in 2008. In comparison, the ratio was 17.5 percent in 1988 and 27.5 percent in 1958 (Table 1 in Appendix 1). Perhaps it is a sign of changed times and lesser food security that the ratio was back up to 14.1 percent in 2009 (Statistics Iceland, 2010a).

Food consumption has also changed in the last fifty years. The Public Health Institute of Iceland (hereafter referred to as PHII) has collected information about the quantity of food available in Iceland since 1956. Even though food supply data like these do not reveal anything about actual consumption per se, they offer useful information and help to track developments in food ‘behaviour’ over longer periods of time (PHII, 2004). After all, demand and supply are incident to each other.

Table 3 shows changes in the volume of supply to the

| Table 3: Supply changes in selected products and periods 1956-2008, kg. per person |
|----------------------------------|-----------------|-----------------|-----------------|
|                                  | 1956-60 | 1981-85 | 2008 | % change 1956-2008 |
| Meal and grain                   |         |         |      |                    |
| - wheat                          | 76.4    | 56.5    | 84.3 | 10.3               |
| - rye                            | 21.4    | 13.6    | 4.0  | -81.3              |
| - rice & meal                    | 1.7     | 2.0     | 5.3  | 271.8              |
| - maize                          | 0.2     | 1.4     | 5.6  | 2700.0             |
| Potatoes                         | 77.3    | 58.1    | 67.7 | -12.4              |
| - fresh potatoes                 | 67.2    | 51.8    | 39.5 | -41.2              |
| - potato products                | 10.1    | 6.3     | 28.2 | 179.2              |
| Vegetables                       | 15.9    | 33.0    | 61.1 | 284.3              |
| - fresh vegetables              | 13.6    | 23.4    | 44.5 | 227.2              |
| - vegetable products            | 2.3     | 9.6     | 16.6 | 621.7              |
| Fruits                           | 29.3    | 46.5    | 90.3 | 208.2              |
| - fresh fruits & berries        | 19.3    | 32.1    | 59.5 | 208.3              |
| - fruit products                | 10.0    | 14.4    | 30.8 | 208.0              |
| Cocoa & Cocoa products          | 1.5     | 5.3     | 7.9  | 426.7              |
| Coffee                          | 8.7     | 10.0    | 6.9  | -20.7              |
| Tea                             | 0.1     | 0.2     | 0.2  | 100.0              |
| Milk**                          | 343.5   | 247.9   | 144.2| -58.0              |
| Skyr                            | 10.5    | 6.6     | 10.2 | -2.9               |
| Cheese                          | 3.6     | 8.5     | 16.5 | 358.3              |
| Meat                            | 71.0    | 79.8    | 87.4 | 23.1               |
| - mutton/lamb                   | 46.2    | 46.9    | 23.1 | -50.0              |
| - beef/veal                     | 8.2     | 11.9    | 12.4 | 51.2               |
| - pork                          | 1.5     | 6.2     | 21.7 | 1346.7             |
| - poultry                       | 0.3     | 5.2     | 24.4 | 8033.3             |
| - other meat                    | 7.8     | 4.0     | 2.7  | -65.4              |
| - variety meat/giblets          | 7.0     | 5.6     | 3.1  | -55.7              |
| Fish & Shellfish**              | 61.8    | 38.3    | 46.6 | -24.6              |


11 The PHII calculates food supply according to this formula: Food supply = production + imports – exports – other uses (such as fodder for animals). Shrinkage or diminution from the production process before the point of reaching the consumer, or waste in the household, is not calculated into the equation. Statistics from 1956-1990 are grouped into four-year long average groups. Statistics from 1991-2008 are given on a yearly basis.
Icelandic market per person in selected products between 1956 and 2008. During this period, the supply of meal and grain increased considerably, especially that of wheat, maize, rice and meal. This shows that imported cereal products are increasingly on Icelandic plates. It is also interesting that the supply of fresh potatoes has decreased while supply of various potato products has nearly tripled. This also indicates an increase in imports, as many potato products are imported, but fresh potatoes are grown domestically. Changes in vegetable and fruit supply during the same period demonstrate the same trend toward more importation of foods. The supply of vegetables nearly quadrupled and that of fruit tripled. As Icelanders cultivate precious little of fresh tropical fruits, it is safe to say that nearly all of this increase was imported. Further, while horticulture is a vibrant industry, Icelanders only produce about 25 percent of the vegetables consumed domestically (see chapter 3.2.2). There has also been an increase in other imported products such as cocoa and tea, but coffee supply has decreased. It is interesting that the supply of products that are mostly produced domestically, like milk and fish, has decreased considerably. Meat supply has indeed increased, but the combination has changed, with the traditional mutton/lamb decreasing and pork and poultry undergoing a complete revolution in consumption. This is an unfortunate development for food security as pork and poultry farming is very dependent on imported grain. All these statistics above clearly show how in the last 50 years the average Icelander has increasingly turned his attention to imported foods, little by little making the country dependent on safe importation.

In addition to the supply information gathered by PHII, Statistics Iceland regularly conducts a Household Expenditure Survey. The survey is a sample survey and consists of three parts: interviews with participants, two-week household expenditure diaries kept by participants, and information gathered from various state agencies. The sample consists of 1,200 households chosen at random from the National Register of Persons (Statistics Iceland, 2008a). Looking at the outcome in the food category for all household types combined, it will be seen that the average food expenditure of an Icelandic household in 2008 was 658,516 Króna. The largest part of the expenditure went on meat (137,750), bread and cereal products (107,742) and milk, cheese and eggs (106,367). It is also

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12 For more detailed breakdown of all the average groups and years, see: PHII, 2009b.
interesting to note that the average household only spent 35,546 on fish (Table 2 in Appendix 1). The survey shows the same trend as the supply information: imported food or food with imported base ingredients such as bread, cereals, oils, fruit, vegetables, sugar, chocolates, cocoa, and coffee make up a large proportion of the expenditure, and this is without taking account of food that needs imported resources to be produced domestically, like meat, fish, and so on.

All these numbers and comparisons show that supply, and consumption, has been changing considerably in the last decades. The diet seems to be moving gradually towards greater diversity and reliance on imported food while traditional domestically produced food like potatoes, milk, mutton, and fish are on the decline. This development is in large part due to Iceland’s steadily relaxing import limitations over the last few decades, the greater purchasing power of individuals, and – not least – a change in lifestyle and dietary habits.

3.2.2 Production

In 2008 food and beverage production counted for 42.8 percent of the total value of manufactured products sold in Iceland. In comparison, the fast growing and much-talked-about basic metal manufacture industry – where aluminium production is the largest sector – counted for only 35.9 percent in the same year. Other manufacturing sectors are much smaller (Table 3 in Appendix 1). Unsurprisingly the fishing industry created the largest single value in the food sector, producing values of 162,1 billion Króna of the total of 234,3 billion produced by the food industry. In distant second place was the meat industry, with 22,4 billion Króna. Other sectors produced far less value, with beverage production and breadstuffs and sweetmeat production the largest among them, counting for a little under 9 billion Króna each (Table 4 in Appendix 1). With the fish industry’s 69.2 percent share of the total value produced, the statistics reflect on a monotonous yet highly important industry for the Icelandic economy.

Even though the wealth generating power of the food sector lies mostly in meat and fish production, several other industries play a part in Icelandic food security – or might do so in the future. Some of them have been growing in stature for the last few years and decades, and none so much as grain farming and horticulture. A good example of the growth in grain farming is the fact that production of cereal grains has soared from 408 tonnes in 1992 to 15,413 tonnes in 2008 (Table 5 in
Appendix 1). This development is seen domestically with great approval as grains and various kinds of cereals have long been considered the basis for food security in most countries. The recent financial difficulties underline the importance of domestic grain farming and many believe that it could make a good and important new contribution to ensuring food security in the future. This newfound enthusiasm was evident in 2009 when the Ministry for Fisheries and Agriculture entrusted the company Intellecta with the task of analysing, in conjunction with interested parties, the feasibility and possibilities of grain farming in Iceland.

According to the Intellecta report, Icelandic grain farming consists nearly exclusively of the growing of barley used for fodder. There is also some growing of winter wheat but that is still in an experimental stage. In 2007, Icelandic farmers produced 11,500 tonnes of barley; at the same time imports of barley for fodder were 11,600 tonnes. This simply means that barley farming needs to be doubled if Icelanders want to become self-reliant in this respect. However, the problem is that cultivation conditions in Iceland are quite difficult since autumns are windier and summers are cooler and shorter than in neighbouring countries. With increased research on cultivation conditions in Iceland, however, new Icelandic varieties have been developed that are suitable for Icelandic conditions. In addition, Icelandic farmers have also been using foreign varieties that are intended for cultivation in northern parts of the globe.

One of the most interesting points made in the report is the fact that seeds used for domestic cultivation are mostly foreign or at least prepared abroad. This means that if imports are for some reason not possible, or there is a contagion abroad, there is a real danger of total collapse in Icelandic grain farming. Nowadays, seeds used in Iceland come from three different directions: Icelandic varieties grown abroad, foreign varieties grown abroad and domestic production. According to the report, Icelandic varieties grown abroad are only imported by four or five importers and only grown by one company. This is risky because access to Icelandic varieties grown abroad could be interrupted for one to three years if an accident or infection should take place. It would therefore be better to let many companies handle the cultivation, but this is not feasible because of the small quantities used in Iceland. As it stands, it is barely tempting enough for one company to go to the trouble. The second type of seed varieties used are the foreign ones grown abroad. A large proportion of the seeds used in Iceland are
foreign varieties developed for northern Scandinavia. In case of a rapid increase in grain farming it is unlikely that the present scale of Icelandic variety growing could handle it. It is therefore easiest to facilitate the increase with imported seeds. The problem is that imports of such varieties can be unreliable in a crisis. The third source for seedstock is domestic breeding. This is financially advantageous because of the high prices of foreign seeds. The problem is that domestic cultivation is very limited and can only cover a certain portion of the total amount used (Intellecta, 2009).

In short, even if Icelanders manage to create a large grain farming industry that helps in feeding the populace, it is most likely going to be based on seed imports. In food security terms this would be considered an unstable situation, but on the other hand, the trend towards increased variety in Icelandic production and food gathering is positive. Another positive is that the Intellecta report has not been put in storage to be forgotten. The Minister for Fisheries and Agriculture has appointed a committee to work out a strategy on how Icelandic grain farming can be strengthened. Using the propositions in the Intellecta report, the committee is to produce an implementation plan (Ministry for Fisheries and Agriculture, n.d.a).

The other food production sector mentioned here is horticulture. At first glance, the country’s global position and geographical isolation do not make Iceland ideal for horticulture. However, the position of the country and certain land qualities it possesses also have their benefits. The country’s geographical isolation means there are fewer vermin, vegetation diseases, and weed flora than in other European countries at similar latitude. What is more, favourable ocean currents make the country warmer than is normal at this latitude. The land itself also has qualities that make horticulture possible: geothermal power can be used for heating greenhouses, to disinfect the soil, and to produce carbon dioxide and electricity. In addition, electricity produced with hydropower can be used for illumination of greenhouses in comparatively inexpensive way. Volcanic materials like pumice are also used as a cultivation medium instead of soil. These natural benefits in conjunction with the rapid progress and development in the industry in the last few years have made it possible to produce tomatoes, cucumbers, and sweet peppers all year round in Icelandic greenhouses (FAI, n.d.; GSA, n.d.). However, this development is not a coincidence: the fact is that the horticulture industry has enjoyed substantial subsidies from the government. This
includes direct payments to farmers who grow cucumbers, tomatoes and paprika, subsidised electrical power, grants for investments in lightning equipment, payments for the obsolescence of greenhouses, and financial contributions to various promotional, research, developmental and retraining projects within the industry (Aðlögunnarsamningur, 2002).

Despite this relative success, Icelanders are still heavily dependent on imports of most vegetables, except tomatoes, cucumbers and potatoes (Ingvarsdóttir, Á. B., 2009). In 2008, Icelanders produced 5,958 tonnes of vegetables, but imported 20,895 tonnes (Table 5 and 10 in Appendix 1). This means that only 28.5 percent of all vegetables in the country are homegrown. According to numbers in Icelandic Agricultural Statistics 2009, the share of homegrown vegetables per capita has in fact decreased 11 percent from 1991 to 2007. This means that even though vegetable production has increased in volume in the period, it does not keep up with population growth. Consequently, vegetables on the market are increasingly foreign in origin (FAI, 2009). Vegetable farmers fear this development might even get worse as the government announced in 2008 that subsidies of electricity and direct grants to farmers would be cut down because of the financial crisis. The Horticulture Farmers Association (hereafter referred to as HFA) warned strongly against this action and claimed that it threatened the earnings and livelihood of horticulture farmers (HFA, 2009).

Just as in other industries, the prominence of horticulture in Icelandic food security depends on the political will to finance the enterprise, rather than on geographical or technical factors. Another problem that the industry faces is its dependence on imported fertilisers. One of the solutions mooted in recent times is to resurrect domestic fertiliser production and use Icelandic substances for production when possible. Another solution would be to try to lessen the industry’s need for imported fertilisers by increasing sustainable and organic cultivation, thus limiting the use of synthetic fertilisers.

A further development in horticulture has taken place since 2008. With deteriorating economic conditions and the growing significance of and interest in organic and sustainable methods, many people are turning to private vegetable gardening. In essence, this is ecologically sound: food grown in rented plots, or in the grower’s back yard, uses no energy for shipping and maintenance. An added
bonus is that the grower himself knows exactly what chemicals and methods were used to cultivate the crops.

Interest in vegetable gardening seemed to increase greatly after the financial crisis of 2008. Many municipalities and towns started to rent out plots and the ones doing so already increased their allotment (“Fleiri matjurtagarðar”, 2009; “Maðjurtagarðar vinsælir”, 2009). A random search on homepages of various municipalities and towns reveals that nearly all have published announcements on plots available for rent, or news about how successful the enterprise was (Reykjavíkurborg, 2010; Fjallabyggð, 2009; Hveragerðisbær, n.d.; “Maðjurtagarðar slógu”, 2009). This sentiment is confirmed in the questionnaire mentioned earlier in this thesis (see chapter 3.1.4). About one third of the participants said they have a private vegetable garden or access to one to grow food. A large proportion of those who have such gardens started to grow their own food after 2008 (see figure 7), i.e. after the financial crisis (see further detail in Appendix 2).

It is too early to say whether this is a purely temporary reaction to the financial crisis, but one thing is sure: the ideology behind these vegetable gardens should not be taken lightly. There is no doubt that such gardens have helped to secure food supplies in past crises (most notably in the Second World War) and could do so in the future. It is therefore important that popular knowledge of work methods in such plots be preserved.

This summary of food production in Iceland shows that food production is an important industry in the country, albeit heavily slanted towards fish and other marine products and reliant on imports. Recent progress in grain farming and the potential of horticulture shows that there are possibilities for further variety in food production, and if they are properly exploited, food security could be enhanced.
3.2.3 Imports

Iceland imports large quantities of food and beverages to supplement its limited production. In 2008, Icelanders imported 232,750 tonnes of food and beverages worth 41.3 billion Króna\(^\text{13}\) CIF\(^\text{14}\) (Table 7 in Appendix 1). As strange as it sounds, the biggest portion spent on imported food was on fish and fish products, with a 7.4 billion Króna CIF. Right behind are grain products such as wheat, rice, barley, maize and other cereals, totalling 7.37 billion Króna CIF. However, when counted in tonnes, the imports of cereals are far greater than fish and fish products. Next in import value are fruits, nuts, and fruit and vegetable juices, valued at 5.2 billion Króna CIF. Vegetables are the fourth largest category of imports at 3.5 billion Króna CIF. Other significant imports are foods that are not intrinsic to Iceland and are often called ‘colonial goods’ (Table 8 in Appendix 1). These import statistics support the findings outlined above: the relatively small imported quantities of milk and meat show that domestic production is largely self-sufficient, whereas the large quantities of imported cereals, fruits, vegetables, coffee, cocoa, sugars, and other similar products underline Icelanders’ current dependence upon them. It is also safe to assert that Icelanders are self-sufficient when it comes to fish despite considerable fish imports.

If a country is dependent on imports, it is evident that it is also reliant on its trading partners. The largest exporters of foods and beverages to Iceland are the countries from the European Economic Area (EEA) with an average share of 72.3 percent of all food imports in 1999-2009. If all European countries are counted together they have an average 77.7 percent share during the period. Other countries, excluding the European countries, United States and Japan, have on average a 12.9 percent import share and the United States alone had a 9.3 percent share during the period (Table 9 in Appendix 1). It is interesting to see that during the last ten years the EEA and other European countries have kept their import share stable around 75-80 percent while imports from the United States have been decreasing. Countries other than the European countries, United States and Japan have doubled their share in food and beverage imports at the same time, from 8.4 percent in 1999 to 16.7 percent in 2009. The positive aspect of this for food

\(^{13}\) Of this 35.4 billion Króna were mainly for household consumption and 5.9 billion Króna were mainly for industry (Table 7 in Appendix 1).

\(^{14}\) CIF (Cost, Insurance, Freight) value means the Fob value plus costs induced until the item is unloaded in the country of import. This chiefly involves freight rates and insurance costs.
security is the fact that ‘other countries’ are getting an increasingly larger share of the cake. However, Iceland is still very dependent on food from Europe and should imports from Europe stop, Icelandic food security could be in danger.

Summing up the plethora of statistics mentioned in the sections above, it is possible to try to calculate the proportion of Icelandic food in the public’s total consumption. As seen before, the total value of domestically manufactured food was 234.3 billion Króna in 2008. Of that, goods to the value of 162.6 billion Króna Fob\(^{15}\) were exported to other countries. That leaves food and beverages valued at 71.7 billion Króna for the domestic market. In addition to this, imported foods and beverages totalled 41.3 billion Króna CIF. Therefore, both imported and domestically produced foods and beverages were worth 113 billion Króna in 2008 (when exported foods are taken out of the equation). Using these figures it can be claimed that Icelanders produced 63.5 percent of their own food and beverages in 2008\(^{16}\).

However, this is oversimplified economics. The fault with these numbers is that they do not disclose how large a part imports play in the domestic production. For example, Icelanders produced fresh bread to the value of 4.9 billion Króna and coffee worth 780 million Króna in 2008 (Statistics Iceland, 2009c). However, wheat production for consumption is near non-existent in Iceland and it is obvious that Icelandic coffee is not made from homegrown coffee beans. Ingredients for both – and many other Icelandic food products – have to be imported. In addition to this, we have seen in the chapters above that the Icelandic food industry is heavily dependent on imported material for fodder and energy.

Experts have tried to estimate the share of domestically produced food in the diet of Icelanders. One such expert found out that agriculture provided half of the ingredient in the Icelandic diet, and with fishing the ratio was 75 percent. Another analysis claimed that Icelandic agriculture alone produced 53 percent of the total energy needs of Icelanders (Halldórsson et al, 2010)\(^{17}\). In an analysis of the

\(^{15}\) Fob (Free on board) value means the price for the item when it is on board whatever means of transport in the country of export.

\(^{16}\) 71.7 billion domestic production ÷ 113 billion of total food in the country = 63.5 percent.

\(^{17}\) This source quotes unpublished information from the FAI where it is stated that the supply of energy from domestic agriculture products is 1,282 kcal per person per day. According to this source, average energy need for Icelanders is 2,400 kcal per person per day. This statistic is then used to calculate that domestic agricultural products count for 53.4 percent of the daily diet. These estimates are however a little askew because one has to bear in mind that the total supply of energy available for each person in Iceland is greater than the 2,400 kcal calculated (people are offered
nation’s energy needs in crisis (see further in chapter 3.3.1), the experts found out that Icelandic food counted for 1,014 kcal of the total 2,700 kcal recommended Icelanders use each day. That makes 37.6 percent share of domestic food in the recommended ‘crisis’ diet (Prime Minister’s Office, 2006). Einar Þórisson, purchasing manager at Aðföng, estimates that about 55 percent of the food basket in Iceland contains domestic food, but he adds that this percentage can be higher when the domestic vegetable harvests is at its peak (Þórisson, personal communication, January 24, 2011).

All these statistics show that experts are somewhat divided on the matter and are using different methods to arrive at their conclusion. The common consensus seen in articles and speeches on the issue is that Icelanders produce roughly half of their food. However, this is – as has been argued above – hard to determine because it is difficult to assess how large a share of imports are used to enable the domestic production. Further research is required on this issue. It is however safe to infer that Icelanders are heavily dependent on constant and guaranteed access to foreign goods when it comes to food and food production.

3.3 Stocks and Reserves
As discussed above it is important to keep both the production and imports of food uninterrupted so that the supply of food is steady. However, if something should happen that would disrupt production or importation it is important to have a fallback position to prevent food shortages. This is the argument for creating stocks and reserves.

The good news for Icelandic food security is that even though there are no big silos or depots full of food all around the country, there are substantial food supplies available in the form of domestic livestock. In September 2006 the Prime Minister’s Office published a report where the economic effects, and possible food security solutions, were considered in case of a potential worldwide

and indeed eat more food than they need/should). According to statistics from the PHII the average energy available to each Icelander in 2007 was 3,358 kcal per day (PHII, 2009a). So if agriculture provided 1,282 kcal of the total supply in 2007 this means that agriculture produced 38.2 percent of the energy supply – not 53.4 percent.

This analysis is different from the other analysis mentioned as it is not a summary of the supply available or appraisal of the current food situation. The analysis was done to estimate what food was needed and best suited in times of crisis to fulfil the nutrition needs of the nation.

Aðföng is the distribution and purchase centre of Hagar: Iceland’s leading business in the retail market.
influenza pandemic. In the report, usually called the ‘influenza report’, it is asserted that there are in all probability enough stocks of milk and meat at any given time to help Icelanders through emergencies, even though stocks of meat are seasonal (Prime Minister’s Office, 2006).

The greatest end of year meat stocks held in Iceland are in mutton and lamb. At the end of 2008, they were 5,593 tonnes (the total domestic sales in 2008 were 7,481 tonnes), while the end of year holdings of other meats were insubstantial: 23 tonnes of beef, 160 tonnes of horsemeat, 392 tonnes of poultry, and no pork at all (Table 6 in Appendix 1). Therefore, at the end of 2008 there were in reality only substantial stocks of mutton and lamb in the country. This is because all of the slaughtering of mutton and lamb happens during the autumn and the meat slaughtered is stored over winter until the next slaughtering season in one year’s time. Holdings at the end of the year reflect this, as only certain portion of the stockpiles has been sold at that time. The reason for the low stock levels of other meats at the New Year is that different procedures apply to other meat categories: there is no slaughtering season for poultry, beef, horsemeat, or pork, and the animals are slaughtered as needed all year round. This practice, although guaranteeing freshness of the goods, is not ideal for food security as stockpiles of meat, other than mutton, are always low. Stocks of mutton are however only low in August and September when the winter supply is running out. Further, although the influenza report argues that stocks of meat and milk are sufficient, it remains a major concern that there is no strategy in place to maintain production and distribution of other agricultural products in time of crisis (Prime Minister’s Office, 2006). This would especially be of concern if the crisis were to last for a long time.

Another potential problem area concerns the reserves of fodder and raw materials for fodder production. According to information from the FAI, there is enough coarse fodder (hay, silage) at each farm for the year. Currency shortages or import blockages can nevertheless weaken this status, as all ready-made fertilisers are imported (Dýrmundsson, personal communication, February 2, 2011).

The restrictive factor in all of this however is the stocks of grains and imported fodder and raw materials for fodder production. According to supply information from Fóðurblandan, a company that makes compound feed for agriculture,
imported stocks of fodder and raw materials could last as long as 50 days (Prime Minister’s Office, 2006). However, in an interview shortly after the collapse of the Icelandic banks in October 2008, Eyjólfur Sigurðsson, chairman of Fôðurblandan, contradicted this estimate and declared that only a 30-day supply of fodder was available at the time. He asserted also that this level of supply was customary. In addition, he stated that if all of the fodder storage sites in the country were full at the same time, they could hold supplies for approximately one and a half months (Sigurdórsson, 2008). From this evidence, it is clear that not only are supplies low, but the capacity to store more is restricted.20

Farmers have been deeply concerned with the security of supply. The issue was discussed at length at both the 2008 and 2009 Búnaðarþing. On both occasions, farmers urged the FAI to start negotiating with the authorities and fodder producers over how the quality and quantity of stocks could be improved. The farmers demanded that at least a three-month supply should be available at any given time; the experience of autumn 2008 showed that stocks had been too modest for comfort (Búnaðarþing, 2008; Búnaðarþing, 2009).

3.3.1 The State

The first entity one looks to when thinking about food supplies of a country is the state. People feel that the state has a responsibility when it comes to this subject. However, the Icelandic state does not currently have any food stocks for such purposes and unlike in other Nordic countries, there is no tradition of state-run food reserves. Further, there is no present indication that Icelandic authorities have any plans for building up such reserves. On top of this, as seen in chapter 3.1.4, the result of the questionnaire indicates that there is not much trust to begin with in the authorities’ ability to fulfil their role of safeguarding food security.

If the state should nevertheless decide to build up stocks and reserves of food, how much food would it need to store? This is a difficult matter to assess and depends on how long the reserves are supposed to last in a crisis; what items are deemed important to have in reserve, how long the food can be stored, and how much the state is prepared to spend on the project. There has been some work

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20 This is however set to improve somewhat with Lifland’s the new feed factory at Grundartangi and its 9,000 tonnes storage space (“Fôðurverksmiðja Liflands”, 2010). Still, the storage capacity is well below the 90-day supply level in other European countries.
done on this subject in the recent past. In the 2006 influenza report, the PHII was charged with the task of researching and listing what food needed to be available in the country, and in what quantities, in the case of an influenza pandemic. The analysis brought out some interesting points for food security, even though it was originally only intended for this one specific purpose.

In the analysis, the average energy needs of the nation were calculated based on gender, age distribution, and average physical activity. The result was that each Icelander needs at average minimum of 2,400 kcal of energy per day (the average Icelander has access to about 3,100 kcal per day under normal circumstances). The authors of the report decided to take the middle course and used 2,700 kcal as a criterion in their analysis. The research by the PHII revealed that domestically produced foods could provide for 1,014 kcal per person each day. As these foods were low in carbohydrates and rich in fat, energy sources in the form of carbohydrates with long storage life had to be added to the domestically produced diet. The authors of the report suggested adding imported foods like flour, whole meal, pasta, rice, rye crispbread, sugar, oats, canned vegetables, dried fruit, beans, cooking oil, muesli, rye, soup powder and mashed potato powder. With this supplement of carbohydrate-rich imported foods the energy would reach about 2,700 kcal per day. In addition, the energy combination of the food mentioned would meet the recommendations for a healthy and nourishing daily diet. The report also recommended storing stocks of multivitamins as fresh fruits or vegetables would be hard to obtain in a crisis (Prime Minister’s Office, 2006). Even though this study was completed in a short time and more research is required on the subject, it offers a notion of what may be needed to feed the population in case of emergency. It is also interesting to note the report’s confirmation that the largest part of the energy Icelanders use comes from imported foods or foods that need foreign raw materials or fertilisers to be produced in Iceland.

21 The report presumed that domestic production of mutton, lamb, beef, pork, horse meat, fish, milk, cheese, butter, and fats would all continue as usual, except poultry and egg production (the report was looking at the situation in case of a bird ‘flu epidemic). The authors only used Icelandic vegetables grown in greenhouses in their analysis; they did however not use carrots, swedes and potatoes, as they are not available all year round.
3.3.2 Private Companies

In the influenza report, it is claimed that inventories at supermarkets would run out fast in crisis and a general shortage of food would occur if rationing did not start right away. It is therefore important, the report claims, that private companies in the food sector have some sort of contingency plan. This should include plans for increased size of stocks of certain foods, decisions about how the food would be distributed in times of danger, a ‘business continuation’ strategy, plans for running the stores with minimum staff, and plans for limiting the interaction between employees (in case of contagion).

The working group that wrote the influenza report met with people from many key companies and industries and during their research discovered that stocks of food at stores were small, and would only last for few weeks. The reason is that companies like to keep small inventories to keep the goods fresh and to minimise operational costs. The company Kaupáss, owner of the supermarket chains Krónan and Nóatún, told the working group for instance that dry food stocks held by the company could last four to five weeks, but other goods would last for much less time (Prime Minister’s Office, 2006). Moreover, in an interview with the news agency Bloomberg, a manager of the discount grocery store Bónus stated that the company storehouse had two weeks’ worth of food supplies (Thomas, 2008). The purchasing manager of Aðföng, the distribution and purchase company of Hagar, confirmed that the company had six to eight weeks supply of food that the company itself imports but about one weeks’ worth of food they buy from other domestic importers and suppliers (Þórisson, personal communication, January 24, 2011). All of this shows that private companies do not hold large supplies.

The influenza report highlighted the importance of cooperation between the authorities and large private companies in preparing possible actions regarding food security. The influenza working group recommended that the Civil Protection Department of the National Commissioner of the Icelandic Police (hereafter referred to as CPD) should work on a contingency plan in cooperation with the companies. The group explored the interest in this among private companies and checked whether they were willing to work on an emergency plan with the authorities. Positive answers came from two large companies: Hagar and

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22 Icelandic: Almannavarnadeild Ríkislögreglustjóra
Kaupás. Hagar held, at the time of writing of the report, about a 50 percent share of all food retailing in Iceland, and Kaupás had about a 25 percent market share. Such a large market share makes both companies important in both the distribution and storing of food. Aðföng, the distribution company of Hagar, met with the working group and together they made a draft for a contingency plan that included, inter alia, plans for increased reserves of certain foods and the organisation of an emergency setup should disaster strike. Representatives of Kaupás also met with the working group and the company declared it was ready to participate in food security measures as well. But at the time when the influenza report was published in 2006, the company had still done little work on the subject.

As discussed above, the influenza working group asked the PHII to put together a list of foods that would be necessary to have available in times of crisis. This list was forwarded to both companies and they declared their willingness to increase their reserves of the foods specified on the list (Prime Minister’s Office, 2006). As late as 2009, the IRAR touched again on this idea of launching cooperation between private companies and authorities, but ascertained that no work had started on any plans in this regard (Ministry for Foreign Affairs, 2009). In 2011, Guðmundur Gunnarsson, the security manager of Hagar, explained that Hagar was ready to participate fully in the process when it started in 2006; but when it came to discussing the costs connected with increasing stocks, the company felt there was some hiccup in the process on the side of the authorities and no decision was taken on increasing stocks of any kind. However, as the company understands the situation now, they are to be contacted by the authorities if a certain level of alert status is activated (Gunnarsson, personal communication, February 15, 2011). Therefore, it seems that there are still no private companies that can boast of special stocks and reserves of food for emergencies, prepared either on their own initiative or in cooperation with the authorities.

When reading the influenza report one has to keep in mind that these discussions between the companies and the authorities, and the commitments following them, took place at a time of great optimism and expansion at the height of the Icelandic financial boom. The question now is whether these companies, the authorities, or any other parties, are willing and able to follow through with such plans after the financial crisis in 2008. Nonetheless, the idea of the state
cooperating with large companies, or even paying them for keeping larger inventories than they usually do, is an interesting one and has some merit. The companies already have inventories up and running, so there is no need for the state to build one, and there is no danger of the food going bad as it would constantly be moving in and out of the retail market (while taking care to have the same amount in stock at any given time). This would also be a financially sound solution for the state since the cost of running a public emergency storage facility could be considerable.

3.3.3 Individual Households

Individual households do store food as well. Naturally, regular households do not have the capacity to stockpile large quantities of food and are therefore not likely to stock up enough to last through some kind of crisis or emergency. Besides, not all individuals who run households think in the same way; some set great store by having ample supplies in their coffers while others make do with small provisions.

In the questionnaire (see Appendix 2) carried out for this thesis, nearly half of the participants, or 48 percent, claim they generally store enough food at their homes for one week and 30 percent claim they store enough for three days or less. Overall, 78 percent of the participants store food for only one week or less. This shows that there is not much food stored at private households in general. However, in this respect, the rural areas are much stronger, with 53 percent of rural homes carrying food for three weeks or more while only 4 percent of households in urban areas do so. Similarly, 31 percent in rural areas store food for one week or less at their homes while 85 percent do so in urban areas.

The participants do not seem to be very concerned with security as only 18 percent of them claim they stockpile what they call an emergency supply of food at their homes. Again, this is more common in rural areas (31 percent compared to 16 percent).
Hoardings is another issue that could become problematic in an emergency as distribution of food would be uneven between citizens and it could create problems for the authorities in ensuring a smooth supply. In the questionnaire, participants were asked if they would be likely to hoard food if there is an uncertainty about food security. The majority of participants (58 percent) claim to be either very likely or rather likely to hoard food while 42 percent claim to be very or rather unlikely to do so. Men and women seem to be equally likely to hoard food but participants in rural areas seem to be more likely to start hoarding if there is uncertainty about food security (69 percent compared to 56 percent).

Despite these results, only 16 percent admit to have actually hoarded food in the past and, contradictorily enough, all but one of them are living in urban areas. It is also interesting to note that only 6 percent of participants claim to have hoarded food after the collapse of the banking system in 2008. In fact, of the eighteen people that admitted to hoarding food, only seven of them did so in 2008 (see further in Appendix 2). This shows that even though the financial crisis in 2008 provoked some sort of response in this field, it was by no means a national frenzy.

The results of the questionnaire show that when making contingency plans for food security the authorities should not count on lasting supplies of food in individual households: one week or less seems to be the trend. Combined with small supplies at private food companies and no emergency stores held by the state, the alarm bells ought to be ringing in food security terms. The results also show that people consider themselves likely to hoard food but only few of them ever do, at least consciously. Furthermore, individuals do not seem to be very concerned with food shortages and only a few seem to stock emergency supplies in their homes.

Figure 9: When there is uncertainty about food security how likely are you to hoard food?
4 Possible Threats to Food Security

There are various types of risks and threats to food security. Most of the threats that are enumerated below reflect the reality that capabilities for diverse and balanced food production are very limited in Iceland. As discussed before, Iceland is very dependent on imports, be it oil for fishing vessels, fertilisers for agriculture, or raw materials for food and fodder production. Consequently, the threats primarily addressed in this thesis are threats that could possibly jeopardise crucial imports: oil shortages, worldwide pandemics, wars or conflicts, financial crisis, devaluation of the currency, and so forth.

In this thesis, the relevant threats are divided into two categories: external threats and internal threats. Those categories are of course not entirely independent of each other, as many of the comprehensive and complex issues mentioned below are intertwined and may give rise to both external and internal threats. For instance, climate change is categorised here as an external risk (in its direct effects) and threat (because of human actions it may trigger), but is to all intents and purposes an internal threat as well: its global reach and multiple consequences cause it to be treated essentially as external. Each type of potential threat will now be discussed in turn.

<table>
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<tr>
<th>Threats (human in nature)</th>
<th>Distribution/Transport Failure</th>
<th>War and Conflict</th>
<th>External Pressure on Food Producers</th>
<th>Terrorism/Subversion</th>
<th>Financial Crisis (impact on global demand/supply)</th>
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<td>Natural Disaster</td>
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<td>Energy Shortage (local breakdown)</td>
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<td>Disease (animals)</td>
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<td>Energy Shortage (oil supplies)</td>
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Table 4: Possible Threats to Food Security
4.1 Internal Threats to Food Security

4.1.1 Natural Disasters

As the recent volcanic activity in Eyjafjallajökull glacier has shown, natural disasters are a real and active threat to food security in Iceland. In 2005, the CPD published a report on civil defence and shock endurance of Icelandic society. According to the CPD report, the biggest threats posed by the Icelandic nature are volcanic eruptions, earthquakes, avalanches, violent storms, mudslides, floods from the sea, rivers and lakes, tidal waves, and glacier bursts (CPD, 2005).

Extreme cold can also be added to this list as it has frequently caused human, agricultural, and financial catastrophes in Iceland. These disasters have different consequences for food production: some, like extreme cold, volcanic eruptions and earthquakes, can have a far-reaching impact on large areas, but others, like mudslides and avalanches, will only have repercussions for small areas and will hardly threaten the overall food security of the nation.

The CPD report claims that the shock endurance of Icelandic society concerning various natural disasters is significant. The report admits however that there is always a possibility of large catastrophic and unforeseen events that would damage or break that endurance. Future changes like terrestrial subsidence and potentially higher sea levels due to climate change can have consequences for food security in the long run as well. Climate change can also increase the frequency of violent storms, which are already plentiful in Iceland (see more on this in section 3.4.2.8). Moreover, the report maintains it is not possible to rule out catastrophic flooding caused by natural disasters in other countries. Undersea earthquakes and landslides can cause tsunami effects in Iceland or volcanic eruptions (followed by landslide), in the Canary Islands for instance, can cause flooding in Iceland and other coastal areas along the Atlantic (CPD, 2005).

Of all the disasters mentioned, volcanic eruptions are probably the most threatening for food security. Volcanic ash, lava flows, lightings, glacier bursts and flash flooding, along with toxic fumes and other fatal compounds, are some of the diverse hazards that follow in the wake of volcanic activity. The recent Eyjafjallajökull eruption provides a perfect lesson in the dangers volcanic eruptions can pose for food security, even though the eruption was a small one on a geological scale. When the sub-glacial volcano in Eyjafjallajökull erupted in
April 2010, it melted vast quantities of ice causing massive flooding. The flood came down from the glacier at high speed and destroyed everything in its way, as well as leaving mud, rocks and ice on the fertile farmlands under the glacier ("Flæðir yfir tún", 2010; “Mikið tjón”, 2010). One of the farmers in the area told reporters that the mud left by the floods was like asphalt and that 50-60 percent of his fields were damaged after the flooding (“,.Þetta er eins og malbik“”, 2010). Not long after the eruption, some farmers in the area had already started to talk about leaving their farms or taking breaks from farming (“Neyðist til að bregða búi”, 2010; “Gerir hlé á ræktun”, 2010). However, most farmers have opted to stay and continue to live under the volcano, despite the difficult circumstances they face especially from sandstorms. This time around, the floods were not great in size but they did cause considerable damage. Bearing in mind that the farmlands under the big volcanoes in Southern Iceland are considered among the best and largest in the country, larger eruptions and floods could cause irreparable damage and seriously disrupt food production.

Toxic fumes from volcanoes can also be very dangerous, especially to livestock: the fumes (mostly carbon dioxide) are heavier than air, causing them to creep along the ground and concentrate in depressions in the ground. This poses a danger of suffocation among small animals and herbivores. Although the danger is very well documented and closely measured nowadays, the fumes are still dangerous, being both invisible and odourless. In addition, high fluorine emissions often accompany volcanic ash and when livestock is exposed to this, it can lead to various ailments and changes in the bite of the animals that disrupt their ability to bite, chew and ruminate. The fluorine can also cause ossification that leads to limping or lameness (CPD, n.d.; Arnþórsdóttir, 2009). The most famous example of the danger of toxic fumes is the so-called Móðuharðindi (The Mist Hardships) caused by an eruption in Laki in 1783-1785. The result was devastating: about seventy-five percent of all livestock died and about twenty percent of the population perished in the ensuing famine (Laxness, 1998). In the recent Eyjafjallajökull eruption, the fluorine volume was well over guideline limits and farmers were instructed to keep livestock from grazing and keep them indoors with plentiful supplies of fresh, untainted water (Búnaðarsamband Suðurlands, 2010; MAST, 2010).
Another danger that inevitably follows eruptions is that of lava flows. Historically, lava flows have laid waste to large quantities of fertile land in Iceland. This did not however happen in the Eyjafjallajökull eruption, mainly because the relatively small output of lava from the volcano flowed northwards in the direction of the uninhabited interior. Yet another part of volcanic activity that threatens food security is the gargantuan quantity of ash an eruption produces. Ash can pose many kinds of threats to food security: it can smother fertile lands under layers of sand, cause sandstorms when weather is dry, threaten the respiratory system of livestock, and clog machines. During the Eyjafjallajökull eruption, there were reports of many nuisances because of ash. For example, farmers had to lock their sheep and lambs indoors or move them over sheep disease prevention borders, meaning they could not be moved back alive, resulting in the temporary abandonment of some farms (“Staða sauðfjárbaenda”, 2010). In addition, dense ash lying over vegetation can cause shortage of hay and fodder for animals. During the Eyjafjallajökull eruption, this was such a concern for farmers that local governments in the danger area charged the FAI with the task of looking in other regions for available hay for purchase (“Vilja kaupa”, 2010). On top of this, it is customary for Icelandic sheep to graze on the heaths of the interior during summer. Due to ash in the area, this will be difficult for Southern farms in the near future and can cause feeding problems for sheep in the region as well.

4.1.2 Internal Energy Shortage
A serious internal energy shortage would have severe consequences for all functions of Icelandic society, including food security. As with many other potential threats to food security, energy threats can be divided into internal and external threats. Internal energy shortage would be caused by the large-scale failure or malfunction of basic facilities in Iceland, such as the domestic electrical system. In contrast, external energy shortage happens when Icelanders run into problems securing imported energy, like oil or gas. When talking of energy, or energy crisis, people tend to think only of oil or gas. However, the concept of ‘energy security’ is not least about protecting the infrastructure of the energy industry. This is very much the case in Iceland, and because seventy percent of all energy in Iceland is renewable hydroelectric or geothermal energy, securing the
production capacity and stability of the domestic system is paramount (Ministry for Foreign Affairs, 2009).

According to the IRAR, natural disasters, earthquakes and harsh winter weather are the principal threats to the Icelandic energy system. Over time, geographical changes can cause interruptions as well. Terrorism and sabotage are also a threat, but the report claims there have been no indications that terrorists are interested in damaging the system in Iceland. However, it would be foolish to ignore international developments in this regard and the power companies must be prepared for every contingency. This situation is not helped by the inherent weak points of the system. Because the country is thinly populated and the market is small, electric lines are few and very long. For this reason, safety surveillance is only carried out in few areas and there is a long time between patrols, making it easy to sabotage transmission lines. Other outdoor equipment is also easy to access and could be vulnerable: reservoirs are for example designed to withstand floods and natural disasters, not sabotage. Larger substations are vulnerable as well. Furthermore, the Icelandic electricity system is isolated from other European systems and if something were to happen, energy disruption would be inevitable, as Icelanders cannot get extra energy from outside. The positive side to this is that interference or sabotage in other countries does not influence the Icelandic system (Ministry for Foreign Affairs, 2009; CPD, 2005).

The stability of the electrical system is very important for the food industry. Any large-scale failure or malfunction of basic facilities in the electric power system would create big problems in food production and without the possibility of refrigeration, food supplies in the country would soon go bad. In addition, the authors of the influenza report point out that coordination of food distribution would be difficult in the event of electric failure, as telecommunication equipment would not work (Prime Minister’s Office, 2006). Furthermore, the banking system would struggle since most banking operations in Iceland are carried out electronically. Without access to a functioning banking system, importers of food would not be able to pay for their goods.

4.1.3 Failure of Domestic Distribution
Good distribution infrastructure is critical for food security: it is not enough to produce or import the food, but it also has to reach the consumer. Domestic
distribution in Iceland goes mainly through the country’s simple road system, although recently there has been talk of revitalising shipping along the coastline. The recent Eyjafjallajökull eruption is a reminder of how important a good road system is for food security and how vulnerable the Icelandic system is. At the start of the eruption, road number one, the ‘hringvegur’, or ring road, had to be cut in three places to let the floodwater through. Immediately, there were reports of food shortage in the village of Vik as the village was cut off from the main distribution centre in Reykjavík (“Brauðskortur orðinn”, 2010). Although this was not a serious shortage and food was delivered shortly afterwards from a nearby town, it shows that stores in the countryside do not have large stocks and food runs out fast if distribution channels close. At the same time, production was put in danger as farmers ran into problems with their milk production. It looked as if the farmers would have to spill their milk, as it could not be transferred to the dairies in time (“Bjarga 30.000”, 2010). The danger of small stocks and the importance of effective domestic distribution were also evident in the heavy snowstorms at the beginning of 2011. An example of this is when the snow made the only road to the community of Seyðisfjörður impassable. When this happened it took only three days for shortages of milk and bread to be felt and the local stores started to ration milk for the inhabitants (“Byrjað að skammta”, 2011).

The IRAR analysis concurs with this assessment and agrees that the road system is the real vulnerable point regarding the safe distribution of food in Iceland. The road system is of considerably worse quality in Iceland than in neighbouring countries, the report asserts. This is down to the fact that the road system is entirely run by the state, access to roads is nearly unlimited, and decisions about the system are taken on political premises. Investment in the road system is particularly important for Iceland because there are no alternative means of land transportation such as trains, shuttles, or underground transit systems available (Ministry for Foreign Affairs, 2009).

Shipping along the coastline could be a good addition to domestic distribution security. The largest shipping companies discontinued transportation by sea in 2004 and since then nearly all of the distribution has been done by land. In a report published in May 2010 by the Ministry of Transport, Communications and Local Government, a working group evaluating the feasibility of coastal shipping recommended resumption of this distribution method. According to the report,
coastal shipping is ideal for ‘patient’ goods such as construction and office supplies, raw materials, fish products, and goods waiting to be exported. Fresh food and other such goods would however always require the speed and flexibility of land transportation (Möller, Guðleifsson, Eyvinds, Helgason, 2010). Coastal shipping would therefore have limited influence on food distribution in itself: but should it start again, it would nonetheless offer a certain degree of added security as an alternative option in emergencies, not to mention decreasing the burden on an already weak road system.

4.1.4 Financial Crises

As can be seen throughout this thesis, financial crises have considerable effect on food security, especially in an import-oriented country like Iceland. The financial crisis of 2008 amplified the threat to Icelandic food security: prices of imported food and fodder increased sharply because of international market trends, while at the same time purchasing power lessened due to devaluation of the Króna. In addition, the international financial crisis closed down the credit market, which made import financing difficult.

By looking at events in Iceland since the beginning of the international crisis in 2008, it is apparent that turn of events in Iceland took many by surprise and Icelanders were ill-equipped to handle the situation. The collapse of the Icelandic banks paralysed the domestic payment system and all banking contacts with financial establishments abroad were temporarily shut down, resulting in a shortage of currency and disruption in trade. Although in hindsight food security was never in serious danger, these events showed how hazardous a currency shortage combined with over-reliance on imports could be for food security.

Refusal of credit and a bad financial reputation constitute another financial threat to food security. As has been discussed before in this thesis, the general level of trust in Iceland and Icelandic companies diminished after the crisis of 2008 and many importers were asked to pay for goods in cash. This put many import companies in a difficult position because many of them did not have cash to pay for merchandise beforehand. If the currency situation had not been rectified in time this could have led to serious food shortage. On an island that is heavily dependent on imports, the lack of immediate funds or weakness of the currency is a real and potent threat.
4.1.5 Pollution

Pollution is another potential threat that can have wide-ranging effects on food security. The influence of climate change and proliferation of heavy industry in Iceland, together with an anticipated increase in shipping and tourism (cruise ships) in the North Atlantic, will without doubt lead to increased waterborne traffic around Iceland in coming years. According to the IRAR, this increase could bring about more pollution in the ocean around Iceland. Even though oil spills are rare, they are always a possibility and could have serious consequences for both the biosphere and the economy. With increased traffic, there is also the added danger of terrorism, although there is no sign of that yet.

The report maintains that Icelanders can expect a steady traffic of oil tankers through waters under Icelandic jurisdiction in the coming years, although gas and oil transports from Russia to North America are probably not going to be as great as first anticipated. According to the report, about 80 oil tankers and 1,000 freight ships sail to Iceland each year, carrying a vast amount of oil. Of the two, freight ships carry more risk and accidents involving such ships happen every ten years on average. The last two freight ships that ran aground were fortunate not to hit skerries; oil pollution was therefore kept to a minimum. In addition, the transportation of cooled, liquid natural gas has started from Norway to the US, passing through Icelandic territorial waters in the process (Ministry for Foreign Affairs, 2009).

The CPD report warns that Iceland is ill equipped to handle any such pollution accidents and the shock endurance of Icelandic society is insufficient if huge accidents were to happen in this field. The report states that there is urgent need for (improved) contingency plans when it comes to treating toxic substances and pollution accidents (CPD, 2005). There is therefore good reason to be alert to the possibility of environmental disaster or pollution that could jeopardise food security.

Radioactive chemicals are also a possible threat to Icelandic food security, although possible sources of incidents are fewer than in neighbouring countries. Use of nuclear material is very limited in Iceland and there are no nuclear power plants or reactors in the country either. Furthermore, the risk of military or terrorist use of nuclear materials is considered minimal. However, according to
the Icelandic Radiation Safety Authority Iceland is not free from all danger. There is a considerable traffic of nuclear submarines and carriers through waters near the country; flights going through the international airport in Keflavík are coming from countries where the terrorist threat is high; a high proportion of all flights over the North-Atlantic pass through the Icelandic airspace; and many nations conduct their naval exercises in the proximity of the island (Pálsson and Holm, 2010). The consequences of any nuclear accident near the country would be catastrophic for the fishing grounds and food security, and even the slightest suspicion of radioactive emission into the sea would have devastating economic effects for a nation that is known for its pure and clean fish.

Another type of pollution that threatens food security is pollution of waterholes. According to the IRAR, microbiological contamination such as the E. coli bacteria is the primary threat to water security in Iceland. Other hazards are pollution and traffic of humans and animals near the springs, building of houses near the water supply, sabotage, oil spills, car accidents near waterholes, natural disasters, or toxic contamination. Of these, toxic contamination could be the most dangerous, but the likelihood of this happening is not considered great. Even if some kind of toxic substance should get into the drinking water, few of them are strong enough to contaminate the whole water supply after being diluted in the waterholes. However, water is not filtered or x-rayed in Iceland so the possibility cannot be ruled out entirely (Ministry for Foreign Affairs, 2009).

4.1.6 Animal Diseases
The spread of a dangerous disease in livestock or fish could have devastating effect on food security. Luckily, the status of animal health in Iceland is very good and in fact superior to that in most other countries. This is mainly due to Iceland’s geographic isolation combined with extremely strict and long-standing import controls on live animals and animal products. Iceland also has a centuries-old history of policies for fighting and exterminating animal diseases (MAST, n.d.a).

Despite these advantages, the danger is always present and animal diseases have affected Icelandic food production in the past, and could do so in the future. Examples of such diseases are various ectoparasites on sheep: the best-known cases are the sheep scab epidemics in 1762 and 1855. In the former instance, about sixty percent of all sheep had to be slaughtered and there was a shortage of
milk and meat in the country. With great effort, the sheep scab has been contained since the last epidemic, mainly by means of sheep dipping and restrictions on the transport of sheep between quarantine areas, but there are still some occurrences of it being reported (Richter, Eydal, Sigurðarson, 1997). Diseases in other animals like fish species, cattle, and chickens can also be difficult to handle and the authorities must be vigilant to this danger for the sake of food security.

4.1.7 Oligopoly

Oligopoly\(^{23}\) is a man-made threat to food security. The Icelandic food sector has all the characteristics of typical oligopoly: the Icelandic market is small by default and there are few major wholesale purchasers sharing the market\(^{24}\). As a result, these buyers can greatly influence price and other market factors. This causes the competition to suffer as the larger companies use their predominance to underbid their smaller competitors. For example, in 2008 the Competition Authority fined the company Hagar, owner of the largest convenience store chain in Iceland, the sum of 315 million Króna for using its predominance in the market to manipulate prices and underbid weaker competitors (Competition Authority, 2008). This kind of oligopoly undermines both healthy competition and food security. As all importation of food is in the hands of private companies, it is in the interest of food security to have as diverse an ownership pattern in the food sector as possible. Any kind of business failure, operating error, negligence or accident involving a predominant actor in retail, distribution, importation, or transportation could understandably cause problems for food security. However, in all probability problems created by the failure or bankruptcy of a private company

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\(^{23}\) Meaning a too-small range of providers: a monopoly market.

\(^{24}\) This is also a problem in the other Nordic countries even though the market is considerably larger there. In 2007, three companies had 88 percent share of the grocery market in Sweden, of which ICA alone had 50 percent. There, the large companies have their hands in the till all the way from the processing industry to the sale in stores. They even operate their own distribution centres (Swedish Emergency Preparedness Office, 2007). In Norway nearly all distribution and sale of food is handled by four large wholesale associations. The supermarket chains that are associated with these wholesale associations have for example increased their market share from around 50 percent in 1990 to 99 percent in 2006 (Norwegian Ministry of Justice and Police, 2006) The Danish risk assessment report does not mention the state of the grocery market but declares its concern over the food production industry that is characterised by few large companies or production blocs. These production blocs cover up to 90 percent of the production (Committee for National Risk Assessment, 2004). The Finnish security strategy also expresses concerns over how the production and distribution system is concentrating and internationalising (Finnish Security and Defence Committee, 2006).
would only be temporary, as the market dictates that another company would take its place eventually.

4.2 External Threats to Food Security

4.2.1 Increasing Food Prices and International Market Trends

According to the FAO Food Price Index, international food prices have risen 157 percent between the start of 2002 and January 2011 (“Food Price Indices”, 2010). This rise in food prices on international markets, along with lesser purchasing power in Iceland, has shown that Icelanders cannot rely on economic superiority to protect their food security. Iceland is an importer and must therefore follow and obey the whims of the international market.

There are two mutually reinforcing factors that play a major part in higher global food prices: increase in demand and decrease in supply. According to a FAO report from 2008, The State of Food Insecurity in the World, the increase in demand is mostly attributable to two factors: consumption patterns and the growing popularity of biofuel. First, consumption patterns have been changing because of growing population, increased urbanisation, economic growth, and the expansion of the middle class in large developing countries such as China and India. Growing purchasing power in these countries and newfound wealth has increased demand for quality food, pushing the prices up. Second, the growing biofuel market has created higher demand for certain agricultural goods that are used for biofuel production. Greater demand for agricultural goods causes a surge in their prices, which in turn leads to higher food prices. In short, the concern is that the more agricultural products one uses for biofuel production, the less is left for food production.

The other factor leading to increased food prices is decrease in supply. According to the aforementioned FAO report, this is mostly caused by the fact that several of the world’s largest cereal producers have changed their agricultural policies, leading to lower levels of cereal stocks. These lower stock levels contribute to higher price volatility, mainly because they give rise to uncertainty about the sufficiency of supplies in emergencies and in case of production failure. Production setbacks due to extreme weathers, droughts, and floods have affected large cereal producing countries badly in recent years and limited the supplies of
food. Poor yields, combined with already low levels of stock, have increased worries and therefore prices. Mounting anxiety over the prospective consequences of climate change on food production has also increased prices. In addition, fuel and food prices are strongly interlinked; increased fuel prices contribute to higher food prices.

The FAO report also looks to other influencing factors. Trade policies have exacerbated the effects of the trends in supply and demand. Implementation of export limitations in some countries has for example reduced supply and decreased trust, the report claims. The turmoil in financial asset markets has also had an impact, as there has been an increased level of speculative activity in the agricultural commodity markets and in some experts’ view this has been a significant factor in higher food prices. However, the report points out that it is not clear whether speculation is increasing prices, or if higher prices are triggering this behaviour among investors. In any case, it is clear that high inflows of money into the agricultural market could be contributing to high food prices and instability (FAO, 2008). All of the above has irrefutably increased the prices of food and could sustain high prices for the unforeseeable future. These developments on the international markets are a clear threat to Iceland’s import dependent food security.

4.2.2 Transportation Blockage on Imports

As Iceland imports a large part of its food and raw material for food production, any obstacle to regular and safe transportation into the country can be dangerous to food security. Air transport is the largest channel for food imports, mainly because food needs the flexibility and speed of delivery that air transport offers. Despite all its conveniences, air transport is sensitive to disruptions like frequent strikes of pilots and air-traffic controllers, weather, or natural disasters. An example of this is the frequently mentioned Eyjafjallajökull eruption. The ash it produced had a massive impact on air traffic in Europe when the authorities closed down the largest airports of the continent for days on end (“Icelandic volcanic”, 2010; “Luftraum über”, 2010). The resulting disruption showed how important stable air transport is for food distribution and how short a time it takes for shortage to be felt. Soon after the disruption, the media in Britain started to report shortages of certain goods (“Ash cloud”, 2010; Hanlon, 2010). The airport
closures did not however have a serious impact on importers in Iceland, mainly because the situation did not last long and importers were able to import foods like fresh fruit from the US instead of the ones stuck in European airports (“Fiskútflytjandi segist”, 2010). There is no question, however, that any prolonged paralysis of air traffic could do serious damage to Icelandic food security, not least as it would take considerable time to load ships and sail to Iceland with food as an alternative. The food supply would not stop entirely but many important food categories would disappear from the stores.

4.2.3 Pandemics
In an ever increasingly interdependent world, the threat of a pandemic is real and any outbreaks would soon reach Iceland. This was plain to see in 2009 when the swine 'flu pandemic spread throughout the world – even though that particular pandemic was not as pernicious as first feared. Pandemics are difficult to anticipate and they can hit without warning. Iceland is an open society in active daily contact with other societies: thus diseases have clear and fast access into the country. The positive aspect is that Iceland is an island and could be, theoretically at least, isolated relatively easily as there are not many exit and entrance points to the country. However, such a closure of the entire country would have undesirable consequences for food security, especially if it lasted for a long time.

Three influenza pandemics spread around the world in the 20th century, the 1918 pandemic being the most virulent of them all with an estimated 50 million casualties. Iceland was hit hard in 1918 and nearly 500 people died; a great toll for such a small society. The age of the victims in such pandemics is usually lower than in regular epidemics. This means that young working people are more likely to be hit than older people or children. This endangers productivity and distribution in the food sector, as well as in other sectors of society. The 2006 influenza report mentioned above claims that the most obvious consequence of an influenza pandemic would be decreased participation in the job market: either through sickness and death, or absenteeism due to fear of infection or nursing of family members. Therefore – the report states – while it is important to keep the infrastructure of the economy as intact as possible, some reduction in productivity is unavoidable (Prime Minister’s Office, 2006). If work in electricity production, waterworks, communication, transportation, or banking should stop it could have
a clear influence on food security. Obviously, the influence depends greatly on how severe the pandemic is. If few are hospitalised and the public stays relatively healthy, as in the swine ‘flu pandemic of 2009, effects on food security are minimal, but if the pandemic reaches the heights of 1918, food security could be in genuine danger. Advances in medicine and the ability to come up with a vaccine relatively fast after an outbreak, as seen in the swine ‘flu pandemic, diminishes the chances of another 1918 pandemic with a catastrophic death toll. Nevertheless, pandemics remain a constant threat to food security as well as the wellness of nations.

4.2.4 External Energy Shortage

Although external energy is not as significant for Icelandic energy management as renewable hydroelectric and geothermal power, it plays a big part in Icelandic society, especially in food security. Externally produced energy, most notably oil, is extremely important for all food production. Without oil, it would not be possible to power fishing vessels, various machines in agriculture, or vehicles used in food distribution.

Icelanders import most of their oil from Norway and the import routes are clear and fast under normal circumstances. Damages to oil refineries in Northern Europe could however cause upheaval in this trade connection and interfere with oil imports into the country (CPD, 2005). World market prices, global supplies, the status of the Króna, and credit facilities among others could also influence oil imports.

Representatives from the Icelandic oil companies asserted in interviews in 2006 with the authors of the influenza report that there were no reasons to fear fuel shortages during crisis. They claimed there were quite sizeable stocks available in the country at any given time and they fully expected demand to decrease in a crisis as well. Representatives from two oil companies claimed the average stock of oil in the country was enough to last forty-five to fifty days without change in demand (Prime Minister’s Office, 2006). Yet, in a draft of a Icelandic energy policy that is now being put together, the stock of oil and petroleum is estimated to be rather smaller, or thirty to forty-five days (National Energy Authority, 2011).
Either way, Iceland boasts of considerably smaller stocks than the ninety-day supply the EU countries and members of the International Energy Agency (IEA) are obligated to store (CPD, 2005; National Energy Authority, 2011). One can imagine as well that the oil in Iceland could last considerably longer if the authorities had the good sense to resort to rationing in time and directed the supplies towards essential services and production. In this context, all food production and distribution would unquestionably fall under the category of essential services.

The threat of external energy shortage can be lessened in the future with domestically produced alternative fuel sources. Rapeseed oil (biodiesel) is an example of this. In November 2010, the farmer at Þorvaldseyri farm was the first Icelander to power his tractor with oil from rapeseed mixed with diesel oil. According to an engineer at the Icelandic Maritime Administration (IMA), which oversees the relevant research, the middlings from the product is very valuable as a fodder and that alone covers the cost of the cultivation. The oil as such is in fact only a by-product and is as such without any cost (“Bóndi ekur”, 2010). If this is the case rapeseed oil could be very competitive compared to other energy sources. Still, other sources, like Ólafur R. Dýrmundsson at the FAI, have expressed their concern that rapeseed cultivation is in direct competition with food cultivation over arable land (Dýrmundsson, personal communication, February 2, 2011). At the IMA, however, the idea is to use rapeseed for soil reclamation on barren land and not as a competitor to other cultivation (“Bóndi ekur”, 2010). It remains to be seen how much biodiesel can be produced this way and if it is viable.

Other alternative energy sources are also being researched. For example, an Icelandic whale watching boat became the first vessel in the world to be powered

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25 Iceland is a member neither of the EU nor IEA and has hitherto set – or rather not set – its own policy in these matters.
26 In fact, this is already being proposed in the draft of the Icelandic energy policy. In the draft, there are propositions on how to increase the durability of oil supplies and suggestions on negotiating with other countries for access to their supplies, placing obligations on the oil companies to keep minimum stocks, and/or an obligation on the state to bear the cost of such stocks or contingency plans. It is also suggested that Iceland examines the pros and cons of joining the IEA and taking up its contingency plans regarding oil supplies. Moreover, it is suggested that there is a need for contingency plans concerning application and rationing of fossil fuels if there is a disruption of importation (National Energy Authority, 2011). However, as this is only a draft of a policy it remains to be seen how these suggestions will fare in the final version and how they will be implemented.
27 The coarse part of the seed that is left after the oil is extracted.
by hydrogen in 2008 as a part of a research programme on hydrogen and its future use (“Hvalaskoðun og skemmtisiglingar”, 2008; “Iceland moves”, 2008). Methane gas is another source that is fast becoming more and more popular as it is both cheaper and milder on the environment than oil. Its positive side is that research and experiments show that it can be produced domestically from organic substances like fish wastes, manure, grass and other biomass from agriculture (Metan, n.d.a; Metan, n.d.b). All of this is something that should be researched further, but its effectiveness in decreasing Iceland’s dependency on imported energy depends on its practicality as well as developments in fossil fuel prices and supply.

4.2.5 Terrorism and Sabotage

Terrorism and sabotage are potential threats to food security, especially if they are targeted at food itself (deliberate contamination) or at the infrastructure important for food production, distribution, or storage. In March 2010, the department of research and analysis at the National Commissioner of the Icelandic Police (hereafter referred to as NCIP) published a detailed evaluation report for the year 2010 where the department analysed the risks of organised crime and terrorism in Iceland. The report itself is confidential but an abridged version was made public and published on the Internet. In the report, the danger of terrorists’ actions against certain targets or events in Iceland is assessed as low. This evaluation is based on the fact that no information has come to light that indicates that such attack is in preparation. However, the report warns that the danger of terrorism is both global and permanent, and it would be as preposterous to dismiss the threat, as it is to exaggerate it (NCIP, 2010).

Nevertheless, Iceland’s ideological stance on the international scene and its participation in international collaboration could lead to terrorists looking to Iceland. The sentiment of repugnance expressed by certain sections of the public, and some politicians, towards Iceland’s involvement in George W. Bush’s list of the “coalition of the willing” in the run-up to the Iraq war echoes such concerns. Many feared that by being on the list, Iceland was making itself a target. Iceland’s participation in NATO operations, high profile visits of Western leaders, or participation in a range of international conferences, could also spark unwanted interest from dissidents or terrorists.
Even though the risk of terrorism or sabotage is estimated low, the lack of the most simple security measures in Iceland is worrisome. A recent incident exemplifies this complacency shown by Icelandic authorities towards security. In March 2010, unknown individual(s) attempted to sabotage a major telecommunication mast in Reykjavík. On the scene, the police found out that electric cables used to power the transmitting equipment upon the mast had been seared badly. The police also found two bottles of flammable material and an explosive device that had not detonated for some reason. Thus, the result of the attempt was only a minor disruption of microwave transmission. Among the equipment in the mast were the antennae of all the largest telecommunication companies and emergency services in the country. Had the sabotage been successful, it would have cut off nearly all communication with the outside world and thus influenced imports into the country and distribution of food within it (“Spellvirkin hefðu”, 2010; “Fjarskipti verði”, 2010). The worrying aspect of the story is how unprotected the mast was, and remains, from sabotage (let alone the recklessness of putting all communication antennae on one mast). This example shows that even though the risk of terrorism or sabotage is low, the possibility is always there – and is practically made inviting with lax security.

4.2.6 War and Conflicts

Inevitably, war has to be counted in this synopsis of external threats to food security. The chance of an outbreak of open warfare that jeopardises food security in Iceland is probably not great. Nonetheless, the realist school dictates that interactions between states always carry the potential for conflict of interests and power struggle. War in other countries, especially in Iceland’s principal trading countries in Europe, would pose a great threat to food security. Nevertheless, for such a war to pose a threat to distribution security, it would probably have to be a large-scale war affecting many important suppliers at once. As things stand, Iceland’s largest trading partners are in Europe, and with the ever-closer integration of that continent war is unlikely. A smaller skirmish or intrastate conflict is a more realistic scenario, but such conflicts would not have any measurable effect on food security unless they were to take place in key trading countries.
4.2.7 External Pressure

Another threat to food security is external pressure. If conditions for food production in larger nations deteriorate for some reason, there is a possibility of these nations pressuring Icelanders to sell their food products to them. Just like other producers, farmers look for the best price available for their products and if they are offered premium prices by desperate foreign parties that the normal Icelandic market cannot compete with, they will sell. There is also the possibility of farmers entering into long-term contracts with foreign parties for Icelandic products, which could lead to a situation where the Icelandic public would get second-rate food, or in a worst-case scenario, nothing. This possibility, even though it sounds remote today, has been discussed in all seriousness most notably by the President of Iceland at the Búnaðarþing in 2008 (Grimsson, 2008b).

Modern variants of such a development can be seen clearly when looking at the course of Asia–Africa relations in recent years. Both private parties and governments in Asia have been trying to secure land for grain farming and food production in Africa. It is clear that these Asian nations are securing their future food production: they anticipate growing populations and/or see possible setbacks to their domestic production in the future. Such setbacks could come in the form of climate change resulting in droughts and crop failures, growing demand for farmland because of growing population, and/or economic growth and increasing quality of life resulting in more demand for production of quality food. The possibility of foreign nations or private parties buying land in Iceland for farming is perhaps rather far-fetched, but the possibility of large nations overbidding the domestic market for the best foods is a potential future danger to food security.

4.2.8 Climate Change

Climate Change is another factor that has potential to have massive impact on Icelandic food security. Whether it will be a good impact, a bad impact, or both, is complicated and far from clear. Even climate change itself and its influence are controversial. Most agree that temperatures have risen in recent decades, but scientists debate about what this really means and whether the development will continue. Furthermore, the debate is riddled with controversy about what impact climate change will have and what strategies to adopt in the matter.
In 2008, a Scientific Committee on Climate Change (appointed by the Minister for the Environment in 2007) produced a comprehensive report on climate change and its influence on Iceland. Among the things that the report touches on is the likely rise in sea levels around the country that is predicted during this century (Björnsson, et al., 2008). This change in the sea level could have significant influence on farming land, as the latter is often located in low-lying areas. Agriculture could therefore be under threat if the elevation of the sea continues or increases.

With higher sea levels, the danger of flooding from the sea increases. In some cases, the authorities have reacted to concurrent effects of rising sea levels and land subsidence by building seawalls. This danger does however not seem to be high in Iceland as the CPD assesses that the overall shock endurance of the country is sufficient when it comes to flooding from the sea (CPD, 2005). However, if the Greenland icecap continues to melt at the same rate as it does now, the consequences could be much more serious for Iceland and it could lead to a rise in sea levels by several metres. This would also have consequences for the fishing grounds as the sea around Greenland would consequently contain less salt and that could influence stratification of the sea and ocean currents (Ministry for Foreign Affairs, 2009).

The Scientific Committee also reports that glaciers will retreat during the century. Drainage, mud discharge, and thaw flooding from the glaciers will increase steadily during the first half of the century but decrease when the glaciers diminish in the latter half. An expected increase in rain, higher temperatures during winter, and thawing of glaciers will all combine to increase water drainage and this will generate larger floods than previously known in Iceland (Björnsson, et al., 2008; Ministry for Foreign Affairs, 2009). It is clear that this increased flooding hazard could have detrimental impact on farmlands. Another consequence of the glacier retreat is the land uplift that occurs when the pressure of the glaciers disappears. This can cause increased frequency in volcanic eruptions, especially under Vatnajökull glacier (Ministry for the Environment, 2009).

Warmer climate, increased rain, and thawing of glaciers will also have effects on hydropower in the country. The current hydropower system will produce much more power in the future due to increased water flow. This change is mostly
positive, at least while the glaciers are still there. The negative side is that flooding and increased unpredictability of the weather can cause problems at power plants (Björnsson, et al., 2008). It is clear that increased power supply will be very positive for food production, especially horticulture, but it is uncertain what the situation will be when the glaciers diminish.

It is thought that climate change increases the frequency of tempests and therefore damage caused by them. Damage caused by tempests is however often only local and the CPD deems that shock endurance of the Icelandic nation in this respect is sufficient, even though damage in particular storms can be great (CPD, 2005). If such tempests increase in the near future, it can affect agriculture, especially grain farming, as it is very sensitive to wind.

Increased temperatures will, and have already, had great impact on the biosphere of the country: vegetation has increased and the timberline of birch has moved higher up. Human, animal, and plant diseases would also increase in higher temperatures. The Scientific Committee report claims that climate change will generally reinforce agriculture in Iceland. Predictions indicate that harvest will increase in all forage plants and potherbs that are currently grown in the country. Cultivation of herbs and plants that have barely prospered until now will be more robust in the future and new plants and herbs that have not been cultivated previously in Iceland (oats, wheat, winter corn, etc.) will have a much greater chance of surviving than in the past (Björnsson, et al., 2008). Researches indicate for instance that the growing season of grains will get longer as the springs will be better and night-frost will be rarer during autumn. This development will however not extend the growing season into the autumn because climate change will cause more danger of stormy weather (Intellecta, 2009). Animal husbandry should also benefit from climate change because of better fodder and a shorter period of artificial feeding as the livestock would stay longer outside (Björnsson, et al., 2008). As mentioned earlier, there are also threats to agriculture posed by climate change, the greatest of them being pests, tempests, and higher sea levels. However, these predictions show that climate change will most likely lead to stronger agriculture overall even though other factors might jeopardise it.

The Scientific Committee report also points out that sea temperatures will increase during the century. Generally, it can be assumed that the warming will
increase productivity in the sea. This is however likely to bring on some changes in fish species living in Icelandic waters: southern species will, and have already, become more common while the productivity and living area of northern species will decrease. It is important though to iterate that in the ecosystem of the sea, causality is very complex and it is very difficult to predict how certain species will react to warmer environs and how particular factors influence the ecosystem (Björnsson, et al., 2008; Ministry for Foreign Affairs, 2009).

Another factor is changes in acidity of the ocean caused by increased carbon dioxide in the atmosphere. This development is worrisome as it can affect diatoms and other organisms in the ocean and decrease the productivity of the biosphere. This development can be harmful for fishing and therefore for the food security of Iceland (Ministry for Foreign Affairs, 2009).

Other more obvious factors can pose a threat to the biosphere of the ocean and to food security in Iceland. A warmer climate will open waterways that were closed before, such as the Arctic Ocean. More frequent accidents that inevitably follow an increase in shipping through Iceland’s waters could have a deleterious influence on the fishing grounds and therefore food security.

Despite these various uncertainties, it is generally believed that climate change will have a positive influence on productivity of the fishing grounds around Iceland. However, the Scientific Committee points out that the warmer climate will not be a sole determining factor as regards improved prospects for the fishing industry. All the signs indicate that efficient and robust fisheries control and good cooperation with neighbouring countries is ultimately more important for a robust and secure fisheries sector than the potential warming of the oceans around the country (Björnsson, et al., 2008).
5 The Icelandic Administration and Food Security

There is no administrative contingency plan for food security in Iceland (Friðriksson, personal communication, February 1, 2011). It is hard to give a single answer as to why this should be so. Some of the reason no doubt lies in complacency regarding food security, stemming from the fact that Icelanders have lived in a relatively food-secure environment for a long time. Icelanders did not for instance, like their Nordic neighbours, experience deprivation and shortage of food due to war and conflicts during the tumultuous 20th century. In fact, Icelanders have probably not suffered food shortages due to war or conflicts since the English blocked the sailing of merchant vessels from Denmark during the Napoleonic Wars.

Another possible reason for the lack of a contingency plan could be the smallness of the Icelandic administration. Its small size, limited manpower, and lack of financial resources mean that projects have to be prioritised: and food security is not exactly a top priority among policy makers when there is no immediate visible threat to the food supply. However, as has been discussed extensively in this thesis, this might be changing.

In an article on economic security, Silja Bára Ómarsdóttir (2009) mentions another potential reason for this lack of policy. She argues that Icelandic politicians and policy makers have simply not been accustomed to a proper security discourse and to the practice of making security policy. This is because for more than fifty years, it was the United States that assessed possible threats to Icelandic security and made appropriate arrangements for Icelanders. Ómarsdóttir claims that when the US forces finally withdrew in 2006, Icelandic policy makers did not seize the opportunity to re-shape their security policy from scratch, and to focus on softer security issues like the environment, society, and economy. Instead, the Icelandic authorities decided to focus on what they knew and had learned from the presence of the US navy: seeking to re-provide external security by measures such as airspace policing and other militaristic security functions. Therefore, little heed has been paid to softer security issues and many fields such as food and economic security have consequently been overlooked by Icelandic policy makers and the administration.
5.1 Civil Defence

Within the administration, protection of food security has traditionally been put under the hat of hagvárnir, or ‘economic defence’ in English\(^\text{28}\). Discussion about economic defence has however been very limited within the public sector and the term has not had any practical significance.

The term first appeared in the Civil Defence Law of 1962. The law, with latter-day revisions, stipulated that the prime minister was to appoint an Economic Defence Council\(^\text{29}\) (hereafter referred to as EDC) under the presidency of the permanent secretary of the Prime Minister’s Office\(^\text{30}\). According to the law, all permanent secretaries of all ministries should sit in the council and the permanent secretary at the Ministry of Justice should be its chairman. The role of the council was to advise and give support to the government in matters concerning economic defence. The government was also allowed to seek the council’s opinion on issues concerning health-related, administrative, and educational preparedness in relation to emergencies.

The EDC was supposed to take appropriate measures to make sure that ministries and state- and municipality institutions would prepare suitable strategies for response and operation in times of danger. In addition, the role of the council was to oversee all administration of supplies and stocks during crisis, i.e. to collect in one place all documentation concerning the need for stocks, and to make plans for procurement of additional stocks if needed and for their distribution and rationing. The council could also, at any time it saw fit, make suggestions to the government regarding actions or decisions that it considered necessary to secure economic defence. Furthermore, the law stipulated that the government had the authority to issue orders to sell and distribute vital commodities in the country or to confiscate food, fuel, spare parts, pharmaceuticals, and other items that could possibly be in danger of running out (Lög um almannaðvarnrir nr. 94/1962).

\(^{28}\) In the 1962 Civil Defence Law, the term ‘economic defence’ does not in any way refer to the security of the financial system or to general economic considerations of any kind. Instead, the term covers security measures and safe supply of basic necessaries, such as food and fuel.

\(^{29}\) Icelandic: Hagvárnarráð.

\(^{30}\) Chapter VI in the law – the chapter containing the Economic Defence Council – was incorporated in its entirety into the original law from 1962 with law no. 85 from 1985. Therefore, the council itself was not added to the original law until 1985.
This shows that the council had considerable authority by law to take security measures and enforce planning among public institutions in several fields. However, the council was never active and did not use its authority to have contingency plans drawn up. In fact, the council only ever convened once: in January 1991. This was in response to fears over both imminent shortages of oil and terrorism threats made against Western countries leading up to the Gulf War ("Birgðastaðan góð", 1991).

In 2008, a new Civil Defence Law was put in place and the older law from 1962 abolished. In the new law, radical changes were made to the civil defence structure of the country, even though some similarities with the older law remain. In the new law, there is no mention of the EDC, but another inter-departmental council is envisaged that is similar in structure but larger and with revamped functions. The new council, called Civil Defence and Security Affairs Council\(^{31}\) (hereafter referred to as CDSAC), is supposed – unlike its predecessor – to set policy on the whole range of civil defence and security affairs of the country\(^{32}\).

According to the new law, the government policy on civil defence and security issues shall be set by the CDSAC for three years at a time. This policy shall start from an analysis of the actual situation and prospects in civil defence and security affairs of the country. It should address important issues in the organisation of civil defence and security, look into preventive measures, and carry out the necessary coordination of contingency plans and operations of public institutions in the field. The policy is also supposed to address necessary stock levels to secure the livelihood of the nation during crisis, organise reconstruction after catastrophes, and provide for other actions that the council deems necessary to secure the goals of civil defence.

The CDSAC itself is larger than its predecessor and is composed of individuals higher up in the administration (as often happens with councils that oversee policy making). The prime minister chairs the council and several other ministers sit on it. The prime minister can add up to two extra ministers when handling special cases. Others who have seats on the council are permanent secretaries and other directors from various state and non-state agencies that have a stake in civil

\(^{31}\) Icelandic: Almannavarna- og öryggismálaráð.

\(^{32}\) This does not however apply to so-called ‘hard’ security like airspace policing and military protection, which is covered in the 2008 Defence Law (and in the 1951 Defence Agreement). See: Varnarmálalög nr. 34/2008.
defence, such as the Director of the Coast Guard, National Commissioner of the Icelandic Police, and a representative from the Red Cross (Lög um almannavarnir nr. 82/2008).

The question thus becomes whether the new council is going to be active in practice or if it is going to be as inactive as the EDC. Two recent experiences show that the verdict on that is still open. The CDSAC was for example not mobilised for action when the Icelandic financial system collapsed in the autumn of 2008 (although the new Civil Defence Law came into effect on June 1, 2008). This raises the question whether the authorities do not consider economic instability as a security threat, or whether they were just asleep on guard. However, the council did convene in June 2010 to review preparedness for the H1N1 influenza pandemic (NCIP, 2009). The council’s inactivity during the financial crisis does therefore not need to be indicative of the council’s future inactivity; it may merely reflect the fact that the law was new, there were still no guidelines on how to mobilise the council at short notice, and the economic shock had thrown both government and society into disarray. Even so, it does point to a certain state of mind among the Icelandic authorities that economic instability (and therefore by extension food insecurity) should not automatically have been treated as part of the civil defence system. All in all, only time will tell if the CDSAC will fulfil its full role as prescribed by law.

Interestingly, according to the new Civil Defence Law, the state is obligated to construct contingency plans. Individual ministries and their subsidiary institutions are supposed – in liaison with the NCIP – to examine the state of crisis resilience in the fields of Icelandic public life that fall under their jurisdiction. These individual ministries and subsidiary institutions shall also organise responses and actions according to the contingency plans they are responsible for creating. These contingency plans address (or should address) operational organisation, the preparedness of response actors, transport and communications, execution of arrangements during crisis, coordination and control of the operation of response actors and other parties, crisis counselling and assistance to victims, along with economic defence, supply, and emergency transportation to and from the

33 On April 30, 2009, the Prime Minister signed a directive wherein the procedures of the council were defined further. With the directive in place, it is possible to convene the CDSAC as needed at short notice (Prime Minister’s Office, 2009).
country\textsuperscript{34} (\textit{Lög um almannavarnir} nr. 82/2008). In this context, it is important to keep in mind that the law does not state that the authorities should make contingency plans for economic defence, supply, and emergency transportation, only that these factors should be included in all the contingency plans. However, if one was to make a contingency plan for food security as a separate issue, all the factors mentioned in the law and deemed necessary in a contingency plan would need to be included.

Another interesting aspect of the new law is that it opens the door for collaboration with private companies. The law states that public and private parties are obliged to hand over necessary information when the state or municipalities are making contingency plans. Each minister, in cooperation with the NCIP, has the authority to require public or private parties to offer assistance or help to further work out certain aspects of the Civil Defence Law. If needed, each minister in cooperation with the NCIP can also decide that public and private parties shall resort to preventive measures concerning sale of goods and the provision of services and production. However, before such decisions are made on the basis of the new law, the authorities are to negotiate with the concerned companies or institutions over the definition of their duties and how much impact this will have on their operations. The authorities are also required to compensate all damage or losses incurred by the concerned party as a result (\textit{Lög um almannavarnir} nr. 82/2008). This new provision in the law is in accordance with what the authorities tried to achieve in their previous attempts to establish cooperation with private companies when making the influenza contingency plan. Of course, the authorities have the power to demand certain things during crisis, and this makes all emergency planning and execution easier in principle: but the way of negotiation should be preferred, and pre-agreed cooperation between the authorities and private companies (such as food suppliers) ought to be favoured.

The new law grants other extensive powers to the authorities during crisis. As in the 1962 law, the government is, among other things, permitted during crisis to issue instructions about the sale and distribution of necessities if the public good so requires. The government can also confiscate food, fuel, spare parts,

\textsuperscript{34} Here the term economic defence (hagvarnir) is not defined further, and therefore it could mean either security of food and oil as in the 1962 law, or economic security in the literal and broader sense. However, as the term is mentioned together with supply and emergency transports it has in all probability the same meaning here as in the 1962 law.
pharmaceuticals, and other vital supplies that are in danger of running out (Lög um almannaðvarnr nr. 82/2008). Thus, the new Civil Defence Law legally facilitates any form of state management of necessities such as food and oil in a crisis.

As of now, there is no contingency plan in place on food security at the CPD. However, some work has been done in this field in relation to a contingency plan for a possible influenza pandemic that was adopted in 2008. The plan, Influenza Pandemic: National Plan, touches on various factors that need addressing to secure proper function of society during an influenza pandemic – food production, supply, and distribution included. In the contingency plan, several vital functions are defined that need to be taken care of during a pandemic. These are issues like banking and financial services, ambulance services, the school system, waste disposal, and so on. Under each of these functions there are several tasks that need to be performed and the responsible parties for them are identified. In the plan, there are two issues that touch directly on food security: ‘distribution of necessities (food - cleaning supplies - fuel)’ and ‘food production’. According to the contingency plan, the main role of the distribution of necessities category is to secure stock keeping, distribution, and record-keeping of necessities. Similarly, the main role of the food production category is to gather and impart information on the status of food supplies in the country during an influenza pandemic and to lay down policy on procedures for food producers. The food producers are then to work according to these procedures to secure minimum supplies of food.

The contingency plan also defines the roles of certain responsible parties and how they are to act during each threat level. The relevance of the parties’ responsibilities and roles to food security varies. Some of them, like the FAI, PHII, MAST, the distribution companies, the grocery stores, the food producers, the importers and producers of fodder, and the food stock suppliers, have direct connections with food security, while others, like the Icelandic Banks Data Centre and the oil companies have indirect influence on food security (CPD, 2008). The influenza contingency plan, even though its focus is mainly on antisepsis, gives a good indication on how a food security contingency plan should be constructed and where the dangers lie and what areas should be

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35 In Icelandic: Heimsfaraldur inflúensu: Landsáætlun.
36 Icelandic: Reiknistofa Bankana
improved. The plan should therefore be considered a good starting point or basis for future contingency plans in the area of food security.

The conclusion that can be drawn from this chapter is that overall the new Civil Defence Law is very general and focuses, according to its preamble, essentially on preparing, organising, and implementing measures that have the purpose of hindering or limiting damage caused by natural disasters, human actions, pandemics, military action, or other similar reasons. The law thus offers no comprehensive plan to tackle food insecurity \textit{per se}, but rather outlines responses to other dangers that can influence food security directly or indirectly. Additionally, the law offers scope to develop the subject further; it addresses the issue of cooperation with the private sector, defines a duty to construct contingency plans for various security requirements, and allows actions regarding supply control during crisis and so on. This is a good basis to start with: but more needs to be done to tackle food insecurity in the round.

Likewise, the influenza contingency plan is a good starting point that offers useful insight into the workings of emergency planning. The experience gained by the CPD in making such plan has been invaluable and could stand in good stead in the future and provide a good basis for other contingency plans. As this particular contingency plan is only to be enacted in case of an influenza pandemic there is a need for other contingency plans, either a general food security plan or further specialized plans where food issues are incorporated. Examples of this could be contingency plans for natural disasters or banking crisis and these could include provisions for food distribution, supply and production. From this perspective, the thesis will next look at public institutions that have a part to play in the Icelandic food sector.

\subsection*{5.2 Public Institutions}

The Ministry of Fisheries and Agriculture is the administrative institution that is responsible for the proper functioning of the food sector. Despite this, there is no office within the ministry that has the role of directly handling food security. In fact, there is no official policy or activity for food security as such within the administration (Friðriksson, personal communication, February 1, 2011).

However, three offices within the ministry touch on different food issues relevant to security. First, the Food and Development Office handles food safety
and consumer matters along with the health of plants, fish, animals and their produce. The office oversees research and innovation in the food industry, including fish farming, matters related to salmon and trout fishing, and tasks according to the laws on agricultural produce. The office also oversees soil conservation, forestry, and professional relations with various institutes and authorities in the food sector (Ministry for Fisheries and Agriculture, n.d.c). The second office that has to do with food is the Natural Resources Office. The office administers matters that relate to the use of natural resources in the sea and on land. It prepares acts of parliament, writes regulations, and prepares advisory opinions and reports on natural resource issues. Most notably the office handles relations with the Marine Research Institute over proposals for exploitation of marine stocks (Ministry for Fisheries and Agriculture, n.d.d). The third office is the Agricultural Land Registry Office, which supervises state owned farms along with the buying and selling of all farms, tenancy and rent arrangements, and mortgaging. This office supervises farm boundaries and communal farms, endorsement of the division of land, release of land from agricultural use, registration of new farms, general laws governing farms, and matters regarding farms and the laws on tenancy (Ministry for Fisheries and Agriculture, n.d.e). As this summary shows, these three offices touch only indirectly on the issue discussed in this thesis.

Several other public institutions and offices work in the food sector. Most of these institutions are mainly concerned with food safety but their purview also relates to food security, either directly or indirectly. Nearly all of them are under the auspices of the Ministry of Fisheries and Agriculture. The Icelandic Food and Veterinary Authority (MAST) is a state agency that oversees food safety in a broad sense and touches therefore on various aspects overlapping food security. It functions mainly as an inspection and administrative body responsible to the Ministry for Fisheries and Agriculture. Its primary role is to ensure food safety, overseeing the primary production of animal and fish products, imports and exports of foodstuffs, the management and monitoring of supplies, and inspection of animal and plant welfare. The Authority also supervises the domestic food inspection measures carried out by municipal authorities in addition to handling veterinary protection, meat classification, and quality control (MAST, n.d.b).
Importantly for food security, MAST also functions as a plant protection agency and in that capacity it is responsible for sustaining plant health and guaranteeing seed quality. The agency is responsible for the oversight of import, export, diseases, production, and the sale of fertilisers, seedstock, plants, and plant products. Its functions also include securing the safety and quality of fodder. In addition, MAST supervises quality, health, and environmental safeguards regarding other major supplies for agriculture, and thus has a role of indirect surveillance over the quality and wholesomeness of food from Icelandic agriculture (MAST, n.d.b). All of this is very important for food security.

Another important aspect of MAST’s work for food security is its role in fighting, controlling, and eradicating infectious diseases in animals. This is done partly through its control of imports and exports of live animals, animal breeding materials, animal products, and animal fodder. The task is large: covering all products, live animals, tourist movements, or other means that can carry contagious substances dangerous to animals or humans. It is important to keep in mind that according to Icelandic law all imports of food of animal origin are forbidden37 (MAST, n.d.b). This law is relatively easy to enforce because of the geographical location of the country and is a strong point in favour of both food security and food safety. However, it has been argued by interested parties in the food production industry that the current safeguards against infection, while of course not foolproof, will be put at major risk if Iceland enters the EU without a special dispensation prohibiting imports of raw meat and livestock (Dýrmundsson, personal communication, February 2, 2011).

Just like MAST, Matís Ltd., a food and biotech research and development institute, handles food safety in a broad sense and touches on issues that are of concern for food security. Founded in 2007 through the merger of three former state-run food research institutes, the institute focuses on innovation in food and biotechnology, providing consultancy and services to companies in the food industry as well as to governmental agencies. The aim is to increase the safety and quality of food products (Matís, n.d.). This work is important to food security as more research and development in Icelandic food production is a necessary step towards more and better domestic production. It helps to promote discoveries that

37 The Minister of Fisheries and Agriculture is permitted to deviate from this ban, following a positive evaluation by MAST.
allow for more sustainability and diversity in food production and therefore help to reduce reliance on imports.

On top of this, several institutions handle fish related issues exclusively. One of them, the Directorate of Fisheries\textsuperscript{38}, is a government institution under the responsibility of the Ministry of Fisheries and Agriculture. The directorate is in charge of implementing government policy on fisheries management and treatment of seafood products. The main purpose of the directorate is to promote conservation and responsible exploitation of marine stocks by enforcing laws and regulations regarding fisheries management (Directorate of Fisheries, n.d.). This work is of concern for food security as overexploitation of the marine stocks in the seas around Iceland could severely damage the nation’s food security.

As seen here, several Icelandic public institutions touch on food safety and food production but none of them has a direct mandate or overall responsibility for food security. Their approach to food security is partial and indirect and their role does not seem to be determined with food security in mind. The general conclusion that can be drawn from this overview of public institutions is that there is no conscious emphasis on food security within these institutions.

5.3 Ad Hoc Working Groups and Task Forces

As stated earlier, however, there has been a noted revival in the food security debate in the last few years and this has been reflected in the number of ad hoc working groups and task forces created that touch on the subject of food security. It suggests that there is some movement within the administration in the direction of defining food security and potential risks to it, even if no governmental institution yet has direct responsibility in the field.

One of those ad hoc groups (mentioned before in the thesis) is a five-person committee that was appointed by the Minister of Fisheries and Agriculture in October 2009 to evaluate the need for revision of laws concerning land use. The commissioning letter to the committee states that it is being set up because in the last few years some debate has arisen in society about whether the ever more frequent subdivision of land into smaller units, scattered ownership, and changed usage (leisure, afforestation), could threaten food security in the future.

\textsuperscript{38} Icelandic: Fiskistofa.
February 2010 the committee published its report where it goes in detail into food security and encourages the authorities to use risk assessment procedures to look further into the foundations of Icelandic food security and the possibility of having permanent stocks of vital materials and foods available at all times (Halldórsson et al, 2010).

At the Búnaðarþing in 2010, Jón Bjarnason, Minister for Fisheries and Agriculture, underlined the importance of the report, arguing that land and tenancy issues were wedded closely to the objective of sustainability and food security. He asserted that the government’s main policy aim must be to maintain and protect the present and future availability of land suitable for food production. Bjarnason stressed the importance of the authorities’ making use of the legal powers available to them to influence relevant developments at any given time (Bjarnason, 2010).

The Minister further explained in a 2009 newspaper interview that the starting point for his concern was that during the financial boom before 2008 there was a lot of demand for land and many non-farmers bought farmland in great quantities. The end result was that many of these farmlands went out of traditional farming. In the Minister’s view, so long as farmland is in the hands of non-farmers and not used for farming, or is even permanently converted for other purposes, this poses a threat to food security (“Matvælaðøryggi í húfi”, 2009).

It is therefore not surprising that the minister went on to appoint a working group with the task of reviewing the land and tenancy law and proposing a new draft law, using the aforementioned committee’s report as guideline (Ministry for Fisheries and Agriculture, 2009). The fact that a minister should wish to change the relatively new land and tenancy law, mainly in order to better safeguard future food security, shows that the idea of food security is slowly gaining ground within the administration.

In recent times the Ministry of Fisheries and Agriculture has also appointed various committees and working groups with the aim of examining and finding ways to strengthen specific production sectors within agriculture. Such work is an important contribution to food security as it points out faults in the relevant production sector and proposes suggestions to remedy these imperfections. This will eventually strengthen the respective production sector and therefore food security as a whole.
One of the most interesting and important working groups in this regard is a group appointed in October 2009 with a mandate to examine and propose ways to strengthen pig farming in Iceland with special regard for Icelandic circumstances concerning food security, fodder procurement, and environmental aspects. The working group handed in its report in February 2010 and it has many interesting findings. For example, the report warns that pig farming does not enjoy the same working environment as other food production sectors: there are no production contracts between the authorities and pig farmers and the latter only get insubstantial subsidies, unlike their counterparts in Europe or other meat farmers in Iceland. Consequently, the report recommends that the government and pig farmers negotiate a deal regarding support, working conditions, and the community obligations of the sector. This would strengthen the industry, and as a consequence, food security.

Furthermore, the report points to the industry’s weak financial footing and how financial institutions have had to intervene in the running of the farms with financial injections. The report also suggests that smaller and more traditional ‘family sized’ farms should be encouraged in the industry. Surveillance of healthiness and the accommodation of pigs would be a lot safer and easier within smaller farms, the report claims. The authors of the report are alarmed by the development in the industry whereby the last ten years the number of pig farms has decreased from 54 to 17 – with the farms becoming larger and more ‘factory like’ in the process. The report warns that with only 17 farms operating in the country there are higher chances of infection in a few farms ruining the total production. This is a concern for food security.

Another interesting point from this report is the suggestion that the industry could become near self-reliant. The report claims that with the emergence of proper grain farming in Iceland it seems that Icelandic pig farmers should be able to feed their animals to a significant degree with domestic grain; and where conditions allow for it, the pig farms could do their bit to support grain farming themselves (each farm produces large amount of pig manure that can be used as fertiliser in grain farming). At the same time, the use of Icelandic fat and fishmeal as fodder can be increased too, the report claims. The report suggest that an 80 percent share of domestic fodder in the pork production process would not be an unrealistic goal for the industry. This would be of great help in saving foreign
currency and also increasing food security in the country (Halldórsson, Steinbjörnsson, Brynjúlfsson, Harðarson, and Harðarson, 2010). This short summary of interesting points from the pig farming report shows clearly how valuable this kind of research can become for food security. It is clearly important that this kind of work be continued in the future.

Fortunately, this seems to be precisely the case. Just as with pig farming, the Ministry of Fisheries and Agriculture has appointed a working group with the task of suggesting ways to strengthen poultry farming with special regard for Icelandic circumstances concerning food security, fodder procurement, and environmental aspects. The working group, appointed in January 2010, is still to deliver its findings (Ministry for Fisheries and Agriculture, n.d.b).

Another such ad hoc working group appointed by the Ministry is tasked to work on a plan for advancing grain farming in Iceland. The mission of the group is to go through the propositions made in the Intellecta report and to produce a plan of implementation based on its conclusions (Ministry for Fisheries and Agriculture, n.d). As seen before there are indications that grain farming could be increased considerably, both for human consumption and for fodder production. Any practical and realistic suggestions and working procedures emerging from this group would be important both for saving foreign currency and for fodder and food security.

These ad hoc groups and task forces show that even if there is no single process seeking wide-ranging solutions for food insecurity as a whole, there is some useful work going on to analyse the major food production sectors with special regard for food security and other Icelandic circumstances. There is a lot of work to be done and many fields to be explored before any sort of final picture can be drawn, but the growth in ad hoc groups in recent years with the mandate to directly look at food security is encouraging.
6 What Is Needed to Improve Food Security?

This thesis has tried to analyse the strengths and weaknesses within the Icelandic system when it comes to food security. Now it is time to build on the information gained and use this knowledge to formulate suggestions on what is needed to improve food security in Iceland. In a nutshell, there are three things that Icelanders need to do to improve food security. First, it is necessary to build some sort of consensus on the way forward for the Icelandic food industry so that policy can be made in harmony with both food producers and consumers. Second, there is a need to analyse the food sector and threats to it to understand its environment and implications. Third, the information gained by analysis of the food sector should be used as a base to devise ways to prevent, limit, and insure against future food shortages. The following section discusses all three of these objectives.

6.1 Consensus on the Way Forward

It is essential for both food producers and the authorities who regulate and work with the industry to know where the industry stands and what the way forward is. The proposal for some sort food covenant, put forward by the President of Iceland at the Búnaðarþing in 2008, is maybe not such a farfetched idea. The basic notion is that Icelanders should collectively mark out some sort of path on how they want the food sector to function in the future.

Looking at consumption in the country it can be seen that Icelanders seem to be consuming ever more imported food. There is little doubt that some of this imported food could be produced domestically instead (grain, vegetables, etc). For example, the state could indubitably find a way to further subsidise electricity for vegetable production to encourage growth in the industry if it so desired. Yet the question is whether there is consent to this strategy within society. Would people feel that the money could be better spent elsewhere? Icelanders need to find consensus on what they want to do in this context: do they want to continue relying on potentially unstable importation or do they want to put energy and money into investing in the domestic industry? There is a need for clear consensus (and therefore policy) on this issue. However, this is unlikely to happen as things stand. According to the questionnaire results reported earlier in this thesis,
securitisation of the food issue has until now not been a success. And so long as Icelanders do not consider the food situation in the country as a security issue, there is little chance that the authorities will come under pressure from the public to put increased resources into the food sector.

Furthermore, the financial crisis seems to have forced Icelanders to review their faith in the power of the free market and its alleged ability to control itself. This review has to happen in the food sector as well. Icelanders have to ask themselves if they want to rely on the free market to solve problems or if they want to lean towards state protection of basic national interests in the field. One only needs to leaf through the farmer’s newspaper, Bændablaðið, to see that the majority of farmers writing there seem to favour increased state protection for their sector. This is of course first and foremost because increased state protection means more subsidies for their farms and higher tariffs on imported food products to protect the domestic production, i.e. their jobs.

For this reason and because of political ideology this debate is highly contentious. Advocates of protectionism talk of how bad the experience of the free market has been for food production and security generally, because countries leaning towards the free market principle have started to count on imports of food and concentrate instead on producing and exporting other more profitable items. This way, nobody wants to produce food anymore. They also argue that food is not like other goods and should therefore not be treated and traded like other goods. On the other hand, advocates of the free market principle in the food industry talk of genuine competitiveness and lower prices for customers. They argue that food security is also about affordable prices, not only protection for farmers.

The fact is, however, that most countries, especially in Europe, apply some sort of mixture of free market principles and protectionism – at least when protecting their producers and food industry against cheaper food from outside the EU market. If the decision in Iceland should go in favour of focussing increasingly on protection of key interests in the food sector and more state intervention to this end, this would also imply greater responsibility for the state in securing food supply. This inevitably involves more cost for the state, but on the other hand, food production would in all probability be safer if – and that is a big ‘if’ – the
state handles things properly. This way, it could be argued that the securitisation of the food sector would be complete.

In recent months, there has also been a lot of discussion on a potential new constitution for Iceland. Several ideas have been put forth about what is supposed to be in this constitution. Few have been as prominent, and widely supported (also by the newly elected constituent assembly members) as the proposition to nationalize the natural resources of the country. Under this system the natural resources of the country would be in the ownership of the state and the state would then rent out access to these resources. It is entirely unclear whether this would benefit the food sector. History has shown that there is no guarantee that natural resources – or other national assets – would be better managed by the state than by private owners, or that prices would be fairer as a result. Such a clause would not benefit food producers unless there were strict rules about the conditions under which these resources would be allocated and how it would affect the food production industry.

Another idea would be to put some kind of provision in the constitution that would elaborate on the responsibility of the state in safeguarding food security. To make the state legally responsible for food security in this way sounds good on paper, but to follow it through to its logical conclusion would undoubtedly be very expensive, involving high subsidies for food production sectors that need such support to operate properly.

It is apparent that these and many other issues need to be discussed before considering an overall policy for food security. Of course, food security policy has to go hand in hand with Iceland’s general agricultural and fisheries policies and both the latter need to be taken into account when building food security policy. Likewise, it is important to consider food security when creating agricultural and fisheries policy. Nowadays the trend is probably towards more state protection, or at least not lessening the level of intervention already in place. This is mainly because of the present weakness of the Icelandic currency and concerns about the general trade balance. How far such a policy can be pushed is however dependent on financial resources, and also on how well the interested parties fare in convincing politicians and the public about the importance of the domestic industry and food security. One thing is clear, that currency rates and prices will continue to fluctuate and financial difficulties will come and go. Subsequently, it
is crucial to mark a clear path for the future on more general principles; to design a policy that addresses food security in an explicit and comprehensive way and defines how large a part the state should and can play in strengthening domestic food production.

6.2 Analysing the Food Sector

The authorities need to carry out a comprehensive assessment on the Icelandic food sector to map weaknesses and areas that need to be protected or strengthened. To an extent, this is what has been attempted in this thesis, but the official authorities can and must do it in a more comprehensive manner and use their considerably superior resources to look into every aspect of the field.

In this assessment, it is especially important to evaluate food production in Iceland: both how the food production industry stands now and its potential for future growth. The fact is that food and beverage production (most importantly fish production) is a big industry in Iceland: counting for nearly 43 percent of the total value of manufactured products sold in the country. It is therefore important for the society as a whole that the industry be evaluated properly. Steps need to be taken to assess where the strong points of the industry are and where it can be strengthened further.

As an example of this, an attempt has been made in this thesis to point to sections in food production that have potential to grow in the coming years for the benefit of food security. Grain farming is one that is an exciting prospect and is looked on with great approval and anticipation by farmers and politicians alike. Icelanders need to assess (and this work has already started in the administration) how far it is viable to put resources and effort into grain farming, or whether this is an unrealistic pipe dream that will never amount to anything.

The same can be said about horticulture, except that horticulture is a more established industry. But as it is heavily dependent on imports and the share of homegrown vegetables consumed has decreased per capita in recent years, it can be said that the industry is at a crossroads. In reality, the future of the industry depends more on political will and availability of finance than on geographical or technical factors. There is thus a pressing need to analyse the pros and cons of maintaining or strengthening the present role of Icelandic horticulture.
Another good example of the value of examining the strong and weak points of the industry is provided by the ad hoc working groups discussed above. By analysing each sector of the food industry in similar fashion, it is possible to build a holistic picture of the status of food security. The authorities need to continue their efforts in this regard and extend the process into other parts of the food production sector.

It is not enough, however, to assess only the food production industry itself and its strengths and weaknesses. One of the most important aspects of analysing the food sector as a whole is to evaluate and prioritise possible outside threats to food security. The Icelandic authorities need to do this in a systematic way and evaluate priority threats and risks. This thesis has tried to pinpoint possible threats to food security in Iceland, but no attempt has been made to evaluate threats and risks according to the probability of their happening or the degree of potential - direct and consequential – damage they would cause. This is part of any rational security assessment and is something that the authorities need to do.

In addition, when mapping the food sector and threats to it, it is necessary for the authorities to analyse the resilience and robustness or ‘shock absorption’ capacity of the nation when it comes to setbacks in food supply. This was done to an extent in the CPD report from 2005 on crisis resilience in Icelandic society. In that report there is a small chapter on food shortages where the report claims that food shortages are not probable in Iceland. The report acknowledges that Icelanders might have to put up with more simple food if the country would be closed off, but would in all probability not starve. According to the report, food shortages would only happen if major catastrophes were to occur. The report further claims that even if imports were stopped, the country’s resilience would be high because of the robust domestic food production, which could even be increased during crisis (CPD, 2005).

It is unclear what research lies behind the analysis in the CPD report, other than a reference to numerical quantities of domestically produced food. As seen earlier in this thesis, the production of domestic food is in fact very dependent on imported materials like oil, fertilisers and fodder. This production could hardly continue uninterrupted, let alone be increased, if the country were to be closed off from the outside world. In this context, more work is clearly needed to evaluate in what way different threat scenarios would affect Icelandic food security. One
example of such a scenario is oil shortage. What food sectors would be influenced in such an event and what is society’s level of shock absorption in this respect? It is clear that the true resilience of the nation is in need of further research and more accurate evaluation than has been provided hitherto.

6.3 Preventing, Limiting, and Insuring Against Food Shortage

The next step after analysing the food sector is to try to gauge what needs to be done to prevent, limit, and insure against food shortage and failure in the food sector. The next sections offer various suggestions, both for general measures in the food sector and for dealing with the specific threats mentioned in chapter 4. These suggestions are inevitably cast in broad terms as in many instances little research has been done on the relevant issues. Also, the factors and threats in question cover a very broad spectrum of public policy and some have more influence on food security than others.

6.3.1 General Suggestions for the Food Sector

First, there is a need to separate long-term and short-term responses to food insecurity (Ministry for Foreign Affairs, 2009). Both the threats themselves and remedies for them can be long-term and short-term. Some threats, like pollution or climate change can be long-term, while others, like oil or currency shortages, are mainly short-term (but can be both). Measures to deal with both types can nevertheless be taken on both a short-term and long-term basis. For example, the reaction to oil shortage can be short-term (buy more, ration, requisition) and it can be long-term (increase permanent storage capacity, develop alternative fuels). It is necessary to make both long-term and short-term plans but the two approaches must be kept separate, clearly defined and unambiguous. It is vital that contingency plans are made that help the nation survive both temporary problems and long-lasting food crises that could even persist for years.

When making contingency plans it is also important for Icelanders to compare their own preparedness (or lack thereof) with the experience gained by neighbouring countries, especially the Nordic countries. However, as the IRAR points out, Icelanders have to keep in mind that the food situation in other Nordic countries is somewhat different from Iceland and in many ways superior. For instance, cultivation conditions are considerably better, geographical location...
makes food distribution easier, and some of these nations (Norway and Denmark) even produce their own oil (Ministry for Foreign Affairs, 2009). On top of this, there are several other notable differences in capabilities to handle food crisis. Size is an important one, along with difference in financial resources, facilities, and technical equipment. Despite these differences, there are commonalities as well and it is advisable to base Icelandic contingency plans on experience gained in neighbouring countries, while adjusting them where possible to Icelandic reality.

Furthermore, there is a need to assess stocks and reserves of food in Iceland. As seen earlier in this thesis, there are in all probability enough stocks of mutton all year round, as it is slaughtered and stockpiled during autumn. However, there is no slaughtering season for other meat – this is slaughtered on demand. This practice guarantees freshness of the meat but it also means relatively low stockpiles most of the time. Other categories of food, such as vegetables, grains, and fruits are mostly imported and are therefore not stockpiled in any considerable quantity. In this context, it is a major concern that there is no strategy to maintain production and distribution of food during crisis. This could be especially serious if the crisis should last for a long time. There is a need to address this with a comprehensive contingency plan. The responsibility for preparing such contingency plans lies with the Ministry of Fisheries and Agriculture and its relevant subsidiary organisations.

In addition to building a strategy to maintain production and distribution of food during crisis, it is necessary to assess the need for increasing stocks of essential food types before an emergency strikes. Today stocks are adequate only for a few weeks. The aim defined by the IRAR is to build up stocks of food that could last for at least six months (Ministry for Foreign Affairs, 2009). The problem is that companies in the food sector like to keep small inventories to minimise their operational costs. Keeping the goods on the move is cheaper as it allows companies to save on storage by literally ‘storing’ their goods on the road.

This trend towards low food stocks and small inventories can be seen in other Nordic countries too and is considered a threat to stability of food supply there as well. In Sweden, wholesalers of food shift their whole stock on a fortnightly basis and stores change their entire inventories approximately 20-25 times per year. According to a Swedish report on food security from 2007, stockpiles of food are
small in Sweden and would evaporate very soon if something should happen (Swedish Emergency Preparedness Office, 2007). In addition, Sweden, like other EU countries, stopped using traditional emergency reserves after the end of the Cold War and has taken up so-called intervention storages. These temporary storages have no security purpose and are only used in the mode of intervention and market support to influence the supply and demand of food products. The market fully controls what is stored and for how long. There are thus no national food caches or security reserves (Swedish Emergency Preparedness Office, 2007).

There are no EU regulated intervention storages in Iceland, but the basic situation is the same: the market, rather than security considerations, controls food stocks. The story is much the same in Norway. There, goods never stop long in storage on their way from the producer/importer to the retail shelves (Norwegian Ministry of Justice and Police, 2006). The issue is also raised, and considered important, in the Finnish strategy for protecting the vital functions of society (Finnish Security and Defence Committee, 2006). Against this background, safe distribution systems where the punctual delivery of goods can be relied on are considered vital to food security, not only in Iceland but also by all of Iceland’s closest neighbours.

As the Icelandic state does not keep any food stocks and there is no tradition of state-run food reserves, the best solution to increase food reserves - and therefore food security - would probably be to find a middle way between the responsibilities of the state and the capabilities of the private sector: namely, private companies in the food sector should prepare contingency plans in cooperation with the authorities. These contingency plans should include a strategy to build up food reserves, plan on how food would be distributed in emergencies, and plan for continued operation of the relevant companies during crisis. As private companies already have warehouses up and running this would save the state the need to construct such establishments and there would be no danger of food going bad, as private companies would steadily move food in and out, taking care to always keep the same stock levels. This solution is also financially good for the state as the cost of running a separate emergency storage facility for food would be great. The benefit for the private companies is that they could continue to do profitable business for longer even if crisis should strike. The responsibility for the implementation of this project would be in the hands of the
CPD under the auspices of the Ministry of Fisheries and Agriculture. The private companies in the field would share responsibility for the project.

As seen in the questionnaire carried out for this thesis, private households are also only storing minimal amounts of food. Given that there is not a great deal of food stored either at private households or by private businesses, the authorities should make plans to organise rationing of food in case of an emergency. Possible hoarding of food immediately after a crisis starts could cause shortages in stores. This needs to be prevented with organised rationing of available foods (and other important goods like oil) to vital industries and social facilities within the country. To this end, there is a need to put a strategy in place and iron out the legal framework so that rationing can start immediately after a crisis starts and before the shelves at the stores are emptied. Proposals should come either from the CPD or from the CDSAC, and the Ministry of Fisheries and Agriculture should prepare the legal framework and work on arrangements for its implementation (which would inevitably come under the coordinating role of the CPD).

Another potential stock problem that needs to be addressed is the reserves of fodder and raw materials for fodder production. As discussed earlier, about one and a half month’s worth of stocks can be stored in the country at any given time. The usual level of fodder available is however near the 30-day mark. Levels of fodder are therefore too low for comfort and the capacity to store more stocks is restricted. Farmers have been deeply concerned with this and want to increase the quantity of the fodder stored. They have declared that they would be content with a minimum of three months’ supply. This is something that is important to look into, as it is imperative to have enough fodder for the food production industry. The FAI has taken the initiative on this matter through resolutions in recent Búnaðarþing meetings. Improvements in this field are in the hands of the Ministry of Fisheries and Agriculture but should be worked on in close cooperation with the FAI or/and other interested parties.

Horticulture – among other food industries – is very dependent on fertilisers for its production. This is a potential threat to food security, as there is no fertiliser production in Iceland any longer. There is a need to look into resurrecting the domestic fertiliser production, preferably with Icelandic substances as ingredients. Another solution would be to try to decrease the food industry’s reliance on synthetic fertilisers altogether. This can for instance be attempted by increasing
sustainable and organic cultivation. The responsibility and initiative in this matter should come from the Ministry of Fisheries and Agriculture. First, there is a need to do a feasibility study and an environmental impact assessment, and then work in cooperation with parties that are interested in operating a fertiliser production plant if it turns out to be a feasible option.

Another significant point for future food security is to find a way to make sure that land usable for agriculture will not be used for other purposes (such as golf courses or summerhouses). Rules should be set on how such land is used. They should include giving the authorities power to determine how large a quantity of land should be specifically reserved for agriculture and how much land should be free for recreational activities and other occupation. This should go hand in hand with a vision for the future development of certain production sectors like grain farming or rapeseed growing: how much land do Icelanders envisage they will use for grain farming or rapeseed growing in the future? The general guideline should be to grant building permits for recreational areas on land that is ill-suited for agricultural activities. There is already work under way on this in a working group appointed by the Ministry of Fisheries and Agriculture. Only time will tell whether this working group recommends something similar to what is proposed above.

6.3.2 Suggestions Regarding Threats to Food Security
In the last section, general proposals were made for addressing aspects of the food sector that need improvement in order to strengthen food security. Next, the thesis tries to offer suggestions on how to deal with extrinsic threats to food security as previously defined in the thesis.

It was seen earlier in this thesis that pandemics are a clear threat to food security. According to the influenza report, the Ministry of Health, Chief Epidemiologist for Iceland, and the CPD are responsible for prophylactic measures and civil defence in this case. These three institutions are to cooperate and make contingency plans for possible pandemics, which will then be for the CPD to implement (Prime Minister’s Office, 2006). Despite this well-defined division of responsibilities, and the improvements made in this field in 2008 with the publishing of the influenza contingency plan, the IRAR asserts in 2009 that there is a need to strengthen emergency planning concerning possible pandemics.
According to the report, clear division of responsibilities and cooperation between institutions responsible for contingency plans in this field needs to be ensured. The report also points out that all relevant inspection and monitoring systems need to be strengthened and that there is a need for better organisation when it comes to storing vaccine and other drugs in a central, safe, and accessible place, so that they can be accessed and distributed at short notice in crisis. The report also suggests that there is a need to increase stocks of pharmaceuticals so there is always a twelve-month supply available (Ministry for Foreign Affairs, 2009).

As stated before, pandemics in this context mainly present a threat to the workforce. Therefore, it is important to support companies and industries so that temporary perturbation caused by pandemics has as little influence as possible. Private businesses and institutions that are important in supplying vital services should prepare their own contingency plans with the goal of keeping up minimum services during pandemics. The influenza report suggests that such contingency plans should include arrangements for minimum use of workforce, minimum communication between staff in the workplace, working from home where possible, choosing a select group of current staff who are prepared to take measures to continue working and keeping the operation going during crisis, and plans for replacing sick employees with others who can do the same work. The report also suggests that these contingency plans should establish which individual within the companies/institutions will control operations during crisis so that the authorities can use this person as an invariable contact point. This way, communication channels are well defined and responsibilities for the operation of the companies and institutions during crisis are clear (Prime Minister’s Office, 2006). It is important to continue making antisepsis plans for private companies and institutions. The Ministry of Health, Chief Epidemiologist for Iceland, and the CPD are responsible for this set of measures.

Barring total catastrophe, Iceland’s resilience in face of various natural disasters is well-proven and significant. The recent Eyjafjallajökull eruption not only showed the potential dangers nature can pose, but also how well organised

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39 According to the latest assessment report on responses to influenza pandemic from January 2010 work on this is ongoing. Antisepsis contingency plans have been made for the schools in the country and each ministry. Regional plans in each antisepsis area are also ready. Several private companies have also worked on making their own plans and many have already finished this work (NCIP and Directorate of Health, 2010).
Icelanders are when it comes to responding to the violence of nature. But while the civil defence system worked admirably during the eruption, there is always room for improvement. There is a need to map the most dangerous natural disasters and make contingency plans where reactions to them are outlined. This is particularly important for natural threats that are influenced by climate change and have grown, or are liable to grow, in the next years. This work should be in the hands of the CDP and The Ministry of the Environment.

In the context of natural disasters, the IRAR further suggests that the emergency system needs to be strengthened and made more independent from volunteer work (Ministry for Foreign Affairs, 2009). Nearly all of the emergency service units in Iceland are built around volunteers, free donations, and fundraising. A bad financial situation could severely weaken the emergency services as donations from the public could wind down or stop. Thus, it is important that the state pledges a necessary minimum of financial backing for these services and tries to make them as professional and financially independent from public donations as possible.

As discussed before, some changes brought about by climate change are positive for food security – others are negative. It is a complicated issue, but good or bad, there is a need for response to these changes. First, there is a need to make contingency plans to respond to the influence of climate change on different levels of society, with particular emphasis on how to react to various natural occurrences incited by climate change. In addition to this, there is a need to increase public information and education for Icelanders on the social, environmental, and economical consequences of climate change so that the public can be aware of climate change’s risks as well as benefits. This is a very broad task and would require cooperation among many governmental institutions, among them the Ministry for the Environment, the Ministry of Fisheries and Agriculture, the Ministry of Education, Science and Culture, and the Ministry for Foreign Affairs.40

40 A recent development in this area is an Action Plan for Climate Change that was ratified by the government in November 2010. By end of January 2011, the Ministry for the Environment had appointed a liaison group of six ministries and the Association of Local Authorities to implement the Action Plan. The Action Plan does however not touch on the issues discussed in this thesis: it focuses on trying to decrease emission of greenhouse gases by 30 percent before 2020, mostly by levying new taxes on businesses and individuals and by growing trees. There is no mention or plan
In the name of better food security, any possible increase in pollution has to be carefully monitored. As mentioned in chapter 3.4.1.5, the CPD report warns that Iceland is ill equipped to handle pollution incidents and there is an urgent need for contingency plans concerning toxic substances and polluting spills (CPD, 2005). The IRAR suggests strengthening the Vessel Reporting Centre (VSS)\textsuperscript{41} so it can better maintain surveillance over ship traffic and pollution in the sea around Iceland. The report also recommends that cooperation with the other Nordic countries be strengthened. Partnership agreements should be negotiated to guarantee that rescue vessels would be ready off the shores of Eastern Greenland and on the waters east and north of Iceland in the event of shipping accidents (Ministry for Foreign Affairs, 2009). This need has been met to some extent with the framework agreement reached among Arctic Council members in Reykjavik in December 2010. The agreement is the first international convention between the members of the Arctic Council and is an important step in cooperation on search and rescue in the Arctic region. In the new agreement, the search and rescue areas that each nation is responsible for are clearly defined and their obligations and cooperation in search and rescue missions made clear (“Samningur um”, 2010). This agreement is also an important step towards monitoring the pollution situation in the region around Iceland, given the expected future increase in Arctic shipping.

As discussed before, radioactive pollution is a potentially devastating threat to food security. There is a considerable danger of this kind from the traffic of nuclear submarines and carrier vessels in the waters around the country and from flights through both the Icelandic airspace and the international airport in Keflavik. Dangers from military exercises, especially naval exercises, cannot be discounted either. Therefore, the authorities need to monitor the comings and goings of nuclear powered vessels, military exercises, and flights through the Icelandic airspace, especially military flights.

On all these grounds there is a clear need to improve the capabilities to handle various kinds of pollution accidents around the country and effective contingency plans need to be in place so that environmental, economic, and also food security

\textsuperscript{41} Icelandic: Vaktstöð siglinga.
can be safeguarded. This work would mainly be the responsibility of the Ministry for the Environment, the CPD, VSS, and the Icelandic Radiation Safety Authority. International agreements in this field are under the auspices of the Ministry of Foreign Affairs.

There is a need to continue to monitor animals, especially imported animals, which can carry infectious diseases as virulent zoonoses (animal diseases) can severely cripple Icelandic agriculture. Therefore, it is essential for appropriate supervisory bodies to stay alert. The Icelandic Food and Veterinary Authority (MAST) is the primary authority on animal disease control and import control and is responsible for the well-being of animals. The Authority is responsible to the Ministry for Fisheries and Agriculture.

The weak point of the domestic distribution system – the road system – needs to be addressed if food security is to be safeguarded in Iceland. For various reasons the road system in Iceland is of considerably worse quality than in neighbouring countries and the system requires substantial investment. Again, the IRAR has useful suggestions on this subject. Icelanders need to start allowing for environmental and security factors when planning the system and they need to start paying more heed to European standards when designing roads. Further, the IRAR points out that it is necessary to make contingency plans on how to react to threats that endanger the security of the roads and the transport system. Mapping possible detours that can be used in emergencies if the main thoroughfares close is also a necessity (Ministry for Foreign Affairs, 2009).

Additionally, Icelanders need to look into the possibilities that coastline shipping affords. Granted, they do not offer a flexible and realistic way of transportation for time-sensitive goods like food, but coastal shipping can at least lighten the burden of an already overloaded and fragile road system in addition to offering an alternative mode of transport in time of emergency road closures. Improvements in the road system and coastal shipping are the responsibility of the Icelandic Road Administration\footnote{Icelandic: Vegagerðin.} (ICERA) and the Ministry of the Interior.

The risk of a serious energy shortage has to be combated both at the internal and external level. At the internal level, it is most important to protect the electrical system, as it is very important for all food production, distribution, and
storage, as well as for the electronic banking system (allowing payment for imported food). It is necessary to strengthen the structure and security features of the system and try to protect buildings, stations, and transmission lines from possible sabotage or other factors such as adverse weather conditions or other natural disasters. The authorities should also stress the need for proper work procedures, emergency exercises, and operative contingency plans in case of energy shortage. The responsibility for this work is in the hands of the Ministry of Industry, Energy, and Tourism and the National Energy Authority (NEA).

At the external level, it is necessary to guard against shortages of imported energy, most importantly oil. Therefore, it is essential to build up strategic reserves of oil that would never fall below a certain level in normal times. To this end, the Icelandic authorities need to assess what scale of reserves are required to keep essential operations going if external supplies are interrupted for whatever reason. It is also important that a legal framework be established to authorise the state to intervene and ration energy supplies in case of an emergency. There is an expectation that this will soon be tackled with the revision of Icelandic energy policy that is in preparation. Supervision of this is in the hands of the Ministry of Industry, Energy, and Tourism and the National Energy Authority (NEA). The CPD should also take part in this work with assistance from the oil companies.

Another important aspect in this context is to continue development and preparatory work on alternative fuel sources such as methane gas, hydrogen, and rapeseed oil. General usage of these fuel sources might be some years or decades off but it is important to keep up the pace of development to maximize domestically produced energy supply in the longer term. The Ministry of Industry, Energy, and Tourism along with the Ministry for the Environment should take the lead in overseeing this development work and should encourage and/or finance research projects.

Furthermore, it is of significance for food imports to keep the national currency strong and steady and credit facilities open. One of the largest projects for Icelandic society after the collapse of 2008 is to resurrect the banking system, credit facilities, and trust in Icelandic companies and institutions. Failing this, it may become impossible to do proper business with foreign parties and imports of various goods, including food, could become difficult. Therefore, there is a definite need for clearer rules on the financial system and more surveillance and
assurance of standards by supervisory bodies. This task is under the responsibility of many state institutions and organisations such as the Financial Supervisory Authority (FME) and the Ministry of Economic Affairs.

The Icelandic food market has all the characteristics of a typical oligopoly where few dominating actors share the market. The best way to counteract this is to strengthen the Competition Authority and increase its power to break up, or prevent, unhealthy monopolies. It is doubtful that the present practice of fining offending companies is of much use as the money used to pay the fines comes most likely out of the pockets of customers through higher mark-ups. This increases the price even more and jeopardises people’s chance of getting food for affordable prices.

The authorities also need to pay more attention to risks of sabotage and terrorism and take measures to redress the lack of the most simple security measures at important installations. The Nordic countries and the EU can be of help in this field. Icelanders should look to them for advice on preparedness against terrorism and sabotage. The IRAR recommends that the police authorities be granted the same powers as neighbouring countries in fighting terrorism (Ministry for Foreign Affairs, 2009). This has however been a highly controversial issue and if increased powers should be granted it is clear that proper and effective surveillance of the way they are exercised would have to be established also. In addition to this, the authorities need to keep a close watch on developments in immigration matters so that mistakes made by other countries in handling that issue will not be repeated. An immigration policy that tries to secure balance in society and facilitates easier adjustment for immigrants is also required. Responsibility for fighting terrorism and sabotage is in the hands of the National Commissioner of the Icelandic Police under the auspices of the Ministry of the Interior.

Last, but not least, other events such as increased international food prices, along with market trends, armed conflicts, and external pressures are variables that Icelandic authorities have limited control over. The only thing possible is to prepare properly and react as well as possible to potential threats. This means good preparedness based on good surveillance of international developments and operational contingency plans that can be executed fast and securely.
As seen in this chapter, the institutions and organisations that handle different factors and threats to food security are located in many different places in the administration. Consequently, it is important that these organisations and institutions try to work better together in the security context to solve potential problems in food security. The Ministry of Fisheries and Agriculture should have the lead in any work on issues that directly influence food security, but the ministry should also seek the cooperation of other institutions and organisations when possible and they should in turn be ready to offer assistance to the ministry.

The issues discussed above are however very varied and it is not easy to estimate their real significance and relative priority as risks/threats for food security and to Icelandic society. On top of this, the resilience or shock–bearing capacity of the nation has in very few instances been measured to any extent. Without such evaluation and definition of what is acceptable damage from each threat, it is difficult to organise concrete remedies or make contingency plans. Therefore, the work should start at home by analysing the asset at risk (the food sector) and estimating how much in the way of shock or setbacks the nation can handle in this field. When this is done, the real work on securing food security can start.
6 Conclusions

In terms of theory, this thesis has tried to tread the middle ground, both pointing out and analysing the realist viewpoint of food as a balance of power tool between states, and paying attention to human security’s claim that security is about not only state power but also the people living within state borders. The fact is that states use food as a leverage against other states or to secure their own future by buying arable land from poorer countries. Likewise, food insecurity is also about the concern of the ordinary individual and how he can access food within the borders of his state.

Another theoretical framework explored extensively in this thesis is the theory of securitisation. In this thesis it has been adapted to Icelandic conditions and questions asked about what is being securitised, who is trying to securitise, and whether these securitisation efforts are being accepted by the target audience. The conclusion has been that interested parties in the food production sector, mainly the FAI and its members, Icelandic farmers, have tried to securitise the food sector but so far the success has been limited. This can be seen from the results of the questionnaire carried out for this thesis, as respondents do not seem to be concerned greatly with food security. However, there has been some success in this regard within the administration as several working groups have been appointed in recent times to evaluate varied production issues inter alia with food security in mind.

The underlying aim of this thesis has been to analyse food insecurity, a major worldwide problem that is growing larger and more problematic every day. As discussed extensively in this thesis, there are many factors that contribute to this growing insecurity. Various factors such as crop failures, urbanisation, increasing biodiesel production, less food exportation, and so on, have eroded the global supply of food at the same time as demand for quality food is increasing in emerging markets. All of this has driven up global food prices.

At the same time as this development was unfolding the Icelandic Króna collapsed, as did the nation’s entire economy. When put together, increasing global prices and the devaluation of the Króna have set the alarm bells ringing: the ability of Icelanders to import the food they want has weakened during this
period. This has provoked a dialogue on the merits of imports versus domestic production. But as the securitisation of the issue is not very successful among the public or among politicians, this dialogue has been on a small scale. The issue has mainly been discussed among interested parties in the food production sector and is only now, in recent years and months, reaching the ears of the administration and policy makers. But even that is an improvement as the dialogue was nearly non-existent before 2008.

To assess the food situation in Iceland the thesis has analysed consumption, production, and importation of food. By looking at food supply and consumption in Iceland it is clear that consumption has been changing in the last decades towards greater diversity in diet and reliance on imported food while traditional domestically produced foods are on the decline. This development does not work in favour of Icelandic food sustainability and this increased reliability on imported food categories is worrisome. However, some positives can be found in the analysis of Icelandic food production. Despite its heavy slant towards marine and meat products, recent progress in grain farming and the potential and future importance of horticulture offers hope of more sustainability and variety in the industry. Statistics show that Icelanders produce roughly half of their own food. This is however hard to determine, as it is difficult to assess how large a share of domestic production is based on imports. The verdict is that despite positive points and future potential in food production, Iceland is heavily dependent on imports.

This thesis analyses stocks and reserves of food in Iceland and how well Iceland is prepared to face food shortages. The finding is that there are no significant reserves of food in the country and reserves of fodder and raw materials for fodder production are nowhere near the suitable level. The state does not hold any emergency food reserves and there is no indication that this is on the cards. Likewise, private companies in the food sector hold very limited stocks of food. In addition, nothing concrete seems to have come out of attempts between the CPD and private companies to establish cooperation on food storage. This thesis reaches the conclusion that cooperation between the state and private companies is a good idea and an essential factor in safeguarding food security. This thesis also reaches the conclusion, with the help of the questionnaire, that
authorities should not count on great supplies in private households, as they only seem to keep food for one week or less.

There are various types of risks and threats to food security and in Iceland most of them reflect the import oriented nature of the Icelandic food sector. Threats to crucial imports are the most prominent ones as shortages of imported goods and foods can have dire consequences. The influence of threats are also different: while some can have far-reaching impact on society others only have repercussions for small areas within the country and will hardly threaten the overall food security of the nation, even though they can cause disruption in certain food sectors. Natural disasters are example of risks that can have far-reaching consequences. Problems with domestic infrastructure and lack of organisation and preparedness are also a large part of the threat to food security. Examples of this are shortcomings in the electric system, limitation of the distribution system, lack of security measures (sabotage), and oligopoly in the food market. And as mentioned before, external threats that jeopardise imports such as global food prices, oil prices, pandemics, and external pressures are major threats to food security in Iceland and should be carefully monitored.

This thesis establishes that there is no contingency plan for food security in Iceland. This is in part due to complacency regarding food security, smallness of the administration, and a lack of proper security discourse and practise in making security policy. Icelanders have also been too concerned with military security to focus properly on ‘soft’ security issues like food security. The Icelandic administration has done remarkably little when it comes to food security and the issue has not been discussed properly, except the aforementioned dialogue in recent two or three years.

The notion of food security (under the heading of economic defence) has existed in the administration and in the civil defence field since 1962, but with the new Civil Defence Laws from 2008 new possibilities have opened up in the estimation of this thesis. The new law has made the civil defence concept more open to ‘soft’ security issues and more flexible in policymaking. Additionally, the new law emphasises the making of contingency and action plans in various fields of society. Another important aspect for food security is how the law opens the door for collaboration between the administration and private companies. This could be very useful when making contingency plans for food security.
Even though there is no contingency plan in place for food security per se, some work has been done in relation to the contingency plan for an influenza pandemic. Despite its different focus this gives a good account of how a food security contingency plan might look, where the main vulnerability lies and what should be improved. Therefore, this thesis concludes that the influenza contingency plan should be considered a starting point and basis for future work in this field.

Public institutions that play a part in monitoring the food sector all have food safety rather than food security as their main objective. This simply reflects on the fact that there is no comprehensive plan or policy on food insecurity within the administration. Positive features in this respect are the ad hoc working groups and task forces that have been appointed in the last few years and touch on the subject. These groups show that even if there is no single process seeking wide-ranging solutions for food insecurity as a whole, there is some useful work going on to analyse the major food production sectors with special regard for food security. However, this thesis warns that there is a lot of work to be done and many fields to be explored before any sort of final picture on food security can be drawn.

This thesis suggests that there are three steps Icelanders need to take to improve food security in the country. First, Icelanders need to build some sort of consensus on the way forward for the Icelandic food industry so that policy can be made in harmony with both food producers and consumers. Icelanders need to decide on how important food security is for them and how much energy and resources to put into improving/increasing domestic production and insuring against various setbacks in this field.

Second, a comprehensive assessment of the Icelandic food sector is needed in order to map weaknesses and areas that need to be protected or strengthened. This thesis reaches the conclusion that it is especially important to evaluate food production in the country and its potential for future growth. Another important feature is to evaluate and prioritise possible outside threats to food security. The shock absorption capacity of the nation in case of setbacks in the food security situation needs to be further researched as well.

Third, the information gained by this analysis should be used as a basis for preventing, limiting, and insuring against future food insecurities. This thesis has listed recommendations for the food sector in general and for dealing with the
specific threats identified. What stands out from the list in the preceding section – which need not be repeated here – is that the complexity and interdependence of different threats and risks, internal and external, demands actions covering almost every sphere of public administration: but that even this will not give efficient results without a healthy culture of consultation, cooperation and appropriate burden-sharing between the administration and the private sector. Other general points that emerge are the need to make maximum use of existing mechanisms for intra-governmental coordination – and further enhance them as needed; and the wisdom of learning from other neighbouring countries’ experiences, both good and bad.

The bottom line and the positive Icelanders can draw from this analysis, even though preparedness in the administration is lacking, is that there is a lot that needs to happen for there to be total shortages of food. If there is a major failure in the fishing industry agriculture would probably come to the rescue and vice versa. The worst possible setback for Icelandic food security is perhaps a total shutdown of imports, not only of food but also of various materials and energy supplies for food production. The likelihood that all possible threats to food security would arise simultaneously is not great and in reality there has to be some sort of total catastrophe for Icelanders to starve. This does not however mean that such a case is impossible: Icelandic history has shown that Icelanders can well end up in a situation where the population has no option to procure or gather food. However slight the danger of a recurrence, nobody knows what the future holds. Therefore, it is so important to make solid contingency plans just in case.

But these are the extreme cases. It must be remembered in this context that food insecurity is not only about starving or not starving: it is also about basic human security factors such as being given the position to be able to procure food for the family or having the means of income to buy food; living in an environment free of violence; or in settings where one is able to acquire food that is healthy and nourishing. It is of no use to produce or import food if nobody can get it. Therefore, the future task for Icelanders is not only to secure imports and production – as important as that is – but also to provide an environment where everyone is in a position to secure food for themselves and their families.
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Þórisson, E. (2011, January 24) Personal communication via e-mail with Einar Þórisson, purchasing manager at Aðföng. (O. Jóhannsson, interviewer).
### Table 1: Consumption of food and non-alcoholic beverages for the last 50 years, 1958-2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Current prices (Million ISK)</th>
<th>Constant prices (Million ISK)</th>
<th>Percent of total household expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>12</td>
<td>13 at 1960 prices</td>
<td>27.5</td>
</tr>
<tr>
<td>1968</td>
<td>46</td>
<td>19 at 1960 prices</td>
<td>25.6</td>
</tr>
<tr>
<td>1978</td>
<td>745</td>
<td>1,415 at 1980 prices</td>
<td>20.4</td>
</tr>
<tr>
<td>1988</td>
<td>26,786</td>
<td>1,809 at 1980 prices</td>
<td>17.5</td>
</tr>
<tr>
<td>1998</td>
<td>52,576</td>
<td>55,928 at 2000 prices</td>
<td>15.4</td>
</tr>
<tr>
<td>2008</td>
<td>93,453</td>
<td>72,612 at 2000 prices</td>
<td>11.8</td>
</tr>
</tbody>
</table>


### Table 2: Household Expenditure Survey: Total household expenditure on food in 2008

<table>
<thead>
<tr>
<th>COICOP classes</th>
<th>Expenditure (ISK Krona)</th>
<th>Percent of total household expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total food and non-alcoholic beverages</td>
<td>658,516</td>
<td>12.9</td>
</tr>
<tr>
<td>Food</td>
<td>594,521</td>
<td>11.6</td>
</tr>
<tr>
<td>Bread and cereals</td>
<td>107,742</td>
<td>2.1</td>
</tr>
<tr>
<td>Meat</td>
<td>137,750</td>
<td>2.7</td>
</tr>
<tr>
<td>Fish</td>
<td>35,546</td>
<td>0.7</td>
</tr>
<tr>
<td>Milk, cheese and eggs</td>
<td>106,367</td>
<td>2.1</td>
</tr>
<tr>
<td>Oils and fats</td>
<td>9,714</td>
<td>0.2</td>
</tr>
<tr>
<td>Fruit</td>
<td>42,713</td>
<td>0.8</td>
</tr>
<tr>
<td>Vegetables including potatoes</td>
<td>54,859</td>
<td>1.1</td>
</tr>
<tr>
<td>Sugar, jam, chocolate, etc.</td>
<td>63,453</td>
<td>1.2</td>
</tr>
<tr>
<td>Food products n.e.c.</td>
<td>36,377</td>
<td>0.7</td>
</tr>
<tr>
<td>Non-alcoholic beverages</td>
<td>63,995</td>
<td>1.3</td>
</tr>
<tr>
<td>Coffee, tea and cocoa</td>
<td>13,655</td>
<td>0.3</td>
</tr>
<tr>
<td>Mineral waters, soft drinks and juices</td>
<td>50,341</td>
<td>1.0</td>
</tr>
</tbody>
</table>


### Table 3: Value of sold manufactured products 1998-2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (Million ISK)</th>
<th>Percent (of total value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food products and beverages</td>
<td>Basic metals</td>
</tr>
<tr>
<td>1998</td>
<td>135,033</td>
<td>24,217</td>
</tr>
<tr>
<td>1999</td>
<td>136,263</td>
<td>27,185</td>
</tr>
<tr>
<td>2000</td>
<td>134,522</td>
<td>34,436</td>
</tr>
<tr>
<td>2001</td>
<td>163,054</td>
<td>41,814</td>
</tr>
<tr>
<td>2002</td>
<td>172,812</td>
<td>42,391</td>
</tr>
<tr>
<td>2003</td>
<td>160,419</td>
<td>41,649</td>
</tr>
<tr>
<td>2003 New threshold</td>
<td>159,880</td>
<td>41,649</td>
</tr>
<tr>
<td>2004</td>
<td>166,445</td>
<td>42,881</td>
</tr>
<tr>
<td>2005</td>
<td>156,966</td>
<td>41,767</td>
</tr>
<tr>
<td>2006</td>
<td>176,550</td>
<td>67,328</td>
</tr>
<tr>
<td>2007</td>
<td>186,789</td>
<td>90,045</td>
</tr>
<tr>
<td>2008</td>
<td>234,301</td>
<td>196,547</td>
</tr>
</tbody>
</table>


### Table 4: Value of sold manufactured food products and beverages in 2008

<table>
<thead>
<tr>
<th>Contracted PRODCOM* categories</th>
<th>Value (Million ISK)</th>
<th>Percent (of total value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat products</td>
<td>22,381</td>
<td>9.6</td>
</tr>
<tr>
<td>Fish products</td>
<td>162,107</td>
<td>69.2</td>
</tr>
<tr>
<td>Potatoes, fruits and vegetables processed and protected from damage</td>
<td>1,082</td>
<td>0.7</td>
</tr>
<tr>
<td>Breadstuffs and sweetmeat products</td>
<td>8,869</td>
<td>3.8</td>
</tr>
<tr>
<td>Chocolate, confectionery and cocoa</td>
<td>2,805</td>
<td>1.2</td>
</tr>
<tr>
<td>Coffee</td>
<td>780</td>
<td>0.3</td>
</tr>
<tr>
<td>Manufacture of flavouring and spices</td>
<td>700</td>
<td>0.3</td>
</tr>
<tr>
<td>Animal, fish, and pet food</td>
<td>5,012</td>
<td>2.1</td>
</tr>
<tr>
<td>Beverage products</td>
<td>8,820</td>
<td>3.8</td>
</tr>
<tr>
<td>Other products not elsewhere specified (including milk products)</td>
<td>21,145</td>
<td>9.0</td>
</tr>
<tr>
<td>Total manufacture of food products and beverages</td>
<td>234,301</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*PRODCOM (Products of the European Community): A category system for the collection and publication of product statistics. The system itself is very exhaustive but Statistics Iceland only publishes certain product categories they consider the most important, other products are put together in the ‘Other products not elsewhere specified (including milk products)’ category.

Source: Statistics Iceland, 2009c.

43 Notice: All statistics are adjusted to the English numerical system. For example, one thousand is written as 1,000 – not as 1.000 as is customary in Icelandic statistics. Likewise, 12.4% (Icelandic system) is written as 12.4% (English system).
Tomatoes, Cucumber, Cauliflowers, Cabbage, Pepper, Chinese cabbage, and Mushroom: Some figures are estimated. Figures from 1995-1999 reviewed.

Source: Statistics Iceland, 2009d.

Table 5: Production of field crops 1986-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>16,578</td>
<td>18,093</td>
<td>10,289</td>
<td>8,382</td>
<td>14,893</td>
<td>15,131</td>
<td>6,292</td>
<td>3,913</td>
<td>11,145</td>
<td>7,324</td>
<td>11,214</td>
<td>8,557</td>
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<td>Turnips</td>
<td>1,025</td>
<td>1,084</td>
<td>671</td>
<td>544</td>
<td>808</td>
<td>643</td>
<td>386</td>
<td>679</td>
<td>1,010</td>
<td>328</td>
<td>902</td>
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<tr>
<td>Carrots</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>331</td>
<td>210</td>
<td>300</td>
<td>248</td>
<td>332</td>
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<td>Cereal grains</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>408</td>
<td>495</td>
<td>794</td>
<td>485</td>
<td>2,061</td>
<td>2,902</td>
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<tr>
<td>Tomatoes</td>
<td>700</td>
<td>740</td>
<td>525</td>
<td>618</td>
<td>495</td>
<td>507</td>
<td>660</td>
<td>625</td>
<td>845</td>
<td>749</td>
<td>812</td>
<td>817</td>
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<tr>
<td>Cucumber</td>
<td>460</td>
<td>510</td>
<td>485</td>
<td>429</td>
<td>534</td>
<td>666</td>
<td>520</td>
<td>583</td>
<td>606</td>
<td>606</td>
<td>603</td>
<td>704</td>
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<tr>
<td>Cauliflower</td>
<td>75</td>
<td>140</td>
<td>140</td>
<td>73</td>
<td>95</td>
<td>70</td>
<td>65</td>
<td>90</td>
<td>118</td>
<td>122</td>
<td>118</td>
<td>91</td>
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<tr>
<td>Cabbage</td>
<td>230</td>
<td>330</td>
<td>470</td>
<td>292</td>
<td>395</td>
<td>715</td>
<td>550</td>
<td>482</td>
<td>507</td>
<td>624</td>
<td>674</td>
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<td>Pepper</td>
<td>78</td>
<td>125</td>
<td>114</td>
<td>137</td>
<td>120</td>
<td>134</td>
<td>140</td>
<td>140</td>
<td>231</td>
<td>194</td>
<td>194</td>
<td>192</td>
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<tr>
<td>Chinese cabbage</td>
<td>0</td>
<td>163</td>
<td>153</td>
<td>187</td>
<td>224</td>
<td>225</td>
<td>200</td>
<td>276</td>
<td>300</td>
<td>301</td>
<td>284</td>
<td>256</td>
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<tr>
<td>Mushroom</td>
<td>80</td>
<td>106</td>
<td>122</td>
<td>118</td>
<td>0</td>
<td>103</td>
<td>210</td>
<td>221</td>
<td>220</td>
<td>251</td>
<td>259</td>
<td>293</td>
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</table>

Table 6: Meat production, domestic sales, and stock 1998-2008

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Mutton and lamb:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals slaughtered, number</td>
<td>525,563</td>
<td>553,352</td>
<td>592,671</td>
<td>547,848</td>
<td>554,966</td>
<td>552,779</td>
<td>552,887</td>
<td>544,181</td>
<td>536,351</td>
<td>546,841</td>
<td>545,986</td>
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<tr>
<td>Production, tonnes</td>
<td>8,176</td>
<td>8,644</td>
<td>9,735</td>
<td>8,616</td>
<td>8,676</td>
<td>8,792</td>
<td>8,644</td>
<td>8,738</td>
<td>8,647</td>
<td>8,644</td>
<td>8,930</td>
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<tr>
<td>Domestic sales, tonnes</td>
<td>7,027</td>
<td>6,913</td>
<td>7,235</td>
<td>6,768</td>
<td>6,427</td>
<td>6,399</td>
<td>7,138</td>
<td>6,263</td>
<td>7,124</td>
<td>6,093</td>
<td>7,481</td>
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<tr>
<td>Exports, tonnes</td>
<td>848</td>
<td>1,038</td>
<td>1,328</td>
<td>1,398</td>
<td>1,718</td>
<td>2,431</td>
<td>2,028</td>
<td>1,320</td>
<td>1,194</td>
<td>1,078</td>
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<tr>
<td>End-of-year stock, tonnes</td>
<td>5,607</td>
<td>6,136</td>
<td>6,886</td>
<td>6,608</td>
<td>6,778</td>
<td>6,776</td>
<td>5,582</td>
<td>5,303</td>
<td>5,461</td>
<td>5,853</td>
<td>5,593</td>
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<td>Beef: Animals slaughtered, number</td>
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</tr>
<tr>
<td>Production, tonnes</td>
<td>23,559</td>
<td>24,285</td>
<td>24,252</td>
<td>23,374</td>
<td>22,700</td>
<td>22,728</td>
<td>21,465</td>
<td>19,976</td>
<td>17,863</td>
<td>19,671</td>
<td>19,830</td>
</tr>
<tr>
<td>Exports, tonnes</td>
<td>5,513</td>
<td>5,663</td>
<td>5,621</td>
<td>5,674</td>
<td>5,687</td>
<td>5,614</td>
<td>5,616</td>
<td>5,361</td>
<td>5,183</td>
<td>5,360</td>
<td>5,313</td>
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<tr>
<td>Horse meat: Animals slaughtered, number</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production, tonnes</td>
<td>79</td>
<td>54</td>
<td>66</td>
<td>70</td>
<td>26</td>
<td>24</td>
<td>6</td>
<td>24</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic sales, tonnes</td>
<td>527</td>
<td>548</td>
<td>673</td>
<td>528</td>
<td>473</td>
<td>486</td>
<td>579</td>
<td>521</td>
<td>704</td>
<td>645</td>
<td>677</td>
</tr>
<tr>
<td>Exports, tonnes</td>
<td>248</td>
<td>480</td>
<td>373</td>
<td>605</td>
<td>549</td>
<td>368</td>
<td>300</td>
<td>199</td>
<td>103</td>
<td>239</td>
<td>257</td>
</tr>
<tr>
<td>Pork: Animals slaughtered, number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production, tonnes</td>
<td>57,015</td>
<td>65,476</td>
<td>64,305</td>
<td>69,002</td>
<td>72,945</td>
<td>79,474</td>
<td>72,440</td>
<td>71,013</td>
<td>75,614</td>
<td>81,321</td>
<td>85,301</td>
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<tr>
<td>Domestic sales, tonnes</td>
<td>3,888</td>
<td>4,706</td>
<td>4,783</td>
<td>5,284</td>
<td>6,011</td>
<td>6,205</td>
<td>5,597</td>
<td>5,300</td>
<td>5,744</td>
<td>6,088</td>
<td>6,645</td>
</tr>
<tr>
<td>Exports, tonnes</td>
<td>216</td>
<td>199</td>
<td>218</td>
<td>138</td>
<td>99</td>
<td>84</td>
<td>88</td>
<td>137</td>
<td>160</td>
<td>200</td>
<td>160</td>
</tr>
<tr>
<td>Poultry: Animals slaughtered, number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production, tonnes</td>
<td>2,106,71</td>
<td>2,250,14</td>
<td>2,204,63</td>
<td>2,756,83</td>
<td>1,275,18</td>
<td>4,166,17</td>
<td>3,728,32</td>
<td>3,856,30</td>
<td>4,410,67</td>
<td>5,084,31</td>
<td>4,784,8</td>
</tr>
<tr>
<td>Domestic sales, tonnes</td>
<td>2,736</td>
<td>3,006</td>
<td>3,051</td>
<td>3,776</td>
<td>4,633</td>
<td>5,706</td>
<td>5,392</td>
<td>5,768</td>
<td>6,653</td>
<td>7,597</td>
<td>7,402</td>
</tr>
<tr>
<td>Exports, tonnes</td>
<td>2,628</td>
<td>2,935</td>
<td>3,220</td>
<td>3,693</td>
<td>4,311</td>
<td>5,433</td>
<td>5,243</td>
<td>6,029</td>
<td>6,382</td>
<td>7,456</td>
<td>7,416</td>
</tr>
</tbody>
</table>

Source: Statistics Iceland, 2009d.
### Table 7: Imports in 2008 by broad economic categories (BEC)

<table>
<thead>
<tr>
<th>Economic Category</th>
<th>Tonnes</th>
<th>Million ISK (CIF)</th>
<th>Percent (of total imports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and beverages</td>
<td>232,750</td>
<td>41,271</td>
<td>8.0</td>
</tr>
<tr>
<td>Primary, mainly for industry</td>
<td>49,966</td>
<td>1,991</td>
<td>0.4</td>
</tr>
<tr>
<td>Primary, mainly for household consumption</td>
<td>76,550</td>
<td>11,392</td>
<td>2.2</td>
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<tr>
<td>Processed, mainly for industry</td>
<td>25,149</td>
<td>3,894</td>
<td>0.8</td>
</tr>
<tr>
<td>Processed, mainly for household consumption</td>
<td>81,083</td>
<td>23,994</td>
<td>4.7</td>
</tr>
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</table>

Source: Statistics Iceland, 2009f.

### Table 8: Imports in 2008 by groups of the SITC Rev. 4

<table>
<thead>
<tr>
<th>Category</th>
<th>Tonnes</th>
<th>Million ISK (CIF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live animals</td>
<td>8</td>
<td>43</td>
</tr>
<tr>
<td>Meat of bovine animals</td>
<td>332</td>
<td>407</td>
</tr>
<tr>
<td>Other meat and meat offal</td>
<td>634</td>
<td>378</td>
</tr>
<tr>
<td>Meat, salted dried or smoked</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>Meat, prepared or preserved</td>
<td>185</td>
<td>120</td>
</tr>
<tr>
<td>Milk, cream and milk products</td>
<td>173</td>
<td>77</td>
</tr>
<tr>
<td>Butter</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cheese and curd</td>
<td>202</td>
<td>193</td>
</tr>
<tr>
<td>Eggs</td>
<td>212</td>
<td>100</td>
</tr>
<tr>
<td>Barley, unmilled</td>
<td>12,517</td>
<td>392</td>
</tr>
<tr>
<td>Maize, unmilled</td>
<td>21,737</td>
<td>578</td>
</tr>
<tr>
<td>Other cereals, unmilled</td>
<td>567</td>
<td>23</td>
</tr>
<tr>
<td>Meal and flour of wheat</td>
<td>4,006</td>
<td>318</td>
</tr>
<tr>
<td>Other cereal meals and flours</td>
<td>1,128</td>
<td>64</td>
</tr>
<tr>
<td>Vegetables, fresh, chilled or frozen</td>
<td>15,869</td>
<td>4,631</td>
</tr>
<tr>
<td>Vegetables, preserved</td>
<td>7,456</td>
<td>1,353</td>
</tr>
<tr>
<td>Fruit and nuts, fresh or dried</td>
<td>20,127</td>
<td>3,475</td>
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<tr>
<td>Fruit, prepared or preserved</td>
<td>2,910</td>
<td>745</td>
</tr>
<tr>
<td>Fruit and vegetable juices</td>
<td>6,008</td>
<td>946</td>
</tr>
<tr>
<td>Sugars, molasses and honey</td>
<td>13,314</td>
<td>841</td>
</tr>
<tr>
<td>Sugar confectionary</td>
<td>1,304</td>
<td>617</td>
</tr>
<tr>
<td>Coffee and coffee substitutes</td>
<td>2,280</td>
<td>1,265</td>
</tr>
<tr>
<td>Cocoa</td>
<td>778</td>
<td>394</td>
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<tr>
<td>Chocolate and cocoa preparations</td>
<td>1,805</td>
<td>1,113</td>
</tr>
<tr>
<td>Tea</td>
<td>73</td>
<td>120</td>
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<tr>
<td>Spices</td>
<td>225</td>
<td>149</td>
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<tr>
<td>Animal feeds, excl. unmilled cereals</td>
<td>24,619</td>
<td>1,699</td>
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<tr>
<td>Margarine and shortening</td>
<td>866</td>
<td>163</td>
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<tr>
<td>Edible products and prep. n.e.s.</td>
<td>8,620</td>
<td>5,067</td>
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<tr>
<td>Non-alcoholic beverages n.e.s.</td>
<td>3,860</td>
<td>746</td>
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</table>

Source: Statistics Iceland, 2009g.

### Table 9: Imports of food and beverages by market areas 1999-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>EEA</th>
<th>Other European countries</th>
<th>United States</th>
<th>Japan</th>
<th>Other countries</th>
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<tr>
<td>1999</td>
<td>12,335</td>
<td>69.6</td>
<td>1,884</td>
<td>10.6</td>
<td>1,984</td>
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<td>2000</td>
<td>12,757</td>
<td>74.2</td>
<td>907</td>
<td>5.3</td>
<td>1,941</td>
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<tr>
<td>2001</td>
<td>14,351</td>
<td>72.2</td>
<td>820</td>
<td>4.1</td>
<td>2,300</td>
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<tr>
<td>2002</td>
<td>15,552</td>
<td>72.2</td>
<td>1,517</td>
<td>6.1</td>
<td>2,030</td>
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<tr>
<td>2003</td>
<td>15,616</td>
<td>77.0</td>
<td>822</td>
<td>4.1</td>
<td>1,750</td>
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<tr>
<td>2004</td>
<td>17,094</td>
<td>73.5</td>
<td>1,221</td>
<td>5.2</td>
<td>2,006</td>
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<tr>
<td>2005</td>
<td>15,851</td>
<td>71.2</td>
<td>1,216</td>
<td>5.5</td>
<td>2,148</td>
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<td>2006</td>
<td>19,054</td>
<td>72.5</td>
<td>1,205</td>
<td>4.6</td>
<td>2,281</td>
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<td>2007</td>
<td>20,685</td>
<td>70.5</td>
<td>1,652</td>
<td>5.6</td>
<td>2,260</td>
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<td>2008</td>
<td>29,317</td>
<td>71.0</td>
<td>1,933</td>
<td>4.7</td>
<td>3,224</td>
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<td>2009</td>
<td>33,042</td>
<td>71.4</td>
<td>1,699</td>
<td>3.7</td>
<td>3,808</td>
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<td>2010</td>
<td>38,174</td>
<td>72.3</td>
<td>1,334</td>
<td>5.4</td>
<td>2,339</td>
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<tr>
<td>Avg.</td>
<td>30,640</td>
<td>71.8</td>
<td>1,659</td>
<td>5.1</td>
<td>3,076</td>
</tr>
</tbody>
</table>

Source: Statistics Iceland, 2010b.
Table 10: Exports of food and beverages 1999-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>Tonnes</th>
<th>Million ISK (Fob)</th>
<th>Percent (of total exports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>413,825</td>
<td>91,781</td>
<td>63.3</td>
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<tr>
<td>2000</td>
<td>404,164</td>
<td>87,631</td>
<td>58.7</td>
</tr>
<tr>
<td>2001</td>
<td>447,615</td>
<td>111,676</td>
<td>56.8</td>
</tr>
<tr>
<td>2002</td>
<td>445,171</td>
<td>112,869</td>
<td>55.2</td>
</tr>
<tr>
<td>2003</td>
<td>524,575</td>
<td>104,611</td>
<td>57.3</td>
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<tr>
<td>2004</td>
<td>534,441</td>
<td>112,292</td>
<td>55.5</td>
</tr>
<tr>
<td>2005</td>
<td>536,639</td>
<td>104,458</td>
<td>53.7</td>
</tr>
<tr>
<td>2006</td>
<td>516,735</td>
<td>117,640</td>
<td>48.5</td>
</tr>
<tr>
<td>2007</td>
<td>503,234</td>
<td>120,261</td>
<td>39.4</td>
</tr>
<tr>
<td>2008</td>
<td>523,206</td>
<td>162,573</td>
<td>34.8</td>
</tr>
<tr>
<td>2009</td>
<td>528,543</td>
<td>198,490</td>
<td>39.6</td>
</tr>
</tbody>
</table>

Source: Statistics Iceland, 2010c.
1. Have you heard of the concept food security?

<table>
<thead>
<tr>
<th></th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>60 54%</td>
<td>37 51%</td>
<td>53 54%</td>
<td>48 53%</td>
<td>10 53%</td>
<td>8 40%</td>
<td>2 40%</td>
</tr>
<tr>
<td>No</td>
<td>45 41%</td>
<td>37 46%</td>
<td>56 44%</td>
<td>34 44%</td>
<td>8 42%</td>
<td>5 5%</td>
<td>3 5%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>6 5%</td>
<td>7 5%</td>
<td>4 4%</td>
<td>5 5%</td>
<td>1 5%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Total</td>
<td>111 100%</td>
<td>38 100%</td>
<td>73 100%</td>
<td>87 100%</td>
<td>19 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

2. In your opinion, what does the concept food security stand for? Describe in one sentence.

<table>
<thead>
<tr>
<th></th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>55 55%</td>
<td>17 50%</td>
<td>38 58%</td>
<td>47 53%</td>
<td>44 54%</td>
<td>5 5%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Fairly often</td>
<td>28 28%</td>
<td>9 26%</td>
<td>19 29%</td>
<td>25 28%</td>
<td>22 27%</td>
<td>3 3%</td>
<td>1 25%</td>
</tr>
<tr>
<td>Never</td>
<td>11 11%</td>
<td>5 15%</td>
<td>6 9%</td>
<td>1 8%</td>
<td>10 12%</td>
<td>1 7%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Total</td>
<td>100 100%</td>
<td>34 100%</td>
<td>66 100%</td>
<td>88 100%</td>
<td>81 100%</td>
<td>15 100%</td>
<td>4 100%</td>
</tr>
</tbody>
</table>

3. Have you thought of the food security of the nation?

<table>
<thead>
<tr>
<th></th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>4 4%</td>
<td>1 3%</td>
<td>3 4%</td>
<td>8 3%</td>
<td>2 2%</td>
<td>2 10%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Fairly often</td>
<td>10 9%</td>
<td>2 5%</td>
<td>8 11%</td>
<td>3 23%</td>
<td>5 6%</td>
<td>4 20%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Never</td>
<td>49 44%</td>
<td>11 26%</td>
<td>38 43%</td>
<td>46 44%</td>
<td>5 5%</td>
<td>5 5%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Total</td>
<td>102 100%</td>
<td>36 100%</td>
<td>66 100%</td>
<td>78 100%</td>
<td>12 100%</td>
<td>8 100%</td>
<td>4 100%</td>
</tr>
</tbody>
</table>

4. Do you think the nation is food secure?

<table>
<thead>
<tr>
<th></th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very secure</td>
<td>12 11%</td>
<td>4 11%</td>
<td>8 11%</td>
<td>2 15%</td>
<td>10 10%</td>
<td>0 10%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Fairly secure</td>
<td>56 50%</td>
<td>15 39%</td>
<td>41 55%</td>
<td>6 46%</td>
<td>58 50%</td>
<td>42 48%</td>
<td>11 55%</td>
</tr>
<tr>
<td>Neither secure nor insecure</td>
<td>16 14%</td>
<td>10 25%</td>
<td>6 15%</td>
<td>9 23%</td>
<td>57 57%</td>
<td>15 15%</td>
<td>5 5%</td>
</tr>
<tr>
<td>Very insecure</td>
<td>18 16%</td>
<td>4 11%</td>
<td>14 19%</td>
<td>2 15%</td>
<td>16 16%</td>
<td>13 15%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>12 11%</td>
<td>5 13%</td>
<td>7 9%</td>
<td>0 0%</td>
<td>12 12%</td>
<td>10 10%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
</tr>
</tbody>
</table>

5. Do you think Icelanders will cope if disaster strikes and the country is closed off?

<table>
<thead>
<tr>
<th></th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>68 61%</td>
<td>25 66%</td>
<td>43 58%</td>
<td>10 77%</td>
<td>58 59%</td>
<td>50 57%</td>
<td>14 70%</td>
</tr>
<tr>
<td>No</td>
<td>22 20%</td>
<td>5 13%</td>
<td>17 23%</td>
<td>0 0%</td>
<td>22 22%</td>
<td>18 21%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>22 20%</td>
<td>5 13%</td>
<td>17 23%</td>
<td>0 0%</td>
<td>22 22%</td>
<td>18 21%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
</tr>
</tbody>
</table>

6. Do you trust the authorities to safeguard the food security of the nation?

<table>
<thead>
<tr>
<th></th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>29 26%</td>
<td>9 24%</td>
<td>20 27%</td>
<td>2 15%</td>
<td>22 22%</td>
<td>22 25%</td>
<td>0 0%</td>
</tr>
<tr>
<td>No</td>
<td>46 41%</td>
<td>20 53%</td>
<td>26 36%</td>
<td>7 54%</td>
<td>39 40%</td>
<td>38 44%</td>
<td>7 35%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>36 32%</td>
<td>9 24%</td>
<td>27 37%</td>
<td>4 31%</td>
<td>32 33%</td>
<td>26 30%</td>
<td>8 40%</td>
</tr>
<tr>
<td>Total</td>
<td>111 100%</td>
<td>38 100%</td>
<td>73 100%</td>
<td>13 100%</td>
<td>98 100%</td>
<td>86 100%</td>
<td>20 100%</td>
</tr>
</tbody>
</table>

7. If there is a crisis and the country is closed off from the outside world, what industry do you think is most likely to supply Icelanders with food?

<table>
<thead>
<tr>
<th>Industry</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing industry</td>
<td>20 18%</td>
<td>8 15%</td>
<td>12 18%</td>
<td>2 15%</td>
<td>14 18%</td>
<td>9 13%</td>
<td>2 13%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>12 11%</td>
<td>5 14%</td>
<td>7 10%</td>
<td>2 15%</td>
<td>10 10%</td>
<td>8 8%</td>
<td>4 21%</td>
</tr>
<tr>
<td>Horticulture</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>All of the above</td>
<td>77 71%</td>
<td>26 70%</td>
<td>51 71%</td>
<td>9 69%</td>
<td>85 71%</td>
<td>72 73%</td>
<td>12 65%</td>
</tr>
<tr>
<td>Other</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Total</td>
<td>109 100%</td>
<td>37 100%</td>
<td>72 100%</td>
<td>13 100%</td>
<td>96 100%</td>
<td>85 100%</td>
<td>19 100%</td>
</tr>
</tbody>
</table>
8. What do you consider is most important in safeguarding food security in Iceland? Choose FOUR options

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide variety of imported goods</td>
<td>28 25%</td>
<td>12 26%</td>
<td>16 24%</td>
<td>0 0%</td>
<td>28 28%</td>
<td>22 25%</td>
<td>5 25%</td>
<td>1 20%</td>
</tr>
<tr>
<td>As much domestic food production as possible</td>
<td>88 79%</td>
<td>26 71%</td>
<td>62 82%</td>
<td>12 76%</td>
<td>76 73%</td>
<td>67 77%</td>
<td>17 85%</td>
<td>4 80%</td>
</tr>
<tr>
<td>Fair prices for consumers</td>
<td>49 44%</td>
<td>12 32%</td>
<td>37 50%</td>
<td>7 54%</td>
<td>42 42%</td>
<td>38 44%</td>
<td>8 40%</td>
<td>3 60%</td>
</tr>
<tr>
<td>Good domestic distribution system</td>
<td>88 55%</td>
<td>25 35%</td>
<td>63 65%</td>
<td>10 77%</td>
<td>56 57%</td>
<td>54 62%</td>
<td>8 40%</td>
<td>4 80%</td>
</tr>
<tr>
<td>Building permanent stocks of food products</td>
<td>36 32%</td>
<td>14 37%</td>
<td>22 30%</td>
<td>4 31%</td>
<td>32 32%</td>
<td>29 33%</td>
<td>6 30%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Reliable transport in and out of the country</td>
<td>63 56%</td>
<td>26 68%</td>
<td>37 50%</td>
<td>4 31%</td>
<td>39 60%</td>
<td>54 62%</td>
<td>9 40%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Good selection of unconnected grocery stores</td>
<td>58 52%</td>
<td>16 42%</td>
<td>42 56%</td>
<td>4 31%</td>
<td>32 32%</td>
<td>29 33%</td>
<td>6 30%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Support (subsidises) for agriculture</td>
<td>40 9%</td>
<td>13 31%</td>
<td>27 74%</td>
<td>5 16%</td>
<td>22 32%</td>
<td>18 28%</td>
<td>0 0%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Total</td>
<td>409 n/a</td>
<td>131 n/a</td>
<td>278 n/a</td>
<td>49 n/a</td>
<td>360 n/a</td>
<td>327 n/a</td>
<td>65 n/a</td>
<td>17 n/a</td>
</tr>
</tbody>
</table>

9. Do you have a private vegetable garden or access to one to grow your own food?

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>38 34%</td>
<td>9 24%</td>
<td>29 39%</td>
<td>8 67%</td>
<td>30 50%</td>
<td>28 33%</td>
<td>9 45%</td>
<td>1 20%</td>
</tr>
<tr>
<td>No</td>
<td>73 66%</td>
<td>28 76%</td>
<td>45 71%</td>
<td>12 92%</td>
<td>76 77%</td>
<td>76 77%</td>
<td>17 85%</td>
<td>4 80%</td>
</tr>
<tr>
<td>Total</td>
<td>111 100%</td>
<td>37 100%</td>
<td>74 100%</td>
<td>12 100%</td>
<td>99 100%</td>
<td>86 100%</td>
<td>20 100%</td>
<td>5 100%</td>
</tr>
</tbody>
</table>

10. If you grow your own food, when did you start doing it? (Those who answered yes in previous question only)

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the year 2000</td>
<td>7 21%</td>
<td>2 20%</td>
<td>5 71%</td>
<td>2 29%</td>
<td>5 19%</td>
<td>5 20%</td>
<td>1 13%</td>
<td>1 100%</td>
</tr>
<tr>
<td>After 2000 and before 2004</td>
<td>5 15%</td>
<td>1 10%</td>
<td>4 17%</td>
<td>1 14%</td>
<td>4 15%</td>
<td>5 20%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>After 2004 and before 2008</td>
<td>7 21%</td>
<td>2 20%</td>
<td>5 61%</td>
<td>1 14%</td>
<td>6 22%</td>
<td>5 20%</td>
<td>2 25%</td>
<td>0 0%</td>
</tr>
<tr>
<td>After 2008</td>
<td>15 44%</td>
<td>5 50%</td>
<td>10 42%</td>
<td>3 43%</td>
<td>12 44%</td>
<td>10 40%</td>
<td>5 63%</td>
<td>4 80%</td>
</tr>
<tr>
<td>Total</td>
<td>34 100%</td>
<td>10 100%</td>
<td>24 100%</td>
<td>7 100%</td>
<td>27 100%</td>
<td>25 100%</td>
<td>8 100%</td>
<td>1 100%</td>
</tr>
</tbody>
</table>

11. Do you engage in blood sausage-making (slátur)

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>21 19%</td>
<td>4 11%</td>
<td>17 23%</td>
<td>8 62%</td>
<td>13 13%</td>
<td>13 15%</td>
<td>6 30%</td>
<td>2 40%</td>
</tr>
<tr>
<td>No</td>
<td>91 81%</td>
<td>34 89%</td>
<td>57 77%</td>
<td>5 38%</td>
<td>86 87%</td>
<td>74 85%</td>
<td>14 70%</td>
<td>3 60%</td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
<td>5 100%</td>
</tr>
</tbody>
</table>

12. If you do engage in blood sausage-making, when did you start? (Those who answered yes in previous question only)

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the year 2000</td>
<td>14 64%</td>
<td>2 40%</td>
<td>12 71%</td>
<td>7 54%</td>
<td>12 50%</td>
<td>6 40%</td>
<td>5 83%</td>
<td>3 100%</td>
</tr>
<tr>
<td>After 2000 and before 2004</td>
<td>1 5%</td>
<td>0 0%</td>
<td>1 6%</td>
<td>0 0%</td>
<td>1 7%</td>
<td>1 8%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>After 2004 and before 2008</td>
<td>3 14%</td>
<td>1 20%</td>
<td>2 12%</td>
<td>0 0%</td>
<td>3 21%</td>
<td>3 23%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>After 2008</td>
<td>4 18%</td>
<td>2 40%</td>
<td>2 12%</td>
<td>1 13%</td>
<td>3 21%</td>
<td>3 23%</td>
<td>1 17%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Total</td>
<td>22 100%</td>
<td>5 100%</td>
<td>17 100%</td>
<td>8 100%</td>
<td>14 100%</td>
<td>13 100%</td>
<td>6 100%</td>
<td>3 100%</td>
</tr>
</tbody>
</table>

13. Do you hunt for food?

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>31 28%</td>
<td>12 32%</td>
<td>19 26%</td>
<td>8 62%</td>
<td>23 23%</td>
<td>20 23%</td>
<td>10 50%</td>
<td>1 20%</td>
</tr>
<tr>
<td>No</td>
<td>80 72%</td>
<td>26 68%</td>
<td>54 74%</td>
<td>5 38%</td>
<td>75 77%</td>
<td>66 77%</td>
<td>10 50%</td>
<td>4 40%</td>
</tr>
<tr>
<td>Total</td>
<td>111 100%</td>
<td>38 100%</td>
<td>73 100%</td>
<td>13 100%</td>
<td>98 100%</td>
<td>86 100%</td>
<td>20 100%</td>
<td>5 100%</td>
</tr>
</tbody>
</table>

14. Was there any food gathering at your home when you were growing up? It is permitted to choose more than one answer.

<table>
<thead>
<tr>
<th>Count</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>20-39 yrs %</th>
<th>40-59 yrs %</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, we had vegetable and/or potato garden</td>
<td>55 49%</td>
<td>17 43%</td>
<td>38 51%</td>
<td>7 54%</td>
<td>44 40%</td>
<td>39 45%</td>
<td>12 65%</td>
<td>3 80%</td>
</tr>
<tr>
<td>Yes, we had livestock</td>
<td>5 9%</td>
<td>1 3%</td>
<td>4 7%</td>
<td>3 54%</td>
<td>5 5%</td>
<td>3 5%</td>
<td>2 10%</td>
<td>2 40%</td>
</tr>
<tr>
<td>Yes, hunting was practiced by household members</td>
<td>9 32%</td>
<td>2 7%</td>
<td>7 22%</td>
<td>5 38%</td>
<td>31 31%</td>
<td>27 31%</td>
<td>6 30%</td>
<td>1 20%</td>
</tr>
<tr>
<td>No, there was no food gathering at my home</td>
<td>30 37%</td>
<td>17 45%</td>
<td>13 23%</td>
<td>4 31%</td>
<td>37 37%</td>
<td>35 40%</td>
<td>6 30%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Other</td>
<td>4 4%</td>
<td>0 0%</td>
<td>4 5%</td>
<td>0 0%</td>
<td>4 4%</td>
<td>3 3%</td>
<td>0 0%</td>
<td>1 20%</td>
</tr>
<tr>
<td>Total</td>
<td>144 n/a</td>
<td>49 n/a</td>
<td>95 n/a</td>
<td>19 n/a</td>
<td>125 n/a</td>
<td>105 n/a</td>
<td>27 n/a</td>
<td>9 n/a</td>
</tr>
</tbody>
</table>
### 15. How much food supply do you generally store at your home?

<table>
<thead>
<tr>
<th>Count %</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>Rural area yrs</th>
<th>Urban area yrs</th>
<th>20-39 yrs</th>
<th>40-59 yrs</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
<td>1 1%</td>
<td>1 3%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>1 1%</td>
<td>0 0%</td>
<td>1 5%</td>
<td>0 0%</td>
</tr>
<tr>
<td>Enough for the household for one to three days</td>
<td>33 29%</td>
<td>13 34%</td>
<td>20 27%</td>
<td>1 8%</td>
<td>32 32%</td>
<td>23 26%</td>
<td>8 40%</td>
<td>2 40%</td>
<td></td>
</tr>
<tr>
<td>Enough for the household for one week</td>
<td>54 48%</td>
<td>18 47%</td>
<td>36 49%</td>
<td>3 23%</td>
<td>54 52%</td>
<td>46 53%</td>
<td>7 35%</td>
<td>1 20%</td>
<td></td>
</tr>
<tr>
<td>Enough for the household for two weeks</td>
<td>13 12%</td>
<td>5 13%</td>
<td>8 11%</td>
<td>2 15%</td>
<td>11 11%</td>
<td>13 15%</td>
<td>0 0%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>Enough for the household for three weeks</td>
<td>4 4%</td>
<td>0 0%</td>
<td>4 5%</td>
<td>0 0%</td>
<td>3 3%</td>
<td>3 3%</td>
<td>3 15%</td>
<td>1 20%</td>
<td></td>
</tr>
<tr>
<td>More</td>
<td>7 6%</td>
<td>1 3%</td>
<td>6 8%</td>
<td>5 38%</td>
<td>2 2%</td>
<td>3 3%</td>
<td>3 15%</td>
<td>1 20%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

### 16. Do you store emergency supply of food at your home?

<table>
<thead>
<tr>
<th>Count %</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>Rural area yrs</th>
<th>Urban area yrs</th>
<th>20-39 yrs</th>
<th>40-59 yrs</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>20 18%</td>
<td>4 11%</td>
<td>16 22%</td>
<td>4 31%</td>
<td>16 16%</td>
<td>13 15%</td>
<td>4 20%</td>
<td>1 20%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>92 82%</td>
<td>34 99%</td>
<td>58 78%</td>
<td>9 69%</td>
<td>32 84%</td>
<td>72 83%</td>
<td>16 80%</td>
<td>4 80%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

### 17. If everyone in the household would be locked in at this very moment, how long could you survive on the food supplies available in your home without changing the consumer pattern (that is, without rationing)?

<table>
<thead>
<tr>
<th>Count %</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>Rural area yrs</th>
<th>Urban area yrs</th>
<th>20-39 yrs</th>
<th>40-59 yrs</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>One day</td>
<td>7 6%</td>
<td>2 2%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>2 2%</td>
<td>1 2%</td>
<td>0 0%</td>
<td>0 0%</td>
</tr>
<tr>
<td>For two to four days</td>
<td>37 33%</td>
<td>11 29%</td>
<td>26 35%</td>
<td>1 8%</td>
<td>34 34%</td>
<td>27 31%</td>
<td>10 50%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>For a week</td>
<td>42 38%</td>
<td>15 39%</td>
<td>27 36%</td>
<td>5 38%</td>
<td>37 37%</td>
<td>34 39%</td>
<td>4 20%</td>
<td>4 80%</td>
<td></td>
</tr>
<tr>
<td>For two weeks</td>
<td>17 15%</td>
<td>8 21%</td>
<td>9 12%</td>
<td>2 15%</td>
<td>15 15%</td>
<td>14 16%</td>
<td>3 15%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>For three weeks</td>
<td>4 4%</td>
<td>0 0%</td>
<td>4 5%</td>
<td>0 0%</td>
<td>4 4%</td>
<td>4 5%</td>
<td>0 0%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>Longer</td>
<td>10 9%</td>
<td>2 5%</td>
<td>8 11%</td>
<td>5 38%</td>
<td>5 5%</td>
<td>6 7%</td>
<td>3 15%</td>
<td>1 20%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

### 18. When there is uncertainty about food security, for instance because of potential food shortage, how likely are you to hoard food?

<table>
<thead>
<tr>
<th>Count %</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>Rural area yrs</th>
<th>Urban area yrs</th>
<th>20-39 yrs</th>
<th>40-59 yrs</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very likely</td>
<td>21 19%</td>
<td>9 24%</td>
<td>12 16%</td>
<td>0 0%</td>
<td>21 21%</td>
<td>16 18%</td>
<td>3 15%</td>
<td>2 40%</td>
<td></td>
</tr>
<tr>
<td>Rather likely</td>
<td>44 39%</td>
<td>14 37%</td>
<td>30 41%</td>
<td>9 69%</td>
<td>33 33%</td>
<td>34 34%</td>
<td>9 45%</td>
<td>2 20%</td>
<td></td>
</tr>
<tr>
<td>Rather unlikely</td>
<td>42 38%</td>
<td>12 32%</td>
<td>30 41%</td>
<td>4 31%</td>
<td>38 38%</td>
<td>33 34%</td>
<td>7 35%</td>
<td>2 40%</td>
<td></td>
</tr>
<tr>
<td>Very unlikely</td>
<td>5 4%</td>
<td>3 8%</td>
<td>2 3%</td>
<td>0 0%</td>
<td>5 5%</td>
<td>4 5%</td>
<td>1 5%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

### 19. Have you ever hoarded food?

<table>
<thead>
<tr>
<th>Count %</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>Rural area yrs</th>
<th>Urban area yrs</th>
<th>20-39 yrs</th>
<th>40-59 yrs</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>19 17%</td>
<td>11 29%</td>
<td>8 21%</td>
<td>1 8%</td>
<td>17 17%</td>
<td>16 18%</td>
<td>3 15%</td>
<td>2 40%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>93 84%</td>
<td>31 82%</td>
<td>62 85%</td>
<td>12 92%</td>
<td>81 83%</td>
<td>72 84%</td>
<td>18 90%</td>
<td>3 60%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>73 100%</td>
<td>13 100%</td>
<td>98 100%</td>
<td>86 100%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

### 20. Did you hoard food in autumn 2008 when the Icelandic banking system collapsed?

<table>
<thead>
<tr>
<th>Count %</th>
<th>Male %</th>
<th>Female %</th>
<th>Rural area %</th>
<th>Urban area %</th>
<th>Rural area yrs</th>
<th>Urban area yrs</th>
<th>20-39 yrs</th>
<th>40-59 yrs</th>
<th>60-79 yrs %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7 6%</td>
<td>2 5%</td>
<td>5 7%</td>
<td>1 8%</td>
<td>6 6%</td>
<td>7 8%</td>
<td>0 0%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>105 94%</td>
<td>36 95%</td>
<td>69 93%</td>
<td>12 92%</td>
<td>93 94%</td>
<td>88 92%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112 100%</td>
<td>38 100%</td>
<td>74 100%</td>
<td>13 100%</td>
<td>99 100%</td>
<td>87 100%</td>
<td>20 100%</td>
<td>5 100%</td>
<td></td>
</tr>
</tbody>
</table>

### Demographics

<table>
<thead>
<tr>
<th>Total Participants</th>
<th>Gender breakdown</th>
<th>Residence breakdown</th>
<th>Age breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>Male %</td>
<td>Female %</td>
<td>Rural area %</td>
</tr>
<tr>
<td>Do you run your own household?</td>
<td>Count %</td>
<td>38 34%</td>
<td>74 66%</td>
</tr>
</tbody>
</table>