

## **Nordic monitoring of diet, physical activity and overweight**

First collection of data in all Nordic Countries 2011

**Rasmussen, Lone Banke; Andersen, L. F.; Borodulin, K.; Enghardt Barbieri, H.; Fagt, Sisse; Matthiessen, Jeppe; Sveinsson, T.; Thorgeirsdottir, H.; Trolle, Ellen**

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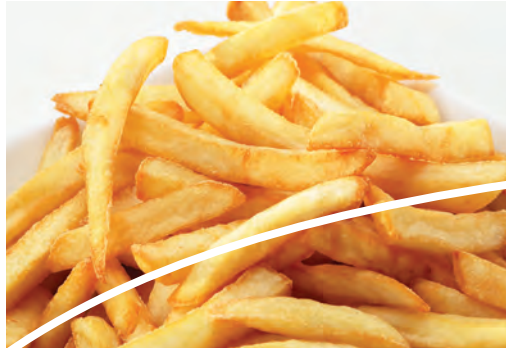
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# Preface

The governments of the Nordic countries have committed themselves nationally to address the issue of an unhealthy diet, physical inactivity and overweight and enacted policies to promote a healthier lifestyle. The Nordic Council of Ministers wants to underline these commitments by formulating common Nordic ambitions on combating an unhealthy diet, physical inactivity, and overweight by drawing up a joint Nordic Action Plan in 2006.

Common goals are to be created to allow for comparisons, whereby national actions taken in each of the Nordic countries can be assessed. A common ambition will be a clear benefit for the Nordic countries when coupled with a common monitoring of effects, an increased sharing of knowledge, a common effort to identify best practice, and increased scientific cooperation. Therefore in 2007, a Nordic working group was established with the aim to describe a future Nordic monitoring system on diet, physical activity and overweight.

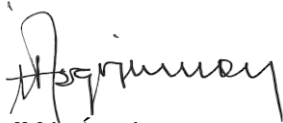
The monitoring project consists of three parts:

- Part 1, 2007-2008: Description of a Nordic method for collecting representative data, including description of sample size and characteristics, as well as practical considerations of the implementation of the monitoring in the Nordic countries.
- Part 2, 2009-2010: Validation of the suggested methods against an objective method (physical activity) or existing survey methods (diet). A network on child growth will also be started with the objective to develop a network of monitoring child health in the Nordic countries, coordinate and harmonize central monitoring using the same measures, standards and way of analyses and third to compare the development in overweight in the Nordic countries.
- Part 3, 2010-2013: First collections of data in all Nordic countries.

The working group has described a common Nordic method for collecting representative data based on indicator questions on diet and physical activity. The monitoring system should be simple and at relatively low cost. Therefore it has been decided to conduct the monitoring as a telephone interview. In 2009, the indicator questions were validated

against an objective method (physical activity) or existing survey methods (diet) and this validation has been described in a report published by the Nordic Council of Ministers.

The present report describes the results from the first data collection of the joint Nordic Monitoring project of diet, physical activity and overweight which was carried out in autumn 2011.



*Halldór Ásgrímsson*

Secretary General

Nordic Council of Ministers

# 1. Summary

As an important element in the Nordic Plan of Action on better Health and Quality of Life through diet and physical activity, the Nordic Council of Ministers decided to carry out a joint Nordic monitoring study of diet, physical activity and overweight. The current report describes the results of the first collection of data in the five Nordic countries. The aim of this first study was to provide baseline data for frequency of intake in selected foods; physical activity level and prevalence of overweight and obesity in the Nordic countries. Furthermore, the objectives are to compare results between countries and to compare with existing recommendations where possible. A further objective is to investigate social inequality in diet and physical activity.

Telephone interviews were performed in simple random samples in all the five Nordic countries with the same validated questionnaire using simple indicator questions. The interviews were carried out from October to December 2011. In total there were 9,153 adults 18–65 y (participation rate 40%); and 2,479 children 7–12 y (participation rate 45%) participating.

## **Results – Dietary Intake**

Oil-butter spread was the most commonly used type of spread in all countries used by 28–48% of the participants, however, some marked differences between countries were found in the type of spread used. To elaborate; low-fat margarine was commonly used in Sweden, Iceland and Norway (by approximately 1 out of 5), and Finland was the only country in which “Becel pro-activ” was commonly used. In Norway and Denmark we found a quite high proportion, 29 and 40% of participants respectively, did not use spread at all. These differences probably reflect the results of campaigns and different recommendations in the five countries. Oil was the most commonly used fat for cooking, used by 31–81% in the various countries. The use of spread and fat in children followed the same patterns as for adults, with the same differences between countries.

The vision for 2021 in the Nordic Plan of Action regarding fat is that the average dietary intake of the population meets the Nordic Nutrition Recommendation on fat and saturated fat plus trans fatty acids, and at least 70% meets the NNR on fat energy percent. With the high proportion of par-

ticipants who used oil for cooking, and the high proportion who used either low-fat spread or no spread at all, we seem to be on the right path, and it will be possible to follow the trend with the next Nordic monitoring.

The amount and type of bread eaten differed between countries. In Iceland the intake of bread of all types was low, the median total bread intake was less than 1 slice a day. Rye bread was mainly eaten by Danes and Finnish people. The intake of whole grain/whole meal bread seemed to be relatively high in Norway with a median intake more than 2 slices per day. White bread was eaten by surprisingly few in this survey; from 43% in Denmark to 80% in Iceland indicated they never or very seldom eat white bread. The intake of bread in children showed the same differences between countries as for the adults. According to the Nordic Plan of Action a vision for 2021 is that *at least 70% of the population has a daily intake of whole-grain bread/cereals corresponding to at least half of their daily intake of bread/cereals*. Cereals other than bread are not included in this study. When comparing the intake of rye bread plus whole-grain bread, these make up more than half of the bread intake in 96% of the participants. However, the bread reported as whole-meal does not necessarily contain a large amount of “whole-grain” as many types of bread contains seeds and a few grains signaling a higher fiber content than the bread actually has. Thus, it is doubtful whether this goal has already been reached but there seems to be a good knowledge of the importance of eating whole-grain at the expense of white bread. The next monitoring will show whether the development is going in the right direction.

The median intake of fruit and vegetables were at the same level in all countries. Fruit and vegetables were eaten between more than 2.5 times and less than 3.5 times a day. The Nordic Plan of Action states that a vision for 2021 is that *at least 70% of the population more than 10 years of age has a daily intake of vegetables and fruits of at least 500 g*, which can be roughly estimated to 5 times a day. According to the present study, 8 to 22% in the various countries have fruit and vegetables 5 times a day, thus we have a long way to go in reaching this goal.

Cakes, sugar sweetened soft drinks and, in particular, chocolate and candy, are eaten regularly in all countries. Only 3–4% of all participants never consumes sugar-rich food or consumes sugar-rich food less than once a month, and the median intake is 4 times a week. Sugar sweetened soft drinks were regularly consumed by 50% of the adult population in the Nordic countries. Iceland had the highest total intake of sugar-rich food and Sweden the lowest. For children sugar-rich food was eaten regularly in all countries and less than 4% ate chocolate or candy never or less than once a month. A typical intake of sugar-sweetened soft

drinks among children was once a week in all five countries and a typical frequency of intake of sugar-rich food was 4 times a week, roughly equivalent to 200–250 g a week. This is the approximate amount which can be eaten each week for a child – if the Nordic Nutrition Recommendation on daily intake of added sugar (max. 10E%) should be fulfilled. In the Nordic Plan of Action the goal is that 80% or more meets the recommendation. According to the present survey, approximately 50% of the children have reached this recommendation.

Quite large differences in intake of fish between the countries were seen both in adults and children. In Iceland and Norway fish is eaten twice a week, this is more than twice as frequent as is consumed in Denmark. Finland and Sweden had an intake in between these two sets of comparisons. Nearly all participants in Iceland, Norway and Sweden regularly consumed fish, in contrast to Denmark, where 12% never, or less than once a month, had fish. However, the questionnaire only included a question regarding fish as a main meal. In some countries it is common to eat fish on bread as part of a smaller meal, so the intake in these countries is probably underestimated. The Nordic Plan of Action has as a vision for 2021 that *at least 70% consume fish or fish products, corresponding to a main dish twice a week*. According to the present survey 43% adults fulfill the recommendation, but it varies across countries from 26% (Denmark) to 66% (Iceland) amongst adults and from 10% (Denmark) to 83% (Iceland) amongst children.

The above mentioned foods were included in a dietary index together with some fat-rich food, in order to be able to say something about how healthy the diet was. The overall dietary index differed; Iceland and in particular Sweden, had the lowest dietary index; Norway the highest with Denmark and Finland in between for adults. The percent with a diet which could be classified as “healthy”, that means a dietary index score of 8 or more, varied from 9% in Sweden up to 18% in Finland and 24% in Norway. The children and adults both had approximately 70% with a medium quality, but more children than adults had a poor diet. Only 0.3% of adults and no children had an optimal diet. A diet defined as “healthy” was only found in 2% of children in Sweden to 10–12% in Denmark and Norway.

When looking at the dietary habits of the two sexes, women had healthier habits than men, judged from the dietary index, they had more healthy fat habits, a higher intake of fruit and vegetables, and a lower consumption of sugar-sweetened soft drinks.

Likewise, participants with a higher education in both sexes had, in general, healthier dietary habits compared with participants with a basic

education. The more highly educated had a corresponding higher dietary index score, more chose oils for cooking and more healthy spread or used no spread on bread. Furthermore, they ate vegetables and fruits more frequently and consumed sugar-sweetened soft drinks less often.

Among the visions of 2021 in The Nordic Plan of Action, one of the goals is that the variation between different social groups with regard to diet would vary, at most, by 20%. It is difficult to calculate this difference, but if the difference in dietary index between educational groups is used, the difference is already less than 10%. The working group has previously suggested more ambitious goals regarding the reduction of social inequality and these goals will be evaluated within the next monitoring period. The reason for the small difference already existing could be that the more unhealthy eating people might not participate in a study of this kind. The results of this study are most useful to reveal trends in dietary factors in the Nordic countries and to follow trends by comparing with similar studies in the future. The high number of participants in Norway who eat healthily is probably due to overrepresentation of highly educated participants and participation of more health conscious persons than the average Norwegian.

### **Results, Physical activity**

Finland and Sweden had the most physically active adult participants and the highest percentages that fulfill both the minimum recommendation (a ½ hour of moderate physical activity daily), about 70% in both countries, and of these 17 and 13% in Finland and Sweden met the full recommendation (which also includes recommendation of vigorous physical activity). Men and women did not differ significantly with respect to physical activity but more men than women tended to be inactive. Furthermore, inactivity increased and the likelihood of fulfilling the full recommendation for physical activity decreased with increasing age. In general fewer with a higher education were inactive and more met the minimum recommendation.

Sweden and Iceland had the lowest screen time with a median of 2.5 hours per day compared with 3.0 hours/day in the other 3 countries. Women spent, in general, shorter time than men in front of a screen. The percentage who had more than 4 hours screen time a day was highest in the youngest age group, in the group with basic education and in singles. Furthermore, among participants living in the countryside fewer spent more than 4 hours a day in front of a screen, compared with participants living in the capital.

Among results for children, Finland and Iceland had the most active participants and the highest percentage who fulfill the recommendation

of at least 1 hours moderate activity daily, 52 and 56%, respectively. In Sweden only 28% fulfill the recommendation. In general, more boys than girls fulfill the recommendation for physical activity.

The vision for 2021 in the Nordic Plan of Action is that all children aged 1–12 and at least 85% of children and youth aged 12–16 years are physically active for at least 1 hour every day. According to the present survey 44% fulfill the recommendation, so this number has to be increased appreciably.

Overall children in this survey spent 2–3 hours a day on screen time, which is a little less than for adults. Likewise for adults, more boys than girls spent more than 4 hours on screen time.

### **Results, overweight and obesity**

Iceland had the highest percentage of overweight (approx. 39%) and obese participants (approx. 18%). Denmark, Sweden and Norway had a comparable number of overweight and obesity, 43–45%. BMI was higher in men than in women, increased with aged and tended to be higher in participants with a basic education. Furthermore, more participants living at the countryside than in the capital were overweight and obese.

The number of children with overweight and obesity was at the same level in all 5 countries; 9–15% were overweight and 2–4% obese.

### **Limitations and strengths**

The indicator questions survey used in the Nordic Monitoring is a rather rough way to measure dietary and physical activity habits; and although the same questionnaire was used in all countries, there are limitations when comparing between countries. For instance, the same frequency of intake can cover up different portion sizes in the different countries. Furthermore, especially the results from Norway should be taken with caution due to the low participation rate. The results should be used as indicators for dietary and physical activity habits and not as absolute numbers.

On the other side, comparison with other surveys in the Nordic countries indicates that the same trends in dietary intake are seen, whereas the physical activity in general seems to be overestimated. The monitoring study provides comparable results on more than 11.500 participants in the Nordic region on diet, physical activity and overweight. Since the questionnaire has been validated and the data collection has been conducted at the same period in all five Nordic countries, the results will give good insight in the status of important health related indicators in the Nordic region.



## **Conclusion**

In conclusion this study gives a good status for dietary intake indicators, indicators for physical activity, sedentary time and overweight which makes it possible in a comparative and relatively simple way, to follow changes in these parameters over time in the Nordic countries.

The results in this report serve a baseline for the next monitoring in 2013, thus enabling the monitoring project to look at how diet, physical activity and overweight develop from 2011 to 2013.

When comparing between countries it should be taken into account that the indicator questions are a rather rough way to measure dietary and physical activity habits. Therefore interpretation should be done with caution.

The baseline results show that all countries are far from the goals of vegetable and fruit intake, sugar rich food is consumed 4 times a week in all countries, the intake of fish is low except in Iceland and in adults in Norway and too few children are physically active at least 1 hour a day. There are areas to be improved in all countries and according to this study there are some differences between countries; Denmark have the highest proportion who do not use spread on bread, but the Danes eat fish more seldom than in the other countries. In Finland a higher proportion than in other countries use Becel Pro Activ on bread and more are physical active. Sweden has the highest intake frequency of sausages, the type of bread eaten differ from the other countries and, furthermore, Sweden have a high proportion of physical active (nearly as Finland), Iceland have a frequent intake of fish, the highest proportion who use oil for cooking, the most frequent intake of sugar rich food and the highest proportion of overweight and obese. However, Icelanders spend less time in front of a computer compared with the other countries. Norwegians have, according to this survey, the highest intake of fruits and vegetables but also the highest consumption of full fat cheese and spend more time in front of a computer than participants from other countries.

## 2. Background

As an important element in the Nordic Plan of Action, the Nordic Council of Ministers decided to carry out a joint Nordic monitoring of diet, physical activity and overweight. A Nordic working group consisting of scientists from Nordic research institutions was established to carry out this task. The monitoring project consists of three parts

- Part 1. Description of a common Nordic method for collecting representative data on diet and physical activity
- Part 2. Validation of the suggested methods against a reference method
- Part 3. First collection of data in all Nordic countries

Part 1 was conducted in 2007–2009. The working group has described a method for collecting representative data based on indicator questions on diet and physical activity in the Nordic countries (Fagt et al 2009). The monitoring system should be simple and at relatively low cost and it was decided to conduct the monitoring as a telephone interview. The questionnaires were evaluated in a validation study (Part 2) in 2010–11 (Fagt et al. 2012).

Based on the work in Part 1 the questionnaire contains 15 indicators of diet and 6 indicators of physical activity as well as self-reported weight and height and background variables of participants. These indicators cover health related elements of diet and physical activity, but will not be able to provide information on all aspects of goals and visions of the Nordic Plan of Action. The dietary indicators reflects the nutritional quality of the diet and regards foods both included in food based dietary guidelines as well as foods related to prevalence of non communicable diseases. The indicators of physical activity are chosen as these reflect different health aspects related to an active lifestyle. They are appropriate to monitor physical activity sufficiently to evaluate the development in physical activity, and whether the goals and vision of the Nordic Plan of Action are met.

The current report describes the results of the first collection of data in the 5 Nordic countries (Part 3).

Furthermore, data regarding smoking and alcohol intake are included in this report based on other representative studies in the Nordic countries.

### **3. Objective**

The objective is to perform a joint Nordic monitoring of diet, physical activity and overweight. This monitoring system use simple indicator questions and is planned to be carried out every second year.

The aim of this first study is to provide baseline data of frequency in intake of selected food, the physical activity level and the prevalence of overweight and obese in the Nordic countries. Furthermore, the objective is to compare results between countries and to compare with the recommended intake of certain food and the recommendation for physical activity. A further objective is to investigate social inequality in diet and physical activity. The study makes it possible to study whether some of the goals in the Nordic Plan of Action are reached and whether diet and physical activity habits change in the desired direction.



## 4. Methods

Telephone interviews were performed in the 5 Nordic countries with a validated questionnaire (Fagt et al 2012). The questionnaire (NFFQ) was simple with indicator questions regarding diet, physical activity, body weight and height, and a few background questions. It took approximately 15 minutes to perform. The questionnaire contained the same questions in all countries except for the questions regarding bread which differed in Sweden and Iceland due to different bread habits.

In each country a simple random sample of adults and children was drawn from national registers. In Denmark the sample was drawn by Statistics Denmark from the “Central Population register”. In Norway the sample was drawn by “Skatteetaten”, in Sweden by “Folkbokföringsregistret”, in Finland by “Väestörekisterikeskus” (folkeregistercentralen) and in Iceland by “Þjóðskrá”, Registers Iceland.

In each country a sample of 5,000 adults aged 18–65 years and 1250 children aged 7–12 years October 2011 1<sup>st</sup> was drawn. In Denmark and Iceland the number in the sample was subsequently reduced as some had “research protection” meaning that they don’t want to be contacted, a few were in prison and some were drawn twice. Adolescents are not included in this monitoring due to financial constraint.

The goal was to carry out at least 2,000 interviews on adults and 500 on children in each country. However, as the maximal sample size was 5,000 adults and 1,250 children then fewer interviews were carried out if the participation rate was below 40%. Respondents received an information letter within one week before the telephone interview. If no contact was obtained contact was tried up to 8 times on different weekdays and times of the day. If no contact was achieved after 8 tries this was noted as “no contact”. Reason not to participate was noted and age, gender and postal code of non-responders were registered.

Telephone interviews were carried out in autumn 2011 in all countries. However, the sample was not received at the planned time in all countries. Therefore, the telephone interviews did not start at the same date (Table 1).

**Table 1. Date of first and last interview in each country**

Country	First interview	Last interview
Denmark	18-10-2011	06-12-2011
Iceland	01-10-2011	10-11-2011
Sweden	10-11-2011	22-12-2011
Finland	02-11-2011	22-12-2011
Norway	24-11-2011	29-12-2011

The data collection ended later than planned especially in Norway but also in Sweden and Finland. Most of the interviews took place during December in Norway and this could probably have influenced the response rate and the results.

SFI, The Danish National Centre for Social Research coordinated the data collection from all countries. In Denmark the data were collected by SFI – Survey. Norstat collected data from Sweden, Finland and Norway and Maskina collected data in Iceland.

## 4.1 Questionnaire

The English versions of the questionnaires are attached in Appendix A. The questionnaires were translated into the 5 Nordic languages. They were nearly identical but the questions regarding bread differed in Iceland and Sweden due to different bread habits in the 5 countries. The exact questions on bread can be found in the footnotes in Table 8. The questionnaire both for adults and for children included questions regarding the frequency intake of various kinds of bread, vegetables, fruits and berries, fish, sausages, candy and chocolate, cakes and biscuits, full fat cheese, fruit juice, soft drinks with and without sugar and energy drinks. Furthermore, questions regarding fat type were included. Questions on physical activity included questions on time spent on moderate and vigorous physical activity during the last week, as well as time spent on screen time (TV, computer). Background questions on age, sex, education, urbanization and family status were also included. Finally, questions on body weight and height were included.

## 4.2 Data handling and calculations

Data were cleaned for coding errors and for unrealistic answers. A further description is found in appendix B together with a description of how calculations for physical activity and screen time were performed.

Weighing factors were calculated for age- and gender group and for education. Weighing factors were calculated for each of the 10 age- and gender groups in each country as the ratio between the proportion of persons in each age-gender group in the background population and in the study population. Likewise, the weighing factors for education were calculated as the ratio between the proportion of persons in each education group in the background population and in the study population. Three groups of education; basic education (up to 10 years), vocational or theoretical education 10–12 year, and higher education (13 years or more) were used in these calculations. Weighing factors were calculated for each country separately.

Main results were calculated with and without weighing. Weighing the results for age- and gender changed the results only marginally. Thus, the results were not weighted for age- and gender. Weighing the results for education also resulted in only smaller changes, but some results for Norway changed after weighing for education. Due to the low participation rate in Norway, reservation about the results in Norway must be taken anyway, weighing or not. The weighing does not necessarily result in more true data, as few persons will count a lot in the analysis. Therefore, it was decided not to show weighted results.

When analyzing data with regard to education, three educational levels were used: Basic, Medium (vocational education or upper secondary education) and higher education (short, medium or long higher education). Likewise, family status was divided into 3 groups: singles; adult(s) living with child(ren) and living with other adult(s).

### **Statistics**

In general the data are skewed, therefore median with 25 and 75<sup>th</sup> percentiles are shown. The only exceptions are dietary index and body mass index where mean and standard deviation are shown.



Non-parametric test (Kruskal-Wallis H test) was used to compare variables between all countries. To compare one variable between two countries parametric test (t-test) was used with subsequent adjustment for multiple comparison (Bonferroni). The adjustment was done because so many variables were compared, to decrease the chance of accidental findings. Parametric tests with adjustment were used as this seems to give a more conservative result than non-parametric test.

When comparing proportions, chi-square test or z-test with subsequent adjustment for multiple comparison (Bonferroni) were performed.

# 5. Results

## 5.1 Participation

### 5.1.1 Adults

The number of invited adults, the number of participants and the participation rate are shown in Table 2. The participation rate differed appreciable between countries with Denmark having a higher participation rate than the other countries. Norway had a very low participation rate.

**Table 2. Number of invited adults, number of participants and participation rate**

Country	Invited (number)	Respondents (number)	Participation rate (%)
Denmark	3,492	2,187	63
Finland	5,000	2,004	40
Sweden	5,000	1,886	38
Iceland	4,252	2,011	47
Norway	5,000	1,065	21
Total	2,2746	9,153	40

Iceland had a very low number who refused to participate, but a high number of invited persons who could not be contacted (Table 3). Other reasons for not participating were not specified in all countries but the reasons could be disease, moved to an unknown address, no telephone or problem with the language.

**Table 3. Reasons for not participating. Adults. Number (percent of sample)**

	Denmark	Finland	Sweden	Iceland	Norway
Did not want to	590 (17)	1,323 (26)	1,388 (28)	355 (8)	2541 (51)
No contact	536 (15)	1,324 (26)	1,059 (21)	1,501 (35)	969 (19)
Other reasons	181 (5)	353 (7)	666 (13)	385 (9)	427 (9)
Total	1307 (37)	3,000 (59)	3,113 (62)	2241 (52)	3,937 (79)

### 5.1.2 Children

The participation rate for children was higher than for adults in most countries, but it was still very low in Norway (Table 4).

**Table 4. Number of invited children, number of participants and participation rate**

Country	Invited (number)	Respondents (number)	Participation rate (%)
Denmark	710	609	86
Finland	1,250	500	40
Sweden	1,250	499	40
Iceland	1,000	518	52
Norway	1,250	353	28
Total	5,460	2,479	45

Denmark and Iceland had few but Norway had many who refused to participate (Table 5). Finland and Iceland, and to some extent Sweden, had a large percentage who could not be contacted.

**Table 5. Reason for not participating. Children. Number (percent of sample)**

	Denmark	Finland	Sweden	Iceland	Norway
Did not want to	39 (5)	136 (11)	247 (20)	31 (3)	565 (45)
No contact	45 (6)	526 (42)	377 (30)	397 (40)	211 (17)
Other reasons	17 (2)	88 (7)	127 (10)	54 (5)	121 (10)
Total	101 (13)	750 (60)	751 (60)	482 (48)	897 (72)

## 5.2 Characteristics of participants

### 5.2.1 Adults

Characteristics of the adult participants are described in Table 6 with regard to sex, age and education. Tables 1–2 in appendix C further describe the participant's place of living and the number in their households.

In all countries more women than men participated. Furthermore, the participation was highest in the age groups 45 years and older.

**Table 6. Background variables for adult participants**

	Denmark		Finland		Sweden		Iceland		Norway	
	Number	%	Number	%	Number	%	Number	%	Number	%
Respondents	2,187		2,004		1,886		2,011		1,065	
<b>Sex</b>										
Men	1,014	46.4	922	46.0	885	46.9	938	46.6	514	48.3
Women	1,173	54.0	1,082	54.0	1,001	53.1	1,073	53.4	551	51.7
<b>Age</b>										
18–24 y	211	9.6	214	10.7	220	11.7	194	9.6	99	9.3
25–34 y	270	12.3	334	16.7	321	17.0	363	18.1	187	17.6
35–44 y	446	20.4	309	15.4	392	20.8	450	22.4	253	23.8
45–54 y	590	27.0	438	21.9	412	21.8	537	26.7	274	25.7
55–65 y	670	30.6	709	35.4	541	28.7	467	23.2	252	23.7
<b>Education</b>										
10 y or less	355	16.2	303	15.1	217	11.5	513	25.5	69	6.5
Vocational 10–12 y	668	30.5	792	39.5	281	14.9	453	22.5	152	14.3
Theoretical 10–12 y	220	10.1	234	11.7	583	30.9	367	18.3	231	21.7
13–14 y	674	30.8	385	19.2	473	25.1	446	22.2	345	32.4
15 y or more	269	12.3	278	13.9	311	16.5	228	11.3	264	24.8

## 5.2.2 Children

Characteristics of the participating children and the interviewed persons are shown in Table 7. In Denmark and Sweden more boys than girls participated whereas it was opposite in the other 3 countries. It was mainly the mother of the children who was interviewed although the difference between sexes of the interviewed person was not that large in Norway. The place of living and the number living in the household of the participating children are shown in Table 3–4 in appendix C.

**Table 7. Sex of the participating children, sex of the interviewed person and parent's education**

	Denmark		Finland		Sweden		Iceland		Norway	
	Number	%	Number	%	Number	%	Number	%	Number	%
Respondents	609		500		499		518		353	
<b>Sex</b>										
Boys	319	52.4	246	49.2	272	54.5	247	47.7	169	47.9
Girls	219	47.6	254	50.8	227	45.5	271	52.3	184	52.1
<b>Sex of interviewed</b>										
Men	91	14.9	43	8.6	39	7.8	70	13.6	150	42.5
Women	518	85.1	457	91.4	460	92.2	446	86.4	203	57.5
<b>Parents education</b>										
10 y or less	39	6.4	17	3.4	8	1.6	100	19.3	16	4.6
Vocational 10–12 y	190	31.2	190	38.1	66	13.3	64	12.4	55	15.8
Theoretical 10–12 y	37	6.1	55	11.0	150	30.2	77	14.9	64	18.4
13–14 y	250	41.1	159	31.9	181	36.4	204	39.5	117	33.6
15 y or more	93	15.3	78	15.6	92	18.5	72	13.9	96	27.6

### 5.3 Representativity

The age and sex distribution among participants and the distribution according to education were compared with the general population in each country.

In general in all countries the participants were older than the general population. Furthermore, women were overrepresented in the present study when comparing with the general population.

More with a basic and short education than with higher education refused to participate in all countries. Thus, persons with short, medium or long higher education were overrepresented in this survey in all countries, especially in Norway. In Iceland the overrepresentation was only minor.

Because of the skewed distribution with regard to age, gender and education compared with the general population in the 5 countries it was considered to weigh the data as described in the Method section. But since it changed the results only marginally, the results were not weighted before further analyses were carried out. The low participation rate in Norway combined with a gross underrepresentation of participants with only basic education means that the results from Norway should be used with caution.

A more thorough description of the representativity in each country is given in the appendix C (Tables 5–14).

### 5.4 Food – Adults

The median frequency of intake of foods in all adults is shown in Table 8 and the mean intake in Table 15 in appendix C. There are significant differences in the intake of all food categories between the countries ( $P < 0.001$  for all except energy drinks  $P = 0.003$ ). Many significant differences were also found in intake of food when two countries were compared as can be seen in the table. Although significant, some of the differences were only minor. Marked differences were found in intake of bread, fish, sausages and full fat cheese.

The amount of bread eaten was lowest in Iceland. Rye bread was mainly eaten by Danes and Finnish people. The intake of whole grain/whole meal bread was highest in Norway. The question on bread was different in Sweden and Iceland than in the other countries. In Sweden rye bread was included in the question of whole grain bread and in Iceland the questions were categorized after fiber content. In all countries the question on

whole grain bread included also whole meal bread, this means the fiber content is not necessarily as high as in whole grain bread.

The intake of fruit and vegetables were at the same level in all countries as fruit and vegetables were eaten more than 2.5 times and less than 3.5 times in all 5 countries.

A quite large difference in intake of fish between the countries was seen. The frequency of intake of fish was highest in Iceland and Norway and lowest in Denmark. In Iceland and Norway fish is eaten twice a week, that is more than twice the intake in Denmark. Finland and Sweden had an intake in between. However, the questionnaire only included a question regarding fish as a main meal. In some countries (e.g. Denmark and Norway) it is common to eat fish on bread.

Sausages were more often eaten by Swedes than by others and full fat cheese was eaten most frequently by Norwegians.

Cakes, sugar sweetened soft drinks and, in particular, chocolate and candy, were eaten regularly in all countries, only 3–4% of all never consume sugar-rich food or consume sugar-rich food less than once a month, and the median intake was 4 times a week. Sugar sweetened soft drinks were only consumed by 50% of the population in the Nordic countries. Iceland had the highest total intake of sugar-rich food and Sweden the lowest.

The mean frequency intake for men and women, respectively, are shown in Table 16 and 17 in appendix C. Frequency of intake of all food differed significantly between countries in both men and women except for the intake of energy drinks.

**Table 8. Median frequency (with 25–75 percentiles) of intake of foods shown for all adult participants**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
Rye bread, slices/day <sup>a,b</sup>	2.0 <sub>a</sub>	1.0	3.0	2,183	2.0 <sub>b</sub>	1.0	4.0	1996	-	-	-	-	0.4 <sub>c</sub>	0.0	1.0	1998	0.0 <sub>c</sub>	0.0	0.7	1,011
Whole grain/meal bread, slices/day	1.0 <sub>a</sub>	0.1	2.0	2,180	0.6 <sub>a</sub>	0.0	2.0	1963	1.0 <sub>b</sub>	0.6	2.0	1874	0.6 <sub>c</sub>	0.1	1.1	1999	3.0 <sub>d</sub>	0.7	5.0	1,052
White bread, slices/day	0.1 <sub>a</sub>	0.0	0.7	2,124	0.0 <sub>b</sub>	0.0	0.4	1950	.1 <sub>a,b</sub>	0.0	0.6	1864	0.0 <sub>c</sub>	0.0	0.0	1982	0.0 <sub>d</sub>	0.0	0.1	1,051
Hard bread, pieces/day	0.0 <sub>a</sub>	0.0	0.3	2,117	0.1 <sub>b</sub>	0.0	0.6	1958	0.6 <sub>c</sub>	0.1	1.4	1869	0.3 <sub>d</sub>	0.0	1.0	1985	0.4 <sub>e</sub>	0.0	2.0	1,049
Vegetables/day	1.0 <sub>a</sub>	0.7	1.0	2,187	1.0 <sub>a,b</sub>	0.9	2.0	2001	1.0 <sub>b</sub>	0.9	2.0	1883	1.0 <sub>c</sub>	0.6	1.0	2004	1.0 <sub>d</sub>	1.0	2.0	1,063
Fruit & berries/day	1.0 <sub>a</sub>	0.7	2.0	2,185	1.0 <sub>b</sub>	0.4	2.0	1999	1.0 <sub>c</sub>	0.6	2.0	1879	1.0 <sub>b</sub>	0.4	1.0	2004	1.0 <sub>c</sub>	0.4	2.0	1,058
Fruit juice/day	0.1 <sub>a</sub>	0.0	0.3	2,168	0.1 <sub>b</sub>	0.0	0.4	1994	0.1 <sub>b</sub>	0.0	0.5	1878	0.3 <sub>c</sub>	0.1	0.7	2003	0.3 <sub>c</sub>	0.0	1.0	1,062
Fish/week	1.0 <sub>a</sub>	0.5	2.0	2,019	1.0 <sub>a,b</sub>	0.8	2.0	2000	1.0	1.0	2.0	1883	2.0 <sub>c</sub>	1.0	3.0	2006	2.0 <sub>d</sub>	1.0	3.0	1,065
Fried potatoes/month	1.9 <sub>a</sub>	0.0	4.0	2,183	0.9 <sub>b</sub>	0.0	1.9	1996	1.9 <sub>a</sub>	0.9	4.0	1882	1.9 <sub>a</sub>	0.9	4.0	2008	0.9 <sub>b</sub>	0.0	1.9	1,059
Sausages/month	0.0 <sub>a</sub>	0.0	1.0	2,177	1.0 <sub>b</sub>	0.0	4.0	1993	4.0 <sub>c</sub>	1.0	4.0	1885	1.0	0.0	3.0	2009	1.0 <sub>d</sub>	0.0	3.0	1,059
Chocolate and candy/month	8.0 <sub>a</sub>	4.0	12.0	2,184	4.0 <sub>b</sub>	2.0	8.0	1997	4.0 <sub>b</sub>	3.0	8.0	1881	8.0 <sub>a</sub>	4.0	16.0	2004	8.0 <sub>a</sub>	4.0	12.0	1,061
Cakes/month	4.0 <sub>a</sub>	2.0	8.0	2,181	4.0 <sub>b</sub>	2.0	12.0	2001	4.0 <sub>a</sub>	1.0	8.0	1881	4.0 <sub>c</sub>	2.0	12.0	2007	3.0 <sub>d</sub>	1.0	4.0	1,055
Full fat cheese/day	0.4 <sub>a</sub>	0.0	1.0	2,176	0.1 <sub>a,c0</sub>	0.0	1.0	1967	0.5 <sub>b</sub>	0.1	1.0	1863	0.3 <sub>c</sub>	0.0	1.0	1996	0.7 <sub>d</sub>	0.3	1.0	1,049
Soft drinks, light/week	0.0 <sub>a</sub>	0.0	2.0	2,168	0.3 <sub>b</sub>	0.0	2.0	1993	0.0 <sub>c</sub>	0.0	0.3	1880	0.0 <sub>d</sub>	0.0	1.0	2008	0.3 <sub>a,b</sub>	0.0	3.0	1,063
Soft drinks, sugar sweetened/week	0.0 <sub>a,c</sub>	0.0	1.0	2,170	0.3 <sub>a</sub>	0.0	1.0	1998	0.3 <sub>b</sub>	0.0	1.0	1879	0.5 <sub>c</sub>	0.0	2.0	2007	0.3 <sub>a,c</sub>	0.0	1.0	1,062
Energy drinks	0.0 <sub>a</sub>	0.0	0.0	2,076	0.0 <sub>a</sub>	0.0	0.0	1993	0.0 <sub>a</sub>	0.0	0.0	1885	0.0 <sub>a</sub>	0.0	0.0	2010	0.0 <sub>a</sub>	0.0	0.0	1,062

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction. M – median, 25 – 25 percentile, 75 – 75 percentile, N – number.

<sup>a</sup> The questions on bread in Sweden were: 1. How many slices of soft bread, type wholegrain bread, “coarse”/wholemeal bread, bread labelled with the keyhole symbol, do you eat? 2. How many slices of Swedish loaf or white bread, e.g. French roll, white toast bread, ciabatta, skogaholmslimpa, do you eat? 3. How many slices of hard bread do you eat?

<sup>b</sup> The questions on bread in Iceland were: 1. Fiberrich bread, fiber content over 6 gr per 100 g, 2. “wholewheat breads”, 3–6 g fibre, 3. White breads 0–3 g fibre. 4. Hard bread

Percentages of participants who never or seldom (less than once a month) ate the various kinds of food are shown in Table 9. Many differences between countries in bread habits were found. In Denmark and Finland most ate rye bread which was not eaten by many Norwegians. In Sweden rye bread was included in the question regarding whole grain/whole meal bread. A surprisingly high part of the participants did not eat white bread in all countries but in particular in Iceland and Norway. Nearly all participants in Iceland, Norway and Sweden regularly ate fish in contrast to Denmark where 12% never, or less than once a month, had fish as a main meal. Sausages are eaten by most Swedes whereas more than half of the Danes seldom eat sausages. More participants in Finland and Denmark seldom ate full fat cheese compared with the other three countries and especially in Norway and Sweden most ate full fat cheese. Light drinks/sugar free soft drinks were not used regularly by many Swedish people.

**Table 9. Percentages of participants who report to consume the food items less than once a month**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
Rye bread	7.0	6.1	-	27.0	66.0
Whole grain/whole meal bread	24.3	29.1	10.7	23.6	15.6
White bread	43.3	55.1	48.9	80.5	71.5
Hard bread	55.4	48.1	20.8	37.4	32.8
Vegetables	0.9	0.7	0.6	1.3	0.4
Fruit and berries	2.6	1.5	1.8	1.6	4.4
Fruit juice	30.3	30.8	26.4	16.0	22.9
Fish	12.0	7.0	4.8	2.3	3.7
Fried potatoes	29.3	33.7	20.9	22.3	34.7
Sausages	54.2	33.0	14.6	30.3	29.8
Chocolate/candy	8.6	13.3	7.8	5.2	8.5
Cakes	16.5	14.1	14.5	10.3	18.3
Full fat cheese	23.0	35.0	9.9	19.9	9.0
Soft drinks, light	50.1	49.8	72.2	55.9	46.4
Soft drinks, sugar sweetened	50.3	49.0	45.2	38.2	45.0
Energy drinks	92.6	89.2	87.6	82.3	86.3

### 5.4.1 Fat type

The question on fat regards the type of fat normally used by the participant (and not the frequency of intake as for the above foods). Oil-butter spread was the most commonly used type of spread in all countries (Table 10). In Norway and Denmark a quite high proportion does not use spread at all. Low fat margarine was used by more than 20 percent in Sweden, Iceland and Norway whereas very few used this kind of spread in Denmark. Becel Pro-Activ was mainly used by Finnish participants and by very few in other countries.



**Table 10. Proportion of adult participants using the different types of spread**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Butter	14.9 <sub>a</sub>	9.2 <sub>b</sub>	4.5 <sub>c</sub>	11.0 <sub>b</sub>	9.1 <sub>b</sub>
Oil-butter spreads	36.0 <sub>a</sub>	35.6 <sub>a</sub>	40.7 <sub>b</sub>	48.2 <sub>c</sub>	28.1 <sub>d</sub>
Vegetable margarine 60-80%	2.3 <sub>a</sub>	11.5 <sub>b</sub>	15.9 <sub>c</sub>	5.3 <sub>d</sub>	5.7 <sub>d</sub>
Low fat margarine	4.0 <sub>a</sub>	16.3 <sub>b</sub>	23.6 <sub>c</sub>	20.6 <sub>c</sub>	23.6 <sub>c</sub>
“BeceI Pro-Activ”	2.1 <sub>a</sub>	18.4 <sub>b</sub>	2.9 <sub>a</sub>	0.2 <sub>c</sub>	2.9 <sub>a</sub>
Margarine 70-80%	0.4 <sub>a</sub>	0.6 <sub>a</sub>	0.0	0.1 <sub>a</sub>	1.7 <sub>b</sub>
Fat (pig, duck, coconut)	0.3 <sub>a,b</sub>	0.2 <sub>a</sub>	0.7 <sub>a,b</sub>	0.9 <sub>b</sub>	0.1 <sub>a,b</sub>
Do not use spread on bread	39.9 <sub>a</sub>	8.3 <sub>b</sub>	11.7 <sub>c</sub>	13.6 <sub>c</sub>	28.8 <sub>d</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

Oil is the most commonly used grease for cooking in all countries especially in Iceland (Table 11). Butter is used more commonly in Finland and Sweden than in the other countries, and fluid margarine is used by more in Denmark and Sweden than in the other countries. Frying or baking margarine is used most in Norway and Denmark.

**Table 11. Proportion of adult participants using the different types of spread/grease for cooking**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Butter	3.4 <sub>a</sub>	19.5 <sub>b</sub>	23.1 <sub>b</sub>	3.9 <sub>a</sub>	9.5 <sub>c</sub>
Oil-butter spreads	1.8 <sub>a,d</sub>	8.2 <sub>b</sub>	1.0 <sub>o,c</sub>	0.6 <sub>c</sub>	2.8 <sub>d</sub>
Frying or baking margarine 70-80% fat	11.3 <sub>a</sub>	1.5 <sub>b</sub>	9.4 <sub>a</sub>	6.5 <sub>c</sub>	17.0 <sub>d</sub>
Vegetable margarine 60-80% fat	2.6 <sub>a,c,e</sub>	3.2 <sub>o,b</sub>	1.4 <sub>c</sub>	1.4 <sub>c,d</sub>	3.7 <sub>b,e</sub>
Fluid margarine, oil-margarine	23.2 <sub>a</sub>	6.7 <sub>b</sub>	24.1 <sub>o</sub>	0.1 <sub>c</sub>	7.7 <sub>b</sub>
Oil	54.6 <sub>a</sub>	54.5 <sub>o</sub>	31.1 <sub>b</sub>	80.6 <sub>c</sub>	53.1 <sub>a</sub>
Use a mixture of oil and butter.	1.4 <sub>a</sub>	2.2 <sub>o</sub>	7.5 <sub>b</sub>	2.1 <sub>a</sub>	4.4 <sub>c</sub>
Fat (pig, duck, coconut)	0.1 <sub>a</sub>	0.0	0.2 <sub>a</sub>	2.5 <sub>b</sub>	0.5 <sub>a</sub>
Do not use fat for cooking	0.7 <sub>a</sub>	0.9 <sub>a</sub>	0.4 <sub>a</sub>	0.5 <sub>a</sub>	0.3 <sub>a</sub>
Do not cook	0.0	0.3 <sub>a</sub>	0.3 <sub>a</sub>	0.3 <sub>a</sub>	.2 <sub>a</sub>
Kasvisterolimargariinia	0.0	1.3 <sub>a</sub>	0.0	0.0	0.0
Do not know	0.8 <sub>a</sub>	1.5 <sub>a</sub>	1.4 <sub>a</sub>	0.0	0.9 <sub>a</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction

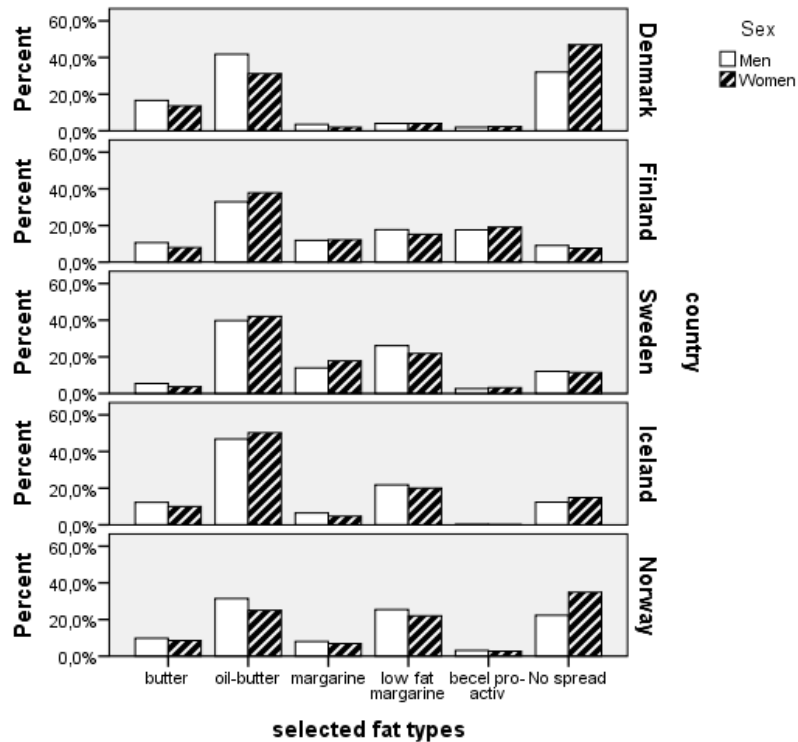
### 5.4.2 Intake of food in relation to gender, age and education

In this section some of the important food groups are investigated in relation to gender, age, education, family status and urbanization. Furthermore, the numbers which comply with the recommendations are investigated. After each food group a short summary and discussion of the intake of this food including results from the previous section, and the possible relation with the above mentioned variables, are presented.

### 5.4.3 Fat type

The distribution of use of selected kind of spread among sexes is shown in Figure 1. In this and the following analyses are the category “fat (pig, duck, coconut)” left out because less than 1% use this kind of fat in all countries. Vegetable margarine 60–80% and margarine 70–80% are grouped together.

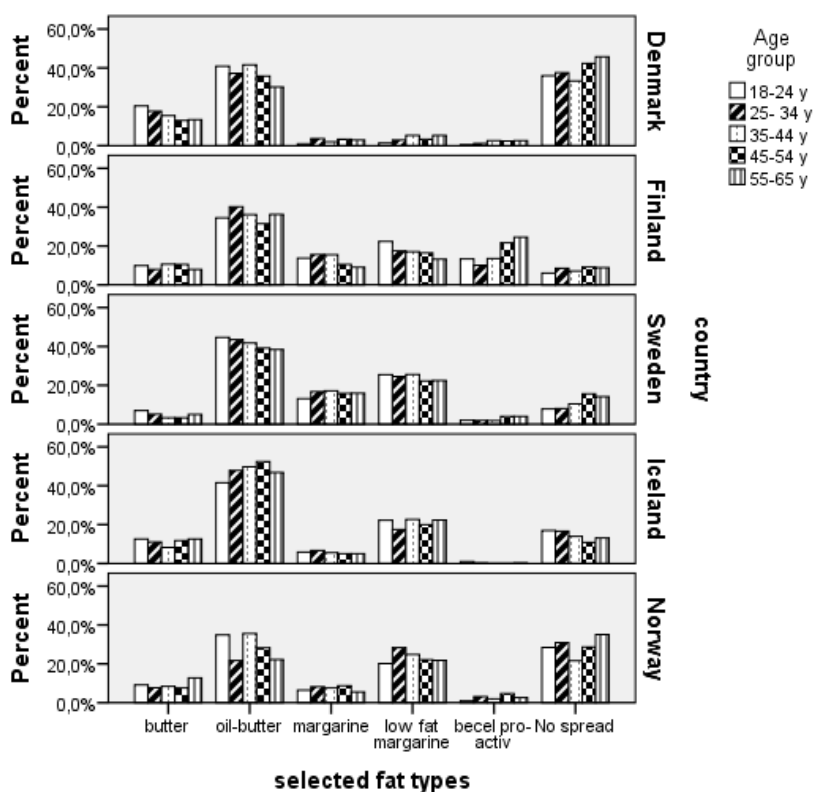
Figure 1. Proportion of men and women using various kind of spread on bread



When analyzing all countries together men more often than women used butter and low-fat margarine whereas women more often did not use spread.

In Denmark men more often used oil-butter spread and margarine than women, who much more often than men did not use spread. The same was seen in Norway except that no difference was seen between sexes for margarine. In Finland women more often than men used oil-butter but men more often used butter than women. Margarine was most often used by women compared with men in Sweden whereas it was opposite with low-fat margarine. No significant sex differences were found in Iceland.

**Figure 2. Proportion using various kind of spread on bread according to age group**

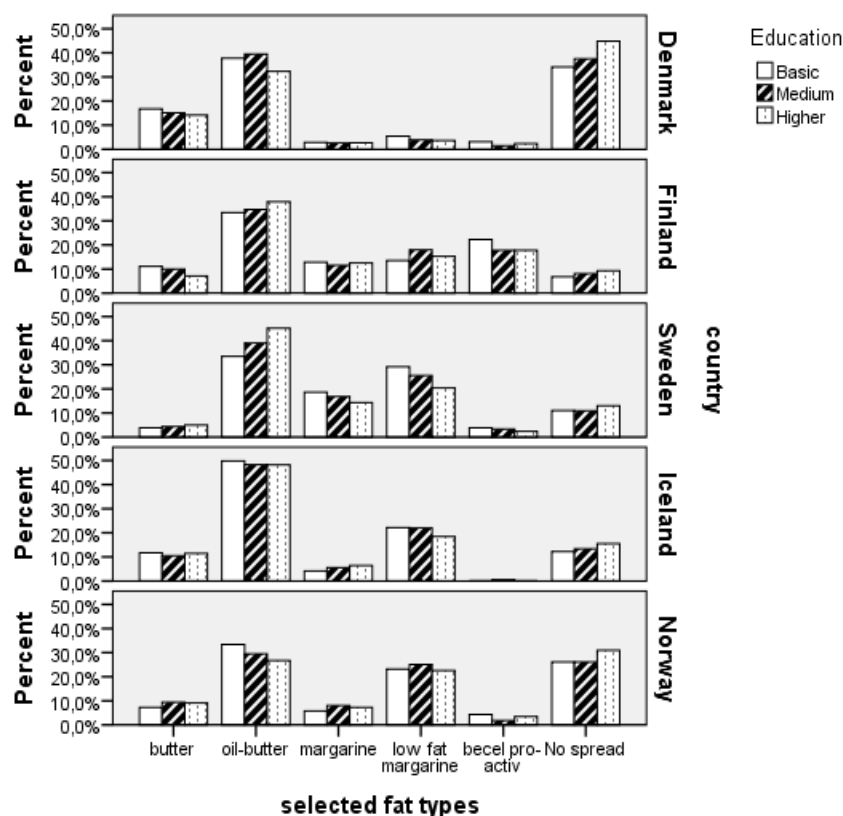


The overall picture showed that no use of spread and the use of Becel Pro-Activ increased with increasing age.

In Denmark the number who did not use spread increased in the oldest age group. The use of low-fat margarine decreased and the use of Becel

Pro-Activ increased with increased age in Finland. The number who did not use spread seemed to increase with increasing age in Sweden.

**Figure 3. Proportion using various kind of spread on bread in relation to educational level**



The use of low-fat margarine was lowest in the group with highest education, but this group had the highest percentage of non-users of spread when all countries were looked at together.

An increased percentage of non-users of spread were also found in Denmark with increased length of education. Likewise, a lower percentage of users of low-fat margarine in the group with highest education were found in Sweden where the same group more often used oil-butter spread. No significant differences in fat use with education were found in the other countries.

The use of spread was also analyzed according to family status and urbanization. Family status was divided into 3 groups: singles; adult(s) living with child(ren) and living with other adult(s). Overall adults living

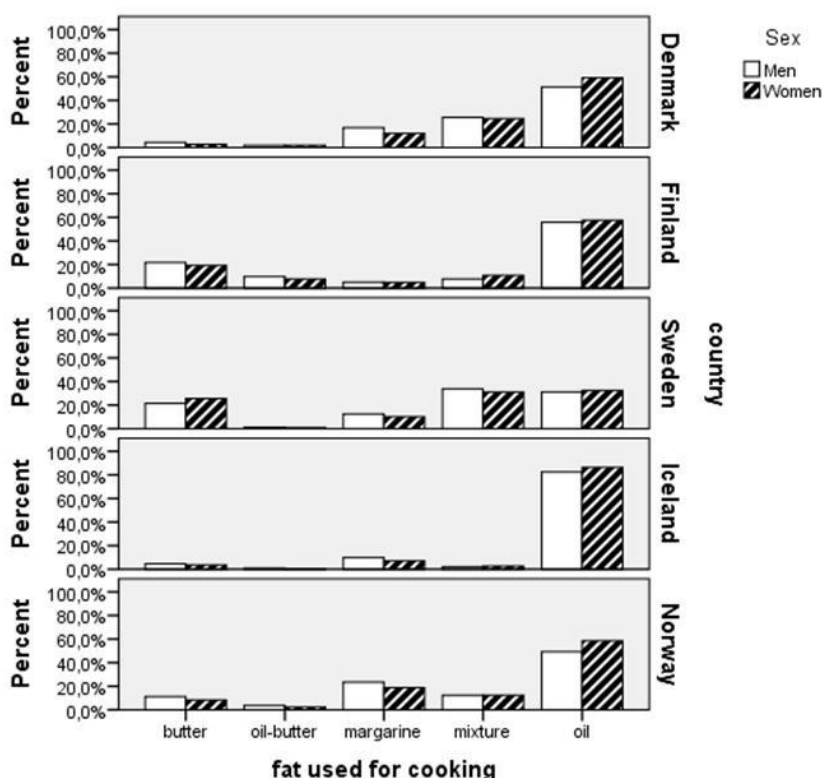
with children less often used no spread than singles or adults living with other adults (results shown in Figure 1, appendix C).

This trend was found in all 5 countries although not significant in all countries. Furthermore, oil-butter spread was more often used by adults with children than adults living with other adults in Denmark, but in Sweden oil-butter spread was more often used by adults living with other adults than by singles. In Sweden low-fat margarine was more often used by adults with children than adults living with other adults.

The use of spread in relation to urbanization showed a varied pattern which looked like random and no great differences between different places of living were seen (Figure 2, appendix C).

In Denmark the most remarkable was that butter was more often used by persons living in the capital than living other places. In Finland the use of low-fat margarine was lowest among persons living at the countryside compared with persons living in the capital and in towns with more than 20,000 inhabitants. In Sweden, Iceland and Norway no significant differences in relation to urbanization were found.

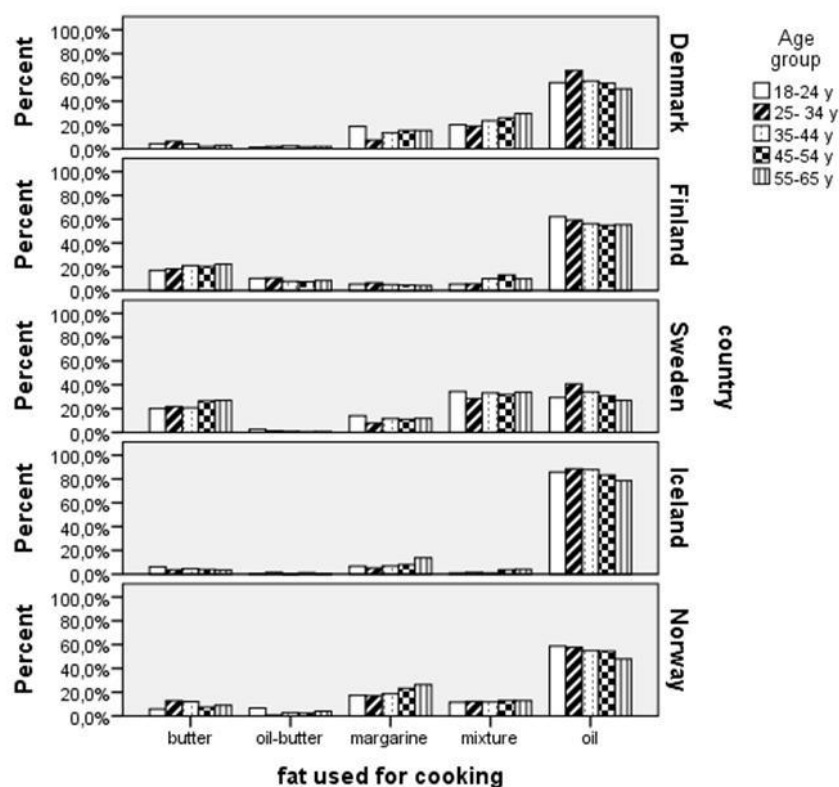
Figure 4. Proportion of men and women using different types of fat used for cooking



Overall men seem to prefer margarine and butter for cooking whereas women prefer oil when all countries were analyzed together.

This difference was significant in Denmark for margarine, butter and oil, in Iceland for margarine and oil, and in Norway for oil. In contrast, butter is used more often by women than by men in Sweden.

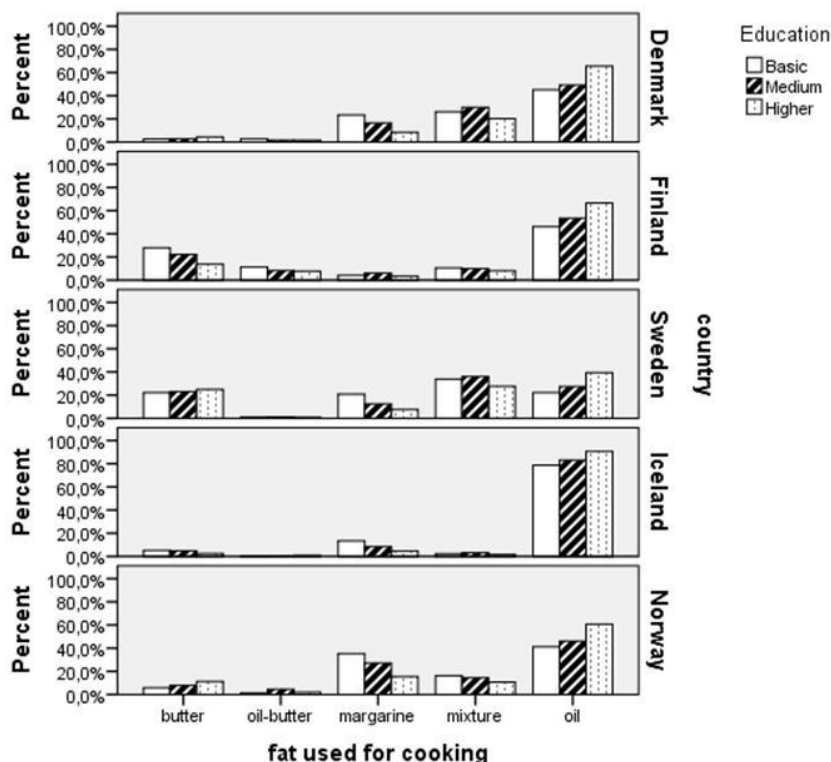
Figure 5. Proportion using different types of fat for cooking in relation to age group



When all countries were analyzed together margarine showed to be used more often by the youngest age group and the two oldest age groups than the age group 25–35 y. Oil was most often used by 25–34 y olds and less often used by the age group 55–65 y.

In Denmark the same was seen except that butter also followed the same pattern as margarine. In Finland the only significant difference was that a mixture of fat types was more often used by 45–54 y olds than by the youngest age groups. In Sweden oil was more often used by the age group 25–34 y than the two oldest age groups. In Iceland the use of oil decreased with age and the use of margarine was highest in the oldest age group. The only difference in Norway between age groups was that oil.

Figure 6. Proportion using different types of fat for cooking in relation to education



Overall the use of butter was lower in the group with highest education compared with the group with medium education, the use of margarine decreased with length of education and the oil was more often used by the group with longest education compared with the other educational groups.

In Denmark, Sweden, Norway and Iceland the use of margarine decreased appreciable with increased length of education and the use of oil increased. In Iceland the use of butter also decreased with increased education as was also found in Finland. The same increase in use of oil with increasing length of education was also found in Finland.

Butter and oil-butter were less often used and oil more often used in adults living with children when all countries were analyzed together (Figure 3, appendix C).

In Sweden singles more often used oil than others but adults living with children less often used butter. Adults living with children more often used oil than others in Iceland.

Overall persons living at the countryside more often used butter, margarine and less often oil than persons living other places (Figure 4, appendix C). The same trend was seen in Denmark and Norway except

for butter which was most often used in the capital or bigger cities. In Finland, Sweden and Iceland the trend followed the overall trend for butter and oil and in Sweden and Iceland for margarine and oil.

#### **Summary and discussion -fat type, adults**

Although oil-butter spread is the most commonly used type of spread in all countries with a use of 28–48% of the participants some marked differences between countries were found in the type of spread used; low-fat margarine was commonly used in Sweden, Iceland and Norway (by approximately 1 out of 5), and Finland was the only country in which Becel pro-activ was commonly used. In Norway and Denmark a quite high proportion, 29 and 40%, respectively, did not use spread at all. These differences probably reflect different recommendations in the 5 countries. The most marked sex difference was that more women than men did not use spread and the number which did not use spread increased with age and increased education length.

Oil was the most common used fat for cooking, used by 31–81% in the various countries, and the use was higher in women than in men and increased with increasing length of education while the use of margarine decreased with increased length of education. Oil was less often used and margarine and butter more often used in persons living at the countryside.

The person with the more healthy fat habits seemed to be a woman with high education who did not live at the countryside. However, the differences were not pronounced in any countries.

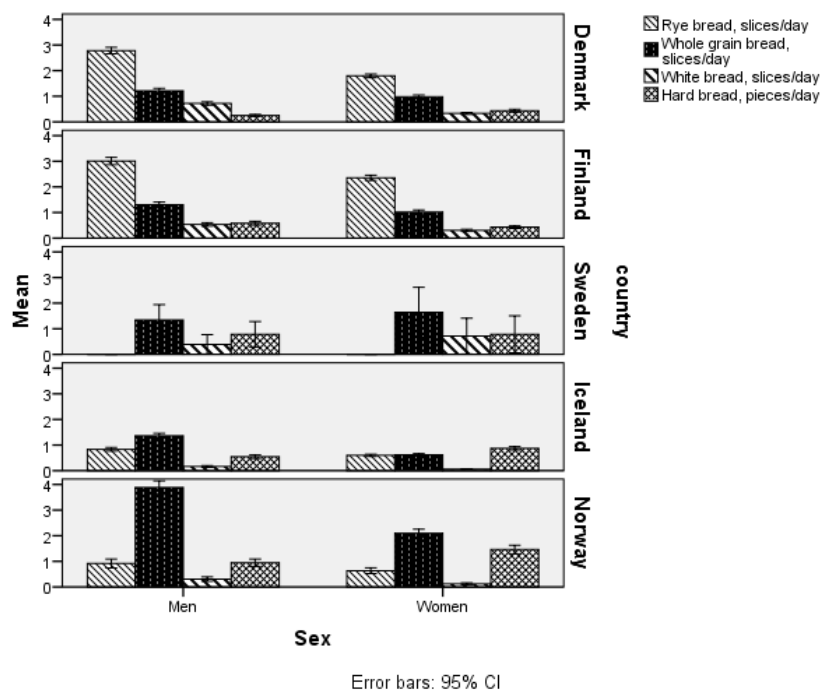
The vision for 2021 in the Nordic Plan of Action regarding fat is that the average dietary intake of the population meets the Nordic Nutrition Recommendation on fat and saturated fat plus trans fatty acids, and at least 70% meets the NNR on fat energy percent. With the high proportion who used oil for cooking and the high proportion who used either low-fat spread or no spread at all we seem to be on the right way and it is possible to follow the trend with the next Nordic monitoring.

#### **5.4.4 Intake of bread**

In the Figures in this and the following sections mean values are shown instead of median values. The median value is often similar in the different countries although the frequency of intake is significant different. To make it more informative mean values are therefore shown.



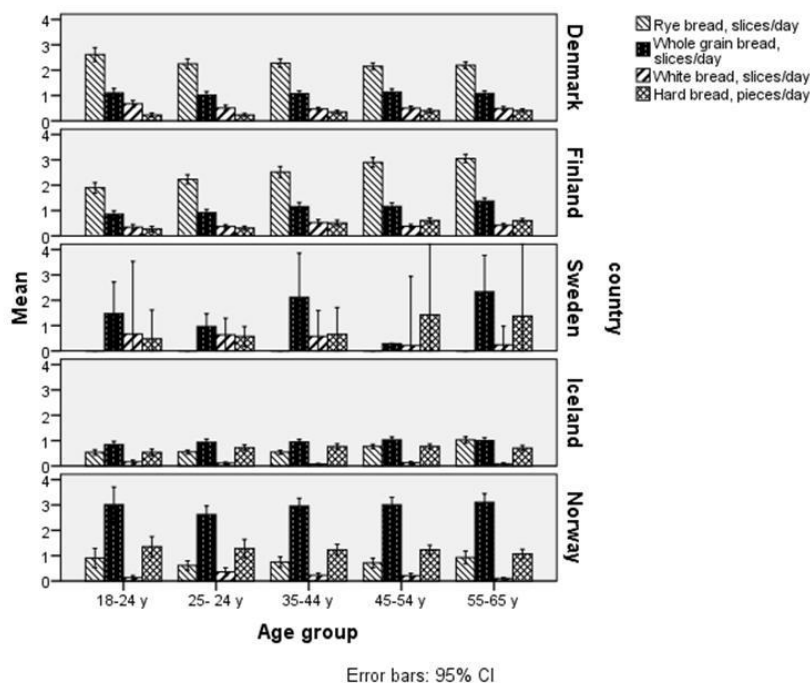
**Figure 7. Bread intake (mean number of slices per day) in the 5 countries in relation to sex**



The intake of all bread types, except hard bread, was significantly higher in men than in women when looking at all countries together.

The same was found in all countries when a single country was analyzed separately.

**Figure 8. Bread intake (number of slices per day) in the 5 countries in relation to age groups**



The results show a very heterogeneous picture. The bread intake differs much more between countries than between age groups. For rye bread and hard bread the intake was significantly higher in the oldest age group compared with all the other groups when looking at all participants. Likewise, for whole grain bread the intake among the oldest age group was significantly higher than the intake in the two youngest age groups. In contrast, the intake of white bread was significantly higher in the youngest age group compared with all other age groups.

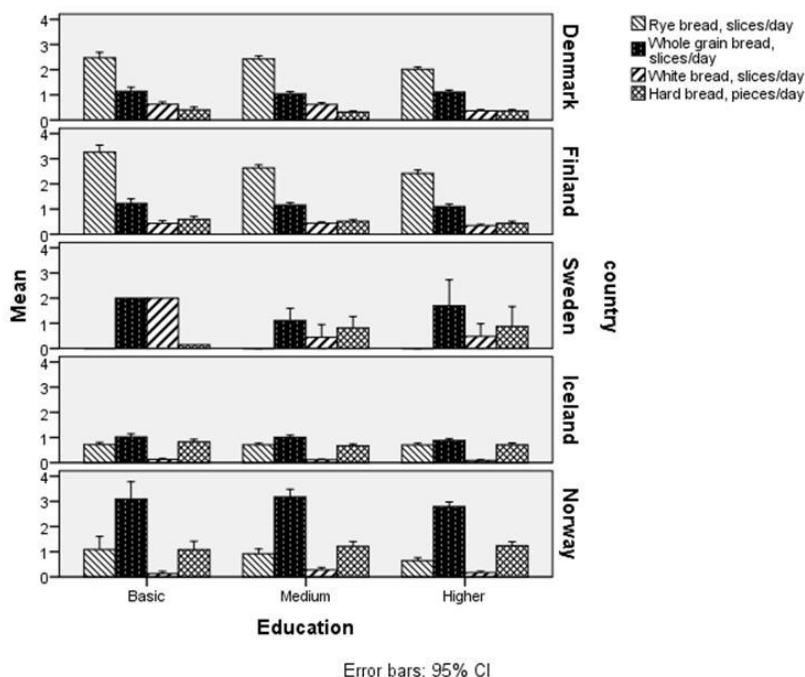
The intake of rye bread was higher in the oldest age group compared with the other age groups in Finland and Iceland whereas the opposite was seen in Denmark.

In Denmark, Iceland and Norway no difference with age were seen in the intake of whole grain/whole meal bread. In Sweden and Finland the intake was highest in oldest compared with youngest age group(s), and there was a general tendency that intake increases with age.

The intake of white bread was significantly higher in the youngest age group compared with all other age groups in Denmark, Sweden and Norway. In Finland and Iceland no difference in intake in relation to age were found.

In Denmark, Sweden and Finland the intake of hard bread increased with increasing age, but no differences related to age were seen in Iceland and Norway.

**Figure 9. Bread intake (mean number of slices per day) in relation to educational level**



The intake of rye bread was significantly higher in persons with basic and medium education than in persons with higher education when looking at all countries together. A higher intake of whole grain bread was found in persons with higher education compared with basic and short education. The intake of white bread was lowest in the group with highest education. The intake of hard bread was in general not related to education.

The intake of rye bread was significantly higher in persons with basic and medium education than in persons with higher education in Denmark and Norway. In Finland the intake was higher in persons with basic education than in the two other groups whereas in Iceland the intake did not differ with educational level.

No significant differences with education were found in single countries for whole grain bread.

The intake of white bread was lowest in the group with highest education in Denmark and Sweden.

In Iceland the intake of hard bread was significantly higher in the group with basic education compared with the other educational groups.

There were no differences on the intake of bread according to family status although there was a tendency in some countries that the intake of rye bread was lower in adults living with children than among singles and adults living with other adults (Figure 5, appendix C).

The intake of bread was lowest among persons living in the capital when all countries were analyzed together and the same tendency was seen for rye bread in Denmark and Finland, and for whole-grain bread in Sweden (Figure 6, appendix C). In Iceland the intake of rye bread and whole-grain bread were highest at the countryside.

### **Summary and discussion – intake of bread, adults**

The amount and type of bread eaten differed between countries; in Iceland the intake of bread of all types was low, the median total bread intake was less than 1 slice a day (Table 8). Rye bread was mainly eaten by Danish and Finnish people. The intake of whole grain bread seemed to be high in Norway, more than 2 slices per day. The question on bread was different in Sweden and Iceland than in the other countries. In Sweden rye bread was included in the question of whole grain bread and in Iceland the questions were categorized after fiber content. White bread was eaten by surprisingly few in this survey; from 43% in Denmark to 80% in Iceland indicate they did not or very seldom eat white bread.

Men ate more bread than women. The highest intake of whole-grain bread and the lowest intake of white bread seemed to be in the highest age group and in persons with higher education although the intake of rye bread was highest in participants with basic education. Furthermore, persons living in the capitals had a less healthy intake of bread e.g. a higher intake of white bread.

The questions in the questionnaire regard number of slices a day. There could be a difference in the size of slices between countries, thus if bread slices in Iceland and Sweden are larger than in the other countries the amount of bread eaten is not necessarily less (Fagt et al 2012).

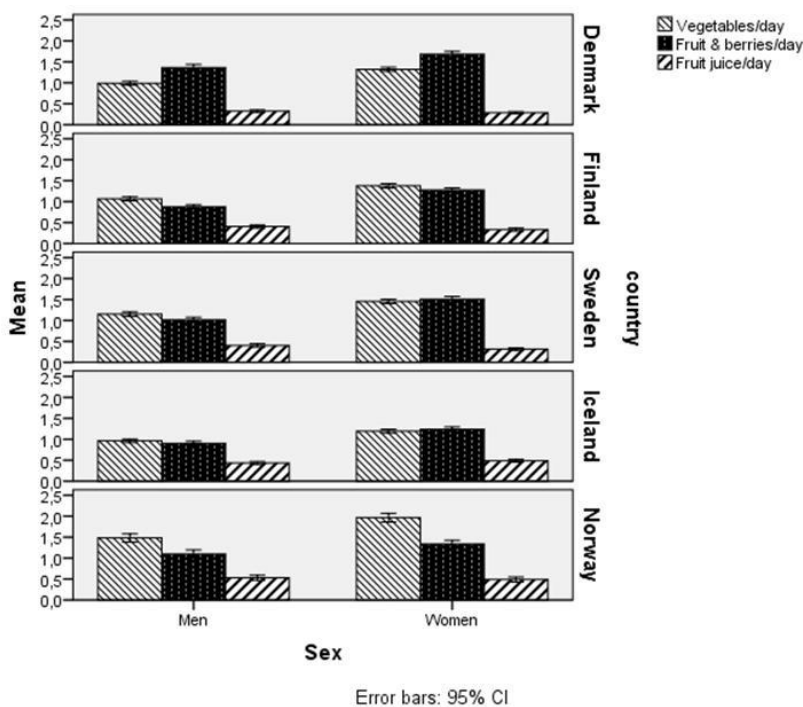
According to the Nordic Plan of Action a vision for 2021 is that at least 70% of the population has a daily intake of whole-grain bread/cereals corresponding to at least half of their daily intake of bread/cereals. Other cereals than bread are not included in this study. When comparing the intake of rye bread plus whole-grain bread this make up more than half of the bread intake in 96% of the participants. However, the reported intake of white bread is very low in this study and, furthermore, the question of whole-grain bread included also whole meal bread which is a broader term which also include bread with a

lower fiber content. So bread reported as whole-grain does not necessarily contains a large amount of whole-grain. Providing comparable data on the bread intake in the Nordic countries has thus been difficult for many reasons.

In general, it is doubtful whether the goal of at least 70% of the population has a daily intake of whole-grain bread/cereals corresponding to at least half of their daily intake of bread/cereals has already been reached but there seems to be a good knowledge of the importance of eating whole-grain at the expense of white bread. The next monitoring will show whether the development goes in the right direction.

### 5.4.5 Intake of fruit and vegetables

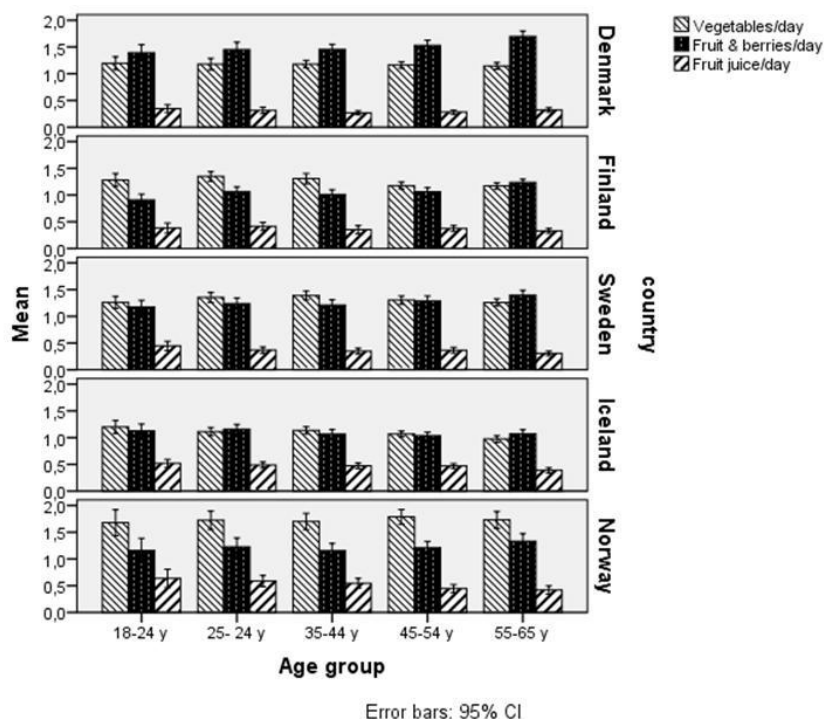
Figure 10. Mean daily frequency of vegetables, fruit and fruit juice in relation to sex



The intake of fruits and vegetables are significantly higher in women than in men whereas the intake of fruit juice seems to be a little higher in men than in women.

In all the individual Nordic countries the same was seen except for fruit juice in Iceland.

**Figure 11. Mean daily frequency of vegetables, fruit and fruit juice according to age**



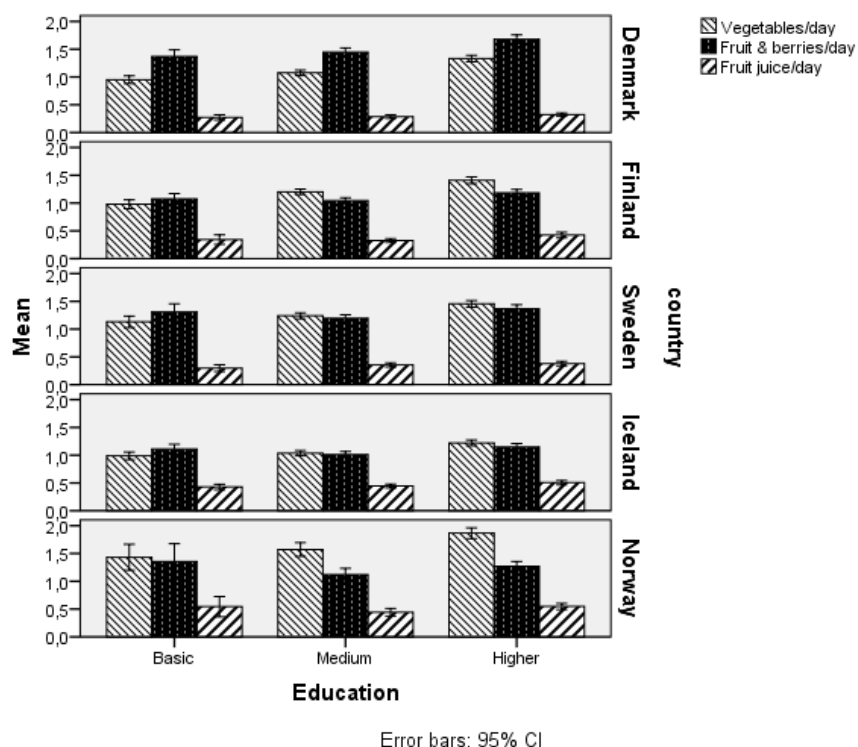
The age group 55–65 y has a lower intake of vegetables than the other age groups but a higher intake of fruit and berries when looking at all Nordic countries. The intake of fruit juice was highest in the youngest age groups and decreased with age.

In Denmark and Sweden no difference in the intake of vegetables was found with age but the intake of fruit and berries increased slightly with age. In Finland the age group 25–44 y had a slightly higher intake than the age groups more than 45 y whereas the intake of fruit and berries was highest in the oldest age group.

In Iceland the intake of vegetables decreased with age but the intake of fruit did not differ between age groups. In Norway either the intake of vegetables or the intake of fruit and berries differed among age groups.

The intake of fruit juice was highest in the youngest age groups and decreased with age in Sweden and Iceland. In the other 3 countries no differences between age groups were seen.

**Figure 12. Mean daily frequency of fruit, vegetables and fruit juice in relation to educational level**



The frequency of intake of vegetables increased with increased education when all countries were analyzed together. The intake of fruit and fruit juice was highest in the group with higher education.

The increase in the frequency of intake of vegetables with increased education was found in all 5 countries separately. The intake of fruit was highest in the group with higher education in Denmark, Finland, Iceland and Norway. In Sweden the fruit intake was not significantly different between basic and higher education. The intake of fruit juice followed roughly the same pattern as the fruit intake.

Singles ate less often vegetables than persons living together with children or other adults in Finland, Sweden and Iceland and there was a tendency for the same in Denmark and Norway (Figure 7, appendix C). No differences with family status were seen for intake of fruit and berries, and for fruit juice, although singles seem to drink less fruit juice than others in Iceland.

Vegetable and fruit intake did in general not differ with place of living (urbanization), only in Finland and Sweden the intake was a little higher in the capital and bigger cities compared with smaller towns (Figure 8, appendix C).

### Intake of fruit and vegetables according to recommendations

The Nordic countries have recommendations for the intake of fruit and vegetables. In Denmark the recommendation is 6 a day or 600 g a day. Norway, Sweden and Iceland recommend at least 500 g a day. Potatoes do not count in any of the countries and fruit juice can only count as one portion (or as 100 g).

The numbers in each country who eat 5 or more than 5 a day are shown in Table 12. In the Nordic countries 12.5% in average eat vegetables and fruits at least 5 times a day according to this study. Norway seems to have the highest percentage of persons with an intake more than 5 a day. However, the low participation rate in Norway questions this result.

**Table 12. Percent of all participants in each country with intake of fruit and vegetables equal to or above 5 times per day. Fruit juice is included with a maximum of 1 per day**

	Country				
	Danmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Fruit, berries and vegetables $\geq$ 5 a day	15.0 <sub>a</sub>	8.5 <sub>b</sub>	13.2 <sub>a</sub>	8.3 <sub>b</sub>	21.9 <sub>c</sub>

Values not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

### Summary and discussion – fruit and vegetable intake, adults

The intake of fruit and vegetables were at the same level in all countries; fruit and vegetables were eaten more than 2.5 times and less than 3.5 times in all 5 countries. In general well educated persons eat more vegetables and fruit than less educated, and women eat more than men. There was no clear connection between age and intake of fruit and vegetables. Singles seemed to eat less vegetables than persons not living alone.

The Nordic Plan of Action state that a vision for 2021 is that at least 70% of the population more than 10 years of age has a daily intake of vegetables and fruits of at least 500 g. If “one time a day” is equal to 100 g we have a long way to go, to reach this goal.

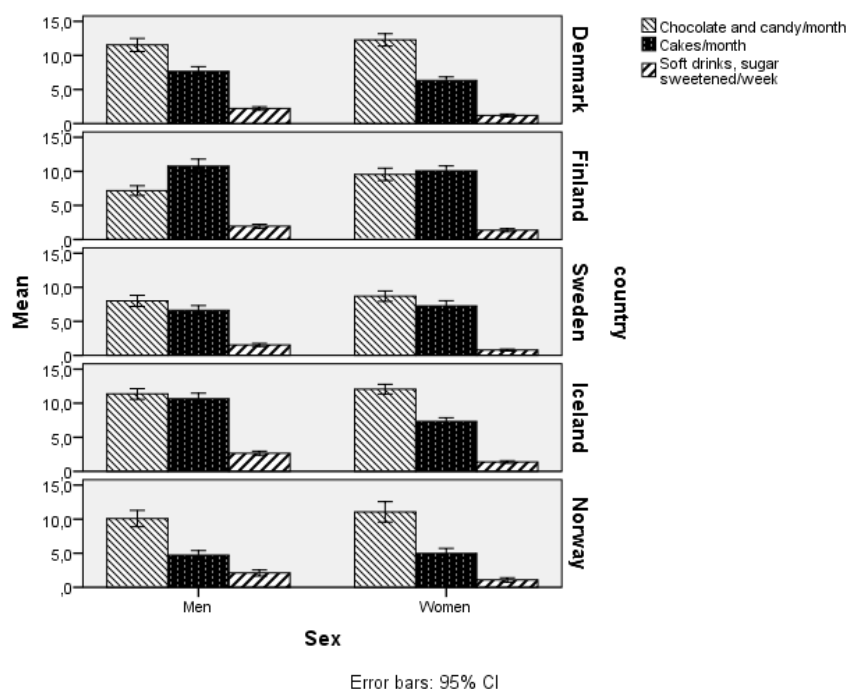
There are some limitations while comparing the results with the recommendation. In this study the question about vegetables sounded: “How often do you eat vegetables, pulses and/or root fruits”. The



amount of vegetables was not asked about. The same regards the question on fruit intake. According to the validation study one time a day was roughly equal to 70–130 g but a typical portion size could differ from country to country (Fagt et al 2012).

#### 5.4.6 Intake of sugar rich food

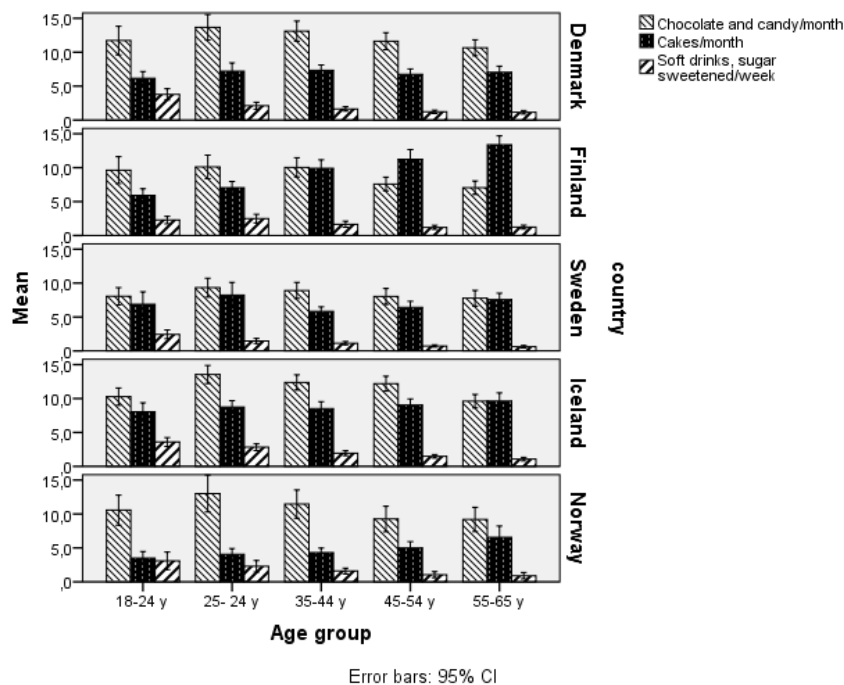
Figure 13. Mean monthly/weekly frequency of sugar rich food in relation to sex



Women ate more often chocolate and candy, and less often cakes than men. The intake of soft drinks and other sugar-sweetened drinks were markedly higher in men than in women.

The same sex differences for chocolate and candy, and for cakes as for all countries together was seen in Denmark and a tendency was seen in Finland and Iceland. In Sweden and Norway there were no statistical difference in intake between men and women. The intake of soft drinks and other sugar-sweetened drinks were markedly higher in men than in women in all countries.

**Figure 14. Mean monthly/weekly frequency of sugar rich food in relation to age**



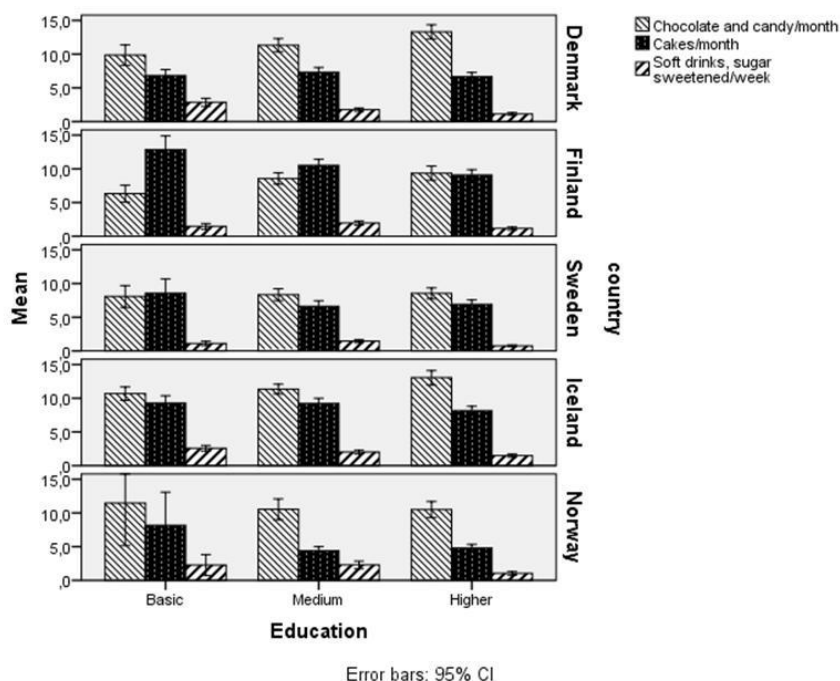
The intake of chocolate was significantly higher in the age groups 25–34 y and 35–44 y than in the other age groups when looking at all countries together. The intake of cakes increased with increasing age and the consumption of sugar sweetened soft drinks decreases clearly with age.

For chocolate the same tendency was found in Finland and Iceland as for all countries together whereas no significant differences with age were found in the other countries.

The intake of cakes increased with increasing age in Finland and Norway. No differences with age were found in the other countries.

Consumption of sugar sweetened soft drinks decreases clearly with age in all countries.

**Figure 15. Mean monthly/weekly frequency of sugar rich food in relation to educational level**



The intake of chocolate was higher in persons with higher education in all countries together. Opposite, the intake of cakes decreased with higher education. Intake of soft drinks was highest in the group with basic education and decreases with higher education.

The intake of chocolate was higher in persons with higher education in Denmark, Finland and Iceland. The same trend was seen in Sweden but in Norway a non-significant higher intake in the group with basic education was seen compared with the other two groups.

Intake of cakes decreased with higher education in Finland. In the other countries a similar but non-significant trend was seen except for Denmark where no differences were observed.

Intake of soft drinks was highest in the group with basic education and decreases with higher education in Denmark and Iceland. In Sweden, Finland and Norway the intake was significantly lower in the group with highest education compared with the group with medium education.

When analyzing all countries together, the intake of chocolate was higher in adults living with children than in singles and the intake of sugar-containing soft drinks was higher in singles than in adults living with other adults (Figure 9, appendix C). However, this was not significant in any single countries except for soft drink intake in Iceland.

The intake of chocolate and candy was highest in the capital when all 5 countries were analyzed together (Figure 10, appendix C). The intake of cakes was highest at the country side.

The intake of chocolate and candy was highest in the capital in Finland. The intake of cakes was highest at the country side in all 5 countries.

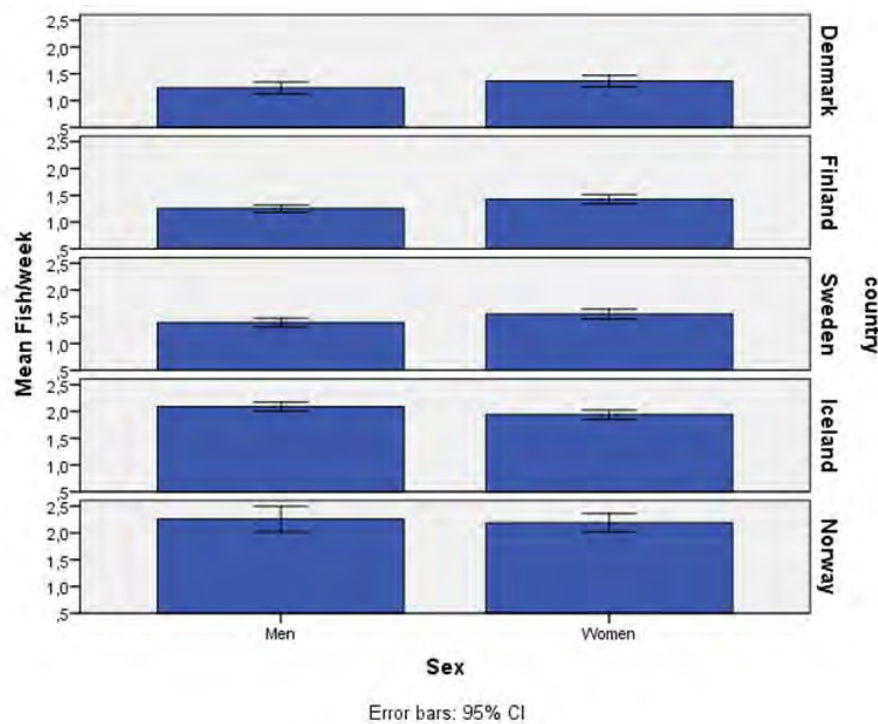
### **Summary and discussion – intake of sugar rich food, adults**

Cakes, sugar sweetened soft drinks and, in particular, chocolate and candy, were eaten regularly in all countries, only 3–4% of all never consume sugar-rich food or consume sugar-rich food less than once a month, and the median intake was 4 times a week. Sugar sweetened soft drinks were only consumed by 50% of the population in the Nordic countries. Iceland had the highest total intake of sugar-rich food and Sweden the lowest.

The various kinds of sugar-rich food are eaten by different groups. Chocolate and candy seems to be eaten more regularly by women with a higher education at the age 25–44 years than by others. On the other hand cakes seem to be eaten more often by elderly, less educated men and by persons living at the country side, whereas sugar containing soft drinks are most often consumed by young men without a higher education.

### 5.4.7 The intake of fish

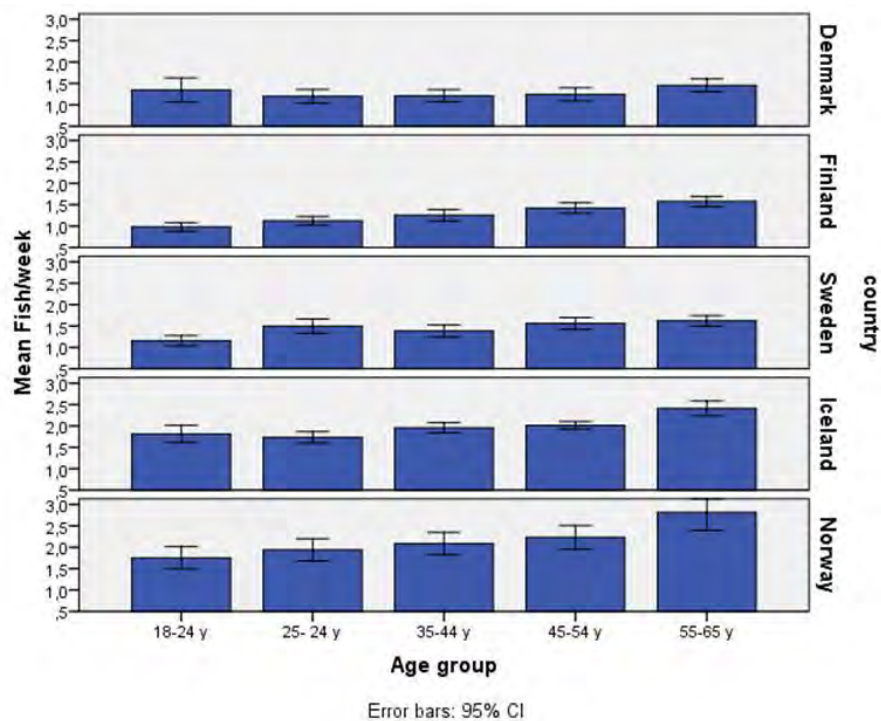
Figure 16. Mean intake of fish (frequency per week) in relation to sex



Overall no sex differences were seen in the frequency of fish consumption.

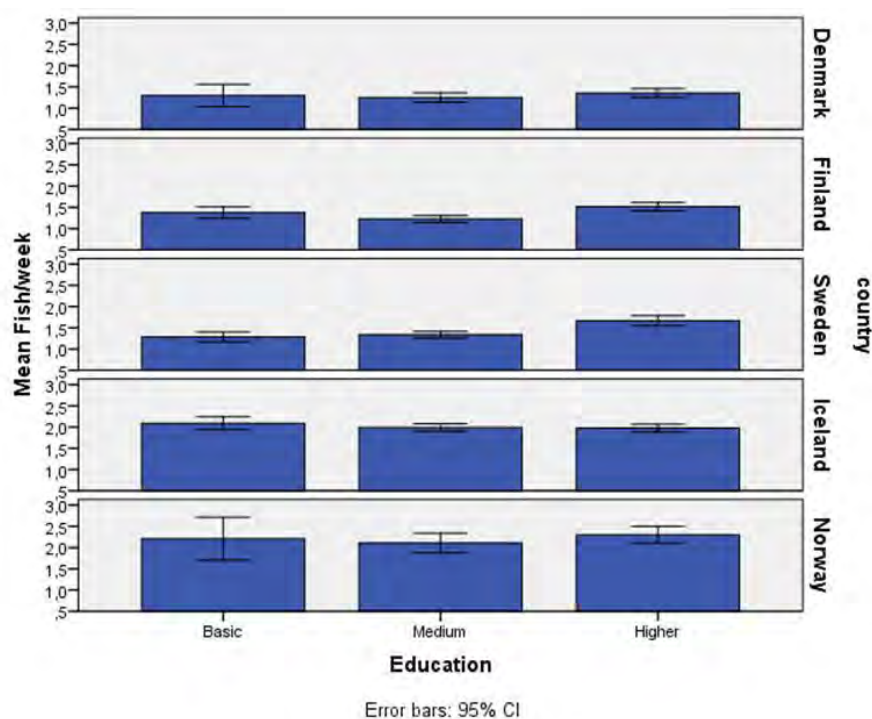
In Finland and Sweden fish was eaten more often by women than by men and the same tendency was seen in Denmark. In contrast men eat fish more often than women in Iceland. In Norway no sex difference was found.

Figure 17. Mean intake of fish (frequency per week) in relation to age



The fish intake increased with increasing age overall and in Finland, Sweden, Iceland and Norway. In Denmark no age differences in fish intake was seen.

**Figure 18. Mean intake of fish ( frequency per week)of fish in relation to educational level**



Overall no differences in fish intake with education were found.

In Finland the intake was significantly higher in persons with higher education than in persons with medium education and in Sweden the intake was higher in the group with highest education than in the other groups. No differences with educational level were found in the other countries.

Only few differences in fish intake with family status were seen; in Finland adults living with other adults had a higher intake than singles whereas in Sweden singles had a higher intake than adults living with children (Figure 1, appendix C).

Fish intake was higher in persons living in the capital than in persons living other places in Denmark, Finland and Sweden, although this difference was not statistical significant in Sweden (Figure 12, appendix C). In contrast, the intake of fish was higher in persons living in small towns than in persons living in the capital in Iceland.

### Intake of fish according to recommendations

Among all participants 43% had fish twice or more a week as a main meal but the number differed appreciable from country to country. The following table shows the percent of participants in each country who had fish twice or more a week.

**Table 13. Percent of participants in each country who had fish twice or more a week as a main meal**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Have fish twice or more a week	26 <sub>a</sub>	34 <sub>b</sub>	38 <sub>b</sub>	66 <sub>c</sub>	61 <sub>c</sub>

Values not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

Iceland and Norway had double as many participants with a fish intake twice or more a week compared with Denmark. Finland and Sweden had more participants than Denmark with an intake of fish at least twice a week but still fewer than Norway and Iceland. However, the questionnaire only included a question regarding fish as a main meal, in some countries (e.g. Denmark and Norway) it is common to eat fish on bread. The picture could have been changed slightly if fish on bread was included.

### Summary and discussion – intake of fish, adults

Quite large differences in intake of fish between the countries were seen. In Iceland and Norway fish is eaten twice a week, that is more than twice the intake in Denmark. Finland and Sweden had an intake in between. Nearly all participants in Iceland, Norway and Sweden regularly ate fish in contrast to Denmark where 12% never, or less than once a month, had fish. However, the questionnaire did not include fish on bread. It was not possible to identify a typical “fish eater” although the intake seemed to increase with age. Surprisingly, educational level did not seem to influence fish intake.

The Nordic Plan of Action has as a vision for 2021 that at least 70% consumes fish or fish products, corresponding to a main dish twice a week. According to the present survey 43% fulfill the recommendation but it varies from 26% (Denmark) to 66% (Iceland) in the various countries.



### 5.4.8 Overall dietary quality (dietary index)

On basis of the dietary indicators an overall index of healthy eating was calculated. The dietary index developed in Sweden was used (Becker 2009). The index does not fit perfectly with dietary recommendations in all Nordic countries, e.g. Finland recommends fat types which are not included, but the index gives a reasonable measure of overall dietary quality.

In Table 14 it is shown how to calculate the index (0–2 points according to intake frequency of different food). The index has values from 0–12 points and scores from 1–4 indicates a poor diet, scores from 5–8 indicates a medium nutritional quality of the diet, whereas scores 9–12 indicates a “healthy diet”, although only 12 indicate an optimal diet. The dietary index was calculated if at least 6 of the 7 variables were non-missing.

**Table 14. Categorisation of answers from questionnaire (Becker. 2009)**

	Unit	0 p	1 p	2 p
Fruit and vegetables	Times per day	< 3	3–4	≥ 5
Bread (wholemeal, rye, hard)	Slices per day	< 1	1–2	≥ 3
Fish and seafood	Times per week	< 1	1–2	≥ 2
Candy, cakes, soft drinks, pommes frites	Times per week	≥ 7	3–6	< 3
Fat on bread	Type	≥ 60% fat	≤ 40% or no spread	-
Cheese	Times per week	≥ 4	1–3	≤ 1
Sausages	Times per week	> 1	≤ 1	-

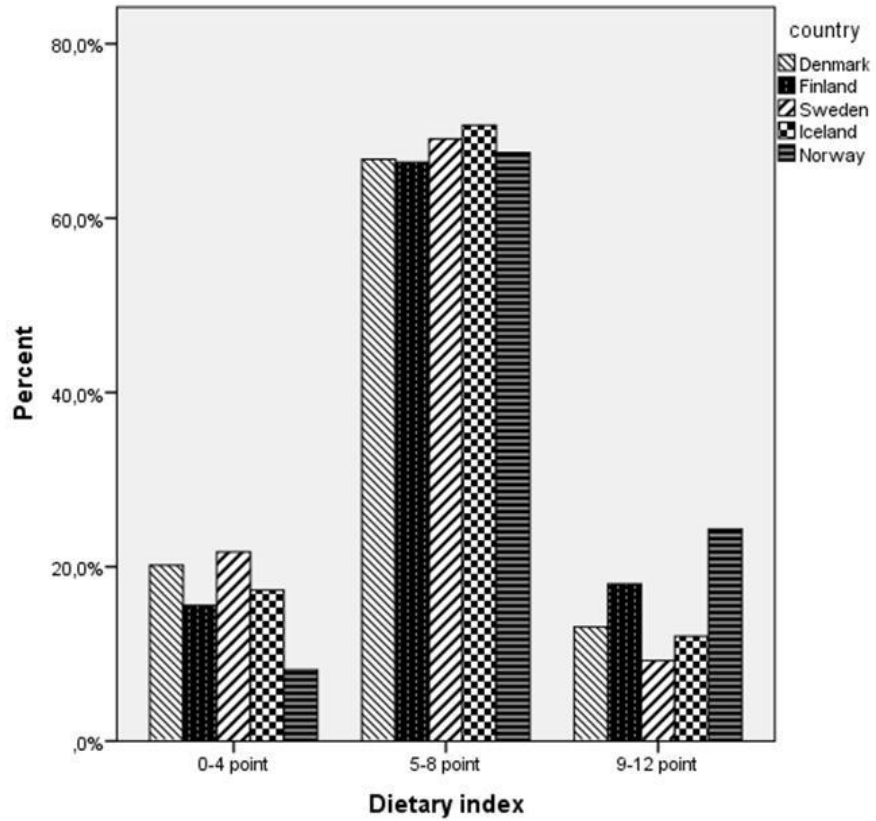
The mean dietary index differed significantly between the five countries (Table 15). Norway had the highest mean index and Sweden the lowest.

**Table 15. Dietary index in the 5 countries**

	Mean±SD	Number
Denmark	6.3 <sub>a</sub> ±2.0	2187
Finland	6.6 <sub>b</sub> ±2.0	2003
Sweden	6.0 <sub>c</sub> ±1.9	1886
Iceland	6.2 <sub>d</sub> ±1.9	2011
Norway	7.1 <sub>e</sub> ±1.9	1065

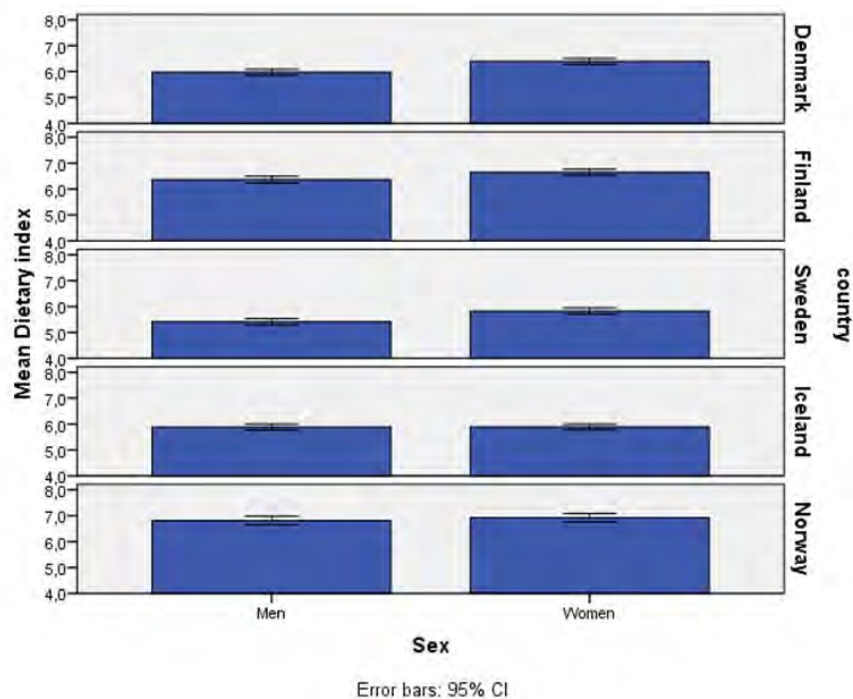
P<0.001 between all countries (ANOVA). Values not sharing the same subscript are significantly different at p<0.05 in the two-sided test of equality for mean. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction. The mean is presented as the dietary index is normally distributed.

**Figure 19. Dietary index categories in the 5 countries**



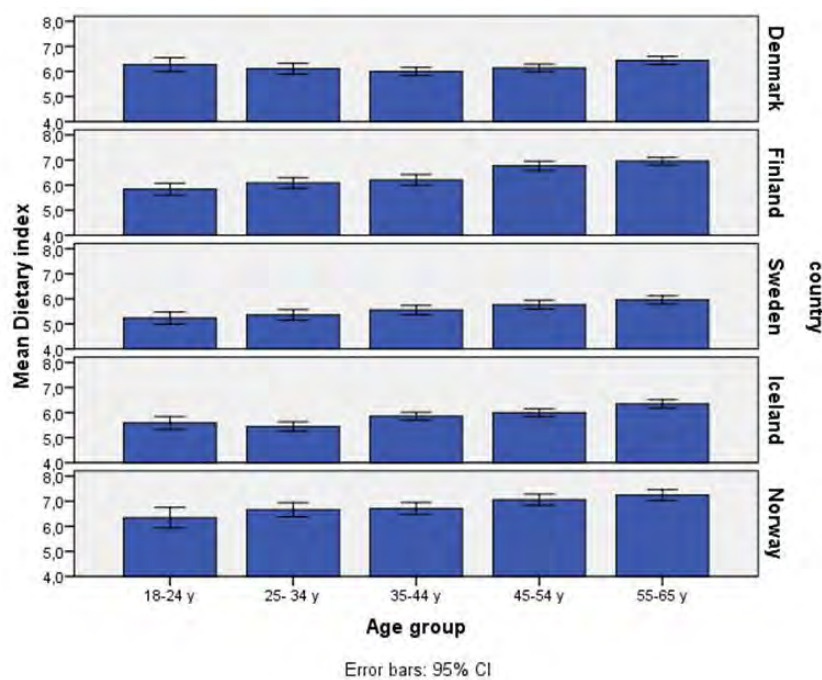
Approximately 70 percent of the population in all countries had a medium nutritional quality of their diet (5–8 points) according to the dietary index and 14% was categorized with a “healthy diet” (9–12 points) but only 0.3% had an optimal diet (12 points). However, the number with a poor diet and the number with a healthy diet differed between countries. More participants have a healthy diet in Norway and Finland than in the other countries and fewer in Sweden had a healthy diet.

**Figure 20. Dietary index in men and women**



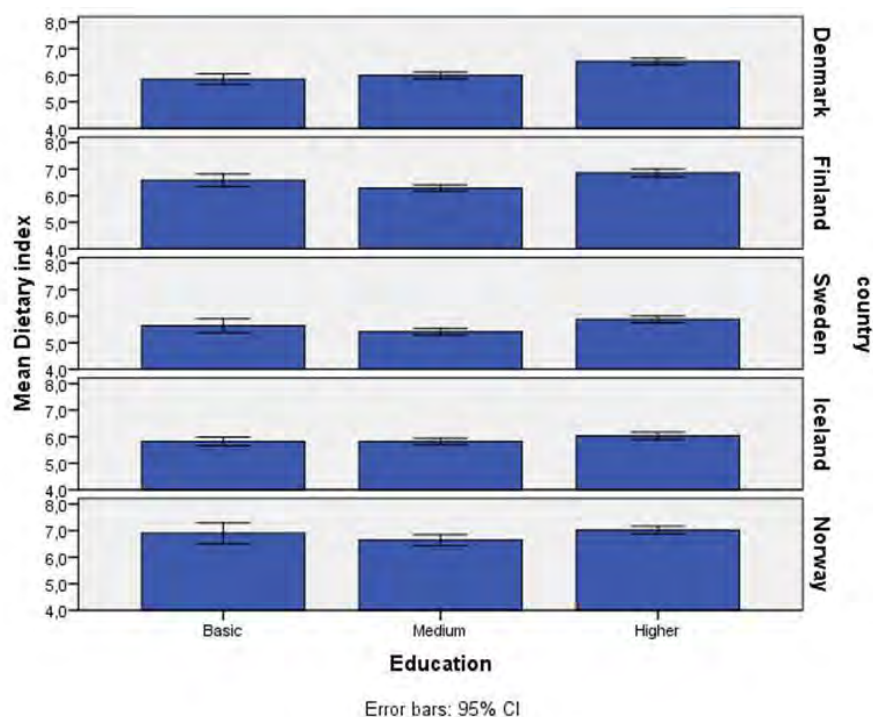
In general women had a healthier diet than men although there was no difference in Iceland.

**Figure 21. Dietary index in relation to age group**



In general the dietary index seemed to increase with increasing age, but another pattern was seen in Denmark where no difference was seen between the youngest and the oldest age groups.

**Figure 22. Mean dietary index in relation to educational level**



The dietary index was highest in the group with the highest education compared with the groups with basic and medium education when all countries were analyzed together.

The same was seen in Denmark whereas in Finland, Sweden and Norway the dietary index was highest in the group with higher education compared to participants with medium education. No relation with education was found in Iceland.

When all countries were analyzed together, adults living with children had the lowest dietary index (Figure 13, appendix C).

Dietary index was not related to family status in Denmark, Sweden, Iceland and Norway. In Finland persons living with other adults had a higher score than adults living with children.

No relation with urbanization was found except in Finland where the score was higher in persons living in the capital compared with others (Figure 14, appendix C).

### **Summary and discussion – overall dietary quality, adults**

The overall quality of the diet differed between countries; Iceland and in particular Sweden, had the lowest dietary index, Norway the highest with Denmark and Finland in between. Women and participants with higher education had the best diet quality according to the present study. Furthermore, the oldest age groups tend to have a better overall diet than the younger age groups. The age of the participants could probably influence the relation with education. To take this into account the relation with education was adjusted by age. This adjustment did not change the overall picture; participants with higher education have a higher dietary index score than participants with basic and medium education. Likewise, adjustment for education did not change the relation with age.

The percent with a diet which could be classified as “healthy”, that means a dietary index score of 9 or more, varied from 9% in Sweden up to 18% in Finland and 24% in Norway. The high number of participants in Norway who eat healthy is probably due to overrepresentation of highly educated participants and participation of more health conscious persons than the average Norwegian.

Among the visions 2021 in The Nordic Plan of Action one of the goals is that the variation between different social groups with regard to diet is at most 20%. It is difficult to calculate this difference, but if the difference in dietary index between educational groups is used the difference is already less than 10%. However, the reason for the small difference could be that those eating very unhealthy do not participate in this kind of study. The results of this study are most useful to find trends in dietary factors in the Nordic countries and to follow trends by comparing with similar studies in the future. Furthermore, the working group has previously suggested additional goals regarding social inequality (Fagt et al 2009) and these may be examined with the next monitoring as they regard development.

## **5.5 Food – Children**

Median frequency of intake of the various foods in children is shown in Table 16 and mean frequency of intake is shown in Table 18 in appendix C for all children. Tables 19 and 20 in appendix C shows the median frequency of intake for boys and girls, respectively.

The intake of all foods differed significantly between countries both when all were analyzed together and in boys and girls, separately, except

for fried potatoes for both sexes and energy drinks for boys. However, many of the differences were only minor although significant.

As was seen for adults marked differences between countries were seen for frequency of intake of bread, fish, sausages and partly for full fat cheese. In addition to that, the consumption of light soft drinks differed with Sweden having a median intake of 0 and Norway a median intake of 1 a week.

The intake of bread in children showed the same differences between countries as for adults; in Iceland the intake of bread of all types were low. Rye bread was mainly eaten in Denmark and Finland. The intake of whole grain bread seemed to be high in Norway. White bread was eaten by few in this survey and in Iceland 80% never or seldom ate white bread.

The countries did not differ appreciable with regard to fruit and vegetables intake, although the intake of fruit was higher in Denmark than in the other countries. Vegetables and fruit were in median consumed once a day in all countries except for Denmark, where fruit was consumed twice a day.

The intake of fish varied a lot from country to country with Iceland having the highest median intake of twice a week and Denmark the lowest with less than once a week. However, as for adults, fish on bread is commonly eaten in some countries, perhaps especially in Denmark and Norway, meaning that the total intake of fish in these countries are higher than indicated by the results.

The median intake of sugar-rich food as chocolate, candy and cakes differed between 8–12 times a week in the 5 countries. A typical intake of sugar-sweetened soft drinks was once a week in all 5 countries.

**Table 16. Median (25–75 percentiles) intake of food for all children**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
Rye bread, slices/day <sup>a,b</sup>	2.0 <sub>a</sub>	1.0	2.9	608	2.0 <sub>a</sub>	0.7	3.0	496	.	.	.	.	0.1 <sub>b</sub>	0.0	0.4	513	0.0 <sub>b</sub>	0.0	0.0	343
Whole grain bread, slices/day	1.0 <sub>a,b</sub>	0.3	2.0	607	1.0 <sub>a,c</sub>	0.3	2.0	489	1.0 <sub>b</sub>	.3	2.0	494	1.0 <sub>c</sub>	0.6	2.0	517	4.0 <sub>d</sub>	2.0	5.0	352
White bread, slices/day	0.3 <sub>a</sub>	0.0	0.7	608	0.3 <sub>a</sub>	0.0	0.7	479	0.6 <sub>b</sub>	0.1	1.0	495	0.0 <sub>c</sub>	0.0	0.0	516	0.1 <sub>d</sub>	0.0	0.3	350
Hard bread, slices/day	0.1 <sub>a</sub>	0.0	0.4	607	0.4 <sub>b</sub>	0.0	1.0	470	0.4 <sub>b</sub>	0.0	1.0	491	0.0 <sub>a</sub>	0.0	0.4	514	0.3 <sub>b</sub>	0.0	0.9	348
Vegetables/day	1.0 <sub>a</sub>	1.0	2.0	608	1.0 <sub>a</sub>	0.9	2.0	498	1.0 <sub>a,b</sub>	1.0	2.0	499	1.0 <sub>b</sub>	0.7	2.0	517	1.0 <sub>a</sub>	0.9	2.0	352
Fruit and berries/day	2.0 <sub>a</sub>	1.0	2.0	609	1.0 <sub>b</sub>	0.6	2.0	500	1.0 <sub>c</sub>	1.0	2.0	499	1.0 <sub>c</sub>	1.0	2.0	515	1.0 <sub>b</sub>	0.6	2.0	349
Fruit juice/day	0.1 <sub>a</sub>	0.0	0.4	609	0.1 <sub>a</sub>	0.0	0.6	497	0.1 <sub>a</sub>	0.0	0.6	498	0.4 <sub>b</sub>	0.1	1.0	514	0.4 <sub>b</sub>	0.1	1.0	348
Fish/week	.8 <sub>a</sub>	0.5	1.0	532	1.0 <sub>b</sub>	1.0	2.0	498	1.0 <sub>b,d</sub>	1.0	2.0	499	2.0 <sub>c</sub>	2.0	3.0	517	1.0 <sub>d</sub>	1.0	2.0	353
Fried potatoes/month	2.0 <sub>a</sub>	1.0	4.3	609	2.0 <sub>b</sub>	1.0	4.3	498	2.0 <sub>a,b</sub>	1.0	4.3	498	2.0 <sub>b</sub>	1.0	3.0	517	2.0 <sub>b</sub>	1.0	4.3	349
Sausages/month	1.0 <sub>a</sub>	0.0	2.0	609	3.0 <sub>b</sub>	2.0	4.0	499	4.0 <sub>c</sub>	3.0	8.0	497	2.0 <sub>b</sub>	1.0	4.0	516	4.0 <sub>d</sub>	2.0	4.0	352
Chocolate/month	8.0 <sub>a</sub>	4.0	8.0	609	4.0 <sub>a</sub>	4.0	12.0	499	4.0 <sub>b</sub>	4.0	8.0	499	4.0 <sub>b</sub>	4.0	8.0	517	8.0 <sub>b</sub>	4.0	8.0	352
Cakes/month	4.0 <sub>a</sub>	4.0	8.0	609	4.0 <sub>a</sub>	4.0	8.0	498	4.0 <sub>a</sub>	4.0	8.0	499	8.0 <sub>b</sub>	4.0	12.0	513	4.0 <sub>c</sub>	2.0	8.0	351
Fullfat cheese/day	0.1 <sub>a</sub>	0.0	0.4	608	0.3	0.0	1.0	494	0.3 <sub>c</sub>	0.0	1.0	495	0.4 <sub>c</sub>	0.0	1.0	514	0.4 <sub>b</sub>	0.1	1.0	345
Soft drinks, light/week	0.5 <sub>a</sub>	0.0	2.0	609	.3 <sub>a</sub>	0.0	2.0	495	0.0 <sub>b</sub>	0.0	0.3	498	0.3 <sub>a</sub>	0.0	2.0	514	1.0 <sub>c</sub>	0.0	3.0	350
Soft drinks, sugar sweetened/week	1.0 <sub>a</sub>	0.0	2.0	609	1.0 <sub>b</sub>	0.5	3.0	498	1.0 <sub>a</sub>	0.5	2.0	499	1.0 <sub>a</sub>	0.3	2.0	516	1.0 <sub>a</sub>	0.6	2.0	352
Energy drinks/month	0.0 <sub>a</sub>	0.0	0.0	609	0.0 <sub>a</sub>	0.0	0.0	495	0.0 <sub>a</sub>	0.0	0.0	499	0.0 <sub>a</sub>	0.0	0.0	516	0.0 <sub>a</sub>	0.0	0.0	346

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

<sup>a</sup> The questions on bread in Sweden were: 1. How many slices of soft bread, type wholegrain bread, "coarse"/wholemeal bread, bread labelled with the keyhole symbol, do you eat? 2. How many slices of Swedish loaf or white bread, e.g. French roll, white toast bread, ciabatta, skogaholmslimpa, do you eat? 3. How many slices of hard bread do you eat?

<sup>b</sup> The questions on bread in Iceland were: 1. Fiberrich bread, fiber content over 6 gr per 100 g, 2. "wholewheat breads", 3–6 g fibre, 3. White breads 0–3 g fibre. 4. Hard bread.

**Table 17. Percentages of children with an intake less than once a month**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
Rye bread, slices	6.9 <sub>a</sub>	7.3 <sub>a</sub>	-	42.9 <sub>b</sub>	82.5 <sub>c</sub>
Whole grain bread, slices	17.0 <sub>a</sub>	17.6 <sub>a</sub>	20.6 <sub>a</sub>	8.7 <sub>b</sub>	7.1 <sub>b</sub>
White bread, slices	30.6 <sub>a</sub>	30.5 <sub>a</sub>	22.4 <sub>b</sub>	79.3 <sub>c</sub>	46.6 <sub>d</sub>
Hard bread, slices	47.8 <sub>a</sub>	27.2 <sub>b</sub>	27.7 <sub>b</sub>	54.5 <sub>a</sub>	38.2 <sub>c</sub>
Vegetables	1.3 <sub>a</sub>	2.0 <sub>a</sub>	1.8 <sub>a</sub>	2.7 <sub>a</sub>	0.3 <sub>a</sub>
Fruit and berries	1.3 <sub>a</sub>	1.0 <sub>a</sub>	1.4 <sub>a</sub>	0.8 <sub>a</sub>	1.7 <sub>a</sub>
Fruit juice	18.4 <sub>a</sub>	24.1 <sub>a</sub>	19.1 <sub>a</sub>	10.1 <sub>b</sub>	10.9 <sub>b</sub>
Fish	9.8 <sub>a</sub>	5.4 <sub>a,b</sub>	3.0 <sub>b,c,d</sub>	1.0 <sub>c</sub>	5.9 <sub>a,d</sub>
Fried potatoes	12.8 <sub>a</sub>	13.5 <sub>a</sub>	9.8 <sub>a</sub>	15.7 <sub>a</sub>	15.2 <sub>a</sub>
Sausage	36.8 <sub>a</sub>	10.2 <sub>b,c</sub>	5.8 <sub>b</sub>	13.0 <sub>c</sub>	9.1 <sub>b,c</sub>
Chocolate/candy	0.5 <sub>a</sub>	0.8 <sub>a</sub>	3.4 <sub>b</sub>	1.4 <sub>a,b</sub>	2.3 <sub>a,b</sub>
Cakes	5.1 <sub>a,b</sub>	5.0 <sub>a,b</sub>	4.8 <sub>a,b</sub>	2.5 <sub>a</sub>	7.4 <sub>b</sub>
Fullfat cheese	43.4 <sub>a</sub>	37.7 <sub>a</sub>	24.2 <sub>b</sub>	24.7 <sub>b</sub>	11.0 <sub>c</sub>
Soft drinks, light	43.8 <sub>a</sub>	48.9 <sub>a</sub>	72.5 <sub>b</sub>	48.1 <sub>a</sub>	34.0 <sub>c</sub>
Soft drinks, sugar sweetened	25.6 <sub>a</sub>	15.7 <sub>b,c</sub>	13.2 <sub>b</sub>	20.3 <sub>a,c,d</sub>	15.1 <sub>b,d</sub>
Energy drinks	97.7 <sub>a</sub>	96.2 <sub>a,b</sub>	97.8 <sub>a,b</sub>	94.4 <sub>b</sub>	95.4 <sub>a,b</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

Percent of children with an intake of less than once a month is shown in Table 17. Marked differences in bread habits were found between countries. Rye bread was eaten by most in Denmark and Finland, by approximately 60% in Iceland but less than 20% in Norway. In Sweden rye bread was not asked about separately, but was included in the question on wholegrain bread. According to this survey many did not eat white bread at all, especially not in Iceland. Vegetables and fruit were eaten by most at least once a month. Most of the participants stated they had fish at least once a month as a main meal but the percentage who never eat fish or eat fish less than once a month varied from 1% in Iceland to 9.8% in Denmark. Fish on bread was not included in the questionnaire. Large differences were found for percentage who never or seldom ate sausages; it varied from 5.8% in Sweden to 36.8% in Denmark. Likewise, large differences were found in full fat cheese, light soft drinks and sugar sweetened soft drinks. Sugar-rich food was eaten regularly in all countries and less than 4% never, or less than once a month, had chocolate or candy

### 5.5.1 Fat type

The type of spread used is shown in Table 18. Oil-butter spreads are the most commonly used spread as for adults. Low-fat spread was the second most commonly used spread in Sweden, Iceland and Norway whereas in Finland it was Becel Pro Activ. This kind of spread was used



by very few in the other countries. Denmark and Norway had the highest proportion of non-users of spread.

**Table 18. Percent of participating children using the various types of spread (%)**

	Country				
	Denmark %	Finland %	Sweden %	Iceland %	Norway %
Butter	11.8 <sub>a</sub>	5.6 <sub>b</sub>	2.0 <sub>c</sub>	7.3 <sub>a,b</sub>	7.6 <sub>a,b</sub>
Oil-butter spreads	49.5 <sub>a,b</sub>	41.8 <sub>a</sub>	47.3 <sub>a,b</sub>	51.8 <sub>b</sub>	30.9 <sub>c</sub>
Vegetable margarine 60-80%	3.1 <sub>a</sub>	18.4 <sub>b</sub>	18.8 <sub>b</sub>	7.1 <sub>c</sub>	7.4 <sub>c</sub>
Low fat margarine	7.7 <sub>a</sub>	11.2 <sub>a</sub>	25.1 <sub>b,c</sub>	20.1 <sub>b</sub>	29.2 <sub>c</sub>
“Becel Pro-Activ”	2.0 <sub>a</sub>	20.2 <sub>b</sub>	1.4 <sub>a</sub>	2.4 <sub>a</sub>	1.7 <sub>a</sub>
Margarine 70-80%	0.0 <sup>1</sup>	0.8 <sub>a</sub>	0.6 <sub>a</sub>	0.2 <sub>a</sub>	0.3 <sub>a</sub>
Fat (pig, duck or coconut)	0.0 <sup>1</sup>	0.0 <sup>1</sup>	0.4 <sub>a</sub>	0.4 <sub>a</sub>	0.0 <sup>1</sup>
Do not use spread on bread	25.8 <sub>a</sub>	1.4 <sub>b</sub>	4.0 <sub>b</sub>	10.8 <sub>c</sub>	21.8 <sub>a</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

The type of fat usually used for cooking is shown in Table 19. Oil was the most commonly used fat for cooking in all countries, although in Sweden oil-margarine and similar, and butter was also used often. Iceland had the highest percent of oil users, Finland and Sweden the highest percent of butter users, and Denmark and Sweden the highest percent of users of oil-margarine. Finally Norway had the highest percent of users of margarine.

**Table 19. Percent of participating children usually using various types of grease for cooking**

	Country				
	Denmark %	Finland %	Sweden %	Iceland %	Norway %
Butter	4.4 <sub>a</sub>	18.6 <sub>b</sub>	22.4 <sub>b</sub>	0.0 <sup>1</sup>	7.4 <sub>a</sub>
Oil-butter spreads	2.1 <sub>a,c</sub>	9.0 <sub>b</sub>	0.6 <sub>a</sub>	1.4 <sub>a,c</sub>	3.1 <sub>c</sub>
Margarine 70-80% fat	9.0 <sub>a</sub>	2.0 <sub>b</sub>	11.4 <sub>a</sub>	3.7 <sub>b</sub>	22.7 <sub>c</sub>
Vegetable margarine 60-80% fat	2.0 <sub>a</sub>	3.2 <sub>a</sub>	3.4 <sub>a</sub>	1.7 <sub>a</sub>	4.8 <sub>a</sub>
Fluid margarine, oil-margarine	21.5 <sub>a</sub>	6.0 <sub>b</sub>	25.5 <sub>a</sub>	0.0 <sup>1</sup>	7.6 <sub>b</sub>
Oil	57.1 <sub>a</sub>	55.8 <sub>a</sub>	29.1 <sub>b</sub>	84.7 <sub>c</sub>	49.3 <sub>a</sub>
Use a mixture of oil and butter	2.5 <sub>a</sub>	2.4 <sub>a</sub>	6.2 <sub>b</sub>	2.9 <sub>a,b</sub>	4.0 <sub>a,b</sub>
Fat (pig, duck)	0.3 <sub>a</sub>	0.0 <sup>1</sup>	0.2 <sub>a</sub>	4.9 <sub>b</sub>	0.3 <sub>a</sub>
Do not use fat for cooking	1.0 <sub>a</sub>	0.4 <sub>a</sub>	0.2 <sub>a</sub>	0.8 <sub>a</sub>	0.3 <sub>a</sub>
We do not prepare food in our household	0.0 <sup>1</sup>	0.0 <sup>1</sup>	0.0 <sup>1</sup>	0.0 <sup>1</sup>	0.0 <sup>1</sup>
Kasvisterolimargariinia	0.0 <sup>1</sup>	1.6 <sub>a</sub>	0.0 <sup>1</sup>	0.0 <sup>1</sup>	0.0 <sup>1</sup>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

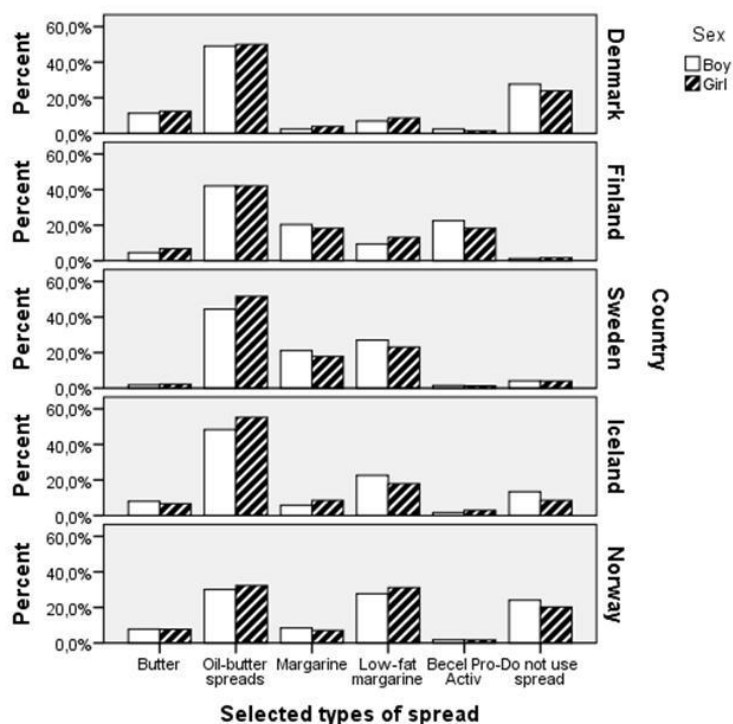
### 5.5.2 Intake of food in relation to sex and parents education

In this section some of the important food groups are investigated in relation to sex of the child and education of the interviewed (adult) person. Furthermore, the numbers which comply with the recommendations are investigated. Because of the low number of parents with basic education in most countries, differences between basic educational level and higher educational level are difficult to find.

### 5.5.3 Fat type

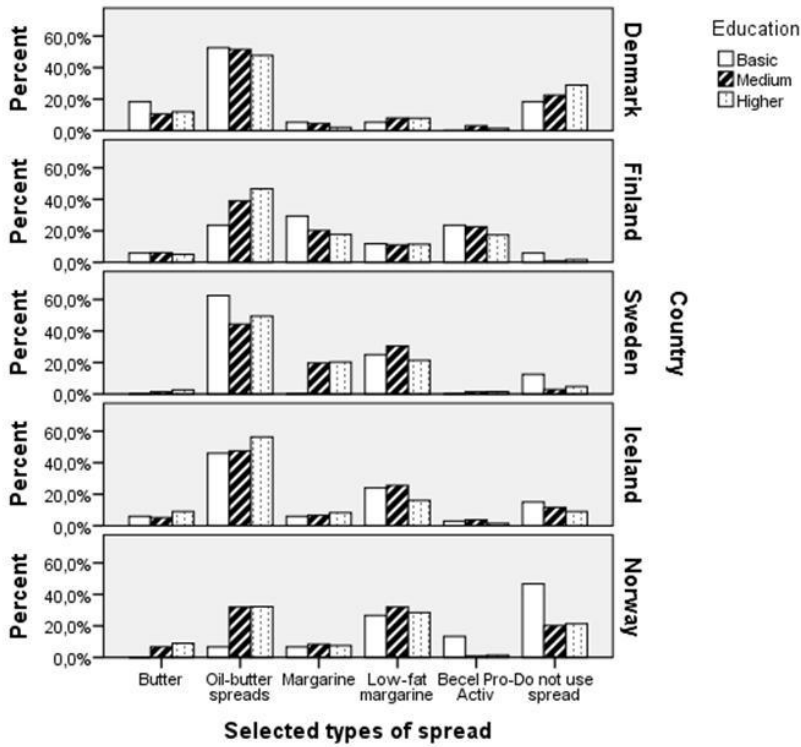
The distribution of use of selected kind of spread among sexes is shown in Figure 23. In this and the following analyses are the category “fat (pig, duck, coconut)” left out because less than 1% use this kind of fat in all countries. Vegetable margarine 60–80% and margarine 70–80% are grouped together.

Figure 23. Proportion using various kind of spread on bread in relation to sex



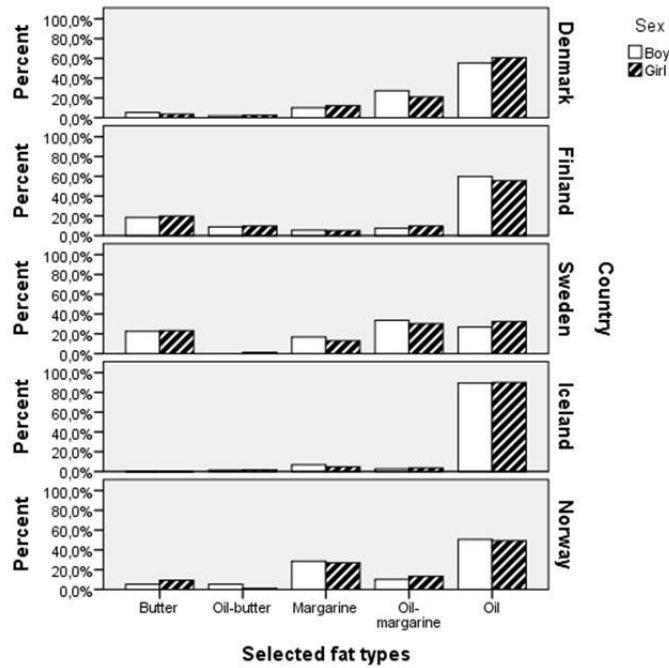
No significant differences in the use of various kinds of spread between boys and girls were found.

**Figure 24. Proportion using various kind of spread on bread in relation to educational level of parent**



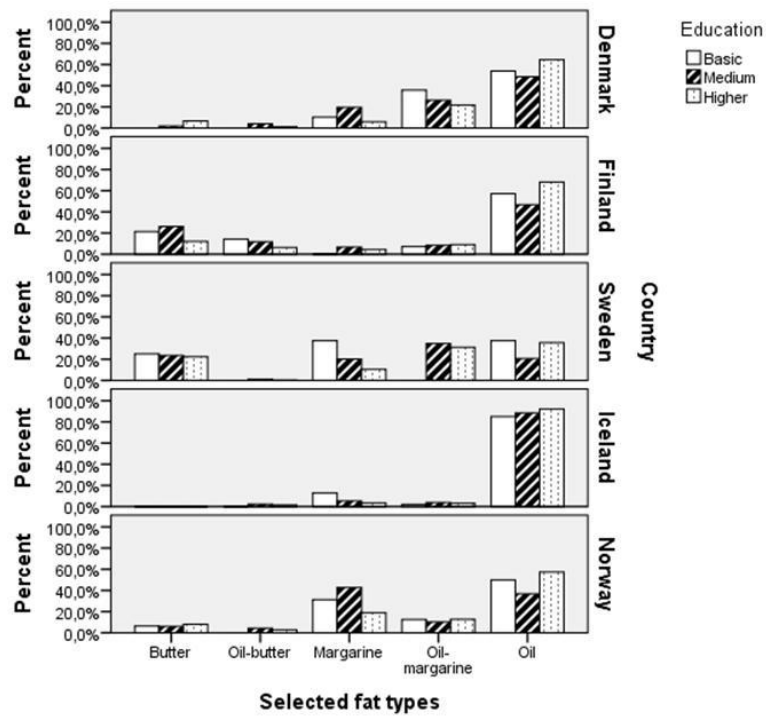
Very few significant differences were seen between parents educational level and type of spread used by the children, however, in some categories we have very few cases and therefore differences are difficult to find.

**Figure 25. Proportion using selected fat types for cooking in relation to sex of the children**



No sex differences were found in the type of fat used in the household.

**Figure 26. Proportion using different fats for cooking in relation to educational level of parent**



Fewer children with a parent having medium educational level than with a parent having a high educational level used (or had food prepared with) oil. This was seen when all countries were analyzed together, and in all the countries except Iceland where oil was commonly used by all. In Finland fewer with a high education used butter when cooking.

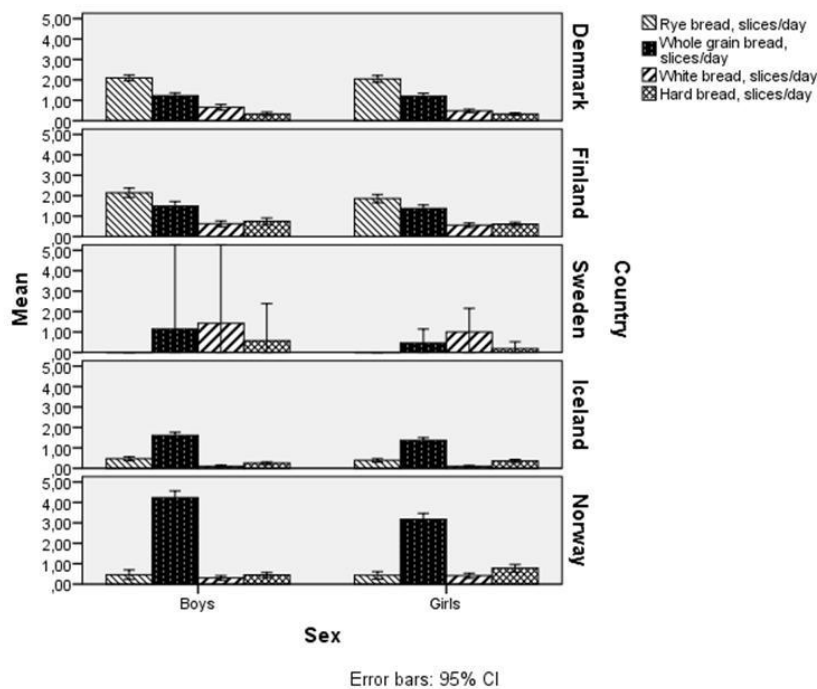
### Summary and discussion – fat type, children

The use of spread and fat in children followed the same pattern as for adults with the same differences between countries; oil-butter spread was the most commonly used type of spread in all countries but some marked differences between countries were found in the type of spread used; low-fat margarine was commonly used in Sweden, Iceland and Norway (by 20–30%), and Finland was the only country in which Becel pro-activ was commonly used (by approximately 20%). In Norway and Denmark a quite high proportion, 22 and 26%, respectively, did not use spread at all. Oil was the most commonly used fat for cooking in all countries.

Boys and girls used similar kind of fats and the use of oil was higher in children which had a parent with higher education than with medium education

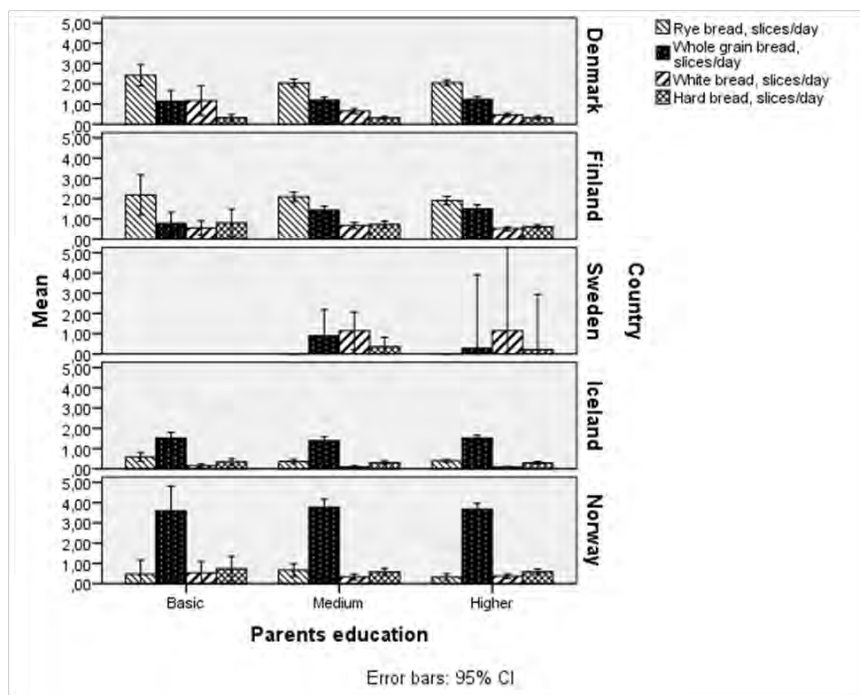
### 5.5.4 Intake of bread

Figure 27. Bread intake in the 5 countries in relation to sex (mean number of slices per day)



In general boys ate more bread than girls except for hard bread. The same was seen in the different countries although the difference was not statistical significant in all countries.

**Figure 28. Intake of bread (slices per day) in children in relation to educational level of parent. The number with basic education in Sweden is only 8 and the graph is not shown**



The intake of bread in children did not change appreciable with educational level of parent but overall a lower intake of rye bread and white bread with higher educational level was found.

The difference in rye bread was only found in Norway and the difference in white bread was only found in Denmark.

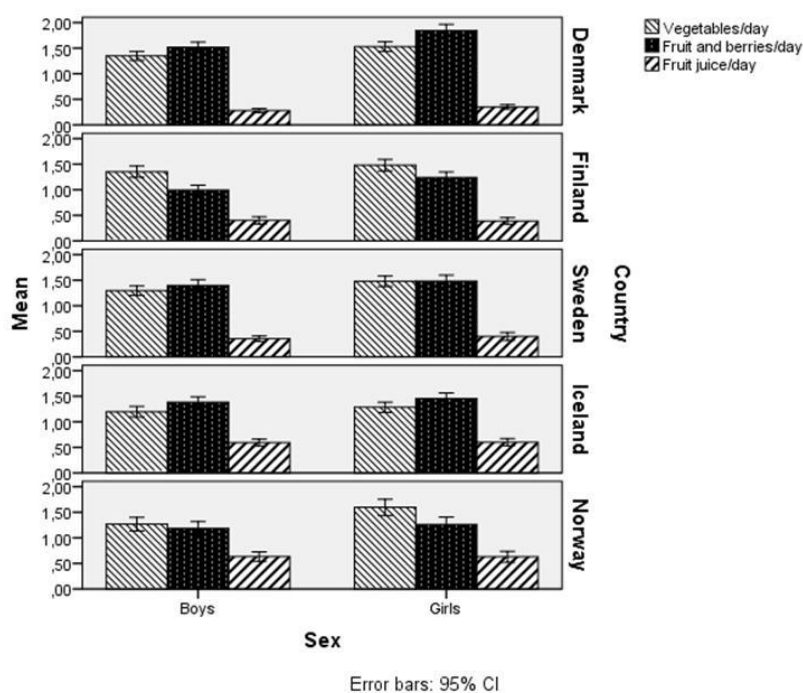
### Summary and discussion – bread intake, children

The intake of bread in children showed the same differences between countries as for adults; in Iceland the intake of bread of all types were low. Rye bread was mainly eaten in Denmark and Finland. The intake of whole grain bread seemed to be high in Norway. White bread was eaten by few in this survey and in Iceland 80% never or seldom ate white bread.

Like for adults, boys ate more bread than girls, but differences according to educational level of the parent were weak.

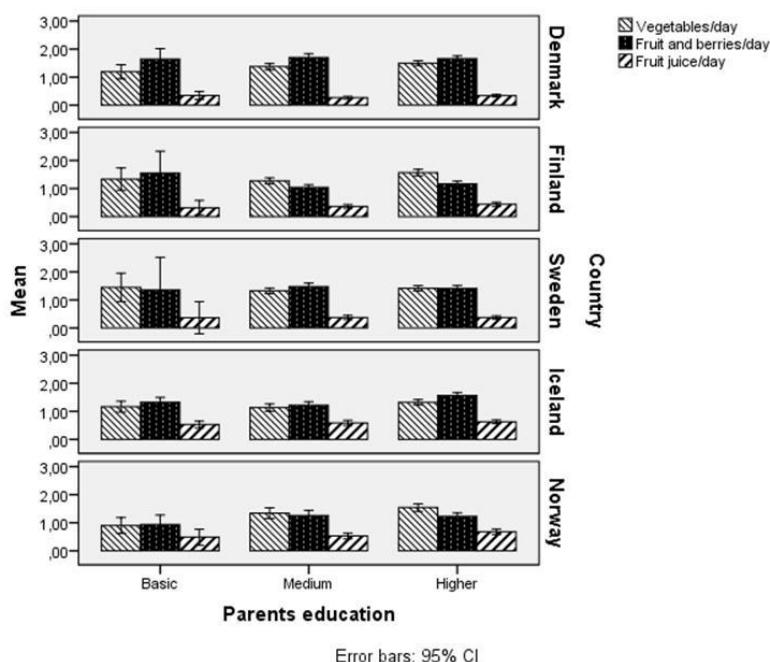
### 5.5.5 Vegetables and fruits

Figure 29. Mean daily frequency of fruit , vegetables and fruit juice *in relation to sex*



The intake of vegetables was higher in girls than boys overall and in Denmark, Sweden and Norway. Likewise, the intake of fruit and berries was higher in girls than in boys overall and in Denmark and Finland. The same trend was found in the other countries.

**Figure 30. Mean daily frequency of vegetables, fruit and fruit juice in relation to educational level of the parent**



The intake of vegetables, fruit and fruit juice was higher among children with a parent with higher education than medium education when all countries were analyzed together. The same trend was seen for vegetables in all countries but it only reached statistical significance in Finland. The fruit intake showed the same in Iceland only. No differences were found in fruit juice consumption in any of the countries.

### **Intake of fruit and vegetables according to recommendations**

The recommended intake of vegetables and fruit for children varies from country to country. Denmark recommends 400 g for children 4–10 years and, above this age, the recommendation for adults (600 g per day) applies. In Sweden 400 g is recommended and in Iceland 5 a day is recommended, but smaller portion sizes than for adults. Norway and Finland do not have specific recommendations for children, thus 5 a day is recommended for all. Potatoes are not included in any country and fruit juice is included up to 1 a day. In the present survey portion sizes were not asked about only the frequency of intake. We have calculated both the number who had 4 a day and the number who had 5 a day. In total of 33% of the children got 4 a day and 15% got 5 a day. The percentage for each country is shown in Table 20. The percent in the age group 7–10 year with an in-



take of 4 or more a day and the percent in the age group 11–12 year with an intake of 5 or more a day are shown in Table 21 and Table 22. In all countries together 35% of children 7–10 years had at least 4 a day and 14% of children more than 10 years had at least 5 a day.

**Table 20. Percent of all children in each country with an intake of vegetables and fruits more than 4 and more than 5 times a day, respectively**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Vegetables and fruit 4 times or more a day	42 <sub>a</sub>	26 <sub>b</sub>	34 <sub>a,b</sub>	30 <sub>b</sub>	29 <sub>b</sub>
Vegetables and fruit 5 times or more a day	18 <sub>a</sub>	13 <sub>a</sub>	15 <sub>a</sub>	15 <sub>a</sub>	11 <sub>a</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

**Table 21. Percent of children 7–10 years in each country with an intake of vegetables and fruits more than 4 a day**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Vegetables and fruit more than 4 times a day	44 <sub>a</sub>	25 <sub>b</sub>	37 <sub>a,c,d</sub>	33 <sub>b,c</sub>	29 <sub>b,d</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

**Table 22. Percent of children 11–12 years in each country with an intake of vegetables and fruits more than 5 a day**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Vegetables and fruit more than 5 times a day	16 <sub>a</sub>	14 <sub>a</sub>	11 <sub>a</sub>	15 <sub>a</sub>	14 <sub>a</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

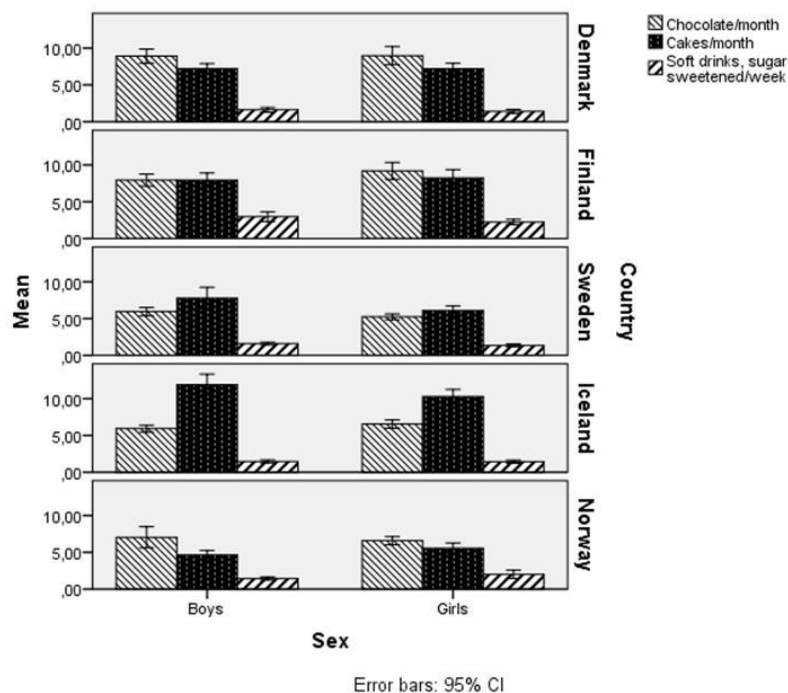
### Summary and discussion – fruit and vegetable intake, children

The Nordic countries did not differ appreciable with regard to fruit and vegetables intake, although the intake of fruit was higher in Denmark than in the other countries. Vegetables and fruit were in median consumed once a day in all countries except for Denmark, where fruit was consumed twice a day.

Like for adults girls ate more fruit and vegetables than boys and overall a higher intake was found in children with a parent with higher education. In the Nordic Plan of Action the vision for 2021 is that the average intake of fruit and vegetables in children 4–10 years are at least 400 g and in children more than 10 years of least 500 g. In the validation study once a day was roughly equivalent to 100 g of fruit and vegetables in Danish children, but once a day was somewhat lower for Icelandic children. We found that approximately 1/3 of the participants in the age group 4–10 years had 4 or more a day and about 12% of children 11–12 years had 5 or more a day, meaning that we have some way to go before the goal is reached.

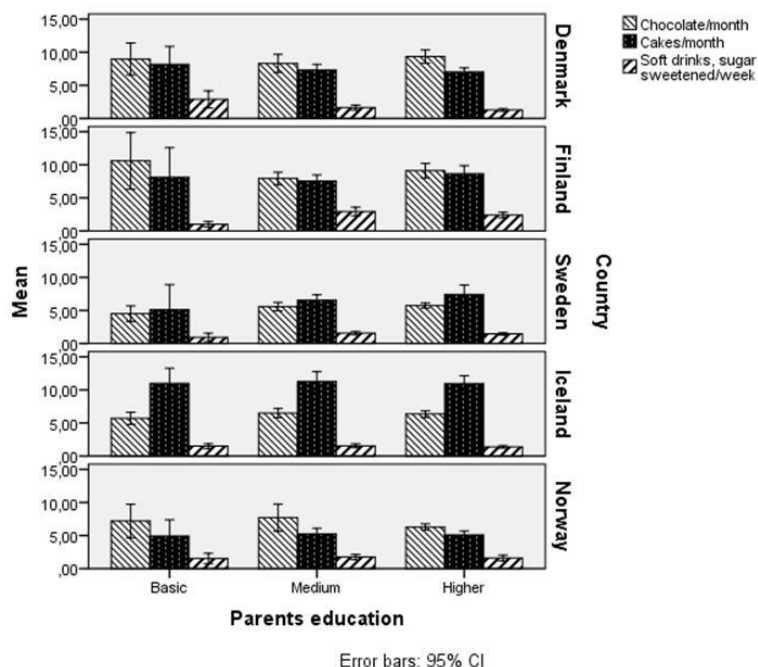
### 5.5.6 Intake of sugar rich food

Figure 31. Monthly/weekly frequency of sugar rich food in relation to sex



No sex-differences exist in intake of sugar-rich food in children except for a lower intake of chocolate in girls than in boys in Sweden.

**Figure 32. Monthly/weekly frequency of sugar rich food in children in relation to the parents educational level**



The intake of sugar sweetened soft drinks decreased with increasing length of parents education in Denmark. Apart from that no significant differences were observed.

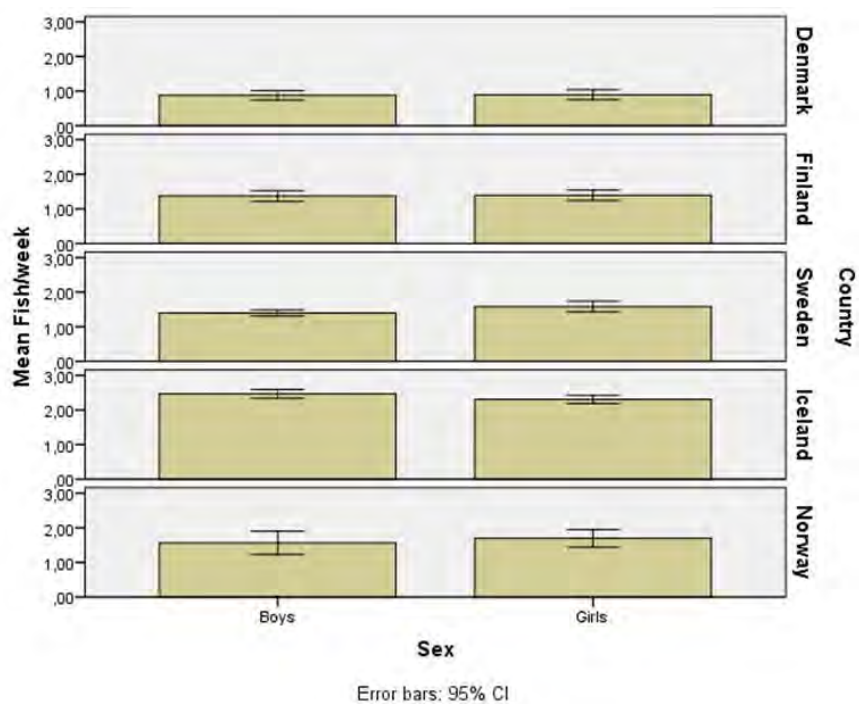
### Summary and conclusion – intake of sugar-rich food, children

Sugar-rich food was eaten regularly in all countries and less than 4% never, or less than once a month, had chocolate or candy. A typical intake of sugar-sweetened soft drinks was once a week in all 5 countries. The intake of sugar-rich food was not related to sex or parents education.

A typical frequency of intake of sugar-rich food was 4 times a week roughly equivalent to 200–250 g a week (Biltoft-Jensen et al, 2005). This is the approximate amount which can be eaten a week for a child, if the recommendation should be fulfilled. In the Nordic Plan of Action the goal is that 80% or more meets the Nordic Nutrition Recommendation on daily intake of added sugar (max. 10E%). According to the present survey approximately half of the children eat more.

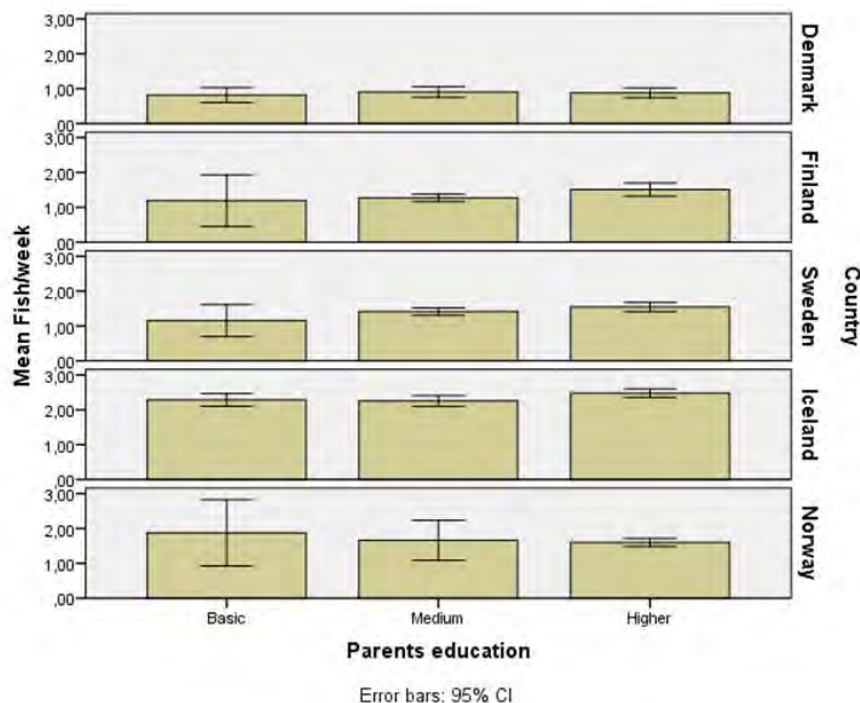
### 5.5.7 The intake of fish

Figure 33. Weekly intake of fish in relation to sex



In general there were no differences between boys' and girls' intake of fish except in Sweden where girls had a higher intake than boys.

**Figure 34. Children’s weekly intake of fish in relation to parent’s education**



When all countries were analyzed together the intake of fish was slightly, but significantly, higher in children with a parent with higher education than in children with a parent with medium long education. This difference was not significant in any single country.

**Intake of fish according to the recommendation**

It is recommended to eat fish corresponding to two main meals a week. Overall 44% of the children had fish twice or more a week, however large differences from country to country exist, see Table 23. Iceland had a high percentage of children having fish at least twice a week and Denmark a low percentage. The questionnaire only asked about fish as a main meal and not about fish on bread. If this was included we expect that a higher proportion would have fish according to the recommendation.

**Table 23. Percent of children who ate fish twice or more a day**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Fish 2 or more times a week	10 <sub>a</sub>	37 <sub>b</sub>	43 <sub>c</sub>	83 <sub>d</sub>	46 <sub>c</sub>

Values not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

### Summary and discussion – intake of fish, children

The intake of fish varied a lot from country to country with Iceland having the highest median intake of twice a week and Denmark the lowest with less than once a week. However, as for adults, fish on bread is commonly eaten in some countries, perhaps especially by Danish and Norwegian children, meaning that the total intake of fish in these countries are higher than indicated by the results.

The vision for 2021 according to the Nordic Plan of Action is that 70% of the population eats fish corresponding to a main dish twice a week. According to this survey Iceland has already reach this goal but the other countries, particularly Denmark, are far from the goal.

### 5.5.8 Overall dietary quality (dietary index)

The dietary quality was calculated in the same way and by using the same scores as for adults, see Table 14.

Mean dietary index in the 5 countries is shown in Table 24. Norway and Denmark had the highest score and Sweden the lowest.

**Table 24. Mean dietary index in the 5 countries**

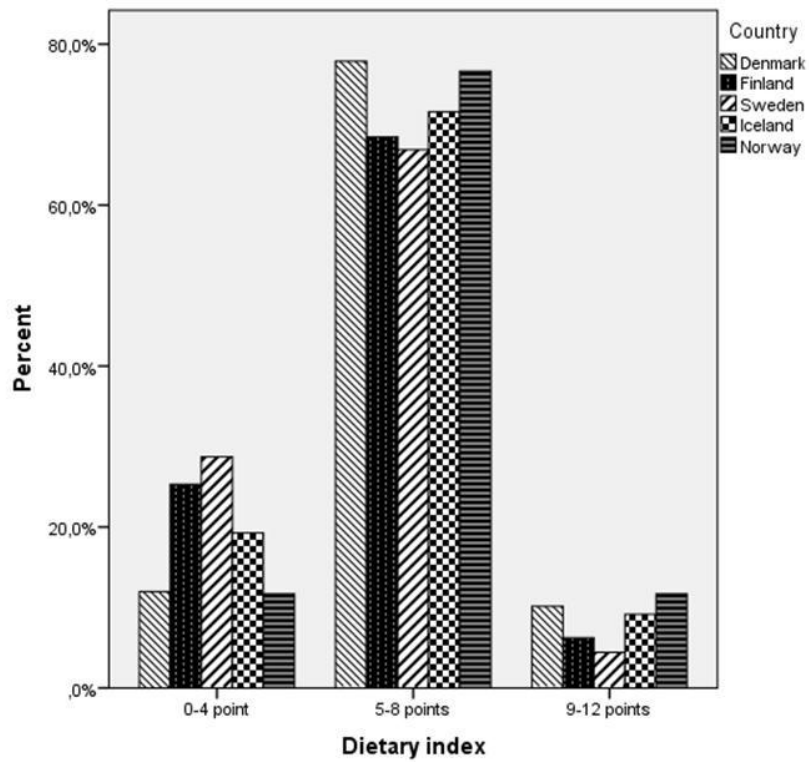
	Mean±SD	Number
Denmark	6.3±1.6 <sub>a</sub>	609
Finland	5.9±1.7 <sub>b</sub>	500
Sweden	5.5±1.7 <sub>c</sub>	499
Iceland	6.1±1.8 <sub>a,b</sub>	518
Norway	6.4±1.7 <sub>a</sub>	353

Values not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction. Mean values are shown as the dietary index is normally distributed.

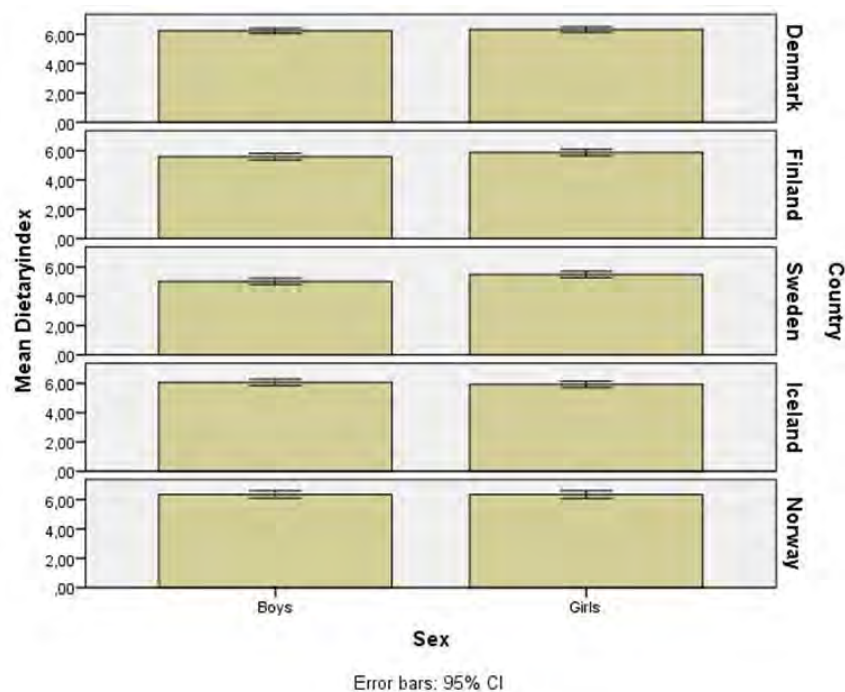
Approximately 70% of the population had a “medium nutritional quality” of their diet, 5–8 points, and only 8% scored 9 or more points indicating a healthy diet. None of the participants got 12 points which indicate an optimal diet. The number within the 3 categories “poor diet”,

“medium quality diet” and “healthy diet” differed between countries as can be seen in Figure 35.

**Figure 35. Dietary index in 3 categories representing poor diet, medium quality diet and healthy diet**

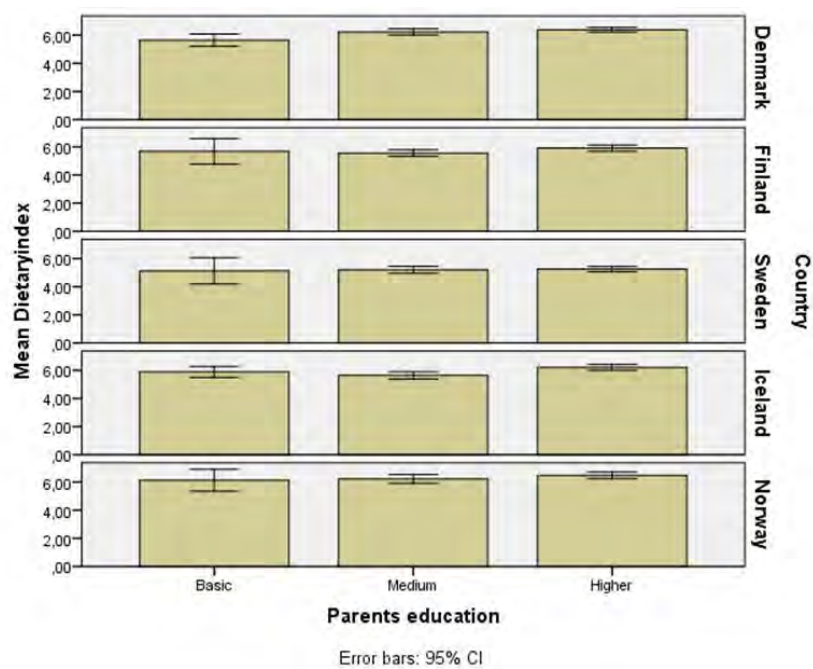


**Figure 36. Dietary index in boys and girls**



Girls had a slightly but significantly higher dietary index than boys when all countries were analyzed together. This difference was also found in Sweden but not in the other countries.

**Figure 37. Dietary index in relation to parent's education**





Children with a parent with higher education tended to have a higher score than children with a parent with medium education. However, this was only significant in Iceland and in all countries analyzed together.

#### **Summary and discussion – overall dietary quality, children**

As for adults approximately 70% of the children had a diet with a medium quality, but a higher proportion of children than adults had a poor diet and none had an optimal diet. From 2% in Sweden to 10% in Denmark and 12% in Norway had a diet defined as “healthy”.

The results suggest that a higher score was found in girls than in boys and was related to the interviewed parent having a higher education. However, these relations were not strong.

#### **5.5.9 Comparison with results from other studies**

In this section results from the Nordic Monitoring Survey of food (NFFQ) are compared with results from other dietary surveys in the Nordic countries. The indicator questions used in NFFQ is a rather rough way to measure the dietary habits and although the same questionnaire was used in all countries there are limitations when comparing between countries. On the other side, comparison with other surveys from the Nordic countries (see below) indicates mainly the same trends in dietary intake s found in the present study.

##### **Denmark**

The results of the NFFQ are in line with results from the Danish National Survey of Diet and physical Activity (DANSDA). However, due to different methods it is difficult to compare the results directly.

The latest data from DANSDA (a 7-day estimated dietary record) are collected in 2005-08. 567 children aged 4–14 y and 2,133 adults aged 15–75 y participated in this period. For both children and adults DANSDA shows that more rye bread than wholegrain bread is eaten, e.g. the same picture as the monitoring results. However, the lowest frequency of bread in the NFFQ is white bread, while DANSDA shows that whole meal bread is less consumed than rye- and white bread. NFFQ shows a similar frequency of white bread among children and adults, which corresponds to an almost equal intake of white bread in DANSDA among children and adults.

NFFQ shows a higher intake of fruits than vegetables for both children and adults, which is similar to results from DANSDA. However the frequency of fruit and vegetables seems a bit lower than can be estimated in DANSDA and this result can be due to some participants might forget some fruits and vegetables eaten in dishes when answering the

NFFQ. In the validation study in 2009, where results from the NFFQ were compared with results from a dietary record, no big discrepancy was seen between the two methods regarding fruits. However the intake of vegetables seemed to be underestimated somewhat in the NFFQ for both children and adults (Fagt et al, 2012). In DANSDA, 16% of the adult population eats at least 600 g a day, while this figure is lower in NFFQ. For children the NFFQ shows that 40 percent fulfill a recommended intake of 4 times fruit and vegetables a day, where DANSDA shows that approximately 33% of children 4–10 years eat 400 gram of fruit and vegetable a day. This difference can be explained partly with the possible underestimation of especially vegetables in the NFFQ, but also a bit different age groups in NFFQ and DANSDA can be part of the difference.

A low intake of sausages and fried potatoes is seen in both NFFQ and DANSDA. Also the intake of fish among children and adults is low in both surveys. DANSDA shows a higher intake of sugared soft drinks than light soft drinks among adults, while the NFFQ show a more frequent intake of light soft drinks than sugared soft drinks. In children, the intake of sugared soft drinks is twice as high as the intake of light soft drinks according to DANSDA. The same picture is not seen in the NFFQ where the mean frequency of sugared soft drinks among children is approximately the same as the frequency of light soft drinks (data shown in appendix). However when looking at the median frequency in children the NFFQ shows a higher frequency of sugared soft drinks than light soft drinks.

DANSDA results show that adult participants with longer education eat healthier than those with shorter education which is in agreement with the monitoring survey, as the dietary index show higher values among participants with longer education than among participants with shorter education.

The dietary Index in the Nordic monitoring show no difference between the youngest and oldest age groups while DANSDA results indicate that the oldest age groups eat healthier than the younger age groups.

No data are available from DANSDA showing overall dietary habits according to household size or urbanization, so comparison between results has not been done in this area.

### **Iceland**

A National Dietary Survey (ISNDS) among adults (method: 2\*24 h recall, along with food frequency questionnaire) was conducted in Iceland 2010–2011. Results from this survey show the same trend in bread intake as the monitoring (NFFQ) results. Bread intake in Iceland is very low, little more than two slices a day on average. More whole grain bread (fiber content 3–6 g/100g) is eaten than rye bread and the lowest

intake is in white bread. NFFQ shows a similar intake of fruits and vegetables, which is similar to results from ISNDS. There is a similar trend in intake of fruits and vegetables in both studies. In ISNDS, 11% of the population ate at least 400 g of fruits and vegetables, fruit juice not included, while this figure is 8.3% in NFFQ for at least 500 g and fruit juice included with a maximum of 1 portion per day. The mean intake of fish in ISNDS is comparable with the mean frequency in NFFQ (data not shown). However, 50% of the participants in ISNDS had a fish meal at least twice a week but in NFFQ the frequency is 66%. Both studies show a higher intake of sugared soft drinks than light soft drinks and a low consumption of energy drinks.

ISNDS results show that low education was associated with poorer diet but in the NFFQ the dietary index showed no relation with education.

### **Finland**

Direct comparisons to earlier Finnish food frequency studies are difficult as the used methods are not exactly the same. Nevertheless, the Adult Health Behavior and Health Study 2010 (AVTK)(Helakorpi et al 2011) and National FINRISK Health Study 2007 (Peltonen et al 2008a and 2008b) are the population studies with large samples with questions on food behavior. For the use of fat on bread, the Finnish population studies suggest that low fat vegetable margarine (max 40%) is the most commonly used type of spread on bread. The percentages are 41.4% in FINRISK Study and 43.6% in AVTK Study for low fat margarine, suggesting much higher proportions than in the NFFQ (16.3%). In the NFFQ, the most commonly reported type of spread was oil-butter spread (35.6%). It may well be that these differences are due to misclassification, as some of the response categories overlap each other from the Finnish point of view, such as the difficulty to understand the categories between vegetable margarine and margarine.

The Nordic Monitoring findings on fat type that is used for cooking are somewhat in line with the previous AVTK and FINRISK studies. The most commonly reported type of fat was oil in all three studies, with proportions of 54.5% in the NFFQ, 50.6% in FINRISK and 53.2% in AVTK. In the NFFQ, the use of butter was slightly higher (19.5%) than in FINRISK (14%) and AVTK (11.8).

For the type of fat used on bread and for cooking, the subgroup analyses were similar to those reported in Finland before. There is no gender or educational differences in spreads, yet there are some age group differences in spreads. For cooking, the gender or age group differences are not found, but are found for educational groups.

For the intake of bread, the direct comparisons are not available, yet the previous studies suggest that eating rye bread is fairly common, as only 2.9% of FINRISK participants reported less than one slice per week and 8.6% AVTK respondents reported having eaten no rye bread during the past week. In the NFFQ, 6.1% reported less than one slice per month. NFFQ results are in line with Finnish studies in terms of no age, gender or educational differences in the use of rye bread.

In the FINRISK Study, only 0.7% reported having fresh vegetables more than 4 times a day, 1.4% reported having fruit more than 4 times daily and 0.5% reported having berries more than 4 times daily. We do not have the statistics to combine the vegetable, fruit and berry categories, but it may well be that the proportion in the NFFQ is a slight overestimation (5 or more times a day: 8.5%). Nevertheless, the gender, age group and educational differences between the vegetable, fruit and berry intakes are similar in the NFFQ and previous Finnish studies.

### **Sweden**

The consumption of the different foods is in general at the same level in the NFFQ and in the two recently conducted studies in Sweden; the Dietary Index (DI) study 2010 (unpublished data) and Riksmaten 2010–11 based on a 4 day estimated food record (Amcoff et al 2012).

The bread consumption was, however, higher in both the DI study and in Riksmaten 2010–11 than in the NFFQ, with almost 1 slice/day, looking at wholegrain bread and hard bread together. In the DI study, about 10 percent reached a consumption of fruit and vegetables of 5 times a day. Fruit juice was included in the fruit question in the DI study, which can make a difference. In Riksmaten 2010–11, 17 percent of the participants consumed 500 g or more. The percent in NFFQ was 13%.

The DI study showed the same results for kind of spread usually used as the NFFQ. Most commonly was oil-butter spread; 42% comparable with 41% in NFFQ. Low fat margarine was used by more than 20 per cent, as in NFFQ. In the DI study as many as 11 percent said they usually use butter, but in NFFQ it was about 5 percent. Equivalent results were found in terms of type of grease used for cooking.

### **Norway**

A National Dietary Survey (NORKOST 3) among 1787 adults (18–70 yr) was conducted in Norway in 2010–2011. The dietary assessment methods used in NORKOST 3 were two independent 24 h recalls, frequency questions on the usual consumption of fruit, vegetables and fish and a food propensity questionnaire.

Results from NORKOST 3 show the same trend in bread intake as the results from the Nordic Monitoring survey. There was observed a quite high intake of whole grain bread and a low intake of white bread in NORKOST 3.

In the Nordic Monitoring about 22% of the Norwegian participants reported to have an intake of fruit and vegetables 5 times per day or more (fruit juice is included with a maximum of 1 per day). Based on the two 24-h recalls NORKOST 3 showed that 22–25% of the population ate at least 500 g of fruits and vegetables (incl maximum 100 g of fruit juice).

The median frequency of fish intake for dinner observed in the Nordic monitoring was 2 times per week and 61% reported to have fish for dinner twice a week or more, in NORKOST 3 60% reported to have fish for dinner 1–2 times per week.

The Nordic Monitoring shows a similar median frequency intake of sugared soft drinks and light soft drinks. In NORKOST 3 there was a higher consumption of sugared soft drinks compared to light soft drinks.

## 5.6 Physical activity and sedentary time – Adults

### 5.6.1 *Physical activity*

Physical activity was investigated in two ways. Participants were asked about which of 4 groups at work and in leisure time best described their activity within the last week. These questions have been commonly used by other large-scale surveys, thus the comparability of the data from this current survey is good. The results are shown in Table 21 in appendix C.

Participants were also asked how many hours (or minutes) they spent doing moderate or vigorous exercise (MVPA), and how many hours (or minutes) of this exercise that was vigorous exercise (VPA) during the last week. Furthermore, they were asked about computer time and time used watching TV (screen time). Moderate and vigorously intense activity, vigorous activity only, and screen time are shown in Table 25 for all adults and in Table 22 and 23 in appendix for men and women separately.

Median MVPA time was higher in Finland and Sweden than in the other 3 countries. The median VPA time was lowest in Norway and significantly lower in Denmark compared to Finland, Sweden and Iceland. Screen time was lower in Sweden and Iceland than in the other countries.

**Table 25. Median (25 and 75 percentiles) moderate and vigorous physical activity (MVPA), vigorous physical activity (VPA) and sedentary time watching TV or computer (screen time). All adults**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
MVPA (hours/week)	3.5 <sub>a</sub>	2.0	6.0	2098	4.0 <sub>b</sub>	2.0	7.0	1835	4.0 <sub>b</sub>	2.0	7.0	1782	3.5 <sub>a</sub>	1.5	6.0	1866	3.0 <sub>a</sub>	1.5	6.0	1019
VPA (hours/week)	1.0 <sub>a</sub>	0.0	2.0	2098	1.0 <sub>b</sub>	0.0	3.0	1835	1.0 <sub>b,c</sub>	0.0	3.0	1782	1.0 <sub>b</sub>	0.0	3.0	1866	.5 <sub>a,c</sub>	0.0	2.0	1019
Screen time (hours/day)	3.0 <sub>a</sub>	2.0	4.5	2136	3.0 <sub>a</sub>	2.0	4.5	1940	2.5 <sub>b</sub>	1.5	4.0	1838	2.5 <sub>b</sub>	2.0	4.0	1966	3.0 <sub>c</sub>	2.0	5.5	1018

Values in the same row not sharing the same subscript are significantly different at  $p < 0,05$ . Tests are adjusted for all pair wise comparisons within a row using the Bonferroni correction.  $P < 0.001$  between countries for all 3 variables (Kruskal Wallis test). M – median, 25 – 25 percentile, 75 – 75 percentile, N – number of participants

The main purpose of the physical activity questions is to monitor the proportion of persons meeting the physical activity recommendations. To evaluate this, six physical activity categories were calculated (see method section). The definition of these categories is presented in Table 26.

**Table 26. Definition of physical activity categories (PAC)**

Physical activity categories (PAC)	Definition
0	Not meeting recommendations, less than 15 min/week
1	Not meeting weekly recommendations, but at least 15 min/week
2	Meeting moderate-intensity recommendations (3.5 hours per week; both in minimum bouts of 10 min)
3	Meeting vigorous-intensity recommendations (1.25 hours per week in minimum of 10 min bouts)
4	Meeting the recommendation by a combination of moderate- and vigorous-intensity physical activity;
5	Meeting both moderate- and vigorous-intensity recommendations

Everyone in physical activity categories 2 to 5 met the minimal recommendation (3.5 hours of moderate-intensity activity per week) whereas only the participants belonging to group 5 met the recommendation for both moderate- and vigorous-intensity recommendations. Overall 67% met the minimum recommendation and of these 13% met the full recommendation. The distribution of participants across the physical activity groups is shown in Table 27. Iceland had the highest percentage of inactive participants, whereas Finland had the highest percentage of participants who met the recommendation for both moderate- and vigorous physical activity.

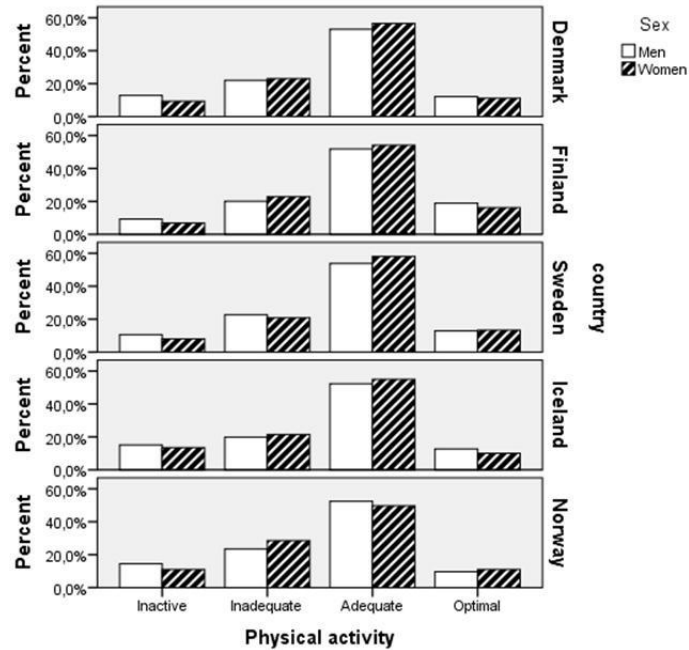
**Table 27. Physical activity categories (PAC). All adults**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
PAC 0	10.9 <sub>a,d</sub>	8.0 <sub>b</sub>	9.1 <sub>a,b</sub>	14.3 <sub>c</sub>	12.7 <sub>c,d</sub>
1	22.5 <sub>a,b</sub>	21.6 <sub>a,b</sub>	21.7 <sub>a,b</sub>	20.7 <sub>a</sub>	26.1 <sub>b</sub>
2	21.6 <sub>a</sub>	20.1 <sub>a,c</sub>	21.0 <sub>a,c</sub>	16.2 <sub>b</sub>	17.3 <sub>b,c</sub>
3	25.5 <sub>a</sub>	27.1 <sub>a</sub>	28.6 <sub>a,b</sub>	32.3 <sub>b</sub>	26.3 <sub>a</sub>
4	7.9 <sub>a</sub>	5.9 <sub>a,b</sub>	6.4 <sub>a,b</sub>	5.2 <sub>b</sub>	7.4 <sub>a,b</sub>
5	11.6 <sub>a</sub>	17.4 <sub>b</sub>	13.1 <sub>a</sub>	11.3 <sub>a</sub>	10.3 <sub>a</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Test are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

In the following analyses the number of PAC groups were reduced to 4; 1 – inactive, 2 – inadequate (not meeting the recommendation), 3 – adequate (meeting the minimum recommendation), 4 – optimal (meeting both moderate and vigorous-intensity recommendations).

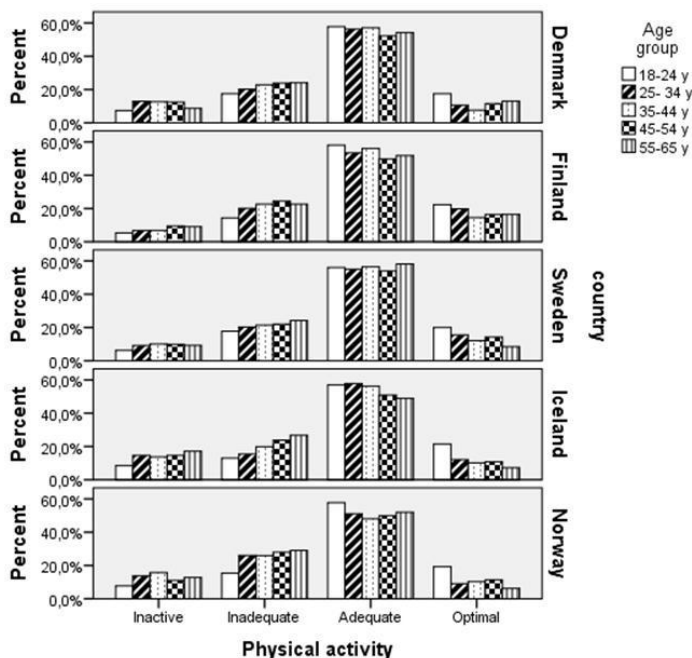
**Figure 38. Physical activity group in relation to sex**



Collectively for the 5 countries 66% of men and 68% of the women met the minimum recommendation, and of these 14% of men and 12% of the women met the full recommendation. More men (12%) than women (10%) were inactive. This was also seen in Denmark, but apart from this no significant differences in activity levels were found between sexes in any of the countries.



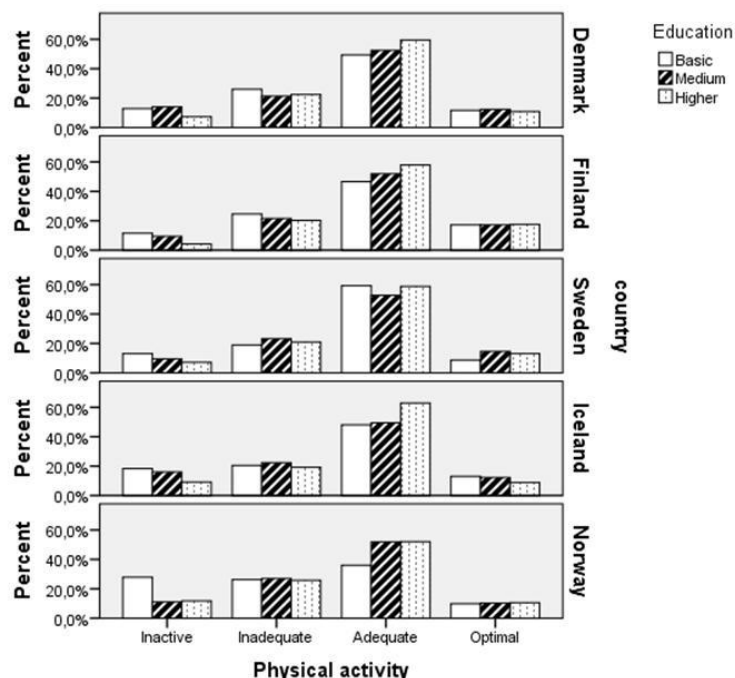
Figure 39. Physical activity categories in relation to age group



When all countries are analyzed together fewer in the youngest group were inactive compared with the other age groups and, likewise, the number with inadequate physical activity increased with age. Fewest in the age group 45–54 y met the recommendation and more in the youngest age group than in other groups met the full recommendation for physical activity.

In Denmark the age group 35–44 y and in Finland the age group 45–54 y had the lowest percentage who met the full recommendation. More in the youngest age group compared with the oldest age group met the full recommendation in Sweden, Iceland and Norway.

Figure 40. Physical activity categories in relation to education



Fewer with a higher education were inactive and more met the minimum recommendation when all countries were analyzed together. Most persons with only basic education were inactive. There was no difference between the parts who met the full recommendation among the various education groups.

In Denmark, Finland and Iceland the same pattern was seen except for the difference between basic and medium education with regard to inactivity. Sweden also followed the same pattern although persons with medium education had the lowest percentage who met the minimum recommendation.

Fewer among persons living with children than among singles and persons living with other adults met the full recommendation for physical activity and fewer among persons living with other adults were inactive (Figure 15, appendix C).

In Denmark the only significant difference was a lower percentage who did not meet the full recommendation among adults living with children than living with other adults. In the other countries no significant differences in physical activity level with family status were found.

More living at the countryside was inactive in leisure time than living in big cities and fewer met the recommendation for physical activity

when looking at all countries at the same time (Figure 16, appendix C). In Denmark more persons living at the countryside were inactive compared with persons living in the capital and in small towns. This was also seen in Sweden although the difference between small towns and the countryside was not significant and fewer in large cities as well as the capital were inactive. In Iceland only the difference between living in the capital and living at the countryside was significant. In Finland no difference with urbanization was found.

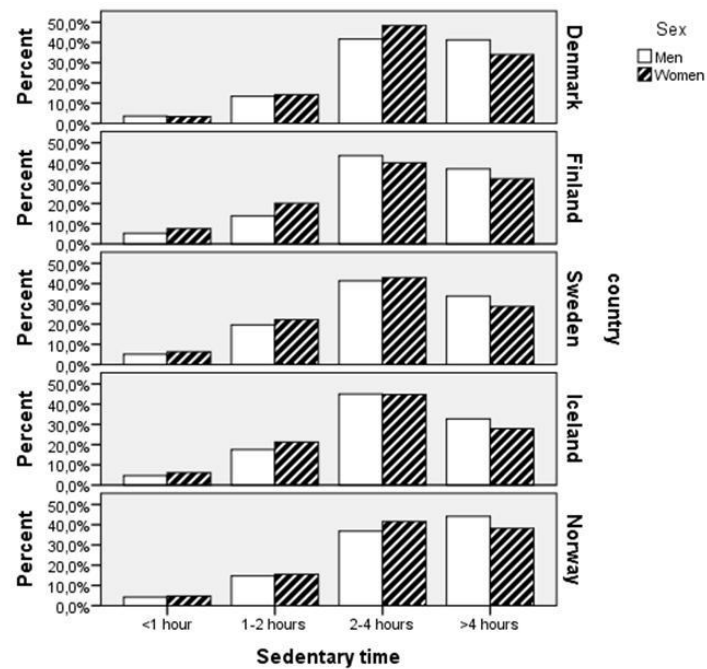
### **Summary and discussion – physical activity**

Finland and Sweden had the most physical active participants, and the highest proportion that fulfill both the minimum recommendation (about 70%) and of these the full recommendation, 17 and 13%, respectively. Men and women did not differ significantly with respect to physical activity but more men than women tended to be inactive. Furthermore, inactivity increased and the likelihood of fulfilling the full recommendation for physical activity decreased with increasing age.

#### **5.6.2 Sedentary time**

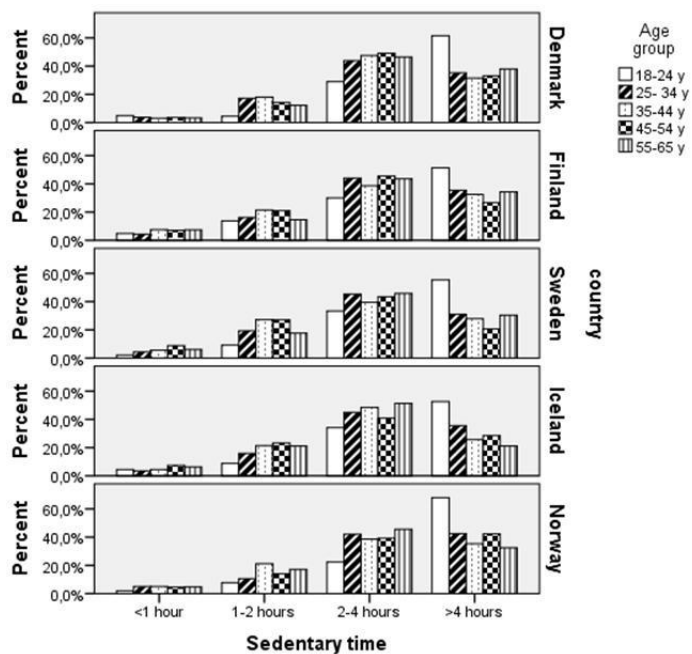
Sedentary time was measured as screen time (TV and computer time etc) which is a subgroup of total sedentary time. Screen time was divided into 4 categories; less than 1 hour per day, 1–2 hours per day, 2–4 hours per day and more than 4 hours per day.

**Figure 41. Proportion with different leisure time screen time per day in relation to sex**



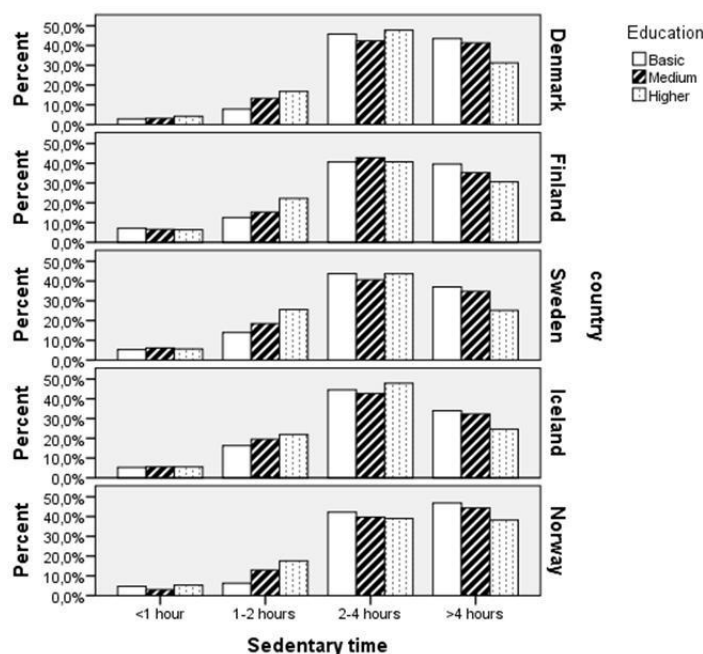
In general fewer women than men spent more than 4 hour in front of a screen in their leisure time (e.g. TV, computer) and more women than men were in the 2 categories which spent less time in front of a screen. In all countries more men than women had more than 4 hours screen time per day although the difference was not statistical significant in Norway.

Figure 42. Proportion with different leisure time screen time in relation to age



More among the youngest age group spend more than 4 hours a day in front of a screen in their leisure time than the older age groups. This finding was significant in all countries.

**Figure 43. Proportion with different leisure screen time per day in relation to education**



Fewer with a higher education than with a basic or medium long education had more than 4 hours screen time daily in their leisure time. This was found overall and for Denmark, Finland, Sweden and Iceland, except that the difference between medium and higher education was not significant in Finland.

Singles spent more time on screen time than adults living with children in all the 5 countries and had a tendency to spend more times than adults living with other adults (Figure 17, appendix C). At the countryside fewer spend more than 4 hours on screen time than persons living other places (Figure 18, appendix C). This difference was only significant when all countries were analyzed together, and in persons living at the countryside compared with persons living in the capital in Denmark and Iceland.

### **Summary and discussion – screen time**

Sweden and Iceland had the lowest screen time with a median time 2.5 hour per day compared with 3.0 hours/day in the other 3 countries. Women spent in general shorter time than men in front of a screen. Portion of participants who spent more than 4 hours a day was highest in the youngest age group, in the group with basic education and in singles. Furthermore, among participants living at the countryside fewer spent more than 4 hours in front of a screen compared with participants living in the capital.

## **5.7 Physical activity and sedentary time – Children**

### **5.7.1 Physical activity**

Hours spent on moderate or harder physical activity and total screen time are shown for all children in Table 28 and in Table 24 and 25 in appendix C results are shown separately for boys and girls. Time spent on physical activity differed between countries with Finland and Iceland having the most physical active children, and Sweden and Norway the least physical active children. Total time used in front of a screen was lower in Iceland than in the other countries.

**Table 28. Median (25 and 75 percentiles) moderate and vigorous physical activity (MVPA), and sedentary time watching TV or computer (screen time)**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
MVPA (hours/week)	6.0 <sub>a</sub>	4.0	10.0	609	7.0 <sub>b</sub>	4.0	10.0	500	4.5 <sub>c</sub>	3.0	7.0	499	7.0 <sub>a,b</sub>	4.0	10.0	518	4.5 <sub>c</sub>	2.5	7.5	353
Screentime (hours/day)	2.5 <sub>a</sub>	2.0	3.5	609	2.0 <sub>a</sub>	1.5	3.0	500	2.5 <sub>a</sub>	1.5	3.5	499	2.0 <sub>b</sub>	1.0	2.5	518	2.5 <sub>a</sub>	1.5	4.0	353

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$ . Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.  $P < 0.001$  between countries for both variables (Kruskal Wallis test). M – median, 25 – 25 percentile, 75 – 75 percentile, N – number of participants

Physical activity categories for children were defined as: Less than 15 min physical activity per week (inactive), 15 min but less than 7 hours per week (inadequate) and 7 hours or more per week (meeting the recommended level of physical activity). The percent of participants in these groups in each country is shown in Table 29.

Overall 44% fulfill the recommendation for physical activity for children. Finland and Iceland had the highest proportion of children which fulfill the recommendation for physical activity, and Sweden and Norway the lowest proportion. Few were found in the present survey to be inactive, the highest proportion was 3.8 and 3.7% in Sweden and Norway, respectively.

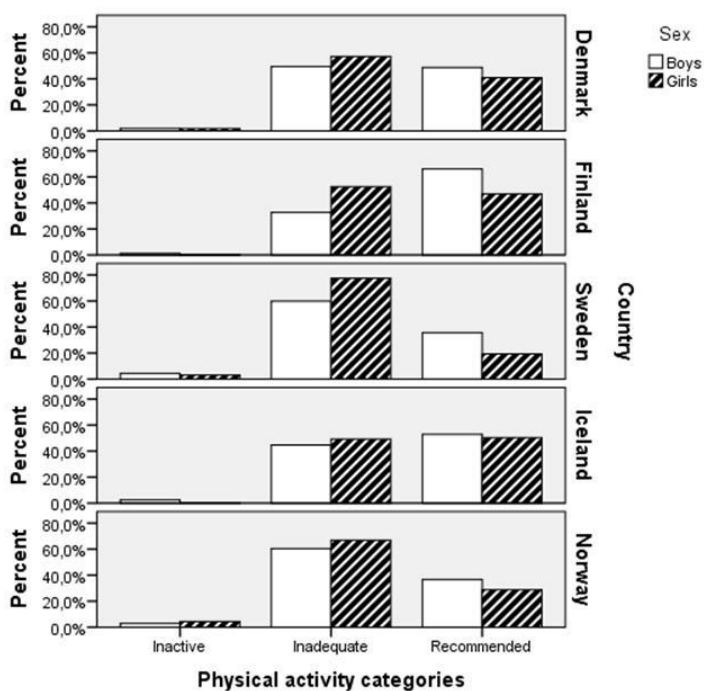


**Table 29. The distribution of children according to physical activity recommendation**

		Country				
		Denmark	Finland	Sweden	Iceland	Norway
		%	%	%	%	%
Physical activity categories	Inactive	1.8 <sub>a,b</sub>	.8 <sub>a</sub>	3.8 <sub>b</sub>	1.4 <sub>a,b</sub>	3.7 <sub>b,c</sub>
	Inadequate	53.1 <sub>a</sub>	42.8 <sub>b</sub>	67.9 <sub>c</sub>	47.1 <sub>a,b</sub>	63.7 <sub>c</sub>
	Recommended	45.0 <sub>a</sub>	56.4 <sub>b</sub>	28.3 <sub>c</sub>	51.6 <sub>a,b</sub>	32.6 <sub>c</sub>

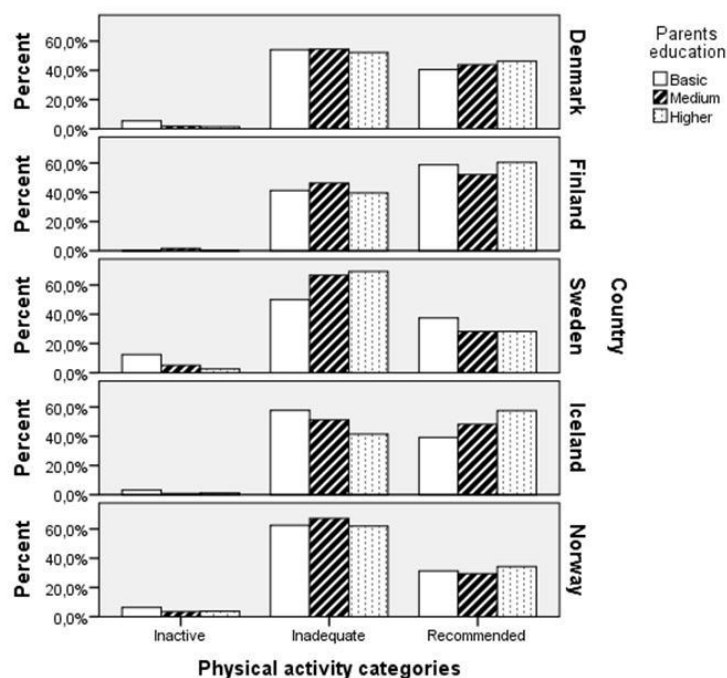
Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

**Figure 44. Proportion within different physical activity categories in relation to sex**



Significantly more boys than girls fulfilled the recommendation for physical activity when all countries were analyzed together. This was also found in both Finland and Sweden.

**Figure 45. Proportion within different physical activity categories in relation to parent's educational level**



In general the parent's educational level did not seem to influence the child's physical activity level. In Iceland significantly more children with a parent with high education fulfill the recommendation for physical activity compared with children with a parent with basic education. No other differences between educational groups were found.

### **Summary and discussion – physical activity, children**

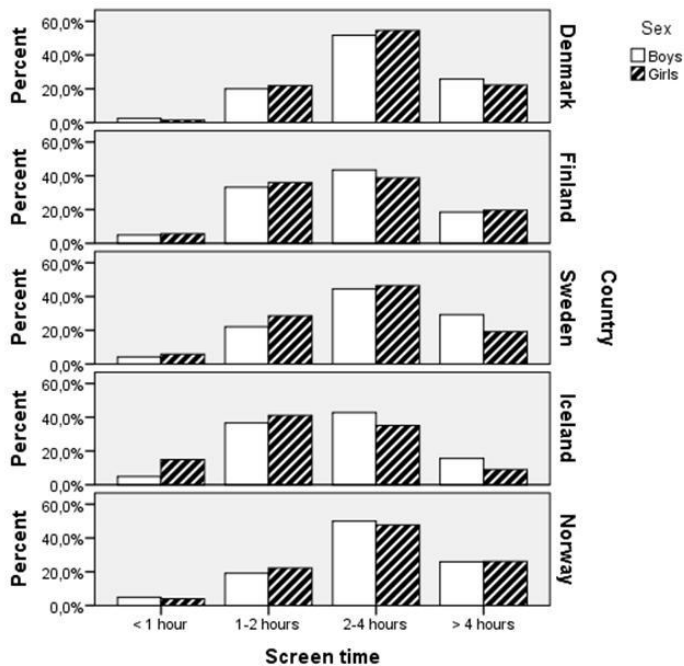
Finland and Iceland had the most active participants and the highest percentage who fulfill the recommendation, 52 and 56%, respectively, of at least 1 hours moderate activity daily. In Sweden only 28% fulfill the recommendation. More boys than girls fulfill the recommendation for physical activity.

The vision for 2021 in the Nordic Plan of Action is that all children aged 1–12 and at least 85% of children and youth aged 12–16 years are physically active for at least 1 hour every day. According to the present survey 44% fulfill the recommendation, so this number has to be increased appreciably.

### 5.7.2 Sedentary time

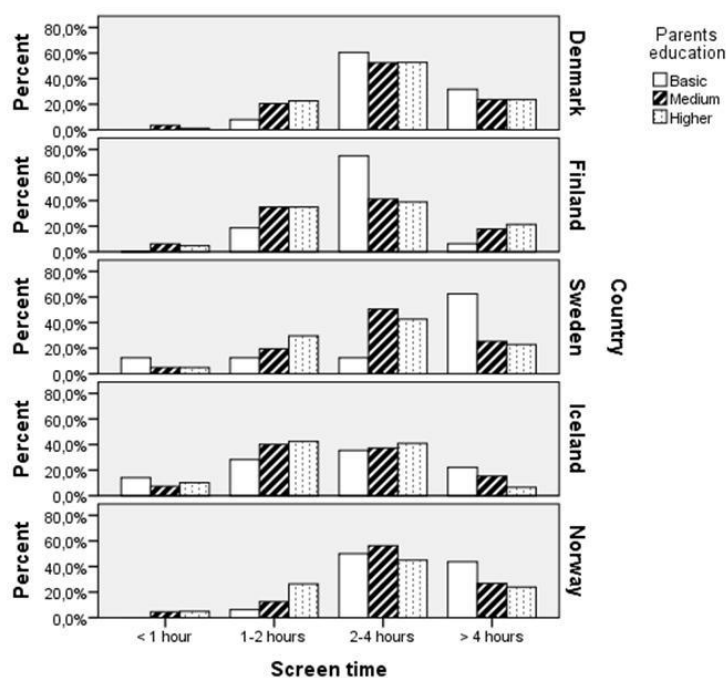
Sedentary time (TV and computer time) during leisure time was divided into 4 categories; less than 1 hour per day, 1–2 hours per day, 2–4 hours per day and more than 4 hours per day. Overall 20.9% of the children spend 4 hours or more in front of a screen daily. The distribution of boys and girls into the 4 groups are shown in Figure 46.

Figure 46. Proportion with different daily screen time in relation to sex



More boys than girls spend more than 4 hours of their leisure time in front of a screen. This was found in all countries together and in Sweden and Iceland.

**Figure 47. Proportion with different daily screen time in relation to parent's education**



No consequent differences with parent's educational level were seen in the time children spent on screen time. However, overall for the countries together, and in Sweden and Norway, more children with a parent with higher education were in the group who had 1–2 hours screen time daily. There seems to be differences in the group with 2–4 hours and 4 hours screen time in Finland and particularly Sweden between basic and longer education. However, few children had a parent with basic education thus this result is very uncertain.

### Summary and discussion – screen time, children

Overall children in this survey spent 2–3 hours on screen time, which is a little less than for adults. Like for adults more boys than girls spent more than 4 hours on screen time.

### **5.7.3 Comparison with other studies on physical activity and screen time**

It seems that the number who fulfills the recommendation is overestimated in the present study when comparing with other studies. In the validation study, the validation of the questionnaires used here was found to have a moderate correlation with objectively measured physical activity that was similar to correlations found in other validation studies for self-reported questionnaires (Fagt et al 2012). It is difficult to compare these results with previously conducted surveys as the questions are not exactly the same. There are several factors that can explain the different results from different surveys. For example, there is some trend for over-reporting physical activity, especially when more complicated and inclusive questionnaires are used.

#### **Denmark**

The results of the Nordic Monitoring overestimate the number who fulfills the recommendation compared with data from the Danish National Survey of Diet and physical Activity (DANSDA) 2003-6. In DANSDA 36% of adult men and 37% of adult women reached the minimum recommendation compared with approximately 67% in the Nordic monitoring. Furthermore, the number increased with increasing age in DANSDA whereas in the Nordic Monitoring we saw a tendency for the opposite. The connection with education was not clear in DANSDA in contrast to Nordic monitoring where the percent who reached the recommendation was higher among persons with a higher education than among persons with a basic education. No sex difference was found in any of the studies.

#### **Finland**

As compared to the results in the Nordic Monitoring study, the National Health Surveys in Finland suggest lower levels of physical activity. In the Adult Health Behavior and Health Study 2010 (AVTK), the proportions of physically inactive men and women were 19% and 13% and the proportion of inadequate level of physical activity 28% and 32% (Helakorpi et al 2011) meaning that 47% of men and 45% of women did not reach the physical activity recommendation according to the AVTK data, while the Nordic Monitoring data suggested 30% having not reached the recommendations. Thus, the number reaching the recommended levels of physical activity may be an overestimation in the Nordic Monitoring. Nevertheless, the comparisons between age and sex are concordant, i.e. older people and lower educated people report to be less physically active (Borodulin et al 2008a and 2008b).

For sedentary behavior, the findings in the Nordic Monitoring are in line with the National FINRISK 2007 Health Study (Peltonen et al 2008). Finnish men report higher amounts of TV and screen time (rough mean 3 hours per day) than women (rough mean 2.5 hours per day) and sitting time decreases with increasing age. Also educational differences are evident in previous Finnish findings, suggesting that higher educated people report lower screen time.

Several previous Finnish studies in children report similar proportions of recommended physical activity levels. Depending on the study, methods and age group used, 46–62% of boys and 37–53% of girls reach the recommended level of activity (Suomalaisten fyysinen aktiivisuus ja kunto 2010).

### **Sweden**

In the national health report 65 percent of the adults 16–84 year of age reached 30 minutes of physical activity a day, and 36 percent 60 minutes a day.

### **Iceland**

In Iceland, the long-form of IPAQ was used in a survey in 2006 and the results indicated that 90% of adult Icelanders reached the recommended level of physical activity (unpublished BS thesis), while the National Nutrition survey in 2010–2011 indicated that 46% of adult Icelanders reached the recommendations (Report in Icelandic). The result for Icelanders in the current study was 65%. There are several factors that can explain the different results from different surveys. For example, there is some trend for over-reporting physical activity, especially when more complicated and inclusive questionnaires, like IPAQ, are used. The National Nutrition survey in Iceland, as many previous studies in all Nordic countries, only asked about moderate physical activities. Thus physical activity category 4 (combination of moderate and vigorous physical activity) and physical activity category 3 (vigorous physical activity only) were not included as they were in the in current study.

### **Norway**

The results from the Nordic Monitoring overestimate the numbers who fulfill the recommendation compared with data from the national survey of physical activity in Norway (Kan1). Objectively measured physical activity in Kan1 shows that 1 out of 5 adults fulfill the recommendation of 30 minutes daily of moderate activity, 22% among women and 18% among men (Helsedirektoratet 2009). There was a connection with education in the Kan1 survey where the percent who reached the recom-

mendation was higher among persons with a higher education than among persons with a basic education.

## 5.8 Body mass index

### 5.8.1 Adults

Mean body mass index (BMI) is shown in Table 30. BMI is highest in Iceland and is also significantly higher in Finland than in the other 3 countries.

**Table 30. Mean BMI (SD) in adults**

	Country									
	Denmark		Finland		Sweden		Iceland		Norway	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
BMI	25.2 <sub>a</sub>	4.3	25.7 <sub>b</sub>	4.3	25.0 <sub>a</sub>	4.2	26.3 <sub>c</sub>	4.5	24.9 <sub>a</sub>	3.8

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column means. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

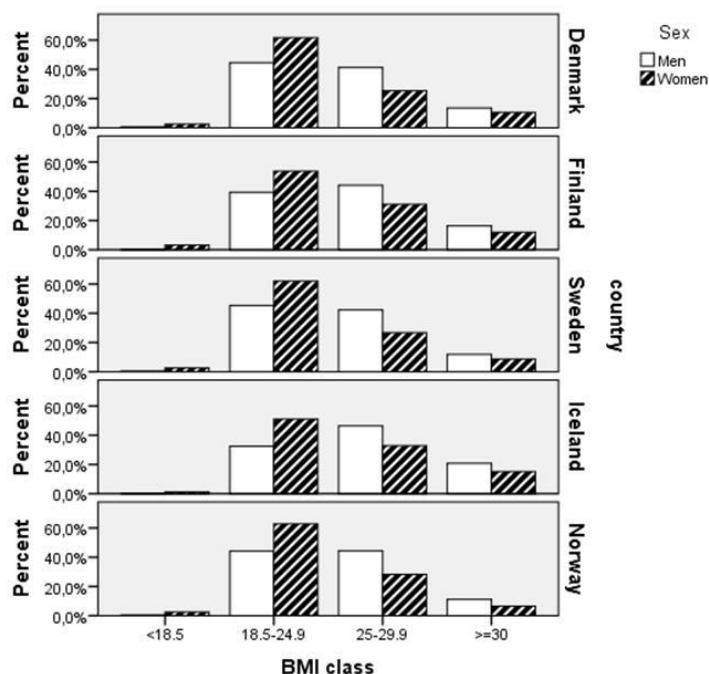
BMI is divided into 4 classes; underweight, less than 18.5, normal weight 18.5–24.9, overweight 25–29.9 and obese  $\geq 30$ . Percent of all adults in these classes in all countries is shown in Table 31. Iceland had the largest number of obese participants and Sweden and Norway the lowest number, while Finland, Iceland and Norway had the largest number of overweight participants. Altogether 12.7% of the participants were obese due to these self-reported data.

**Table 31. BMI in 4 classes (percent). All adults**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
BMI class					
<18.5	1.6 <sub>a,b</sub>	1.7 <sub>a</sub>	1.6 <sub>a,b</sub>	.7 <sub>b</sub>	1.5 <sub>a,b</sub>
18.5-24.9	53.6 <sub>a</sub>	47.1 <sub>b</sub>	54.0 <sub>a</sub>	42.2 <sub>c</sub>	53.7 <sub>a</sub>
25-29.9	32.8 <sub>a</sub>	37.2 <sub>b,c</sub>	34.2 <sub>a,b</sub>	39.3 <sub>c</sub>	36.1 <sub>a,b,c</sub>
$\geq 30$	12.0 <sub>a,b</sub>	14.0 <sub>a</sub>	10.2 <sub>b</sub>	17.8 <sub>c</sub>	8.7 <sub>b,d</sub>

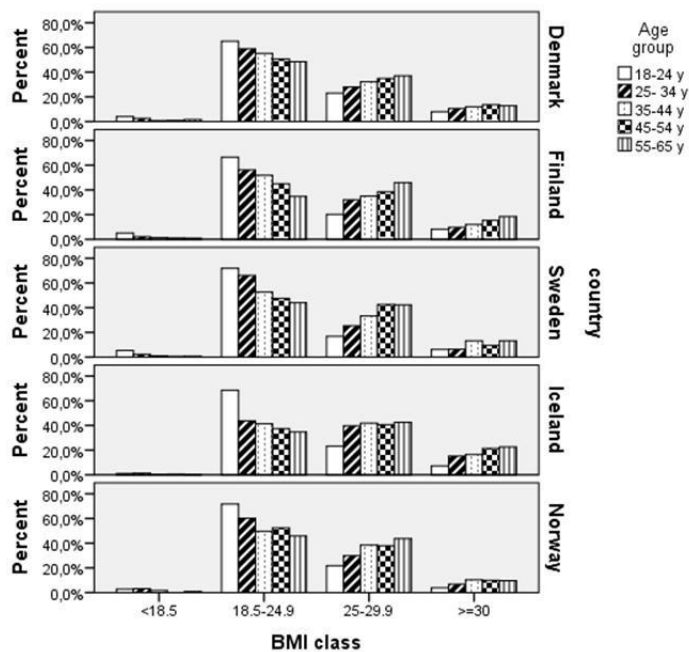
Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

**Figure 49. Proportion in different BMI classes in relation to sex**



Mean BMI was significantly higher in men than in women in all countries (results not shown) and more men than women were overweight and obese. This was seen in all the countries.

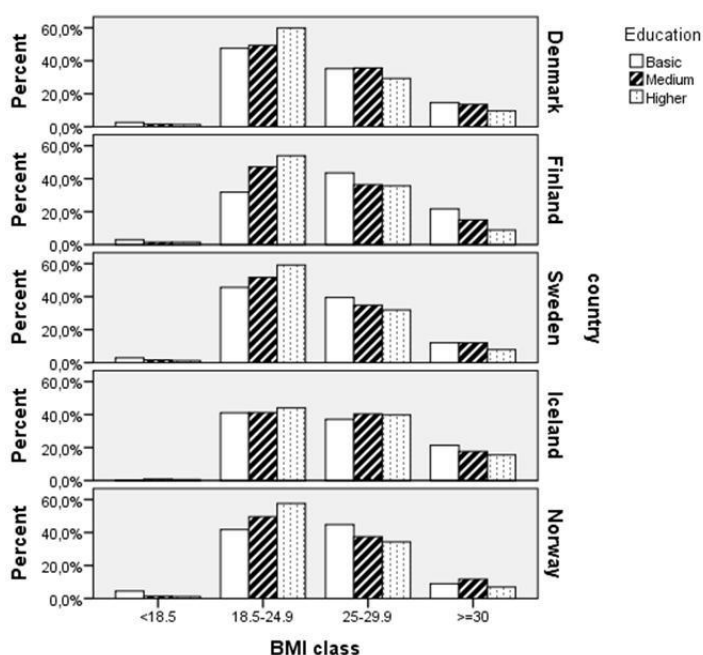
**Figure 50. Proportion of adults in different BMI classes in relation to age group**





Overall the percentage of overweight and obese persons increased with age. The same trend was seen in each of the 5 countries.

**Figure 51. Proportion of adults in different BMI classes in relation to education**



When looked at all countries together fewer with a higher education were overweight compared with persons with a basic or a medium long education. Likewise, fewer with a higher education was obese than persons with a medium education and the percentage of overweight was highest in the group with basic education. When looking at the countries separately, all countries, except Norway, had significantly fewer obese with a higher education than with a basic education. Furthermore, a non-significant trend was found with fewer being overweight with increasing length of education.

Generally, no differences with family status were seen (Figure 19, appendix C). Compared with persons living in the capital, more persons living at the country side were overweight and obese. More persons with overweight at the country side compared with the capital were also seen in Denmark and Finland whereas more obese at the country side than at the capital were found in Sweden (Figure 20, appendix C).

### **Summary and discussion - overweight adults**

Iceland had the highest percentage of overweight (approx. 39%) and obese people (approx. 18%). Denmark, Sweden and Norway had a comparable number of overweight and obese, 43–45%. BMI was higher in men than in women, increased with age and tended to be higher in participants with basic education. Furthermore, more participants living at the countryside than in the capital were overweight and obese.

The number with overweight and obesity in this survey is comparable with the number found in other surveys with self-reported data in *Denmark*. The part of overweight or obesity in another survey with 172,220 participants was 46.7% compared with 44.8% in the present survey (National Board of Health 2011). Furthermore, 13.4% were obese compared with 12.7% in this survey. The relation with sex, age, education, family status and urbanization was also the same as was found in the present survey.

In *Iceland* the prevalence of overweight among adults in the Icelandic National Dietary Survey 2010–2011 (N=1312) was 36.2% compared with 39.3% in the present survey. Furthermore, 20.8% were obese (ISNDS 2010–2011) compared with 17.8% in this study. The relation with sex and age is the same as was found in this survey but a higher prevalence of overweight and obesity in the country side was only seen among women in ISNDS. Furthermore, a non-significant trend was found with fewer being obese with increasing length of education in ISNDS but in this study it was a significant trend.

In the *Finnish* AVTK Study, which used self-reported data, the percentages of overweight (34.1%) and obesity (15.6%) are in line with the ones found in the Nordic Monitoring (37.2% and 14.0%) (Helakorpi et al 2011). However, the measured overweight and obesity levels are higher (Peltonen 2008). The FINRISK 2007 reported 40.4% overweight and 22.8% obesity in the population, as based on measured height and weight. In the FINRISK Study, the population mean of BMI was 27.4 in men and 26.9 in women, which is strikingly higher than in the Nordic Monitoring (men and women together, 25.7). The numbers in this report underestimates the true overweight and obesity levels, yet in line with other self-reported values.

In the *Swedish* national public health survey 2011 (age 16–84), 36 percent were overweight and 13 percent obese (www.fhi.se). More men than women were overweight, for example in the age group 45–64, 50 percent of the men and 33 percent of the women were overweight. In Riksmaten 2010–11 (Amcoff et al 2012), age 18–80, 28 percent of the women and 44 percent of the men were overweight. Obesity was found in 14 percent and

13 percent, respectively. The mean BMI was 25 in women and 26 in men. Thus, compared with the Nordic Monitoring (10% obesity) the number with obesity was a little higher in the other surveys.

The prevalence of overweight in Norway incl obesity in the Nordic monitoring survey was about 46%. In Norway there are no national representative data on the prevalence of overweight. However based on health studies from five counties (Oslo, Oppland, Hedmark, Troms and Finnmark) conducted between 2000–2003 over half of the adult men in Norway were found to be overweight and 15–18% were obese, according to BMI-values. The proportion of women who were overweight was somewhat lower. This difference between gender was also observed in the Nordic Monitoring study. Forty-year olds with high education are to a lesser degree obese than groups with lower education. In Oslo, the adult population is heavier in eastern districts than in western, particularly among women (National Public Health Institute, Overweight and obesity in Norway – fact sheet. Web-site read 18.06.12)

### 5.8.2 Children

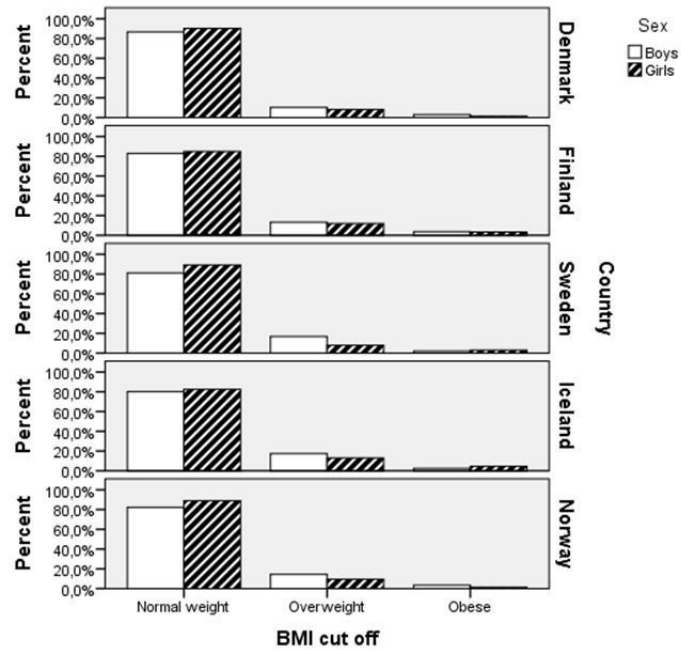
Body mass index for children was divided into 3 categories corresponding to normal weight, overweight and obesity. The cut-off values for the categories in children differ with age. The cut-off values used in this report are taken from Cole et al (2000) where cut-off values for every half year of age for boys and girls were established. Overall 85% of the children were normal weight, 12.2% were overweight and 2.8% obese. Percent of the children in the 3 categories in each country is shown in Table 32. The number of overweight and obese was quite similar in the 5 countries although fewer were normal weight in Iceland than in the other countries.

**Table 32. Percent of children with overweight**

	Country				
	Denmark	Finland	Sweden	Iceland	Norway
	%	%	%	%	%
Normal weight	88,4 <sub>a</sub>	84,0 <sub>a,b</sub>	84,8 <sub>a,b</sub>	81,4 <sub>b</sub>	85,6 <sub>a,b</sub>
Overweight	9,3 <sub>a</sub>	12,6 <sub>a</sub>	12,8 <sub>a</sub>	15,1 <sub>a</sub>	12,0 <sub>a</sub>
Obese	2,3 <sub>a</sub>	3,5 <sub>a</sub>	2,4 <sub>a</sub>	3,5 <sub>a</sub>	2,4 <sub>a</sub>

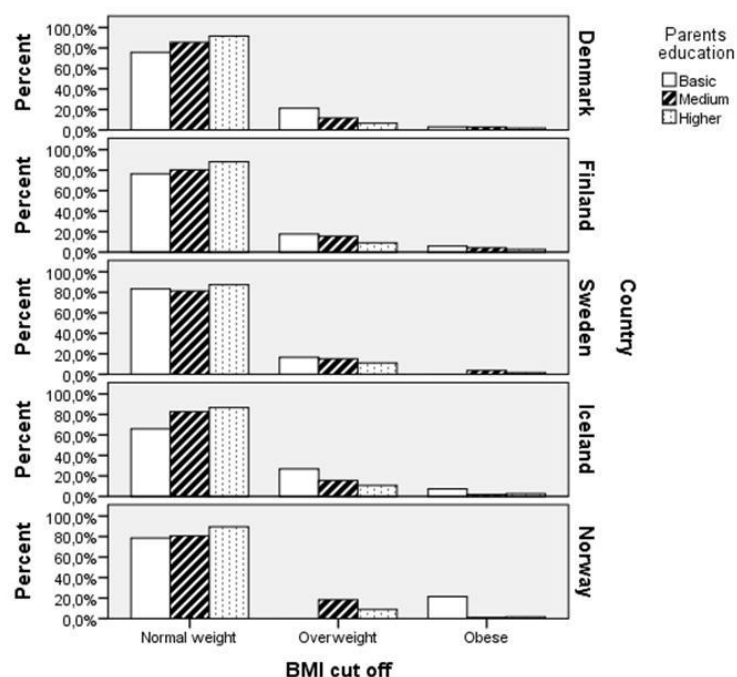
Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

Figure 52. Proportion of overweight in children in relation to sex



More girls than boys were normal weight and fewer were overweight in the whole cohort but this difference was only significant in Sweden. The low number with obesity makes it difficult to explore the potential sex differences.

**Figure 53. Proportion of overweight in children in relation to parent's educational level**



Overall the number with normal weight increased with increased educational level of the parent. The same trend was seen in all countries but was only significant in Iceland.

### Summary and discussion –overweight, children

The number of children with overweight and obesity was at the same level in all 5 countries; 9–15% were overweight and 2–4% obese.

In *Finland*, based on the LATE report (Maki 2010) where fifth grade boys and girls were measured for their BMI, the percentages of overweight and obesity were 14.5% and 0.9%. This finding is in line with overweight and obesity levels in the Nordic Monitoring. In another study (Luopa 2008), among slightly older children, the proportion of overweight children using self-reports was 20% in boys and 12% in girls.

In *Norway* no national representative data are available on the prevalence of overweight and obesity among children. From the information we have today, 15–20% of Norwegian children in the 8–12 year age group are overweight or obese (Helsedirektoratet 2008, Juliusson et al 2007, Vilimas et al 2005, Hovengen & Strand 2010). Approximately 8–14% of Norwegian 15–16-year olds are overweight or obese (Helsedirektoratet 2008, Grøholt et al 2008, Juliusson et al 2007).

In *Denmark*, a representative survey among schoolchildren using self-reports of weight and height in 2008 showed that 12% of children 11–15 year old were classified as overweight/obese (National Board of Health, 2010).

In *Sweden*, a representative survey among children in 2008 showed that 17% of children 7–9 year old were classified as overweight/obese (Sjöberg et al, 2011).



## 6. Smoking

Questions regarding smoking were not included in the questionnaire. However, smoking habits have been included in other representative surveys in the Nordic countries. The surveys differ from country to country with respect to number included, age groups and the way data were collected but still the data give a reasonable indication of smoking habits in the five countries.

**Table 33. Daily smokers (%) among men and women**

	Women	Number	Men	Number	All	Number
Denmark	19.3	93,526	22.7	79,717	20.9	17,3243
Finland	15.7	1,583	23.2	1,243	19.0	2826
Sweden	13/17*	5,404/5,442	12/30*	4,529/4,563	13/23*	9,933/10,005
Iceland	14	1,608	14	1,586	14	3,194
Norway	18		17		17	

\*smoking/smoking or "snus"

According to these data Denmark has the largest percentage of smokers among women whereas Finland and Denmark have approximately the same percentage of smokers among men.

**Table 34. Daily smokers (%) in different age groups**

Age (year)	Denmark <sup>a</sup>		Finland		Sweden <sup>b</sup>		Iceland <sup>c</sup>		Norway	
	M	W	M	W	M	W	M	W	M	W
15–24	19.4	15.6	17.5	17.9	27	16	12.4	6.3	9	13
25–34	19.7	15.7	22.3	15.8	30	16	8.4	10.0	16	13
35–44	22.7	20.0	21.7	16.1			16.3	15.8	15	18
45–54	26.5	24.7	27.3	15.8	34	21	17.8	16.3	21	23
55–64	27.2	23.3	23.8	13.9			17.5	17.6	23	21
65–74	21.5	18.5	-	-	22	11	11.1	14.4	23	21
>75	16.8	13.0	-	-			17.3	8.1	-	-
80–89	-	-	-	-			0	7.4	-	-

<sup>a</sup>The first age group in the Danish survey was 16–24

<sup>b</sup>The age groups in the Swedish survey were: 16–29 y, 30–44 y, 45–64 y and 65–85 y

<sup>c</sup>The age groups in the Icelandic survey were: 15–19 y, 20–29 y, 30–39 y, 40–49 y, 50–59 y, 60–69 y, 70–79 y and 80–89 y.



The highest amount of smokers are found among the middle-aged in all five countries with women in Finland being the only exception; in Finland women among the age group 15–24 y has the highest percentage of smokers.

The data are derived from various investigations. These investigations are shortly described in appendix.

## 7. Alcohol intake

In the present study, questions regarding alcohol intake have not been included but questions regarding alcohol intake have been included in other surveys in all countries. However, the questions asked in the various surveys are not comparable.

A high alcohol intake was seen in 10.6% (13.3% in men, 8% in women) in a Danish study and in 13% (16% in men, 10% in women) in a Swedish study. However, in Denmark a high intake was defined as a consumption more than 21 drinks per week for men and 14 for women whereas in Sweden it was called a risky alcohol intake calculated as an index which combined 3 questions of alcohol consumption.

In Denmark the percent who drink more than 5 drinks on one occasion at least once a month(%) and in Finland 6 drinks were:

**Table 35. Proportion of adults drinking more than 5 drinks on one occasion (%)**

	Men	Women	All
Denmark	38.5	19.2	28.7
Finland	43.4	18.2	29.3

In Finland and Iceland the frequency of alcohol intake were asked about:

**Table 36. Proportion with different frequency of alcohol intake (%)**

Frequency	Finland		Iceland <sup>c</sup>	
	Men	Women	Men	Women
Daily	6.8	1.3	3.2	1.0
2-3 times a week	24.9	13.1		
Once a week	17.3	15.2		
2-3 times a month	20.9	26.5		
A few times a year	19.9	32.3		
Never	10.3	11.6	3.7	6.6

The different ways to investigate alcohol intake makes it impossible to make a comparison between the Nordic countries. If we should be able to do that, a few questions of alcohol consumption is recommended in the next data collection in the Nordic monitoring.



## 8. Strengths and limitations of the study

The monitoring project provides comparable results on more than 11.500 participants in the Nordic region on diet, physical activity and overweight.

Since the questionnaire has been validated and the data collection has been conducted at the same period in all five Nordic countries, the results will give good insight in the status of important health related indicators in the Nordic region. The development of the Nordic indicator questionnaire has provided the Nordic region with an important tool for evaluating whether the goals and visions of the Nordic Plan of Action are developing in the right direction and to examine whether certain groups in the region are further from a healthy lifestyle than other groups.

With the Nordic indicator questionnaire it is possible to obtain knowledge which can help evaluating already existing health-promoting initiatives or lead to future initiatives. The questionnaire also enables regional or local stakeholders to collect data on the health behaviour of a particular population group on basis of a simple and validated method.

The indicator questions survey used in the Nordic Monitoring is however a rather rough way to measure dietary and physical activity habits; and although the same questionnaire was used in all countries, there are limitations when comparing between countries. For instance, the same frequency of intake can cover up different portion sizes in the different countries. Furthermore, especially the results from Norway should be taken with caution due to the low participation rate. The results should be used as indicators for dietary and physical activity habits and not as absolute numbers. On the other side, comparison with other surveys indicates the same trends in dietary intake, whereas the physical activity in general seems to be overestimated.



## 9. Overall conclusion

All countries are far from the goals of vegetable and fruit intake, sugar rich food is consumed more than 5 times a day in all countries, the intake of fish is low except in Iceland and in adults in Norway and too few children are physically active at least 1 hour a day. There are areas to be improved in all countries and according to this study there are some differences between countries; Denmark have the highest proportion who do not use spread on bread, but have fish more seldom than in the other countries. In Finland a higher proportion than in other countries use Becel Pro Activ on bread and more are physical active. Sweden has the highest intake frequency of sausages, the type of bread eaten differed from the other countries and, furthermore, Sweden have a high proportion of physical active people (as Finland), Iceland have a frequent intake of fish, the highest proportion who use oil for cooking, the most frequent intake of sugar rich food and the highest proportion of overweight and obese. However, Icelanders spend less time in front of a computer compared with the other countries. Norwegians have, according to this survey, the highest intake of fruits and vegetables but also the highest consumption of full fat cheese and spend more time in front of a computer than participants from other countries.

In conclusion this study gives a good status for dietary intake indicators, indicators for physical activity, sedentary time and overweight which makes it possibly in a comparative and relatively simple way to follow changes in these parameters over time in the Nordic countries.



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# 11. Sammenfatning

Som en vigtig del af Nordisk Handlingsplan for bedre sundhed og livskvalitet gennem mad og fysisk aktivitet 2006 har Nordisk Ministerråd besluttet at udføre et fælles nordisk monitoreringsstudie af kost, fysisk aktivitet og overvægt. Nærværende rapport beskriver resultaterne af den første dataindsamling i de 5 nordiske lande. Formålet med denne første dataindsamling er at tilvejebringe baseline data for frekvensen af indtaget af udvalgte fødevarer, for fysisk aktivitet samt for forekomsten af overvægt og fedme i de nordiske lande. Formålet er endvidere at sammenligne resultaterne mellem landene og at sammenligne med eksisterende anbefalinger, hvor dette er muligt. Endelig er formålet at se på social ulighed af kostvaner og fysisk aktivitet.

Telefoninterview blev gennemført i en tilfældig stikprøve i alle 5 nordiske lande med det samme validerede spørgeskema, som indeholdt simple indikatorspørgsmål. Interviewene blev udført fra oktober til december 2011. I alt deltog 9.153 voksne 18–65 år (deltagerprocent 40) og 2.479 børn 7–12 år (deltagerprocent 45).

## Resultater – kost

Den mest brugte type fedtstof på brød var i alle 5 lande blandingsprodukter af olie og smør (f.eks. Kærgården), som blev brugt af 28–45 % af deltagerne. Der var derudover markante forskelle i hvilken type fedtstof der blev brugt i de enkelte lande; margarine med lavt fedtindhold blev brugt af ca. 1 ud af 5 i Sverige, Island og Norge, hvorimod "Becel proactiv" blev brugt af næsten 1 ud af 5 i Finland. I Norge og ikke mindst i Danmark angav en stor andel, henholdsvis 29 % og 40 % af deltagerne, at de ikke brugte fedtstof på brød. Disse forskelle reflekterer sandsynligvis de forskellige anbefalinger i de forskellige nordiske lande. Olie var den type fedtstof der hyppigst blev brugt til madlavning i alle lande, 31–81 % angav at de brugte olie til madlavning. Brugen af fedtstof på brød og til madlavning hos børn fulgte det samme mønster som for voksne med de samme forskelle mellem landene.

Visionen i Den Nordiske Handlingsplan for 2021 hvad angår fedt er, at det gennemsnitlige indtag i populationen opfylder de Nordiske Næringsstofanbefalinger (NNR) for fedt heriblandt mættet fedt og transfedtsyrer, og at 70 % opfylder anbefalingen om den procentvise mængde energi fra

fedt. Med den høje andel af deltagerne, som brugte olie til madlavning, og den høje andel der anvendte enten fedtfattig margarine eller ingen fedtstof på brød, ser det ud til at de nordiske lande er på rette vej.

Både mængden og typen af brød der spises varierede mellem de nordiske lande. I Island var brødindtaget mindre end 1 skive om dagen, hvilket var lavere end i de øvrige nordiske lande. Rugbrød blev fortrinsvist spist af danskere og finner. Indtagelsen af fuldkornsbrød/grovbrød så ud til at være høj i Norge med en median indtagelse på over 2 skiver om dagen. Hvidt brød blev spist af overraskende få i følge denne undersøgelse; fra 43 % i Danmark og op til 80 % i Island indikerede at de aldrig eller sjældent spiste hvidt brød. Hos børnene sås de samme forskelle mellem landene som for de voksne. I følge Den Nordiske Handlingsplan er visionen for 2021 at mindst 70 % af populationen har et dagligt indtag af fuldkornsbrød/cerealier svarende til mindst halvdelen af deres daglige indtagelse af disse fødevarer. Andre cerealier end brød var ikke inkluderet i nærværende studie. Når man sammenligner indtagelsen af rugbrød plus fuldkornsbrød/grovbrød udgør disse mere end halvdelen af brødindtaget hos 96 % af deltagerne. Brødet der rapporteres som fuldkornsbrød/grovbrød indeholder dog ikke nødvendigvis meget fuldkorn og kostfiber. Det er derfor tvivlsomt om målet mht. fuldkornsbrød er nået, men der synes at være en god viden om vigtigheden af at vælge fuldkornsbrød på bekostning af hvidt brød.

Den mediane indtagelse af frugt og grøntsager var på nogenlunde samme niveau i alle 5 lande. Frugt og grøntsager blev spist mellem 2,5 og 3,5 gange om dagen. Den Nordiske Handlingsplan har som en af visionerne for 2021 at mindst 70 % af populationen over 10 år har en daglig indtagelse af frugt og grøntsager på mindst 500 g, en mængde som kan estimeres til 5 gange om dagen. I følge nærværende studie havde 8–22 % af deltagerne i de forskellige lande en indtagelse over 5 gange om dagen. Der er således lang vej til dette mål er nået.

Kager, sukkerholdige sodavand og lignende, og især chokolade og slik, spises ofte i alle lande. Kun 3–4 % af alle deltagere angav at de aldrig eller sjældent spiste sukkerrige fødevarer, og den mediane indtagelse var 4 gange om ugen. Sukkerholdige sodavand o. lign. blev regelmæssigt indtaget af 50 % af den voksne befolkning i de nordiske lande. Island havde den højeste indtagelse af sukkerrige fødevarer, mens Sverige havde den laveste. Blandt børnene blev sukkerrige fødevarer spist regelmæssigt af langt de fleste, og mindre end 4 % angav, at de aldrig eller mindre end 1 gang om måneden, spiste chokolade eller slik. Et typisk indtag af sukkerholdige sodavand o. lign. blandt børn var en gang om ugen i alle 5 lande, og et typisk indtag af sukkerrige fødevarer var 4 gan-

ge om ugen, nogenlunde svarende til 200 til 250 g om ugen. Dette svarer til den mængde, som børn maksimalt kan spise om ugen, hvis Nordiske Næringsstofanbefalinger skal overholdes. Næringsstofanbefalingerne lyder på at max 10 procent af energien skal komme fra sukker, dette kan groft oversættes til 250 g om ugen, dog afhængig af børnenes alder. Målet er at mindst 80 % af børnene overholder denne anbefaling. I følge nærværende undersøgelse gør ca. 50 % det.

Undersøgelsen viste ret store forskelle i indtagelsen af fisk mellem de nordiske lande både hos voksne og børn. I Island og Norge spiste deltagerne fisk som hovedmåltid to gange om ugen, mens fisk kun blev spist halvt så ofte i Danmark. Sverige og Finland havde et indtag mellem disse to yderpunkter. Næsten alle deltagere i Island, Norge og Sverige spiste regelmæssigt fisk i modsætning til i Danmark, hvor 12 % angav at de aldrig, eller sjældnere end 1 gang om måneden, spiste fisk. Spørgeskemaet indeholdt dog kun spørgsmål om fisk til hovedmåltid. Da det er almindeligt at spise fisk som pålæg i nogle lande, bla. Danmark og Norge, er indtagelsen af fisk underestimeret i disse lande. I Den Nordiske Handlingsplan er visionen for 2021 at mindst 70 % spiser fisk eller fiskeprodukter svarende til to hovedmåltider om ugen. I følge nærværende undersøgelse opfylder 43 % af de voksne og 10 % af børnene denne anbefaling, men det varierer meget fra land til land.

De ovenfor nævnte fødevarer blev inkluderet i et kostindex sammen med nogle fedtrige fødevarer (pølser, fuldfed ost) samt fedtstof. Dette index er et udtryk for hvor sund kosten er. Kostindexet var forskelligt fra land til land; Island og Sverige havde den laveste score, som indikerer den mindst sunde kost, mens Norge havde den højeste score. Den andel som kunne betegnes som havende en sund kost, dvs. de, som havde en score på 8 eller derover (af 12 mulige) varierede fra 9 % i Sverige og op til 18 % i Finland og 24 % i Norge. Gennemsnitligt havde 70 % af både børn og voksne en kost, som kunne betegnes middel sund, men flere børn end voksne havde en dårlig kost. Kun 0,3 % af de voksne og ingen af børnene fik den højeste score. Blandt børnene havde 2 % af de svenske børn en kost, som kunne betegnes som sund, mens 10–12 % havde en sund kost i Danmark og Norge.

Når man ser på kostvanerne hos de to køn, så har kvinderne sundere kostvaner end mænd, vurderet ud fra scoren af kostindexet. Endvidere havde kvinderne sundere vaner hvad angik fedtindtag, de havde en højere indtagelse af frugt og grøntsager og en lavere indtagelse af sukkerholdige sodavand.

Deltagere med en lang uddannelse havde generelt sundere kostvaner end deltagere med kort uddannelse.

Blandt visionerne for 2021 i Den Nordiske Handlingsplan, er et af målene, at forskellen mellem de forskellige socialgrupper med hensyn til kostvaner, ikke skal afvige mere end 20 %. Det er vanskeligt at beregne denne forskel, men hvis man ser på forskellen i kostindex mellem deltagere med kort og lang uddannelse, er forskellen mindre end 10 %. En årsag til, at forskellen mellem deltagere med kort og lang uddannelse ikke er større, kan være, at de mindst sundhedsbevidste ikke vil deltage i en undersøgelse som denne. Resultaterne af nærværende studie er mest anvendelige til at beskrive forskelle mellem landene og følge ændringer i kostvaner i de nordiske lande i fremtiden. Den høje andel af nordmænd, som spiste sundt, kan skyldes en overrepræsentation af højt uddannede og sundhedsbevidste personer blandt deltagerne sammenlignet med den gennemsnitlige nordmand. Resultaterne er især usikre i Norge pga. lav deltagerprocent.

### **Resultater – fysisk aktivitet**

Deltagerne fra Finland og Sverige var de mest fysisk aktive blandt de voksne og disse 2 lande havde flest som opfyldte både minimum anbefalingerne på en halv times moderat fysisk aktivitet dagligt (ca. 70 %) og den fulde anbefaling for fysisk aktivitet, som også indeholder anbefaling af hård fysisk aktivitet (17 og 13 % i Finland og Sverige, henholdsvis). Mænd og kvinder var ikke signifikant forskellige mht. fysisk aktivitetsniveau, men lidt flere mænd end kvinder var inaktive. Endvidere så steg andelen af inaktive med stigende alder, hvorimod andelen, som opfyldte den fulde anbefaling faldt med alderen. Generelt var der færre inaktive blandt deltagere med lang uddannelse og flere opfyldte minimumanbefalingen.

Deltagere fra Sverige og Island brugte mindst fritid foran TV, computer o. lign. med en median tid på 2,5 timer sammenlignet med 3 timer i de 3 øvrige lande. Kvinder brugte generelt mindre tid foran TV, computer o. lign. end mænd. Andelen, som sad mere end 4 timer ved TV, computer eller lign. i fritiden var højest blandt den yngste aldersgruppe, i gruppen med kort uddannelse og blandt singler. Herudover var der færre blandt deltagere bosiddende på landet, som havde mere end 4 timers skærmtid sammenlignet med deltagere bosiddende i en hovedstad.

Blandt børn var deltagerne fra Finland og Island de mest aktive, og i disse lande var der flest, 52 og 56 % henholdsvis, som opfyldte anbefalingen om 1 times daglig fysisk aktivitet. I modsætning var der kun 28 % af de svenske deltagende børn, som opfyldte denne anbefaling. Generelt var der flere drenge end piger, som opfyldte anbefalingen.

I den Nordiske Handlingsplan er en af visionerne for 2021 at alle børn i alderen 1–12 år og mindst 85 % af børn og unge mellem 12 og 16

år er fysisk aktive mindst 1 time om dagen. Nærværende undersøgelse fandt at 44 % af de nordiske børn var fysisk aktive 1 time dagligt.

Børnene brugte i gennemsnit 2–3 timer foran fjernsyn og/eller computer dagligt – lidt mere end de voksne. Ligesom hos voksne, var der flere drenge end piger, der brugte mere end 4 timer foran skærmen.

### **Resultater – overvægt og fedme**

Island havde den højeste andel af overvægtige (ca. 39 %) og fede (ca. 18 %). Danmark, Sverige og Norge havde næsten samme andel overvægtige; 43–45 %. BMI var højere hos mænd end hos kvinder, steg med stigende alder og havde en tendens til at være højere blandt deltagere med kort uddannelse. Flere af deltagerne bosiddende på landet end i hovedstaderne var overvægtige og fede.

Andelen af overvægtige børn var nogenlunde ens blandt de 5 lande; 9–15 % var overvægtige og 2–4 % var fede.

### **Styrker og begrænsninger**

De indikatorspørgsmål, som anvendes i nærværende studie, er en ret grov måde at måle kost- og fysisk aktivitetsvaner, og selvom samme spørgeskema anvendtes i alle 5 lande, er der begrænsninger når man skal sammenligne mellem landene. F.eks. spørges der om hyppigheden af indtag, og denne hyppighed kan dække over forskellige portionsstørrelser og dermed indtag i de forskellige lande. Resultaterne skal derfor kun bruges som indikatorer for kostvaner og fysisk aktivitet, og ikke som absolutte værdier. Endelig skal især resultaterne fra Norge tages med et vist forbehold pga. den lave deltagerprocent.

Andre undersøgelser i de nordiske lande viser samme trends i kostvaner, men nærværende undersøgelse ser ud til at overestimere den fysisk aktivitet. En styrke ved undersøgelsen er, at den giver sammenlignelige resultater mellem landene og har over 11500 deltagere. Da spørgeskemaet er valideret og da dataindsamlingen blev udført på (næsten) samme tidspunkt i alle 5 lande, vil resultaterne give god indsigt i status for vigtige sundhedsrelaterede indikatorer i norden.

### **Konklusion**

Denne undersøgelse giver en god status for udvalgte indikatorer for kostvaner og fysisk aktivitet, stillesiddende tid samt overvægt, og gør det muligt i en sammenlignende og relativt simpel undersøgelse, at følge ændringer i disse indikatorer over tid i de nordiske lande.

Alle lande er et godt stykke fra målet hvad angår indtagelsen af frugt og grøntsager. Sukkerrige fødevarer indtages ca. 4 gange om ugen i alle lande og indtagelsen af fisk er lav, med Island og voksne i Norge som

undtagelser. Endvidere er for få børn fysisk aktive i mindst 1 time dagligt i alle lande. Der er flere forskelle mellem landene; Danmark har den højeste andel som ikke bruger fedtstof på brød, men spiser fisk sjældnere end i de andre lande. I Finland er der en stor andel, som bruger Becel Pro Activ på brød og det er det land, som har flest fysisk aktive. Sverige har den hyppigste indtag af pølser og spiser andre typer brød end i de øvrige lande. Derudover har Sverige en stor andel, som er fysisk aktive (næsten ligeså stor som i Finland). Island har en hyppig fiskeindtagelse, har den højeste andel som bruger olie ved madlavning, det hyppigste indtag af sukkerrige fødevarer og den højeste andel af overvægtig og fede. Islændingene bruger dog mindst tid foran computer, fjernsyn m.m. sammenlignet med de øvrige lande. Norge har, ifølge denne undersøgelse, det højeste indtag af frugt og grønt, men også det højeste indtag af fede oste, og de tilbringer mere tid foran computeren end deltagere fra de andre lande.

# 12. Appendix A

## 12.1 Questionnaires

The questionnaire used in children (7–12 year) and adults (18–65 year) are shown in the following pages.

The questionnaire is developed to be used as a telephone interview (computer assisted). It is recommended not to change the order of questions, but national adaptation can be necessary. A preliminary suggestion of coding is shown. In general, text in bold is read out aloud, whereas text in italics normally is information for the interviewer.

<b>Diet and physical activity of Nordic adults</b>	
<i>Date of interview</i>	
<i>Name of interviewer, identification number of respondent etc.</i>	
<b>Q0</b>	<b>Registration of the sex of the interviewed person</b>
	Male ..... <input type="checkbox"/> 1
	Female ..... <input type="checkbox"/> 2
<b>Q1</b>	<b>What is your date of birth?</b>
	1A Month <input type="text"/> <input type="text"/> 1B Year <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	January =01
	February=02
	May =03
	Etc.
<b>Q2</b>	<b>What is your education<sup>1</sup>?</b>
	[The years have to be adjusted to different countries]
	Basic education (10 years or less) ..... <input type="checkbox"/> 1
	Vocational education/Upper Secondary education – practical (approx. 10-12 y) ..... <input type="checkbox"/> 2
	Upper Secondary education – theoretical (approx. 10-12 y) ..... <input type="checkbox"/> 3
	Short higher education (i.e. Bachelor degree or comparable; approx. 13-14 y) ..... <input type="checkbox"/> 4
	Medium higher and long higher education (i.e. Master or doctoral level education; approx. 15 y+) ..... <input type="checkbox"/> 5

<sup>1</sup> Combined school and further education. The education has to be completed.



**Q3** Which description explains best where you live?

[The years have to be adjusted to different countries]

*(Place only one cross)*

The Capital and suburb .....  1

A large city (more than 50.000 inhabitants) .....  2

A city of between 20.000 – 49.999 inhabitants .....  3

A town between 1000 – 19999 inhabitants .....  4

Country side .....  5

Do not know .....  88

**Q4** Do you live together with anyone? (multiple responses possible)

1 = Yes, 0 = No

4.1 Yes, with spouse/partner or cohabite .....  1=Yes, else 0

4.2 Yes, with mother/father/parents .....  1=Yes, else 0

4.3 Yes, with kids living at home (kids < 18 y) .....  1=Yes, else 0

4.4 Yes, with kids living at home (≥18 y) .....  1=Yes, else 0

4.5 Yes, with others .....  1=Yes, else 0

4.6 no I live alone .....  1=Yes, else 0

4.6 (Single Response only) If 4.6 = 1 → go to question 6

**Q5** How many people live in your household including yourself?

Number of persons in the household  
(Must be at least 1)

**Q6** How tall are you?

\_\_\_\_\_ cm.

Do not know .....  888

Refuse .....  999

**Q7** How much do you weight? (for pregnant women: the weight before pregnancy)

\_\_\_\_\_ kg.

Do not know .....  888

Refuse .....  999

*The following questions regard what you usually eat. Please keep the last 12 months in mind when you respond to the questions. You have to keep in mind what you eat most often*

**Q8** What type of spread/grease do you usually put on your bread? If you use more than one kind, respond to what you use the mos.?

*If the respondent mentions butter, ask if he/she means butter or butter-oil spreads*

*If the respondent is in doubt whether she/he uses margarine or vegetable margarine, ask if the grease comes in paper wrapping or in a container*

Butter .....  1

Oil-butter spreads .....  2

Vegetable margarine 60-80% .....  3

Low fat margarine (e.g. 'Lätta', 'Becel', 38% fat) .....  4

'Becel Pro-Activ' .....  5

Margarine 70-80% .....  6

Fat (pig or duck, coconut) .....  7

Do not use spread/grease/fat on bread .....  8

Do not know .....  88

**Q9** What type of fat, eg. butter, margarine or oil, do you usually use for domestic cooking?

If you use more than one kind, respond regarding to what you use most

*If the respondent mentions butter, ask if he/she means butter or butter-oil spread.*

*If the respondent is in doubt whether she/he uses margarine or vegetable margarine, ask if the grease comes in paper wrapping or in a container*

Butter .....  01

Oil-butter spreads .....  02

Frying or baking margarine 70-80% fat .....  03

Vegetable margarine 60-80% fat .....  04

Fluid margarine, oil-margarine (e.g 'BeceI', 'Lise').....  05

Oil (e.g. rapeseed oil, olive oil, corn oil, sunflower oil, grapeseed oil, salad oil etc) .....  06

Use a mixture of oil and butter/butter-oil spread .....  07

Fat (pig, duck, coconut) .....  08

Do not use spread/grease/fat for cooking .....  09

We do not cook/prepare food in our household.....  10

Do not know .....  88

**Q10** How many slices of bread do you eat per day or per week?

Answer according to slice/piece/½ roll

*Wholegrain bread also includes wholemeal bread, full grain bread and might carry the wholegrain label.*

*Rolls are also considered bread.*

		<i>Slice/piece/½ roll</i>	
		<i>A per day</i>	<i>B per week</i>
<b>10.1</b>	<b>Rye Bread</b>		
	How many slices of rye bread do you eat?	┌┐	┌┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88
<b>10.2</b>	<b>Wholegrain/Wholemeal bread (not rye bread)</b>		
	How many slices of wholegrain/wholemeal bread do you eat?	┌┐	┌┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88
<b>10.3</b>	<b>White bread</b>		
	How many slices of white bread, toastbread, ciabatta do you eat?	┌┐	┌┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88
<b>10.4</b>	<b>Hard bread</b>		
	How many slices of hard bread do you eat?	┌┐	┌┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88

**Q11** How often do you eat fruit and vegetables during a day, a week or a month. If you do not eat fruit and vegetables every day, please think about how often you eat it in a week or in a month. Think about the last 12 months when you respond.

*Please respond to both sub questions, but only one response (cross, X) on each row*

Do not count small portions, e.g. a slice of cucumber on bread, parsley as decoration, berries on cake etc.

**11.1** How often do you eat vegetables, pulses and/or root fruits (includes fresh, frozen, canned, glass/potted etc)

**DO NOT COUNT POTATOES**

It is vegetables such as carrots, tomatoes, cucumber, broccoli, peppers, salad, beans, chick peas, lentils, beetroot, celery and parsnip.

Try also to include dishes that have vegetables in them, such as mixed salad, mixed vegetables, fried vegetables, vegetable soup and stews.

Times per month				Times per week						Times per day					
<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Don't know .....  88

None .....  66

**11.2** How often do you eat fruit and berries (includes fresh, frozen, canned, glass/potted etc)

Fruit and berries include: an apple, an orange, a banana, a brunch of grapes, a plate of strawberries or fruit and berries that are part of a fruit stew or fruit salad etc.

Times per month				Times per week						Times per day					
<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Don't know .....  88

None .....  66

**Q12** Now I will ask you how often you eat and drink a selection of food. Please consider the past 12 months when you answer these questions.  
Please answer all questions, but only cross one box on each row

	A				B						C			
	Times per month				Times per week						Times per day			
	<1*	1	2	3	1	2	3	4	5	6	1	2	3	4 or more
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How often do you eat/drink?</b>														
12.01 French fries, roasted/fried potatoes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.02 Fish and shellfish as main course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.03 Sausage as a main course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.04 Chocolate and/or candy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.05 Cake, biscuits, tart etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.06 Full fat cheese (45-60+ or 24-44% fat)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.07 Low fat/sugar-free fizzy drinks, cordial, ice-tea, light or sugar free drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.08 Normal fizzy drinks, cordial, ice-tea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.09 Energy drinks, red bull, cult etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.10 Fruit juice or Vegetable Juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Don't know .....													<input type="checkbox"/>	88
None .....													<input type="checkbox"/>	66

The next questions regard your physical activity

[Comment: *The interviewer reads three examples of activity. Additional examples are in italics and if the respondents have difficulties in answering, the interviewer can add some of these additional examples on request. Generally the interviewer does not read the text in italics but can use the text as a reminder or can read it on request.*]

I am going to ask you about physical activity during the last 7 days. Your information is important even if your child has not been physically active.

**Q13** Do you work, attend school or university?

Yes .....  1

No .....  5

**Filter:**

If No (5) in question 13 → go to question 15

**Q14** Which one of the following descriptions best fits your occupation, or school hours?

*Do not include travel to and from work or school*

Mostly sedentary work like office work .....  1

*Additional examples are cashier in a store or in a bank, and light manual work*

Work that requires a lot of walking like teaching .....  2

*Additional examples are shop assistant, light industrial work*

Work that requires a lot of walking and lifting, like a nurse .....  3

*Additional examples are heavy industrial work*

Heavy manual labour like heavy construction .....  4

*Additional examples are heavy farm work, heavy forestry*

[Question 15 (moderate or harder activity)]

Next, I am going to ask you about all physical activity during your leisure time and active transportation e.g. commuting to and from work or school. include PA while running errands. Include all activity where the physical effort is moderate or harder, that is, you should include both moderate and vigorous activity. This kind of activity accelerates heart rate and breathing. Examples are brisk walking, running and heavy gardening. Additional examples are Nordic walking, bicycling, and golf; these examples can be country specific.

Q15

During the last 7 days, how much time in total did you spend in physical activity where the physical effort was moderate or harder and lasted for at least 10 min each time? Estimate to the nearest half an hour.

The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if physical activity is less or more than 150 min (2½ h) and if it is more or less than 300 min (5 h)

Hours .....

Minutes .....

Don't know .....  88

[Question 16 (vigorous activity)]

Q16

Next, I am going to ask you how much of the physical activity you indicated in the last question, was vigorous. This kind of activity causes substantial increase in heart rate and sweating, as well as rapid breathing that makes it difficult to talk. Examples are running or playing soccer Additional examples are fast bicycling, badminton or tennis, and cross-country skiing; these examples can be country specific.

During the last 7 days, how much time in total did you spend during leisure time in vigorous physical activity that lasted for at least 10 min each time? Estimate to the nearest half hour.

The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if physical activity is less or more than 75 min (1 h and 15 min) and if it is more or less than 150 min (2½h)

Hours .....

Minutes .....

Don't know .....  88



[Question 17a (Sedentary time: TV watching)]

During the last 7 days, how much time per day on average did you spend sitting and watching TV during your leisure time? Estimate it to the nearest half hour. Include videos, DVD and console games (PlayStation, Xbox, etc) played on TV screen.

*The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours*

Hours .....

Minutes .....

Don't know .....  88

[Question 17b (Sedentary time: Computer screen time)]

During the last 7 days, how much time per day on average did you spend in front of a computer screen during your leisure-time? Estimate to the nearest half an hour. Include video-games, mobile phone games and internet use, and TV programs watched on a computer screen; include home work.

*The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours*

Hours .....

Minutes .....

Don't know .....  88

[Question 18 (classification of leisure-time physical activity)]

Choose one of the following descriptions that best fits your leisure time activity during the last 7 days.

- Reading, watching TV or other sedentary activity?  1
- Walking, cycling, or other forms of light exercise that lasted for at least 4 hours during the last 7 days. Include walking or cycling to and from place of work, Sunday-walking, etc. ....  2
- Participation in recreational sports, heavy gardening, etc., where the duration of the activity lasted for at least 4 hours in total during the last 7 days  3
- Participation in hard training or sports competitions, regularly several times during the last 7 days.....  4

<b>Diet and physical activity of Nordic children</b>	
<i>Date of interview</i>	
<i>Name of interviewer, identification number of respondent etc</i>	
<b>Q0</b>	<b>Registration of the sex of the interviewed person</b>
Male .....	<input type="checkbox"/> 1
Female .....	<input type="checkbox"/> 2
<b>Q1A</b>	<b>What is your child's date of birth?</b>
	1A Month <input type="text"/> <input type="text"/>   1B Year <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	January =01
	February=02
	May =03
	Etc.
<b>Q1B</b>	<b>What is your child's sex?</b>
Boy .....	<input type="checkbox"/> 1
Girl .....	<input type="checkbox"/> 2
	<b>Q1B open: What is the child's pet name? Write here:</b> _____
<b>Q1C</b>	<b>Are you the child's:</b>
Mother/Stepmother .....	<input type="checkbox"/> 1
Father/Stepfather .....	<input type="checkbox"/> 2
	Other, write the relationship here: _____

**Q2** What is your education<sup>2</sup>?

[The years have to be adjusted to different countries]

Basic education (10 years or less) .....  1

Vocational education/Upper Secondary education – practical (approx. 10-12 y) .....  2

Upper Secondary education – theoretical (approx. 10-12 y) .....  3

Short higher education (i.e. Bachelor degree or comparable; approx. 13-14 y) .....  4

Medium higher and long higher education (i.e. Master or doctoral level education; approx. 15 y+) .....  5

**Q3** Which description explains best where you live?

[The years have to be adjusted to different countries]

*(Place only one cross)*

The Capital and suburb .....  1

A large city (more than 50.000 inhabitants) .....  2

A city of between 20.000 – 49.999 inhabitants .....  3

A town between 1000 – 19999 inhabitants .....  4

Country side .....  5

Do not know .....  88

<sup>2</sup> Combined school and further education. The education has to be completed.

**Q4 Do you live together with anyone? (multiple responses possible)**

1 = Yes, 0 = No

4.1 Yes, with spouse/partner or cohabite .....  1=Yes, else 0

4.2 Yes, with mother/father/parents .....  1=Yes, else 0

4.3 Yes, with kids living at home (kids < 18 y) .....  1=Yes, else 0

4.4 Yes, with kids living at home (≥18 y) .....  1=Yes, else 0

4.5 Yes, with others .....  1=Yes, else 0

4.6 no I live alone .....  1=Yes, else 0

4.6 (Single Response only) If 4.6 = 1 → go to question 6

**Q5 How many people live in your household including yourself?**

Number of persons in the household  
(Must be at least 1)

**Q6 How tall is your child?**

cm.

Do not know .....  888

Refuse .....  999

**Q7 How much do you child weight?**

kg.

Do not know .....  888

Refuse .....  999

The following questions regard what your child usually eat. Please keep the last 12 months in mind when you respond to the questions. You have to keep in mind what your child eats most often

**Q8** What type of spread/grease do your child usually put in his/hers bread? If your child uses more than one kind, respond to what your child uses the most?

*If the respondent mentions butter, ask if he/she means butter or butter-oil*

*If the respondent is in doubt whether the child uses margarine or vegetable margarine, ask if the grease comes in paper wrapping or in a container*

Butter .....  1

Oil-butter spreads .....  2

Vegetable margarine 60-80% .....  3

Low fat margarine (e.g. 'Lätta', 'Becel', 38% fat) .....  4

'Becel Pro-Activ' .....  5

Margarine 70-80% .....  6

Fat (pig or duck, coconut) .....  7

Do not use spread/grease/fat on bread .....  8

Do not know .....  88

**Q9** What type of fat, eg. butter, margarine or oil, do you usually use for domestic cooking?

If you use more than one kind, respond regarding to what you use most

*If the respondent mentions butter, ask if he/she means butter or butter-oil spreads*

*If the respondent is in doubt whether she/he uses margarine or vegetable margarine, ask if the grease comes in paper wrapping or in a container*

Butter .....  01

Oil-butter spreads .....  02

Frying or baking margarine 70-80% fat .....  03

Vegetable margarine 60-80% fat .....  04

Fluid margarine, oil-margarine (e.g 'Becel', 'Lise').....  05

Oil (eg. rapeseed oil, olive oil, corn oil, sunflower oil, grapeseed oil, salad oil) .....  06

Use a mixture of oil and butter/butter-oil spreads .....  07

Fat (pig, duck, coconut) .....  08

Do not use spread/grease/fat for cooking .....  09

We do not cook/prepare food in our household.....  10

Do not know .....  88

**Q10** How many slices of bread does your child eat per day or per week?  
 Answer according to slice/piece/½ roll

*Grain bread also includes wholemeal bread, full grain bread and might carry the wholegrain label.*

*Rolls are also considered bread.*

		<i>Slice/piece/½ roll</i>	
		<i>A per day</i>	<i>B per week</i>
<b>10.1</b>	<b>Rye Bread</b>		
	How many slices of rye bread does your child eat?	┌──┐	┌──┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88
<b>10.2</b>	<b>Wholegrain/wholemeal bread (not rye bread)</b>		
	How many slices of whole grain/wholemeal bread does your child eat?	┌──┐	┌──┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88
<b>10.3</b>	<b>White Bread</b>		
	How many slices of white bread, toast-bread, ciabatta does your child eat?	┌──┐	┌──┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88
<b>10.4</b>	<b>Hard bread</b>		
	How many slices of hard bread does your child eat?	┌──┐	┌──┐
	Never eat .....		<input type="checkbox"/> 77
	Do not know .....		<input type="checkbox"/> 88

**Q11** How often does your child eat fruit and vegetables during a day, a week or a month. If your child does not eat fruit and vegetables every day, please think about how often your child eats it in a week or in a month. Think about the last 12 months when you respond.

*Please respond to both sub questions, but only one response (cross, X) on each row*

Do not count small portions, e.g. a slice of cucumber on bread, parsley as decoration, berries on cake etc.

**11.1** How often does your child eat vegetables, pulses and/or root fruits (includes fresh, frozen, canned, glass/potted etc)

**DO NOT COUNT POTATOES**

It is vegetables such as carrots, tomatoes, cucumber, broccoli, peppers, salad, beans, chick peas, lentils, beetroot, celery and parsnip.

Try also to include dishes that have vegetables in them, such as mixed salad, mixed vegetables, fried vegetables, vegetable soup and stews.

Times per month				Times per week						Times per day					
<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Don't know .....  88

None .....  66

**11.2** How often does your child eat fruit and berries (includes fresh, frozen, canned, glass/potted etc)

Fruit and berries include: an apple, an orange, a banana, a bunch of grapes, a plate of strawberries or fruit and berries that are part of fruit stew, or fruit salad etc.

Times per month				Times per week						Times per day					
<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Don't know .....  88

None .....  66

**Q12** Now I will ask you how often your child eats and drinks a selection of food. Please consider the past 12 months when you answer these questions.  
*Please answer all questions, but only cross one box on each row*

	A				B						C			
	Times per month				Times per week						Times per day			
	<1*	1	2	3	1	2	3	4	5	6	1	2	3	4 or more
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How often does you child eat/drink?</b>														
12.01 French fries, roasted/fried potatoes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.02 Fish and shellfish as main course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.03 Sausage as a main course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.04 Chocolate and/or candy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.05 Cake, biscuits, tart etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.06 Full fat cheese (45-60+ or 24-44% fat)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.07 Low fat/sugar-free fizzy drinks, cordial, ice-tea, light or sugar free drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.08 Normal fizzy drinks, cordial, ice-tea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.09 Energy drinks, red bull, cult etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.10 Fruit juice or Vegetable Juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Don't know ..... <input type="checkbox"/> 88													
	None ..... <input type="checkbox"/> 66													



The next questions regard physical activity of the child

[Comment: *The interviewer reads three examples of activity. Additional examples are in italics and if the respondents have difficulties in answering, the interviewer can add some of these additional examples on request. Generally the interviewer does not read the text in italics but can use the text as a reminder or can read it on request.*]

I am going to ask you about physical activity of your child outside school hours during the last 7 days. Your information is important even if your child has not been physically active.

[Question 13]

I am going to ask you about all physical activity during your child's leisure time and active transportation [e.g. *transportation to and from school*]. Include all activity where the physical effort is moderate or harder that is, you should include both moderate and vigorous activity. This kind of activity accelerates heart rate and breathing. Examples are bicycle riding, football (soccer) or outdoor games.

*Additional examples are playing handball, skateboarding; these examples can be age and country specific*

During the last 7 days, how much time in total did your child spend in physical activity where the physical effort was moderate or harder? Estimate to the nearest half hour.

*The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if physical activity is less or more than 3½ hours and if it is more or less than 7 hours*

Hours .....    
Minutes .....    
Don't know .....  88

[Question 14a (Sedentary time, TV watching)]

During the last 7 days, how much time per day on average did your child spend sitting and watching TV in his/her leisure time? Estimate it to the nearest half hour. Include videos, DVD and console games (PlayStation, Xbox, etc) played on TV screen.

*The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours*

Hours .....    
Minutes .....    
Don't know .....  88

[Question 14b (Sedentary time; Computer screen time)]

During the last 7 days, how much time per day on average did your child spend in front of a computer screen during his/her leisure-time? Estimate to the nearest half an hour. Include video-games, mobile phone games and internet use, and TV programs watched on a computer screen; include home work.

*The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours*

Hours .....    
Minutes .....    
Don't know .....  88

## 13. Appendix B

### 13.1 Data handling and calculations

The questions on bread intake asked how many slices of bread were normally eaten either per day or per week. Answers more than 15 slices per day were judged unrealistic and changed to missing. Other questions on frequency intake asked per month (<1 to 3 times), per week (1–6 times) or per day (1 to ≥6 times). Results coded as values higher than these were judged to be a mistake and changed to missing.

Answers on frequency questions were transformed into times/slices a day, times a week or times a month. The conversion factor between month and day was 30, and between month and week 4.

Unfortunately, many strange/unrealistic results were found for physical activity and screen time. In the question about time spend on moderate and vigorous physical activity answers between 1 and 4 minutes per day were changed to missing values (as these data were probably entered wrongly). Answers between 22 and 35 hours a day were truncated down to 21 hours a week. Answers above 35 hours were changed to missing (as these were judged unrealistic). In question 15 in the questionnaire for adults (time spend on vigorous physical activity the last week) answers between 10 and 21 hours were changed to 10 hours and answers more than 21 hours were judged unrealistic and changed to missing. Answers in question 14 and 15 were changed to nearest ½ hour and further calculations were done in hours.

To calculate time spend on moderate physical activity time (adults) question 15 (vigorous physical activity, VPA) were subtracted from question 14 (moderate and vigorous physical activity, MVPA). When this was done 294 participants had negative values. This should of course not be possible. These were changed to missing also in question 14 and 15.

In the two questions on screen time answers more than 18 hours a day were changed to missing and answers between 12 and 18 hours were truncated down to 12 hours.

Physical activity categories (PAC) were calculated from question 14 (MVPA) and 15 (VPA) for adults. First moderate physical activity (MPA) was calculated by subtracting VPA from MVPA.

Then  $MPAratio = MPA/MPAcp$  was calculated.  $MPAcp$  (cut-point for MPA) was set at 3,5 hours/week. Likewise,  $VPAratio = VPA/VPAcp$  were calculated.  $VPAcp$  was set to 1.25 hours/week. Six PAC groups were calculated:

- PAC=0: if  $MPAratio=0$  and  $VPAratio=0$
- PAC=1:  $MPAratio+VPAratio < 1.0$
- PAC=2:  $MPAratio \geq 1.0$  and  $VPAratio < 1.0$
- PAC=3:  $MPAratio < 1.0$  and  $VPAratio \geq 1.0$
- PAC=4:  $MPAratio + VPAratio \geq 1.0$
- PAC=5:  $MPAratio \geq 1.0$  and  $VPAratio \geq 1.0$

# 14. Appendix C

## 14.1 Additional results

### 14.1.1 Characteristics of participants

**Table 1. Place of living of the adult participants (%)**

	Denmark	Finland	Sweden	Iceland*	Norway
The capital and suburb	16.6	18.2	15.7	65.2	16.6
A large city >50.000 inhabitants	13.8	27.3	30.4	13.0	20.6
City 20,000–49,999 inhabitants	20.2	17.6	16.0	12.7	15.6
Town between 1000–19.999 inhabitants	36.4	11.4	17.1	4.6	28.5
Country side	12.6	24.7	19.9	4.3	18.0
Missing/do not know	0.5	0.7	0.9	0.1	0.7

\*The categories in Iceland were: The capital and suburb, village > 5000 inhabitants, 1000–4999 inhabitants, 200–999 inhabitants and the country side.

**Table 2. Number of persons in households of the adult participants (%)**

	Denmark	Finland	Sweden	Iceland	Norway
1	15.5	20.6	16.9	10.2	15.4
2	38.0	44.4	36.4	27.3	33.8
3	16.2	14.2	17.0	20.8	16.0
4	20.9	13.5	22.6	22.9	21.0
5+	9.2	7.2	7.1	18.8	13.7

**Table 3. Place of living of participating children (%)**

	Denmark	Finland	Sweden	Iceland*	Norway
The capital and suburb	17.1	17.6	15.0	60.8	10.5
A large city >50.000 inhabitants	10.2	20.8	27.3	15.8	20.2
City 20,000–49,999 inhabitants	14.6	17.4	13.5	17.4	16.0
Town between 1000–19.999 inhabitants	38.4	11.6	20.5	6.0	32.5
Country side	19.7	32.5	23.8	0.0	20.8
Missing/do not know	0.0	0.0	0.0	0.0	0.0

\*The categories in Iceland were: The capital and suburb, village > 5000 inhabitants, 1000–4999 inhabitants, 200–999 inhabitants and the country side.

**Table 4. Number of persons in the participating children's households (%)**

	Denmark	Finland	Sweden	Iceland	Norway
1	-	-	-	-	-
2	3.1	4.4	3.2	4.4	5.9
3	9.4	16.4	16.8	12.4	12.7
4	47.6	39.8	49.1	34.9	39.1
5+	39.9	39.4	30.9	48.3	42.2

### 14.1.2 Representativity

#### Denmark

**Table 5. Age distribution among adults in the present study and among the adult Danish population aged 18–65 years**

Age	Respondents		The Danish adult population*	
	Men (%)	Women (%)	Men (%)	Women (%)
18–24 y	5.2	5.2	7.1	6.9
25–34 y	6.2	6.5	9.4	9.3
35–44 y	9.7	11.9	11.3	11.1
45–54 y	11.8	14.9	11.4	11.2
55–65 y	13.4	15.1	11.1	11.3
Total	46.3	53.6	50.3	49.8
<i>Total</i>		<i>99.9</i>		<i>100.1</i>

\*From Statistic Denmark 2011

In Denmark the age group 18–24 y and 25–34 y were under-represented in both sex, and women more than 45 y and men more than 55 y were overrepresented compared with the background population (Table 10). Roughly the same pattern was seen for the Icelandic participants as for the Danish participants with regard to age distribution (Table 16). In Norway men and women below 35 years were underrepresented, and women 45–65 years were overrepresented (table 18). In Finland both men and women below 45 y are underrepresented and women more than 45 y and men more than 55 y overrepresented (Table 12). In Sweden men and women below 34 y are underrepresented and women more than 55 y overrepresented (Table 14). However, the age distribution among the participants was more similar to the background population in Sweden than in the other countries.

**Table 6. Level of education in the study population and the Danish population**

	Respondents	The Danish adult population*
Basic education	16.2	31.1
Vocational education/practical	30.5	35.7
Upper secondary education theoretical	10.1	6.4
Short higher education	30.8	19.5
Medium and long higher education	12.3	6.8

\*From Statistic Denmark 2011 in the age group 15–69 years

In Denmark an underrepresentation of participants with basic education and an overrepresentation of participants with short, medium or longer higher education were found (Table 11). With regard to education the Icelandic participants were not very different compared with the Icelandic population although persons with only basic education were underrepresented (Table 17). A clear underrepresentation of participants with basic education and a clear overrepresentation of participants with short or longer higher education were found in Norway (Table 19). It is not clear how to compare the Finnish respondents with the Finnish population with regard to education because the educational categories were not the same in the present study and the statistical data available, but it is obvious that persons with basic education are underrepresented (Table 13). Persons with basic and vocational education were underrepresented and persons with short, medium and long higher education were overrepresented in Sweden (Table 15).

## Finland

**Table 7. Age distribution among adults in the present study and among the adult Finnish population aged 18–65 years**

Age	Respondents		The Finnish adult population*	
	Men (%)	Women (%)	Men (%)	Women (%)
18–24 y	5.6	6.2	7.0	6.7
25–34 y	8.2	8.5	10.4	9.9
35–44 y	7.0	8.7	10.0	9.6
45–54 y	10.1	12.6	11.2	11.0
55–65 y	15.1	18.0	12.4	12.8
Total	46.0	54.0	51.0	50
<i>Total</i>		<i>100</i>		<i>101</i>

\*From Statistics Finland 2011

**Table 8. Level of education in the study population and the Finnish population**

	Respondents	The Finnish adult population*
Basic education	15.2	33
Vocational education/practical	39.8	39.2
Upper secondary education theoretical	11.7	
Short higher education	19.3	27.8
Medium and long higher education	14.0	

\*From Statistic Finland 2011 in the age group 15+ years

## Sweden

**Table 9. Age distribution among adults in the present study and among the adult Swedish population aged 18–65 years**

Age	Respondents		The Swedish adult population*	
	Men (%)	Women (%)	Men (%)	Women (%)
18–24 y	7.4	5.8	7.9	7.5
25–34 y	7.8	8.7	10.2	9.7
35–44 y	9.9	11.7	10.9	10.6
45–54 y	10.8	11.0	10.7	10.4
55–65 y	11.0	15.9	11.0	11.0
Total	46.9	53.1	50.7	49.2
<i>Total</i>		<i>100</i>		<i>99.9</i>

\*From Statistics Sweden 2011

**Table 10. Level of education in the study population and the Swedish population**

	Respondents	The Swedish adult population*
Basic education	11.6	21
Vocational education/practical	15.1	23
Upper secondary education theoretical	31.3	21
Short higher education	25.4	13
Medium and long higher education	16.7	19

\*From Statistics Sweden 2010, aged 16–74 years

## Iceland

**Table 11. Age distribution among adults in the present study and among the adult Icelandic population aged 18–65 years**

Age	Respondents		The Icelandic adult population*	
	Men (%)	Women (%)	Men (%)	Women (%)
18–24 y	5.3	5.3	8.4	8.4
25–34 y	8.2	10.6	11.6	11.6
35–44 y	10.3	12.4	10.7	10.7
45–54 y	12.2	14.6	10.8	10.8
55–65 y	10.7	10.4	9.3	9.3
Total	46.7	53.3	50.8	50.8
<i>Total</i>		<i>100</i>		<i>100</i>

\*From Statistic Iceland 2011

**Table 12. Level of education in the study population and the Icelandic population**

	Respondents	The Icelandic adult population*
Basic education	25.6	34.0
Vocational education/practical	22.6	22.4
Upper secondary education theoretical	18.3	14.7
Short higher education	22.2	19.4
Medium and long higher education	11.4	9.0

\*From Statistic Iceland 2011 in the age group 15–69 years

## Norway

**Table 13. Age distribution among adults in the present study and among the adult Norwegian population aged 18–65 years**

Age	Respondents		The Norwegian adult population*	
	Men (%)	Women (%)	Men (%)	Women (%)
18–24 y	5.7	4.5	7.4	7.1
25–34 y	8.6	9.6	10.3	10.0
35–44 y	12.5	11.1	11.9	11.3
45–54 y	11.2	14.8	10.9	10.4
55–65 y	10.2	11.7	10.5	10.2
Total	48.3	51.7	51.0	49.0
<i>Total</i>		<i>100</i>		<i>100</i>

\*From Statistics Norway

**Table 14. Level of education in the study population and the Norwegian population**

	Respondents	The Norwegian adult population*
Basic education	6.5	29.4
Vocational education/practical	14.3	42.7
Upper secondary education theoretical	21.7	21.1
Short higher education	32.4	6.7
Medium and long higher education	24.8	

\*From Statistisk årbok 2011 in the age group 16+ years



### 14.1.3 Food – Adults

Table 15. Mean (SD) frequency of intake in all adults

	Country														
	Denmark			Finland			Sweden			Iceland			Norway		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Rye bread, slices/day	2.3 <sub>a</sub>	1.7	2183	2.7 <sub>b</sub>	2.0	1996	.	.	.	.7 <sub>c</sub>	1.0	1998	.8 <sub>c</sub>	1.6	1011
Whole grain bread, slices/day	1.1 <sub>a</sub>	1.3	2180	1.2 <sub>a</sub>	1.5	1963	1.6 <sub>b</sub>	1.5	1874	1.0 <sub>c</sub>	1.2	1999	3.0 <sub>d</sub>	2.6	1052
White bread, slices/day	.5 <sub>a</sub>	.9	2124	.4 <sub>b</sub>	.9	1950	.5 <sub>a,b</sub>	.9	1864	.1 <sub>c</sub>	.4	1982	.2 <sub>d</sub>	.7	1051
Hard bread, pieces/day	.4 <sub>a</sub>	.8	2117	.5 <sub>b</sub>	1.0	1958	1.0 <sub>c</sub>	1.2	1869	.7 <sub>d</sub>	1.1	1985	1.2 <sub>e</sub>	1.8	1049
Vegetables/day	1.2 <sub>a</sub>	.8	2187	1.2 <sub>a,b</sub>	.8	2001	1.3 <sub>b</sub>	.8	1883	1.1 <sub>c</sub>	.7	2004	1.7 <sub>d</sub>	1.2	1063
Fruit & berries/day	1.5 <sub>a</sub>	1.2	2185	1.1 <sub>b</sub>	.8	1999	1.3 <sub>c</sub>	1.0	1879	1.1 <sub>b</sub>	.9	2004	1.2 <sub>c</sub>	1.1	1058
Fruit juice/day	.3 <sub>a</sub>	.5	2168	.4 <sub>b</sub>	.6	1994	.4 <sub>b</sub>	.6	1878	.5 <sub>c</sub>	.5	2003	.5 <sub>c</sub>	.7	1062
Fish/week	1.3 <sub>a</sub>	1.7	2019	1.3 <sub>a,b</sub>	1.3	2000	1.5 <sub>b</sub>	1.4	1883	2.0 <sub>c</sub>	1.4	2006	2.2 <sub>d</sub>	2.4	1065
Fried potatoes/month	2.8 <sub>a</sub>	7.1	2183	1.8 <sub>b</sub>	2.6	1996	2.7 <sub>a</sub>	5.5	1882	2.7 <sub>a</sub>	3.9	2008	1.8 <sub>b</sub>	3.1	1059
Sausages/month	1.0 <sub>a</sub>	2.9	2177	2.5 <sub>b</sub>	4.9	1993	3.5 <sub>c</sub>	3.8	1885	2.1 <sub>d</sub>	2.9	2009	2.1 <sub>d</sub>	3.7	1059
Chocolate and candy/month	11.9 <sub>a</sub>	15.6	2184	8.4 <sub>b</sub>	13.5	1997	8.4 <sub>b</sub>	12.2	1881	11.7 <sub>a</sub>	12.1	2004	10.5 <sub>a</sub>	15.9	1061
Cakes/month	7.0 <sub>a</sub>	9.9	2181	10.4 <sub>b</sub>	13.9	2001	7.0 <sub>a</sub>	11.7	1881	8.9 <sub>c</sub>	10.9	2007	4.9 <sub>d</sub>	8.6	1055
Cheese (times/month)	17.2 <sub>a</sub>	18.1	2176	16.7 <sub>a,c</sub>	26.3	1967	20.9 <sub>b</sub>	20.9	1863	14.8 <sub>c</sub>	16.9	1996	26.2 <sub>d</sub>	26.3	1049
Soft drinks, light	9.5 <sub>a</sub>	20.1	2168	12.1 <sub>b</sub>	27.4	1993	3.5 <sub>c</sub>	12.3	1880	6.6 <sub>d</sub>	15.6	2008	11.3 <sub>a,b</sub>	24.3	1063
Soft drinks, sugar sweetened	6.7 <sub>a,c</sub>	15.6	2170	6.5 <sub>a</sub>	16.7	1998	4.6 <sub>b</sub>	11.8	1879	7.9 <sub>c</sub>	15.6	2007	6.4 <sub>a,c</sub>	18.3	1062
Energy drinks	.5 <sub>a</sub>	4.7	2076	.7 <sub>a</sub>	4.8	1993	.7 <sub>a</sub>	4.1	1885	.8 <sub>a</sub>	3.1	2010	.8 <sub>a</sub>	4.1	1062

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column means. Tests assume equal variances. Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

**Table 16. Median (25 and 75 percentiles) intake of food. Men**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
Rye bread, slices/day	2.0	2.0	4.0	1011	3.0	1.7	4.0	918	.	.	.	.	.4	.0	1.0	932	.0	.0	.7	481
Whole grain bread, slices/day	1.0	.0	2.0	1010	.7	.0	2.0	901	2.0	.6	3.0	877	1.0	.3	2.0	932	4.0	2.0	6.0	505
White bread, slices/day	.3	.0	1.0	985	.1	.0	.7	904	.3	.0	1.0	872	.0	.0	.0	922	.0	.0	.1	509
Hard bread, pieces/day	.0	.0	.1	981	.1	.0	.7	905	.6	.1	2.0	874	.1	.0	.6	924	.3	.0	1.0	505
Vegetables/day	1.0	.4	1.0	1014	1.0	.6	1.0	920	1.0	.6	2.0	884	1.0	.6	1.0	934	1.0	.9	2.0	514
Fruit & berries/day	1.0	.4	2.0	1014	1.0	.3	1.0	919	1.0	.4	1.0	881	.9	.4	1.0	935	1.0	.3	2.0	511
Fruit juice/day	.1	.0	.4	1004	.1	.0	.5	916	.1	.0	.7	881	.3	.1	.7	934	.3	.0	1.0	512
Fish/week	1.0	.5	1.0	940	1.0	.5	2.0	920	1.0	1.0	2.0	885	2.0	1.0	3.0	936	2.0	1.0	2.0	514
Fried potatoes/month	1.9	.9	4.0	1013	1.9	.9	4.0	919	1.9	.9	4.0	884	1.9	.9	4.0	937	1.9	.9	4.0	513
Sausages/month	1.0	.0	2.0	1011	2.0	.0	4.0	917	4.0	2.0	4.0	885	2.0	1.0	4.0	937	2.0	.0	4.0	512
Chocolate and candy/month	8.0	4.0	12.0	1014	4.0	1.0	8.0	918	4.0	2.0	8.0	883	8.0	4.0	16.0	936	8.0	4.0	12.0	512
Cakes/month	4.0	2.0	8.0	1011	4.0	1.0	12.0	920	4.0	1.0	8.0	883	8.0	4.0	12.0	935	3.0	1.0	4.0	511
Full fat cheese/day	.4	.1	1.0	1010	.1	.0	1.0	901	.5	.3	1.0	871	.3	.0	1.0	928	.5	.3	1.0	505
Soft drinks, light/week	.3	.0	3.0	1004	.5	.0	3.0	917	.0	.0	.5	885	.0	.0	2.0	936	.3	.0	3.0	513
Soft drinks, sugar sweetened/week	.5	.0	2.0	1010	.5	.0	2.0	919	.5	.0	2.0	882	1.0	.0	3.0	937	.5	.0	2.0	511
Energy drinks	.0	.0	.0	966	.0	.0	.0	916	.0	.0	.0	885	.0	.0	1.0	938	.0	.0	.0	511

**Table 17. Median (25 and 75 percentiles) intake of food. Women**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
Rye bread, slices/day	2.0	1.0	2.0	1172	2.0	1.0	4.0	1078	.	.	.	.	.4	.1	1.0	1066	.0	.0	.6	530
Whole grain bread, slices/day	1.0	.1	2.0	1170	.6	.0	2.0	1062	1.0	.4	2.0	997	.4	.0	1.0	1067	2.0	.3	4.0	547
White bread, slices/day	.0	.0	.4	1139	.0	.0	.3	1046	.0	.0	.3	992	.0	.0	.0	1060	.0	.0	.1	542
Hard bread, pieces/day	.1	.0	.4	1136	.1	.0	.6	1053	.6	.1	1.0	995	.4	.0	1.0	1061	.9	.1	2.0	544
Vegetables/day	1.0	1.0	2.0	1173	1.0	1.0	2.0	1081	1.0	1.0	2.0	999	1.0	.7	2.0	1070	2.0	1.0	3.0	549
Fruit & berries/day	2.0	1.0	2.0	1171	1.0	.7	2.0	1080	1.0	1.0	2.0	998	1.0	.6	2.0	1069	1.0	.4	2.0	547
Fruit juice/day	.1	.0	.3	1164	.1	.0	.4	1078	.1	.0	.4	997	.3	.1	1.0	1069	.1	.0	1.0	550
Fish/week	1.0	.5	2.0	1079	1.0	.8	2.0	1080	1.0	1.0	2.0	998	2.0	1.0	3.0	1070	2.0	1.0	3.0	551
Fried potatoes/month	.9	.0	2.8	1170	.9	.0	1.9	1077	.9	.0	1.9	998	.9	.0	2.8	1071	.9	.0	1.9	546
Sausages/month	.0	.0	1.0	1166	1.0	.0	3.0	1076	3.0	1.0	4.0	1000	1.0	.0	2.0	1072	1.0	.0	2.0	547
Chocolate and candy/month	8.0	4.0	12.0	1170	4.0	2.0	12.0	1079	4.0	4.0	8.0	998	8.0	4.0	16.0	1068	8.0	4.0	12.0	549
Cakes/month	4.0	1.0	8.0	1170	4.0	2.0	12.0	1081	4.0	1.0	8.0	998	4.0	2.0	8.0	1072	3.0	1.0	4.0	544
Full fat cheese/day	.4	.0	1.0	1166	.1	.0	1.0	1066	.5	.1	1.0	992	.4	.0	1.0	1068	1.0	.3	1.0	544
Soft drinks, light/week	.0	.0	2.0	1164	.0	.0	1.5	1076	.0	.0	.0	995	.0	.0	1.0	1072	.5	.0	2.0	550
Soft drinks, sugar sweetened/week	.0	.0	1.0	1160	.0	.0	1.0	1079	.0	.0	1.0	997	.3	.0	1.0	1070	.0	.0	1.0	551
Energy drinks	.0	.0	.0	1110	.0	.0	.0	1077	.0	.0	.0	1000	.0	.0	.0	1072	.0	.0	.0	551

## Fat type

Figure 1. Type of spread in relation to family status

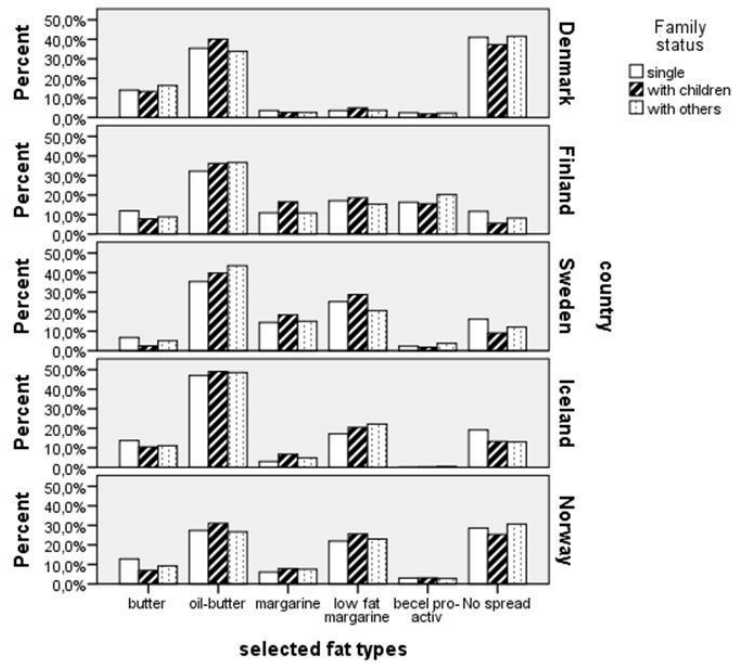


Figure 2. Spread type in relation to urbanization

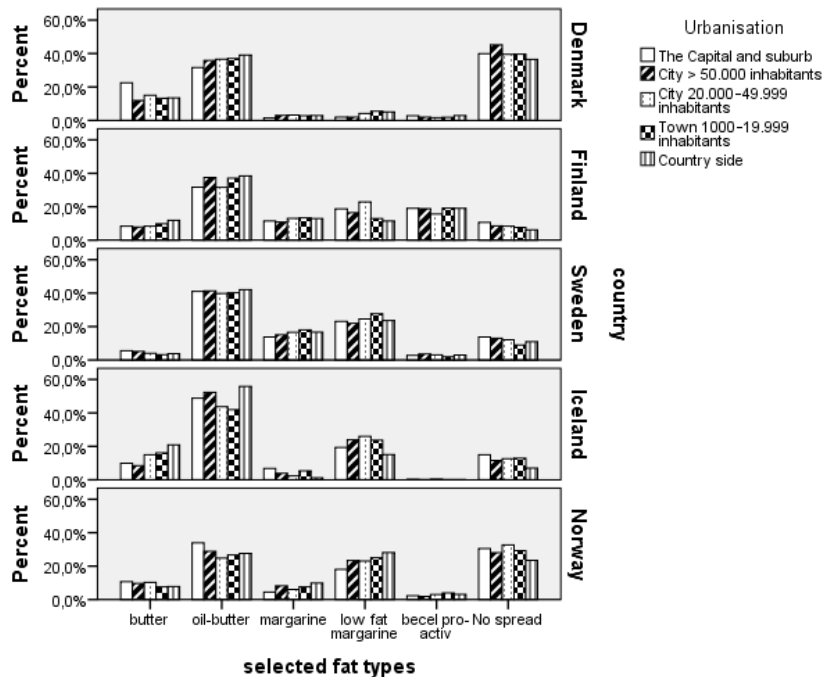


Figure 3. Fat type used for cooking in relation to family status

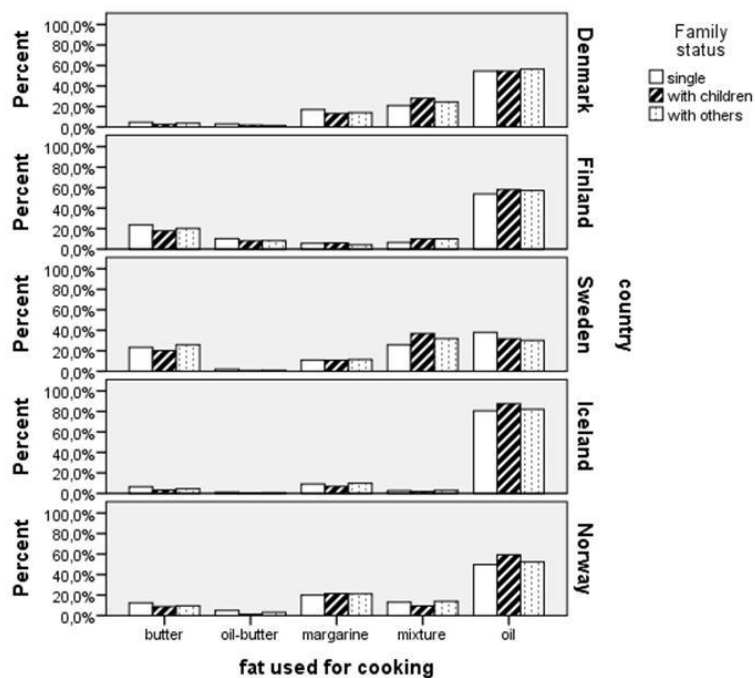
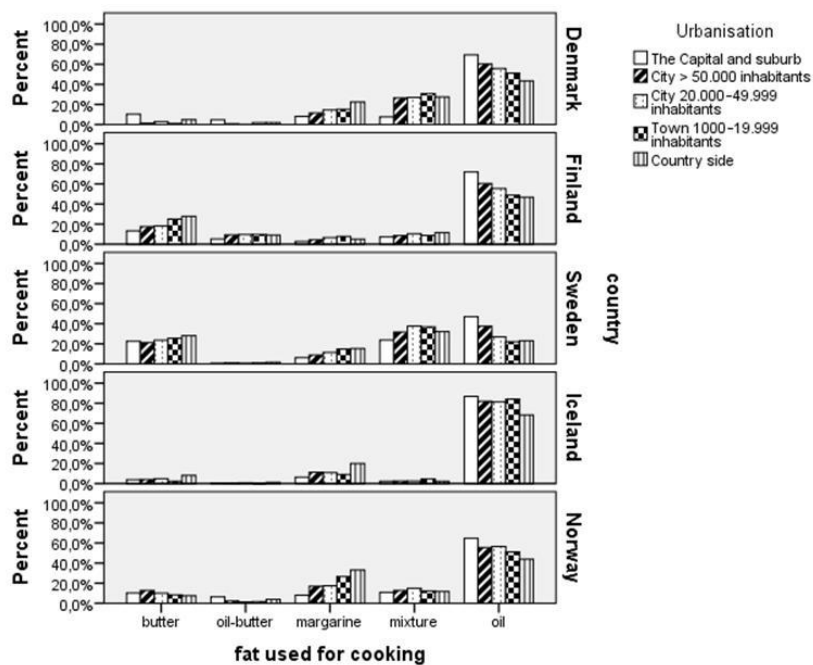


Figure 4. Fat in relation to urbanization



## Bread

Figure 5. Bread intake in relation to family status

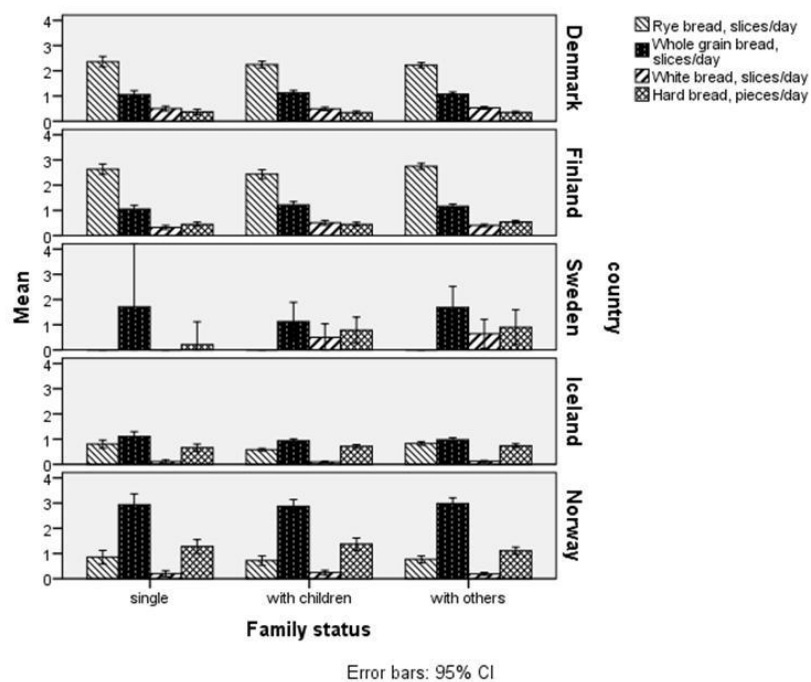
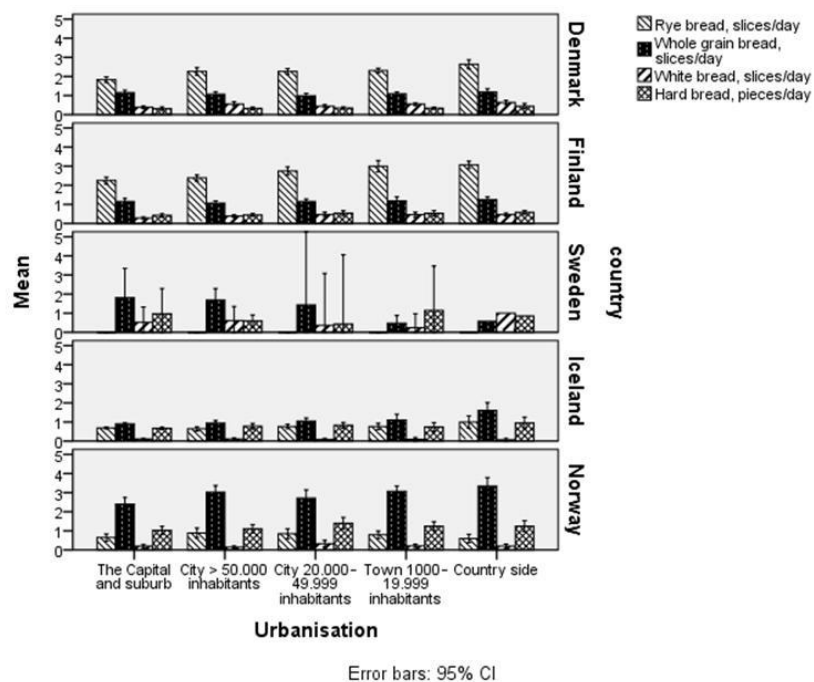


Figure 6. Intake of bread in relation to urbanization



## Vegetables, fruit and juice

Figure 7. Intake of vegetables, fruit and fruit juice in relation to family status

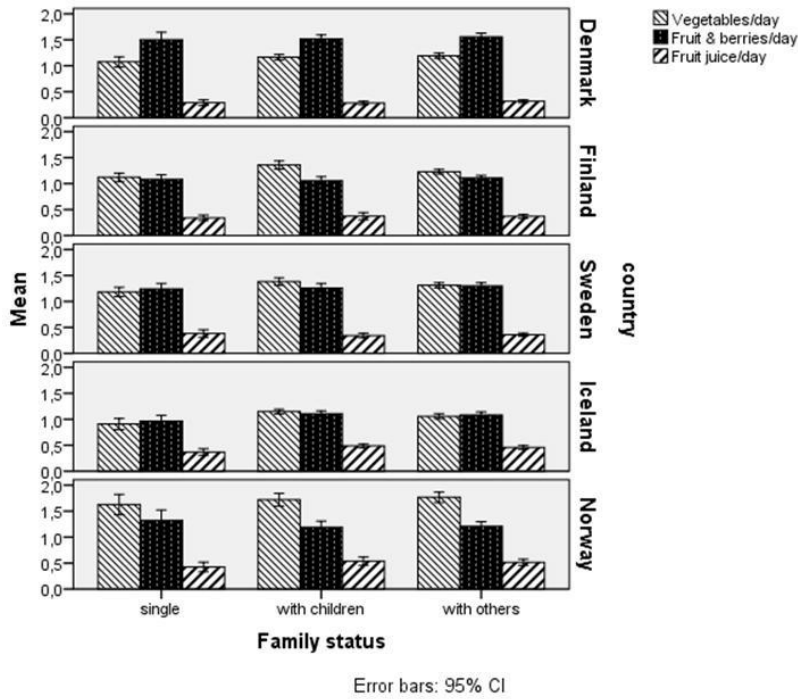
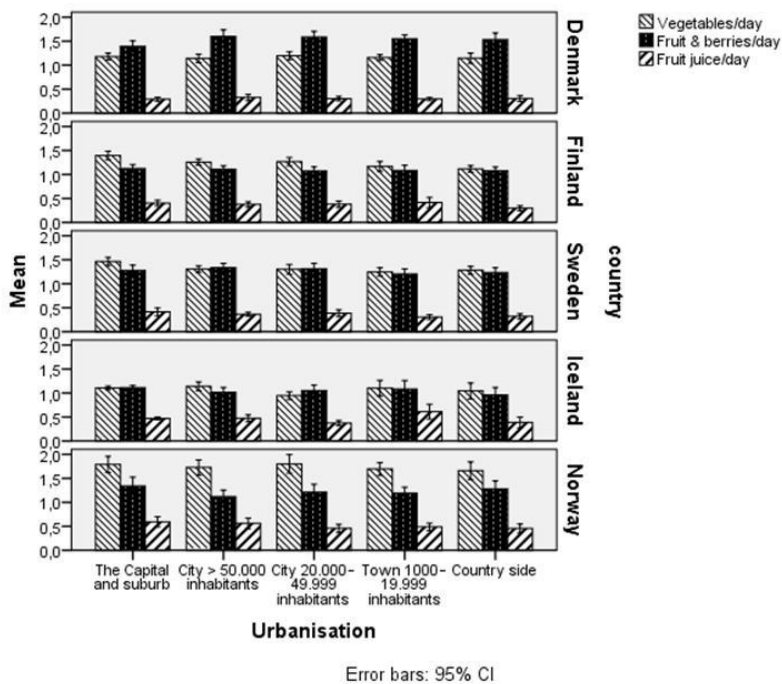


Figure 8. Intake of vegetables and fruit in relation to urbanisation



## Chocolate, candy, sugar-rich soft drinks

Figure 9. Intake of sugar rich food in relation to size of household

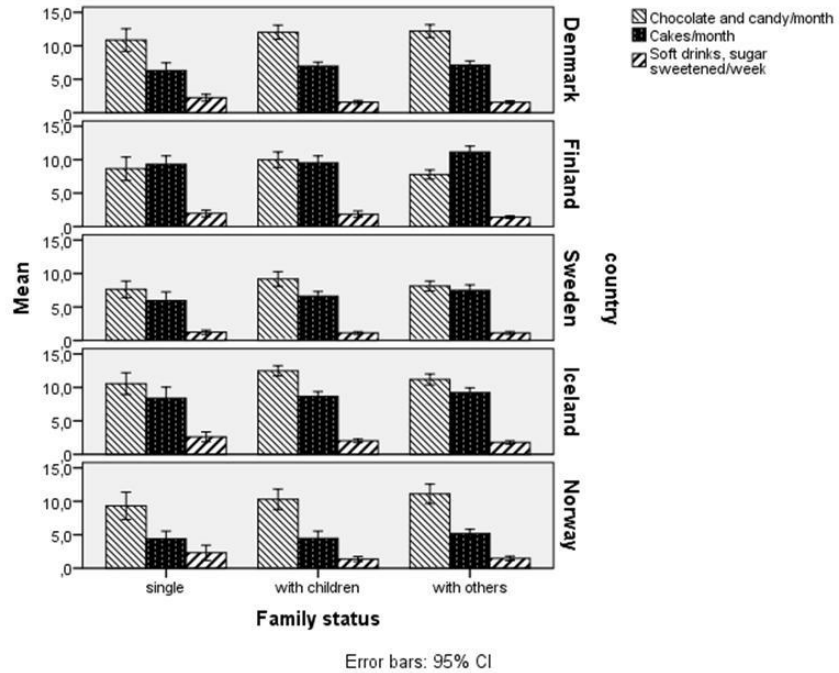
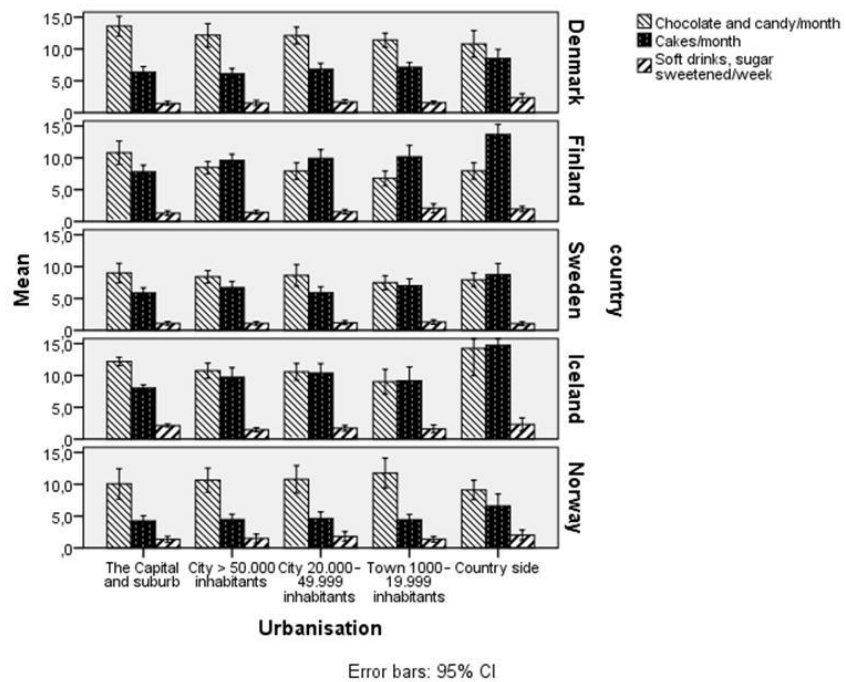


Figure 10. Intake of sugar rich food in relation to urbanisation





## Fish

Figure 11. Fish intake in relation to family status

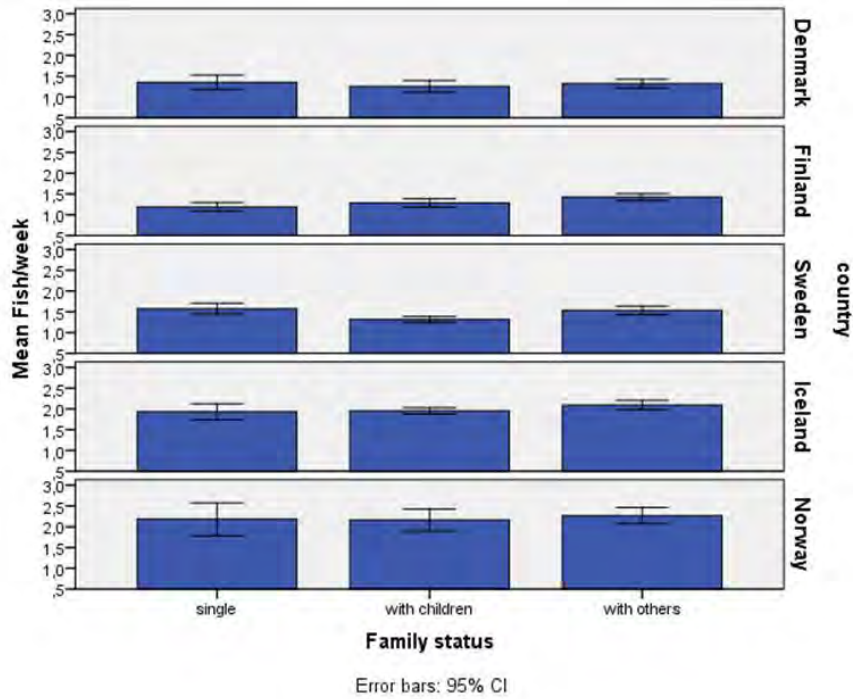
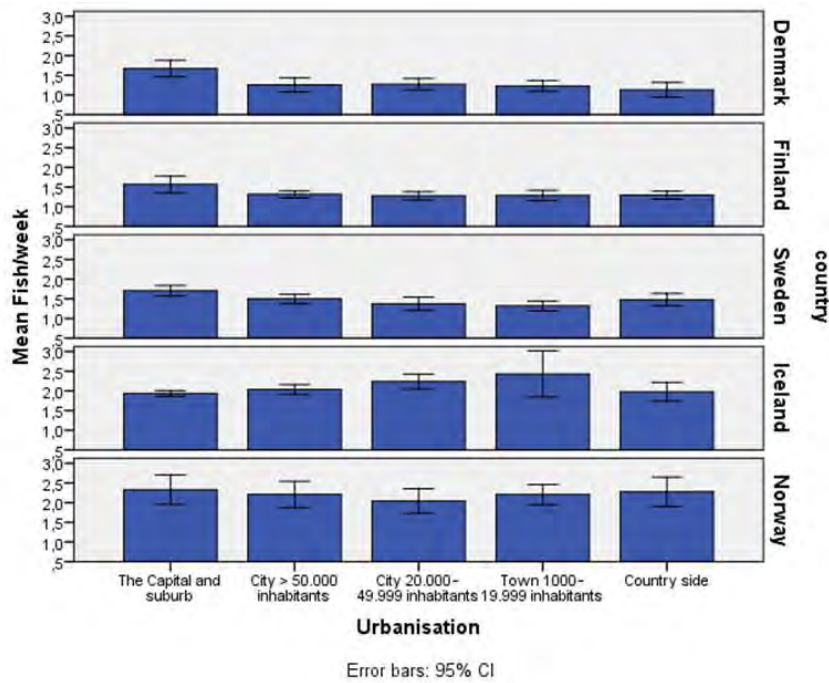


Figure 12. Fish intake in relation to urbanization



## Dietary index

Figure 13. Dietary index in relation to family status

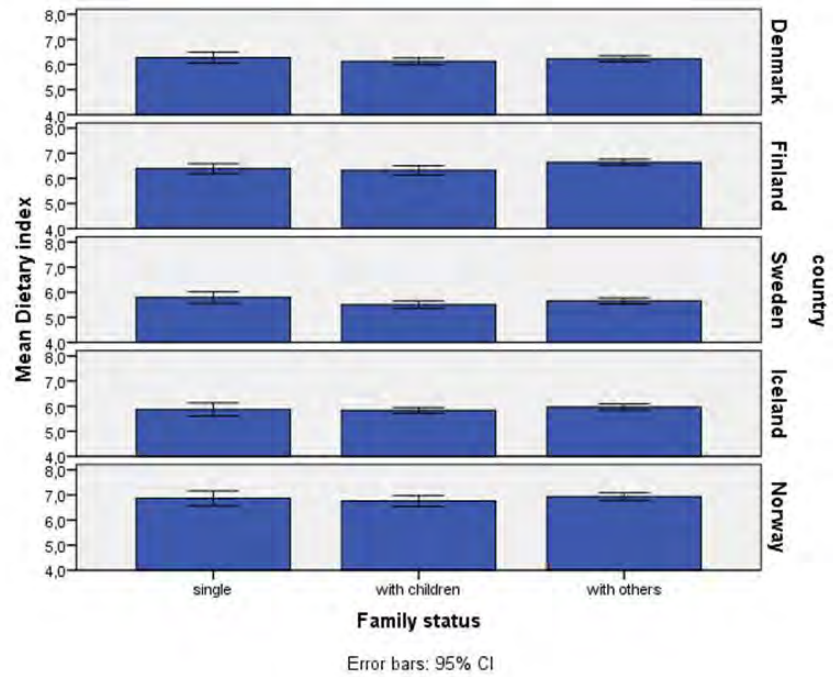
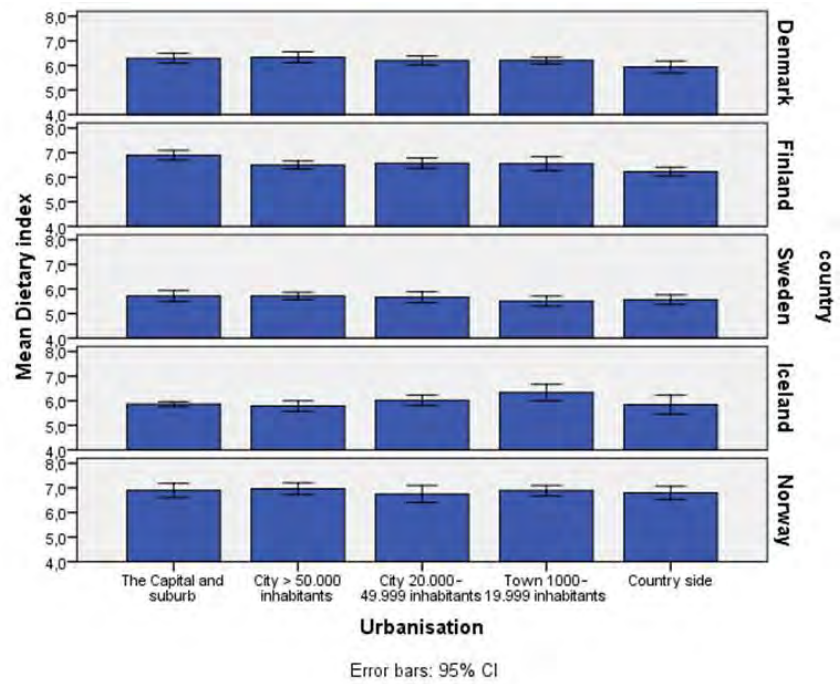


Figure 14. Dietary index in relation to urbanization



### 14.1.4 Food – Children

Table 18. Mean (SD) frequency of intake in children

	Country														
	Denmark			Finland			Sweden			Iceland			Norway		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Rye bread, slices/day	2.1 <sub>a</sub>	1.4	608	2.0 <sub>a</sub>	1.6	496	.	.	.	.4 <sub>b</sub>	.7	513	.5 <sub>b</sub>	1.4	343
Whole grain bread, slices/day	1.2 <sub>a,b</sub>	1.2	607	1.4 <sub>a,c</sub>	1.5	489	1.1 <sub>b</sub>	1.2	494	1.5 <sub>c</sub>	1.2	517	3.7 <sub>d</sub>	2.1	352
White bread, slices/day	.6 <sub>a</sub>	1.0	608	.6 <sub>a</sub>	.9	479	.9 <sub>b</sub>	1.1	495	.1 <sub>c</sub>	.3	516	.4 <sub>d</sub>	.8	350
Hard bread, slices/day	.3 <sub>a</sub>	.7	607	.7 <sub>b</sub>	1.0	470	.6 <sub>b</sub>	1.1	491	.3 <sub>a</sub>	.6	514	.6 <sub>b</sub>	1.0	348
Vegetables/day	1.4 <sub>a</sub>	.8	608	1.4 <sub>a</sub>	.9	498	1.4 <sub>a,b</sub>	.8	499	1.2 <sub>b</sub>	.8	517	1.4 <sub>a</sub>	1.0	352
Fruit and berries/day	1.7 <sub>a</sub>	1.0	609	1.1 <sub>b</sub>	.8	500	1.4 <sub>c</sub>	.9	499	1.4 <sub>c</sub>	.9	515	1.2 <sub>b</sub>	.9	349
Fruit juice/day	.3 <sub>a</sub>	.4	609	.4 <sub>a</sub>	.5	497	.4 <sub>a</sub>	.5	498	.6 <sub>b</sub>	.6	514	.6 <sub>b</sub>	.7	348
Fish/week	.9 <sub>a</sub>	1.2	532	1.4 <sub>b</sub>	1.2	498	1.5 <sub>b,d</sub>	1.0	499	2.4 <sub>c</sub>	1.0	517	1.6 <sub>d</sub>	2.0	353
Fried potatoes/month	3.2 <sub>a</sub>	4.1	609	2.5 <sub>b</sub>	3.2	498	2.6 <sub>a,b</sub>	2.8	498	2.3 <sub>b</sub>	2.5	517	2.5 <sub>b</sub>	2.6	349
Sausage/month	1.4 <sub>a</sub>	2.6	609	3.1 <sub>b</sub>	2.5	499	5.2 <sub>c</sub>	5.1	497	2.7 <sub>b</sub>	2.4	516	3.9 <sub>d</sub>	4.6	352
Chocolate/month	8.9 <sub>a</sub>	9.7	609	8.6 <sub>a</sub>	8.1	499	5.6 <sub>b</sub>	4.0	499	6.2 <sub>b</sub>	4.3	517	6.9 <sub>b</sub>	7.2	352
Cakes/month	7.2 <sub>a</sub>	6.1	609	8.1 <sub>a</sub>	8.4	498	7.0 <sub>a</sub>	9.7	499	11.0 <sub>b</sub>	9.9	513	5.1 <sub>c</sub>	4.5	351
Full fat cheese/day	.3 <sub>a</sub>	.4	608	.7 <sub>b</sub>	1.0	494	.5 <sub>c</sub>	.6	495	.5 <sub>c</sub>	.5	514	.8 <sub>b</sub>	1.0	345
Soft drinks, light/week	1.7 <sub>a</sub>	3.2	609	1.7 <sub>a</sub>	3.8	495	.6 <sub>b</sub>	1.8	498	1.4 <sub>a</sub>	2.6	514	2.4 <sub>c</sub>	4.5	350
Soft drinks, sugar sweetened/week	1.5 <sub>a</sub>	2.6	609	2.6 <sub>b</sub>	4.3	498	1.5 <sub>a</sub>	1.5	499	1.4 <sub>a</sub>	1.7	516	1.7 <sub>a</sub>	3.0	352
Energy drinks/week	.1 <sub>a</sub>	.7	609	.1 <sub>a</sub>	1.4	495	.1 <sub>a</sub>	.5	499	.1 <sub>a</sub>	.7	516	.2 <sub>a</sub>	1.7	346

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column means. Tests assume equal variances.

Tests are adjusted for all pairwise comparisons using the Bonferroni correction.

**Table 19. Median (25 and 75 percentiles) intake of food. Boys**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
Rye bread, slices/day	2.0 <sub>a</sub>	1.3	3.0	319	2.0 <sub>a</sub>	.7	3.8	244	.	.	.	.	.1 <sub>b</sub>	.0	.6	245	.0 <sub>b</sub>	.0	.0	165
Whole grain bread, slices/day	1.0 <sub>a</sub>	.3	2.0	318	1.0 <sub>a,b</sub>	.3	2.0	238	1.0 <sub>a</sub>	.1	2.0	270	1.4 <sub>b</sub>	.7	2.0	247	4.0 <sub>c</sub>	3.0	6.0	169
White bread, slices/day	.3 <sub>a</sub>	.0	.7	319	.3 <sub>a</sub>	.0	.7	238	.6 <sub>b</sub>	.1	1.4	270	.0 <sub>c</sub>	.0	.0	247	.0 <sub>c</sub>	.0	.3	169
Hard bread, slices/day	.0 <sub>a</sub>	.0	.4	317	.3 <sub>b</sub>	.0	1.0	235	.4 <sub>c</sub>	.0	1.0	269	.0 <sub>a</sub>	.0	.3	246	.1 <sub>c</sub>	.0	.6	165
Vegetables/day	1.0 <sub>a</sub>	1.0	2.0	319	1.0 <sub>a</sub>	.7	2.0	245	1.0 <sub>a</sub>	.9	2.0	272	1.0 <sub>a</sub>	.6	2.0	247	1.0 <sub>a</sub>	.7	2.0	169
Fruit and berries/day	1.0 <sub>a</sub>	1.0	2.0	319	1.0 <sub>b</sub>	.4	1.0	246	1.0 <sub>a,c</sub>	1.0	2.0	272	1.0 <sub>a,c</sub>	1.0	2.0	247	1.0 <sub>b,c</sub>	.6	2.0	167
Fruit juice/day	.1 <sub>a</sub>	.0	.3	319	.1 <sub>b</sub>	.0	.6	244	.1 <sub>a,b</sub>	.0	.4	271	.4 <sub>c</sub>	.1	1.0	246	.4 <sub>c</sub>	.1	1.0	167
Fish/week	.8 <sub>a</sub>	.3	1.0	278	1.0 <sub>b</sub>	.8	2.0	245	1.0 <sub>b</sub>	1.0	2.0	272	2.0 <sub>c</sub>	2.0	3.0	247	1.0 <sub>b</sub>	1.0	2.0	169
Fried potatoes/month	2.0 <sub>a</sub>	1.0	4.3	319	2.0 <sub>a,b</sub>	1.0	4.3	246	2.0 <sub>a,b</sub>	1.0	4.3	271	2.0 <sub>b</sub>	1.0	3.0	247	2.0 <sub>a,b</sub>	1.0	4.3	167
Sausages/month	1.0 <sub>a</sub>	.0	2.0	319	4.0 <sub>b,d</sub>	2.0	4.0	245	4.0 <sub>c</sub>	4.0	8.0	271	2.0 <sub>b</sub>	1.0	4.0	247	4.0 <sub>d</sub>	2.0	4.0	169
Chocolate/month	8.0 <sub>a</sub>	4.0	8.0	319	4.0 <sub>a,c</sub>	4.0	8.0	246	4.0 <sub>b</sub>	4.0	8.0	272	4.0 <sub>b</sub>	4.0	8.0	247	4.0 <sub>b,c</sub>	4.0	8.0	169
Cakes/month	8.0 <sub>a</sub>	4.0	8.0	319	4.0 <sub>a</sub>	4.0	8.0	246	4.0 <sub>a</sub>	4.0	8.0	272	8.0 <sub>b</sub>	4.0	16.0	244	4.0 <sub>c</sub>	2.0	8.0	168
Cheese/day	.1 <sub>a</sub>	.0	.4	319	.3 <sub>b</sub>	.0	1.0	244	.4 <sub>c</sub>	.0	1.0	269	.4 <sub>b,c</sub>	.0	1.0	245	.6 <sub>b,c</sub>	.3	1.0	164
Soft drinks, light/week	.5 <sub>a</sub>	.0	2.0	319	.3 <sub>a,c</sub>	.0	2.0	244	.0 <sub>b</sub>	.0	.5	272	.3 <sub>a,b</sub>	.0	2.0	245	1.0 <sub>c</sub>	.0	3.0	169
Soft drinks, sugar sweetened/week	1.0 <sub>a</sub>	.0	2.0	319	1.0 <sub>b</sub>	.5	3.0	246	1.0 <sub>a</sub>	.8	2.0	272	1.0 <sub>a</sub>	.5	2.0	246	1.0 <sub>a</sub>	.5	2.0	168
Energy drinks/month	.0 <sub>a</sub>	.0	.0	319	.0 <sub>a</sub>	.0	.0	244	.0 <sub>a</sub>	.0	.0	272	.0 <sub>a</sub>	.0	.0	246	.0 <sub>a</sub>	.0	.0	166

**Table 20. Median (25 and 75 percentiles) intake of food. Girls**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
Rye bread, slices/day	2.0 <sub>a</sub>	1.0	2.1	289	2.0 <sub>a</sub>	.7	3.0	252	.	.	.	.	.1 <sub>b</sub>	.0	.4	268	.0 <sub>b</sub>	.0	.0	178
Whole grain bread, slices/day	1.0 <sub>a,b</sub>	.3	2.0	289	1.0 <sub>a</sub>	.3	2.0	251	1.0 <sub>b</sub>	.3	2.0	224	1.0 <sub>a,b</sub>	.6	2.0	270	3.0 <sub>c</sub>	2.0	5.0	183
White bread, slices/day	.3 <sub>a</sub>	.0	.6	289	.3 <sub>a</sub>	.0	.7	241	.4 <sub>b</sub>	.1	1.0	225	.0 <sub>c</sub>	.0	.0	269	.1 <sub>a</sub>	.0	.4	181
Hard bread, slices/day	.1 <sub>a</sub>	.0	.4	290	.6 <sub>b,c</sub>	.0	1.0	235	.4 <sub>b</sub>	.0	1.0	222	.0 <sub>a</sub>	.0	.4	268	.3 <sub>c</sub>	.0	1.0	183
Vegetables/day	2.0 <sub>a</sub>	1.0	2.0	289	1.0 <sub>a,b</sub>	.9	2.0	253	1.0 <sub>a,b</sub>	1.0	2.0	227	1.0 <sub>b</sub>	.7	2.0	270	1.0 <sub>a</sub>	1.0	2.0	183
Fruit and berries/day	2.0 <sub>a</sub>	1.0	2.0	290	1.0 <sub>b</sub>	.7	2.0	254	1.0 <sub>c</sub>	1.0	2.0	227	1.0 <sub>b,c</sub>	1.0	2.0	268	1.0 <sub>b,c</sub>	.6	2.0	182
Fruit juice/day	.3 <sub>a</sub>	.1	.4	290	.1 <sub>a</sub>	.0	.4	253	.3 <sub>a</sub>	.1	.6	227	.4 <sub>b</sub>	.1	1.0	268	.4 <sub>b</sub>	.1	1.0	181
Fish/week	.8 <sub>a</sub>	.5	1.0	254	1.0 <sub>b</sub>	1.0	2.0	253	1.0 <sub>b</sub>	1.0	2.0	227	2.0 <sub>c</sub>	2.0	3.0	270	1.0 <sub>b</sub>	1.0	2.0	184
Fried potatoes/month	2.0 <sub>a</sub>	1.0	4.3	290	2.0 <sub>b</sub>	1.0	4.3	252	2.0 <sub>b</sub>	1.0	3.0	227	2.0 <sub>b</sub>	1.0	3.0	270	2.0 <sub>a,b</sub>	1.0	4.3	182
Sausages/month	1.0 <sub>a</sub>	.0	2.0	290	2.0 <sub>b</sub>	2.0	4.0	254	4.0 <sub>c</sub>	3.0	8.0	226	2.0 <sub>b</sub>	1.0	4.0	269	4.0 <sub>c</sub>	2.0	4.0	183
Chocolate/month	8.0 <sub>a</sub>	4.0	8.0	290	4.0 <sub>a</sub>	4.0	12.0	253	4.0 <sub>b</sub>	4.0	8.0	227	4.0 <sub>b</sub>	4.0	8.0	270	8.0 <sub>b</sub>	4.0	8.0	183
Cakes/month	4.0 <sub>a,b</sub>	4.0	8.0	290	4.0 <sub>a</sub>	4.0	8.0	252	4.0 <sub>b</sub>	3.0	8.0	227	8.0 <sub>c</sub>	4.0	12.0	269	4.0 <sub>b,d</sub>	2.0	8.0	183
Cheese/day	.1 <sub>a</sub>	.0	.4	289	.1 <sub>b,c</sub>	.0	1.0	250	.3 <sub>b</sub>	.0	1.0	226	.3 <sub>a,b</sub>	.0	.7	269	.4 <sub>c</sub>	.1	1.0	181
Soft drinks, light/week	.5 <sub>a,c</sub>	.0	2.0	290	.0 <sub>a,c</sub>	.0	2.0	251	.0 <sub>b</sub>	.0	.0	226	.3 <sub>a</sub>	.0	2.0	269	1.0 <sub>c</sub>	.0	3.0	181
Soft drinks, sugar sweetened/week	1.0 <sub>a</sub>	.0	2.0	290	1.0 <sub>b</sub>	.5	3.0	252	1.0 <sub>a</sub>	.5	2.0	227	1.0 <sub>a</sub>	.3	2.0	270	1.0 <sub>a,b</sub>	.8	2.0	184
Energy drinks/month	.0 <sub>a</sub>	.0	.0	290	.0 <sub>a</sub>	.0	.0	251	.0 <sub>a</sub>	.0	.0	227	.0 <sub>a</sub>	.0	.0	270	.0 <sub>a</sub>	.0	.0	180

### 14.1.5 Physical activity and sedentary time- Adults

**Table 21. Physical activity in 4 categories at work and in leisure time, respectively. All adults**

	Country				
	Norway %	Sweden %	Finland %	Denmark %	Iceland %
<b>Work</b>					
Mostly sedentary work like office work	48,6 <sub>a</sub>	46,0 <sub>a,b</sub>	42,7 <sub>b</sub>	41,8 <sub>b,c</sub>	48,2 <sub>a</sub>
Work that requires a lot of walking like teaching	24,4 <sub>a,c</sub>	25,3 <sub>a,c</sub>	21,2 <sub>a</sub>	31,7 <sub>b</sub>	26,1 <sub>c</sub>
Work that requires a lot of walking and lifting, like a nurse	17,6 <sub>a,c</sub>	21,6 <sub>a,b</sub>	25,3 <sub>b</sub>	20,3 <sub>a,c</sub>	17,6 <sub>c</sub>
Heavy manual labour like heavy construction	9,4 <sub>a,b</sub>	7,1 <sub>a,c</sub>	10,8 <sub>b</sub>	6,1 <sub>c</sub>	8,1 <sub>a,b,c</sub>
<b>Leisure time</b>					
Reading, watching TV or other sedentary activity?	34,6 <sub>a</sub>	41,1 <sub>b</sub>	27,7 <sub>c</sub>	30,0 <sub>a,c</sub>	51,8 <sub>d</sub>
Walking, cycling, or other forms of light exercise that lasted for at least 4 hours during the last 7 days. Include walk	43,0 <sub>a</sub>	41,0 <sub>a</sub>	42,3 <sub>a</sub>	49,3 <sub>b</sub>	30,8 <sub>c</sub>
Participation in recreational sports, heavy gardening, etc., where the duration of the activity lasted for at least 4 ho	11,2 <sub>a</sub>	11,8 <sub>a</sub>	24,6 <sub>b</sub>	15,9 <sub>c</sub>	11,3 <sub>a</sub>
Participation in hard training or sports competitions, regularly several times during the last 7 days.	11,2 <sub>a</sub>	6,1 <sub>b</sub>	5,4 <sub>b</sub>	4,7 <sub>b</sub>	6,0 <sub>b</sub>

Values in the same row not sharing the same subscript are significantly different at  $p < 0.05$  in the two-sided test of equality for column proportions. Cells with no subscript are not included in the test. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.

**Table 22. Median (25 and 75 percentiles) moderate and vigorous physical activity (MVPA), vigorous physical activity (VPA) and sedentary time watching TV or computer (screen time). Results are in hours per day. Men**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
MVPA	3.5 <sub>a,c</sub>	2.0	6.0	962	4.5 <sub>b</sub>	2.0	7.0	832	4.0 <sub>a,b</sub>	2.0	7.0	834	3.5 <sub>a,c</sub>	1.0	7.0	866	3.0 <sub>c</sub>	1.0	6.0	489
VPA	1.0 <sub>a</sub>	.0	2.0	962	1.0 <sub>b</sub>	.0	3.5	832	1.0 <sub>a,b</sub>	.0	3.0	834	1.0 <sub>b</sub>	.0	3.5	866	1.0 <sub>a</sub>	.0	2.5	489
Screen time	3.0 <sub>a</sub>	2.0	5.0	986	3.0 <sub>a</sub>	2.0	5.0	884	3.0 <sub>a,b</sub>	2.0	4.5	857	3.0 <sub>b</sub>	2.0	4.0	916	3.5 <sub>c</sub>	2.0	6.0	489

Values in the same row not sharing the same subscript are significantly different at  $p < 0,05$ . Tests are adjusted for all pairwise comparisons within a row using the Bonferroni correction.  $P < 0.001$  between countries for all 3 variables (Kruskal Wallis test).

**Table 23. Median (25 and 75 percentiles) moderate and vigorous physical activity (MVPA), vigorous physical activity (VPA) and sedentary time watching TV or computer (screen time). Results are in hours per day. Women**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
MVPA	3.5 <sub>a</sub>	2.0	6.0	1136	4.0 <sub>b</sub>	2.0	7.0	1003	4.0 <sub>b</sub>	2.0	7.0	948	3.8 <sub>a</sub>	1.5	6.0	1000	3.0 <sub>a</sub>	1.5	6.0	530
VPA	1.0 <sub>a</sub>	.0	2.0	1136	1.0 <sub>b</sub>	.0	2.5	1003	1.0 <sub>b</sub>	.0	2.5	948	1.0 <sub>b</sub>	.0	3.0	1000	.5 <sub>a,b</sub>	.0	2.0	530
Screen time	3.0 <sub>a</sub>	2.0	4.0	1150	2.5 <sub>a</sub>	1.5	4.5	1056	2.5 <sub>b</sub>	1.5	4.0	981	2.5 <sub>b</sub>	1.5	4.0	1050	3.0 <sub>a</sub>	2.0	5.0	529

Values in the same row not sharing the same subscript are significantly different at  $p < 0,05$ . Tests are adjusted for all pair wise comparisons within a row using the Bonferroni correction.  $P < 0.001$  between countries for all MVPA and screen time,  $P = 0.003$  for VPA (Kruskal Wallis test).

### 14.1.6 Physical activity and sedentary time- Children

**Table 24. Median (25 and 75 percentiles) moderate and vigorous physical activity (MVPA), and sedentary time watching TV or computer (screen time). Boys**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
MVPA (hours/week)	6.5 <sub>a</sub>	4.0	10.0	318	8.0 <sub>b</sub>	5.5	14.0	242	5.0 <sub>c</sub>	3.0	8.0	272	7.0 <sub>a</sub>	4.5	10.0	244	5.0 <sub>c</sub>	3.0	8.0	169
Screentime (hours/day)	2.5 <sub>a</sub>	2.0	4.0	315	2.0 <sub>a</sub>	1.5	3.0	244	2.5 <sub>a</sub>	1.5	4.0	263	2.0 <sub>b</sub>	1.5	3.0	243	2.5 <sub>a,b</sub>	2.0	4.0	162

Values in the same row not sharing the same subscript are significantly different at  $p < 0,05$ . Tests are adjusted for all pair wise comparisons within a row using the Bonferroni correction.  $P < 0.001$  between countries for both variables (Kruskal Wallis test). M – median, 25 – 25 percentile, 75 – 75 percentile, N – number of participants

**Table 25. Median (25 and 75 percentiles) moderate and vigorous physical activity (MVPA), and sedentary time watching TV or computer (screen time). Girls**

	Country																			
	Denmark				Finland				Sweden				Iceland				Norway			
	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N	M	25	75	N
MVPA (hours/week)	5.5 <sub>a</sub>	3.5	8.5	288	6.0 <sub>a</sub>	4.0	9.5	253	4.0 <sub>b</sub>	3.0	6.0	227	7.0 <sub>a</sub>	4.0	10.0	266	4.5 <sub>b</sub>	2.0	7.0	184
Screentime (hours/day)	2.5 <sub>a</sub>	2.0	3.5	288	2.0 <sub>a</sub>	1.5	3.0	250	2.0 <sub>a</sub>	1.5	3.0	224	1.0 <sub>b</sub>	1.0	2.5	268	2.5 <sub>a</sub>	1.5	4.0	176

Values in the same row not sharing the same subscript are significantly different at  $p < 0,05$ . Tests are adjusted for all pair wise comparisons within a row using the Bonferroni correction.  $P < 0.001$  between countries for both variables (Kruskal Wallis test). M – median, 25 – 25 percentile, 75 – 75 percentile, N – number of participants

Figure 15. Physical activity in relation to family status

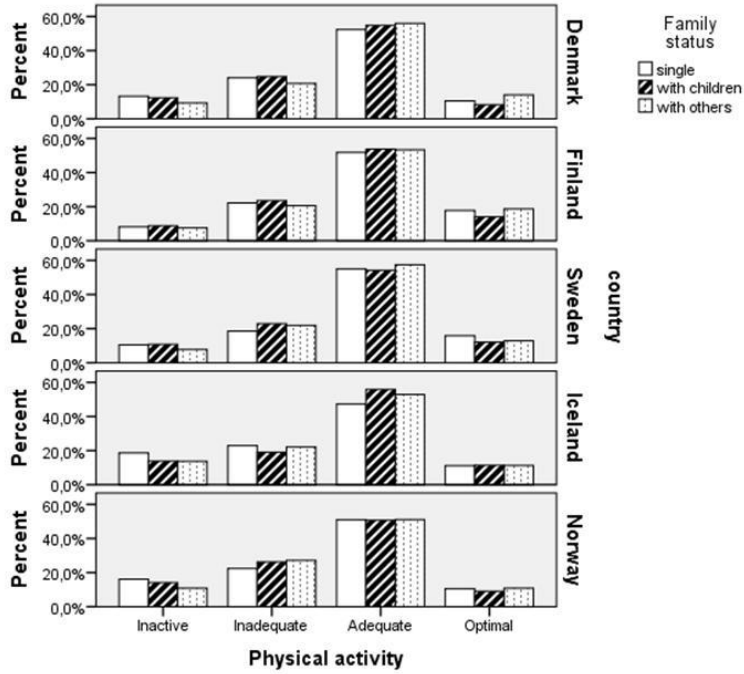


Figure 16. Physical activity in relation to urbanization

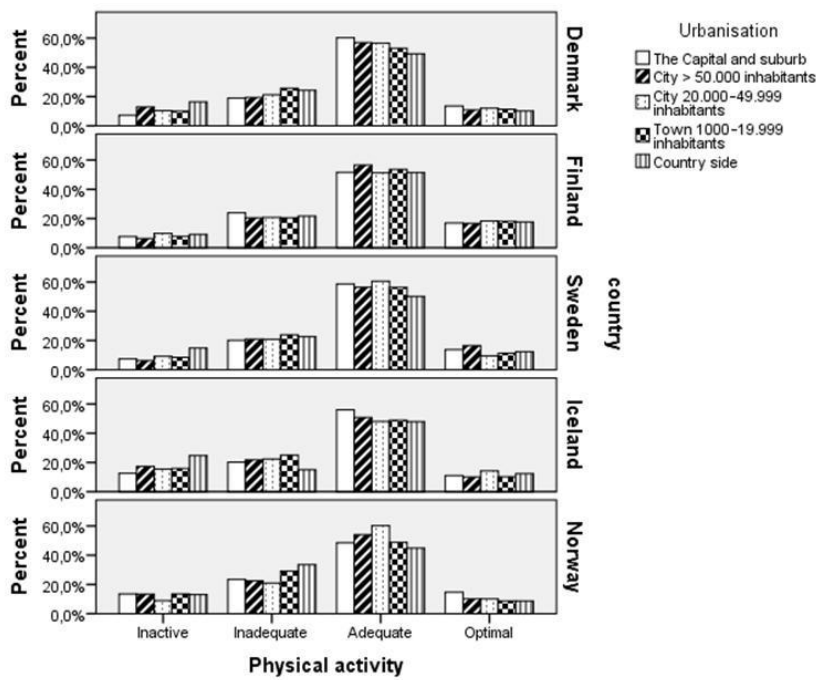


Figure 17. Screen time in relation to family status

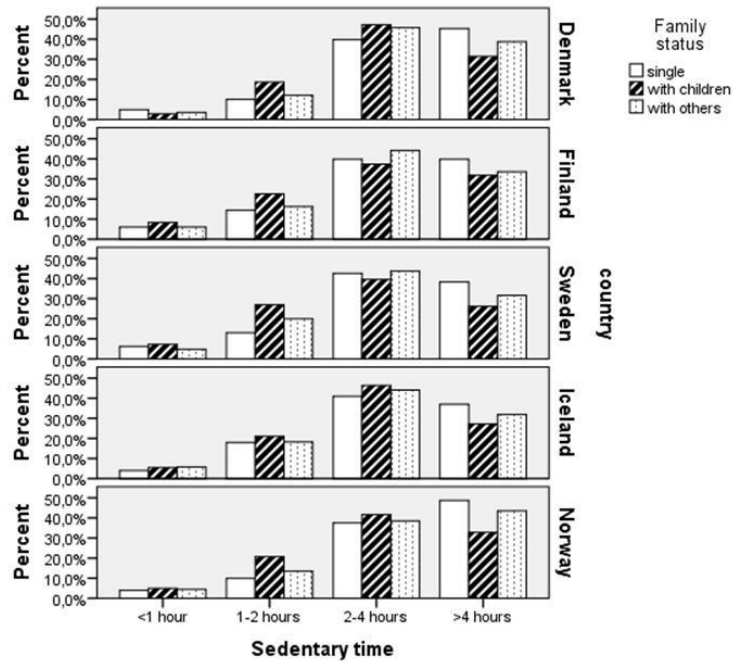


Figure 18. Screen time in relation to urbanisation

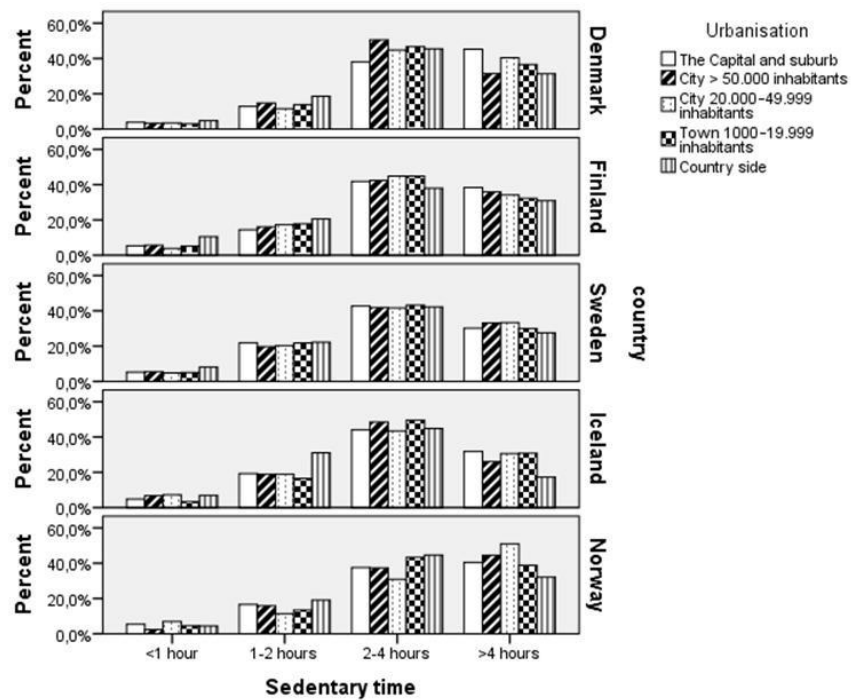




Figure 19. BMI in relation to family status

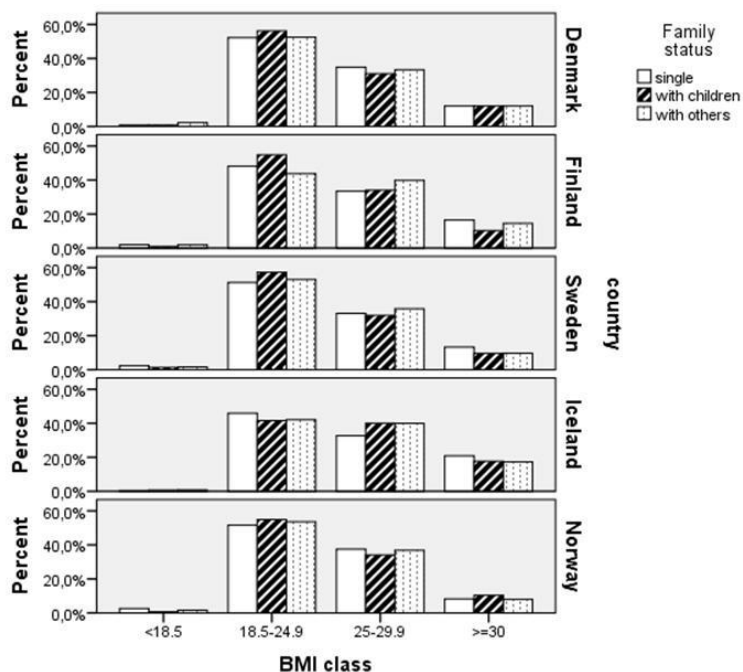
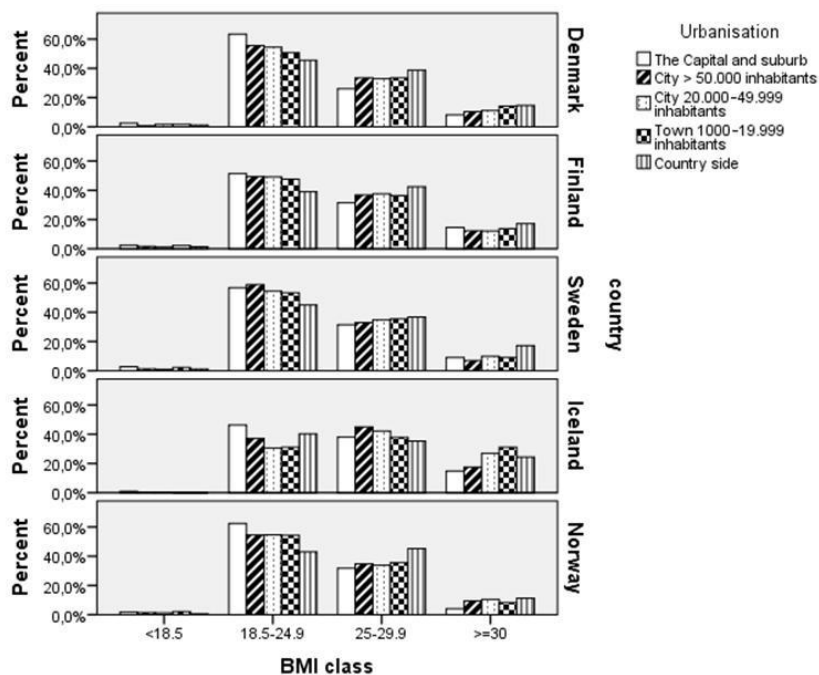


Figure 20. BMI in relation to urbanisation



## 14.2 Sources of data on smoking and alcohol

### Short description of the surveys that provided data

#### **Denmark:**

Danish data are from “Den Nationale Sundhedsprofil 2010” (National Board of Health 2011). A random sample of 298,550 persons aged 16 years or more representing the whole country was chosen. All received an information letter and a questionnaire with 52 questions regarding health and life style. 177,639 (59.5%) answered the questionnaire; the response rate among men was 55.5% and among women 63.4%. This investigation is planned to be repeated in 2013.

#### **Finland:**

The Finnish data are from “Health behavior and Health among the Finnish Adult population” which collected data in spring 2010. A random sample of 5000 Finnish adults aged between 15–64 years was derived from the Population Register. The questionnaire was mailed to the responders. The response rate was 57% (2826 respondents).

#### **Sweden:**

The Swedish data are from the investigation “Nationella folkhälsoenkäten – Hälsa på lika villkor?” (Statens folkhälsoinstitut 2011) (eller “Levnadsvanor. Lägesrapport 2010”). A random sample of 20,000 individuals from SCB:s Register for total population in the age group 16–84 years received an introduction letter and a questionnaire with 75 questions. The response rate was 50.6%. The study has been conducted annually since 2004.

#### **Iceland:**

The Icelandic data are from 4 investigations regarding smoking, two web based and two based on telephone interviews carried out at different times of the year 2011. Response rate was 55.7%; 57.5%; 58.2% and 53.6%, respectively. Two of the investigations were on the age group 15–89 years and the other two on the age groups 16–75 years.

#### **Norway:**

The data are from Statistisk Sentralbyrå.



## Nordic monitoring of diet, physical activity and overweight

### First collection of data in all Nordic Countries 2011

The report describes the results of the first collection of data in the joint Nordic monitoring study of diet, physical activity and overweight. The study provides baseline data for frequency of intake in selected foods, physical activity level and prevalence of overweight and obesity in the Nordic countries. Telephone interviews were performed in the Nordic countries with the same validated questionnaire using simple indicator questions. The interviews were carried out in the autumn of 2011 including 9,153 adults and 2,479 children.

The results show that all countries are far from the goals in the Nordic Plan of Action and there are areas to be improved in all countries.

The study gives a good status for dietary intake indicators, indicators for physical activity, sedentary time and overweight which makes it possible to follow changes in these parameters over time in the Nordic countries.

