

Trends in food availability in Estonia — the ANEMOS project

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Introduction

The present report will focus on the analysis of food availability³ data, collected through one of the most representative surveys of Estonia i.e. the Household Budget Survey (HBS) of 2003–2007. The unit responsible for the consumption/expenditure data is the Social Surveys Service at Statistics Estonia.

History of the consumption/expenditure surveys in Estonia

In Estonia, the first household budget survey was conducted in the autumn of 1925 by the State Central Bureau of Statistics. The budget survey of 1937–1938 was conducted according to the principles of the International Statistical Institute (ISI). One of the purposes of the survey was international comparability. Surveys of household budget were continued starting from 1952. Continuous surveys were carried out from 1960 to 1978. This survey was conducted in Estonia analogously with other regions of the Soviet Union. The survey data are not available any more, as the processing of data was mainly carried out in Moscow. Aggregated tables were sent to Estonia. The data from the survey, which took place during the Soviet period, are not comparable with the data of present-day household budget surveys. In 1991, the marketing research and consulting company EMOR started a new family budget survey ordered by Statistics Estonia. In 1994, Statistics Estonia started a new household budget survey based on internationally recognized methodology. The surveys, grounded on this methodology, which followed, were conducted during 1996–2007 by Statistics Estonia.

The data from 2003 to 2007 concerning food availability in Estonia were selected to be integrated in the DAFNE databank through the ANEMOS project. Statistics Estonia has been the Estonian co-ordinator of the project. A nutritionist from the

³ Throughout this text the meaning of "availability" equals the meaning of "consumption".

National Institute for Health Development in Estonia took part in the project as an expert.

Material and methods

The ANEMOS project data for Estonia are based on Statistics Estonian's national HBS data of years 2003 to 2007.

The purpose of HBS in Estonia is to get reliable information about the expenditure and consumption of private households. Besides information about the structure of households, the survey provides information on the demographic and social characteristics of household members (family relations, employment status, education) as well as on living conditions and acquired durable goods.

The results on HBS have been published in the publications of Statistics Estonia. The relevant data are also available in the public database on the web site of Statistics Estonia www.stat.ee

Main definitions

The key term in HBS is the "household", which as a rule does not coincide with the concept "family".

Household is defined as a group of persons living in a common main dwelling (at the same address) who share joint financial and/or food resources and consider themselves to be members of one household.

Household members are persons who belong to the household.

Head of the household or reference person is an adult household member who for a longer period has brought the greatest income to the household . If the household has joint incomes, the reference person is the household member who is the owner of the enterprise or undelying real estate.

Classification of the socio-demographic characteristics

In the ANEMOS project, households are classified according to different socio-economic characteristics: location, education and occupation of the household head and whole household.

Location of the residence: according to the DAFNE classification scheme, location is grouped into urban, semi-urban, and rural areas. After evaluating the country's structure and as an outcome of discussions, it was decided to group the residential areas only into the urban or rural ones.

Persons who live in towns or small towns comprise the urban population and all the rest (in townships and villages) are rural population.

Education of the household head: for the classification of the educational level of the household head, the International Standard Classification of Education (ISCED) is used in Statistics Estonia. According to the DAFNE classification scheme, education is classified into three groups:

1. Illiterate/ elementary education — primary education according to ISCED
2. Secondary education — secondary education according to ISCED
3. Higher education — tertiary education according to ISCED.

Occupation of the household head: classified into five groups: manual, non-manual, retired, unemployed and other. Employed persons were classified under the groups “manual” and “non-manual” according to the occupation of the household head. For the classification of jobs, the International Standard Classification of Occupations (ISCO) is used in Estonia. The two or three digit level ISCO codes are used for grouping households under manual or non-manual categories. The category “retired” includes persons in retirement or early retirement or those who are no longer employed.

Results on the group "unemployed" are not published in the case the households classified under this category comprised less than 5% of the total survey sample.

Household composition: the household composition has been classified into nine groups: single adult, two adults, lone parent, two adults with children, adult and elderly persons, adult with children and elderly persons, a single elderly member, two elderly persons, and other.

Children have been defined as up to 17 years of age, adults from 18 to 65 years of age and the elderly as 65 years of age and older.

Data by household composition are presented only if the group comprises at least 0.5% of the total survey sample and/or more than 100 households are classified under this group.

All household members who live permanently in Estonia are considered the surveyed population. Persons living in institutional households (children's homes, care homes, convents) are excluded.

The rotation period of the survey is 12 months. Every year, a half of the sample is replaced; every household is in the sample in the same month of two consecutive years.

Sampling is based on the list of persons recorded in the Population Register which is administered by AS Andmevara and involves **stratified systematic sampling** procedure. Only the records concerning persons aged 15 and over are used in sampling. This way, an "**address-person**" is obtained. Every "address-person" brings his/her household into the sample. Depending on the size of address (i.e. number of persons aged 15 and over registered at the address of "address-person"), one of the following two rules is used:

The address-rule: if the address obtained was complete (i.e. the address was represented in the database by up to nine 15-year-old or older persons). The household or all households living at the given address were included in the survey irrespective of whether the "address-person" (i.e. the person obtained from the list of persons) actually lived at the specified address or not.

The person-rule: if the size of address in the database was nine persons or more (regarding 15-year-old or older persons), then the person-wise approach is used. Then, only the address-person and his/her household was included in the survey. If the household concerned had moved within the same county, it was traced and kept in the survey. Persons who had left the county were excluded from the survey and not replaced.

Before selecting the address-person, the register of persons aged 15 and over is sorted and stratified on county level (i.e. geographically). Counties (and the capital Tallinn) are grouped into three strata according to the population size. Hiiu county forms a separate stratum since it is the smallest county. The rest of the regions have been

divided into two strata — big counties (Tallinn, Harju, Ida-Viru, Lääne-Viru, Pärnu, Tartu) and small counties (Jõgeva, Järva, Lääne, Põlva, Rapla, Saare, Valga, Viljandi, Võru).

The sample size of the 2003–2007 survey ranged from 3,200 to 3,700 households. During the fieldwork, the sample size might increase since in case of the address-rule all households residing at a selected address were included in the sample. Households in the old (i.e. repeated) part of the sample participated in the survey in the same month as the year before; the new part was allocated uniformly between months.

Response rate by survey years

Year	Sample size	Response rate
2003	3.334	56%
2004	3.179	54%
2005	3.594	50%
2006	3.774	52%
2007	3.402	48%

The data were collected from households through an interviewer-administered questionnaire. For this purpose, four questionnaires were used:

1. Household Picture is a questionnaire collecting information on the general data of the household to be completed in the course of a face-to-face interview at the first meeting with the household. Also, information about the economic situation, living conditions, acquired durable goods, use of land and possibility of using free services was collected.
2. The Diary Book for Food Expenditure was being filled out in the household during 15 days (half of the sample filled in the diary in the first half of the month and half of the sample did it in the second half of the month). The cases of eating out and consumption of self-produced or free food products were registered as well.
3. The Diary Book for Income, Taxes And Expenditure was filled out in order to collect data on monetary and non-monetary income of the survey month, on consumer goods and services bought by the household. The Diary included separate parts for recording the expenditure on construction and renovation activities and the expenditure related to the household's economic and

production activities as well as expenditure on the investment of money and other transactions for what no goods were received in return (borrowing/lending of money, loan repayments, etc.).

4. The aim of the Post-interview was to determine the consumption household (i.e. fixing the number of persons who participated and to which extent participated in household consumption during the survey month). In the Post-interview, changes in the household composition during the survey period were registered, and some questions containing self-assessments of the household's economic coping were asked.

Statistics Estonia has used its own interviewers for carrying out HBS. 58 interviewers who have received special training for interviewing households were permanently involved in the survey. Despite the fact that each household participated in the survey during one month (the survey month), interviewer's collaboration with the household was even somewhat longer during the period.

During the month preceding the survey, the "Household Picture" document was completed and, in the month after the survey — the "Post-interview" was carried out. Each interviewer also had to fill in a form reporting on the work undertaken, where he/she recorded all his/her visits to the households as well as the reasons for non-response and other important information about the survey process.

Results

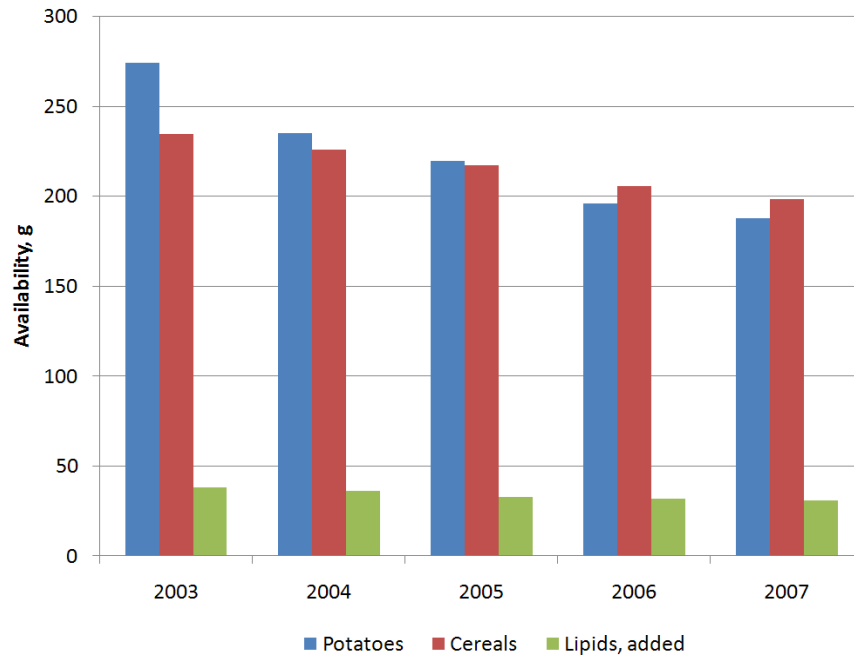
Table 1 presents the mean daily food availability of 15 main food groups by survey year.

Table 1 Mean food availability of 15 main food groups in Estonia by survey year
(quantity/ per person / per day)

	2003	2004	2005	2006	2007
Eggs (pieces)	0.50	0.44	0.44	0.43	0.44
Potatoes (g)	274	235	219	196	188
Pulses (g)	1.86	1.51	1.02	1.01	0.99
Nuts (g)	0.89	1.06	1.19	1.73	1.73
Cereals (g)	235	227	217	206	198
Milk products (g)	309	305	299	308	308
Meat, meat products and dishes (g)	165	170	169	166	168
Vegetables (g)	208	189	176	178	183
Fish, seafood and dishes (g)	39	45	39	36	37
Fruits (g)	114	119	126	124	137
Lipids, added (g)	38	36	33	32	31
Beverages, alcoholic (ml)	48	52	56	62	71
Beverages, non-alcoholic (ml)	360	367	389	387	419
Sugar and sugar products (g)	110	79	57	63	61
Fruit and vegetable juices (ml)	48	44	56	62	68

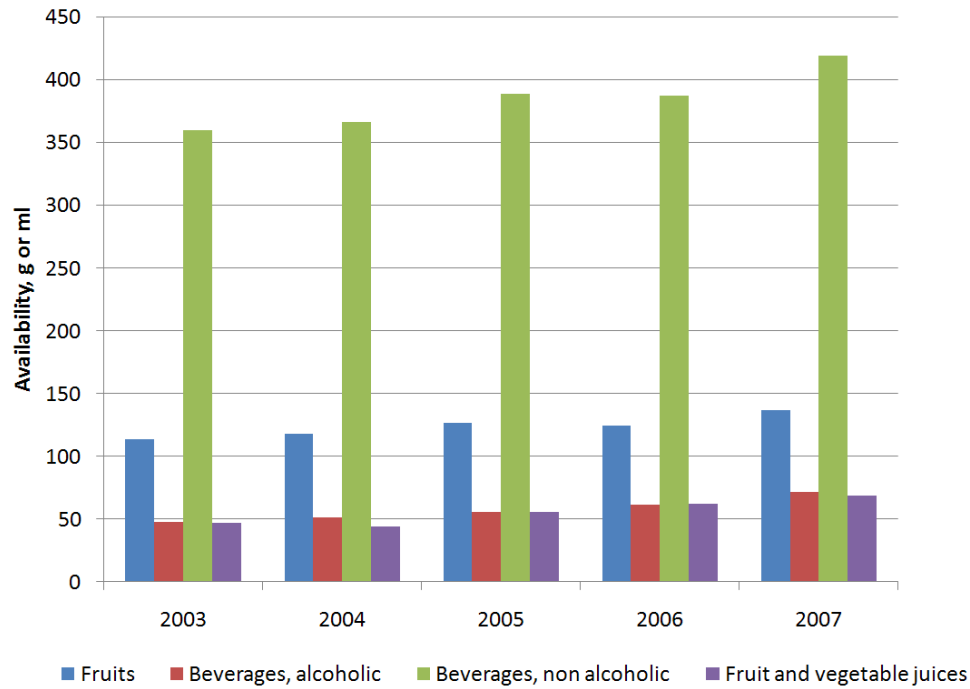
Availability of cereals, potatoes, added lipids (Figure 1) as well as pulses and eggs has decreased during the period from 2003 to 2007.

Figure 1 Mean availability of potatoes, cereals and added lipids by survey year (g/ per person / per day)



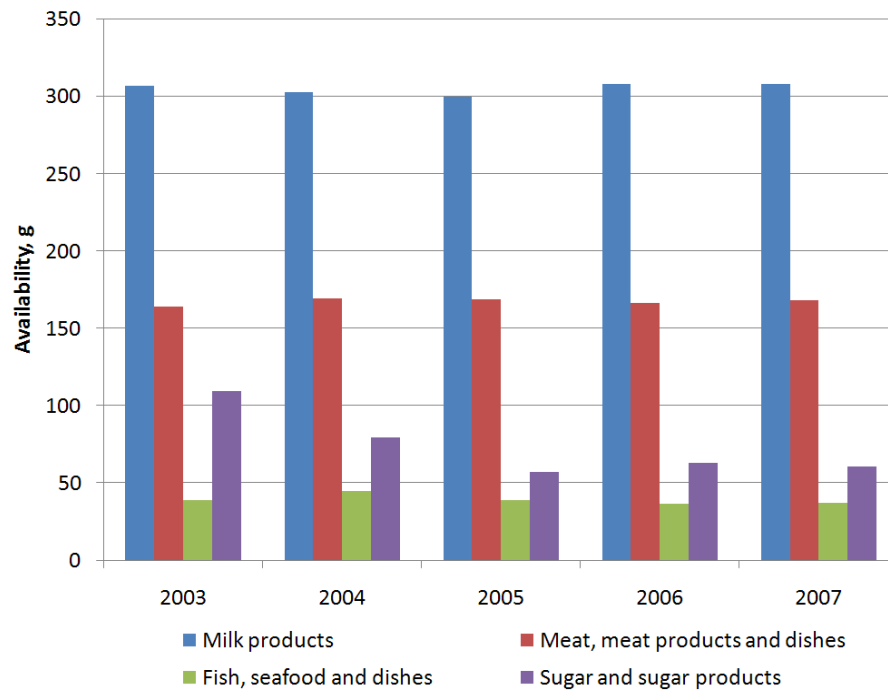
During the same period (i.e. from 2003–2007), the daily per person availability of fruits, fruit and vegetable juices and both alcoholic and non-alcoholic beverages (Figure 2) increased.

Figure 2 Mean availability of fruits, fruit and vegetable juices, alcoholic and non-alcoholic beverages by survey year (g or ml / per person / per day)



The daily per person availability of fish, seafood and dishes as well as meat, meat products and dishes has remained almost unchanged over the years. The mean availability of vegetables, and milk and milk products decreased from 2003 to 2005 and increased anew in recent years. Availability of sugar and sugar products has decreased almost twice from 2003 to 2005, and stabilized rather in recent years (Figure 3).

Figure 3 Mean availability of milk products, meat, meat products and dishes, fish, seafood and dishes, and sugar and sugar products by survey year (g/ per person / per day)



Besides, urban-rural differences can be detected in food availability. Availability of cereals, potatoes, vegetables, milk and milk products, meat, meat products and dishes, added lipids, sugar and sugar products, and alcoholic beverages (Table 2) as well as eggs and pulses was higher among rural households compared to the urban ones in most of the surveyed years.

Table 2 Mean availability of food products by location of dwelling and by survey year (g or ml / per person / per day)

	2003		2004		2005		2006		2007	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Eggs (pieces)	0.64	0.43	0.48	0.41	0.46	0.42	0.47	0.37	0.46	0.39
Potatoes	356	235	301	200	280	189	278	126	246	137
Pulses	2.50	1.53	1.87	1.32	1.22	0.92	1.15	0.57	1.07	0.98
Nuts	0.82	0.92	0.97	1.11	0.92	1.33	1.28	1.72	1.33	2.18
Cereals	267	220	243	218	251	200	228	180	213	178
Milk products	352	287	334	289	320	289	337	280	326	294
Meat, meat products and dishes	182	156	188	161	187	159	182	152	177	158
Vegetables	220	203	207	180	194	167	185	173	185	183
Fish, seafood and dishes	42	38	54	40	42	38	35	37	37	36
Fruits	97	122	94	132	111	134	101	146	116	152
Lipids, added	42	36	38	35	37	31	36	28	31	28
Beverages, alcoholic	50	47	55	50	67	50	71	57	86	57
Beverages, non-alcoholic	332	374	330	387	362	403	352	386	395	403
Sugar and sugar products	144	93	89	74	72	50	76	53	69	50
Fruit and vegetable juices	53	45	46	43	60	53	63	64	63	72

The daily per person availability of fruits and non-alcoholic beverages (Table 2) and nuts was higher among urban households when compared to rural ones.

The daily per person availability of fish, seafood and dishes was higher in rural households in earlier years, but has become equal with that of urban households in recent years.

In 2005 the availability of fruit and vegetable juices was higher in rural households, but in 2007 the availability of these food products was higher in urban households (Table 2).

The mean availability of cereals (included rye bread, white bread and oat flakes) and added lipids was higher in rural households, while the availability of rice and buckwheat was higher in urban households. No specific trend has been traced in the consumption of ordinary oil (mostly rapeseed oil), but the availability of olive oil was a little higher in urban households. One could guess that, because historical eating habits, the availability of butter is higher in rural areas and that of margarine in urban areas, but actually it is the other way round.

The urban-rural differences inside the vegetable group are not so big. The availability of beets, carrots, turnips, pickled cucumber and sauerkraut is a little higher in rural households.

The availability of sugar, jams and compotes is mostly higher in rural households, but the availability of chocolate and different sweets and candies is considerably higher in urban households.

There have also been some socio-economic differences in food availability. The availability of potatoes, cereals, meat, meat products and dishes, added lipids, sugar and sugar products (Table 3) as well as eggs has, in most of the survey years, been higher among households whose head had elementary education. Sugar availability among households whose head had higher education was higher compared to households whose head had secondary education.

Table 3 Mean availability of food products by educational level of the household head and by survey year (g or ml / per person / per day)

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	2003			2004			2005			2006			2007		
	IEE	SE	HE	IEE	SE	HE	IEE	SE	HE	IEE	SE	HE	IEE	SE	HE
Eggs (pieces)	0.66	0.44	0.43	0.48	0.43	0.40	0.48	0.45	0.38	0.50	0.41	0.40	0.55	0.52	0.46
Potatoes	322	262	245	277	230	202	268	229	168	284	176	153	271	227	192
Pulses	2.41	1.75	1.42	1.52	1.23	1.82	1.18	0.94	1.01	1.72	0.90	0.62	1.51	1.22	1.36
Nuts	0.67	0.76	1.29	0.94	0.90	1.36	0.68	1.13	1.70	1.25	1.66	2.20	1.19	1.52	2.40
Cereals	268	223	220	253	215	217	248	212	198	243	193	191	259	219	212
Milk products	326	291	313	300	298	318	299	290	313	322	289	318	351	326	346
Meat, meat products and dishes	175	161	160	175	162	175	177	173	158	184	160	161	196	186	177
Vegetables	195	189	247	190	185	193	177	180	171	187	166	185	208	202	216
Fish, seafood and dishes	47	34	37	50	38	48	45	37	37	43	33	34	48	41	43
Fruits	87	108	149	85	113	156	101	123	153	95	115	160	114	139	173
Lipids, added	46	35	35	42	34	34	41	31	28	41	28	28	44	34	33
Beverages, alcoholic	45	50	48	39	56	59	47	65	53	56	62	66	69	73	82
Beverages, non-alcoholic	325	344	416	338	353	411	365	398	400	368	375	414	431	463	474
Sugar and sugar products	138	99	96	86	83	69	65	56	52	74	57	60	87	64	67
Fruit and vegetable juices	37	47	58	32	43	57	40	55	71	52	59	76	58	73	85

Note: IEE — illiterate / elementary education; SE — secondary education, HE — higher education.

The daily per person availability of fruits, non-alcoholic beverages, fruit and vegetable juices and nuts (Table 3) was higher in those households whose head had higher education compared to those with elementary education.

Retired persons report a bigger number of food products, reflecting probably either a less frequent eating out of home, or they have a common habit of preparing food for their children's households. With respect to the occupation of the household head by the survey year, across all food groups, the availability was higher in the group of retired people, followed by manual workers who consume more potatoes, cereals, meat, meat products and dishes, added lipids, sugar and sugar products, eggs and pulses. The availability of milk products and vegetables is mostly higher in the group of non-manual workers.

On the other hand, the availability of alcoholic beverages, fruit and vegetable juices and nuts is the lowest in the group of retired persons and the highest in the group of non-manual workers. No specific trend worth pointing out can be found in the availability of fruit, fish, seafood and dishes and non-alcoholic beverages.

Table 4 Mean availability of food products by occupation of the household head by survey year (g or ml / per person / per day)

	2003			2004			2005			2006			2007		
	Manual	Non-manual	Retired	Manual	Non-manual	Retired	Manual	Non-manual	Retired	Manual	Non-manual	Retired	Manual	Non-manual	Retired
Eggs (pieces)	0.42	0.41	0.86	0.41	0.38	0.59	0.43	0.37	0.57	0.43	0.37	0.55	0.45	0.35	0.61
Potatoes	255	230	386	222	201	292	221	167	304	181	150	302	206	136	245
Pulses	1.39	1.11	3.87	1.18	1.06	2.68	0.70	0.74	1.84	0.79	0.53	2.27	0.78	0.61	2.26
Nuts	1.00	1.18	0.42	0.74	1.43	0.73	1.06	1.65	0.84	1.81	2.01	1.35	1.60	1.92	1.90
Cereals	220	204	315	211	201	306	203	184	309	191	178	285	190	168	286
Milk products	278	303	393	278	304	373	277	298	380	283	302	387	290	303	384
Meat, meat products and dishes	169	155	185	166	170	190	169	156	201	167	158	196	181	153	181
Vegetables	182	222	253	173	183	229	164	169	218	166	175	223	175	165	257
Fish, seafood and dishes	34	33	60	37	44	61	35	34	57	32	34	49	36	34	51
Fruits	100	145	99	108	155	95	122	144	121	112	147	124	130	152	141
Lipids, added	35	30	57	33	29	53	30	25	53	28	25	52	28	23	53
Beverages, alcoholic	52	57	31	51	63	38	62	62	43	65	68	43	75	78	50
Beverages, non-alcoholic	355	394	334	350	399	360	370	418	403	377	404	396	417	416	464
Sugar and sugar products	93	94	171	75	71	96	53	50	76	64	50	86	58	48	98
Fruit and vegetable juices	44	63	33	37	59	34	47	75	41	62	74	46	65	84	50

Comparison of the daily per person availability of food products by household composition is given in Table 5.

The availability of main food products, i.e. eggs, potatoes, pulses, cereals, milk products, vegetables, fish, seafood and dishes, fruits, added lipids, and alcoholic and non-alcoholic beverages has been higher in one-adult households than in two-adult households in most of the survey years. The availability of meat, meat products and dishes, as well as sugar and sugar products was higher in two-adult households in most of the surveyed years.

Observation of the households with elderly members reveals no specific trends, and about half of these trends are similar to those of one- and two-adult families: the availability of eggs, cereals, milk products, fruits, added lipids and non-alcoholic beverages is higher in households consisting of one elderly member than in households consisting of two elderly members in most of the survey years. The availability of potatoes, vegetables, alcoholic beverages, and fruit and vegetable juices is higher in households consisting of two elderly members than in households consisting of one elderly member in most of the survey years.

Comparison between the one- or two-adult households with children and the one- or two-adult households without children reveals less trends in food availability. In most of the survey years, the daily per person availability of eggs, nuts, fruits and non-alcoholic beverages is higher and the availability of milk products, meat, fish and seafood, alcoholic beverages, and sugar and sugar products is lower in one-adult households with children compared to two-adult households with children.

Table 5 Comparison of the availability of food products by household composition (x — higher in the households of respective household type through all the survey years)

	Comparison 1		Comparison 2		Comparison 3	
	1 adult, No children	2 adults, no children	1 elderly	2 elderly persons	1 adult + child(ren)	2 adults + child(ren)
Eggs	x		x		x	
Potatoes	x (excl. 2007)			x (excl. 2006)	no trend	
Pulses	x		no trend		no trend	
Nuts	no trend		no trend		x (excl. 2004)	
Cereals	x		x		no trend	
Milk products	x (excl. 2004)		x (excl. 2003)			x (excl. 2005)
Meat, meat products and dishes		x (excl. 2005)	no trend			x
Vegetables	x (excl. 2003)			x	no trend	
Fish, seafood and dishes	x (excl. 2004)		no trend			x (excl. 2003)
Fruits	x (excl. 2005)		x (excl. 2004)		x	
Lipids, added	x		x		no trend	
Beverages, alcoholic	x (excl. 2004)			x		x
Beverages, non-alcoholic	x (excl. 2006)		x		x	
Sugar and sugar products		x (excl. 2005)	no trend			x (excl. 2006)
Fruit and vegetable juices	no trend			x (excl. 2007)	no trend	

Discussion

Comparison with other dietary surveys

Comparisons of the data collected with different methods are rather difficult to provide. In the Household Budget Survey (hereinafter HBS), data are gathered at household level. In HBS, loss from non-edible parts, food acquired but not consumed and food eaten out of home are not included. Results of the Association of Estonian Food Industry's survey "Eating habits in the Baltic States, 2007" show that half of the participants have their main meal outside home. Neither can it be defined which member(s) of the household eat which food and in what amounts. Nevertheless, HBS is the best tool to evaluate a country's food availability and to compare the results with other countries.

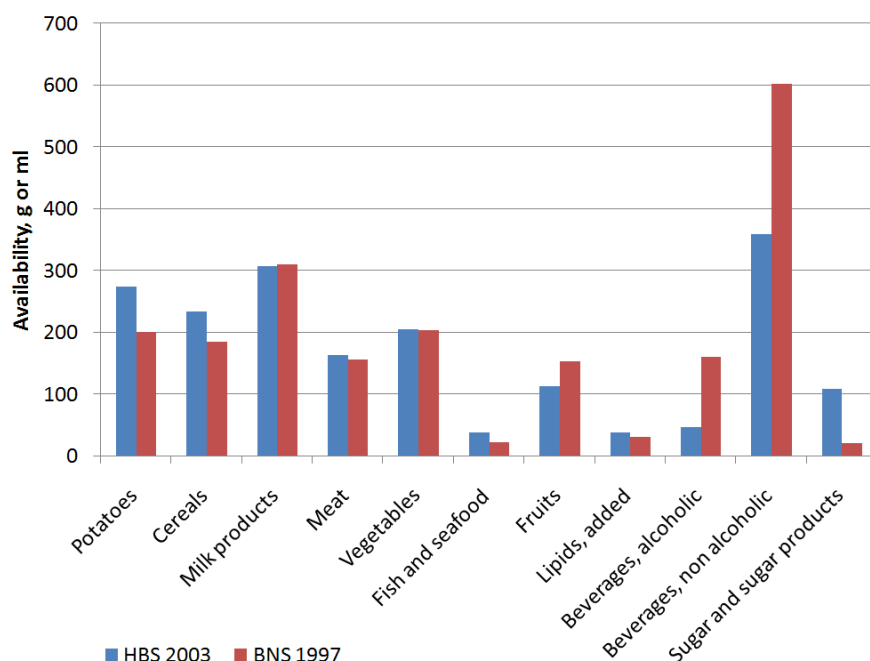
In the specially designed food consumption surveys such as Baltic Nutrition Survey (BNS) (Pomerleau, J et al, 2000), only food actually eaten by each person is asked about. Consequently, food consumption surveys are considered to be the best method for studying food consumption at individual level, which is the main aim in epidemiologic studies (Cameron, M.E., 1988). BNS was conducted by the World Health Organization in Estonia, Latvia and Lithuania in the summer of 1997. The survey sample was taken from a simple random sample of 3,000 people aged 19–64 by using the 24-hour recall method in each country. Unfortunately, the BNS data are over ten years old by now and no representative nutrition survey has been conducted since 1997. Therefore, the Household Budget Surveys can currently provide a realistic alternative as they are based on nationally representative samples and the trends in nutrition over the recent ten years can be followed on the basis thereof.

For some food items, the Estonian HBS data can still be compared with the results of BNS data from the year 1997. The BNS did not analyze pulses, nuts, and fruit and vegetable juices separately. Pulses are under vegetables, vegetable and fruit juices are partly under non-alcoholic beverages (diluted juices) and partly under vegetables or fruits (juices, nectars), and nuts are under added lipids. In this report, the BNS 1997 data are being compared with the HBS 2003 data.

More recent surveys such as the survey on Health Behavior among Estonian Adult Population (Tekkel, M. et al., 2007) cannot be considered comparable since the consumption frequency of only some food groups is asked in this survey.

The comparison between the HBS and BNS data showed similarity in the availability/consumption of milk products, meat, meat products and dishes as well as vegetables (Figure 4) and eggs.

Figure 4 Mean availability of specific food groups based on the HBS (2003) and BNS (1997) data (quantity/ per person / per day).



The availability of potatoes, cereals, lipids, fish, seafood and dishes as well as sugar and sugar products is higher according to the HBS data (Figure 4). The possible reasons for higher potato and cereal availability, on the basis of HBS, can be due to the fact that food waste or its use for animal feed have also not been taken into account in HBS.

The reason for higher availability of fish and seafood can be explained by the overall increase in the availability thereof until 2004. A higher availability of sugar and sugar products is possibly, because people do not use sugar only for direct day-to-day consumption, but also for making jams and compotes.

Another possible reason for an increased consumption of sugar is that people used to store big amounts of sugar before accession to the European Union. Also, a big decrease in the availability of sugar between the survey years 2003 and 2005 (Figure 3) may be conditioned by a drastic price increase of sugar in 2005 (from 7 kroons to 14 kroons) — but the sugar available had already been stored in people's homes (Household Budget Survey 2003, 2005).

The availability of fruits, alcoholic and non-alcoholic beverages is higher according to BNS (Figure 4). Notwithstanding differences in the methodology used in the two surveys, which may be responsible for the differences observed, higher availability of fruits and non-alcoholic beverages might be due to the fact that fruit juices were not calculated separately but under these two groups in BNS. Non-alcoholic beverages and especially alcoholic beverages show bigger consumption according to BNS, because their overall consumption has increased over years and also probably because these items are often consumed outside home and therefore not included in HBS. Also, the lack of own production of food is a limiting factor in HBS.

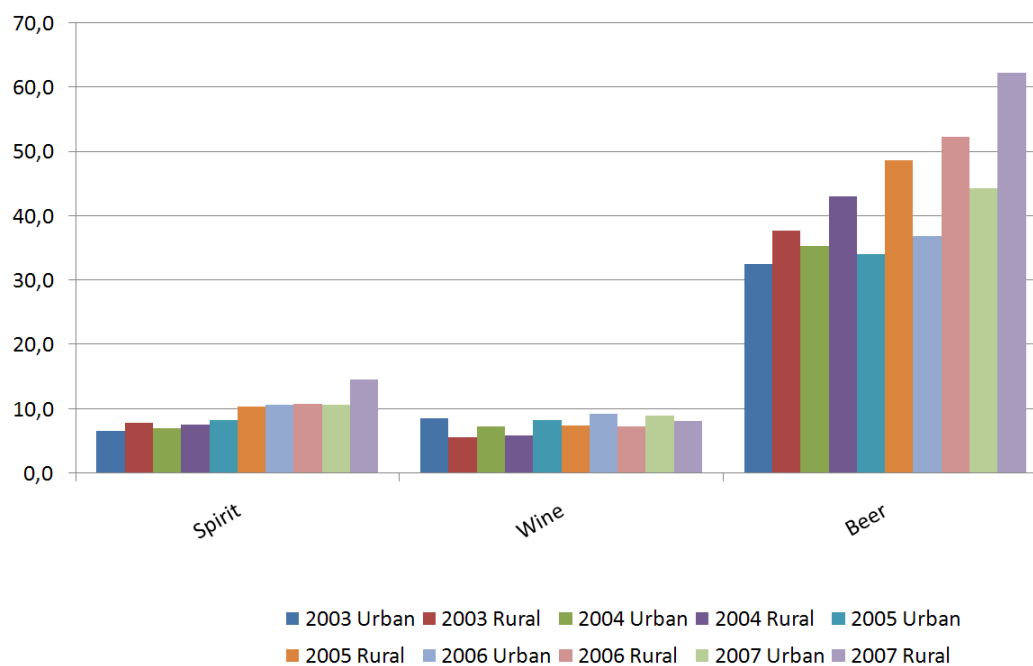
Observation of the HBS and BNS data by location reveals similarities in the availability of potatoes, cereals, milk products, vegetables, fish, seafood and dishes, fruits, and alcoholic beverages (Table 6). While BNS did not show any differences by location in the availability of added lipids, sugar and sugar products, the consumption of the products of both food groups was higher in rural households according to HBS. A possible reason for sugar consumption is the storage thereof, but the reason for the differences in added lipids is unknown. It is also impossible to know reasons for the differences in the availability of meat and non-alcoholic beverages by location in HBS and BNS without further research. It is interesting to note that location-specific differences in the availability of alcoholic beverages are smaller according to HBS than according to BNS. Once again, the reason might lie in the possibility that alcoholic beverages are often consumed outside home.

Table 6 Mean availability of food products on the basis of BNS (1997) and HBS (2003) by location of dwelling (quantity/ per person / per day)

	1997 BNS		2003 HBS	
	Rural	Urban	Rural	Urban
Eggs (pieces)	0.53	0.55	0.64	0.43
Potatoes (g)	223	189	356	235
Cereals (g)	192	182	267	220
Milk products (g)	334	298	352	287
Meat, meat products and dishes (g)	154	158	182	156
Vegetables (g)	207	203	220	203
Fish, seafood and dishes (g)	24	23	42	38
Fruits (g)	113	174	97	122
Lipids, added (g)	32	32	42	36
Beverages, alcoholic (ml)	188	147	50	47
Beverages, non-alcoholic (ml)	610	599	332	374
Sugar and sugar products (g)	21	21	144	93

Figure 5 shows that Estonians mostly drink beer. The availability of beer and spirits is higher in rural households, the availability of wine in urban households.

Figure 5 Mean availability of spirits, wine and beer by location of dwelling and by survey year (ml/ per person / per day)



What concerns the educational level of household head, there are only some similarities in the availability of food products between HBS 2003 and BNS 1997 (Table 9). It can be explained by the fact that HBS has looked into the educational level of household head and BNS at the surveyed person's educational level. By comparing BNS with HBS, it can be admitted that higher food intake has been observed in case of persons with higher education.

Table 9 Mean food availability in HBS (2003) and BNS (1997) by the educational level of the household head (g or ml / per person / per day)

	2003 HBS			1997 BNS		
	Elementary	Secondary	Higher	Elementary	Secondary	Higher
Eggs (pieces)	0.66	0.44	0.43	0.38	0.55	0.59
Potatoes (g)	322	262	245	190	216	188
Cereals (g)	268	223	220	229	190	167
Milk products (g)	326	291	313	270	316	315
Meat, meat products and dishes (g)	175	161	160	131	157	163
Vegetables (g)	195	189	247	177	199	219
Fish, seafood and dishes (g)	47	34	37	27	22	23
Fruits (g)	87	108	149	56	160	176
Lipids, added (g)	46	35	35	28	32	33
Beverages, alcoholic (ml)	45	50	48	140	150	181
Beverages, non-alcoholic (ml)	325	344	416	533	603	624
Sugar and sugar products (g)	138	99	96	16	21	23

No similarities could be detected in the consumption of food products if observed by surveyed person's occupation in BNS 1997 and if observed by household head's occupation in HBS 2003 (Table 10). BNS (1997) does not confirm the fact that retired people consume more food products (Table 4). One possible explanation for that is that retired people tend to live more in the countryside and have probably more domestic animals to feed with the food they have declared in HBS as their own food. By comparing the manual and non-manual categories, both HBS and BNS show big differences, but further research is needed to find out the reasons.

Comparison of household types between HBS and BNS is not possible, because only persons, not the respective family, were analyzed in BNS. But looking more closely at the HBS data and more specifically at the mean daily availability of alcoholic beverages, it is noteworthy that in the “one adult without children” household type the availability of alcohol is higher than in the “two adults without children” family type. At the same time, in the household types “one elderly person” and “one adult with child(ren)” this indicator was lower than in the household types “two elderly persons” and “two adults with child(ren)”. It is probably so, since the main alcoholic beverage consumers in the households “two elderly persons” and “two adults with child(ren)” are men, whereas in the households “one elderly person” and “one adult with child(ren)” the household heads are mostly women. But the reason why the availability of alcoholic beverages in “one adult without children” household is bigger could lie in the fact that women living alone tend to consume more alcohol compared with women living together with a partner. Or, men living alone drink much more alcohol compared to men who are living with a partner.

Table 10 Mean food availability in HBS (2003) and in BNS (1997) by the occupation of household head (g or ml / per person / per day)

	2003 HBS			1997 BNS		
	Manual	Non-manual	Retired	Manual	Non-manual	Retired
Eggs (pieces)	0.4	0.4	0.9	0.7	0.6	0.3
Potatoes (g)	255	230	386	177	219	181
Cereals (g)	220	204	315	174	191	175
Milk products (g)	278	303	393	290	340	292
Meat, meat products and dishes (g)	169	155	185	173	178	105
Vegetables (g)	182	222	253	227	211	180
Fish, seafood and dishes (g)	34	33	60	24	25	20
Fruits (g)	100	145	99	173	166	73
Lipids, added (g)	35	30	57	32	36	25
Beverages, alcoholic (ml)	52	57	31	173	174	39
Beverages, non alcoholic (ml)	355	394	334	653	622	551
Sugar and sugar products (g)	93	94	171	24	22	18

Comparison with other countries

Comparisons with other countries have been based on national reports from Finland, Sweden and Norway because of our similar cultural and eating habits, on the national report of Latvia because of our similar recent history and that of Germany which has influenced Estonia's eating habits over centuries and also on the reports provided by farther countries like Portugal, Greece and Italy to find out the biggest differences (Table 11). As the survey years for these countries are mainly from 1996 to 1998, thus the closest survey year to compare them with the data on Estonia's mean daily food availability is the year 2003. The availability of eggs, potatoes, meat, meat products and dishes, sugar and sugar products is one of the highest in Estonia, compared to the data of other chosen countries. The availability of vegetables is surprisingly high. The

explanation for that might lie in the fact that Estonia's (and also Latvia and Greece's) data are more recent and the availability of vegetables may have increased during the last years in other countries as well.

Other surveys show that Estonia's population is quite modest in the consumption of vegetable and fruits compared to other countries. The lowest availability of fruits can also be seen in Table 11. The availability of nuts and alcoholic beverages is also lower compared to other countries. On the other hand, the availability of spirits was quite high, right after Germany (Figure 6). HBS does not reflect consumption of home-produced alcohol and alcohol drunk outside home, which both may in fact contribute a large proportion to overall consumption.

In Estonia, the availability of sugar and sugar products (Figure 7) is about twice as high as in other countries on average. The reason for that might lie in the fact that Estonians stored large quantities of sugar because of the fear of price increase before accession to the EU.

The availability of fish, seafood and dishes is quite average compared to other countries, but BNS showed much more modest consumption (Table 6) reflecting much smaller amounts than recommended. Although the survey "Health Behavior among Estonian Adult Population" (Tekkel, M., et al. 2007) from 2006 showed, that about 75% of people in Estonia consume fish once a week or more and 25% never do it. But according to the NorBaGreen study (Similä, M. et al. 2003) from the year 2002, 65% of people in Estonia consume fish once a week or more and 17% once a month or less frequently. In neither of the surveys, the consumed amounts were not specified.

Table 11 Mean availability of food products in Estonia, Finland, Sweden, Norway, Latvia, Germany, Portugal, Greece and Italy by survey year (g or ml / per person / per day)

	Estonia	Finland	Sweden	Norway	Latvia	Germany	Portugal	Greece	Italy
	2003	1998	1996	1996-98	2003	1998	2000	2004	1996
Eggs (pieces)	0.5	0.3	0.4	0.3	0.5	0.4	<u>0.2</u>	<u>0.2</u>	0.3
Potatoes (g)	274	111	85	114	289	115	180	124	<u>76</u>
Pulses (g)	1.9	0.8	2.0	<u>0.8</u>	4.7	<u>0.6</u>	9.2	14.0	4.1
Nuts (g)	<u>0.9</u>	1.6	1.9	3.8	2.1	7.6	3.0	4.4	<u>0.9</u>
Cereals (g)	235	205	<u>200</u>	<u>201</u>	274	217	239	246	335
Milk products (g)	308	507	445	386	306	311	276	295	<u>271</u>
Meat, meat products and dishes (g)	165	149	<u>128</u>	126	172	132	160	159	136
Vegetables (g)	208	123	128	<u>109</u>	227	180	137	283	184
Fish, seafood and dishes (g)	39	30	30	50	40	<u>16</u>	83	46	38
Fruits (g)	<u>114</u>	157	122	135	123	182	198	264	233
Lipids, added (g)	38	<u>31</u>	39	<u>32</u>	45	37	51	77	63
Beverages, alcoholic (ml)	<u>48</u>	102	-	73	49	200	125	60	149
Beverages, non-alcoholic (ml)	360	531	492	720	373	915	<u>171</u>	244	824
Sugar and sugar products (g)	110	53	56	79	77	59	<u>30</u>	<u>34</u>	49
Fruit and vegetable juices (ml)	48	82	-	48	21	123	<u>11</u>	37	<u>9.6</u>

Figure 6 Mean availability of alcoholic beverages, beer, spirits and wine in different European countries (ml/ per person / per day)

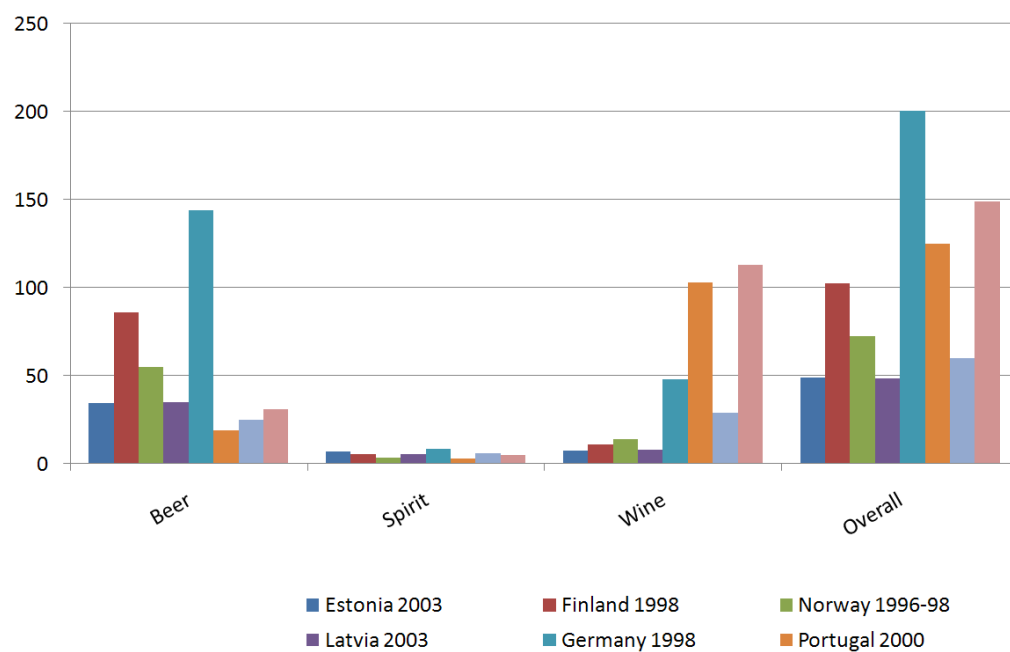
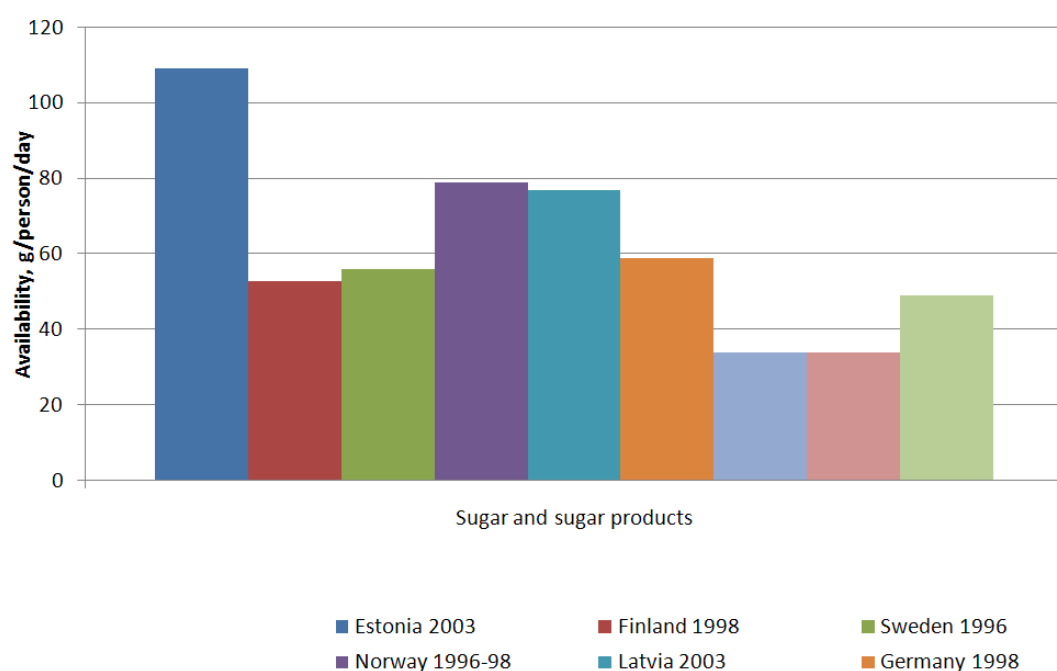


Figure 7 Mean availability of sugar and sugar products in different European countries (g/ per person / per day)



Summary

From the public health point of view, the diet of Estonia's population, as depicted through the national HBS, has undergone both positive and negative changes during recent years. One of the positive changes is the increasing availability of fruits. However, the level of fruit consumption is still low as well as the consumption of vegetables, compared to other European countries, and according to the recommended consumption of at least five portions on a daily basis.

To increase the intake of fruits and vegetables, the National Institute of Development launches healthy eating campaigns every year (for example the campaign "Eat more fruits and vegetables" conducted from 19 October 2009 to 8 November 2009). In addition, each person can retrieve useful information on healthy menus on the site www.toitumine.ee

According to HBS; the consumption increases from year to year across almost all food groups. The availability of fish, seafood and dishes is still continuously smaller than recommended (Vaask, S., et al. 2006), but the availability of added lipids has decreased slightly over the years.

In conclusion, HBS has provided a good possibility to describe the availability of food or variety of food at the household or country level or for undertaking international comparisons, but factual food consumption surveys must be used when nutrition is studied at individual level.

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