Trends in food availability in Lithuania – the ANEMOS project

Agnė Čiapaitė[1], Vilma Dapkutė[1] and Romualdas Zemeckis[1]

[1]Lithuanian Institute of Agrarian Economics

Introduction

Lithuania became a member of the Network in 2008. The participation is insured through the Lithuanian Institute of Agrarian Economics.

The DAFNE-ANEMOS databank is based on information collected in the context of household budget surveys (HBS). HBS collect data on expenses and income of private households together with households' socio-economic characteristics, such as educational background, occupational status, household type, etc. The data obtained enables a detailed evaluation of food (including beverages) availability, as data on the quantity of food and beverages acquired at household level are recorded (all food purchases, own production and payments in kind are recorded). However no permanent nutritional analyses is carried out

Since 1996 HBS is rendered according to methods, complying with main EUROSTAT requirements. The HBS data from 2003 to 2007 were selected to be integrated in the DAFNE-ANEMOS databank through the project ANEMOS – Expanding and update of existing nutrition monitoring systems.

The DAFNE classification scheme for foods and socio-demographic characteristics were applied to the Lithuanian HBS data, in order to assure comparability among countries.

This report presents the data on daily individual availability of 15 main food groups. The availability is analyzed in various aspects, taking into account different socio-demographic characteristics. Also changes in the availability during the reference period (2003 – 2007) were followed.

Material and Methods

Material

Lithuanian HBSs are carried out annually and data are collected for the whole year. The sample of the survey was selected using a two-stage stratified sampling procedure. The sampling frame was Resident's Register. Firstly, individuals were chosen and then households were created taking into account all persons living at the same address.

The sample unit is defined as a person or a group of persons sharing the same accommodation and expenditures, including collective provision of vital needs. Persons living in institutional households (nursing homes, prisons, compulsory military service installations, etc.) are excluded from the survey. Households participate on a voluntary basis and are financially compensated (15% of the minimum standard of living).

The survey sample covers the whole territory of Lithuania. Every participating household has to fill in an expenditure diary for 15 days. The diary comes in a form of an open questionnaire. The households are asked to record the acquired/self produced food (including alcoholic beverages) quantities and the prices actually paid. The number of food items recorded in food quantities and expenditures were in 2003–2004 – 116 and 126 in 2005-2007 – 118 and 128 respectively. The data are collected all over the year capturing seasonal variability. Information on the social and demographic characteristics of the household, as well as the income, is also collected.

Sample size varied through years from 7.000 to 8.000 households. The sample size for 2003 was 7.826 households, for 2004 – 7.969, for 2005 – 7.586, for 2006 – 7.178 and for 2008 – 6.917 households.

Response rate is relatively high, varying from 62.7% in 2007 up to 73.3% in 2004.

Methods

Lithuanian HBSs data were analyzed according to the DAFNE methods and procedures. Individual availability was estimated under the assumption of equal distribution of food within the household and during the survey period.

Households were classified according to four socio-demographic characteristics:

1. ***Completed educational level of the household head:***
    - Illiterate/Elementary education;
    - Secondary education;
    - Higher education;
2. ***Current occupation of the household head*:***
    - Manual;
    - Non-manual;
    - Retired;
    - Unemployed
    - Others
3. ***Household composition**:***
    - Households of one adult member;
    - Households of two adult members;
    - Households of one adult member and children (single parents);
    - Households of two adult members and children;
    - Households of adult and elderly residents;
    - Households of adult, children and elderly residents;
    - Households of one elderly member;
    - Households of two elderly residents;
    - Other types;
4. ***Locality of the residence:***
    - Urban;
    - Rural.

According to the DAFNE classification schemes, locality is classified under three categories: urban, semi-urban and rural areas. At the 1st plenary meeting of the project participants from Lithuania expressed their concern on the feasibility to identify semi-

* Results on the categories 'Unemployed' and 'Others' are not presented due to the small number of households classified under these categories

** Children were defined as up to 18 years of age, adults from 19-65 years of age and elderly as more than 65 years old.

urban areas in their country. Thus, results for urban and rural areas will only be presented.

Furthermore, two criteria are being used for publishing the estimations of the mean daily food availability:

In the case of occupation, data on daily food availability will be reported only if the group corresponds to at least 5% of the total survey sample and

In the case of household composition, the group corresponds to at least 0.5% of the total survey sample **AND** more than 100 households are classified under the group.

Results

Table 1 presents the overall mean per person daily availability of the 15 main DAFNE food groups in Lithuania from 2003 to 2007. The presented results indicate, that the mean per person daily availability of eggs, potatoes, pulses, cereals, milk products, vegetables, fish, seafood and dishes, added lipids, sugar and sugar products has decreased, while the availability of nuts, fruits, alcoholic beverages, non-alcoholic beverages, fruit and vegetable juices has generally but not steadily increased during the period. High values of household food availability were recorded for potatoes, cereals, milk products, meat, meat products and dishes as well as in vegetables. The results of beverage availability indicate that Lithuanians prefer non-alcoholic beverages to fruit and vegetable juices.

Table 1: Overall mean availability of the main food groups in Lithuania, by survey year (quantity/ day / person)

Food Groups	2003	2004	2005	2006	2007
Eggs (piece)	0.62	0.60	0.60	0.53	0.51
Potatoes (g)	337	324	298	254	234
Pulses (g)	7.98	6.96	5.69	4.84	4.37
Nuts (g)	3.35	3.27	3.37	3.51	4.20
Cereals (g)	276	278	277	253	249
Milk products (g)	372	348	332	300	291
Meat, meat products and dishes (g)	221	225	236	229	223
Vegetables (g)	266	256	254	244	230
Fish, seafood and dishes (g)	44	45	46	43	43
Fruits (g)	149	145	161	161	154
Lipids, added (g)	51	50	48	41	39
Beverages, alcoholic (ml)	51	53	63	72	68
Beverages, non alcoholic (ml)	351	373	428	437	478
Sugar and sugar products (g)	99	96	95	92	82
Fruit and vegetable juices (ml)	33	33	34	43	44

Results by socio-economic characteristics and demographic groups

Locality of the dwelling

The results of mean per person daily food availability by locality of the dwelling are presented in Table 2. The results indicate that in the beginning of the recorded period the overall per person food availability has been much higher for rural households. Food availability decreases annually for rural, but also for urban households and the gap between dietary habits in rural and urban areas extends. The major differences during the period are observed in the availability of potatoes, milk products, fruits and non alcoholic beverages (incl. juices) – rural households tend to consume more potatoes and milk products, while the availability of fruits, juices and other non alcoholic beverages is much higher among urban households.

Table 2: Mean availability of main food groups by locality of the dwelling in 2003, 2005 and 2007 (quantity/ person/day)

Food Groups	2003		2005		2007	
	Rural	Urban	Rural	Urban	Rural	Urban
Eggs (piece)	0.64	0.60	0.62	0.59	0.56	0.48
Potatoes (g)	455	278	404	245	330	186
Pulses (g)	10.81	6.58	8.01	4.53	5.88	3.61
Nuts (g)	2.13	3.95	2.01	4.06	2.64	4.97
Cereals (g)	338	246	340	246	303	223
Milk products (g)	587	266	493	252	382	245
Meat. meat products and dishes (g)	264	200	283	212	267	201
Vegetables (g)	298	250	282	240	258	217
Fish. seafood and dishes (g)	48	42	49	44	46	41
Fruits (g)	128	160	134	175	125	168
Lipids. added (g)	67	43	62	41	50	34
Beverages. alcoholic (ml)	41	56	49	70	57	73
Beverages. non alcoholic (ml)	278	387	335	475	383	526
Sugar and sugar products (g)	131	83	126	79	108	69
Fruit and vegetable juices (ml)	28	36	24	40	32	50

Education of the household head

The average per person daily availability by educational level during the period from 2003 to 2007 is presented in table 3. The values refer to arithmetic means of average availability in all survey years (data collected annually from 2003 to 2007). Food availability for all three groups has been steadily decreasing since 2003. In the referent period, the overall daily food availability declined 11% for illiterate/elementary educated and higher educated household heads' and 3% for those with secondary education.

The table also shows considerable disparities in daily food availability – more than 40% on average. Especially high differences are recorded in daily per person availability of juices and nuts, both of which are significantly more available in households of higher education. Juices, nuts, fruits and alcoholic beverages are the four food groups available more among households of higher educational level.

Added lipids (fats and oils) and potatoes are the two food groups with substantial higher daily availability among households of lower education as compared to their highly educated counterparts. Elementary education households are consuming much more of milk products and much less of alcoholic beverages, increasing the changes observed between these two educational levels.

Table 3: Average mean availability* of main food groups by education of the household head from 2003 to 2007 (quantity/person/day)

Food groups	**Illiterate/Elementary education**	**Secondary education**	**Higher education**
Eggs (pieces)	0.65	0.57	0.52
Potatoes (g)	375	294	208
Pulses (g)	7.85	5.88	4.66
Nuts (g)	2.24	3.31	5.16
Cereals (g)	358	256	221
Milk products (g)	434	317	273
Meat, meat products and dishes (g)	250	232	196
Vegetables (g)	255	251	243
Fish, seafood and dishes (g)	51	42	42
Fruits (g)	128	146	194
Lipids, added (g)	63	45	34
Beverages, alcoholic (ml)	49	59	77
Beverages, non alcoholic (ml)	344	409	480
Sugar and sugar products (g)	114	91	80
Fruit and vegetable juices (ml)	23	35	56

* Values refer to arithmetic means of average availability values of all survey years.

Disparities in daily per person food availability for different household groups have been changing during the period analyzed. The food availability increased for about 8% on average in households of higher education as compared to those of elementary education (table 4). This trend is mostly observed in the availability of juices, pulses, meat, meat products and dishes. For alcoholic beverages and milk products the contrary trend is observed – the gap is decreasing, although for different reasons. Between households of secondary and higher education groups the gap in availability of alcoholic beverages, juices, nuts and fruits significantly decreased, as well as in availability of vegetables and fish, seafood and dishes but with slighter declines. The increase in discrepancy is observed in the availability of pulses, meat, meat products and dishes as well as in potatoes. Comparing elementary and secondary education groups, the most significant changes are recorded in availability of nuts, fruits and

non-alcoholic beverages (gap increased), also cereals, fish, seafood and dishes, sugar and milk products (gap decreased).

Occupation of the household head

There is a positive correlation between household head's educational level and his/her occupation (manual or non-manual) consequently, similar tendencies are observed when comparing food availability changes between manual and non-manual household groups. For example, households defined as manual, have higher availability of potatoes, pulses and milk products, whereas "non-manuals" have higher availability of juices, nuts, fruits and alcoholic beverages (exactly as higher education households). However, changes through the years are of slightly different nature. For example, the difference in mean daily availability of juices and nuts are in an ascending scale, staying at a significantly high level. Other considerable decreases are recorded in the daily mean availability of milk products, cereals, pulses and lipids.

Retired people acquire substantially more food that employed people. Except several food items, that usually are more expensive (juices, nuts, alcoholic beverages). This household group changed their diet less than two other groups in the reference period. The negative tendency – retired people started acquiring much more alcoholic beverages. Though this tendency is true for all the groups, as well as increase in daily availability of nuts and non alcoholic beverages.

Retired individuals reported higher food acquisition, reflecting probably either less frequent out of home eating, or the common habit of preparing food for their children's households. The relevant results are presented at table 5.

Household composition

Households, according to their composition, vary considerably across their dietary pattern. One adult households' availability of various food groups especially differs from the average (about 50 %). This group of households also characterizes itself as having biggest daily per person availability of most food groups, except pulses, cereals, milk products, sugar products and lipids, which in biggest daily quantities are available for single elderly households. The least daily per person food availability is recorded for adult households, as well as elderly and children households. These tendencies only with slight difference are observed through all the reference period. Since 2003 to 2007 the per person availability of all food groups declined, except of

alcoholic and non-alcoholic beverages. Daily per person availability for the formers increased for all household groups. The largest decrease in general daily per person availability of food (not including beverages) is recorded for adults with children and adult with elderly households (app. 13 %); the least decrease – for adult, elderly and children households (app. 2 %).
The relevant results are presented at tables 6-8.

Discussion

The presented food availability data bear several limitations. First of all, the data are based on the HBS surveys and are limited to the household. The data on the quantities available for food consumption by each household member are not available. In order to determine the individual daily food availability, products, available for the household are divided by the referent period and the mean household size. Food losses, waste or food amounts consumed by household guests are not taken into consideration. What is more, food stocks and large food purchases are treated as food, consumed during the survey period and no special handling of it is recorded. Eating-out expenditures comprise 9-13% of the total food expenditures during the period analyzed, but the detailed information on food products consumed is not available. These limitations result to certain inconsistencies with the food actually consumed and lack of data on food availability among different age groups and sex of the household members.

Despite the indicated limitations, it should be emphasized, that DAFNE-ANEMOS databank provides a simple and cost-effective tool to monitor and compare food patterns and their socio-demographic determinants across European countries, through the exploitation of the nationally representative HBS when individual – based data are not available. In Lithuania, as well as in other European countries, availability of dietary data for assessing and monitoring the diet of the population is limited, thus current nutrition policies and strategies are based on assumptions of dietary habits rather than on actual food consumption indicators. Therefore, the DAFNE databank is regarded as a realistic alternative for monitoring nutrition habits, comparing them to the indicators of other countries and dietary guidelines and for setting targeted nutrition strategies.

The comparison of DAFNE-ANEMOS data to other officially published by the Statistical Office data on nutrition habits was limited since data are available only for few food groups. In addition the published information is not solely based on the HBS data; therefore the comparison is limited as the result of differing methodologies.

In 2007 the national Nutrition centre (since 1 October, 2008 – The State Environmental Health Center) carried out the study of actual nutrition and lifestyle habits among Lithuanian adult population (sample size – 3.000) [1]. The questionnaire part on food availability was designed to assess the amounts of the products consumed by the respondents the previous day. Consumption of food products was classified into 15 food groups (with sub-groups) according to the European Food Safety Authority recommended food grouping system. The data obtained were consistent to the DAFNE-ANEMOS data regarding potatoes, cereals, meat, meat products and dishes, vegetables, fish, seafood and dishes, alcoholic and non- alcoholic beverages and fruit and vegetable juices, whereas differences were recorded regarding sugar and sugar products, fruit and added lipids: HBS data recorded more than twice greater availability of those food products. Furthermore, the respondent's inability to actually measure the exact amounts of these products consumed, the period for the food availability record is different – these factors may undermine comparisons of the figures obtained from the surveys.

To evaluate whether the DAFNE-ANEMOS data depict food habits in the country, the DAFNE-ANEMOS derived Lithuanian results were compared to the food balance sheets, published in the database [2]. In the database Lithuanian food balance sheets are only available for year 2003. The corresponding food groups' estimates were compared for most of the food groups as well as for separate food products and checked for correlation. The results showed high correlation of 0.92.

The food availability trend shows the decrease in consumption of vegetables and insufficient amounts of consumed fruit. Meat dishes still substantially prevail over fish dishes, non alcoholic beverages are preferred to fruit and vegetable juices and the amounts of consumed alcoholic beverages increase over time. These factors indicate Lithuanian diet may not conform to recommendations of healthy eating and may that

explain the overall health state of Lithuanian society. Coronary mortality rate in 2007 constituted 53.3 %, of overall mortality and deaths of were 18.2 % of total deaths [4]. Theses indicators are among the highest in the EU and mostly are the result of unbalanced diet, intake of saturated fats, alcohol, lack of vitamins and minerals in nutrition, as well as insufficient physical activity, smoking and stress.

On the other hand, decreasing household availability of added lipids and sugar products reflects positive Lithuanian nutritional changes. Comparisons over time indicate a sharp decrease in availability of potatoes. Potato dishes used to be a major component of Lithuanian diet, especially in rural areas and among elderly people, however the derived data show significant change in Lithuanian dietary habits.

It should be noted that higher education was associated to better nutrition habits. The same tendency is observed comparing the data by household composition – younger household members tend to make healthier food choices.

Conclusion

Participation in DAFNE-ANEMOS project provides Lithuanian researchers and policy makers with possibility to assess individual daily food availability, thus enabling to gain more information on the overall nutrition habits of Lithuanian population. The DAFNE-ANEMOS information together with DAFNE-ANEMOS tool may be very helpful for monitoring changing nutrition habits as well as for formulating nutrition and health improvement strategies.

Table 4: Mean availability of main food groups by education of the household head in 2003, 2005 and 2007 (quantity/ person/day)

	2003			2005			2007		
Food Groups	**IEE**	**SE**	**HE**	**IEE**	**SE**	**HE**	**IEE**	**SE**	**HE**
Eggs (pieces)	0.70	0.61	0.55	0.69	0.59	0.55	0.58	0.52	0.45
Potatoes (g)	430	337	250	381	307	208	313	241	164
Pulses (g)	10.75	7.64	6.37	7.49	5.58	4.52	6.34	4.40	2.95
Nuts (g)	2.33	3.02	5.23	1.95	3.20	4.95	2.43	4.05	5.71
Cereals (g)	380	257	233	369	268	227	324	245	208
Milk products (g)	502	355	299	436	320	278	360	285	257
Meat, meat products and dishes (g)	245	222	197	259	240	206	243	236	181
Vegetables (g)	285	259	270	255	257	246	229	238	216
Fish, seafood and dishes (g)	52	42	42	52	44	45	48	43	39
Fruits (g)	134	137	200	137	153	202	120	148	189
Lipids, added (g)	72	49	37	65	47	36	53	39	29
Beverages, alcoholic (ml)	42	47	71	48	60	82	57	68	74
Beverages, non alcoholic (ml)	316	337	422	354	425	497	385	482	534
Sugar and sugar products (g)	125	94	90	116	93	82	98	83	69
Fruit and vegetable juices (ml)	24	29	53	20	32	52	22	44	60

Note: IEE: Illiterate elementary education, SE: Secondary education, HE: Higher education

Table 5: Mean availability of main food groups by occupation of the household head in 2003, 2005 and 2007 (quantity/ person/day)

Food Groups	2003		2005		2007	
	Manual	Non manual	Manual	Non manual	Manual	Non manual
Eggs (piece)	0.61	0.57	0.57	0.55	0.48	0.46
Potatoes (g)	368	251	326	219	246	171
Pulses (g)	8.10	5.76	5.76	3.99	3.94	3.09
Nuts (g)	2.49	4.56	2.65	4.64	3.51	5.17
Cereals (g)	268	225	266	224	230	212
Milk products (g)	394	286	333	269	274	250
Meat, meat products and dishes (g)	227	203	248	211	228	200
Vegetables (g)	256	252	250	242	219	221
Fish, seafood and dishes (g)	39	42	42	43	39	42
Fruits (g)	124	177	140	186	129	184
Lipids, added (g)	51	38	47	36	37	30
Beverages, alcoholic (ml)	47	66	61	74	67	79
Beverages, non alcoholic (ml)	321	407	398	489	431	551
Sugar and sugar products (g)	96	85	90	82	78	69
Fruit and vegetable juices (ml)	26	44	28	48	39	58

Table 6: Mean availability of main food groups by household composition in 2003, 2005 and 2007 (quantity/ person/day)

Food Groups	2003		2005		2007	
	Single adult	Two adults	Single adult	Two adults	Single adult	Two adults
Eggs (piece)	0.94	0.78	0.88	0.73	0.81	0.60
Potatoes (g)	455	412	367	340	327	288
Pulses (g)	12.24	10.49	7.33	8.30	6.20	6.18
Nuts (g)	5.09	4.61	5.52	4.66	7.13	5.42
Cereals (g)	411	323	390	313	369	284
Milk products (g)	430	422	396	366	399	324
Meat, meat products and dishes (g)	280	290	290	293	289	273
Vegetables (g)	370	361	339	335	318	297
Fish, seafood and dishes (g)	74	58	68	60	65	54
Fruits (g)	227	195	248	199	217	202
Lipids, added (g)	80	64	69	56	62	45
Beverages, alcoholic (ml)	91	82	121	103	114	108
Beverages, non alcoholic (ml)	567	439	687	559	756	621
Sugar and sugar products (g)	126	122	116	110	111	98
Fruit and vegetable juices (ml)	50	43	46	45	61	55

Table 7: Mean availability of food main groups by household composition in 2003, 2005 and 2007 (quantity/ person/day)

Food Groups	2003		2005		2007	
	Single elderly	Two elderly	Single elderly	Two elderly	Single elderly	Two elderly
Eggs (piece)	0.93	0.68	0.92	0.66	0.83	0.59
Potatoes (g)	434	378	374	336	351	284
Pulses (g)	13.24	10.46	8.18	6.95	8.45	6.77
Nuts (g)	3.92	2.73	3.15	3.47	4.66	4.39
Cereals (g)	522	403	494	372	436	340
Milk products (g)	552	506	499	445	468	378
Meat, meat products and dishes (g)	254	237	266	256	265	251
Vegetables (g)	338	301	316	284	301	272
Fish, seafood and dishes (g)	65	56	68	57	64	55
Fruits (g)	191	175	189	171	197	162
Lipids, added (g)	95	67	87	65	74	54
Beverages, alcoholic (ml)	27	41	37	45	39	51
Beverages, non alcoholic (ml)	446	315	489	309	505	388
Sugar and sugar products (g)	165	142	153	143	124	122
Fruit and vegetable juices (ml)	34	31	26	26	31	34

Table 8: Mean availability of main food groups by household composition in 2003, 2005 and 2007 (quantity/ person/day)

Food Groups	2003		2005		2007	
	Single with child	Two with child	Single with child	Two with child	Single with child	Two with child
Eggs (pieces)	0.62	0.52	0.55	0.48	0.54	0.38
Potatoes (g)	315	296	267	259	212	182
Pulses (g)	8.74	5.93	5.09	4.12	2.84	3.00
Nuts (g)	2.60	2.92	3.51	2.81	3.45	3.47
Cereals (g)	249	215	232	214	229	191
Milk products (g)	329	325	281	285	247	241
Meat. meat products and dishes (g)	204	192	183	203	192	182
Vegetables (g)	258	222	203	210	222	184
Fish. seafood and dishes (g)	33	34	30	35	31	32
Fruits (g)	150	131	160	136	125	130
Lipids. added (g)	43	39	41	36	34	28
Beverages. alcoholic (ml)	20	45	30	52	38	57
Beverages. non alcoholic (ml)	342	315	399	369	464	408
Sugar and sugar products (g)	87	80	78	75	63	62
Fruit and vegetable juices (ml)	29	31	33	34	46	43

ACKNOWLEDGEMENTS

This report was prepared in the context of the project ANEMOS - *Expansion and update of existing nutrition monitoring systems*, which has received funding from the European Union, in the framework of the Public Health Programme.

References

1. Barzda, A., Bartkevičiūtė, R., Šatkutė, R., Stukas, R., Abaravičius, A., Berniukevičiūtė, L. (2009) Food consumption patterns in adult Lithuanian population. *Health sciences*, No. 3, 2388-2394.
2. FAOSTAT food balance sheets database, http://faostat.fao.org/
3. Lithuanian statistics database, http://www.stat.gov.lt/en/
4. The National Lithuanian Health Board report on Health status of Lithuanian population and control of chronic non-infectious diseases. (2008). http://www3.lrs.lt/docs2/CEVNGPPT.PDF