

FOOD CONSUMPTION IN UKRAINE AND ITS DYNAMICS

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Content of the paper is based on the report on food consumption in Ukraine prepared in the framework of the FP7 BaSeFood project. It is shown that the dietary intake of Ukrainian population is gradually improving. However, consumption of foods has a deformed structure with deficiency of proteins and excess of carbohydrates. The diet of Ukrainians has specific features caused by stereotypes of consumer behavior. There must be cardinal changes in the diet according to scientific recommendations.

Содержание статьи основано на докладе о потреблении продуктов питания в Украине, подготовленном в рамках проекта FP7 BaSeFood. Показано, что рацион питания украинского населения постепенно улучшается. Тем не менее, потребление продуктов питания имеет деформированную структуру с дефицитом белков и избытком углеводов. В рационе украинцев имеются специфические особенности, обусловленные стереотипами потребительского поведения. Необходимы кардинальные изменения в рационе питания в соответствии с научными рекомендациями.

Key words: food consumption, households, diet, Ukraine

In the framework of the FP7 BaSeFood project a report has been prepared on food consumption in Ukraine and its dynamics based on available statistic data. Following the Ukraine Cabinet of Ministers Resolution [1], a quarterly (four times a year) survey of about 10 thousand households is carried out by the State Statistics Committee. All expenditures and consumptions are registered daily. Household survey results are published every year by the State Statistics Committee of Ukraine under the title of "Household Expenditures and Resources" [3]. Recently published tables [2] contain information related to the period of time till 2010. This paper is based on the analyses of the published data and our own investigations in the subject.

The sampling during the household surveys is done using a probability method and multistage stratification, through the selection of the territorial units with a probability proportional to the size. For the sampling frame determination, 2001 nationwide census data is used in urban settlements, while in rural areas materials of the household registration by the administrative - territorial divisions are used. A household is defined as a group of people living in a residential building or in a part of it, providing themselves with everything necessary for their life, occupied with their common household, fully or partially putting together and spending their money, who may be related by blood, by law, or not be related at all. The usual response rate is about 80 % (10 % refused to participate, 10 % did not participate for other reasons).

Initial information is collected in the form of household current expenditure diaries, where all required data are recorded during 7 days in succession. The seasonal variability is tracked by the survey quarterly performance. All foods in the template of the current expenses diary are divided into the following 11 groups:

- Meat, meat products, bacon, animal fats (with exception of butter);
- Fish, fish products, sea products;
- Milk, dairy products, butter, ice-cream;
- Bread and bakery products, flour, groats, legumes, macaroni products;
- Eggs;
- Oil, margarine, mayonnaise;
- Sugar, confectionery products, sweets, chocolate, jam, fruit butter, honey;
- Potato, vegetables, vegetable canned foods, mushrooms;
- Fruits, berries, fruit-berry canned food, water-melons, melons;
- Alcoholic and soft drinks, tea, coffee;
- Salt, spices.

In a separate table of the diary all expenses for outdoors meals are registered according to the place where the meal was consumed: restaurant; diner, cafeteria at work or at school; cafe, cafeteria, snack bar, cafeteria at the theatre, vending machine, bar. In a separate table, food products received either from a personal part-time farm, or presented as gifts, or received free-of-charge from other sources are registered as well.

It is interesting that a relatively detailed description of consumed foods is contained in individual household diaries. However, at the next stage, when the diaries are collected, the information is processed in such a way, that all items in a specific group are summarized. Further statistical treatment is performed on the compressed data on 11 groups of the food products. Therefore, it is not possible to extract data on consumption of a specific

food later on, for example, nuts, or butter, or juices, or soft drinks. Moreover, the consumption of all dairy products is recalculated for fresh milk. That is why rather ridiculous figures appear in statistical tables on consumption of milk and dairy products.

Table – 1 Households characteristics

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average size of household, persons	2.73	2.71	2.62	2.62	2.61	2.60	2.60	2.60	2.60	2.59
with one person	21.0	20.9	22.4	22.4	22.2	24.6	24.0	23.7	23.2	23.5
with two persons	28.1	29.2	29.6	30.2	29.3	27.2	27.1	27.0	28.6	28.3
with three persons	22.1	22.6	23.5	23.3	24.5	23.4	25.0	25.7	25.2	25.4
with four persons and more	28.8	27.3	24.5	24.1	24.0	24.8	23.9	23.6	23.0	22.8
(%) of households with children	42.5	41.3	38.9	37.2	37.5	37.7	37.7	37.8	37.8	37.8
(%) of households without children	57.5	58.7	61.1	62.8	62.5	62.3	62.3	62.2	62.2	62.2

As one can see from Table 1, the households are characterized by the average size of the household in number of persons [2]. The households are also considered with and without children, taking into account the specified number of children. During the last 10 years the average size of the household in Ukraine decreased from 2.73 in 2001 to 2.59 in 2010. It is interesting that there are almost equal four groups of households consisting of 1-, 2-, 3-, 4 and more persons. Number of households with children significantly decreased from 42.5 % in 2001 to 37.8 % in 2010 reflecting a steady tendency of the birth rate reduction.

As follows from the structure of the total expenditure (Table 2), the well-being of Ukrainian population gradually increases. Consumption expenditure has decreased from 93.7% in 2001 to 90 % in 2010, while expenditure for food products and soft drinks decreased from 62.6 % to 51.6 % for the same period of time. The latter indicate that Ukraine should not be considered a poor country any more; because it is believed that a population lives in the state of poverty, if the food products expenditure exceeds 60 % of all consumption expenses.

Table – 2 Structure of total expenditure

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Monthly expenditure per household, UAH	607	658	737	904	1229	1443	1723	2590	2754	3073
Total consumption expenditure, %	93.7	92.8	93.3	92.6	91.1	90.5	90.0	86.2	87.8	90.0
Food and soft beverages, %	62.6	59.1	58.6	57.5	56.6	53.2	51.4	48.9	50.0	51.6
Alcoholic beverages and tobacco, %	2.8	2.6	2.8	2.8	2.9	2.6	2.6	2.2	3.2	3.3
Manufactured goods and services, %	28.3	31.1	31.9	32.3	31.6	34.7	36.0	35.1	34.6	35.1
Non-consumption total expenditure, %	6.3	7.2	6.7	7.4	8.9	9.5	10.0	13.8	12.2	10,0

Improvement of living conditions and well-being of Ukrainian citizens is confirmed by the data of Table 3 indicating that in 2010 only 21,8 % of population lived with average per capita total income under subsistence minimum, while in 2001 more than 80 % of the total population were in condition of poverty.

It follows from Tables 2 and 3 that in 2008 people lived better than in 2010. This is obviously explained by the worldwide economic crisis that started at the end of 2009.

Table 3 – Population with average per capita income lower than subsistence minimum

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Million person	39.9	39.8	35.2	30.3	25.3	22.5	12.3	7.2	6.9	9.7
% of the population	82.7	83.3	76.2	65.6	55.3	49.7	27.2	16.1	15.5	21.8
Subsistence minimum (per person per month, UAH)	311.3	342.0	342.0	362.2	423.0	463.8	518.5	607.5	638.5	843.2

From analysis of foods consumed by households in the last 10 years (Table 4) it is seen that consumption of meat and meat products increased during the decade by 82.1 %, milk and dairy products – by 10.4 %, eggs – by 25 %, fish and fish products – by 28.6 %, vegetables by 5.5 %, fruit, berries, nuts, grapes – by 68.2 %. At the same time, consumption of potatoes in 2010 decreased comparing to 2001 by 31.5 %; bread and bakery products by 13.1 %. sunflower-seed oil and other vegetable oils – by 10 %, sugar by 10 %. Decrease of bread, potatoes and sugar consumption is positive and reflects improvement of foods variety in the diet. Increase of the income of the population has given the consumers a better chance for maintaining the appropriate level of the domestic nutrition and for its improving.

Table 4 – Foods consumed by households, average monthly, per one person

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
– meat and meat products, kg	2.8	3.3	3.9	4.0	4.4	4.7	5.1	5.1	4.8	5.1
– milk and dairy products, kg	17.3	18.8	19.1	20.2	21.7	22.3	22.1	22.6	19.8	19.1
– eggs, units	16	17	17	18	21	19	20	20	20	20
– fish and fish products, kg	1.4	1.4	1.4	1.6	1.8	1.9	1.9	2.1	1.8	1.8
– sugar, kg	3.3	3.1	3.2	3.6	3.6	3.2	3.2	3.4	3.2	3.0
– sunflower and other oils, kg	2.0	2.0	2.0	1.9	1.9	1.7	1.7	1.8	1.9	1.8
– potatoes, kg	11.1	10.3	9.9	10.1	9.6	8.7	8.3	8.4	8.0	7.6
– vegetables, kg	9.0	9.5	9.0	8.7	9.1	9.4	8.7	9.3	10.1	9.5
– fruit, berries, nuts, grapes, kg	2.2	2.4	2.5	2.7	3.1	3.0	3.6	3.7	3.6	3.7
– bread and bakery, kg	10.7	10.7	10.3	10.4	10.3	9.8	9.6	9.6	9.3	9.3

Table 5 – Food value and nutrients in foods consumed in households in 2007 (average per day per person)

	Food value (kcal)	Proteins (g)	Lipids (g)	Carbohydrates (g)
All households	3482	93	159	426
Urban households	3370	92	161	395
Rural households	3713	97	156	491
With children	2923	80	134	357
Without children	4097	109	188	502
The poorest 10 %	2830	73	123	366
The richest 10 %	3792	108	185	429

As one can see from Table 5, the average caloric content of per person daily diet, in 2007, was 3482 kcal with 93 g of proteins in the consumed foods, 159 g of lipids, and 426 g of carbohydrates. The caloric value in all groups is higher than the norms for both active and disabled persons. The lowest value (2923 kcal) is observed in the households with children. Even in the households where per person income is lower than the minimum cost of living (subsistence minimum) the caloric value is higher than the norm for the active persons. As a paradox,

the highest caloric value (4813 kcal) is observed in the households consisting only of persons of disabled age, being more than twice as high as the recommended value of 2000 kcal. The caloric value is especially high in rural households (3713 kcal) and households without children (4097 kcal). This tendency should be considered as a negative one, because firstly it is a possible cause of the obesity and secondly this is a clear indication of the misbalanced diet.

Three groups of households have shown a deficit of proteins: households with children (80 g), households with children not having either one or both parents (83 g), and households with per person income lower than the subsistence minimum (78 g). The situation is especially negative, if one considers the data on the content of lipids in consumed foods in the same groups. There is no deficiency observed; on the contrary, the content of lipids is 30-40 % higher than the norm indicating that there is a considerable misbalance in ratio between proteins and lipids. Such a distortion is observed in all groups of households. The situation is particularly alarming in the households without children where 188 g of fats are consumed per day instead of the recommended 100 g, and in the households consisting only of persons of disabled age where 216 g of lipids are consumed daily.

Content of carbohydrates in consumed foods in households of three groups, namely, in urban households (395 g), in households with children not having one or both parents (377 g), and in households with per person income lower than minimum cost of living (384 g) is almost equal to the recommended norms, while the consumption in households with children (357 g) is lower than the norm. Again, in households consisting only of persons of disabled age the consumption of carbohydrates is enormously high, 2 times exceeding the recommended norm.

The caloric content of a daily diet per countryman was 10 % higher than that of the urban population. The countrymen consumed more: potato by 50 %, bread and grain products by 31 %, sugar by 10 %, milk and dairy products by 5 %, vegetables and melons by 3 %.

Consumption of foods in the households depends on the number of children (Table 6). Amount of the consumed basic foods per person in households with children was 1.6-1.1 times less than in households without children. Consumption almost in all households with many children was much lower than that in one-child households. Consumption of fruits, berries, nuts, grapes, meat and meat products, fish, eggs, oil and other vegetative fats, vegetables and melons was less by 31-19 %, milk and dairy products by 14 %, sugar by 11 %. At the same time, consumption of potato, bread and bakeries in households with three and more children was accordingly by 31 % and 4 % higher than in the case of only one child.

Table 6 – Food consumption in households (average per day per person, g)

	All	In urban area	In rural area	With children	Without children	Poorest 10 %	Richest 10 %
Meat and meat products	170	183	137	143	197	107	233
Milk and dairy products	736	723	759	636	846	523	916
Eggs	40	42	36	38	42	34	42
Fish and fish products	63	67	57	50	80	43	87
Sugar	107	103	113	87	130	83	113
Oil and other vegetable oils	57	57	57	47	67	47	60
Potato	276	236	366	246	313	263	256
Vegetables and melons	290	286	296	240	346	210	356
Fruits, berries, nuts, grapes	120	140	70	107	130	66	210
Bread and cereal products	320	290	380	266	380	290	300

In households with young families, expenses for foods in 2007 amounted 51 % of all cumulative expenses that is less than the average for all households. Consumption of all basic foods and caloric content in such households was by 23-25 % lower than the average figures per person.

Low among all groups were the energetic value and the contents of nutrients in the diet of households of the first decile group defined by the distribution of total per person income level. In this group content of proteins, lipids, carbohydrates and caloric content of the foods consumed per person per day were higher comparing to the norms established by the living wage for the disabled population, but was lower (except for lipids and caloric content) than corresponding norms for healthy population.

The differentiation was continued in consumption of foods between households of the poorest 10 % with the total per month income lower than the subsistence minimum and the most prosperous 10 % of households (Table

6). The latter spent for meals 1.6 times smaller part of their cumulative expenses (40 %) than the first decile, while the caloric content (3792 kcal) was 1.3 times higher. In households of the first decile and in groups with the total income lower than the subsistence minimum, one person consumed fruits, berries, nuts, grapes, meat and meat products, fish, milk and dairy products, vegetables and melons, sugar, vegetative fats, eggs 3.2-1.2 times less than persons from the most prosperous last decile group, while consumption of bread and potato was more by 3 % and 4 % accordingly in the poorest group.

Foods produced at personal farms traditionally play a significant role in population life, particularly in that of the rural one. In 2007 more than a half of potatoes consumed in the households was produced at such farms as well as about one third of vegetables, melons and gourds, a quarter of eggs, 14 % of milk and dairy products, 11 % of fruits, berries, nuts, grapes, meat and meat products. In the rural households, it has been produced accordingly from 90 % to 36 % of the specified products.

There is a very important question: does the diet of Ukrainians correspond to international recommendations and norms? Annually the UN releases a report on the level of human development. The basic generalized parameter is the Human Development Index (HDI) calculated using data on the life expectancy, the degree of literacy and the total per capita product. According to the Human Development Report 2011 [4], the highest HDI has Norway (0.943) with the life expectancy of 81.1 years and gross national income per capita of 47 575 US\$. The Ukraine occupies 76th place with HDI=0.729, the life expectancy of only 68.5 years, and the gross national income per capita of 6 145 US\$ (for comparison, in Russia GNI=14 561 US\$, i.e. 2.4 times higher).

The low life expectancy is caused partly by a wrong diet. Seven risk factors have the greatest influence on the death rate from non-infectious diseases [5], four of which are related to nutrition (hypercholesterolemia, superfluous body weight, alcohol abuse, insufficient consumption of fruits and vegetables). All these risk factors are actual for the population of Ukraine.

In the European Union, considerable attention is paid to interrelation between nutrition and health, and millions of euros are spent for financing corresponding projects. Unfortunately, except for the selective inspection of households, anything similar has not been done in Ukraine. So-called "consumer's basket" [6,7] was not reconsidered since 2000. There is no national program of the healthy nutrition. At the same time, precise scientifically proved recommendations on a rational and healthy nutrition are very popular abroad [8-10]. In Ukraine, recommendations on the balanced diet are based on so-called formula of the balanced nutrition [11] suggested by A. A. Pokrovskiy in 1964 and used until now in spite of the fact that approach to problems of the balanced diet has essentially changed during the last 40 years.

The Ukrainian norms underestimate importance of proteins, overstating at the same time contents of fats. As a result, recommended for Ukrainians relation between proteins, fats and carbohydrates does not correspond to the last recommendations of scientists. Moreover, interrelation between saturated, vegetative and polyunsaturated fat acids is also distorted.

Survey has shown that Ukrainian population does not pay serious attention to a balanced diet, and some questions cannot be answered at all. It appeared, for example, that 10 % of the population have never measured and do not know their body mass, almost half (44.5 %) cannot estimate the caloric value of the diet, every third (32.7 %) eats irregularly and only 5.9 % follow a low cholesterol diet.

Twice overstated are Ukrainian norms for sodium (4-6 g/day). At the same time, recommendations on such important minerals as potassium, magnesium, iron and zinc in the Ukrainian norms are understated by 1.5-2.0 times. As for vitamins, 4-6 times understated are Ukrainian norms for vitamin B₃, and 2.5 times the norms for B₁₂.

It was interesting to compare consumption of basic foods in Ukraine with that in other European countries [12]. Data on a diet in 16 European countries were obtained from the DAFNE database reflecting consumption in 1999-2005 [13]. The corresponding data for Ukraine have been taken from the State Statistics Committee report [2] and from composition of the "consumer's basket" [6,7].

In Table 7 only average figures for the European countries are presented, although there was a wide scatter practically for all parameters. For example, at the average consumption of animal fats of 11.9 g/day, only 0,8 g/day are consumed in Greece, while 41 g/day are consumed in Poland, i.e. 50 times more(!). Comparison with Ukraine on this parameter is impossible, since by the Ukrainian methodology all milk products including butter, are recalculated in pure milk.

According to Ukrainian norms, consumption of animal and vegetative fats should correspond to 1:1 ratio, although consistent with most recent European and American recommendations this ratio should be 1:2 for the benefit of vegetative fats. The average ratio for the European countries, as one can see from Table 7, is 1:3, while in Greece where only olive oil is commonly consumed this ratio reaches 1:100 (!). The Mediterranean diet [14] with high consumption of the olive oil is considered by some scientists as the ideal one for all European countries. It is necessary to note, that on consumption of vegetative oils Ukraine does not differ from majority of the European countries.

Table 7 – Consumption of main foods

Foods consumed by households, per day per one person, g	Average in EU countries	Ukrainian "consumer's basket"	Real consumption in Ukraine in 2008
– meat and meat products	153	146	170
– milk and dairy products	300	394	753
– fish and fish products	30.5	35.7	70
– sugar	31	66	113
– animal fats	11.9	19.2	?
– vegetable oils	32.4	19.5	60
– potatoes	132	260	280
– vegetables and melons	163	301	310
– fruit, berries, nuts, grapes	164	175	123
– bread and bakery products	134	301	320

The Ukrainian norm for consumption of bread and bakery products more than 2 times exceeds average for the European countries (134 g/day), with the actual consumption being even higher (345 g/day). This reflects from one side a national tradition of eating all dishes with bread, but, from another side, it is the result of the relative poverty and inability to have a more rational diet. The similar situation is observed with potato, consumption of which in Ukraine is 2 times higher than the average in the countries of Europe.

Consumption of vegetables and fruits under modern recommendations should exceed 400 g/day. Apparently, as it is seen from Table 7, even in the European countries this norm is not met with 163 g/day of vegetables and 164 g/day of fruits. Ukrainian norms considerably exceed the European recommendations; however actual consumption in Ukraine, especially of fruits (123 g/day), is still low.

A serious problem is the over-consumption of sugar by Ukrainians (113 g/day) that should be reduced, at least by half. Now in Ukraine almost 4 times more sugar is consumed compare to other European countries, in contradiction with recommendations for the healthy diet.

Thus, as it is seen from Table 7, consumption of all foods in Ukraine is higher than in other European countries in average, except fruits. A special study of the dietary intake of Ukrainian students [15] has shown that bread and potato which were the main foods in the diet of Ukrainians until the end of 20th century become less and less consumed. Only 63.8 % of females and 77.1 % of males still consume bread daily, while, only 21.7 % of females and 34.3 % of males eat potato daily. This fact and a sharp increase in consumption of fruits and vegetables show that the well-being of Ukrainians is improving during the last years.

The following facts are interesting. Contrary to modern recommendations, 44.9 % of females and 60.0 % of males eat butter daily, while 60.9 % of females and 28.6 % of males never eat lard ("salo") generally believed to be the most traditional Ukrainian food.

Conclusion

The statistical data on the dynamics of consumption of different food groups indicate that the dietary intake of Ukrainian population is gradually improving. However, consumption of foods by its structure is still typical for countries with a low standard of living and is characterized by a deformed structure of the diet with deficiency of proteins and excess of carbohydrates. Such situation is the result of inflation and rise in prices that has led to mass transition to consumption of "Giffen goods", i.e. cheap products of poor quality. The strongly pronounced differentiation of the Ukrainian population by character and quality of the diet is observed and connected with stratification of the society by the level of material well-being.

The diet of the Ukrainian population has specific features caused by stereotypes of consumer behavior developed during decades, as well as the features of the Ukrainian mentality. Increase in material well-being of households is accompanied by increase not only in the cost and quality, but also in volume of foods that contradicts to existing norms and recommendations. In spite of the increase of the caloric value, the daily diet remains unsatisfactory, since the increase of the caloric value occurs, first of all, due to fats and carbohydrates.

The culture of the eutrophy in Ukraine demands some cardinal changes in the diet, such as the maintenance of the recommended relation between proteins, lipids and carbohydrates; increase in consumption of complex carbohydrates (up to 50-70 % of the caloric value and fibers (up to 40 g/day); consuming of not less than 400 g/day of vegetables and fruits; considerable reduction of the consumed sugar (up to 50 g/day); decrease in amount of salt (up to 6 g/day); minimum of alcohol; lowering the excessive body mass. At the same time, it is necessary to avoid eurocentrism, not forgetting that the national cuisine and traditions of the healthy eating result from a long adaptation of the population to specific conditions of life and environment.

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АНАЛІЗ АСОРТИМЕНТУ ТА МАРКЕТИНГОВІ ДОСЛІДЖЕННЯ СПОЖИВНИХ МОТИВАЦІЙ І ПЕРЕВАГ ПРИ ВИБОРІ ЗЕРНОВИХ ХЛІБЦІВ

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Стаття присвячена формуванню якості нових видів зернових хлібців підвищеної харчової цінності. Представлено їх сучасний асортимент на ринку України. Проведено маркетингове дослідження стосовно впровадження на ринок цього нового виду продукту.

This article is devoted to the formation of the quality of the new kinds of grain, high food value and presented their modern range on the market of Ukraine. Conducted marketing research on the implementation of the market of this new type of product.

Ключові слова: сухі сніданки, зернові хлібці, асортимент, маркетингове дослідження.

Одним з найважливіших факторів, який обумовлює стан здоров'я сучасної людини, є харчування. Рациональне харчування в сучасних умовах має актуальне значення у зв'язку з подальшим погіршенням екології навколишнього середовища. Відомо, що рациональне харчування сприяє профілактиці захворювань, продовженню життя, створенню умов для підвищення здатності організму протистояти несприятливим умовам навколишнього середовища, забезпечує нормальний ріст і розвиток дітей [1]. Виявлено, що раціони харчування населення України дефіцитні за вмістом практично всіх біологічно активних речовин, зокрема споживання білка тваринного походження в середньому на душу населення зменшилось на 10,9 %, вітамінів і мікроелементів – 15...55 %, харчових волокон – 30 %.