

STUDY ON THE CURRENT FEEDING BEHAVIOUR OF A POPULATION GROUP IN A RURAL AREA OF BIHOR COUNTY

¹Monica Laslău, ²Zoia Bitea, ¹Adriana Constăngioară, ¹Lucia Daina, ¹Sonia Drăghici

¹ University of Oradea, Faculty of Medicine and Pharmacy, 1 Decembrie St., nr.10, Oradea, Romania, e-mail: caterinalaslau@yahoo.com

²Public Health Administration Bihor, Oradea

Abstract

This study evaluates the feeding behaviour of a group of 57 persons living in a rural community of Bihor county, in 2010, using the method of individual investigation about the food consumed in 24 hours. A caloric and nutritional deficit in the diet of individuals in the selected group could be observed. Qualitatively, the diet proved deficient in vegetable fat and excessive in animal protein. Percentage rations of essential micronutrients were within the recommended limits. The largest part of the diet was made up of meat and meat products, eggs, cheese, cereals derivatives and less milk, vegetable and fruit, animal and vegetable fat than it would be necessary. The calories consumed during the day were improperly distributed on the main meals. Breakfast was eaten by all subjects, but only 28% of them took one or two snacks during the day. The caloric intake of breakfast and lunch were close to recommendations.

Key words: behaviour, nutrition, information, health, investigations, habits

INTRODUCTION

Nutrition represents the major and most influential factor in promoting health, in preventing and treating diseases and in the improvement of life quality (Gibney M J, HH Vorster, FJ Kok,2009). Food can be a social event that brings together people, but at the same time, social factors may restrict the choice or food consumption (Insel P.et al,2010). Factors influencing food choices are: personal preferences, acquired habits, ethnic heritage and traditions, social interactions, availability and convenience, economic and financial factors, possible associations (positive or negative), emotions, weight and body image, religion, people disregarding nutritional and health benefits (E. Whitney, Whitney EN, Rolfes S.,2011).The desire to lose weight can be a powerful motivation for the acceptance or rejection of food (K. Mooney, L. Walbourn, 2001). Malnutrition refers not only to protein-energy deficiency, but also to nutritional disorders due to the excess of food or food supplements (Coulston AM, CJ Boushey,2008). American literature describes the notion of “obesogenic environment” as being a lifestyle suitable for the uncontrolled growth in weight: houses situated far away from healthy food shops, lack of individuals’ interest for physical activity, repulsion to vegetables and some fruit, predisposition for the consumption of unhealthy food (Rinzler CA,2011). Unhealthy habits such as eating chips in increased quantities, eating low quantities of fruit and fresh fruit juices

favour the appearance of chronic diseases (Sienkiewicz S., E.Whitney, AT Piché, 2011).The consumption of some high calorie diets is connected to the development, in time, of some chronic diseases, such as obesity and diabetes and diseases associated to their complications (Brown JE,2010). Diets rich in fibres reduce the incidence of colon cancer by accelerating intestinal transit and decreasing the absorption of some toxic chemicals in the mucosa (Shils M, S.Moshe, A.C.Ross, B.Caballero, R.Cousins,2006). Each nutrient has specific functions and connections and acts in interconnection with the other nutrients, but individual ratios are determined genetically and physiologically (Kirschmann JD,2007).

MATERIAL AND METHOD

The study was conducted in 2010, in a rural community in Bihor county by the individual investigation of 57 people in the chosen group. The dietary survey method, applied for 24 hours and recognized and accepted by experts in the field, was used, as it represents a retrospective descriptive and epidemiological investigation. Data on the types and quantities of foods consumed the previous day, on meals time, the frequency of various food groups consumption were recorded. The structure of the diet consumed by people in the chosen group was calculated, as well as the caloric and qualitative assurance of physiological need for food, and the energy share of the meals served throughout the day. These were used food composition tables to calculate average calorie and trofin content of the daily menu consumed. Recommendations on food, energy and nutrients need was taken from tables prepared by the Regional Public Health Administration Cluj-Napoca, depending on age, sex, level of effort, as recommended by FAO / WHO and national recommendations.

RESULTS AND DISCUSSIONS

The group consisted of 57 persons, residing in Salard village, aged between 20 and 78 years old; 40.35% of the group (23) being males and 59.65% (34) being females (Table 1).

Table 1

Distribution of subjects by gender and age-groups				
Age group/ sex	20 – 40 years	41 – 65 years	Over 65 years	Total
Masculine	11	8	4	23
Feminine	16	14	4	34
Total	27	22	8	57

In order to understand the nutritional needs of subjects in correlation with the physical activity performed, it was necessary to classify them by degree of effort, knowing that the need for food increases with the intensity of the activity performed.

Table 2

Distribution of subjects by gender, age-groups and physical effort

Age groups	Sex	Effort			Total
		Little	Average	Great	
20 – 40	Men	1	5	5	11
	Women	5	10	1	16
41 – 65	Men	2	3	3	8
	Women	7	7	0	14
Over 65	Men	4	0	0	4
	Women	4	0	0	4

The distribution of subjects by sexes, age groups and type of effort is indicated by data included in table 2. In assessing the degree of effort, the agricultural work done by subjects was taken into account, as most subjects are involved in such action outside the workplace, due to local conditions. For persons aged over 65 a low degree of effort was coded, according to the recommended methodology, although in their case different agricultural or gardening activities were nevertheless registered.

Using and processing data resulting from the survey, the average daily consumption of calories and nutrients was calculated, divided into categories: lipids, proteins, carbohydrates. The values obtained were compared with the recommended daily average for this group, after which deviations were calculated. The alcoholic beverages consumed were not taken into account, as methodology recommended their registering only in the form of consumption frequency. Table 3 indicates the existence of deviations for all calculated indicators, which represent a caloric and dietary deficit, thus: a deficit of 16.63% in the number of calories actually consumed, a deficit of 9.03% for the consumption of lipids, a deficit of 14.71% in the consumption of proteins and a deficit of 28.86% in the consumption of carbohydrates, as related to actual need.

Table 3

Average caloric and nutritional value of food consumed

No. of calories		Fat		Proteins		Carbohydrates	
Reco- mmended	Consumed	Reco- mmended	Consumed	Reco- mmended	Consumed	Reco- mmendedt	Consumed
2729,82	2276,05	88,94	80,91	93,82	80,02	417,2	296,81
deviation	-16,63%	deviation	-9,03%	deviation	-14,71%	deviation	-28,86%

We calculated the share of vegetable fats from the total fat amount and the percentage of animal protein from the total quantity of proteins. Nutritional recommendations for a balanced diet suggests keeping a report of 1/1 for vegetable fat / animal fat, and for protein the provision of a ratio of 35% -50% of animal protein from the calorific value provided by the entire quantity of proteins of the diet. Our results indicate a lack of 50.3% in the consumption of fat from vegetables, valuable for their provision of polyunsaturated fatty acids and a rather increased consumption of animal

protein (on average with 5g/day, representing 12%) as compared to the maximum value of recommendations (Table 4).

Table 4

The qualitative composition of food ratio

Total lipids	Vegetable lipids			Total proteins	Animal fat		
Consumed (g)	Recommended (g)	Consumed (g)	Deviation %	Consumed (g)	Recommended (g)	Consumed (g)	Deviation %
80,9	40,45	20,1	-50,3%	80,02	28 – 40,01	44,9	+12,2

Looking at the energy value of the food consumed by subjects, we calculated the share of nutrients from the average calorific value of the food consumed. We noted the limitation within the recommended percents of the average consumption of lipids and proteins, as a qualitative structure of the daily diet, though from a quantitative point of view the daily consumption of each nutrient is deficient. The important quantitative deficit of carbohydrates, of almost 30%, is reflected in the percentage of carbohydrates of the intake, this being close to the lower limit recommended for this nutrient (Table 5).

Table 5

Percentual coverage of food ratio calculated in relation to the intake of nutrients

	Lipids	Proteins	Carbohydrates
Recommended	20 – 35%	10 – 15%	50 – 70%
Consumed	33%	14,4%	52,6%

We observed a very low intake of **milk**, the deviation being of – 46.6%, the declared frequency of consumption being 2-3 times a week.

Cheese intake showed a positive deviation of about 10%, which also reduces the overall deficit of milk.

Meat consumption was 34% lower than the recommended amount, subjects consuming most often poultry and pork, and no beef and sheep at all.

Meat products were also consumed in an excess of 16.6% of the recommended values, most commonly subjects consuming semi-smoked products (cremwurst, baloney, boiled and smoked salami) and less often smoked products (bacon, ham).

Fish consumption was extremely low, with a deficit of 65%, in conjunction with low frequency of consumption.

Eggs, basic food in rural areas, were consumed in excess of about 28%, correlated with the high frequency declared.

The average intake of **potatoes** in the lot had a very high negative deviation of 96.3%. The declared frequency indicates that usually potatoes are consumed less frequently.

Vegetables with 10% HC were deficient by 66, 8% at the time of study, although people declared to consume them relatively frequently.

5% HC vegetables were consumed in smaller quantities than the ones in the previous category, the minus deviation being of 73.5%, despite positive frequency of consumption (2-3 times a week), according to declarations.

Fruit consumption indicates a deficit of 92.4% on the day of the investigation, but the declared frequency was of 2-3 times a week. Subjects' statements indicate that the fruit consumed is predominantly formed by local seasonal fruit, or the ones produced in their homes or purchased, when prices are affordable.

Bread is consumed daily several times, but in small quantities, which is reflected in the negative deviation of 38.7%. At the same time, there were several people who did not eat bread at all the day before the survey.

The consumption of **cereals derived products** proved to be in surplus as compared to recommendations, for it recorded a significant positive deviation of 251%. Foods in this group were macaroni, flour dumplings, noodles, rice, in combination with meat or cheese-derived products. No food made from corn flour was consumed.

Dried legumes were present in the diet on the day of investigation in amounts up to 55.4% higher than the recommended media for the study group, being represented by peas and dried beans.

Consumption of **sugar and sugar products** was low, with a deficit of 67.7% that day, being consumed, as declared, at a rate of 2-3 times per week.

For **animal fats** lower values (by 32.9%) than the recommended ratio were recorded, they being consumed predominantly as fat and less as butter.

For **vegetable fats**, consumption indicated a negative deviation of 47.7%, they being consumed as such or as vegetable oil and margarine (Table 6).

Table 6

Average consumption of food groups

Food	Recommended	Consumed	Deviation %	Declared average frequency
Milk	226,6	121	- 46,6	3
Cheese	27,5	30,21	+ 9,8	3
Meat	94,9	125,27	+32	1 for beef and sheep 2 for pork 3 for chicken
Meat products	18	42,03	+133,5	2
Fish	20	7	-65	2
Eggs	23,8	30,44	+27,9	3
Potatoes	297,5	110,2	- 96,3	3
Vegetables with 10% HC	264	87,72	- 66,8	3
Vegetables with 5% HC	242,3	64,32	- 73,5	3
Fruit	269,6	20,56	- 92,4	3
Bread	312,4	191,5	- 38,7	5
Cereal derivates	33,4	117,4	+ 251	2
Dried legumes	14,8	23,02	+55,4	2
Sugar and sugar confectionery	46,5	15,02	- 67,7	3
Animal fat	24,9	16,7	- 32,9	2
Vegetable fat	22,5	11,98	- 47,7	4

Table 7 indicates that positive deviations were present only at persons over the age of 65, these representing an excess of the recommended caloric intake. In fact, correlating the daily caloric intake with physical effort consumed in uncoded physical activities, the energetic balance returns to normal values. The highest negative deviation was obtained in the case of women of 20-40 years of age, followed in descending order by men aged 20-40 (-21,5%), then men aged 41- 65 (-20,2%). The lowest negative deviation was registered at women aged 41-65. Information obtained after the investigation indicate that the caloric deficit recorded is due to several cumulative factors: the absence of snacks between main meals (at 72% of the subjects), failure to give sufficient attention to the intake of food, insufficient time for taking meals, restrictive diets or some diets aimed at weight loss, adopted by young women, the absence of knowledge or interest concerning the principles of a balanced diet.

Tabel 7

Coverage of the daily energy needs by age groups, gender and degree of effort

Calories /age group/gender		Recommended	Consumed	Deviation %
Men	20 – 40	3381,82	2655	- 21,5
	41 – 65	3050	2433,99	- 20,2
	Peste 65	2300	2529,4	+ 9,97
Women	20 – 40	2650	1924,12	- 27,4
	41 – 65	2428,6	2144,51	- 11,7
	Peste 65	2100	2532,93	+ 20,6

Table 8 shows the caloric and percentage coverage of the average daily ration, resulting from the menus consumed at the main and the supplementary meals. The percent values obtained were compared with the recommended percents.

We could observe a percent coverage that is close with the recommended one in the case of breakfast and lunch. Dinners proved more abundant, the registered percentage exceeding the recommended one by 11.23%, and the snacks taken covered on average only 4.97% of the daily energy needs, as compared with the recommended value, of 15%.

As during the day a large part of the subjects were involved in different daily activities, dinner was better represented quantitatively, including more calories than it was necessary, becoming for more the only meal served together with the family.

Table 8

Percentage distribution of menus in relation to meals

	Average daily consumption	Breakfast	Lunch	Dinner	Snacks
Calories	2276,05	557,6	1008,2	597	113,1
Consumed %	100	24,50	44,30	26,23	4,97
Recommended %	100	30	40	15	15
Absence in the consumption (% subjects)		0	7	8,8	72

CONCLUSIONS

Food rations of subjects did not cover, in food intake, the caloric need recommended for the studied group. For all age groups (except subjects over 65) and both sexes, depending on the degree of effort, ratios registered, as energy intake, lower values than the necessary ones. The value of the deficit was close at both sexes (-41.7% for men and -39.1% for women). A global deficit of macronutrients (proteins, fats, carbohydrates) in the consumed meals was registered, the most significant one being that of carbohydrates. In terms of quality, food intake brought a small quantity of vegetable fat and a large quantity of animal fat, larger than the quantity recommended by nutritionists. The energy intake derived from the three types of trofins was balanced, each nutrient holding an appropriate proportion, as the one proposed by experts.

As far as dairy products are concerned, people in the group consumed mainly cheese, even above the required quantity, and less milk, whose important deficit was not balanced by the consumption of cheese.

An exaggerated consumption of meat was observed, especially of pork and chicken grown in the respective households; beef and sheep were not eaten at all. Fish was consumed in very small quantities, and resulted from fishing. Meat products were consumed in quantities larger than the recommended ones, being represented by semi-smoked fresh products rather than by smoked products. Eggs were consumed in larger quantities than the recommended ones; these may pose the risk of dyslipidemia, hypercholesterolemia and atherogen for certain consumer groups, presenting cardiovascular diseases. The consumption of fruit and vegetables was extremely reduced, though the declared frequency was of 2-3 times a week. Potatoes were consumed in small quantities, as correlated to the frequency declared. Fresh seasonal fruit were preferred, mostly from personal production. Cereal derivatives and dried legumes were consumed in large quantities on the day of the investigation, to the detriment of bread, which is nevertheless consumed daily. However, they failed to balance the low ration of carbohydrates, especially of sugar and sugar products, which were consumed in small quantities. Fat food, both of vegetal and animal origin, was eaten in small quantities, as such or for the culinary preparation of food.

Butter and lard are used, as declared, once a week, while oil and margarine are used daily. The distribution of calories consumed during the meals of the day was unbalanced. Closer to recommendations was the intake at breakfast and lunch, the first being under and the second above the recommended limits. A positive aspect is the taking of breakfast by all subjects. Only 28% of the subjects took one or two snacks during the day, which suggests that, from different reasons, this healthy habit, correlated

with the needs of the body and the stages of digestion, has not been established as a habit among the population. In people over 65 an excess of calories was observed, which we consider is due to coding the effort of these persons as being low, this being actually medium or high, for which the recommended ratios would have been higher, so the excess is not real.

REFERENCES

1. Brown JE, 2010, Nutrition Now, 6-th Edition, Wadsworth, Cengage Learning, Belmont, USA, 1
2. Coulston AM, CJ Boushey, 2008, Nutrition in the prevention and treatment of disease, 2-nd Edition, Elsevier Academic Press, USA, 57
3. Gibney M J, HH Vorster, FJ Kok, 2009, Introduction to Human Nutrition, Blackwell Publishing, UK, 4
4. Insel P., D. Ross, K. McMahon, M. Bernstein, 2010, Nutrition, 4-th Edition, Jones and Bartlett Publishers, USA, 6
5. Kirschmann JD, 2007, Nutrition Almanac, 6-th Edition, The Mc Grow-Hill Publishing, NY, USA,11
6. Mooney K., L. Walbourn, 2001, When college students reject food: not just a matter of taste, *Appetite* 36 (2), pp 111-118
7. Rinzler CA, 2011, Nutrition for dummies, 5-th Edition, Wiley Publishing, Inc., Indianapolis, USA, 41
8. Shils ME, S.Moshe, AC.Ross, B.Caballero, R.Cousins, 2006, Modern nutrition in health and diseases, 10-th Edition, Lippincott Williams & Wilkins Publishers, [Philadelphia](#), USA, pp 65-66
9. Sienkiewicz S., E. Whitney, L.A. Piché, 2011, Nutrition concepts and controversies, Second Canadian Edition, Nelson Education Ltd., 7
10. Whitney E., E.N. Whitney, S. Rolfes, 2011, Understanding Nutrition, Cengage Learning, USA, pp 4-5