

DIETARY PATTERNS OF POLISH SENIORS IN RETIREES' HOUSEHOLDS

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ABSTRACT

Background. About 7 million people in Poland receive pensions. The amount of benefits paid to pensioners is reflected in the income at their households and expenses, including food expenses.

Objective. The aim of the study was to evaluate the dietary patterns of Polish seniors in the retirees' households on the basis of an analysis of food consumption and energy and nutrient intake.

Material and method. Food consumption evaluation was based on household budget survey conducted by Statistics Poland in 2019 throughout the whole country. Energy and nutrient intake were calculated using the conversion factors.

Results. The consumption of unprocessed red meat in retirees' households was 1.83 kg/person/month, meat products – 2.90 kg and kitchen salt – 0.24 kg. 6.52 kg of vegetables and 5.99 kg of fruit were consumed per person per month. The mean energy intake in members of these households was 2387 kcal/day. The proportion of energy from fat was high – 36.6%. 14.2% of energy was derived from protein and 49.6% from digestible carbohydrates. The share of animal fat (55.0 g) was higher than vegetable fat (43.7 g). It was associated with a high percentage of energy from saturated fatty acids – 13.4%. The content of polyunsaturated fatty acids was less than half of the saturated fatty acids. Calcium and vitamin D intake was low (658 mg and 3.8 µg respectively).

Conclusions. Red meat, processed meat and salt consumption by seniors was too high in relation to the nutritional recommendations. Vegetables and fruit were consumed in amounts that are recommended. Seniors diet was improperly balanced, e.g. due to the high percentage of energy from fat, including saturated fatty acids. However, the intake of polyunsaturated fatty acids was low. Calcium and vitamin D intake was lower than Reference Intakes.

Key words: seniors, food consumption, dietary patterns, household budget survey

STRESZCZENIE

Wprowadzenie. Emerytury w Polsce pobiera ok. 7 mln osób. Wysokość świadczeń wypłacanych emerytom przekłada się na dochody, którymi dysponują ich gospodarstwa domowe i wydatki, w tym wydatki na żywność.

Cel. Celem badań była ocena zwyczajów żywieniowych polskich seniorów w gospodarstwach domowych emerytów na podstawie analizy spożycia żywności oraz energii i składników odżywczych.

Material i metody. Ocena spożycia została dokonana na podstawie danych GUS z badania budżetów gospodarstw domowych przeprowadzonego w 2019 r. w całym kraju. Po zastosowaniu współczynników przeliczeniowych obliczono również wartość energetyczną diety i zawartości w niej składników odżywczych.

Wyniki. Spożycie nieprzetworzonego mięsa czerwonego w gospodarstwach domowych emerytów wyniosło 1,83 kg/osobę/miesiąc, przetworów mięsnych – 2,90 kg, a soli kuchennej – 0,24 kg. Spożywano miesięcznie w przeliczeniu na osobę 6,52 kg warzyw i 5,99 kg owoców. Wartość energetyczna diety członków gospodarstw emerytów wynosiła średnio 2387 kcal/dobę. Duży był udział energii z tłuszczu – 36,6%. Z białka pochodziło 14,2%, a z węglowodanów przyswajalnych 49,6% energii. Znacznie więcej tłuszczu wносиły produkty pochodzenia zwierzęcego (55,0 g), niż roślinnego (43,7 g). Wiązał się z tym wysoki odsetek energii z kwasów tłuszczowych nasyconych – 13,4%. Zawartość kwasów wielonienasyconych stanowiła mniej niż połowę kwasów nasyconych. Stwierdzono niskie spożycie wapnia i witaminy D (odpowiednio: 658 mg and 3,8 µg).

Wnioski. Wśród seniorów zbyt duże było spożycie mięsa czerwonego i przetworzonych produktów mięsnych oraz soli. Warzywa i owoce spożywane były w ilościach odpowiadających zaleceniom. Dieta seniorów była nieprawidłowo zbilansowana m.in. ze względu na duży udział energii z tłuszczu, w tym z kwasów tłuszczowych nasyconych. Przy tym małe było spożycie kwasów wielonienasyconych. Spożycie wapnia i witaminy D było niższe od Referencyjnych Wartości Spożycia.

Słowa kluczowe: seniorzy, spożycie żywności, zwyczaje żywieniowe, badanie budżetów gospodarstw domowych

INTRODUCTION

The household budget survey is a national survey that focuses on household spending on goods and services that gives an overview of living conditions in the country. Data from household budget survey are a valuable source of information on national food consumption. Data on food consumption are an important aspect of health monitoring in a country, especially if they are collected regularly and include a representative group of subjects. These requirements are met by household budget survey. Data from this survey can be used especially to analyse trends in the consumption of various products and any potential changes in dietary patterns and the comparison of food consumption between different households [5, 6, 8].

In each household, one person is defined as its head or reference person. This is a person whose personal characteristics can be used in the classification and analysis of information on the household [13].

The household budget survey in Poland is conducted by Statistics Poland. It covers five basic socio-economic groups of the population, including households of retirees. The head of these households is the person who receives a highest pension. Source of maintenance of other members of a household could be different. However, most of the people living in these households are retired. In 2019, they accounted for 81.8% of the members of retirees' households [8].

Retirees constitute a large part of the Polish population. In 2019, pensions were received by 6,977,000 people. However, the number of people in post-productive age was 8,407,900 that year which was 21.9% of total population. Retirees' households are inhabited mainly by the elderly. In 2019, people aged 65 years and over accounted for 67.5% of members of these households, aged 60-64 years – 15.4%. A prognostic analysis showed that the share of post-productive age people (including retirees) would be grown to 26.2% in 2030 [9]. Therefore, it is very important to identify selected nutritional factors in this group.

The aim of the study was to evaluate the dietary patterns of Polish seniors in retirees' households on the basis of an analysis of food consumption and energy and nutrient intake.

MATERIAL AND METHODS

Food consumption evaluation was based on household budget survey conducted by Statistics Poland in 2019 throughout the country. This survey in 2019 covered 35,923 households including 12,054 retirees' households (33.6%). The total number of persons living in all households was 93,674, including 22,072 persons living in retirees' households (23.6%) [8].

Household budget survey provides information on the living conditions of the population, i.e. available income, expenditures, food consumption, housing conditions and equipment of the households with durables. The above information is combined with the data on different demographic, social and economic characteristics of the households and their members. The survey covers randomly selected sample of all households with the exception of those living in institutional households (for example retirement home) [20].

The survey is conducted through the use of monthly rotation which means that each month different households participate in it. Each participating household keeps a special diary for a month, where registers incomes, expenditures and food quantities purchased, obtained free or derived from individual farm, garden or business activity. Food consumption is assessed by purchasing and receiving from other sources. The methodology used does not include however food quantities consumed in catering establishments, canteens, hospitals, nurseries, kindergartens, etc. These feature is common for household budget surveys in many countries and originates from the fact that expenditures on eating out of the household are intentionally underestimated [8].

Data on food consumption were converted into energy and nutrient amounts through energy and nutrient conversion coefficients worked out at the Institute with the use of the national Tables of Composition and Nutritive Value of Food [17].

The manuscript presents the food products consumption and energy and nutrient intake among members of retirees' households compared to other households together, i.e. employees, farmers, the self-employed and pensioners.

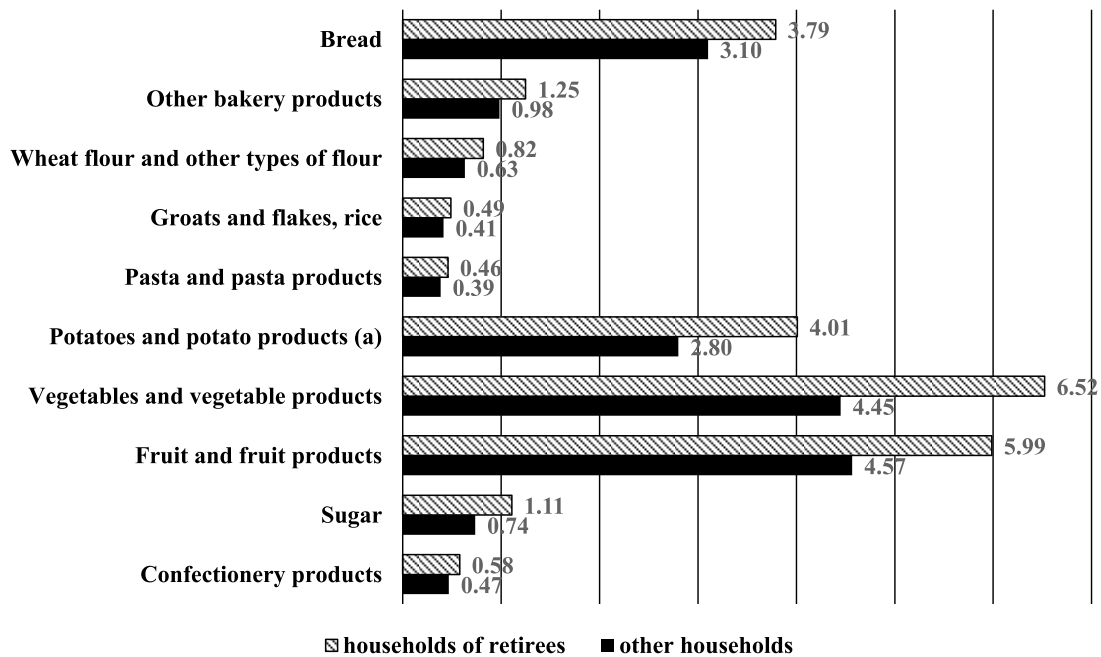
RESULTS

Food consumption

Figures 1 and 2 presents data on the consumption of particular groups of food products expressed in kilograms, liters and units per month in retirees' households and other households.

In the group of cereal products the consumption of bread, other bakery products and flour (Figure 1) by retirees' households was 3.79, 1.25 and 0.82 kg/person/month.

It was observed more than 4 kg/person/month the consumption of potatoes and their products and close to 7 kg/person/month the consumption of vegetables and their products by retirees' households. The less value was observed in the consumption of fruits and their products including juices (5.99 kg/person/month). All these kinds of products were consumed in higher amounts in retirees' households than in others.



a)– with potato chips

Figure 1. Food group consumption in retirees' households in comparison to other households in Poland, 2019 (kg/person/month)

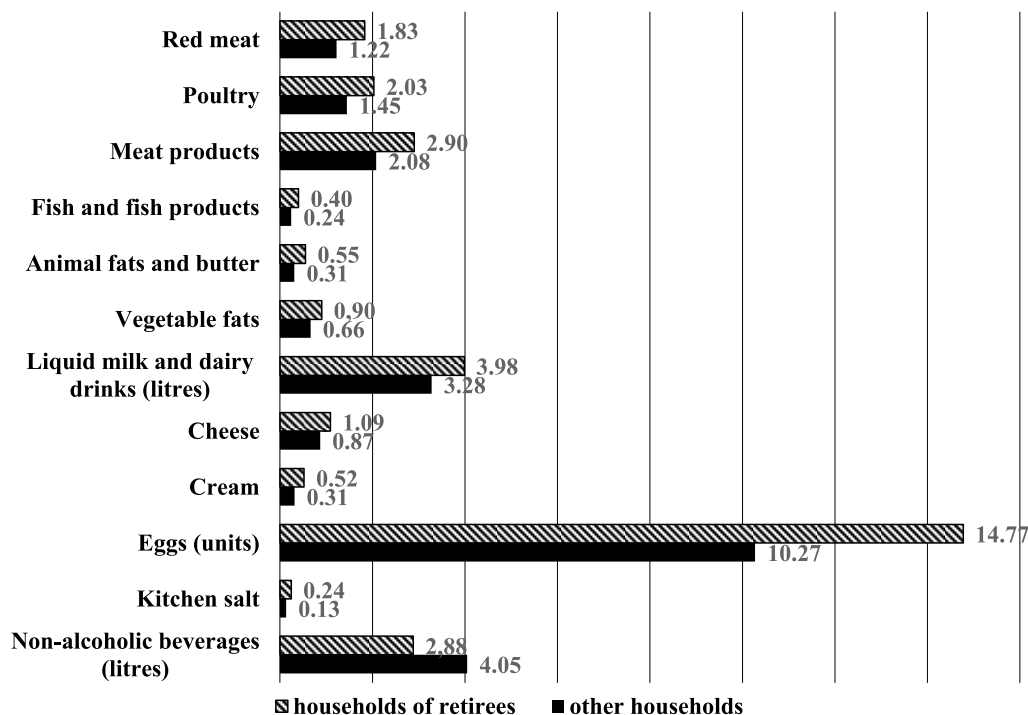


Figure 2. Food group consumption in retirees' households in comparison to other households in Poland, 2019 (kg/person/month) - continuation

It is necessary to underline the high consumption of sugar and confectionery products in the retirees' households (more than 1 kg/person/month of sugar and near 0.6 kg/person/month of the confectionery products).

The consumption of meat and meat products (Figure 2) was close to 7 kg/person/month, including 1.83 kg of unprocessed red meat and 1.85 kg of processed red

meat. In the respect of fish and fish products, it was 0.40 kg/person/month.

The consumption of butter and animal fats was more than 0.5 kg/person/month but the consumption of vegetable fats was almost 2 times higher (0.9 kg/person/month).

In the retirees' households the consumption of milk and dairy drinks was 4 l/person/month. The cheese

and cream consumption was 1.09 and 0.52 kg/person/month respectively.

The consumption of kitchen salt (excluding salt contained in food products) in retirees' households was 0.24 kg/person/month.

In comparison to the other types of households, the food consumption by retirees' households was in the most cases higher, excluding non-alcoholic beverages.

Energy and nutrient intake

Tables 1-3 presented the results of energy and nutrient intake by members of retirees' households in comparison to members of other households. These results were expressed per person per day.

The energy intake by retirees was 2387 kcal/person/day (Table 1) and it was found the 31% of the energy of animal origin in it.

The total protein intake was 83 g/person/day and there was 61% of protein of animal origin in it. The total fat intake was close to 100 g/person/day (36.6% of energy) and the share of the fat of animal origin was 56%.

There were observed a quit similar proportions of energy from total protein, total fat and digestible

carbohydrates in retirees' diets and in the group of other households.

The intake of saturated fatty acids and monounsaturated fatty acids was respectively 36 and 40 g/person/day but the polyunsaturated fatty acids intake was 17 g/person/day.

The mineral intake (Table 2) by retirees' households was higher than in the group of other households. The calcium intake was 658 mg/person/day but the phosphorus intake was almost twice higher (exceed 1300 mg/person/day). Moreover the sodium dietary intake was very high in the group of retirees' households members and it was close to 5400 mg/person/day.

Similarly as in the respect of minerals, the intake of vitamins (Table 3) by the members of retirees' households was higher than in the group of other households. The intake of vitamin A was 1304 µg/person/day in the group of retirees' households members. The intake of vitamin D was less than 4 µg/person/day. The intake of the water soluble vitamins like B₁, B₂ and B₆ was close to 2 mg/person/day. The intake of niacin was resulted as 23.6 mg/person/day. Foliates intake was 289 µg/person/day. The intake of vitamin C was equal to 100 mg/person/day.

Table 1. Energy and selected nutrients average intake in households of retirees in comparison to other households in Poland, 2019 (per person/day)

Energy and nutrients	Unit	Retirees' households	Other households
Total energy	kcal	2387	1785
Energy from products of animal origin	kcal	732	517
Energy from products of vegetable origin	kcal	1655	1268
Protein: in total	g	83.2	61.5
of animal origin	g	50.4	37.0
of vegetable origin	g	32.8	24.4
Fats: in total	g	98.7	71.5
of animal origin	g	55.0	37.7
of vegetable origin	g	43.7	33.8
Digestible carbohydrates	g	291	224
Proportion of energy from total protein	%	14.2	14.0
Proportion of energy from total fat	%	36.6	35.4
Proportion of energy from digestible carbohydrates	%	49.6	51.0
Saturated fatty acids	g	35.7	25.7
Monounsaturated fatty acids	g	39.8	28.9
Polyunsaturated fatty acids	g	17.2	12.7
Proportion of energy from saturated fatty acids	%	13.4	13.0
Ratio of polyunsaturated and saturated fatty acids		0.5	0.5
Cholesterol	mg	312	218
Fibre	g	21.6	16.0

Table 2. Minerals average intake in retirees' households in comparison to other households in Poland, 2019 (per person/day)

Minerals	Unit	Retirees' households	Other households
Sodium	mg	5398	3480
Potassium	mg	3817	2750
Calcium	mg	658	526
Phosphorus	mg	1330	997
Magnesium	mg	392	285
Iron	mg	13.2	9.5
Zinc	mg	11.7	8.6
Copper	mg	1.8	1.3
Manganese	mg	5.3	3.8
Iodine	µg	217	126

Table 3. Vitamins average intake in retirees' households in comparison to other households in Poland, 2019 (per person/day)

Vitamins	Unit	Retirees' households	Other households
Vitamin A	µg	1304	856
β-carotene	µg	2996	2113
Vitamin D	µg	3.8	2.6
Vitamin E	mg	13.5	10.0
Vitamin B ₁	mg	1.8	1.3
Vitamin B ₂	mg	1.9	1.4
Niacin	mg	23.6	16.6
Vitamin B ₆	mg	2.1	1.6
Folates	µg	289	207
Vitamin B ₁₂	µg	4.2	2.9
Vitamin C	mg	100	73

DISCUSSION

In 2019, average monthly available income in retirees' households amounted to PLN 1,864 *per capita* and accounted for 102.4% of the national average. At the same time, average monthly expenditures in these households amounted to PLN 1,364 and accounted for 108.9% of the national average. Retirees' households belonged to households with a relatively high rate of expenditures in available income - 73.2%. For total households this rate was 68.8% [8].

Expenditure on food and non-alcoholic beverages had the highest share in the structure of expenditures. In retirees' households, they accounted for 28.2% of all expenditures, with 25.2% for total households. The amount spent by retirees on the purchase of food and non-alcoholic beverages was PLN 385 per person per month, while for all households it was PLN 314.

Expenditure on food and non-alcoholic beverages in other households was lower than in retirees' households [8].

Taking into account the differences in food intake between retirees' household and the other types of households it is worthy to underline the differences in expenditures on hotels and restaurants. In 2019 the average value for these expenditures by retirees' household was 49 PLN and they were about 20% lower than in all types of the households [8].

Data from different EU countries collected by European Statistical Office – Eurostat indicate that the structure of household expenditure differs between age groups. Households with a reference person aged 60 years or more in most countries tend to spend proportionally more of their expenditure on food and non-alcoholic beverages than other households. In 2015 their expenditure on these products was 7% higher than the average share for all households in EU. This proportion was the highest in Cyprus (33% higher) and Estonia (27% higher). In three countries: Denmark, Germany and Sweden expenditure on food and non-alcoholic beverages in households of the elderly was lower (respectively 7%, 2% and 2%) than in all households [4].

The households of retirees surveyed in Poland most often consisted of two (51.5%) or one person (36.3%), which could determine the expenditure on food and non-alcoholic beverages [8]. The number of people in a household affects the differences in the level and structure of expenses. Expenditure on food and non-alcoholic beverages per capita is the highest in small households and decreases with the increase of the number of people in the household. Higher expenditures on food and non-alcoholic beverages in small households can be associated with the economy scale effect related to savings in the joint preparation of meals [11].

The expenditure analysis indicated that retirees' households spent the most on food and non-alcoholic beverages of all households. Data presented in our manuscript showed that retirees' households were characterised by a high consumption of food products compared to other households.

Earlier data also indicated a higher consumption of food products in retirees' households. An analysis of data from household budget survey from 2014, carried out by *Turczak* [23], showed that in the households of retirees and pensioners, the *per capita* consumption of meat, fish and seafood, milk, cream, eggs, oils and fats, fruit, vegetables, sugar, jam, honey, chocolate and confectionery products, coffee and tea were higher than the average consumption in Poland. On the other hand, the consumption of fruit and vegetable juices was low compared to the average.

Considering that retirees' households usually consist of two persons, we wanted to know the differences between monthly food consumption by this type of households and the whole group of households of two people [8]. It was observed 5% higher consumption of bread and cereal products in the group of retirees' households in comparison to the total types of households. However the highest consumption of cereal products was in farmers' households. Also, in the respect of meat and meat products the farmers' households represented the highest consumption of this group. Among the other groups of animal products like milk, cream and eggs, a higher consumption of these products was also noted among farmers' households. It is necessary to underline the highest consumption of cheese and yogurts in the employees' households of non-manual labour positions. However, the fish consumption was highest in the retirees' households. In respect of fruit consumption, the retirees' and self-employed households were characterised by the highest consumption. However, in the group of vegetable the farmers' households consumed the highest monthly amount. Taking into account sugar and sugar product consumption the farmers' households consumed them the most, but the retirees' households were in the second place in this respect. In conclusion the comparison of food consumption between different types of two-person households did not indicate the retirees' households as a group of the highest consumers of the most of the food products as it was shown in the result section of this paper. The higher consumption of the most of food products in retirees' households than in the group of the other households seems to be the result of, among others, different number of members in households.

We analysed the food consumption from household budgetary survey also in 2010-2018 and we stated that the inhabitants of rural areas consumed more bread, potatoes, meat products, milk and dairy drinks, eggs and sugar [21]. It can be assumed that they are mostly farmers.

Data on the consumption of some food products in retirees' households made it possible to compare it with the recommendations.

The consumption of vegetables and fruit was 12.51 kg/person/month, which was equal to 411.3 g/person/day. Considering the recommendations of the World Health Organisation (WHO) concerning the daily consumption of vegetables and fruit, which should be at least equal to 400 g [26], the total consumption of products from these was in line with these recommendations.

The consumption of unprocessed and processed red meat was 3.68 kg monthly, i.e. 845 g per week. Consumption of all processed meat was 2.90 kg per month, i.e., 667 g per week. The World Cancer

Research Fund/American Institute of Cancer Research (WCRF/AICR) recommends to limit weakly red meat consumption to no more than 350-500 g cooked weight (500 g of cooked meat roughly equivalent of 700-750 g of raw meat) [25]. It is also recommended to consume very little, if any, processed meat. In relation to these recommendations, the consumption of red and processed meat in retirees' households should be assessed as too high. However, it should be noted that opinions on the reduction of red and processed meat are not unanimous. Nutritional Recommendations (NutriRECS) Consortium suggests that adults continue current unprocessed red meat and processed meat consumption as the results of meta-analyses showed that the possible effects of red and processed meat consumption on all-cause mortality, cancer mortality and incidence and adverse cardiometabolic outcomes are very small, and the evidence is of low certainty [12, 15, 29].

Members of retirees' households consumed 0.24 kg of salt per month, i.e. 7.9 g/day. However, taking into account the sodium content in food products, the total salt intake was 13.5 g/day. It clearly exceeded the WHO recommendations of no more than 5 g/day [27].

When analysing the energy intake from individual macronutrients in retirees' households, a very high percentage of energy from fats was observed – 36.6%, exceeding the Polish Dietary Reference Value (DRV) of 20-35% [14]. The energy intake from carbohydrates was relatively low – 49.6%. It was in the range of the Polish DRV, but close to the lower value of this range. Retirees consumed more animal fat than vegetable fat. The structure of fatty acids intake was the result of this. Their diet was characterised by a high content of saturated fatty acids providing 13.4% of energy. In the diet ensuring the proper nutritional value, their intake should be as low as possible. Moreover, the content of the polyunsaturated fatty acids represented only half of the saturated acids and their ratio was equal to 0.5.

The intake of the most of minerals and vitamins by seniors' households was higher than Reference Intakes (RIs for labelling) [14] excluding calcium and vitamin D.

Household budget survey may not include the entire food consumed by studied person. Moreover, the obtained data show the average consumption among all inhabitants of the households and do not reflect the differences depending on age and gender. Therefore, not all the data resulting from this methodology may correspond to the recommendations.

Data on individual consumption facilitate a more accurate assessment of the energy and nutritional value of the diet.

Surveys of Polish seniors showed many abnormalities in their diet. Among subjects living in family homes in West Pomeranian voivodeship the energy intake was

relatively low – 1603 kcal/day [3]. The energy value of the diet of the elderly in Łódź was also low – 1681 kcal/day, moreover this study reported an unfavourable trend of a decrease in energy intake and an increase in the proportion of energy from fat and saturated fatty acids with age [10]. In the Lower Silesia Voivodeship, energy intake was 1707 kcal among men and 1373 kcal among elderly women [19]. In turn, in the same voivodeship in rural areas energy intake was 1731 kcal in men and 1312 kcal in women and the proportion of energy from fat was too high [28].

Surveys among seniors confirmed a high proportion of energy from fat and saturated fatty acids, as well as household budget survey. In a study conducted in Krakow concerning mainly fat consumption, it was estimated that among the elderly, total fat and saturated fatty acids exceeded the recommended values [16]. An excess of saturated fatty acids has also been reported in the diet of seniors from Łódź. Moreover LCPUFAs and dietary fibre intake was too low [10].

Vitamin and mineral deficiencies were often reported in the diets of seniors from various regions of Poland. Among subjects from West Pomeranian voivodeship the intake of calcium, magnesium, vitamin D, E, folate was too low [3]. The diet of elderly from Łódź contained insufficient amounts of potassium, magnesium, vitamin C, vitamin D and folate [10]. In the diet of seniors from Lower Silesia Voivodeship the content of vitamins D, C, folate, potassium, calcium, magnesium and iodine was lower than the Polish DRVs. Moreover, in the diet of women insufficient content of vitamin B₁ was found, and in the meals of men – zinc and vitamin E [19]. Inhabitants of rural areas of that voivodeship consumed diet with low amount of vitamin C and folate [28] compared to Polish DRVs.

Some studies have found a high sodium intake, confirming the finding of a high salt consumption households budget survey. Too much sodium has been reported in the diet of elderly from West Pomeranian and Łódź [3, 10].

In other countries, abnormalities in the diets of seniors have also been found. In Cork, Ireland total fat and saturated fat intake was high while dairy food consumption was inadequate. A considerable proportion of subjects, particularly males, had inadequate intake of calcium, magnesium, zinc, vitamin C, vitamin D and folate [18]. The elderly people from Palma de Mallorca, Spain were consuming a diet with too high proportion of energy from protein, fat, saturated fatty acids and sugars, and too low from carbohydrates. Dietary fibre intake was low. High percentages of subjects had inadequate intake of calcium, magnesium, zinc, vitamin D, E and folic acid [22]. According to nationwide survey in Germany dietary intake was adequate for most nutrients. However, the intake of dietary fibre, calcium

and vitamin D in a large proportion of subjects was too low [24]. A high prevalence of inadequate intake of vitamins A, D and E, calcium, magnesium and pyridoxine was observed in the Brazilian seniors [7].

Surveys on individual food consumption do not clearly show how eating habits change after retirement. The results of survey conducted in Helsinki, Finland showed that transition to retirement was associated with an increase in fruit consumption among men and a decrease in vegetable consumption among women. Fish consumption did not change with the employment status [2]. Fish consumption did not differ by retirement status in a survey of British people from London [1]. However, the authors of mentioned surveys assessed only the number of portions, they had no information about its size.

The observed differences in food consumption between households of retired people and others could result not only from the employment status, but also from the age structure, the number of people in the household and methodology of the survey.

Taking into account the food consumption and nutrient intake data in retirees' households, it should be borne in mind that, as a consequence of the methodology used, budget survey does not take into account food consumption outside households (mass catering sector). If such studies could be carried out, they would undoubtedly show that groups of households such as, in the first place, the self-employed and employees, actually eat a diet more abundant in energy and nutrients. This hypothesis is justified by the data on the amount of monthly (disposable) income per person by socio-economic groups of households. According to them, the income of self-employed households (the highest among all groups) was more than 1/5 higher than the average for of the total number of households, and the incomes of employees' households slightly exceeded this average [20].

The results of household budget survey presented in this manuscript indicate that they are a valuable source of data on food consumption. The conducted analyses confirmed the usefulness of this study for comparing consumption between different types of households. However, other characteristic should also be considered, such as number of people in the household.

The data from the study allowed for a general characterisation of the diet, however the results of individual consumption studies should also be taken into account when assessing dietary intake. Data from household budget survey showed that Polish seniors, who were a significant part of retirees' households, consumed too much red and processed meat and salt.

Their diet contained too much energy from fat, including saturated fatty acids. Among minerals and vitamins the intake of calcium and vitamin D was too

low. On the other hand, individual consumption surveys showed that the diet of the elderly was frequently deficient in vitamins and minerals, especially calcium, magnesium, vitamin D, vitamin C and folate.

CONCLUSIONS

There are some abnormalities in the diets of Polish seniors. Data from household budget survey indicated that red and processed meat consumption was too high. This was accompanied by a very high salt intake. Vegetables and fruit in retirees' households were consumed in the amounts that meet the recommendations. The diet of seniors from retirees' households was improperly balanced, e.g. due to the high percentage of energy from fat, including saturated fatty acids. At the same time, the intake of polyunsaturated fatty acids, calcium and vitamin D was low.

Data from household budget survey indicated a higher consumption of food products in retirees' households than in the group of the other households, except non-alcoholic beverages. It could result, among others, from different number of members in households, because the comparison of data on consumption in two-person households did not confirm a higher consumption of most food products in households of retired people.

In order to accurately assess dietary intake, data from the household budget survey could be supplemented with data on individual food consumption.

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Conflict of interest

The authors declare no conflict of interest.

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