

EMILIA SŁOCIAK, ELŻBIETA BARTNIKOWSKA

DIETARY ASSESSMENT OF MALES FROM SEVENTH-DAY ADVENTIST CHURCH IN WARSAW

OCENA SPOSOBU ŻYWIENIA MĘŻCZYŹN ADWENTYSTÓW DNIA SIÓDMEGO Z WARSZAWY

Department of Dietetics
Faculty of Human Nutrition and Consumer Sciences
Warsaw University of Life Sciences
02-787 Warsaw, ul. Nowoursynowska 166
e-mail: eslociak@wp.pl
Kierownik: prof. dr hab. J. Gromadzka-Ostrowska

The main purpose of this research was to assess the quality and quantity of daily food rations and the intakes of selected nutrients by males aged 30 to 50 years – the Seventh-Day Adventists (SDA) from the Warsaw assembly. The assessment of the daily intakes of nutrients showed no significant difference from recommended values formulated by National Food and Nutrition Institute in Warsaw. Daily food intakes by the Adventist males closely follow the healthy eating recommendations over daily nutrients intakes of whole population of males in Poland living in cities. Such results are mostly related to low consumption of fats, cholesterol, salt and higher intake of dietary fiber and vitamin C.

Key words: diet structure, Healthy Eating Index, Keys' Diet Atherogenicity Index, Seventh-Day Adventist from Poland

Słowa kluczowe: struktura diety, Healthy Eating Index (HEI), wskaźnik aterogenności diety Keysa, Adwentyści Dnia Siódmego.

Introduction

The members of the Seventh-Day Adventist (SDA) Church follow the rules of healthy lifestyle mostly as a part of their religious practices. The Adventists' church forbids the consumption of alcoholic beverages, pork and pork preparations, crustaceans and at the same time encourages the reduction in overall consumption of meat and intake of strong coffee and tea, strong spices as well as highly processed food. On the other hand, Adventists' church strongly recommends consumption of diet high in fruits, vegetables, and wholegrain products. Moreover, high physical activity in everyday life is strongly advised and smoking is forbidden [6].

Diet of the Adventists, which is high in plant food products, generally meets the requirements of both atherosclerosis and cancer preventive diets (low consumption of fats mostly

saturated fatty acids, cholesterol and salt, and high level of intake of antioxidant vitamins and dietary fiber). Therefore, as expected the results of many epidemiological studies show significantly lower existence of cardiovascular diseases risk factors and mortality rates caused by cardiovascular diseases in population of Adventists [2,12]. Researchers from Loma Linda Adventists University elaborated The Bibliography of Health-related Research Studies among SDA from the whole world [5], which is currently being updated.

There is a lack of nutritional research assessing the pattern of consumption among population of Adventists living in Poland.

The main purpose of this research is to assess the quality and quantity of the daily food rations and the intakes of selected nutrients among males - the Seventh Day Adventists from Warsaw.

Permission for this study was issued by Bioethical Commission of National Food and Nutrition Institute (NFNI).

MATERIALS AND METHODS

The assembly of Adventists in Warsaw consists of approximately 500 members, of whom about 60% are females and about 40% - males. 63 males aged 23 to 76 years took part in this study. For the purpose of this work, daily food intakes of the males aged 30 to 50 years were analyzed. This age span is the highest in Warsaw Adventists. Moreover, in Poland the recommendations in regards to energy and nutrient intakes for this age group have also been formed.

The three-day food record method was used to collect data regarding food products, meals and drinks consumption. The respondents were asked to provide a record of all drinks, food and meals during 2 weekdays and one weekend day. The data collected were to be presented in household measures or using mass/volume units. In order to simplify the estimation of the size of food portions *Album of photographs of food products and meals* was used [11]. The data collected using 3-day food records were transferred to Dieta 2 – a computer software prepared by experts from NFNI in Warsaw in order to assess the energy and nutrient intakes. This software was prepared on the basis of Official Recommendation of Nutrient Intake for the Citizen of Poland [13]. This computer software takes into account the wastage during food processing as well as age, weight, physical activity of the respondents. Furthermore, it compares the intakes of all nutrients with dietary recommendations at the safe level and minimal level for the consumption of sodium and potassium.

In order to assess the quality of the diet of Adventists group two score methods were used: the Starzyńska's method [3] and Healthy Eating Index (HEI) [1]. In Starzyńska's score method, attention is directed towards the elements of the diet that directly influence the composition of daily food consumption such as the number of meals, the frequency of planned consumption of milk, cheese, vegetables, fruits as well as whole meal bread, grits and pulses.

Healthy Eating Index on the other hand refers to recommendations of World Health Organization and deals with the structure of the diet. The value of the Healthy Eating Index (HEI) is obtained by scoring the size of the consumption of chosen food groups like grain products, vegetables, fruits, milk, meat in relation to one portion and nutrients (fatty acids, saturated fatty acids as a percentage of energy provided in daily diet, intake of cholesterol and sodium in mg per day). The Healthy Eating Index includes also the evaluation of variety of food products consumed [1].

In evaluation of the Adventists' diet Keys atherogenicity index of diet was employed [4]. In order to compare the diet structure of the Adventists and the whole population of males living in cities epidemiological studies from Poland were used for example Pol-Monica Bis Study [7], NFNI Project [9], and WOBASZ Study [8].

The data collected were compared using ANOVA single factor test.

RESULTS AND DISCUSSION

The results of the quality of the Adventists' diet assessment are presented in Table I and Figure 1. The results of the quantity assessment are shown in Table II. The obtained results have been compared with the results of the Project conducted by NFNI in Warsaw entitled *The investigation of individual intake and Nutritional Status in Households* [9] and with the results of Pol-Monica Bis Study [7].

Table I. The evaluation of quality of Adventists diet according to *Starzyńska* score and HEI
Ocena jakości diet Adventystów metodami wg. *Starzyńskiej* i HEI

	Total daily rations of Adventists aged 30-50 years n = 117	
	According to <i>Starzyńska</i>	According to HEI
Diets composed adequately	2,6 %	25,6 %
Diets composed satisfactorily, but need correction	94,8 %	71,8 %
Diets composed wrongly – not possible to correct	2,6 %	2,6 %

The evaluation of the quality of daily food intake using both *Starzyńska's* method and HEI score showed that 97% of the of Adventists' diets meet the recommended values at the adequate or sufficient level.

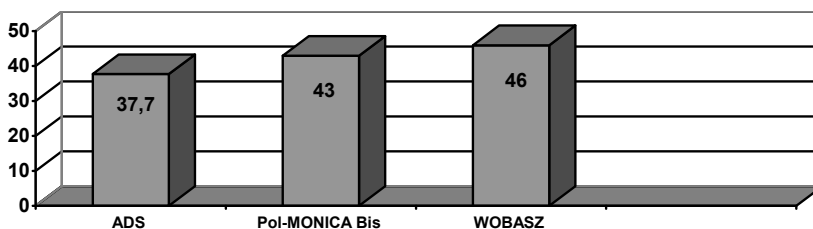


Figure 1. The evaluation of Keys atherogenicity index of diet of males living in Poland

The comparisons of Keys atherogenicity index of diet of males living in Poland (Fig. 1) indicate that Adventists' diets were composed adequately reaching nearly recommended values for men (34 or less). In contrast, diets of the males living in Warsaw (Pol-Monica Bis Study) and males living in the cities of Mazovian province in Poland (WOBASZ Study) are composed incorrectly because the values of this index are significantly higher.

The results presented in table II clearly indicate that there was a significant difference in both energy intake and nutrient consumption (macronutrients, minerals and vitamins) between Adventists males and whole population of males in both Warsaw (Pol-Monica Study) and other cities in Poland (NFNI Project).

The mean values showed that daily food rations of Adventists provided less energy in comparison with daily food rations of males living in Warsaw and males living in the cities in Poland (Table II).

Table II. Average intakes of energy and nutrients by men-Adventists from Warsaw and whole population of men living in Poland
Średnie pobranie energii i składników odżywczych przez mężczyzn Adwentystów z Warszawy i populacji ogółu mężczyzn w Polsce

Energy and selected nutrients		Adventists males aged 30-50 years from Warsaw n = 117	Males aged 26-60 years living in cities in Poland (NIFN Project) n = 542	Males aged 35-64 years living in Warsaw (Pol-MONICA Bis Study) n = 428
Energy	kcal	2053,6±810,3	3022,0±1059,0	2335,9±860,7
Total protein	grams	65,3±28,6	102,6±40,3	82,8±33,5
	% energy	13,0±3,3	14,0±3,3	14,7±4,0
Total fats	grams	72,9±43,4	128,4±58,6	99,0±48,9
	% energy	30,5±7,3	36,8±8,0	37,9±8,7
Total carbohydrates	grams	311,1±106,4	375,2±134,4	291,4±110,6
	% energy	56,5±7,8	47,2±8,3	47,3±9,3
Dietary fiber	grams	29,9±12,9	27,9±11,0	22,5±9,9
Cholesterol	mg	241,8±241,4	544,0±378,0	377,1±314,7
Calcium	mg	639,1±379,9	640,0±415,0	520,8±360,1
Iron	mg	13,9±6,6	16,2±9,7	13,2±8,4
Magnesium	mg	377,3±151,0	385,0±128,0	304,5±113,5
Sodium	mg	3358,4±1366,2	5870,0±2326,0	2490,9±1177,2
Potassium	mg	3748,0±1578,8	4330,0±1544,0	3451,7±1412
Vit. A (eq. retinol)	µg	1423,3±946,5	1823,0±3897,0	1534,7±4335,9
Vit. E (eq. tocopherol)	mg	15,7±11,0	15,7±9,0	11,4±7,1
Vit. C	mg	184,1±139,3	95,6±81,4	90,5±93,6
Vit. B ₁	mg	1,2±0,6	1,8±0,9	1,5±0,8
Vit. B ₂	mg	1,59±0,72	2,05±1,19	1,64±1,26

Adventists' daily food intakes at an average were poorer in proteins, fats and cholesterol and, at the same time providing higher amounts of dietary fiber in comparison with diets of males living in Warsaw and living in cities in Poland which indicates better composition of macronutrients in the diet of the Adventists.

The low consumption of calcium as well as high intake of salt (sodium) is characteristic for the Polish diet. Inadequate intake of calcium and over consumption of salt (sodium) was found in both Adventist males from Warsaw and whole population of males living in Warsaw as well as whole population of males living in cities in Poland. The intake of calcium in Adventists' diet and males living in the cities diet meets the recommended intake requirements at the level of 80%. Moreover, males living in the cities consumed less calcium than the two previously mentioned groups.

The consumption of salt by Adventists from the Warsaw assembly was six-fold greater than recommended minimal intake, at the same time diets of males living in the cities in Poland provide the amount of salt about 10-fold greater than recommended minimal value. It

is worth stressing that surprisingly the lowest consumption of salt was found in whole population of males living in Warsaw.

The analysis of diets showed that the intake of vitamin C was two times greater by Adventists than by both males living in Warsaw and in males living in the cities in Poland. High intake of plant foods rich in vitamin C and E as well as other substances with antioxidative properties is responsible for high total antioxidant status of Adventists' blood [10].

Diets of Adventists did not provide adequate levels of vitamin B complex (intake of vitamin B1 was usually at the 78% level of recommended values, B2 – at the level of 72% of the recommended value). Lower as recommended intakes of vitamins from the B group also were noted in both males living in Warsaw and in males living in cities in Poland.

Our data indicate that diets of Adventists men from Warsaw Poland are composed more adequately than diet of whole population of men living in Warsaw or in other cities of Poland. These results are in agreement with the data from other countries concerning the comparison of Adventists diets and diet of whole population.

CONCLUSION

1. Diets of males – Adventists from Warsaw generally met the requirements of both atherosclerosis and cancer preventive diet (low consumption of fats, particularly animal fat, cholesterol and salt and high consumption of dietary fiber and antioxidant vitamins). In contrast, Keys atherogenicity index of diet of males living in Warsaw and living in cities in Mazovian province reached high values.
2. However, diets of males – Adventists from Warsaw generally provided adequate amounts of nutrients, did not provide adequate supply of calcium and vitamin B complex.

E. Słociak, E. Bartnikowska

DIETARY ASSESSMENT OF MALES FROM SEVENTH-DAY ADVENTIST CHURCH IN WARSAW

Summary

The main purpose of this research was to assess the quality and quantity of daily food rations and the intakes of selected nutrients by males aged 30 to 50 years – the Seventh-Day Adventists from the Warsaw assembly. The results of the quality of daily food rations showed that around 97% of food rations of Adventists were composed satisfactorily or adequately. Furthermore, the assessment of the daily intakes of nutrients showed no significant difference from recommended values formulated by National Food and Nutrition Institute in Warsaw. Daily food intakes by the Adventist males closely follow the healthy eating recommendations over daily nutrients intakes of whole population of males in Poland living in cities. Such results are mostly related to low consumption of fats, cholesterol, salt and higher intake of dietary fiber and vitamin C.

E. Słociak, E. Bartnikowska

OCENA SPOSOBU ŻYWIENIA MĘŻCZYZN ADWENTYSTÓW DNIA SIÓDMEGO Z WARSZAWY

Streszczenie

Celem pracy jest ocena jakościowa i ilościowa całodobowych racji pokarmowych mężczyzn w wieku 30-50 lat – Adwentystów Dnia Siódmego (ADS) ze zboru w Warszawie. W ocenie jakościowej stwierdzono, że ok. 97% racji pokarmowych Adwentystów zestawiono w stopniu dobrym lub dostatecznym, zaś analiza ilościowa wykazała, że podaż składników odżywczych w całodobowych racjach pokarmowych Adwentystów nie odbiega w istotnym stopniu od zaleceń opracowanych przez specjalistów IŻŻ w Warszawie dla osób tej grupy. Całodobowe racje pokarmowe mężczyzn ADS odpowiadają bardziej prozdrowotnemu modelowi żywienia niż racje pokarmowe populacji ogółu mężczyzn z Warszawy. Wynika to głównie z mniejszego spożycia tłuszczów, cholesterolu i soli kuchennej, a większego spożycia włókna pokarmowego i witaminy C przez Adwentystów.

REFERENCES

1. *Basiotis P. P., Carlson A., Gerrior S. A., Juan W. Y., Lino M.*: The Healthy Eating Index: 1999-2000. U.S. Department of Agriculture, Center for Nutrition Policy and Promotion 2002, CNPP-12. www.usda.gov/cnpp (15.03.2008).
2. *Fraser G. E.*: Diet as primordial prevention in Seventh-Day Adventists. *Prev. Med.* 1999, 29, S18-S23.
3. *Gawęcki J., Hryniewiecki L.* (red): Żywnienie człowieka. Podstawy nauki o żywieniu. Tom 1, PWN, Warszawa 2000. (in Polish)
4. *Keys A., Anderson J., Grande F.*: Serum cholesterol response to changes in the diet. IV Particular saturated fatty acid in the diet. *Metabolism* 1965, 14,776-87.
5. Loma Linda University Adventist Health Study . Bibliography of Health-related Research Studies among Seventh-Day Adventists. www.llu.edu/llu/health/abstracts (15.03.2008).
6. *Nieman D. C.*: Adwentystyczny styl zdrowego życia. Warszawa, Chrześcijański Instytut Wydawniczy "Znaki Czasu" 2001.(in Polish)
7. Program POL-MONICA BIS WARSZAWA. Stan zdrowia ludności Warszawy w roku 2001. Część I. Podstawowe wyniki badania przekrojowego. Biblioteka Kardiologiczna 79, Instytut Kardiologii, Warszawa 2002.(in Polish)
8. Program WOBASZ. Wieloośrodkowe Ogólnopolskie Badanie Stanu Zdrowia Ludności. Ogólnopolskie i regionalne rozpowszechnienie głównych czynników ryzyka układu sercowo-naczyniowego. *Kardiologia Polska* 2005, 63, (supl. 4) (in Polish).
9. Projekt Instytutu Żywności i Żywienia. Badania indywidualnego spożycia żywności i stanu odżywienia w gospodarstwach domowych., *IŻŻ*, Warszawa 2003 (in Polish).
10. *Słociak E., Bartnikowska E.*: Ocena profilu lipidowego i całkowitego potencjału antyoksydacyjnego (TAS) surowicy mężczyzn-członków Kościoła Adwentystów Dnia Siódmego (ADS) z Warszawy. *Żyw. Człow. Metab.* 2007, 3/4, 1102-6. (in Polish; English abstract)
11. *Szponar L., Wolnicka K., Rychlik E.*: Album fotografii produktów i potraw. *IŻŻ*, Warszawa 2000 (in Polish).
12. *Willett W.*: Lessons from dietary studies in Adventists and question for the future. *Am. J. Clin. Nutr.* 2003; 78, 539S-43.
13. *Ziemiański Ś.*, (red): Normy żywienia człowieka. Fizjologiczne podstawy. PZWL, Warszawa 2001 (in Polish).

Otrzymano 02.06.2008 r.

Akceptowano: 03.07.2008 r.