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Fats in women's diet and everyday life

Abstract

Introduction. Currently, vegetable oils are used not only for consumption but also for medicinal and cosmetic purposes. They are especially eagerly used by women, although their knowledge in this field is usually insufficient.

Aim. The aim of the study was to determine the dietary habits of women and to analyse the importance and position of vegetable fats in their diet and life. Another objective was to assess the level of knowledge and awareness of the health-enhancing properties of these products.

Material and methods. The study involved women (n=253) aged 18-30, 31-40, and over 40 years living in Lubelskie Province, Poland. The modified questionnaire was composed of questions about their diet, regularity of meals, habits and preferences of fat intake, and motivation behind including fats in the diet or for cosmetic or medicinal applications.

Results. Approximately 45% of the respondents sometimes used fats with their meals and 23% used them regularly. Fats were consumed by approximately 86% of the total number of respondents and were used for medicinal and cosmetic purposes by ca. 15.5 % and 6% of the respondents, respectively. Linseed oil (34%) and coconut oil (27%) were regarded as the most valuable fats. Butter and rapeseed oil were consumed most frequently (p<0.05). Approximately 47% of the respondents regarded refined oils as valuable products, and 40% of the respondents were aware of the harmful effects of trans fats.

Conclusion. The survey indicates a necessity of implementation of educational campaigns among consumers in order to disseminate the knowledge about the role of fat in the diet and the risks associated with excessive consumption and poor quality of these products.

Keywords: women, dietary fats, diet, everyday life.

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INTRODUCTION

Fats are essential nutrients in a balanced diet. Particularly noteworthy are vegetable fats, as they are a source of valuable fatty acids exerting a beneficial effect on consumer's health. They are highly desirable in everyday diet due to their high content of unsaturated fatty acids and absence of cholesterol [1]. Regular consumption of vegetable fats stabilises the lipid metabolism in the organism, prevents cardiovascular diseases, and has a positive effect on foetal development. A similarly important issue is the quality of consumed fats, in particular processed ones, as these may contain excessive amounts of undesirable trans acids [2]. Rational nutrition, taking into account the basic metabolism of the organism and physical activity, should comprise an adequate proportion of vegetable fats in relation to animal fats. In the current healthy eating pyramid for the Polish population, vegetable oils are placed at the top, while there are no animal fats [3]. At present, vegetable oils are widely used not only for consumption but also for medicinal and cosmetic purposes. They are especially eagerly used by women [4]. The modern market offers a particularly wide range of vegetable oils. Besides traditional fats, e.g. rapeseed or sunflower oils, consumers have an opportunity to buy such niche products as hemp oil, coconut oil, or castor oil [5].

AIM

The aim of the study was to identify the dietary habits of women and to analyse the importance and position of vegetable fats in their diet and life. The study was also aimed at assessment of the level of their knowledge and awareness of the health-enhancing properties of these products.

MATERIAL AND METHODS

The study involved women (n=253) aged 18-30 (n=87), 31-40 (n=91), and over 40 years (n=75) living in Lubelskie Province. The study was carried out with the use of a modified questionnaire with questions about their diet, regularity of meals (4-5 meals per day were regarded as an appropriate number), habits and preferences for vegetable fat intake, and motivation behind including fats in the diet or for cosmetic or medicinal applications. The study had an auditory character, which ensured higher reliability of the questionnaire responses. A 6-point scale was used to determine the frequency of consumption of selected food products (6 – several times a day; 5 – once a day; 4 – several times a week; 3 – once a week; 2 – once or twice a month; 1 – not at all), which allowed the use of an ordinal-rank scale [6].

Descriptive statistics parameters were calculated (StatSoft Statistica 13.0), the rank-ordinal scale R was used, and a non-parametric rank Kruskal-Wallis test at the significance level of $\alpha=0.05$ and a non-parametric χ^2 test with Yates correction ($\alpha=0.05$) were applied.

RESULTS

The respondents most frequently declared usual consumption of 4 or 3 and 5 meals a day (33 and 27%, respectively) (Table 1). The women in the age group of 31-40 years had the most rational meal scheme. The following frequency of meals was declared: dinner (98% of the total number), the first breakfast (87%), and supper (over 81%). The women in the oldest group consumed meals less frequently, the least often eaten were the second breakfast and afternoon tea (38% and 33%, respectively). The exclusion of meals from the daily menu was associated with longer breaks between the meals. Only 69% of the total number of the respondents reported 2-3h breaks between meals, whereas as many as approximately 30% did not eat any meal for 4h or longer. The women from the youngest group exhibited the highest regularity in meals, i.e. approximately 72% did not exceed a 2-3-h interval. The 5-h long breaks between meals during the day declared by ca. 11% of the respondents were a disturbing phenomenon. However, the observed differences were not statistically significant.

Approximately 45% of the respondents declared occasional use of fats, while 23% reported the product as a regular component of their meals (Table 2). A majority of the respondents (86%), regardless of their age, reported using fats for nutritional purposes. Fats were used mainly ($P=0.237$) for nutritional purposes by the women from the 18-30 and 31-40 age groups (87 and 93%, respectively). The women aged 18-30 and 31-40 years eagerly used fats for medicinal (18% and 19%) purposes.

TABLE 1. Characteristics of meals, percentage of the group.

Variables	18-30 year olds, n=87	31-40 year olds, n=91	Above 40 year olds, n=75	The whole group of respondents n=253	χ^2 value	p value
Number of meals						
3	25	21	30	27	0.227	0.082
4	31	38	29	33	0.112	0.470
5	29	30	27	27	0.135	0.166
More than 5	15	11	14	13	0.147	0.175
Type of meals*						
I breakfast	92	89	79	87	0.120	0.733
II breakfast	65	75	38	59	4.024	0.042
Dinner	100	97	96	98	0.127	0.578
Afternoon tea	74	61	33	56	3.520	0.027
Supper	86	95	59	81	1.920	0.098
Breaks between meals (h)						
2	5	4	14	8	1.217	0.372
3	56	68	57	61	0.278	0.417
4	27	20	12	20	0.167	0.359
5 and longer	12	8	17	11	1.612	0.134

*The values do not add up to 100% because there was an opportunity to indicate more than one answer
 χ^2 value of p – the values in the lines differ significantly at $p<0.05$

The surveyed consumers appreciated linseed oil (34% of the total number) and coconut oil (27% of the total number) for their nutritional and health-enhancing properties. Only 4% of the women indicated the sunflower oil as a valuable health-enhancing product.

Rapeseed oil was the main fat used for thermal meal processing by the respondents (72% of the total number) (Table 2). The consumers readily chose this oil for preparation of meals requiring thermal processing. Sunflower oil (17%), olive oil (85%), and linseed oil (54%) were used most frequently as an addition to unprocessed food. Coconut oil was most commonly used for cosmetic purposes (43% of all respondents), especially by the 31-40-year-old women (53%).

TABLE 2. Importance of fats in the diet and life of women, percentage of the group.

Variables	18-30 year olds, n=87	31-40 year olds, n=91	Above 40 year olds, n=75	The whole group of respondents n=253	χ^2 value	p value
Importance of fats in the diet						
I do not pay attention to them	2	20	0	11	2.027	0.032
I avoid them	18	8	31	17	4.012	0.042
I use them in excess	0	6	3	4	0.135	0.166
I sometimes use them as a meal addition	53	51	32	45	0.147	0.182
I always use them as a meal component	27	15	34	23	0.278	0.457
The purpose of fat use*						
Nutritional	87	83	93	86	0.324	0.237
Medicinal	18	19	7	13	3.125	0.034
Cosmetic	4	8	0	3	0.520	0.253
Positive opinion of consumers regarding the health impact of fats on the organism*						
Linseed oil	34	30	37	34	0.289	0.345
Olive oil	21	17	26	19	1.223	0.172
Rapeseed oil	16	22	8	15	0.105	0.317
Coconut oil	25	30	23	27	0.167	0.263
Palm oil	1	0	0	1	0.312	0.134
Sunflower oil	3	1	6	4	0.167	0.357
Use of oils*						
Thermal meal processing						
Rapeseed oil	82	66	60	72	5.478	0.089
Coconut oil	39	32	13	27	0.187	0.179
Unprocessed food						
Sunflower oil	10	24	10	17	1.157	0.078
Olive oil	94	78	80	85	2.475	0.029
Linseed oil	56	66	20	54	0.351	0.045
Beauty treatments						
Coconut oil	31	20	53	43	0.516	0.064

*The values do not add up to 100% because there was an opportunity to indicate more than one answer
 χ^2 value of p – the values in the lines differ significantly at $p<0.05$

TABLE 3. Frequency of consumption of chosen fats.

Fats	R	18-30 year olds, n=87	R	31-40 year olds, n=91	R	Above 40 year olds n=75	R	The whole group of respondents n=253	SEM*	p value
Lard	6	4.96	4	4.71	5	4.93	5	4.87	0.215	0.273
Butter	1	2.00b	1	2.54a	1	1.87b	1	2.15	0.137	0.027
Margarine	3	4.24	3	4.10	3	4.00	3	4.13	0.079	0.361
Coconut oil	4	4.53b	6	4.95ab	6	5.30a	6	4.87	0.105	0.045
Rapeseed oil	2	3.24	2	3.51	2	3.60	2	3.43	0.126	0.122
Sunflower oil	5	4.65a	4	4.71a	4	4.17b	4	4.55	0.239	0.018
Palm oil	7	5.76	7	5.61	7	5.37	7	5.61	0.018	0.139

SEM – standard error of the mean

p-value (Kruskal-Wallis test <0.05). R- ranked position

a,b – statistically significant between age groups (18-30, 31-40 and above 40 year olds) at p<0.05

Butter was the most frequently consumed fat, especially in the group of the 31-40-year-old women (Table 3). Rapeseed oil was the most popular vegetable oil. Coconut oil was more often indicated by the respondents from the group over 40 years, whereas the respondents from the other groups (18-30- and 31-40-year-olds) reported preference for sunflower oil.

The respondents were asked for their opinion about refined oils. A majority, regardless of their age (54%), did not answer the question, because they did not have sufficient knowledge. About 47% of respondents from the oldest group regarded such fats as valuable products as they ensure long storage and use of high temperatures. Over 40% of all the respondents were aware of the negative effect of fats containing trans isomers on the organism. The greatest awareness in this respect was demonstrated by the women in the oldest age group (53%). Yet, approximately 58% of the respondents, mainly those aged 18-30 (42%) and 31-40 (37%) were not certain about their harmful effects, as these fats are present in a majority of processed products available on the market.

DISCUSSION

An appropriate number of 4-5 meals consumed every 2-3 h a day is a key element of healthy nutrition habits of consumers at any age [7]. Only approximately 64% of the respondents consumed the recommended number of meals. The limitation of the number of meals mainly affected the second breakfast and afternoon tea and was associated with prolongation of the breaks between meals. This was particularly pronounced in the group of respondents over 40 years of age. This survey group also skipped suppers in the menu. There are many literature reports showing that some meals, especially breakfast and supper, are omitted mainly by girls or young women [8-9]. Metabolic changes occurring in women over 40 years of age are often associated with an increase in body weight. In order to reduce their weight, they consciously eliminate meals that seem unnecessary to them. High persistence in such conduct may lead to nutritional deficiencies rather than to the expected reduction of body weight [7].

All the respondents used mainly vegetable fats in their diets, with ca. 23% of women (primarily in the oldest age group) using them regularly for preparation of meals and 5% using the products even excessively. The nutritional use of fats is well grounded in the Polish and European tradition of food preparation. Almost all groups of consumers declare a regular use of fats, as fat-containing products or dishes prepared using fats are regarded as tastier [10]. Nearly half of the respondents,

especially those in the young age group, declared caution in the use of fats and 17% avoided fat in their daily diet.

Butter, rapeseed oil, and olive oil were the most popular fats. This is confirmed by the results reported by Kondratowicz-Pietruszka and Białek [5]. The authors showed that the consumption of margarines and oils, especially rapeseed, soybean, sunflower and olive oils, is increasing. This is in line with the current nutritional recommendations [3]. The American Heart Association/American College of Cardiology lifestyle guidelines and the 2015 to 2020 Dietary Guidelines for Americans report that lower intake of saturated fat coupled with higher intake of polyunsaturated and monounsaturated fat is associated with lower rates of cardiovascular disease (CVD). In contrast, replacement of saturated fat with mostly refined carbohydrates and sugars is not associated with lower rates of CVD. The lowered intake of dietary saturated fat and replacement thereof with polyunsaturated vegetable oil in diets can reduce CVD by about 30% [1]. Changes in the eating habits are also recorded in Poland. This phenomenon was reported by Waśkiewicz et al. [11], who examined the adult population of Warsaw over a period of 28 years (1984-2012) and found a significantly reduced risk of death related to cardiovascular diseases (SCORE). Declining trends were noted for total energy, total fat, cholesterol, and added animal fat intake. Intake of saturated fatty acids decreased until 2001 and increased thereafter. These changes in the dietary habits of the Warsaw population correlated with the SCORE risk values.

Only 13% of the respondents used vegetable oils, mainly linseed oil, for medicinal purposes as well. Linseed oil is regarded as healthy vegetable fat, although this niche product is characterised by poor chemical stability and can only be consumed raw [12]. It contains over 90% of essential unsaturated fatty acids, mainly α -linolenic acid, which regulates blood pressure, prevents cardiovascular diseases, and exerts a positive effect on the condition of the skin. Coconut oil was highly valued by the respondents (27% of the total number) as well. Despite its constantly growing popularity, there are diverse and inconsistent literature reports on its health-enhancing properties. In a study conducted on 1839 women from the Philippines aged 35-69, Feranil et al. [4] found an increase in the HDL cholesterol level and stability of the cholesterol-to-HDL ratio after consumption of coconut oil. In turn, Eyres et al. [13] found no significant impact of coconut oil consumption on the lipid profile in the organism. This oil generally raised total and low-density lipoprotein cholesterol to a greater extent than cis unsaturated plant oils, but to a lesser extent than butter. Observational evidence suggests that consumption

of coconut flesh or squeezed coconut in the context of traditional Indonesian dietary patterns does not lead to adverse cardiovascular outcomes. However, due to the high content of saturated fatty acids (92%), coconut oil has always been classified, along with butter, palm oil, and animal fats, as a source of saturated fat to be consumed at low levels in the diet. In contrast, Jessa and Hozyasz [14] claimed that consumption of this type of oil leads to weight loss, prevents cardiovascular diseases, and protects liver cells. Given the multitude of contradictory results of research on the nutritional and health properties of coconut oil in the diet, the Dietary Guidelines for Americans classifies this product equally with palm oil and animal fats [15]. Together with the American Heart Association, it classifies this oil as an unhealthy product and recommends exclusion thereof from the diet [1].

The quality and nutritional value of fats is determined not only by the fatty acid composition but also by alterations in their isomerism. The awareness of health threats posed by the presence of trans acids in the diet was expressed by approximately 40% of the respondents. The negative impact of fatty acid trans isomers on human health has been demonstrated in many studies [2,16]. Intake of large quantities thereof disturbs the lipid metabolism and promotes development of e.g. type 2 diabetes, cardiovascular diseases, and cancers. Additionally, trans fats reduce fertility and may be harmful to pregnant women and the developing foetus. It is disturbing that still over 42% of all the respondents, especially in the younger group, were not certain about their harmfulness, as they believed that their widespread presence in most processed products available on the market is a sufficient proof of their safety.

The respondents had equally low knowledge of the quality of refined oil. Over half of the surveyed women declared complete ignorance in this field, and approximately 47% of the oldest respondents claimed that it is a fully-fledged and convenient dietary product. The respondents were not aware that oil extraction at high temperature triggers substantial modifications of the chemical composition and organoleptic traits [17]. Cold-pressed oils have higher nutritional value than refined fats, although the stability of their quality is questionable [18]. One of the causes of improper nutrition is lack of knowledge of the principles of correct quantitative and qualitative composition of meals, which consequently leads to health problems. This is confirmed by the Multicenter National Health Examination Surveys (WOBASZ). Their results show an increasing number of overweight and obese Polish subjects aged 20-34 (39% men, 21% women). The average diet of the young adults was characterised by high atherogenicity: total fat (men – 37% of energy, women – 35% of energy), saturated fatty acids (13.9% vs. 13.2%, respectively). It is disturbing that the diet composition was unsatisfactory even in the group of respondents declaring sufficient nutritional knowledge [19].

CONCLUSION

1. Over 60% of the respondents consumed the right number of meals. The women in the oldest group often omitted smaller meals.
2. As declared by half of the respondents, fats were an addition to dishes, and rapeseed oil turned out to be preferred the most. Similarly, despite its high atherogenicity, butter was willingly chosen by the consumers. Approximately 34% of the respondents chose flaxseed oil as the healthiest fat. The popularity of coconut oil was a disturbing phenomenon.

3. Over 40 % of the respondents knew about the risks associated with consumption of fats containing trans isomers, but similar percentage was unaware. More than half of the surveyed women had no knowledge of the value of refined oils.
4. The study indicates a necessity of implementation of educational campaigns in order to disseminate the knowledge