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FACTORS INFLUENCING THE CHOICE OF VEGETABLES AND FRUIT CONSUMED BY THE SCHOOL YOUTH FROM SZCZECIN

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The aim of the study was to evaluate the kind and importance of factors influencing the choice of vegetables and fruit consumed by the youth. The research was carried out on youth group aged 15–16. The group consisted of 966 pupils, including 483 girls and 483 boys, living in Szczecin. They were selected for the research in two steps, in groups. Fourteen choice factors of raw vegetables and fruit, without separating their assortment, were examined, with the use of a test based on a 3-point hedonic scale.

Between girls and boys no differentiation in the choice factors ranking according to their importance was stated, both in the vegetables and fruit choice. Factors to a great degree taken into account by the youth included: freshness, taste, stability, influence on health, external appearance and nutritional value. In girls group, in comparison to boys, the vegetables choice was significantly more strongly determined by such factors as influence on health, external appearance, nutritional value and habit, and the fruit choice by external appearance and influence on health. Sex of pupils influenced some factors importance degree, independently from their parents education. Significant correlation between the mean vegetables and fruit choice factors importance indicates that there may be elaborated a common behaviour strategy aiming at the youth nutrition rationalization.

INTRODUCTION

The food choice is a psychological fact, expressed with definite behaviour, depending on a complex of external and internal human conditioning [Babicz-Zielińska, 1998]. Along with market development and a growing number of factors which may have an impact on definite product choice, a need of their classification has appeared. Most authors divide them into three groups, *i.e*. connected with: (i) a product (qualifying its physical-chemical, sensory and functional properties and nutritional value); (ii) a consumer (referring to personal features, psychological and physiological factors); and (iii) environment (covering economic, cultural and social factors) [Babicz-Zielińska, 1999]. It turns attention that the food choice is also affected by the context, which is an effect of time, place, circumstances, and habit as well as the fact who and what a given product is consumed with [Babicz-Zielińska, 2001].

Usual nutritional error made by the majority of the Polish society is too small intake of vegetables and fruit [Gronowska-Senger, 2001 a, b; Mitek *et al.*, 1998]. Current state of nutritional and medical knowledge indicates univocally that these products should be intaken several times a day because of health reasons [Dixon *et al.*, 2001; Krebs-Smith & Kantor, 2001; Szponar & Sekuła, 1994; Zatoński & Boyle, 1996; Ziemlański & Panczenko-Kresowska, 1998]. The dissemination of knowledge on vegetables and fruit consumption by all people, and particularly by children and youth, may significantly decrease the risk of any disease incidence on the basis of improper nutrition. They are most of all: arteriosclerosis, and on its basis heart ischemia and brain stroke, obesity, insulin-independent diabetes and some intestine illnesses. The importance of vegetables and fruit in prophylactics and treatment of these diseases results from the fact that they are a very important source of vitamin C, carotenoids, some vitamins from the B group, many minerals and fibre, which role in maintaining good health state is much bigger than it was thought about yet not long ago [Czapski, 2001; Janeczko & Schlegel-Zawadzka, 2001; Krebs-Smith & Kantor, 2001; Szponar & Sekuła, 1994].

The insufficient intake of vegetables and most of all fruit, revealed in the studies, is conditioned by many factors, recognition of which may make elaborating the effective nutrition rationalisation programmes easier.

The aim of the undertaken studies was, therefore, to evaluate the kind and importance of factors influencing the choice of vegetables and fruit consumed by the youth.

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MATERIALS AND METHODS

The studies were carried out on a group of youth aged 15–16. The group consisted of 966 pupils including 483 girls and 483 boys, living in Szczecin, who were selected for the research in two steps, by group. First, 20 elementary and 20 secondary schools situated in Szczecin were drawn. Then, one class was drawn from all parallel eighth classes in each elementary school and from first classes in each secondary school. Pupils filled in the tests in an auditorium. Before filling in the test, they were informed about the aim of the research to be carried out and instructed how to give answers. The research was carried out in May 2000.

The majority of youth declared a good economic situation of their families (Table 1). The education level of parents of the examined population was diversified depending on the sex of respondents. More mothers and fathers of the examined boys had secondary and university education. Of the investigated youth, 1% came from incomplete families.

Fourteen choice factors of raw vegetables and fruit were examined, without separating their assortment. The analyzed factors were determined in the preliminary studies. A test based on a 3-point hedonic scale: "I do not take into account" (1), "I take into account to a small degree" (2), and "I take into account to a great degree" (3) was used.

TABLE 1. The analysed youth population characteristic.

Socio-economic categories	Population percentage, [%]		
	in total	girls	boys
Mother education		chi^2=14.26	p<0.001
Elementary or primary	26.1	31.3	21.0
Secondary	53.7	51.2	56.2
University	20.2	17.5	22.8
Father education		chi^2=8.63	p<0.05
Elementary or primary	29.6	33.8	25.4
Secondary	52.6	50.3	54.8
University	17.8	15.9	19.8
Economic situation		chi^2=1.82	p>0.05
Bad	2.8	2.3	3.3
Sufficient	13.6	14.1	13.0
Good	64.6	65.6	63.6
Very good	19.0	18.0	20.1

TABLE 2. The importance of vegetables choice factors depending on sex of pupils.

Choice factors	Girls N=483 x±SD	Boys N=483 x±SD	K-S test significance level
Freshness	2.82±0.48	2.75±0.57	ni
Taste	2.81±0.48	2.74±0.57	ni
Stability	2.71±0.56	2.64±0.63	ni
Quality	2.63±0.61	2.65±0.63	ni
Influence on health	2.58±0.66	2.40±0.73	<0.001
External appearance	2.54±0.66	2.40±0.73	<0.05
Nutritional value	2.52±0.69	2.39±0.71	<0.01
Consistency	2.36±0.68	2.30±0.72	ni
Storage ease	2.30±0.69	2.30±0.72	ni
Preparation ease	2.27±0.68	2.27±0.73	ni
Habit	2.18±0.72	2.01±0.71	<0.01
Novelty on the market	1.93±0.73	1.93±0.71	ni
Price	1.87±0.68	1.84±0.71	ni
Advertisement	1.76±0.71	1.72±0.71	ni
Correlation coefficient	τ_K=0.96	p<0.0001	-

N – size, x – mean, SD – standard deviation, ni – statistically insignificant

TABLE 3. Vegetables choice factors importance depending on sex of pupils and education of their mothers.

Choice factors	Mothers education								
	elementary or primary			secondary			university		
	girls N=150 x±SD	boys N=100 x±SD	K-S significance level	girls N=245 x±SD	boys N=268 x±SD	K-S significance level	girls N=84 x±SD	boys N=109 x±SD	K-S significance level
Freshness	2.87±0.41	2.73±0.59	ni	2.80±0.51	2.79±0.53	ni	2.81±0.51	2.70±0.62	ni
Taste	2.81±0.44	2.71±0.61	ni	2.81±0.48	2.80±0.50	ni	2.77±0.55	2.63±0.65	ni
Stability	2.74±0.55	2.64±0.66	ni	2.72±0.56	2.66±0.59	ni	2.64±0.60	2.59±0.67	ni
Quality	2.63±0.60	2.66±0.63	ni	2.62±0.62	2.65±0.61	ni	2.66±0.57	2.64±0.65	ni
Influence on health	2.61±0.64	2.31±0.76	<0.05	2.58±0.66	2.46±0.70	ni	2.54±0.67	2.31±0.75	ni
External appearance	2.53±0.68	2.37±0.78	ni	2.57±0.63	2.47±0.70	ni	2.53±0.69	2.26±0.74	<0.05
Nutritional value	2.52±0.70	2.34±0.70	ni	2.56±0.66	2.46±0.69	ni	2.42±0.73	2.29±0.76	ni
Storage ease	2.35±0.71	2.31±0.69	ni	2.29±0.67	2.31±0.71	ni	2.24±0.71	2.28±0.74	ni
Consistency	2.32±0.70	2.33±0.70	ni	2.36±0.68	2.31±0.71	ni	2.45±0.69	2.23±0.77	ni
Preparation ease	2.27±0.67	2.20±0.71	ni	2.27±0.68	2.31±0.72	ni	2.27±0.66	2.24±0.77	ni
Habit	2.17±0.73	2.04±0.74	ni	2.18±0.71	1.98±0.70	ni	2.20±0.76	2.04±0.73	ni
Price	1.99±0.68	2.03±0.75	ni	1.80±0.68	1.78±0.68	ni	1.89±0.64	1.86±0.74	ni
Novelty on the market	1.96±0.71	1.99±0.69	ni	1.90±0.72	1.94±0.72	ni	1.98±0.80	1.85±0.69	ni
Advertisement	1.77±0.71	1.75±0.70	ni	1.74±0.69	1.72±0.71	ni	1.77±0.79	1.69±0.72	ni
Correlation coefficient	τ_K=0.88	p<0.0001	-	τ_K=0.96	p<0.0001	-	τ_K=0.82	p<0.0001	-

N – size, x – mean, SD – standard deviation, ni – statistically insignificant

Basic statistical parameters were counted, *i.e*. the mean choice importance with standard deviations (x±SD), which were used to rank the factors according to their importance. Statistical analysis of the obtained results was performed with the use of the τ-Kendall correlation coefficient (τ_K) and the Kołmogorow-Smirnow test (K-S) [Stanisz, 1998]. The τ-Kendall correlation coefficient was a tool of similarity evaluation of factors ranked according to their importance in girls and boys group, while Kołmogorow-Smirnow test enabled the comparison of mean choice importance for particular factors in these groups. Verifying statistically the results obtained the authors considered also the fact that the education level of parents of the studied youth was diversified depending on the sex of pupils under study. The statistical calculations were made with the use of the STATISTICA PL v. 6.0 program.

RESULTS

As it follows from Table 2, ranking of the vegetables choice factors according to their importance was almost identical in girls and boys group (τ-Kendall=0.96, p<0.0001). The factors which the youth took into consideration to a great degree turned out to be freshness, taste, stability, quality, influence on health, external appearance and nutritional value (x≥2.34). Girls decidedly took into account also consistency (x=2.36). The mean importance of some factors was significantly higher in girls group, in comparison to boys. It concerned influence on health, external appearance, nutritional value and habit. For no factor the mean choice importance was lower than 1.67, so all of them may be considered as factors with small or major importance, and advertisement, price, and novelty on the market were recognised as factors with the slightest importance for vegetables choice.

In Tables 3 and 4, the vegetables choice factors depending on the sex of the examined youth population and education of their parents are displayed. Independently from education of mothers and fathers of the examined youth, a significant correlation was found between boys and girls in the vegetables choice factors ranking according to their importance. The calculated τ-Kendall correlation coefficients amounted from 0.82 to 0.97 and were statistically significant at p<0.0001. Girls to a significantly greater degree than boys took into account the influence on health. However, the situation took place only when the examined youth parents had elementary and primary education. The external appearance was also statistically more often taken into account by girls than by boys, but it concerned only the part of youth whose parents had university education.

TABLE 5. The fruit choice importance depending on sex of pupils.

Choice factors	Girls N=483 x±SD	Boys N=483 x±SD	K-S significance level
Freshness	2.83±0.47	2.77±0.54	ni
Taste	2.81±0.48	2.78±0.50	ni
Stability	2.74±0.54	2.65±0.63	ni
Quality	2.63±0.60	2.64±0.64	ni
External appearance	2.58±0.67	2.41±0.74	<0.01
Influence on health	2.56±0.67	2.41±0.74	<0.01
Nutritional value	2.55±0.67	2.43±0.72	ni
Consistency	2.38±0.66	2.31±0.72	ni
Storage ease	2.31±0.70	2.30±0.72	ni
Habit	2.16±0.74	2.09±0.74	ni
Preparation ease	2.13±0.71	2.20±0.76	ni
Price	1.98±0.70	1.92±0.71	ni
Novelty on the market	1.90±0.71	1.86±0.72	ni
Advertisement	1.78±0.74	1.73±0.73	ni
Correlation coefficient	τ_K=0.91	p<0.0001	-

N – size, x – mean, SD – standard deviation, ni – statistically insignificant

TABLE 4. Vegetables choice factors importance depending on sex of pupils and education of their fathers.

Choice factors	Mothers education								
	elementary or primary			secondary			university		
	girls N=162 x±SD	boys N=121 x±SD	K-S significance level	girls N=241 x±SD	boys N=261 x±SD	K-S significance level	girls N=76 x±SD	boys N=94 x±SD	K-S significance level
Freshness	2.83±0.46	2.81±0.51	ni	2.81±0.49	2.74±0.58	ni	2.83±0.50	2.70±0.62	ni
Taste	2.80±0.47	2.78±0.54	ni	2.81±0.48	2.74±0.57	ni	2.81±0.48	2.69±0.61	ni
Stability	2.72±0.56	2.67±0.61	ni	2.72±0.56	2.62±0.64	ni	2.65±0.58	2.60±0.66	ni
Quality	2.62±0.60	2.74±0.56	ni	2.64±0.58	2.62±0.64	ni	2.60±0.68	2.61±0.68	ni
Influence on health	2.60±0.66	2.39±0.73	<0.05	2.59±0.65	2.41±0.73	ni	2.53±0.68	2.36±0.75	ni
External appearance	2.54±0.66	2.46±0.72	ni	2.52±0.67	2.40±0.74	ni	2.64±0.63	2.29±0.73	<0.01
Nutritional value	2.51±0.71	2.40±0.71	ni	2.55±0.66	2.40±0.71	ni	2.49±0.72	2.36±0.73	ni
Storage ease	2.33±0.68	2.32±0.74	ni	2.33±0.68	2.30±0.71	ni	2.16±0.74	2.24±0.73	ni
Consistency	2.34±0.69	2.33±0.69	ni	2.38±0.69	2.31±0.74	ni	2.36±0.69	2.20±0.73	ni
Preparation ease	2.23±0.70	2.33±0.73	ni	2.30±0.65	2.28±0.72	ni	2.25±0.72	2.17±0.77	ni
Habit	2.20±0.73	2.02±0.73	ni	2.17±0.72	2.02±0.73	ni	2.19±0.73	1.97±0.68	ni
Price	1.91±0.69	1.85±0.72	ni	1.87±0.67	1.84±0.71	ni	1.79±0.66	1.81±0.71	ni
Novelty on the market	1.95±0.70	1.90±0.67	ni	1.89±0.74	1.97±0.73	ni	2.03±0.77	1.87±0.71	ni
Advertisement	1.72±0.70	1.72±0.70	ni	1.76±0.71	1.74±0.73	ni	1.85±0.75	1.67±0.69	ni
Correlation coefficient	τ_K=0.91	p<0.0001	-	τ_K=0.97	p<0.0001	-	τ_K=0.82	p<0.0001	-

N – size, x – mean, SD – standard deviation, ni – statistically insignificant

Similar, like for vegetables, distribution of the choice factors importance features may be perceived for fruit (Table 5). The τ-Kendall correlation coefficient amounted to 0.91 ($p<0.0001$), which indicates significant similarity of the mean choice factors importance ranges in girls and boys group. The factors which the youth took into account to a great degree while choosing fruit, turned out to be freshness, taste, stability, quality, external appearance, influence on health and nutritional value ($x\geq2.34$). A factor decidedly taken into account by girls was also consistency ($x=2.38$). The mean importance of two factors turned out to be significantly higher in girls group, in comparison to boys. It concerned the external appearance and the influence on health. For no factor the mean choice importance was lower than 1.67, so all may be considered as factors with small or major importance, while advertisement, novelty on the market and price were recognised as factors with the slightest importance for the fruit choice.

The fruit choice factors importance depending on the sex of the examined youth and education of their parents is displayed in Tables 6 and 7. The calculated τ-Kendall correlation coefficients amounted from 0.87 to 0.95 and were significant at $p<0.0001$. They prove that, independently from mothers and fathers education of the examined youth,

TABLE 6. The fruit choice factors importance depending on sex of pupils and education of their mothers.

Choice factors	Mothers education								
	elementary or primary			secondary			university		
	girls N=150 x±SD	boys N=100 x±SD	K-S significance level	girls N=245 x±SD	boys N=268 x±SD	K-S significance level	girls N=84 x±SD	boys N=109 x±SD	K-S significance level
Freshness	2.84±0.45	2.71±0.61	ni	2.85±0.46	2.81±0.49	ni	2.80±0.51	2.72±0.61	ni
Taste	2.81±0.44	2.78±0.50	ni	2.82±0.48	2.82±0.47	ni	2.76±0.57	2.70±0.59	ni
Stability	2.75±0.52	2.62±0.66	ni	2.73±0.57	2.66±0.62	ni	2.74±0.52	2.68±0.62	ni
Quality	2.61±0.60	2.59±0.68	ni	2.66±0.59	2.68±0.59	ni	2.60±0.62	2.64±0.67	ni
Influence on health	2.61±0.61	2.41±0.74	ni	2.57±0.69	2.41±0.74	<0.05	2.44±0.73	2.40±0.75	ni
External appearance	2.63±0.63	2.43±0.74	ni	2.59±0.66	2.42±0.74	ni	2.43±0.73	2.37±0.74	ni
Nutritional value	2.60±0.61	2.41±0.73	ni	2.57±0.67	2.44±0.73	ni	2.40±0.75	2.42±0.72	ni
Storage ease	2.42±0.69	2.34±0.71	ni	2.27±0.71	2.28±0.73	ni	2.23±0.70	2.33±0.71	ni
Consistency	2.38±0.63	2.37±0.71	ni	2.39±0.67	2.31±0.70	ni	2.33±0.70	2.30±0.75	ni
Preparation ease	2.13±0.73	2.24±0.78	ni	2.12±0.71	2.18±0.75	ni	2.14±0.71	2.26±0.75	ni
Habit	2.17±0.76	2.06±0.80	ni	2.14±0.72	2.08±0.72	ni	2.21±0.73	2.12±0.75	ni
Price	2.03±0.72	2.16±0.71	ni	1.91±0.68	1.86±0.69	ni	2.08±0.68	1.83±0.71	ni
Novelty on the market	1.94±0.71	1.90±0.69	ni	1.85±0.70	1.85±0.72	ni	1.96±0.77	1.83±0.74	ni
Advertisement	1.80±0.76	1.77±0.76	ni	1.73±0.71	1.74±0.73	ni	1.93±0.79	1.70±0.73	ni
Correlation coefficient	$\tau_K=0.88$	$p<0.0001$	-	$\tau_K=0.91$	$p<0.0001$	-	$\tau_K=0.91$	$p<0.0001$	-

N – size, x – mean, SD – standard deviation, ni – statistically insignificant

TABLE 7. The fruit choice factors importance depending on sex of pupils and education of their fathers.

Choice factors	Mothers education								
	elementary or primary			secondary			university		
	girls N=162 x±SD	boys N=121 x±SD	K-S significance level	girls N=241 x±SD	boys N=261 x±SD	K-S significance level	girls N=76 x±SD	boys N=94 x±SD	K-S significance level
Freshness	2.84±0.47	2.83±0.44	ni	2.85±0.43	2.75±0.57	ni	2.78±0.56	2.72±0.59	ni
Taste	2.81±0.47	2.80±0.48	ni	2.81±0.49	2.79±0.48	ni	2.80±0.52	2.71±0.60	ni
Stability	2.73±0.54	2.63±0.65	ni	2.62±0.59	2.66±0.62	ni	2.70±0.61	2.63±0.67	ni
Quality	2.63±0.61	2.66±0.65	ni	2.76±0.52	2.66±0.62	ni	2.64±0.60	2.57±0.70	ni
Influence on health	2.57±0.66	2.40±0.75	ni	2.58±0.67	2.42±0.73	ni	2.49±0.74	2.37±0.76	ni
External appearance	2.60±0.65	2.49±0.68	ni	2.60±0.66	2.39±0.75	<0.05	2.46±0.72	2.34±0.77	ni
Nutritional value	2.57±0.67	2.45±0.72	ni	2.60±0.64	2.41±0.73	<0.05	2.39±0.73	2.41±0.74	ni
Storage ease	2.38±0.70	2.26±0.77	ni	2.32±0.70	2.31±0.72	ni	2.17±0.74	2.28±0.69	ni
Consistency	2.42±0.65	2.27±0.73	ni	2.35±0.66	2.33±0.71	ni	2.33±0.68	2.30±0.73	ni
Preparation ease	2.13±0.71	2.22±0.80	ni	2.15±0.70	2.21±0.76	ni	2.08±0.78	2.16±0.72	ni
Habit	2.16±0.76	2.03±0.78	ni	2.19±0.70	2.11±0.74	ni	2.12±0.78	2.10±0.72	ni
Price	1.99±0.73	2.01±0.74	ni	1.97±0.68	1.89±0.71	ni	1.97±0.69	1.84±0.68	ni
Novelty on the market	1.91±0.70	1.77±0.66	ni	1.86±0.71	1.91±0.74	ni	2.00±0.75	1.81±0.75	ni
Advertisement	1.72±0.73	1.69±0.73	ni	1.78±0.73	1.81±0.75	ni	1.92±0.80	1.62±0.70	ni
Correlation coefficient	$\tau_K=0.95$	$p<0.0001$	-	$\tau_K=0.87$	$p<0.0001$	-	$\tau_K=0.89$	$p<0.0001$	-

N – size, x – mean, SD – standard deviation, ni – statistically insignificant

there are significant similarities between girls and boys in the fruit choice factors ranking according to their importance. The mean importance of "influence on health" factor was higher in girls group in comparison to boys, but it concerned this part of the examined population whose mothers had secondary education. Sex differentiated also the mean choice importance for two factors among youth having fathers with secondary education. Girls to a significantly greater degree than boys took into account external appearance and nutritional value.

Analysing results included in Tables 3 and 4 and also 6 and 7 it may be stated that sex determined some factors importance degree, irrespectively of the education of the inquired youth parents. Despite the fact that more mothers and fathers of the investigated boys had secondary and university education, girls to a significantly greater degree took into consideration such factors as influence on health, nutritional value and external appearance.

For all analysed choice factors correlation was calculated between mean vegetables and fruit choice factors importance (Figure 1). The discussed correlation turned out to be significant (τ-Kendall=0.93, $p<0.0001$).

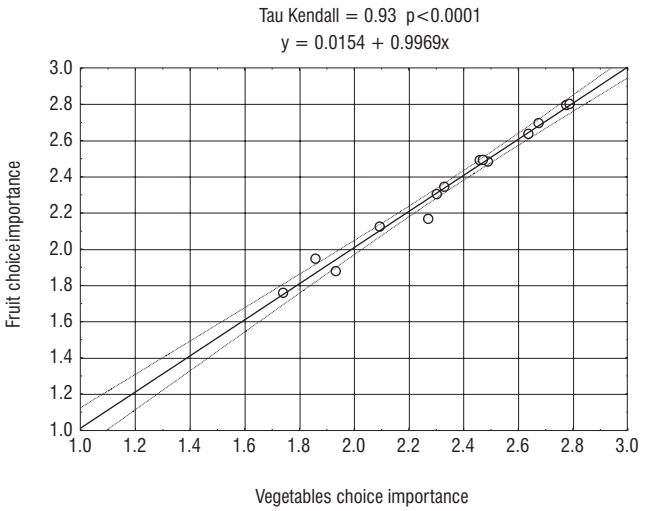

FIGURE 1. The corelation between the mean vegetables and friut choice importance.

DISCUSSION

The nutritional behaviour studies are carried out in a wide scale, both in country and abroad, and their importance results from the fact that they give incredibly valuable information not only for nutritionists but also for food producers [Babicz-Zielińska, 2001; Bonke, 1996; Kearney *et al.*, 1997; Lennernäs *et al.*, 1997; Narojek, 1993].

On the basis of the studies held in the Member States of the European Union, it was stated that the most important factors influencing the food choice, without indicating its assortment, were freshness, price, taste, health state, and habit [Lennernäs *et al.*, 1997]. Lilley [1996] revealed that food choice and consumption of elderly people, over 75 years of age, were decided at most by taste, health state and economic factors. Nestle *et al.* [1998] observed that taste had bigger influence on preferences and food habits than nutritional value or product's safety. Then, Stewart and Tinsley [1995] discovered that preferences and products consumption frequency by the American youth depended mainly on the products appearance and taste.

According to Baryłko-Pikielna [1998], a consumer expects from food that it will be characterized with high sensory attractiveness, nutritional value, and also that it will be safe for health and have no defects. Narojek and Ostrowska [1997] showed that a factor deciding about buying bread, meat, pork-butcher's meat, fish and cheese was taste, and in the case of milk and fats – wholesome value. While evaluating factors deciding about fats purchase, Kozłowska-Wojciechowska and Uramowska-Żyto [1996] obtained sensory factors and price on the first places of the ranking list. Kowrygo *et al.* [1997] stated that for most of respondents factors deciding about food purchase were freshness, taste and nutritional value. In the opinion of Babicz-Zielińska [2001] there are some food choice attributes that are independent from the kind of food, and the main determinants of most products choice are the sensory and qualitative factors, with taste and freshness prevailing. Economic, health and cultural factors play on the other hand a much smaller role. The confirmation of the above-mentioned are not only results received within this work, but also these presented in the earlier publications by the same authors. And so, the biggest role in the dairy products choice played freshness and taste [Wądołowska *et al.*, 2001]. These factors were to a greater degree taken into account by the youth also in the case of grain products [Czarnocińska *et al.*, 2001]. Similarly, the choice of fats for buttering bread, frying and baking by students depended above all on their freshness, taste and stability [Babicz-Zielińska & Łysiak-Szydłowska, 1997; Babicz-Zielińska *et al.*, 2000]. Students also, like the youth in Szczecin, ranked the vegetables and fruit choice factors importance very similarly [Babicz-Zielińska & Zagórska, 1998].

It is advisable to take into consideration a very low advertisement influence on consumer behaviour evaluation. It is not unlikely that the last position of advertisement in the importance ranking results from the respondents reluctance to admitting to not-independent decision-making. Other explanation may be the fact of not being aware of the advertisement influence on choices made by consumers. It is interesting that such an important and expensive process of influencing consumer choices like advertisement is valued so low by themselves. The small importance of advertisement is also underlined in other Polish works [Babicz-Zielińska & Łysiak-Szydłowska, 1997; Babicz-Zielińska *et al.*, 2000; Babicz-Zielińska & Zagórska, 1998; Czarnocińska *et al.*, 2001]. Growth observed recently in consumption of yoghurts, margarines and oils suggests, however, some advertisement influence on nutritional behaviour, because these products are quite widely advertised in the media [Krajewski *et al.*, 1998; Narojek & Ostrowska, 1997]. The studies carried out in the European Union Member States and the USA proved that advertisement significantly influences changes in the nutrition manner [Kearney *et al.*, 1997; Meiselman & Hedderley, 1994; Zunft *et al.*, 1997].

Along with advertisement, such vegetables and fruit choice attributes as price and novelty on the market were recognised as factors with the slightest importance. Similar results were obtained for grain products and fats for buttering bread, frying and baking [Babicz-Zielińska *et al.*, 2000; Czarnocińska *et al.*, 2001]. It should be underlined

that the quoted studies concerned school or university youth. The purchase cost plays yet a role in the case of retired employees, pensioners and the unemployed [Lennernäs *et al.*, 1997; Narojek & Ostrowska, 1997]. Moreover, it was proven that the economic factors to a high extent influence the choice of new products [Babicz--Zielińska & Rybowska, 2001; Bonke, 1996].

CONCLUSIONS

1. Between girls and boys no differentiation in the choice factors ranking according to their importance was stated, both in the vegetables and fruit choice.

2. Factors taken into account to a great degree by the youth when choosing vegetables and fruit included: freshness, taste, stability, influence on health, external appearance, and nutritional value.

3. In girls group, in comparison to boys, the vegetables choice was significantly more strongly determined by such factors as influence on health, external appearance, nutritional value and habit, and the fruit choice – by external appearance and influence on health.

4. Sex of pupils influenced some factors importance degree, independently from their parents education.

5. Significant correlation between the mean vegetables and fruit choice importance indicates that there is a possibility of elaborating a common strategy aiming at the youth nutrition rationalization.

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REFERENCES

1. Babicz-Zielińska E., 1999, Studia nad preferencjami pokarmowymi oraz nad determinantami wyboru żywności w wybranych grupach konsumenckich. Wyd. WSM, Gdynia, 48–50, (in Polish).
2. Babicz-Zielińska E., Wybrane aspekty badań upodobań żywieniowych. Żyw. Człow. Metab., 1998, 25, 195–202 (in Polish).
3. Babicz-Zielińska E., Zachowania konsumentów w stosunku do żywności i żywienia. Żywność, 2001, 29, Supl., 5–15 (in Polish).
4. Babicz-Zielińska E., Łysiak-Szydłowska W., Preferencje młodzieży akademickiej w zakresie spożycia tłuszczów. Żyw. Człow. Metab., 1997, 24, 27–34 (in Polish).
5. Babicz-Zielińska E., Przysławski J., Wądołowska L., Schlegel-Zawadzka M., Preferences and choice factors for fats among female students of some Polish universities. Pol. J. Food Nutr. Sci., 2000, 50, 51–55.
6. Babicz-Zielińska E., Rybowska A., Preferencje ryb morskich i owoców morza w środowisku studenckim. Żyw. Człow. Metab., 2001, 28, Supl., 550–555 (in Polish).
7. Babicz-Zielińska E., Zagórska A., Factors affecting the preferences for vegetables and fruits. Pol. J. Food Nutr. Sci., 1998, 48, 755–762.
8. Baryłko-Pikielna N., Analiza sensoryczna w zapewnieniu jakości żywienia. Przem. Spoż., 1998, 12, 25–28 (in Polish).
9. Bonke J., Economic influences on food choice – non convenience versus convenience food consumption, 1996, *In*: Food Choice, Acceptance and Consumption (ed. H.L. Meiselman, H.J.H. MacFie), Chapman and Hall, London, 293–318.
10. Czapski J., Owoce i warzywa – szansa czy zagrożenie. Żywność, 2001, 29, Supl., 29–39 (in Polish).
11. Czarnocińska J., Babicz-Zielińska E., Wądołowska L., Przysławski J., Schlegel-Zawadzka M., Czynniki wpływające na preferencje produktów zbożowych wśród młodzieży szczecińskiej. Żyw. Człow. Met., 2001, 28, Supl., 502–507 (in Polish).
12. Dixon L.B., Cronin F.J., Krebs-Smith S.M., Let the pyramid guide your food choices: capturing the total diet concept. J. Nutr., 2001, 131, 461S–472S.
13. Gronowska-Senger A., Błędy żywieniowe stanowiące ryzyko dla zdrowia w Polsce. Żywność, 2001a, 29, Supl., 50–61 (in Polish).
14. Gronowska-Senger A., Współczesne problemy żywienia dzieci szkolnych w Polsce. Żywność, 2001b, 28, Supl., 23–30 (in Polish).
15. Janeczko Z., Schlegel-Zawadzka M., Owoce cytrusowe – Źródło substancji odżywczych i leczniczych a zwyczaje i upodobania żywieniowe wśród dzieci i młodzieży. Żyw. Człow. Metab., 2001, 28, Supl., 765–769 (in Polish).
16. Kearney M., Kearney J.M., Gibney M.J., Methods used to conduct the survey on consumer attitudes to food, nutrition and health on nationally representative samples of adults from each member state of the European Union. Eur. J. Clin. Nutr., 1997, 51, S3–S7.
17. Kowrygo B., Górska-Warsewicz H., Ługowska K., Ocena preferencji konsumenckich w zakresie żywności i żywienia. Żywność. Technologia. Jakość, 1997, 11, 51–60 (in Polish).
18. Kozłowska-Wojciechowska M., Uramowska-Żyto B., Tłuszcze roślinne czy zwierzęce. Wybory polskich kobiet w świetle badań konsumenckich. Czynniki Ryzyka, 1996, 2–3, 40–43 (in Polish).
19. Krajewski K., Górska-Warsewicz H., Świątkowska M., Zmiany na rynku jogurtów w Polsce. Przem. Spoż., 1998, 11, 16–18, 28 (in Polish).
20. Krebs-Smith S.M., Kantor L., Choose a variety of fruits and vegetables daily: understanding the complexities. J. Nutr., 2001, 131, 487S–501S.
21. Lennernäs M., Fjellström C., Becker W., Giachetti I., Schmitt A., Remaut de Winter A.M., Kearney M., Influences on food choice perceived to be important by nationally representative samples of adults in the European Union. Eur. J. Clin. Nutr., 1997, 51, S8–S15.
22. Lilley J., Food choice in later life. Nutr. Food Sci., 1996, 2, 4–7.
23. Meiselman H.L., Hedderley D., Effect of effort on meal selection and meal acceptability in a student cafeteria. Appetite, 1994, 23, 43–55.
24. Mitek M., Przewoźniak K., Kuźma I., Zatoński W., Spożycie owoców i warzyw w Polsce w latach 1996–1997. Przem. Spoż., 1998, 4, 10–13 (in Polish).
25. Narojek L., 1993, Niektóre aspekty uwarunkowań zachowań żywieniowych. Wyd. IŻŻ, Warszawa, 7–10 (in Polish).
26. Narojek L., Ostrowska A., Zachowania żywieniowe rodzin wielkomiejskich w nowej sytuacji społeczno-

-ekonomicznej. Cz. II. Motywacje towarzyszące zakupom żywności. Żyw. Człow. Met., 1997, 24, 437–447 (in Polish).
27. Nestle M., Wing R., Birch L., DiSogra L., Drewnowski A., Middleton S., Behavioral and social influences on food choice. Nutr. Rev., 1998, 56, S50–S74.
28. Stanisz A., 1998, Przystępny kurs statystyki w oparciu o program STATISTICA PL na przykładach medycyny. Wyd. StatSoft, Kraków (in Polish).
29. Stewart B., Tinsley A., Importance of food choice influences for working young adults. J. Am. Diet. Assoc., 1995, 9, 227–230.
30. Szponar L., Sekuła W., Owoce, warzywa i ich przetwory w zapobieganiu i zwalczaniu chorób na tle wadliwego żywienia. Żyw. Człow. Metab., 1994, 21, 64–78 (in Polish).
31. Wądołowska L., Babicz-Zielińska E., Przysławski J., Schlegel-Zawadzka M., Czarnocińska J., Czynniki wpływające na wybór produktów mlecznych wśród 16-letniej młodzieży. Żyw. Człow. Met., 2001, 28, Supl., 525–531 (in Polish).
32. Zatoński W., Boyle P., Commentary. Health transformations in Poland after 1988. J. Epid. Biostat., 1996, 1, 183–197.
33. Ziemlański Ś., Panczenko-Kresowska B., 1998, Podstawowe Zalecenia Żywieniowe. Wyd. IŻŻ, Warszawa, 3–12 (in Polish).
34. Zunft H.J.F., Friebe D., Seppelt B., de Graaf C., Margetts B., Schmitt A., Gibney, M.J., Perceived benefits of healthy eating among a nationally-representative sample of adults in the European Union. Eur. J. Clin. Nutr., 1997, 51, S41–S46.

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CZYNNIKI WPŁYWAJĄCE NA WYBÓR WARZYW I OWOCÓW SPOŻYWANYCH PRZEZ MŁODZIEŻ SZKOLNĄ ZE SZCZECINA

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Celem badań była ocena rodzaju i ważkości czynników wpływających na wybór warzyw i owoców przez młodzież. Badania przeprowadzono w grupie młodzieży w wieku 15–16 lat. Objęto nimi 966 osób, w tym 483 dziewcząt i 483 chłopców, mieszkających w Szczecinie. Badano 14 czynników wyboru warzyw i owoców z wykorzystaniem testu opartego na 3-punktowej skali hedonicznej.

Pomiędzy dziewczętami i chłopcami nie stwierdzono zróżnicowania w uszeregowaniu czynników wyboru według ich ważkości, zarówno przy wyborze warzyw, jak i owoców. Do czynników w dużym stopniu branych pod uwagę młodzież zaliczyła: świeżość, smak, trwałość, wpływ na zdrowie, wygląd zewnętrzny i wartość odżywczą. W grupie dziewcząt, w porównaniu z chłopcami, wybór warzyw był istotnie silniej determinowany przez takie czynniki jak wpływ na zdrowie, wygląd zewnętrzny, wartość odżywcza i przyzwyczajenie, zaś wybór owoców przez wygląd zewnętrzny i wpływ na zdrowie (tabela 2 i 5). Płeć wpłynęła na stopień ważkości niektórych czynników, niezależnie od wykształcenia rodziców ankietowanej młodzieży (tabela 3, 4, 6 i 7). Istotna korelacja pomiędzy średnią ważkością wyboru warzyw i owoców wskazuje (rys. 1), że można opracowywać wspólną strategię postępowania zmierzającą do racjonalizacji odżywiania się młodzieży.