

FOOD PREFERENCES, FREQUENCY AND INTAKE BY SCHOOLGIRLS*Jolanta Czarnocińska¹, Jacek Aniola¹, Joanna Grabowska¹, Grzegorz Galiński¹, Lidia Wądołowska²**¹Department of Human Nutrition Hygiene, Poznan University of Life Sciences, Poznan; ²Department of Human Nutrition, University of Warmia and Mazury in Olsztyn, Olsztyn*

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Studies were conducted on a group of 125 girls aged 13-15 years. Food preferences were determined in relation to 77 products, along with habitual eating frequency and amounts of consumed products, with individual correlations analysed for all products separately and joint correlations for 6 assortment groups. A significant interdependence between food preferences and habitual frequency of consumption was found for 77.9% products and a significant interdependence between food preference and the mean amount of consumed food for 83.1% products. Joint correlations for assortment groups were high and statistically significant, except for sweets. It may be stated that preferences in relation to a given product may constitute a good indicator making it possible to forecast its consumption by girls.

INTRODUCTION

Human diet to a large degree depends on non-economic factors, including food preferences [Birch, 1999]. Results of foreign studies confirm the existence of statistically significant correlations between preferences towards different products and the frequency of their consumption [Monteleone *et al.*, 1998; Drewnowski & Hann, 1999; Drewnowski *et al.*, 2000]. Polish studies concerning this problem are narrow in scope, primarily due to the small number of products included in those studies. Studies on the preferences and frequency of consumption of dairy products indicate the beginning of further more extensive research [Wądołowska *et al.*, 2002; Jeżewska-Zychowicz, 2005]. Women are more likely to be influenced by others than men [Van den Bree *et al.*, 1999]. They also exert a greater influence on food purchases, preparation of meals and circumstances connected with food consumption [Story *et al.*, 2002; Neumark-Sztainer *et al.*, 2003]. For this reason, they may affect food consumption by other family members [Fisher *et al.*, 2004; Wądołowska *et al.*, 2007]. Habits acquired in childhood and teenage years constitute an independent factor affecting food consumption by people at later periods in life [Jeżewska-Zychowicz, 2004; Larson *et al.*, 2006]. These relationships indicate a significant role of women in the modification of eating behaviour of other people and justify an interest in food consumption by girls. The study verified dependencies between preferences and frequency and amount of food products eaten by girls.

MATERIALS AND METHODS

Investigations were conducted on a group of 125 girls aged 13-15 years, attending two junior high schools in the city of Poznań.

Investigations were conducted in two stages. In both stages of the experiment a total of 77 identical food products was used, coming from six assortment groups: (i) cereals, (ii) vegetables, (iii) fruits, (iv) dairy products, (v) meat, fish and eggs, as well as (vi) sweets. At the first stage of the experiment food preferences towards products were defined based on a 5-point hedonic scale, using a calibrated questionnaire designed to analyse food preferences (Food Preference Questionnaire – FPQ). In earlier studies a high repeatability was shown for FPQ results [Czarnocińska & Wądołowska, 2006]. The second stage of the study consisted in conducted interviews on the habitual frequency and amounts of consumed food products. At this stage a calibrated food frequency questionnaire (FFQ) was used, also considered a reliable and appropriate measuring tool [Wądołowska, 2005]. The FFQ questions were open. Eating frequency of food products was described by respondents freely, declaring habitual eating frequency of products during a day, week, month and year. Amounts of eaten products were given in grams, based on photographs in the “Album of Photographs of Food Products and Dishes” [Szponar *et al.*, 2000].

For each product basic statistical parameters were established, *i.e.* mean preference, and mean eating frequency and amount of food products eaten by girls, after which products were appropriately ranked. Statistical verification of results was performed using Spearman rank correlation coefficient, using which individual correlations were determined for all 77 products separately and joint correlations for 6 assortment groups. All calculations were performed using STATISTICA PL v.7.1. software package by StatSoft.

TABLE 1. Joint correlations for 6 assortment groups and individual correlations for 77 food products.

Group of products Food items	Preference vs.		Group of products Food items	Preference vs.	
	A	B		A	B
Cereal products	0.65*	0.78**	Dairy products	0.82***	0.84***
Brown bread	0.26**	0.29**	Buttermilk	0.56***	0.56***
Buckwheat groats	0.39***	0.40***	Cheese	0.20	0.14
Corn crisps	0.21*	0.26**	Dairy fermented drinks	0.28**	0.28**
Corn flakes with sugar	0.29**	0.30**	Dairy fermented fruits drinks	0.16	0.19
Millet groats	0.24*	0.24*	Flavored fresh cheese	0.32***	0.36***
Muesli	0.43***	0.43***	Flavored processed cheese	0.42***	0.40***
Oat flakes	0.30**	0.30**	Fresh cheese	0.16	0.16
Pasta	0.09	0.09	Fungal flora ripened cheese	0.66***	0.66***
Semi-sweet yeast buns	0.34***	0.36***	Kefir	0.49***	0.51***
Wheat bread	0.06	0.08	Milk	0.43***	0.43***
Wheat-rye bread with grain	0.29**	0.33***	Milk drink	0.55***	0.55***
Vegetables	0.81***	0.85***	Processed cheese	0.41***	0.42***
Asparagus	0.51***	0.52***	Smoked cheese	0.61***	0.61***
Aubergine	0.23*	0.23*	Meat, fish and eggs	0.65**	0.64**
Beetroot	0.55***	0.57***	Beef	0.40***	0.44***
Broccoli	0.64***	0.64***	Carp	0.50***	0.65***
Celeriac	0.23*	0.24*	Chicken	0.22*	0.25*
Cucumber	0.07	0.07	Cod	0.44***	0.45***
Kohlrabi	0.00	0.03	Duck or goose	0.29**	0.29**
Leek	0.39***	0.40***	Eel	0.51***	0.51***
Lettuce	0.19	0.23*	Eggs	0.06	0.19
Pepper	0.63***	0.67***	Hake	0.07	0.07
Red cabbage	0.24*	0.24*	Herring	0.58***	0.59***
Squash	0.42***	0.43***	High-fat meat products	0.08	0.08
Tomato	0.46***	0.44***	Low-fat meat products	0.38***	0.38***
Turnip	0.22*	0.22*	Offal products	0.26**	0.26**
White cabbage	0.19	0.21*	Pate	0.31**	0.33***
Fruit	0.67**	0.70**	Pork	0.27**	0.31**
Apple	0.25*	0.32**	Sausages various	0.26**	0.21*
Apricot	0.20*	0.24*	Turkey	0.33***	0.33***
Avocado	0.25*	0.24*	Veal	0.15	0.17
Gooseberry	0.50***	0.51***	Sweets	0.31	0.63
Grape	0.16	0.26*	Chocolate	0.39***	0.39***
Grapefruit	0.68***	0.67***	Cream cakes	0.30**	0.30**
Kiwi fruit	0.29**	0.29**	Layer cakes	0.22*	0.32**
Lemon	0.33***	0.36***	Puff pastry cakes	0.37***	0.39***
Orange	0.28**	0.31**	Sponge cake	0.11	0.11
Peach	0.13	0.24*	Whipped cream	0.29**	0.34**
Pineapple	0.52***	0.55***	Yeast cake	0.10	0.10
Plum	0.41***	0.47***			
White currant	0.45***	0.45***			
Wild strawberry	0.28**	0.28**			

A – eating frequency, B – amounts of eaten food, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

RESULTS AND DISCUSSION

A significant interdependence was shown between food preferences and habitual consumption frequency for 60 products, which constituted 77.9% all food products included in the study (Table 1). A lack of significant correlations between preferences and eating frequency was recorded in the case of 2 cereal products, 4 vegetables, 2 fruits, 3 dairy products, 4 products from the group of meat, fish and eggs, as well as 2 products from the group of sweets. Significant dependencies between food preferences and mean amounts of eaten products were found for the same 60 products, for which a significant dependence was observed between preferences and eating frequency, and additionally for 2 vegetables and 2 fruits, accounting for 83.1% all analysed products.

The results obtained justify the statement that preferences towards a given food product may constitute a good indicator making it possible to forecast its consumption by girls. Significant correlations between food preferences and frequency, as well as amounts of eaten products show low individual variation. High individual variation was recorded only for a dozen or so products, belonging to different assortment groups. This indicates that a lack of significant correlations was non-selective, as they pertained to 0-28% for each of the assortment groups. A certain explanation for the lack of correlations between food preferences in girls and eating frequency of food products in relation to some of them may be connected with other factors determining the selection of food, such as availability of products (*e.g.* for kohlrabi), or their price and income levels of consumers (*e.g.* for grapes and dairy fermented fruits drinks). Another explanation may be national traditions and customs. Some food products are commonly eaten by Poles, irrespective of the degree of their liking. Such examples include *e.g.* white bread and cabbage.

Joint correlations for groups of products turned out to be significant for 5 out of 6 assortment groups. The calculated correlation coefficients were high and for the preferences *vs.* frequency system they ranged from 0.64 to 0.85, while for the preferences *vs.* amount they were from 0.65 to 0.82. This confirms a strong interdependence between food preferences and the eating frequency and the amount of individual food products consumed by girls, and indicates a potential applicability of aggregate data (to assortment groups) in studies on food consumption. A lack of a significant correlation was recorded only for sweets. This result may be easily explained. Sweets are commonly liked products, especially by girls and women, but due to the interest in maintaining a slim figure their consumption is often consciously reduced. In the analysed group of girls 84.3% of them stated that they consciously cut down on sweets. However, it may be assumed that preferences of girls in relation to sweets did not change. It should be stressed that significant correlations between preferences and frequency of consumption, or between preferences and the amount of consumed sweets pertained to 5 out of 7 products from this assortment group. This confirms the potential applicability of data on preferences in relation to individual sweets when forecasting their consumption by girls.

Studies may be found in available literature, concerning relationships between preferences and frequency of con-

sumption in the case of selected food products, although such studies are still scarce. No definite conclusions may be drawn from a review of literature on the subject. Some studies are consistent with the results obtained in this study [Monteleone *et al.*, 1998; Babicz-Zielińska, 1999; Drewnowski & Hann, 1999; Drewnowski *et al.*, 2000; Wądołowska *et al.*, 2002; Jeżewska-Zychowicz, 2005], while others suggest that the rate of liking of food products does not affect the frequency of their consumption [Babicz-Zielińska, 1999; Michicich *et al.*, 1999; Górecka *et al.*, 2003; Szczepaniak *et al.*, 2004]. However, it needs to be stressed that it is difficult to compare the results of those studies with the findings of this study due to differing methodology, both in terms of preference scales and the method used when defining the eating frequency of food products. Moreover, not all authors verified their results statistically using appropriate tests.

CONCLUSIONS

A significant interdependence was shown between food preferences and the habitual food consumption frequency for 77.9% products and a significant interdependence between food preferences and the average amount of food eaten for 83.1% products. For groups of products the assessed correlations were high and statistically significant, except for sweets. On the basis of the results obtained it may be stated that preferences for a given product may constitute a good indicator making it possible to forecast its consumption by girls.

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