

NUTRITIONAL PREFERENCES AMONG CHILDREN AT PRE-SCHOOL AGE

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Abstract: Preference degree of selected by 132 pre-school children food products was examined in the study. Preferential series were established for both: the total of the examined, and separately for young girls and boys. Degree was defined by children with usage of 4-point mimic scale and large-scale illustrations with colourful prints representing studied food products.

Fast-food type products, sweets, fruits, vegetables, as well as meat and meat products were the mostly preferred groups of food products. High preference degree of meat dishes and particularly poultry, fish, as well as lean sausages was noticed. Among drinks, children drank the most preferably fizzy drinks, especially coca-cola, as well as lemon tea, and milk. Statistically significant influence of sex on preferences of some analysed food products was found. Girls preferred mostly apples, fish, potatoes and fruit juices while homogenized cheese, pears and berries were more often chosen by boys.

Key words: preferences, pre-school children, nutritional habits

INTRODUCTION

Pre-school period is a period of both intensive physical, as well as intellectual development, and rational nutrition at this age is one of the most important factors influencing proper growth. Improper nourishment practices shaped in childhood influencing unfavourably physical development and nourishing state and also have essential influence on nutritional habits and customs remaining for the whole life [Birch 1993, Bereger 1992, Gronowska-Senger 1995, Gronowska-Senger et al. 1998, Hasik and Gawęcki 2000].

In the field of food and nutrition, the choice of definite kind of product or dishes is dictated by a series of various factors correlated with both products, as well as with a consumer and environmental conditions [Babicz-Zielińska 1998, Birch 1998, Kimmel et al. 1994].

Preferences can be inborn, and these are comparatively stable, as well as acquired showing different stability. Inborn preferences are, first of all, preferences towards sweet food, remaining in most of cases for the whole life. Unhesitating reluctance to consuming sour and bitter dishes show both younger, as well as older children. It per-

mits to think that there is a permanent, inborn aversion for these tastes that to some degree protects from consumption of substances harmful for the organism [Gawęcki 1982 a, Gawęcki 1982 b, Nestle et al. 1998].

Many preferences develop and change with age, under the influence of alimentary experiences. They are correlated with profitable or undesirable influence of food on human organism. In relation to food that does not cause visible positive or negative effect, preferences may be formed on repetition way and then they are of habit character. It is particular importance in case of small children, with whom it is easy to develop proper nutritional habits preventing from so frequent nowadays civilization diseases at the adult mature age.

First of all noone should direct to a child one's own gustatory feelings, especially concerning food products that are not recommended in rational nutrition. A child from infantile period should not be getting used to salty taste. A need of it does not occur when child is born [Cutting et al. 1999, Gawęcki 1982 a, Gawęcki 1982 b]. This way of introduction of low salt diet is easy to obtain by salting dishes insufficiently. Similar situation occurs in case of sugar, because in diet containing proper quantity of complex carbohydrates, sucrose is redundant. Thus, formation of proper nutritional habits both by parents, as well as by nursery schools already is an essential matter in prophylactic of civilization diseases.

There is not much literature concerning children of pre-school age nutrition quality, and especially their alimentary preferences.

The aim of the study was an estimation of preferences among children at pre-school age in reference to the selected food product groups in aspect of rules of this population rational nutrition.

MATERIALS AND METHODS

The study was made among the 132 kindergarteners selected from three different kindergartens in small towns of the Wielkopolska region from which 53% were boys. All the subjects were chosen by random sampling. Children from each nursery were examined in the same number – 44 persons. The oldest pre-school children at age of 5-6 (43%) were the most numerous group, meanwhile the youngest children at age of 3-4 (23%) were the least numerous. Remaining 34% were children at age of 4-5. Investigations were made by a method of direct interview with help of questionnaire suitably drawn up. Questions concerned eleven selected groups of products. They were: fruits, vegetables, milk and milk products, meat and meat products, fish, starch additives to main dishes, sweets, cold and warm drinks, as well as “fast food” type product (pizza, hamburgers, hot dogs etc.).

Children had colourful photographs of the studied food products so that the assessors did not have to taste the samples. The factor that greatly influenced the decision to use photographs of the samples was the assumption that the children would be happier to cooperate if they knew they would not have to eat anything that they did not like. Each assessor was interviewed individually by an interviewer. All tests with children took place in one of the kindergarten classrooms. Children defined, their preference degree of the mentioned products and dishes with facial expressions. Four different images of a face created the hedonic scale. The choice made was converted to the num-

ber, beginning from 1: “I do not like it very much” – unsatisfied face to 4: “I like it very much – smiled face” [Kimmel et al. 1994, Kroll 1990, Thomas and Murray 1980].

The obtained results were used for calculation of average preference degree for each group of products, as well as for preferential series settlement for separate products in individual group. They were formed for both the total of the examined, as well as separately for girls and boys.

To evaluate significance of the differences in food preferences among girls and boys correlation coefficient of Spearman rank and estimation of statistical strength of relationship significance were conducted with the t-Student test.

RESULTS AND DISCUSSION

Analysis of mean values of preferences calculated for separate groups of examined products and dishes preference coefficients showed that there was no group decidedly unpopular among pre-school children ($x < 2.0$). The mostly preferred among the total of the children ($x > 3.0$) were “fast food” type products, then sweets, fruits, vegetables as well as meat and meat products. Weker et al. [2001] showed similar preferences in relation to “fast-food”, vegetables and fruits among children.

Most of products were slightly more popular among boys, with exception of cold drinks, sweets and “fast food” type products (Fig. 1).

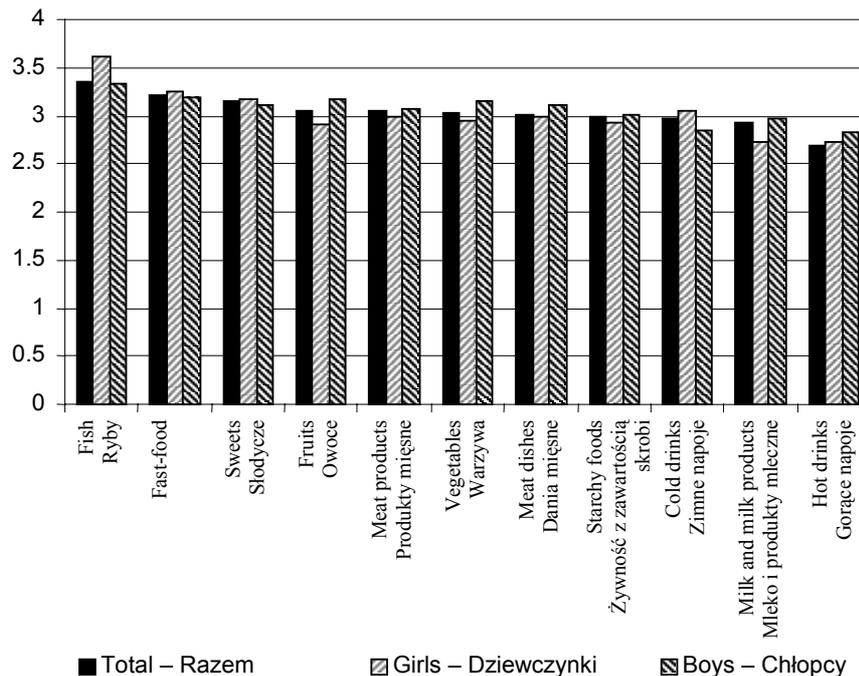


Fig. 1. Preference degree of selected groups of products dependence on pre-school children sex
Rys. 1. Stopień preferencji wybranych grup produktów w zależności od płci dzieci w wieku przedszkolnym

Described preferences are an expression of prevailing popularity of products of “fast food” type among Polish society at present, despite recommendations of their avoidance in rational nutrition. Simultaneously, they also confirm for a number of proper nutritional fancies, to which relatively high preference of fruits and vegetables degree particularly observed in case of boys undoubtedly belongs. The most popular fruits among children were strawberries, pears, apples, berries (among boys), bananas and mandarins. However gooseberries, pineapples and grapefruits did not suit them and especially young girls ($x < 2.0$) decidedly – Tables 1 and 2. Babicz-Zielińska [1999] showed similar preferences in relation to fruits among slightly older children.

These results would show children’s inborn susceptibility to sweet taste and reluctance to sour and bitter tastes.

The Spearman correlation coefficient between preference rankings of fruits for young girls and boys was 0.495. Influence of sex was statistically significant in this case ($p < 0.05$).

Almost all vegetables were characterised with quite high preference degree. Children liked beetroots (3.44), carrot (3.43), and also tomatoes (3.42) the most. Brussels sprouts (2.24) and additives to dishes such as dill (2.40) and green parsley (2.50) were not very popular among pre-school children. Statistical analysis ($p < 0.05$) did not show significant influence of sex on preference degree of analysed vegetables ($r_s = 0.803$).

Table 1. The most preferred products ($x \geq 3.5$) among pre-school children
Tabela 1. Produkty najbardziej lubiane ($x \geq 3,5$) przez przedszkolaków

Products Produkty	Examined population – Grupa testowana		
	total – razem	girls – dziewczynki	boys – chłopcy
Strawberries – Truskawki	3.71	3.66	3.95
Chicken – Kurczak	3.58	3.59	3.57
Hot-dogs – Hot-dog	3.56	3.61	3.50
Homogenized cheese Serek homogenizowany	3.75		4.00
Fish – Ryby	3.61	3.87	
Saturated drinks – Napoje gazowe	3.54	3.61	
Ham – Szynka	3.53	3.61	
Tea with lemon – Herbata z cytryną	3.50		3.60
Chocolate sweets Czekoladowe cukierki	3.50		3.54
Apples – Jabłka		3.70	
Fruit juices – Soki owocowe		3.62	
Potatoes – Ziemniaki		3.61	
Forcemeat balls – Kotlety mielone		3.58	
Chips – Czipсы		3.58	
Mandarins – Mandarynki		3.53	
Beetroot – Buraki		3.50	
Pears – Gruszki			3.87
Berries – Jagody			3.80
Bananas – Banany			3.54
Middle comminuted sausage Parówki			3.50

Table 2. The less preferred products ($x \leq 2.0$) among pre-school children
 Tabela 2. Produkty najmniej lubiane ($x \leq 2,0$) przez przedszkolaków

Products Produkty	Examined population – Grupa testowana		
	total – razem	girls – dziewczynki	boys – chłopcy
Tea with milk (“Bawarka”) Herbata z mlekiem	1.24	1.06	1.40
Not saturated drinks Napoje niegazowane	2.00		1.94
Porridge – Owsianka	2.00	1.96	
Gooseberry – Agrest		1.85	
Pineapples – Ananasy		1.93	
Grapefruits – Grejfruty		1.96	
Ribs – Żeberka		1.96	
Brussels sprouts – Brukselka			1.74

All children liked meat dishes, and particularly chicken (3.58), forcemeat balls (3.37) and steak chops (3.30) to a considerable degree. High preference degree of poultry, as well as fish (3.37) was decidedly positive element in nutritional behaviour of the examined children. Such a high preference of poultry was found in the study Pelant [2001]. Steak chops location among favourite dishes by children speaks for consolidated structure of meat consumption among Polish society, in which pork participation is traditionally highest. The total of pre-school children, and especially young girls did not like meat with visible fat, as ribs (2.07 and 1.96 respectively). Statistical analysis showed significance of differences ($p < 0.05$) in meat dishes preferences between young girls and boys ($r_s = 0.535$). It was particularly shown by a higher mince chops and ribs preference among boys. Similarly to meat, processed meat products belonged to products particularly popular among children. Lean sausages without visible fat, ham (3.53) and sirloin (3.28) were on the first place. Fine comminuted and cooked sausages (“parówka” type) were also consumed preferably (3.29). Fat that was contained in them (often in large quantity) is invisible, so these sausages were traditionally accepted as suitable for small children and probably often were given to them by parents. Dry sausages and pork blade steak were placed on the last places in preferential series. It is probably correlated with a large amount of visible fat as well as quite high price awareness of which makes them probably rarely present in child’s menu. Differences in preferences of sausages between young girls and boys were statistically not significant ($p < 0.05$; $r_s = 0.714$).

None of the examined milk products became rejected among children. Homogenized cheeses were the most popular (3.75), and to least preferred group belonged natural yoghurt (2.13), particularly unpopular among young girls – 2.09, as well as cottage cheese (2.31) and cheese spread (2.40). Influence of children’s sex on preferences of this group of products was not shown ($p < 0.05$; $r_s = 0.726$).

The total of children preferred saturated drinks (3.54) than non saturated (2.00). Coca-cola (3.39) unfortunately turned out to be the favourite drink among pre-school children. This fact became softened with only a little lower fruit juices preference degree (3.38), and even the highest in case of young girls (3.62).

In warm drinks preferential series were found in following order: lemon tea (3.50), milk (3.31), and then cocoa (3.07). Tea with milk (called "Bawarka") was the only drink decidedly not popular among children (1.24).

All the children liked potatoes (3.42), and then chips (3.29) and rice (3.20) the most among starchy dishes served with meat. Porridge (2.03) took the last place in preferential series, which shows, that despite nutritional recommendations it is not very popular in everyday nutrition. Differences in preferences of this additives among young girls and boys were statistically significant ($p < 0.05$; $r_s = 0.107$). In boys preferential line departing from remaining, rice was on the first place, then noodles, and just on third place were potatoes.

From among all products and dishes that underwent evaluation, particularly popular (of preference degree $x > 3.5$ and decidedly not preferred of degree $x < 2$) among pre-school children were selected. Young girls and boys nutritional habits showed a number of differences. Strawberries, chicken and hot dogs were most liked in both examined groups of children while tea with milk ("Bawarka") belonged to those not popular (Tab. 1 and 2).

CONCLUSIONS

Nutritional preferences among examined pre-school children showed a number of both positive and negative behaviours. They were first of all a reflection of inborn children preferences to sweet taste (sweet fruits, sweets), as well as reluctance in relation to sour and bitter taste (grapefruits, gooseberry, brussels sprouts).

They were also correlated with traditional Polish society consumption structure (high consumption of pork and underestimation of porridge), but willing to accept novelty, not always recommended in rational nutrition ("fast food" type products).

High preference degree referring to fruits and juices, vegetables, meat dishes and sausages with low fat content, fish and homogenized cheese may be numbered to proper nutritional behaviour. However, low preference of no-saturated drinks, porridge, and simultaneously high preference of "fast food" type products, sweets, Coca-cola indicate incorrect trends in pre-school children nutrition.

Statistically significant influence of children's sex on preference degree was observed in case of some products and dishes (fruits, meat dishes and starchy foods served with meat in the main course). Apples, fish, potatoes and fruit juices were mostly preferred by girls, while boys mostly chose homogenized cheese, chocolate sweets, pears and berries.

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UPODOBANIA ŻYWIENIOWE DZIECI W WIEKU PRZEDSZKOLNYM

Streszczenie: W pracy badano stopień preferencji wybranych produktów spożywczych 132 przedszkolaków. Szeregi preferencyjne ustalono zarówno dla ogółu badanych, jak i osobno dla dziewczynek i chłopców. Dzieci określały swoje upodobania używając 4-punktowej skali mimicznej oraz plansz z kolorowymi rycinami przedstawiającymi badane produkty spożywcze.

Do najbardziej preferowanych grup produktów spożywczych należała żywność typu „fast food”, słodczyce, owoce, warzywa oraz mięso i jego przetwory. Stwierdzono wysoki stopień preferencji dań mięsnych, a szczególnie drobiu, ryb oraz chudych wędlin. Spośród napojów dzieci najchętniej piły napoje gazowane, a zwłaszcza coca-cole, a także herbatę z cytryną i mleko. Stwierdzono statystycznie istotny wpływ płci na preferencje niektórych analizowanych produktów spożywczych.

Słowa kluczowe: preferencje, dzieci w wieku przedszkolnym, nawyki żywieniowe

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