

EVALUATION OF PREFERENCE AND CONSUMPTION FREQUENCY OF ALCOHOL-FREE AND ALCOHOLIC DRINKS AMONG YOUTH FROM SECONDARY SCHOOLS IN KONIN

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The aim of the study was to evaluate nutritional predilections for various alcohol-free and alcoholic drinks among the youth from secondary schools in Konin. The studies were carried out using the questionnaire method. The preference degree of the evaluated drinks depended on the sex of the respondents. Both girls and boys pointed out fruit juices as the most preferred alcohol-free drinks, while as the least preferred the drink called “Dynamic” was indicated among girls, and natural coffee – among boys. Relatively high similarity of drink consumption was found between boys and girls. Tea, fruit drinks and fruit juices scored the highest ranks in the consumption frequency series, while the lowest ranks were observed for energetic drinks, and – among boys – also for natural coffee. Not all of the most preferred drinks belonged to the most frequently consumed ones. Alcoholic drinks were consumed rarely by the respondents, while beer was the most preferred and most often consumed drink of this type, independently from sex. The results obtained show that the selection of drinks consumed by youth corresponded in general to the rational nutrition recommendations.

INTRODUCTION

As the main source of water for human organism, drinks are an indispensable component of the proper diet. Water procurement to organism at least in the quantity of 1.5 litre daily [Gibson *et al.*, 1998; Rogers *et al.*, 2001] is very important to assure the proper life processes. Adults can survive just 3–5 days without drinking. Drinks can be the source of saccharides, and so – the energy originating from the added sweetening agents or from substances naturally-occurring in them (some juices). They can deliver easily available sugars and organic acids (particularly fruit and vegetable juices), mineral components, trace elements, vitamins (from B and C group, β -carotene), as well as other nutritionally-valuable components, such as polyphenols and dietary fibre [Jędrzejczyk & Janicki, 1996; Jędrzejczyk, 1996; Johnson & Frary, 2001; Krugła *et al.*, 2001].

Natural non-nutritional components indicating the desirable physiological activity connected mostly with antioxidative properties might play an important role in the prevention of cardiovascular diseases [Krugła *et al.*, 2001; Yanishlieva-Maslarova & Heinonen, 2001].

Dietary fibres that are mainly present in nectars, fruit and vegetable juices demonstrate the ability of binding such substances like cholesterol and bile acids in the alimentary tract [Górecka *et al.*, 2003].

Low-percentage alcoholic drinks may also be a source of polyphenols (wine), as well as vitamins (*e.g.* beer containing vitamins from B group). Tea and coffee deliver first of all the stimulating components, as well as polyphenols (tea) and PP vitamin (coffee) [Smit & Rogers, 2000; Yang &

Landau, 2000; McKay & Blumberg, 2002]. The refreshing effect of many drinks results from the presence of alkaloids (caffeine, teobromines, and teofilines), tannins, and ethereal oils. The consumption of various drinks has a significant importance for the functioning of a human body.

During the last 12 years, the drink market in Poland has changed considerably. The assortment of fruit and vegetable juices, bottled waters, or sweetened fizzy drinks has grown significantly [Birbaum, 1998; Kubiak, 1998; Szczepaniak & Wigier, 2001]. Like in other countries, the production of the so-called “functional” drinks has also been developed [Hollingsworth, 1997; Latz-Weber, 1997; Kos, 1998; Pszczola, 1999; Trezdel, 1999; Krugła *et al.*, 2001].

Since a large number of drinks are at the moment available on the market, and among them are the drinks both recommended and non-recommended in rational nutrition, their selection is very important. It is particularly important in the case of children and youth, since bad nutrition habits can be a reason of abnormal development and an increase in civilization diseases morbidity risk.

In consequence, the evaluation of consumption frequency and preferences of the selected alcohol-free and alcoholic drinks among secondary schools youth from Konin was the principal aim of this study.

MATERIAL AND METHODS

The studies carried out in 2002 included 260 pupils of secondary schools from Konin, aged 15 to 19. The examined population of pupils included 145 girls and 115 boys. Girls were pupils of the technical school for collective nutrition

(72%), house building secondary school (10%), and a secondary school of general education (10%). Most of the boys (76%) attended the house building secondary school, 15% – the technical school for collective nutrition, and 9% were the pupils of a secondary school of general education. On the basis of self-estimation, the respondents qualified their financial standing, which was described as: very good (6.5%), good (56.3%), sufficient (29.1%), and bad (8%). Taking under consideration the percentages, more girls evaluated their financial standing as bad and sufficient, and boys – as very good and good. As it results from the answers, in the houses of 89.2% of respondents, mother was responsible for housekeeping. In the predominant part, parents possessed professional and secondary education. Among the studied population preferably female youths were keen on sports (80.8%), especially recreational ones, while male youths (75.9%) preferred team sports.

A direct interview method supported with questionnaires was used. Questions concerned the preference and consumption frequency of different groups of alcohol-free drinks (black tea, herbal tea and fruit tea, natural coffee and cereal coffee, fruit and fruit-vegetable juices, fruit fizzy and non-fizzy drinks, mineral fizzy and non-fizzy waters, and energetic drinks), as well as alcoholic drinks (wine, beer, vodka, alcoholic drinks). The mean consumption frequency of the drinks was established with the use of a 3-point scale. The following descriptions of the consumption frequency were given numerical values, namely: 'every day' and 'almost every day' (3), 'at least once a week' (2), or 'not at all' or 'very rarely' (1). For the preference degree a 5-point scale was used: 'I like it very much' – 5, 'I like it' – 4, 'I neither like or dislike it' – 3, 'I do not like it' – 2, 'I do not like it very much' – 1. The results obtained were used for calculation of the mean preference degree and consumption frequency for the analysed drinks among the respondents. These values were characterised by ranks creating decreasing

preference series and consumption frequency series. The correlation between these preference series for girls and boys and consumption frequency of the studied drinks in both sex groups, as well as between the preferences and the drinks consumption frequency, separately in the group of girls and boys, was verified using the Kendall's test. The statistical analysis was made with the use of a computer program Statistica 5.0 PL.

RESULTS AND DISCUSSION

The results concerning the preference degree of the studied alcohol-free drinks have been presented in Table 1. None of the drinks was considered disliked by the youth. Fruit juices ($\bar{x}=4.65$) and fruit non-fizzy drinks ($\bar{x}=4.50$), as well as fruit teas ($\bar{x}=4.40$) and fruit-vegetable juices ($\bar{x}=4.39$), respectively, were the most preferred by the whole examined population. Cereal coffee ($\bar{x}=3.14$) and natural coffee ($\bar{x}=3.34$), as well as energetic drinks obtained the lowest preference degree ($\bar{x}=3.77$ to $\bar{x}=3.28$). Large differences were obtained in the preference series of drinks for girls and boys, which is confirmed by weak correlation strength between these two series ($p<0.05$). The greatest differences were observed in functional drinks that were ranked higher in boys preference series than in the girls series. "Red Bull" was an example for which the rank difference was up to eight units. Vegetable juice, fruit-vegetable juice, herbal tea, as well as natural coffee occupied higher positions in girls preference series than in the boys series.

The average consumption frequency of alcohol-free drinks among the examined population has been presented in Table 2. Black tea ($\bar{x}=2.40$), fruit non-fizzy drinks ($\bar{x}=2.38$) as well as fruit juices ($\bar{x}=2.34$) were the most often consumed drinks by the whole population. Youth consumed energetic drinks the most rarely ($\bar{x}=1.38$ to $\bar{x}=1.46$), and next cereal coffee ($\bar{x}=1.53$), natural coffee ($\bar{x}=1.75$), herbal

TABLE 1. Degree of liking of non-alcoholic drinks for the examined groups.

Drinks	Total population N=260			Girls N=145			Boys N=115		
	\bar{x}	SD	R	\bar{x}	SD	R	\bar{x}	SD	R
Fruit juice	4.65	0.61	1	4.63	0.67	1	4.67	0.63	1
Non-fizzy fruit drink	4.50	0.75	2	4.38	0.69	4	4.64	0.55	2
Fruit tea	4.40	0.83	3	4.42	0.88	3	4.36	0.95	3
Fruit-vegetable juice	4.39	0.91	4	4.49	0.93	2	4.26	1.00	6
"Coca-cola" type drink	4.27	0.90	5	4.23	0.85	5	4.24	0.82	7
Fizzy fruit drink	4.15	1.06	6.5	3.99	0.80	8	4.34	0.85	4
Non-fizzy mineral water	4.15	0.96	6.5	4.22	1.07	6	4.07	1.04	8
Vegetable juice	3.92	1.17	8	4.07	1.21	7	3.72	1.32	13.5
Black tea	3.89	1.05	9	3.95	1.11	9	3.81	1.16	12
Fizzy mineral water	3.87	1.10	10	3.77	0.99	10	4.00	1.14	9
"Red bull" drink	3.77	1.19	11	3.37	1.10	13	4.28	1.10	5
Herbal tea	3.62	1.22	12	3.70	1.26	11	3.52	1.22	15
Energy drink	3.47	1.23	13	3.10	1.13	14	3.93	1.15	10.5
"Isostar" drink	3.41	1.27	14	3.00	1.23	16	3.93	1.21	10.5
Natural coffee	3.34	1.38	15	3.47	1.41	12	3.17	1.39	17
"Dynamic" drink	3.28	1.22	16	2.93	1.14	17	3.72	1.15	13.5
Cereal coffee	3.14	1.23	17	3.03	1.32	15	3.28	1.28	16

$r_k=0.38$ $p<0.05$

N – group size; \bar{x} – mean degree of liking; SD – standard deviation of the liking degree; R – rank of liking degree.

TABLE 2. Consumption frequency of non-alcoholic drinks for the examined groups.

Drinks	Total population N=260			Girls N=145			Boys N=115		
	\bar{x}	SD	R	\bar{x}	SD	R	\bar{x}	SD	R
Black tea	2.40	0.79	1	2.45	0.82	1	2.32	0.85	5
Non-fizzy fruit drink	2.38	0.65	2	2.29	0.67	2	2.51	0.61	1
Fruit juice	2.34	0.66	3	2.24	0.65	3	2.47	0.67	3
Fizzy fruit drink	2.29	0.71	4	2.15	0.77	4	2.49	0.54	2
Fruit tea	2.16	0.84	5	2.13	0.76	5	2.21	0.82	7.5
Fruit-vegetable juice	2.15	0.66	6	2.10	0.64	6	2.21	0.69	7.5
Non-fizzy mineral water	2.10	0.76	7	1.92	0.75	7	2.36	0.71	4
Fizzy mineral water	2.01	0.82	8	1.83	0.83	9	2.26	0.74	6
“Coca-cola” type drink	2.00	0.70	9	1.90	0.71	8	2.15	0.66	9
Vegetable drink	1.93	0.73	10	1.79	0.67	10	2.13	0.76	10
Herbal tea	1.78	0.74	11	1.73	0.75	12	1.85	0.72	11
Natural coffee	1.75	0.80	12	1.79	0.83	11	1.68	0.75	15
Cereal coffee	1.53	0.67	13	1.41	0.61	13	1.70	0.72	14
“Red bull”	1.46	0.68	14	1.23	0.45	14	1.79	0.82	12
“Isostar”	1.44	0.69	15	1.23	0.51	15	1.75	0.81	13
Energy drink	1.38	0.63	16	1.23	0.51	16	1.60	0.72	16
“Dynamic”	1.33	0.61	17	1.18	0.45	17	1.55	0.75	17

$r_k=0.79$ $p<0.0097$

N – group size; \bar{x} – mean degree of liking; SD – standard deviation of the liking degree; R – rank of liking degree.

tea ($\bar{x}=1.78$), and vegetable juices ($\bar{x}=1.93$). In the case of consumption frequency series for these drinks, no significant differences between girls and boys were observed, which was reflected in high Kendall’s ranks-correlation coefficient ($r_k=0.79$). The greatest observed differences concerned fizzy and non-fizzy mineral water, which were

ranked higher in the consumption frequency series for boys ($R=4$ and $R=6$) than for girls ($R=7$ and $R=9$). As refers to black tea and natural coffee the situation was opposite. This drinks were more frequently consumed by girls ($R=1$ and $R=11$) than by boys ($R=5$ and $R=15$).

TABLE 3. Correlation between ranks of consumption frequency and liking degree for non-alcoholic drinks.

Drinks	Girls N=145		Boys N=115	
	Consumption frequency	Preferences	Consumption frequency	Preferences
Black tea	1	9	5	12
Non-fizzy fruit drink	2	4	1	2
Fruit juice	3	1	3	1
Fizzy fruit drink	4	8	2	4
Fruit tea	5	3	7.5	3
Fruit-vegetable juice	6	2	7.5	6
Non-fizzy mineral water	7	6	4	8
Fizzy mineral water	9	10	6	9
“Coca-cola” type drink	8	5	9	7
Vegetable drink	10.5	7	10	13
Herbal tea	11	11	11	15
Natural coffee	10.5	12	15	17
Cereal coffee	13	15	14	16
“Red bull”	14	13	12	5
“Isostar”	15	16	13	10.5
Energy drink	16	14	16	10.5
“Dynamic”	17	17	17	14

τ - Kendall =0.54 τ - Kendall =0.55
 $p = 0.01$ $p = 0.01$

N – group size

The interaction between the consumption frequency ranks and liking degree of alcohol-free drinks, as presented in Table 3, showed the mean correlation both in the group of girls as well as in group of boys ($r_k=0.54$ and $r_k=0.55$). Black tea in both groups was ranked higher in the consumption frequency series than in the preference series (7–8 units ranks difference). Similar interaction was observed for fruit fizzy drinks (among girls) and mineral fizzy and non-fizzy water (among boys). Fruit-vegetable juices and drinks of the type of “Coca-cola” ranked the highest in the preference series of girls ($R=2$ and $R=5$), however, were consumed by them considerably rarely ($R=6$ and $R=8$). The same situation occurred in the case of energetic drinks in the group of boys. “Red Bull” and “Energy Drink” occupying respectively the 5th and 10th positions in the preference series, were only on the 12th and 16th positions in the consumption frequency series.

While analysing the alcoholic drinks preference degree (Table 4) it was observed that among both girls and boys beer was the most popular ($\bar{x}=3.81$), followed by ($\bar{x}=3.36$). Vodka was liked least of all among alcoholic drinks. The Kendall’s rank-correlation coefficient equal to 0.67 confirmed the average correlation strength between the girls and boys preference series. The most popular beer, was also consumed most often by both girls and boys (Table 5). It should be stressed, that the mean consumption frequency of all these drinks oscillated at a low level and did not exceed the consumption coefficient of 1.70 (on a 3-point scale).

The consumption frequency series of alcoholic drinks for girls and boys differed ($r_k=0.35$). The greatest difference concerned wine, which occupied the second position in

TABLE 4. Degree of liking of alcoholic drinks for the examined groups.

Drinks	Total population N=260			Girls N=145			Boys N=115		
	\bar{x}	SD	R	\bar{x}	SD	R	\bar{x}	SD	R
Beer	3.81	1.20	1	3.66	1.32	1	4.00	1.21	1
Wine	3.36	1.20	2	3.38	1.32	2	3.33	1.28	3
Alcoholic drinks	3.27	1.28	3	2.97	1.40	3	3.66	1.29	2
Vodka	2.37	1.14	4	2.01	1.23	4	2.83	1.17	4
$r_k=0.67$							$p<0.01$		

N – size; \bar{x} – mean degree of liking; SD – standard deviation of the liking degree; R – rank of liking degree.

TABLE 5. Frequency of consumption of alcoholic drinks for the examined groups.

Drinks	Total population N=260			Girls N=145			Boys N=115		
	\bar{x}	SD	R	\bar{x}	SD	R	\bar{x}	SD	R
Beer	1.60	0.64	1	1.53	0.57	1	1.70	0.72	1
Wine	1.28	0.56	2	1.23	0.48	3	1.36	0.65	2.5
Alcoholic drinks	1.22	0.49	3	1.24	0.46	2	1.19	0.52	4
Vodka	1.21	0.48	4	1.12	0.32	4	1.36	0.62	2.5
$r_k=0.35$							$p<0.05$		

N – group size; \bar{x} – mean degree of liking; SD – standard deviation of the liking degree; R – rank of liking degree.

the consumption frequency series for the group of girls, and the fourth – the last one – among boys. However, such alcoholic drinks as vodkas obtained higher ranks ($R=2.5$) for boys in this series than for girls ($R=4$). Generally, it may be said that the average consumption frequency of all the studied alcoholic drinks with the exception of wine, was higher in the group of boys.

The production of fruit juices in Poland has been growing for a dozen of years now, and their larger and larger choice on the market enables the involvement of such drinks into the daily diet of a growing number of consumers. Juices consumption has increased in Poland from 7.7 L/person in 1995 to 16.5 L/person in 2001 [Kubiak, 2003]. Many authors conducting investigations in this area in the different parts of Poland and among populations of consumers at various ages reported, similarly as in this study, high preference degree and consumption frequency for fruit juices [Jeruszka *et al.*, 2002; Matuszewska & Szczecińska, 1998; Górska-Warszewicz, 2001; Pietruszka *et al.*, 2002; Nazarewicz & Babicz-Zielińska, 2002].

Frequent consumption of juices that are an additional source of not only vitamins but also minerals and dietary fibre in a daily diet of humans, should be considered as one of the proper nutritional behaviours among the polled youth. Lower consumption of fruit-vegetable and particularly vegetable juices might be connected with the generally low popularity of such drinks, their modest offer, as well as high preference for sweet taste typical of fruit juices [Pietruszka *et al.*, 2002; Kubiak, 2003]. Black tea, characterised by relatively low preference degree, belonged to drinks consumed most often, particularly in the group of girls. At the moment, it is a commonly consumed and the most popular drink in Poland [Kolanowski, 1997; Pietruszka *et al.*, 2002]. On the contrary, fruit teas, in spite of high preference degree, were drunk less frequently among the respondents, probably because of too high a price.

Various fizzy and non fizzy fruit drinks that demonstrate rather low nutritive value belonged to the drinks charac-

terised by high consumption frequency, especially among boys. Mineral waters, considered to be a source of mineral compounds, were consumed more frequently by boys and rather seldom by girls. These waters are an important source of micro- and macroelements that are indispensable for the proper functioning of a human body. Therefore, to slake their thirst and, simultaneously, not to loose time for preparing drinks, boys were more interested in cold fruit drinks, juices or mineral waters.

From the nutritional point of view, the relatively low consumption of fizzy sweet drinks like "Coca-cola", very popular in Poland not so long ago, should be considered as a desirable phenomenon. These drinks deliver only water and "empty calories" instead of the valuable compounds. Additionally, phosphoric acid used as one of the additives in the production of such drinks is an inadvisable compound for children because of its calcium binding ability. Similar results were obtained during investigations conducted among youth from secondary schools in Płock, Biała Podlaska and Nowy Sącz [Pietruszka *et al.*, 2002; Jeżewska-Zychowicz, 2002]. These drinks are also a source of saccharose in food and might cause obesity increase among youth. Energetic drinks were relatively seldom consumed among youth, and particularly among girls. As refers to boys, these drinks – as "Red Bull" for example – were located higher in the preference series than in the frequency of consumption series, which can be explained by the relatively high price of such drinks. Natural and cereal coffees belonged to rather disliked drinks and rarely consumed ones, especially among boys. In the group of alcoholic drinks, beer was the most popular, which corresponds well to the observations of other authors [Pietruszka *et al.*, 2002; Urban, 2003]. The growing consumption of beer is connected with its broad assortment currently available on the domestic market and the widespread advertising. It results also from the fashion and generally growing tendency of beer consumption [Głos, 2003; Kuchciak & Sadowski, 2003].

CONCLUSIONS

1. The most preferred alcohol-free drinks among the polled youth were fruit juices. The drink called "Dynamic" was the least preferred one among girls, while natural coffee – among boys.

2. The most frequently consumed alcohol-free drinks both in the group of girls and boys were: black tea, fruit drinks and fruit juices, while energetic drinks were consumed the least frequently.

3. Alcoholic drinks were consumed seldom among all respondents, while beer was the most preferred and most frequently consumed drink of this type.

4. The relatively frequent consumption of fruit juices and mineral waters and infrequent consumption of natural coffee and energetic drinks may be considered to be a positive nutritional behaviour among the youth examined.

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OCENA PREFERENCJI I CZĘSTOTLIWOŚCI SPOŻYCIA NAPOJÓW BEZALKOHOLOWYCH I ALKOHOLOWYCH WŚRÓD MŁODZIEŻY SZKÓŁ PONADPODSTAWOWYCH W KONINIE

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Celem pracy była ocena upodobań żywieniowych młodzieży szkół ponadpodstawowych w Koninie w odniesieniu do różnego typu napojów bezalkoholowych i alkoholowych. Badania przeprowadzono metodą ankietową. Stopień preferencji analizowanych napojów był zależny od płci ankietowanych. Do najbardziej preferowanych napojów bezalkoholowych, zarówno dziewczęta jak i chłopcy zaliczyli soki owocowe, zaś do najmniej lubianych wśród dziewcząt należał napój Dynamic, a wśród chłopców kawa naturalna (tab. 1). Stwierdzono dość duże podobieństwo w spożyciu badanych napojów wśród dziewcząt i chłopców. Najwyższe rangi w szeregu częstotliwości spożycia zajęły herbata, napoje owocowe oraz soki owocowe, zaś najniższe napoje energetyzujące, a wśród chłopców również kawa (tab. 2). Nie wszystkie najbardziej preferowane napoje należały do najczęściej konsumowanych. Napoje alkoholowe były rzadko spożywane przez ogół ankietowanych, przy czym do najbardziej preferowanych i najczęściej konsumowanych, niezależnie od płci, należało piwo (tab. 4). Uzyskane wyniki badań wykazały szereg pozytywnych zachowań żywieniowych ankietowanej młodzieży w zakresie spożycia napojów.