

## Young consumer preferences of basic food products depending on age and gender

### Preference základních potravin mladými konzumenty v závislosti na věku a pohlaví

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#### ABSTRACT

A balanced diet is an integral part of healthy lifestyle. The aim of this study was to evaluate the preferences of consumption of selected food groups depending on age and gender. Pupils and students (n=389) of primary, secondary and tertiary education (the university) in the South Bohemia region were given a questionnaire focused on their preferences regarding consumption of basic foods. The findings show relatively large differences in the popularity of various types of meat, depending on age and gender. The preferences of students at the university were comparable in regards to chicken and pork (77 and 80%), in the younger age group (pupils), the preference of chicken prevailed (91 and 72%). Girls gave more preference to meat with higher nutritional value – chicken (84%), turkey (28%) or fish (22%) than boys (80, 11, 23% resp.) Age played a large role also in the case of milk consumption as it became less popular with age (79, 73, 64% resp.). The most popular dairy product across all age groups was yogurt. Regarding the preferences of bakery products, the findings show that 45% of respondents preferred white bread, while 37% preferred whole meal bread. Boys (54%) preferred white bread more than girls, who mostly preferred whole meal bread (48%). The survey has shown that the interest in fish meat consumption is relatively low, whereas pork is more highly preferred. Milk, which is one of the most nutritionally valuable foods, tends to become less preferable with age. However, the high consumption of yogurt amongst all age groups is favourable. With regards to bakery products, the preference of white bread by young consumers prevails.

**Keywords:** age, food, gender, preferences, pupils, students

#### ABSTRAKT

Nedílnou součástí zdravého životního stylu je racionální výživa. Cílem předložené práce bylo vyhodnotit preference v konzumaci vybraných skupin potravin v závislosti na věku a pohlaví. Žákům a studentům základních, středních a vysokých škol (n=389) byl předložen dotazník zaměřený na jejich preference týkající se konzumace masa, mléčných produktů a pekařských výrobků. Výsledky prokázaly poměrně značné rozdíly v oblíbenosti jednotlivých druhů mas v závislosti na věku i pohlaví. Zatímco u studentů vysokých škol byly preference kuřecího a vepřového masa srovnatelné (77 a 80%), u nižších věkových kategorií (základní školy) převažovala oblíbenost kuřecího masa (91 a 72%). Dívky více preferují nutričně příznivější druhy mas – kuřecí (84%), krůtí (28%) nebo rybí (33%) než chlapci (80, 11, resp. 23%). Věk sehrál důležitou úlohu i v případě konzumního mléka, jehož oblíbenost se stoupajícím věkem klesá. Nejoblíbenějším mléčným produktem byl pak u všech věkových kategorií jogurt. Pokud jde o preference pekařských výrobků, bylo zjištěno, že 45% dotazovaných preferuje bílé pečivo, pro konzumaci vhodnější celozrnné pečivo upřednostňuje 37% respondentů. Vysoce statisticky

průkazný byl zjištěn vliv pohlaví na preferenci pečiva. Chlapci (54%) ve svém jídelníčku upřednostňují bílé pečivo, na rozdíl od dívek, které více preferují pečivo celozrnné (48%). Dotazníkovým šetřením byl zjištěn nízký zájem o konzumaci rybího masa, na rozdíl od vepřového masa, jehož obliba byla nejvyšší. V konzumaci mléka dochází ke klesající tendenci s věkem. Za příznivé lze označit vysokou oblibu jogurtů. Pokud jde o preferenci pekařských výrobků, převládá mezi mladými konzumenty obliba bílého pečiva.

**Klíčová slova:** pohlaví, potraviny, preference, studenti, věk, žáci

## INTRODUCTION

Human health and the prevention of lifestyle diseases are influenced by many factors. The significance of nutrition is indisputable in regards to its positive or negative effect. The issues of rational nutrition are regularly under scrutiny not only by professionals and scientific researchers but also by consumers. In this context, it is often referred to as the food guide pyramid based on nutritional recommendations (Montagnese et al., 2015).

Awareness of a healthy diet is acquired in the early stages of life. Children, as a target group, account for nearly one-third of food product consumers and are affected by their parents' preferences as well as the ever-present media (Calvert, 2008). Other factors, such as social-economics, demographics and religion, also affect the preferences of food consumption (Reisch et al., 2013). Observing and monitoring these influences remains a crucial model for marketing, which in turn determines consumer behaviour and the demand of particular products. A good example of this is the consumption of fish and sea food products, which is strongly influenced by the lifestyle of consumers and of course the availability and price of products on the market (Myrland et al., 2000).

According to Fitzgerald et al. (2010) the habits acquired when choosing food during childhood and adolescence tend to persist into adulthood, including long-term health consequences. From this perspective, adolescents are a very important research group (Pohjanheimo et al., 2010).

The aim of this study was to assess differences in preference for selected food groups (meat, dairy and bakery products) depending on demographic influences – i.e. age and gender in selected levels of schools in the Czech educational system.

## MATERIAL AND METHODS

For this project of surveying food preferences of pupils and students in the South Bohemia region, a set number of schools were approached - eight primary schools, five secondary schools and one regional university (tertiary level of the Czech educational system) during 2012 and 2013. Four primary schools, two secondary schools (a secondary vocational school and a senior grammar school) and the University of South Bohemia agreed to participate in the project.

Questionnaires (n=389) were personally given to the pupils and students, who were in their final year, by a member of the research team while being supervised by the teachers (Table 1). "Final year" is the ninth year of study at primary schools, fourth year at secondary schools, third year (Bachelor degree) and fifth year (Master degree) at the university.

All 141 respondents from primary schools were from towns of fewer than 5,000 citizens (39%) and above 5,000 citizens (61%). Secondary schools (n = 95) were represented by 24% of respondents from vocational school and 76% of respondents from grammar school. The number of respondents at the university level was 153, representing 52% from Bachelor studies and 48% from Master degree students.

**Table 1.** Characteristics of respondents by type of school (age), and gender

Type of school	Number of classes	Gender		Age
		Male	Female	
Primary	5	67	74	14.9 ± 0.5
Secondary	5	36	59	18.7 ± 0.5
Tertiary	8	74	79	23.6 ± 1.3
Total	18	177	212	19.2 ± 3.9

Pupils and students were thoroughly acquainted with the meaning and importance of the project. Each individual question was explained to the respondents. The accuracy of their answers was emphasized and a member of the research team answered all the questions which the students had. The completion of the questionnaire was not limited by time but its duration did not exceed 15 minutes.

Questions, in the questionnaire, were based on the positive or negative preferences of the respondents:

- a) Put the following types of meat in order of preference and state which you do not consume (1. pork, 2. chicken, 3. turkey, 4. duck, goose, 5. beef, 6. mutton, lamb, 7. rabbit, 8. game, 9. fish);
- b) Put the following types of dairy products in order of preference and state which you do not consume (1. milk; 2. fermented milk; 3. yogurts; 4. quark; 5. cheese; 6. butter);
- c) Which of the following types of bakery products listed do you consume more often (1. white bread, 2. whole meal bread, 3. either).

Data gathered by the survey was analysed using computer tools, Microsoft Excel 2007 and Statistica 10.0 (StatSoft, CZ). The frequency of answers is always expressed in the total number of answers given by a particular group. To verify the statistical significance of the dependent qualitative variables, within the contingency tables, the  $\chi^2$ -test was chosen.

## RESULTS

In the first part, the task of the respondents', of selected types of schools, was to identify the three most popular types of meat. The preference frequency for each type of meat shows that the most popular types of meat for the respondents of all the selected schools is chicken (82%) and pork (73%) (Table 2). Respondents from primary and secondary schools mostly prefer chicken whereas students from tertiary schools (the university) prefer pork. More than half of the respondents from secondary and tertiary schools also like beef.

In the second part, the respondents had an option to

select which type or types of meat they do not consume at all. The results show that the least popular meat is mutton (35%) and game (25%). There were a relatively high percentage of respondents who do not consume fish or rabbit (17 and 18% resp.). The survey also reflects that girls choose meat with higher nutritional value, so by comparison with boys they prefer chicken (84 and 80% resp.), turkey (28 and 11% resp.) and fish (33 and 23% resp.).

Another significant group of animal food products is milk and dairy products. Based on the gathered preferences, the most commonly consumed dairy products are yogurt (80%) and milk (72%), however the popularity of milk decreases with age (79%, 73%, 64% resp.,  $P < 0.05$ ) for all school levels.

Another favourable dairy product is cheese (72%), and a relatively high percentage of respondents also like butter (41%). A low number of respondents selected quark (15%) and fermented milk (20%). For respondents from secondary schools, age affected their preference of fermented milk in almost equal ratio of likes/dislikes (34% / 38%). It is possible to presume that these students are in a transitional period and future preferences could shift either way, which can be seen in the tertiary group of respondents (16% / 42%).

Taking gender into account, the most significant difference in positive preferences were found in milk, with boys 78% at and girls at 67% ( $P < 0.05$ ).

Upon analysis of the bakery product preferences, it is apparent that 45% of the respondents prefer white bread. Whole meal bread, which is more suitable for consumption, is preferred by 37% of the respondents (Table 3). Gender played another statistically significant role in the preference of bakery products ( $P < 0.001$ ). Boys (54%) prefer white bread, whereas girls prefer whole meal bread (48%). Still, 37% of girls include white bread in their diet.

**Table 2.** Positive (Pos.) and negative (Neg.) preferences (in %) for various kinds of meat and dairy products depending on type of school (age), and gender

	Type of school							Gender						Total		
	Pos.			P	Neg.			P	Pos.		Neg.		P	Pos.	Neg.	
	P	S	T		P	S	T		M	F	M	F				
Meat																
Pork	72	62	80	**	4	6	0	*	82	65	***	0	5	**	73	3
Chicken	91	78	77	**	1	2	1	ns	80	84	ns	2	1	ns	82	1
Turkey	22	22	18	ns	12	6	5	ns	11	28	***	8	8	ns	21	8
Duck, goose	28	22	8	***	13	15	11	ns	21	17	ns	14	12	ns	19	13
Beef	36	54	52	**	7	3	3	ns	47	46	ns	3	5	ns	47	4
Mutton, lamb	4	4	2	ns	39	27	36	ns	6	1	*	29	40	*	3	35
Rabbit	10	14	20	†	21	18	15	ns	16	13	ns	15	21	ns	15	18
Game	11	13	9	ns	30	26	21	ns	12	9	ns	19	31	**	11	25
Fish	26	32	29	ns	23	14	14	†	23	33	*	17	17	ns	29	17
Dairy products																
Milk	79	73	64	*	9	12	7	ns	78	67	*	8	8	ns	72	8
Yogurt	80	71	86	*	4	5	2	ns	79	81	ns	3	3	ns	80	3
Fermented milk	14	34	16	**	48	38	42	ns	19	20	ns	46	40	ns	20	43
Quark	14	19	14	ns	21	16	10	*	14	17	ns	16	14	ns	15	15
Cheese	68	67	78	ns	11	7	3	*	69	74	ns	7	6	ns	72	7
Butter	44	37	42	ns	13	4	10	†	41	42	ns	10	9	ns	41	10

ns - not significant; † P<0.1; \* P<0.05; \*\* P<0.01; \*\*\* P<0.001.

P - primary school; S - secondary school; T - tertiary school; M - male; F - female

**Table 3.** Positive (Pos.) preferences (in %) for various kinds of bakery products depending on type of school (age), and gender

	Type of school				Gender				Total
	Pos.			P	Pos.		P	Pos.	
	P	S	T		M	F			
Bakery products									
White bread	51	32	47		54	37		45	
Whole meal bread	25	50	39	***	24	48	***	37	
Either	24	18	14		22	15		18	

ns - not significant; † P<0.1; \* P<0.05; \*\* P<0.01; \*\*\* P<0.001.

P - primary school; S - secondary school; T - tertiary school; M - male; F - female

## DISCUSSION

Meat is an important source of proteins with high biological value, B vitamins and a wide spectrum of micro- and macronutrients (Higgs, 2000). From a nutritional point of view, "white" meat (fish, rabbit and chicken) has higher nutritional value, while "red" meat (beef, pork, mutton and game) has lower nutritional value due to its higher content of fat and less suitable profile of amino acids (De Smet, 2012).

The resulting analysis of the respondents' preferences of each type of meat corresponds, to a certain extent, with a long-term trend of meat consumption in the Czech Republic (CZ) (Czech Statistical Office, 2014), where there is also an apparent difference in preference between each type of meat. Whilst the consumption of pork has not varied significantly within the last few years, the popularity of poultry has been increasing, and the consumption of beef has been decreasing. Total meat consumption per year has increased from 33.3 kg per person in 1948 up to its maximum (97.4 kg) in 1989. Since 2005, it has been around 80 kg. In 2015, consumption of meat 79.3 kg was noted, and at that time pork represented 54%, poultry 33% and beef 10%.

Štiková (2004) reported that beef is in terms of popularity, in third place after chicken and pork. One reason for this lower consumption of red meat might be due to the current orientation of many consumers towards their health, as white meat is presumed to be healthier. Further reasons could include the lower prices and easier culinary preparation of chicken. Furthermore, fast-food restaurants, being so popular with younger generations, use more chicken. For a rational diet, the consumption of white meat is optimal. It has been proven that excessive consumption of red meat is one of the factors increasing the risk of colorectal cancer (Larsson and Wolk, 2006).

The results also show that the least favourite types of meat among the respondents are mutton (34%) and game (26%). This could be due to a lower availability on the market, or other factors, such as the consumer's experience, socio-economic status etc. (Casini et al., 2013). Similar reasons might have played a role in the

negative preferences of rabbit or fish (Midland et al., 2000).

According to Nicklaus et al. (2004), the preference of animal products varies for men and women. These changes start to take effect during adolescence, when men gradually begin to prefer animal products, including meat, more and more. According to Mooney and Walbourn (2001), one of the reasons girls tend not to eat meat is due to ethical issues. The results of the survey confirm that girls choose types of meat with higher nutritional value than boys.

Regarding fish, long term consumption in CZ has been low, and in 2015, it was only 5.5 kg per person (Czech Statistical Office, 2016). Whilst the optimal number, according to Dostálová et al. (2012), should be 400 g per week, which is 20.8 kg per year. In the survey, 30% of respondents confirmed a preference for fish above game and mutton, which are the most disliked. According to Nicklaus et al. (2004), one of the reasons for the lower preference of fish is its specific aroma, which is negatively perceived, especially by women. Nevertheless, according to the survey, girls prefer fish more than boys.

The second group of foods was milk and dairy products. Milk is one of the most balanced foods, and therefore it is a highly valuable component of good nutrition. According to Drownowski et al. (2015), milk and dairy products are not only good sources of easily utilized calcium but are also cheap and less energetically demanding than other food sources. The survey demonstrates the difference in preference of milk and dairy products with regards to gender and age. These preferences are actually a combination of both factors (Caine-Bish and Scheule, 2009).

The results agree with the opinion of Ton Nu et al. (1996), who proved that changes in food preference appear in children during adolescence. Based on the results, the respondents prefer to consume yogurt rather than milk, which is better from a nutritional point of view. The preference of yogurt, regardless of age and gender, was at 80%. This high percentage is reflected in the wide variety of yogurt products in the retail market

– products vary according to fat content, the addition of probiotic microorganisms, and flavours (Bayarri et al., 2011). Advertising and parental influence also play a very important role here (Boyland and Halford, 2013).

Compared to yogurt, fermented milk was preferred much less. Age played a large role in the preference of fermented milk. Low consumption of fermented milk drinks in the form of kefir is also reported by Bilici et al. (2012). The survey shows that only 16% of respondents confirm consumption of these products, women showing higher consumption (20%) than men (9%).

With regards to the consumption of bakery products, it is an important group of basic foods. In European countries, wheat-based foods provide 20-30% of daily energy intake (Szira et al., 2014). These foods are important for their content of dietary fibre (Gómez et al., 2002), which has a positive metabolic and physiological effect on the human organism (Rosell and Santos, 2010). According to Szira et al. (2014), whole meal products are of the highest importance, both for their fibre content and the number of biologically active substances.

The survey shows that 45% of the respondents prefer white bread, while 37% prefer the more suitable whole meal bread. According to De la Fuente-Arrillaga et al. (2014) bread from white flour causes high glycaemic index, therefore it also causes higher glycaemic strain than whole meal bread. The authors found a correlation between obesity and white bread consumption.

From the above findings it is conclusive, that it would be desirable to increase the consumption of whole meal bread. It is more tolerable for pupils from primary schools to consume products made from white flour, as Dostálová et al. (2012) recommend only 16-20 g per day of fibre for children between the age of 11 and 15. It is then more appropriate to increase the consumption of whole meal bread for students in secondary and tertiary schools, because of their fibre requirement, which should reach 30 g per person per day in adulthood.

## CONCLUSIONS

Appropriate food choice is an important topic for discussion and research, especially for young age groups. A questionnaire survey concerning the preferences of basic foods among primary, secondary, and tertiary school students has not been carried out to such an extent in the South Bohemia region as of yet. The survey has shown that the interest in fish meat consumption is relatively low, whereas pork is more highly preferred. This preference does not reflect an optimum balanced diet. Milk, which is one of the most nutritionally valuable foods and a great source of calcium, tends to become less preferable with age. This trend can also be viewed as unsatisfactory. However, the high consumption of yogurt amongst all age groups is favourable. With regards to bakery products, the preference of white bread by young consumers prevails, which does not correspond well with proper nutritional requirements. However, nearly 40% of respondents include whole meal bread into their diet, which is positive especially in higher age categories. The added value of this survey is to provide an important information for nutrition specialists of school canteens.

## ACKNOWLEDGEMENTS

This study was supported by projects Grant Agency of South Bohemia University GAJU 002/2016/Z, Ministry of Agriculture of the Czech Republic No. QJ1510336 and No. QJ1610324.

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