

# The attitudes and habits of Serbian preschool children in consumption of meat and fish

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*Abstract:* The goal of this study was to explore attitudes and habits of Serbian preschool children to consumption of meat and fish. Altogether, 60 preschool children from 5 to 7 years old participated in this study. The results showed that 100% of preschool children eat meat and fish. Results showed that 75% of respondents consumed meat once a day. Data analysis of fish consumption frequency showed that participants consumed fish once a week (75%). The most frequently consumed meat was poultry. Preschool children preferred river fish in their diet over sea fish. Also, parental influence in this childhood period is significant.

**Keywords:** preschool children, consumption, fish, meat.

## Introduction

Healthy eating habits are essential for the normal growth and development of preschool children and to prevent nutrition-related diseases later in life (Dietz, 1994). Food habits that develop during childhood are maintained as children entered school (Singer *et al*, 1995), and dietary choices of elementary school-aged children track into adolescent (Kleder *et al*, 1994). Healthy eating habits in childhood are important because they help prevent undernutrition, growth retardation, and acute childhood nutrition problems, such as obesity, coronary heart disease (CHD), type-2 diabetes, and stroke (Nicklas and Hayes, 2008).

Although food habits are not stable and unchanging during a person's lifetime, a basis for healthy food habits can be created in early childhood. Children's food habits can be assumed to be influenced by their parents' food habits and choices (Nicklas *et al*, 2008). Parents can influence their children's food choice by making specific foods available and by acting as models for their behaviour in specific situations. Parental acceptance of meat nutritional recommendations in their own dietary practices may serve to underline attempts to ensure healthful dietary practices of the children (Brewis and Gartin, 2006). Therefore, it is conceivable that parental behaviours and child feeding

practices interact with genetic predispositions to promote the development of problematic eating behaviours or less nutritious food choices in children. Food preferences play a central role in food choices and consumption, and can be described as a general predisposition for particular food, an expressed degree of liking (Nicklaus *et al*, 2008).

The purpose of this study was to provide information about meat and fish consumption by Serbian preschool children in the Republic of Serbia. Heavy food is integral part of Serbian traditions and culture. For many Serbian families, a meal without meat is a rare exception (Sarcevic *et al*, 2013). On the other hand, consumption of fish is not as frequent as is recommended in most countries (FAO, 2008). European public authorities recommended two to three meals that include fish per week. The field of children's food choice and behaviour remains challenging and no children's preferences, purchase behaviour and consumption of food category as well as specific brands within a food category.

## Materials and Methods

The sample frame for this research consisted of preschool children from one public kindergarten in one Belgrade municipality in the Republic of Serbia.

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Convenience sampling was used and a questionnaire was distributed to all preschool children's parents who agreed to participate after they were informed about the goals of this research and to provide information about children's eating habits with respect to consumption of meat and fish. A total of 60 preschool children, aged 5–7, participated in this study.

Parents participated in the investigation instead of their children, and they were asked to fill out a questionnaire designed by authors to collect appropriate data. Descriptive statistics, analysis of variance (ANOVA) and post-hoc Tukey-Kramer HSD test were used for analysis of collected results. Data were arranged and analysed using Microsoft Office Excel software.

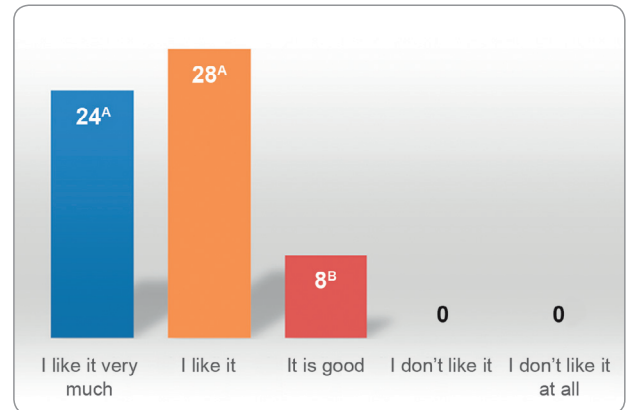
## Results and Discussion

In this study, we started the investigation from the hypothesis that preschool children usually consume meals prepared at home, created by their parents. Parents' education and nutritional knowledge might have long-term effects on health outcomes. Vereecken *et al.* (2004) have established that better maternal nutritional knowledge was associated with better diets for children, although their influence increased with child age. Results of our survey presented in Table 1 showed that 100% of respondents ate meat and fish.

**Table 1.** The percentage of responses to the question Do you eat meat/fish?

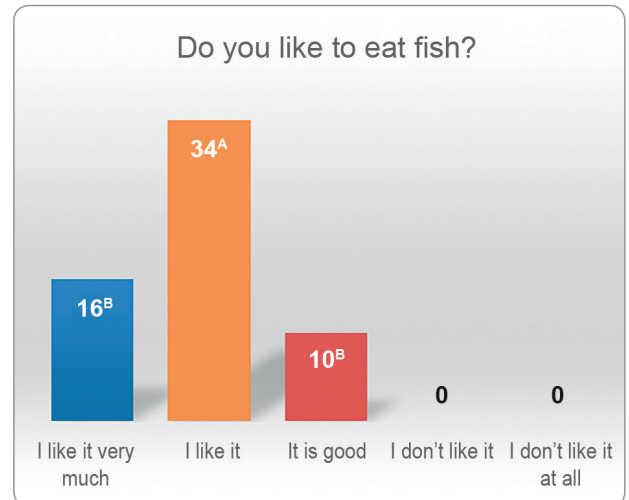
Meat		Fish	
Yes	No	Yes	No
60	0	60	0
100%	0	100%	0

Parental acceptance of nutritional recommendations for meat in their own dietary practices may serve to underline attempts to ensure healthful dietary practices of the children (Brewis and Gartin, 2006). In Figure 1, results showed that there was no significant difference between the answers "I like it very much" and "I like it" and they can be considered as one group of answers to the question "Do you like to eat meat?". Almost 90% of responses to the question "Do you like to eat meat?" were in this group.



**Figure 1.** Level of preference in consumption of meat by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

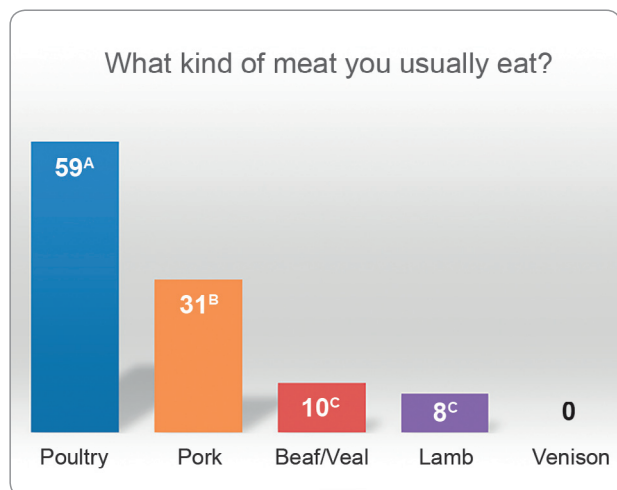
Answers to the question "Do you like to eat fish?" showed that "I like it" was reported by fewer than half of them (Fig 2). Results of ANOVA demonstrated that there was no significant difference between the number of respondents stating "I like it very much" and "It is good". However, no respondents replied "I don't like it" or "I don't like it at all", as was the case for the question "Do you like to eat meat?".



**Figure 2.** Level of preference in consumption of fish by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

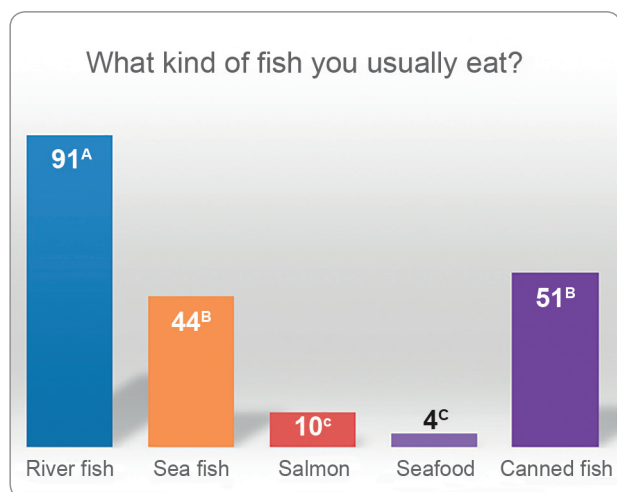
The ratios between the answers "I like it very much" and "I like it" for consumption of meat and fish imply that preschool children prefer to eat meat rather than fish, which is in line with Serbian eating culture and cuisine.

The most common answer to the question "What kind of meat do you usually eat?" (Fig 3) was poultry (98.33%), then pork (51.67%) and then



**Figure 3.** Preference for species of meat consumed by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

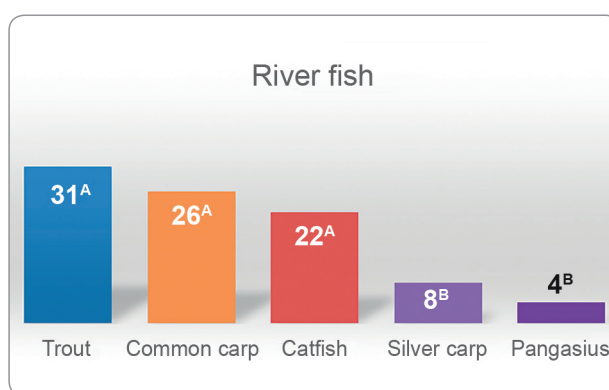
followed beef/veal (16.67%) and lamb (13.33%), with no significant difference between these two meat species ( $P > 0.05$ ). Similarly to our investigation, in 2007, the Australian National Children’s Nutrition and Physical Activity Survey was conducted to provide data on nutrition and meat consumption of Australian children (Bowen et al, 2012). The data indicated that 90% of enrolled children, aged 4–8 years, consumed poultry, pork, beef/veal and lamb, which is very close to the results we obtained. Also, this is in accordance with previous statements regarding the position of meat in Serbian attitudes and eating habits, as a very nutritious food in everyday use (Sarcevic et al, 2013).



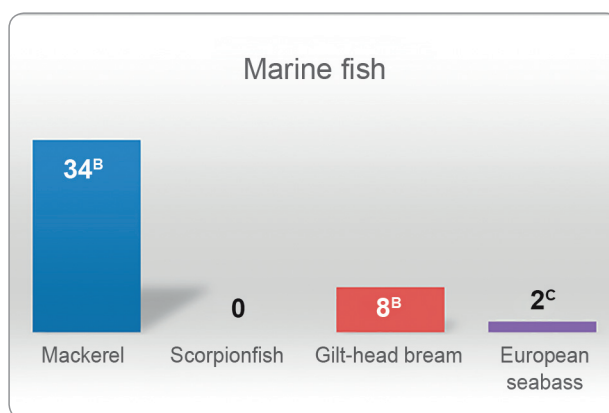
**Figure 4.** Preference for type of fish consumed by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

Results showed that responses to the question “What kind of fish do you usually eat?” can be sorted into three groups (Fig 4). River fish was the most favoured kind and comprised the first group, sea fish and canned fish comprised the second group, and the third group consisted of salmon and sea food, which were the least preferred types of fish.

Results of statistical analysis shown in Figure 5 showed that there was no significant difference between children’s preference for consumption of trout, common carp and catfish. The children enrolled in the study consumed silver carp and pangasius less often than the other three types of river fish.

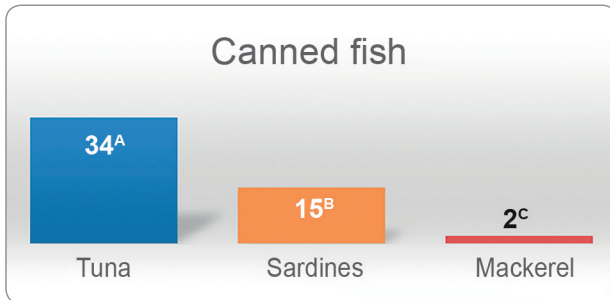


**Figure 5.** River fish consumption by preschool children (different letters indicate statistical significance,  $P < 0.05$ )



**Figure 6.** Sea fish consumption by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

Preschool children consumed more mackerel than any other type of marine fish (Fig 6). In Fig 6, no significant differences were observed in consumption frequency of scorpion fish and European sea bass, and these fish seem to be neglected by respondents.

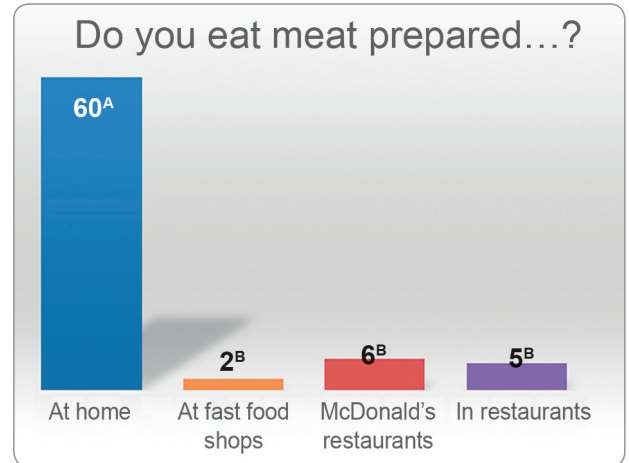


**Figure 7.** Canned fish consumption by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

Data analysis of the kinds of canned fish consumed showed that, unlike sea fish consumption, mackerel was consumed the least frequently, and tuna was the most favoured canned fish.

Statistical analysis of responses demonstrates that 3/4 of participants consumed meat once a day (Fig 8). There were no observed significant differences between the other answers. Data analysis of fish consumption frequency showed that many participants (75%) consumed fish once a week. No differences were noticed between the other answers.

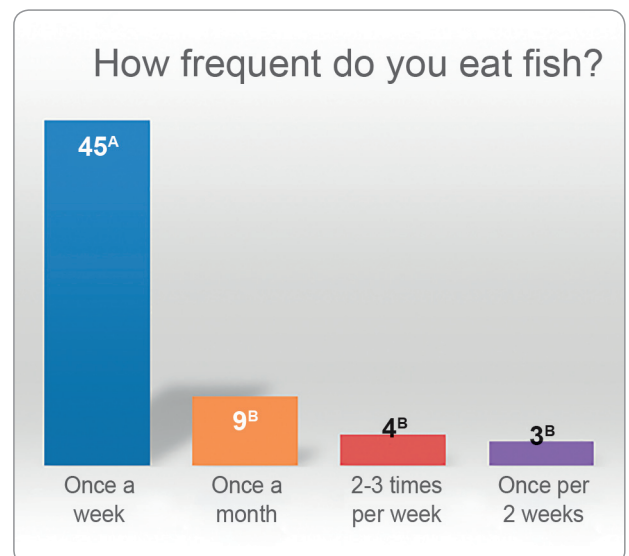
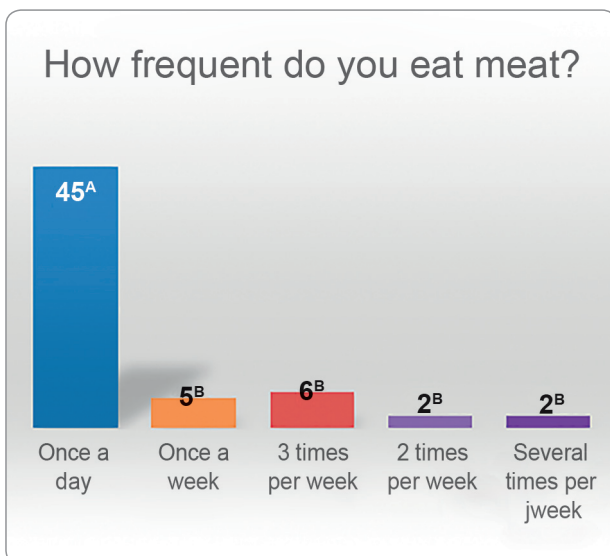
For both questions regarding place of consumption (Figs 9 and 10), Do you eat meat prepared at...? and Do you eat fish prepared at...?, reported answers in this survey showed that 100% of parents routinely prepared meat and fish meals at home. Children sometimes ate meat or fish outside the home, but these occasions were relatively rare.



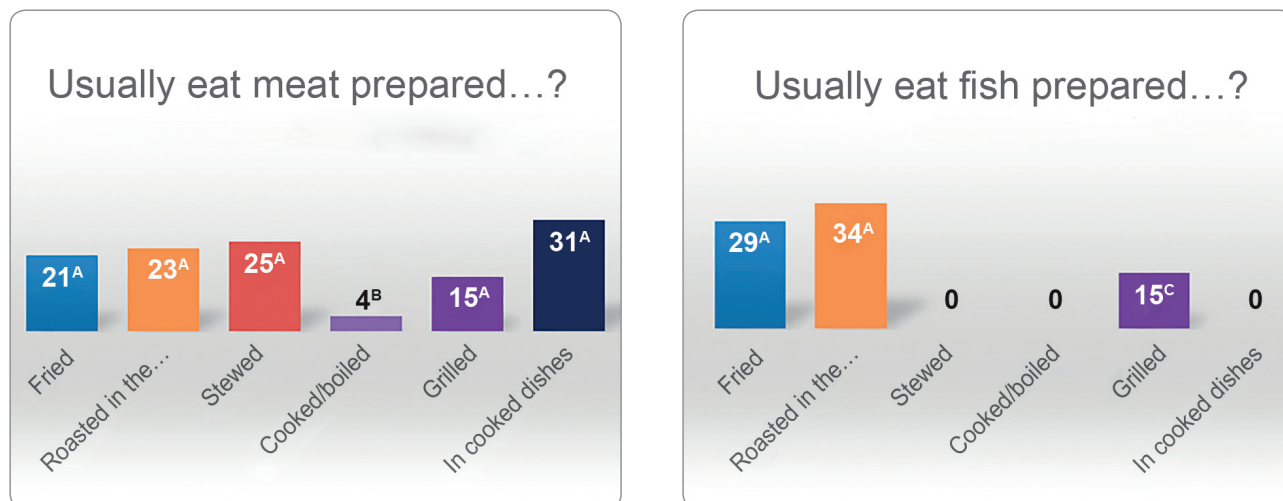
**Figure 9.** Reported place of meat consumption (different letters indicate statistical significance,  $P < 0.05$ )



**Figure 10.** Reported place of fish consumption (different letters indicate statistical significance,  $P < 0.05$ )



**Figure 8.** Frequency of meat and fish consumption by preschool children



**Figure 11** Method of food preparation for meat and fish consumed by preschool children (different letters indicate statistical significance,  $P < 0.05$ )

Results of ANOVA showed that no statistical differences were observed for the method of meat preparation, except for boiling, which was rarely used. The preferred kinds of fish preparation were roasting in the oven and frying, less favoured was grilling, while stewing, boiling and utilisation in complex dishes containing non-fish ingredients were not used at all.

## Conclusion

Parental influence on preschool children's attitudes and habits with regard to consumption of meat and fish is predominant and hence in some part

interpretation of survey results should be considered with caution. According to the results of our survey, we can conclude:

- Preschool children consumed meat rather than fish;
- Fish is not consumed as often as is recommended by European Union authorities;
- Preschool children consumed river fish rather than sea fish;
- For preschool children, meals were prepared in 100% of the homes, which should give parents the opportunity to provide education on proper nutrition. The impact of restaurants and fast food was negligible.

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## References

- Bowen, J., Baird, D., Syrette J., Noakes M. & Baghurst, K. (2012).** Consumption of beef/veal /lamb in Australian children: Intake, nutrient contribution and comparison with other meat, poultry and fish categories. *Nutrition and Dietetics*, 69 (2), 1–16.
- Brewis, A. & Gartin, M. 2006.** Biocultural construction of obesogenic ecologies childhood: parent feeding versus child eating strategies. *American Journal of Human Biology*, 18, 203–213.
- Dietz, W. (1994).** Critical period in childhood for the development of obesity. *American Journal of Clinical Nutrition*, 59, 995–999.
- FAO 2008.** The state of the world fisheries and aquaculture. Rome, Italy: FAO fisheries and aquaculture development, Food and Agriculture Organization of United Nations.
- Kleder, S., Perry, C., Klepp, K. & Lytle, L. (1994).** Longitudinal tracking of adolescent smoking, physical activity and food choice behaviors. *American Journal of Public Health*, 84, 1121–1126.
- Nicklas, T. A. & Hayes, D. (2008).** Position of the American Dietetic Association: Nutrition guidance for healthy children ages 2 to 11 years. *Journal of American Dietetic Association*, 108, 1038–1044; 1046–1047.

- Nicklaus, S., Boggio, V., Chabanet, C. & Issanchou, S. (2004).** A prospective study of food preferences in childhood. *Food Quality and Preferences*, 15 (7), 805–818.
- Sarcevic, D., Djordjevic, V., Petronijevic R., Matekalo-Sverak, V., Karabasil, N., Popovic, Lj. & Jankovic, V. (2013).** The attitudes and habits of Serbian schoolchildren in consumption of meat. *Tehnologija Mesa*, 54, 2, 160–167.
- Singer, M., Moore, L., Garrahe, E. & Ellison, R. (1995).** The tracking of nutrient intake in young children: the Framingham children's study. *American Journal of Public Health*, 85, 1673–1677.
- Vereecken, C., Keukelier, E. & Maers, L. (2004).** Influence of mother's education level of food parenting practices and food habits of young children. *Appetite*, 43, 93–103.

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