

MACRONUTRIENT CONTRIBUTION TO TOTAL ENERGY INTAKE IN INFANTS, TODDLERS AND CHILDREN UNDER 9 YEARS

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Introduction

Macronutrients are the major source of energy in diet and include carbohydrates, proteins and fats. Balanced intake of macronutrients is essential for growth and development in early stages of life. In today's society, various trends related to eating habits are noticed. This research was conducted as a pilot study for Food Consumption Survey on Infants and Children in Croatia 2017-21. Primary goal of this research is to determine the eating habits of children in the Republic of Croatia. The data obtained from this research will be used for food intake assessment, developing national nutritional guidelines, exposure and food-related risk assessment.

Participants and methods

Study was done in February 2019 on randomly selected population from cities of Osijek and Zagreb. 43 children aged 3 months to 9 years, and their parents who participated in this study are presented in **Table 1**. One face-to-face interview and two computer assisted telephone interview (CATI) were conducted with each participant (**Figure 1**). A face-to-face interview included measuring height and weight of the children, completing a general questionnaire and FPQ. The food diary was kept for two non-consecutive days by parents themselves and entries were checked by interviewers.

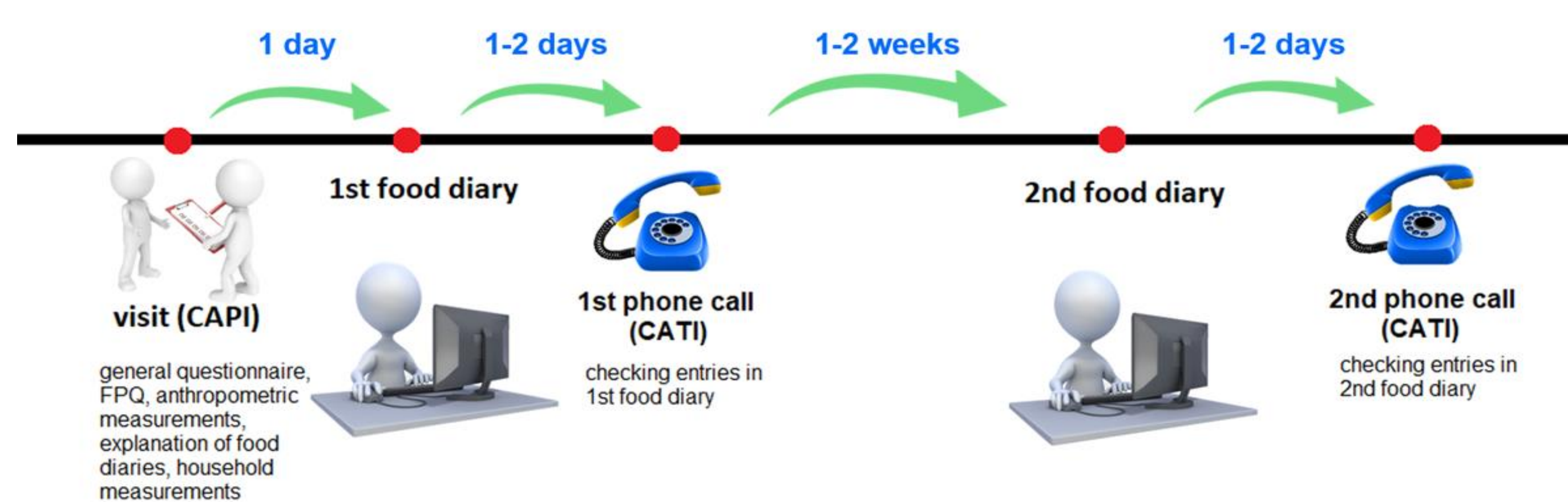


Figure 1 Study methodology timeline

Table 1 Participant characteristics and intake of macronutrients

Age	N (total)	Male	Female	Osijek	Zagreb	proteins			fats			carbohydrates		
						Mean (g/day)	min (g/day)	max (g/day)	Mean (g/day)	min (g/day)	max (g/day)	Mean (g/day)	min (g/day)	max (g/day)
<1	13	7	6	7	6	28,34	11,67	53,51	31,22	17,1	49,99	115,13	53,13	172,42
1-3 yr	13	8	5	7	6	37,91	9,99	72,71	45,15	15,94	80,84	148,27	48,31	298,57
4-9 yr	17	8	9	11	6	45,58	13,96	80,29	49,23	15,51	104,21	176,73	74,44	259,24

Results

Average energy intake for infants was 768 kcal/day, for toddlers 1045 kcal/day and for children 1506 kcal/day, with carbohydrates as predominant energy source for all age groups (**Figure 2**). Average daily intake of macronutrients in gram per day are presented in **Table 1**. The majority of the results were in agreement with the recommendations for the targeted population. 38.46% of infants exceed the recommendations for carbohydrate intake, meanwhile the recommendations for fat are exceeded in 15.38% of respondents, while 46.15% of them have a lower intake. 7.7% of children between 1 and 3 years of age exceed the protein intake recommendations while the same percentage of participants had lower intake of fats and carbohydrates than recommended. 11.76% of children over 3 years of age have a lower protein intake than recommended, as do 17.65% of children for carbohydrates. On the other hand, the same percentage of children (11.76%) have exceeded fat intake given by the recommendations while 46.15% had lower intake of fats than recommended.

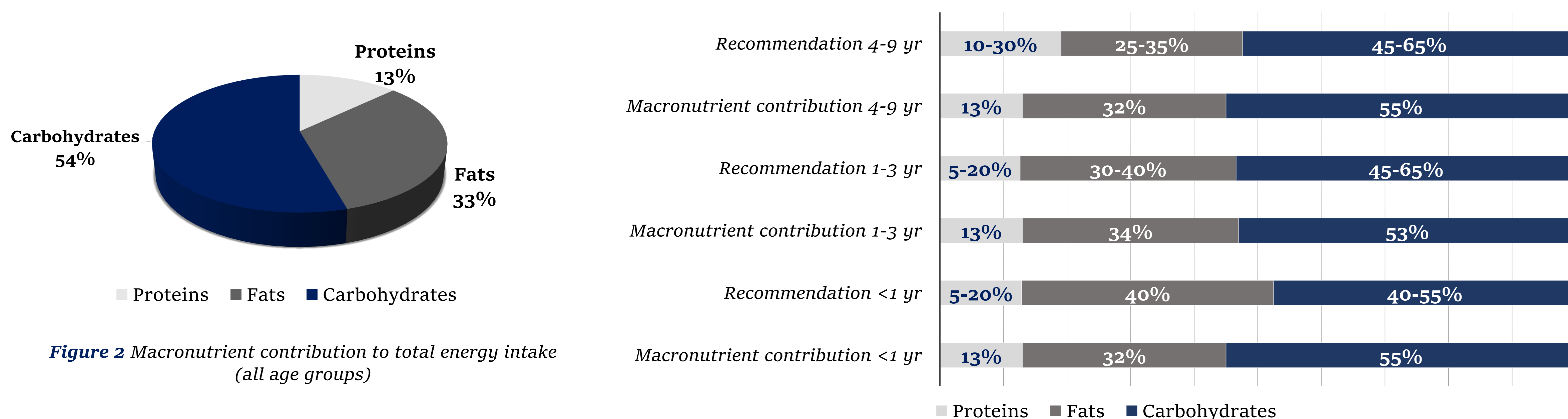


Figure 2 Macronutrient contribution to total energy intake (all age groups)

Figure 3 Comparison of macronutrient contribution in total daily intake with age group recommendations

Conclusion

Dietary intake of the participants contained more energy from carbohydrates than fats and proteins. The majority of the results were in line with the recommendations for the target population. Several participants exceed recommendations for their age group, but worrying result is low intake of fats for 30% of children in total. Reasons for this result can be various and are yet to be confirmed on a larger sample.

