

National Study Plan: Trans Fatty Acids in Breast Milk in the Czech Republic

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This study is organized in cooperation with the Ministry of Health and all 14 Regional Health Authorities in the Czech Republic in 2017.

Introduction

- Breast milk is the only source of nutrition of infants that are fully breastfed. To a certain extent it's composition depends on diet of breastfeeding women. That is why content of some of the breast milk components, e.g. fat acids (FA), trans fatty acids (TFA), can oscillate and according to a diet composition.
- Due to the proven negative influence the amount of TFA in diet should be minimized during a lifespan. According to EFSA and WHO (2010) the daily energy intake from fats should be 20 - 35 %, from which content of saturated FA (SFA) and TFA in diet should be as low as possible (SFA within 10 % and TFA within 1 % from the daily energy intake). As in other countries, there is an effort to reformulate food composition to minimize or even eliminate partly hydrogenated fats containing TFA from the Czech market.
- Table 1 shows an amount of TFA in breast milk and its changes in some countries during past years when reformulation of food is going on.
- Previous results of similar studies in the Czech Republic signaled average content about 3-4 % TFA from total fat content (Wt%) in breast milk.

Table 1. Amount of TFA in breast milk as measured in selected countries

Country	Year of the study, author	Content of TFA in breast milk (Σ Wt %) *
CZE	2002 (DLOUHÝ P. et al.)	4,2 ± 1,9 (1,8 – 9,8)
	2007 (MARHOL P., DLOUHÝ P. et al.)	3,13 ± 1,26 vs. 3,78 ± 1,88
Turkey	2009 (SAMUR G. et al.)	2,13 ± 1,03
Poland	2003 (MOJSKA H. et al.)	1,37 (1,00 – 2,00) vs. 1,80 (1,42 – 2,48)
		2,59 (1,49 – 3,34) vs. 2,41 (1,79 – 4,31)
		2,36 (1,55 – 3,92) vs. 2,77 (1,53 – 4,18)
USA	2005 (MOSLEY E. E. et al.)	7,0 ± 2,3
Canada	1995 (CHEN Z.Y. et al.)	7,2 ± 3,0 (0,1 – 17,2)
	1998 (INNIS S.M. et al.)	7,1 ± 0,32
	2006 (FRIESEN R. et al.)	6,2 ± 0,48 vs. 4,6 ± 0,32
	2014 (RATNAYAKE W. M. N. et al.)	2,7 ± 0,9 (1,4 – 7,2) vs. 1,9 ± 0,5 (0,9-3,9)
Greece	2013 (ANTONAKOU A. et al.)	0,78 (± 0,47) vs. 0,19 ± 0,34
Germany	2010 (SZABÓ E. et al.)	1,55 (1,73) vs. 1,43 (1,55)

* Range of analyzed TFA can be influenced by sampling and analytical methods

Work hypothesis

- Ongoing changes in food composition (reformulation) decreased intake of TFA from usual Czech diet, therefore content of TFA in breast milk decreased at least about 1%.

Study objectives

Results should be representative for the Czech Republic, not to compare individual regions. Based on results from previous Czech studies we calculated minimum number of breast milk samples at least 43 for statistical significance CI95%.

I. Random collection of 3-5 (mature) breast milk samples in each of 14 Czech regions

II. Mapping of usual dietary habits of breastfeeding women

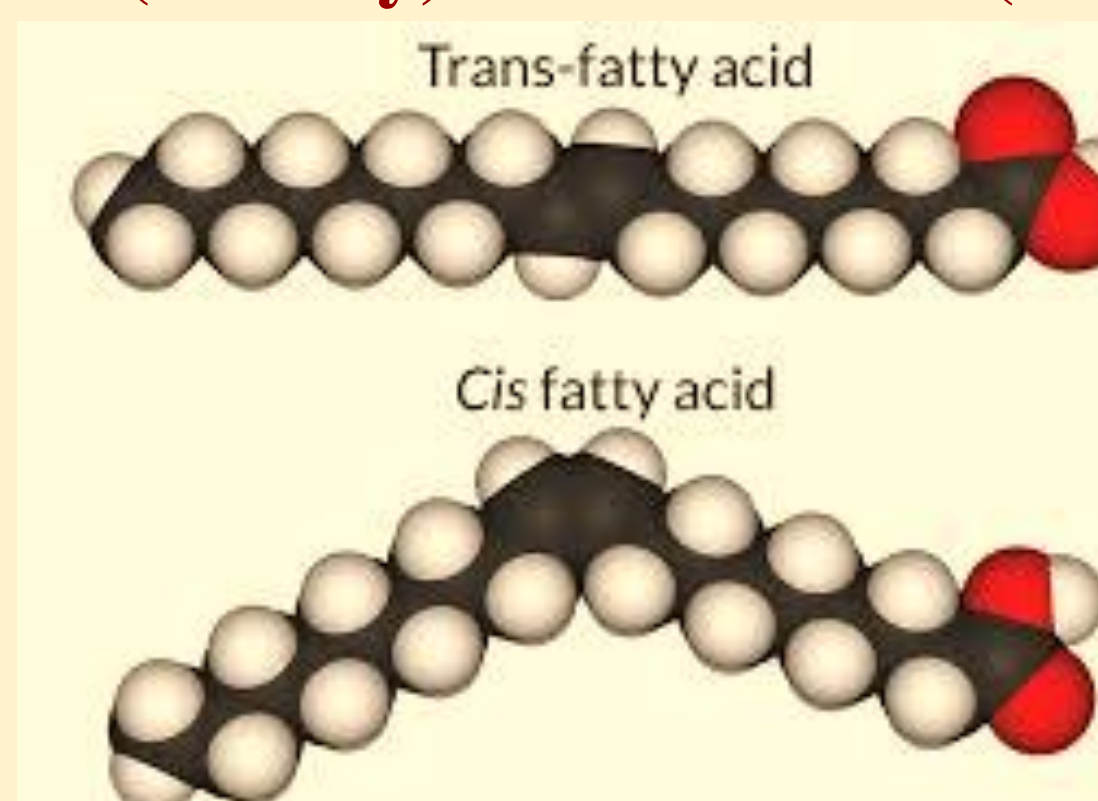
III. Analyses of mature breast milk considering contents of TFA and other FA

(in a case of sufficient volume of milk sample we will analyze also content of iodine)

IV. Statistical analyzes of results and evaluation of trends



Cis-FA (healthy) and Trans-FA (unhealthy)



Study expects these TFA sources in the usual Czech diet for 18-40 years old women

National Institute of Public Health, Centre for Health, Nutrition and Food evaluated total fat intake and TFA from usual diet (Ruprich, J. et al., unpublished data, 2016) for 18 – 40 years old Czech women (potentially fertile respondents). Median of fat intake was 86 g/person/day, median of TFA intake) was 1,08 g/person/day. Figures 1 and 2 show food groups that are the most common exposure sources of total fat and TFA in usual Czech diet.

Fig 1. The most common exposure sources of total fat in the usual Czech diet

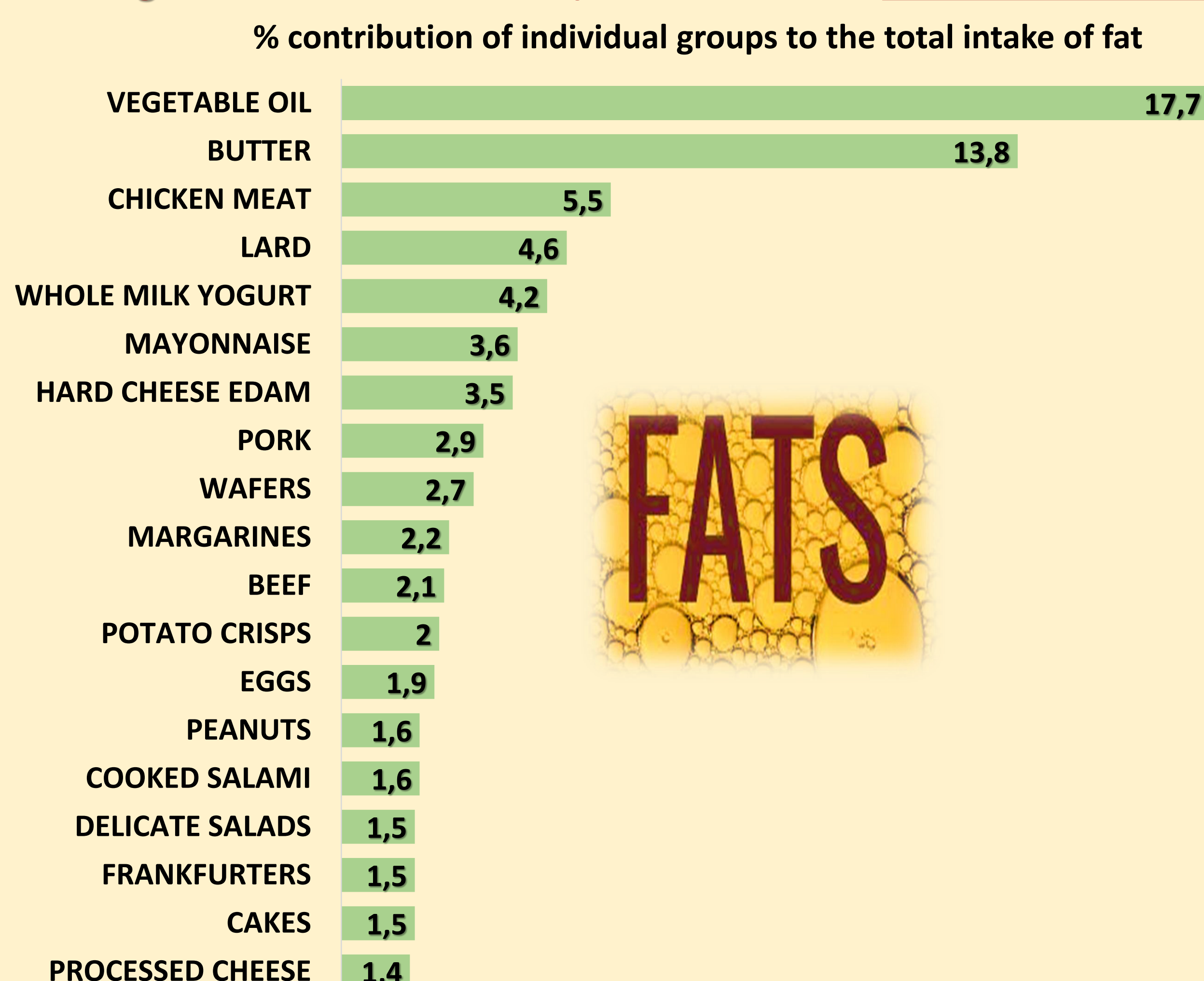


Fig 2. The most common exposure sources of TFA in the usual Czech diet

