

Trans fats and cardiovascular health: What is the current situation?

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Dutch researchers from the department of Health Sciences and the [EMGO Institute for Health Care Research](#) of VU University, in Amsterdam, and the [Division of Human Nutrition of Wageningen University](#), have published a paper in the European Journal of Clinical Nutrition, concluding that detrimental effects of industrial trans fatty acids (TFAs) on heart health are beyond dispute and that limiting their intake will likely lower cardiovascular disease (CVD). In addition, effects specific to trans fatty acids that are naturally present in dairy and meat and trans fatty acids produced as supplements for weight loss (conjugated linoleic acid) warrant further study.

TFAs are unsaturated fatty acids with at least one double bond in the trans configuration, whereas most unsaturated fatty acids have a cis configuration. This makes the shape of the TFA straighter, similar to saturated fatty acids. TFAs can be formed during the food production process (industrial) and can also be naturally present in dairy and meat (ruminant). A range of different TFA isomers – molecular structures – exist. The relative amounts of these isomers vary between industrial and ruminant trans fat. Scientific evidence supports an association between consumption of industrial TFA and increased risk of CVD. In response to that, action from the food industry (such as food reformulation, food labelling) and actions from governments has resulted in a considerable decrease in TFA consumption over the last two decades. TFA consumption currently ranges between 1-2% of energy intake among the European population.

In the paper from Brouwer, Wanders and Katan (2013), the researchers have summarised the evidence from human studies, examining the relationship between all TFAs and cardiovascular health. Besides industrial and ruminant TFAs, they also discussed conjugated linoleic acid (CLA), which originates from milk, but is now industrially produced and sold as a supplement intended to aid weight loss. Finally, they examined whether there are any unresolved important questions, and what the focus of future research should be.

By pooling data from the available studies, the researchers calculated that, gram for gram, all TFAs (regardless of origin) similarly worsen the blood lipid profile towards a higher risk of developing CVD. However, ruminant TFA consumption is very low, making the relevance of these fatty acids for cardiovascular health debatable. This is not the case for CLA, as recommended dosages of this supplement go up to 6 grams/day. To put this amount into context, the World Health Organization recommends TFA intakes below 1% of dietary energy, which corresponds to about 2.2 grams/day for someone with a daily energy need of 2000 kcal.

The authors conclude, from both observational studies on CVD and intervention studies on lipid profiles in the blood, that the adverse health effects of industrial TFA consumption have been scientifically established, and limiting TFA consumption will likely reduce CVD risk. Further studies into these TFAs is not a top research priority and future research should therefore focus on finding alternative ingredients, especially in the bakery sector, where replacing TFAs is particularly challenging without compromising product characteristics, such as baking stability.

Yet, one important question remains unsolved: what is the exact mechanism for the effect of TFAs on CVD? The researchers state that the effects seen in observational studies are larger than can be explained by TFA-mediated changes to blood lipids alone. They postulate that TFAs may have other adverse effects through pathways including systemic inflammation, oxidative stress, endothelial function and insulin resistance or diabetes.

For further information:

[Brouwer IA, Wanders AJ & Katan MB. \(2013\). Trans fatty acids and cardiovascular health: research completed? European Journal Clinical Nutrition 67\(5\): 541-547. doi: 10.1038/ejcn.2013.43](#)