Scientific input to the Commission Report on Trans Fatty Acids

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Outline

- **Background: EC report & *trans fats***
- Trans fats in food and diets in the EU
- Existing policies & policy options at EU level
- *(Cost-)effectiveness of policy interventions*
Commission report on trans fat

Article 30 (7) of Regulation (EU) No 1169/2011

"By 13 December 2014, the Commission, taking into account scientific evidence and experience acquired in Member States, shall submit a report on the presence of trans fats in foods and in the overall diet of the Union population.

The aim of the report shall be to assess the impact of appropriate means that could enable consumers to make healthier food and overall dietary choices or that could promote the provision of healthier food options to consumers, including, among others, the provision of information on trans fats to consumers or restrictions on their use; The Commission shall accompany this report with a legislative proposal, if appropriate."
Issues addressed by the JRC

- Health issues linked to *trans* fat intake
- Presence of *trans* fats in foods & diets in the EU → Literature survey (JRC) & input from MS, stakeholders
- Evidence on/experience with measures for reducing *trans* fats in foods and diets → Literature review, including reports from outside the EU (JRC) & input from MS, stakeholders
- Assessing impact of possible EU measures → Assessment based on scientific evidence and modelling (JRC) & input from MS, stakeholders
Health issues linked to *trans* fats intake

- Increased risk for **coronary heart disease** (CHD) (e.g., Willett *et al.*, 1993; EFSA, 2010)
- "The consumption of TFA increases the risk of heart disease more than any other macronutrient..."
  -> For every 2%E/day *trans* fats replacing carbohydrates, saturated, *cis* mono-unsaturated, or *cis* poly-unsaturated fat CHD risk increases by 24%, 20%, 27%, 32%, respectively (Mozaffarian & Clarke, 2009)

- Possibly increased risk also for: breast cancer, insulin resistance, metabolic syndrome, inflammation, endothelial dysfunction, adiposity (EFSA, 2010; Mozaffarian & Clarke, 2009)
Recommendations for *trans* fat intake

- **EFSA** (2010): "...*trans* fatty acids intake should be as low as is possible within the context of a nutritionally adequate diet."

- "**As low as possible**: Nordic Countries (2012), Netherlands (2001); USA (2005)

- **<1% of energy**: Germany-Austria-Switzerland (2008); WHO/FAO (2003)

- **<2% of energy**: United Kingdom (1991), France (2001)
Sources of *trans* fats

- **Naturally occurring in ruminant fats**
  -> Ruminants synthesize *trans* fats via microbial fermentation of ingested feed

- **Industrially produced**
  -> main source: during hardening (hydrogenation) of liquid vegetable (and rarely fish) oils to achieve desired functional properties and added to foods
  -> *trans* fats are formed during *incomplete* (partial) hydrogenation of oils/fats
Ruminant vs industrially produced trans fats (rTFA vs iTFA)

- Different proportion of TFA in fat (2 to 3% rTFA vs <1% to >50% iTFA)
- Essentially contain the same individual trans fatty acid compounds but in different proportions (e.g., vaccenic acid, 18:1t11 dominant in rTFA vs elaidic acid 18:1t9 in iTFA)
- Different preferential positions in triacylglycerols (sn-1(3) of 18:1t11 in rTFA vs sn-2 of 18:1t9 in iTFA)
- Similar (adverse) effects on blood lipids
- "The available evidence is insufficient to establish whether there is a difference between ruminant and industrial trans fatty acids consumed in equivalent amounts on the risk of coronary heart disease." (EFSA, 2010)
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Assessing the current situation by JRC

- A structured but broad literature search of articles in the English language from 2005 to present (2013)
  However, due to lack of data:
  -> year later adapted to 2003 for intakes;
  -> selected additional publications in other languages added
- Geographic coverage: EU MS, acceding, candidate and potential EU candidate countries

→ presence of trans fats in foods
→ dietary intake of trans fats
Most foods had low amounts (< 2% TFA in total fat) of or no TFA at all, HOWEVER, some had moderate amounts of TFA, and a few still had high or very high amounts of TFA.

This analysis summarises data for 1225 food items.
Observations and limitations

- Geographic coverage: 19 EU MS + CH, RS, TR
- Majority of foods sampled now 4-7 years ago
- Non-representative sample of food items;
  -> most common: biscuit, bun, cake and pastry products (35%); fats and oils; convenience, fast food, and bread products
Recent updates on TFA in foods

- Sampling biscuits/cakes/wafers with ‘partially hydrogenated vegetable fat’ (or similar) on the list of ingredients in 20 European countries in 2013,
  -> no foods were found in 7, foods with 'intermediate' TFA levels in 4, and foods with 'high' TFA levels in 9 countries;
  -> of 5 countries where sampling took place in the same way in 2006, 3 had similar and 2 lower TFA levels in 2013 (Stender et al., 2014)
- Same study approach in 6 SE-European countries with foods sampled in 2012 and 2014:
  -> Number of identified products increased (new products introduced) and number of products available on the market that exceeded 2% TFA in fat ≈ doubled from 2012-2014 (Stender et al., 2016)
- Total TFA content in the fat in products from various categories sampled in 2013 in PT ranged from 0.06% to 30.2% (average 1.9%); 19% of the samples had more than 2% TFA in fat (Costa et al., 2016)
TFA intake in the EU - males

Average TFA intakes varied between 0.4 and 1.1 E%.

Boxplot representing TFA intake (reported as contribution to total energy intake) for males stratified by age range.
Boxplot representing TFA intake (reported as contribution to total energy intake) for females stratified by age range.

Average TFA intakes varied between 0.4 and 1.2 E%.
Observations and limitations

- 13 studies, original research and national surveys
- Geographic coverage: 9 EU MS; important gaps in E/SE
- Half of the studies are now 7-10 years old
- Representative of the national population only in 4 MS
- Some studies may not or incompletely include ruminant TFA intakes (average intakes 0.4-0.6 E%)
Updated estimates for TFA intakes

- Based on updated information from EU MS on TFA intakes and the contributions from rTFA and iTFA (SWD(2015) 268 final) we estimated an average of $\approx 0.3 \pm 0.19$ E% iTFA intake in the EU across sex and age groups (unpublished data).

- Based on modelling, adult (males and females $\geq 20$ years) population total TFA consumption estimates in 28 EU countries in 2010 ranged from 0.8 to 2.4 E% (Micha et al., 2014). From this modelled data we estimated an average EU population TFA intake of $\approx 1.2$ E% and an average iTFA intake of $\approx 0.7$ E% (unpublished data).
Population averages vs high trans fat intakes in parts of the population

- Population intakes at the 95th percentile (P95) ranged from 0.8-3.3 E% in children, and 0.9-1.7 E% (2.7 E% at P97.5) in adults (EFSA, 2010)
- Approximately 10% of the population in DE were estimated to have TFA intakes between 1 and 2 E% (BfR, 2013)
- 1-5% of the population in NL were estimated to have TFA intakes above 1 E% (RIVM, 2011)
- Lower income groups had higher TFA intakes (mean: 1.3 E%; P97.5: 1.8-3.1 E%) than the general population (mean: 0.7-0.8 E%) (Allen et al., 2015; Nelson et al., 2007)
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Mapping existing measures*

- **Legal limits:** Denmark, Austria, Hungary, Latvia, Switzerland, Liechtenstein, Iceland, Norway, Greece (only for school food), EU (on infant formulae and follow-on formulae), USA (on partially hydrogenated oils), South Africa, Singapore, Chile, Brazil, Argentina, Colombia, India, Saudi Arabia, United Arab Emirates, California, NYC, Philadelphia, British Columbia, Puerto Rico

- **Mandatory declaration of trans fat amounts:** USA, Canada, Hong Kong, Taiwan, South Korea, Paraguay, Chile, Argentina, Uruguay, Brazil, Colombia, India, Saudi Arabia, United Arab Emirates

- **Voluntary provision of information on trans fats:** Australia & New Zealand (becomes mandatory in combination with certain nutrition claims), Israel, China, Cuba, Malaysia

- **Nutrition claims about trans fats allowed:** USA, Canada, Australia, New Zealand, Saudi Arabia

- **Voluntary agreements:** Belgium, Bulgaria, Estonia, Finland, Germany, Malta, The Netherlands, Poland, United Kingdom, Canada, Costa Rica, Argentina, South Korea, San Francisco

*subject to correction*
EU policy options considered

- Mandatory TFA content declaration
- Setting legal limits for restricting use of industrially produced *trans* fats
- Voluntary agreements at EU level to reduce industrially produced trans fats
- No action
Assessing impacts of policy options

Issues to be addressed/considered:

- Public health benefits
- Burden (costs) to food industry (SMEs)
- Technological alternatives
- Costs to the public
- Food prices
- Consumer literacy/motivation
- Health inequalities
- Environmental impacts
- Trade
- Functioning of the internal market
- Competitiveness/Innovation
- Proportionality of measure
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Evidence on the effectiveness of existing policy interventions

- All measures seem to be accompanied by significant reductions in food TFA content, however, the largest reductions have been linked to legal limits (Downs et al., 2013)
- Incidence of coronary deaths decreased by about 14.2 deaths per 100,000 people (≈4% reduction) in DK following introduction of a legal limit (Brandon et al., 2015)
- iTFA intake in the US decreased from 2 E% to 0.6 E% from before 2003 (introduction of TFA labelling) to 2009 (Doell et al., 2012)
- Low consumer awareness for TFA in the EU and challenges for consumers in making complex decisions (TNS, 2014)
- Data from various studies based on food sampled between 2006 and 2014 suggest that voluntary agreements have led to (virtual) removal of iTFA from foods in some countries but not in others (e.g., Stender et al., 2012, 2014, 2016; Ansorena et al., 2012; Costa et al., 2016; BfR ,2013)
Economic evaluation of TFA policy options

Methodology:

- Mathematical model (Markov model) to estimate the future costs and effects of 3 policy options (legal limit, mandatory TFA labelling and voluntary agreements) against no action at EU level.
- Analysis of different scenarios (uncertainty in current TFA intake levels in the EU) and probabilistic sensitivity analysis addressed to test parameter uncertainty.
- Taking a societal perspective including direct health care costs (government), other direct costs (interventions from government), indirect costs (incurred by patients) and loss of productivity.
Study findings

• Taking EU-level action towards reducing population TFA intakes can provide additional health benefits and reductions in public spending.
• Both a legal limit and voluntary agreements would produce large enough CHD morbidity and mortality reductions that the related costs reductions outweigh the costs linked to the implementation of these strategies.
• Introducing mandatory labelling would also provide additional health benefits but the measure would likely not be cost-effective.
• Introducing a legal limit at EU level would produce the greatest health benefits of the options considered in this study.

Reminder: A cost-effectiveness analysis provides only one element to be considered when comparing policy options!

(-> Martin Saborido et al., submitted for peer reviewed publication)
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Key EC references:
• Food information to consumers – legislation:
• Commission report on TFA:
• Commission staff working document:
• JRC Report (2014): "Trans fatty acids in Europe: where do we stand?":
• JRC workshop report (2013): "Trans fatty acids in Diets: Health and legislative implications":
• TNS (2014): "Study on the Impact of Food Information on Consumers’ Decision Making":