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# Scientific input to the Commission Report on Trans Fatty Acids

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Seminar at the Permanent Representation of  
Hungary to the EU  
Brussels, BE, 4 April 2016

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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



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## *Trans* fatty acids

in **Europe**: where do we stand?

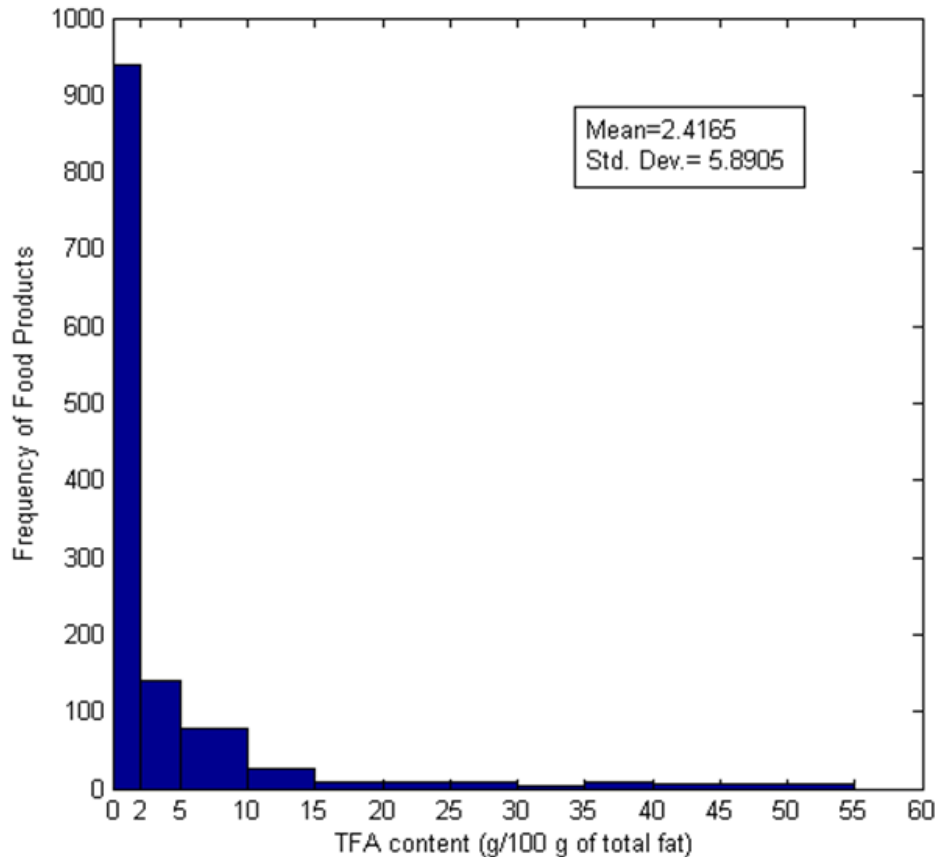
*A synthesis of the evidence: 2003-2013*

Theodora Mouratidou, Anastasia Livanou,  
Carlos Martin Saborido, Jan Wollgast  
and Sandra Caldeira

2014



# *Trans* fatty acid (TFA) content in food



-> 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

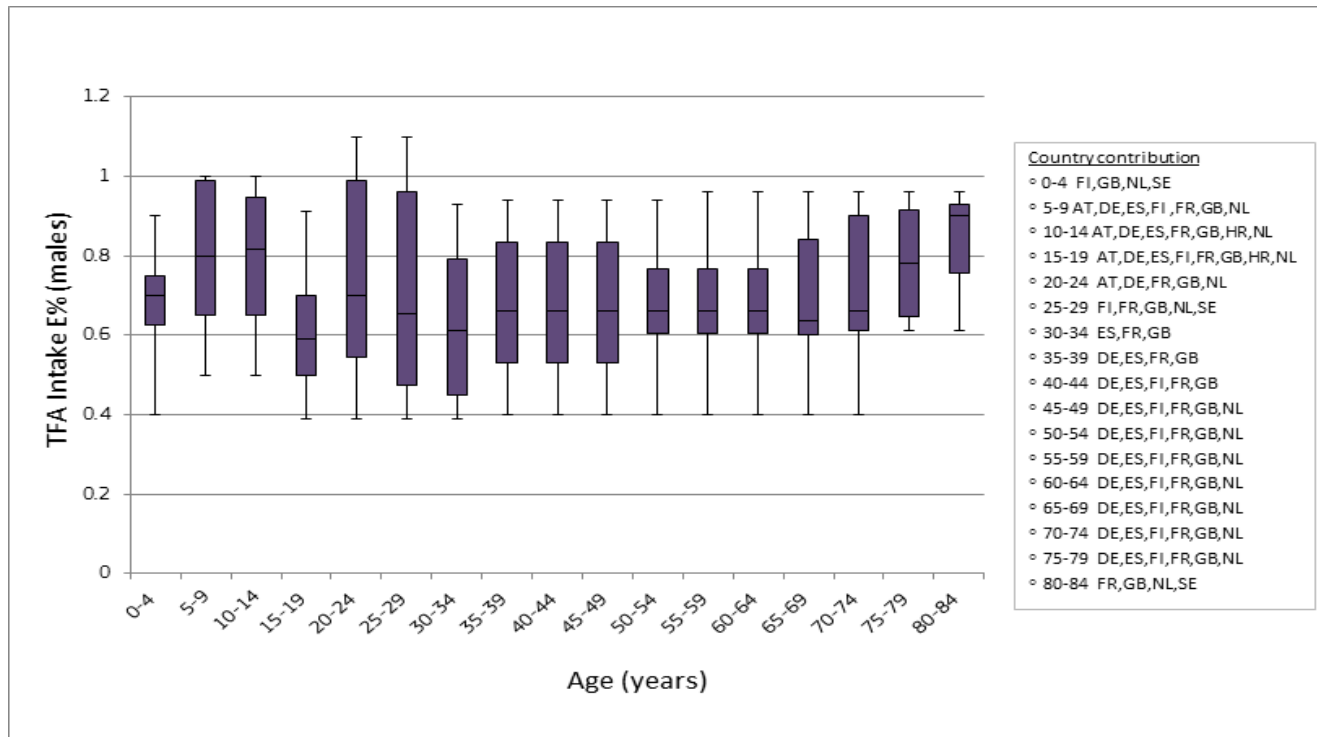


## Recent updates on TFA in foods

- 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  $\approx$  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

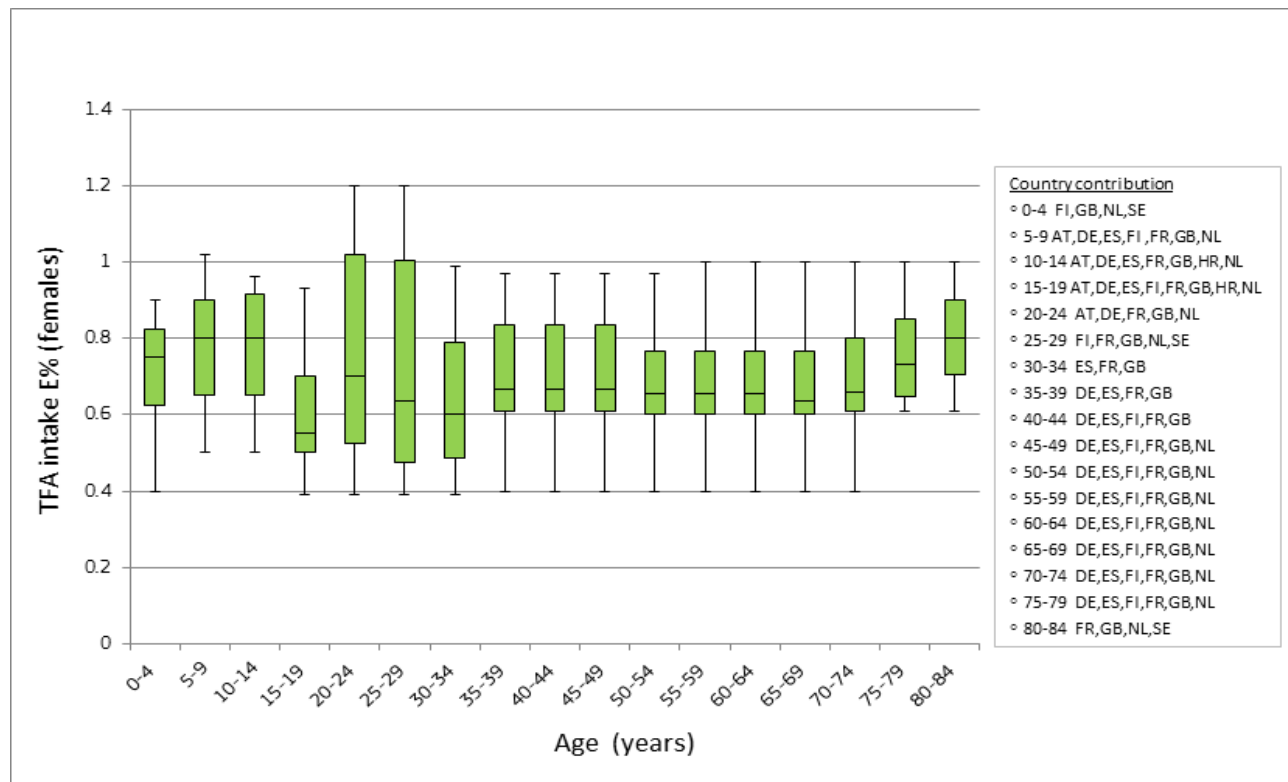
Average TFA intakes varied between 0.4 and 1.1 E%.



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

# TFA intake in the EU - females

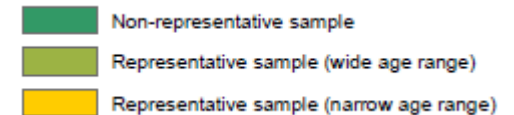
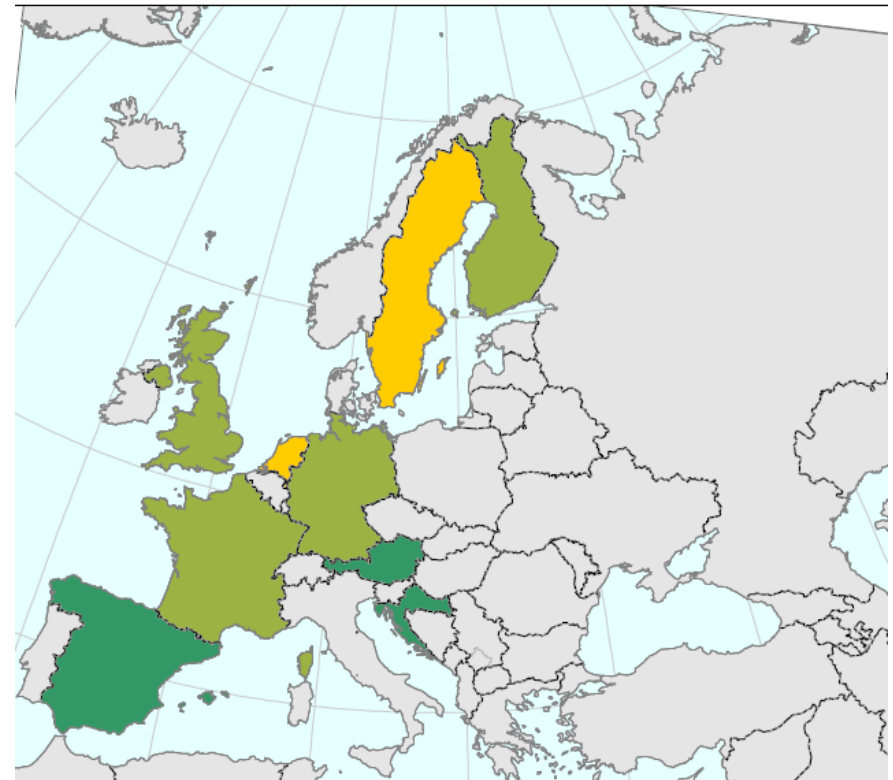
Average TFA intakes varied between 0.4 and 1.2 E%.



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

# 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 95<sup>th</sup> 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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## ***Trans* Fatty Acids in Diets: Health and Legislative Implications**

*A workshop report  
9<sup>th</sup>-10<sup>th</sup> April 2013  
Zagreb, Croatia*

Theodora Mouratidou, Carlos Martin Saborido, Jan Wollgast, Franz Ulberth and Sandra Caldeira

2013



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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 ( $\approx 4\%$  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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- MS & stakeholder representatives
- Permanent Representation of Hungary to the EU, in particular C. Kontor

## Key EC references:

- Food information to consumers – legislation:  
[http://ec.europa.eu/food/safety/labelling\\_nutrition/labelling\\_legislation/index\\_en.htm](http://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation/index_en.htm)
- Commission report on TFA:  
[http://ec.europa.eu/food/safety/docs/fs\\_labelling-nutrition\\_trans-fats-report\\_en.pdf](http://ec.europa.eu/food/safety/docs/fs_labelling-nutrition_trans-fats-report_en.pdf)
- Commission staff working document:  
[http://ec.europa.eu/food/safety/docs/fs\\_labelling-nutrition\\_trans-fats-oswp\\_en.pdf](http://ec.europa.eu/food/safety/docs/fs_labelling-nutrition_trans-fats-oswp_en.pdf)
- JRC Report (2014): "Trans fatty acids in Europe: where do we stand?":  
<https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/trans-fatty-acids-europe-where-do-we-stand>
- JRC workshop report (2013): "Trans fatty acids in Diets: Health and legislative implications":  
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