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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*

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## Table of Contents

Preface.....	3
Executive summary.....	4
Introduction.....	5
The setting of the workshop.....	6
Plenary Sessions: ' <i>Trans</i> Fatty Acids in Diets: Health and Legislative Implications".....	7
Brainstorming sessions: Building on the plenary sessions and exchanging ideas and insights on specific questions.....	10
Brainstorming session A.....	11
Brainstorming session B.....	13
Brainstorming session C.....	15
Conclusions.....	22
ANNEX I.....	23
ANNEX II.....	23

## Preface

The Joint Research Centre (JRC) is the European Commission's in-house science service. Within the frame of its Enlargement and Integration Action (E&IA) it also gives scientific and technical support to countries on the road towards EU membership, new Member States and associated countries<sup>1</sup>. On the 9<sup>th</sup> and 10<sup>th</sup> of April 2013, the JRC organised the workshop '*Trans* Fatty Acids in Diets: Health and Legislative Implications' that brought to Zagreb experts on fats, food science and technology, public health and nutrition from the E&IA countries. The main aim of this workshop was to collect and discuss data on the presence of *trans* fatty acids in the diets of populations from the E&IA countries as well as the EU-27, and exchange practices and ideas on how to reduce the consumption of *trans* fatty acids. The following workshop report summarises the presentations held as well as the discussions that took place in dedicated brainstorming sessions.

We would like to thank all participants for their valuable contribution during the plenary discussions and brainstorming sessions, and also for their enthusiasm and motivation that made this workshop successful.

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<sup>1</sup> The countries covered by the E&IA activities are Albania, Croatia, Former Yugoslav Republic of Macedonia, Israel, Montenegro, Norway, Switzerland, Bosnia and Herzegovina, Faroe Islands, Iceland, Liechtenstein, Moldova, Serbia, Turkey.

## Executive summary

Increased consumption of *trans* fatty acids (TFA) is associated with increased risk of cardiovascular disease (CVD). The European Commission's Joint Research Centre (JRC) organised a workshop on the 9<sup>th</sup> and 10<sup>th</sup> April in Zagreb, Croatia entitled '*Trans* fatty acids in diets: health and legislative implications'. The workshop brought together around 30 European experts on fats, food science and technology, public health and nutrition and aimed to 1) present and discuss recent data on the presence of TFA in food and their consumption in Europe and 2) to exchange ideas and practices on how to reduce exposure to TFA.

This report summarises the data presented and the discussions held at this workshop. The known negative health implications of industrial *trans* fatty acids (iTFA) consumption were re-emphasised but it was also made clear that in contrast with the worrying situation seen in many European countries ten to fifteen years ago, the vast majority of the food products analysed for TFA content in recent years do not contain high levels of TFA. This improved situation is likely due to efforts from several stakeholders in reducing iTFA levels in foods, both voluntarily or enforced in some member states by regulatory measures. Nevertheless, data presented at the workshop showed that products with high levels of TFA can still be found on the market in some countries and depending on their frequency of consumption these may represent a cause for public health concern. The participants also discussed the need for further data collection on the presence of TFA in foods and how to best collect these data as well as the different technological options to reduce and replace iTFA in foods along with their costs and health benefits. Participants also noted that any public health measures related to TFA in this regard must not neglect the health implications of overconsumption of other nutrients such as saturated fats (SFA), salt (sodium) and sugars.

During the last session of the workshop, the participants discussed different public health approaches to further reduce TFA intake in Europe, such as legislative limits on TFA content in foodstuffs, mandatory and voluntary TFA labelling schemes and voluntary food reformulation pledges. The outcome of this session is presented in this report in the form of a table including relevant criteria to be considered when comparing these different approaches.

## Introduction

*Trans* fatty acids (TFA) are a particular type of unsaturated fatty acids. In the Codex Alimentarius they are defined as '*all the geometrical isomers of monounsaturated and polyunsaturated fatty acids having non-conjugated, interrupted by at least one methylene group, carbon-carbon double bonds in the trans configuration*'<sup>2</sup>. TFA can be classified as either TFA of industrial origin or naturally occurring ruminant TFA. TFA of industrial origin (iTFA) are formed during partial catalytic hydrogenation of liquid oils (mostly plant or fish oils) giving them processing qualities desirable by the food companies (*e.g.* turning oils into semi-solid and solid fats, increased tolerance against repeated heating, prolonged product shelf-life, sensory aspects). iTFA can be found in several food products including certain bakery products (*e.g.* biscuits and pastries), vegetable fats (*e.g.* margarines and spreads), confectionary (fillings and creams) or some fried foods (*e.g.* burgers and potato crisps). The final iTFA content in these products varies considerably from < 1% up to more than 50% of total fat and is dependent on the type of fat used. Ruminant TFA (rTFA), on the other hand are produced in the rumen of animals such as cattle and sheep, and can be found in the fat of milk, butter, cheese and beef at levels of 2–9 %<sup>3,4,5</sup>.

The adverse effects of dietary TFA intakes on blood lipoprotein profile (increased low-density lipoprotein [LDL] and decreased high-density lipoprotein [HDL] levels amongst others) and coronary heart disease (CHD) risk are well established<sup>6,7</sup>. On a per calorie basis, TFA appears to increase the risk of CHD more than any other macronutrient<sup>8</sup>. An analysis of several studies indicated a 24, 20, 27 and 32% higher risk of myocardial infarction or CHD-related death when 2% energy derived from carbohydrates, saturated fatty acids, *cis* monounsaturated fatty acids, and *cis* polyunsaturated fatty acids, respectively was replaced by 2% energy derived from TFA consumption<sup>8,9</sup>. Because of such evidence on the adverse health effects of TFA, the World Health Organization (WHO) in 2004 recommended that dietary TFA should not exceed 1% of total energy intake<sup>10</sup>. This equates to about 2 g of TFA per day for a person requiring 2000 kcal. The European Food Safety Authority (EFSA) has also issued a recommendation on TFA intake, concluding that '*TFA intakes should be as low as is possible within the context of a nutritionally adequate diet*'<sup>4</sup>. As a response to such health concerns several countries have taken different actions to limit TFA intake. Denmark in 2003, Switzerland in 2008, Austria in 2009 and Iceland in 2011 have imposed legal limits to the presence of TFA in foods<sup>11,12,13, 14</sup>. Other European countries have witnessed

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<sup>2</sup> CODEX ALIMENTARIUS CAC/GL 2-1985 Guidelines on Nutrition Labeling <http://www.codexalimentarius.org/standards/list-of-standards/> (Accessed on 03 of September 2013)

<sup>3</sup> EFSA Journal (2004) 81, 1-49

<sup>4</sup> EFSA Journal (2010) 8, 1461

<sup>5</sup> PLoS One. (2010) 3, 5, e9000

<sup>6</sup> Eur J Clin Nutr (2013) 67, 541-547

<sup>7</sup> Bull World Health Organ (2013) 91, 262-269

<sup>8</sup> Eur J Clin Nutr. (2009) 63, 568-75

<sup>9</sup> N Engl J Med (2006) 354, 1601-1613

<sup>10</sup> Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases (2002: Geneva, Switzerland) Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation, Geneva, 28 January – 1 February 2002.

<sup>11</sup> Executive Order No. 160 of 11 March 2003 on the Content of Trans Fatty Acids in Oils and Fats

<sup>12</sup> <http://www.admin.ch/opc/fr/classified-compilation/20050165/index.html#a7> (Accessed on 20 of June 2013)

<sup>13</sup> 267th Order of the Federal Minister for Health on the trans fatty acid content of foodstuffs (Trans Fatty Acids Order) Federal Ministry of Health, Trans-Fettsäuren-Verordnung, Austria, 2009. Federal Ministry of Health, Trans-Fettsäuren-Verordnung, Austria, 2009.

several efforts from various stakeholders to reduce the levels of iTFA in foods, and subsequently consumption of iTFA has been decreasing within the EU in the last twenty years<sup>6</sup>. As a result, ruminant fats appear to be the major source of TFA in many European countries today<sup>6</sup>. Nevertheless, there is still limited information on TFA intakes in several EU countries<sup>15</sup> and recent evidence suggests that in the absence of additional measures by the public health sector, specific population groups may be at risk of excess dietary TFA<sup>16</sup>.

The recent EU Regulation 1169/2011<sup>17</sup> on the provision of food information to consumers calls for a report by the European Commission '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'. Within the frame of this request, the Joint Research Centre organized the workshop '**Trans Fatty Acids in Diets: Health and Legislative Implications**'. The goals of the workshop were to (i) take stock of the available data regarding TFA presence in foods and diets in E&IA countries, (ii) present and generate discussion of TFA presence in foods and diets in the EU27, (iii) present existing initiatives on TFA reduction, (iv) present methodologies and related knowledge in assessing TFA in foods and diets and (v) generate a discussion on possible policy measures for providing healthier dietary options to consumers by reducing TFA. This report details the outcome of the workshop.

### **The setting of the workshop**

The workshop agenda and a list of the participants with short biographies can be found in Annex I of this report. Further information can also be found in the website of the event<sup>18</sup>.

The workshop consisted of two types of sessions:

- **Plenary sessions** where invited speakers presented state of the art knowledge and data on TFA-related issues, followed by comments and questions from participants.
- **Brainstorming sessions** where the participants built further on the discussions that took place in the plenary sessions and exchanged ideas and insights on specific questions set by the organisers. The outcome of the brainstorming sessions A and B is summarised in pages 10-14 and of the brainstorming session C presented in Table 1.

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<sup>14</sup> [http://www.eftasurv.int/media/notification-of-dtr/2011\\_9009\\_IS-draft-EN.pdf](http://www.eftasurv.int/media/notification-of-dtr/2011_9009_IS-draft-EN.pdf) (Accessed on 20 of June 2013)

<sup>15</sup> Eur J Clin Nutr (2009) 63, S2

<sup>16</sup> BMJ Open (2012) 2, e000859

<sup>17</sup> Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 L 304/35

<sup>18</sup> [http://ihcp.jrc.ec.europa.eu/our\\_activities/public-health/nutrition/workshop-trans-fatty-acids-in-diets-health-and-legislative-implications](http://ihcp.jrc.ec.europa.eu/our_activities/public-health/nutrition/workshop-trans-fatty-acids-in-diets-health-and-legislative-implications) (Accessed on 20 of June 2013)

## Plenary Sessions: '*Trans* Fatty Acids in Diets: Health and Legislative Implications'

To set the stage and highlight the health implications of TFA consumption, **Ingeborg A. Brouwer** (VU Amsterdam) introduced TFA to the audience covering issues such as their chemical structure and dietary sources. She then went on to give a brief historical perspective of TFA development and use, acknowledging that TFA decreased in fats and spreads through voluntary reformulation worldwide over the last decades. She stressed that there is now scientific consensus and sufficient evidence to support an adverse relationship between iTFA consumption and changes in serum lipoprotein profiles as well as increased CHD risk. Establishing an independent effect for rTFA intake on CVD is not that clear but her recent study showed that rTFA, conjugated linoleic acid (CLA) and iTFA all increase the LDL/HDL ratio<sup>5</sup>. Assessing further the impact of rTFA on CHD will be a challenging task as rTFA are present in foods and diets in much smaller amounts than iTFA. Ingeborg Brouwer also discussed the importance of reaching consensus on the use of TFA alternatives with similar properties but substantially less adverse health effects. SFA are often used as alternatives but their association with increased risk of CHD must be considered too. The presentation ended with a call for looking further into the effects of CLA intakes on CVD; even though dietary CLA intake is very low through ruminant-derived foods, CLA supplements, currently present in several markets worldwide, are sold with recommended dosages of up to 6 g/day and their health effects are doubtful.

**Theodora Mouratidou**, from the Joint Research Centre presented preliminary results of a broad literature search on the presence of TFA in foods and in the overall diet of the European population. Despite several methodological issues that limit the strength of the analysis, the data presented regarding the presence of TFA in foods in seventeen different EU countries (collected from 2005 onwards) showed that the majority of products in the market do not contain iTFA or contain levels that are below 2 g TFA per 100 g total fat (the legal limit set for example by Denmark). Nevertheless, some studies reported the existence of products in the EU market with TFA levels much higher than this (*e.g.* a shortening found in the Polish market containing 54% TFA<sup>19</sup>). As for the intake of iTFA at population level, in the eight countries (nine studies) where data (collected from 2003 onwards) could be found, the average amount of TFA consumed did not exceed the WHO-recommended threshold of 1% of total daily energy intake<sup>10</sup>. However, in a low income UK population (materially deprived) the average TFA contribution to total daily energy intake reached 1.3%<sup>20</sup> and in Croatian University students it reached 1.2%<sup>21</sup>. The average values observed are in line with the reported decrease of TFA intakes in European countries<sup>4</sup>. However, the limited availability of recent data hampers a solid assessment of TFA exposure in the European population.

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<sup>19</sup>Pol J Food Nutr Sci (2011), 61, 45-49

<sup>20</sup>Michael Nelson, Bob Erens, Beverly Bates, Susan Church and Tracy Boshier. Low income diet and nutrition survey. Volume 2, Food consumption and Nutrient intake. 2007. LONDON:TSO.

<sup>21</sup> Int J Food Sci Nutr (2007) 58, 398-410

Importantly, there is a possibility that particular groups such as Croatian University students may be at risk of high exposure.

After explaining the nomenclature of fatty acids, **Franz Ulberth** (JRC) presented in detail the techniques currently available used to measure TFA in food products such as infrared spectroscopy (IR), gas chromatography (GC) and high-performance liquid chromatography (HPLC). Different techniques have their own strengths and weaknesses mostly related to reproducibility, separation ability and precision but also time, costs and resources. IR analyses provide an estimation of the sum of TFA while chromatography based methods can measure individual TFA as well as other groups of nutritionally important fatty acids, also with precision at low levels. Nevertheless, complete separation of *cis* and *trans* isomers may require an additional silver-ion chromatography separation, which adds another analytical step and thus makes it a more laborious procedure. The presentation made clear that the measurement choice is often scope- and cost-dependent.

**Sergey Melnikov** (Unilever R&D) provided an overview of the industrial processes currently used to reduce or eliminate iTFA from food products, as well as of the challenges and opportunities faced by the industry when doing so. Partly Hydrogenated Vegetable Oils (PHVO) containing TFA are temperature stable, have a good mouthfeel and are effective in the structuring of fat-continuous food products, but the high TFA levels typical for PHVO are undesirable from a health perspective. Sergey Melnikov explained that TFA reduction poses some challenges to the food processing industry, for example how to give the desired structure and sensory properties to the product when replacing PHVO with alternative fats. In addressing these challenges, new opportunities arise and Sergey Melnikov described his experience exploring an 'oil modification toolbox', searching for novel fat stocks and processing technologies to produce clean-label TFA-free tasty products. Some of the tool box elements referred to are the process of fractionation of fats, full hydrogenation, fat rearrangement/inter-esterification (specially through the use of lipases) and blending of oils and fats, all of which can aid in producing PHVO-free blends of plant oils and fats with similar properties to those of TFA oil/fat blends. Palm oil is often used within these alternative approaches but in some markets consumers have reservations against its use (for more detail see brainstorming session B). As for novel plant oil sources currently being explored, the speaker referred to the use of *Allanblackia*, a plant rich in stearic acid, as an alternative to palm oil. Since 2012 none of Unilever products contain PHVO. When asked about the costs incurred by the company in reformulating their products, Sergey Melnikov, indicated that there were no major costs.

**Steen Stender** (Copenhagen University Hospital) has been assessing the levels of TFA in foods and diets in Europe and worldwide over the last 10 years. Participants heard first-hand about the 'Danish experience' *i.e.* the introduction in 2003 of a legal upper limit of food TFA content of 2 g per 100 g of oil or fat. This legislation was prompted by the detrimental health effects of iTFA

intake and the fact that roughly 1% of the Danish population at that time had high intakes of this type of fat (more than 4 g iTFA per day). The legislation resulted in a reduction of iTFA from the diet after its introduction without any obvious side effects for the population. Steen Stender presented some of the studies conducted by his team on foods sampled over the last years, across various European countries. Interestingly, one study showed that in 2005<sup>22</sup> high iTFA levels could still be found in fried chicken and French fries purchased from various fast-food chains in different countries. The levels of iTFA varied not only depending on the chain but also products from the same fast food chain had different levels of iTFA depending on the country where they were purchased. Similarly, findings from a market basket investigation<sup>16</sup> showed differences in the TFA content of 'a high *trans* menu' *i.e.* a large fast food serving (French fries and fried chicken) as well as biscuits/wafers/cakes and microwave popcorn (sampled in 2006 and 2009) in seven European countries. Several popular foods in Western Europe had low TFA content but the same products still had high TFA levels in Eastern European countries. Steen Stender also presented unpublished results of products sampled in 2012 in Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Croatia, Montenegro, Serbia and Slovenia that contained high iTFA levels (often over 4-5 g/100 g final product or more than 25-30 g/100 g oil or fat). Importantly, while such products were mostly produced in Serbia and Croatia they were also found outside these countries, for example in small Balkan specialty corner shops in Sweden and Norway.



'.....as long as foods high in iTFA are around, some people will be at risk of high TFA intakes...'

The fact that products with such iTFA levels still exist in the market is worrying. As long as such products exist, there will be individuals consuming them and therefore low iTFA average population intakes do not preclude the existence of particular sub-groups that are exposed to much higher TFA levels.

Following, **Theodora Mouratidou** (JRC) presented the results of the JRC survey conducted among the participants prior to the workshop. The questionnaire used is presented in Annex II and responses were collected from Bosnia and Herzegovina, Bulgaria, Croatia, and the former Yugoslav Republic of Macedonia, Iceland, Israel, Moldova, Montenegro, Norway, Romania, Serbia and Switzerland. The questionnaire asked for country-specific information regarding the presence of TFA in foods and the intake levels of the population, the existence of TFA-related national policies/actions, established daily recommended (maximum) intake levels and food composition databases. According to the participants' replies, only a few of the countries represented in the survey have recommendations regarding a maximum intake level of TFA, the majority of which follow the WHO guidelines (max. 1% of daily energy requirements). Iceland<sup>11</sup> and Switzerland<sup>12</sup> currently have in place a legal maximum limit of TFA in foods. More specifically, the Icelandic act

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<sup>22</sup> N Engl J Med (2006) 354, 1650-1652

states that *'It is prohibited to place foods on the market which contain over 2 grams of trans-fatty acids per 100 grams of total fat content'*, and the Swiss act states that *'100 grams of vegetable cooking oil and vegetable cooking fat will only be permitted to contain a maximum of 2 grams of TFA'*. Only in four countries (the former Yugoslav Republic of Macedonia, Iceland, Norway and Serbia) did food composition databases (FCDB) contain information on TFA levels in foods, a point that deserves particular attention given its significance for estimating TFA dietary exposure. Concluding the presentation, the team was pleased to briefly describe some on-going and planned national initiatives in tackling TFA such as initiatives which form part of action frameworks for raising public awareness (*e.g.* the former Yugoslav Republic of Macedonia and Bosnia and Herzegovina), actions to encourage industry/catering to reformulate products (*e.g.* Israel and Moldova), and monitoring activities (*e.g.* Croatia).

Highlighting further the importance of up-to-date comprehensive and reliable FCDB, **Mirjana Gurinovic** from the University of Belgrade presented an on-going project related to capacity development and harmonisation of FCDB in Central and Eastern Europe and Balkan countries<sup>23</sup>. Participants heard of the latest developments on the Balkan Food Platform project and of the development of the first online Regional FCDB for West Balkan Countries. Mirjana Gurinovic also provided a short description of the EuroFIR AISBL Food Explorer web tool developed and used by the EuroFIR consortium<sup>24</sup>. Exploring these European databases revealed that only few country databases have total TFA data and of these only The Netherlands has data on individual TFA. Such projects are invaluable in accurately assessing dietary exposure across the population, which can then support problem formulation and the development of appropriate solutions.

Finally, **Stephanie Bodenbach** (DG Health & Consumers) provided an insight into public health policy options and actions taking place across the world to reduce TFA exposure. Some examples include mandatory labelling of TFA (as a nutrient) as done in the United States of America and Canada or legal limits as in Austria, Denmark or Switzerland. Industry self-regulation and other voluntary agreements are among additional approaches that are being explored in Europe (for example in Germany, The Netherlands and the UK). These examples helped the participants to understand better the many aspects to consider when implementing a TFA-related policy and were further developed in a dedicated brainstorming session (Table 1, p 16).

## **Brainstorming sessions: Building on the plenary sessions and exchanging ideas and insights on specific questions**

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<sup>23</sup> The project is a collaboration between EuroFIR-Nexus and the Network for CD in Nutrition in Central and Eastern Europe (NCDNCEE-CAPNUTRA). Additional information at <http://www.agrowebcee.net/ncdn>

<sup>24</sup> <http://www.eurofir.org/foodexplorer/login1.php> (Accessed on 20 of September 2013)

The workshop included 3 brainstorming sessions, 2 of which were held in parallel. For these, the participants were divided in two groups (A and B) and the sessions started with a recap of the plenary session. Participants were asked to focus on specific questions taking advantage of the information and discussions raised during the plenary session. Brainstorming session C involved all the participants and took place on the second day. What follows is a brief summary of these discussions in the form of bullet points and a table (Table 1, p 16), which reflect the opinion of one or more participants. The summary and these opinions are not to be seen as consensual points. They have not been exhaustively fact checked for their veracity by the authors of this report.

### **Brainstorming session A**

The group approached questions A1 and A2 (see below) considering what would be the best way forward to generate the necessary data to answer the questions from a practical point of view regardless of costs. Prior to addressing the questions, participants reflected on the necessity to generate new data when negative health effects of TFA are known. The participants felt that there is a need for increased awareness among the public, policy makers and other stakeholders to bring TFA actions higher up on the public health agenda. In general, the participants indicated that considerations for measures of TFA reduction should be informed by experiences from other countries.

#### **Question A1: How do we best generate fit for purpose data within a reasonable time frame on the presence of TFA in foods in Europe?**

##### Existing knowledge:

- There is existing evidence and we should learn from earlier approaches *e.g.* the TRANSFAIR study<sup>25</sup>.

##### Generate data:

- The development of a priority list of food items that contribute most to TFA dietary intakes might be a good start to generating fit for purpose data.
- Countries within a region such as the Balkan region could synchronise efforts and work collectively on generating data on the presence of TFA in foods. Collaborating in this way could be more efficient as it minimises redundant analyses (*e.g.* same products) and could free resources for increasing the final number of foods analysed.
- Collaboration with the private sector and especially the food industry is desirable and beneficial to generate new data.

#### **Question A2: How do we best generate fit for purpose data within a reasonable time frame on dietary TFA intake in Europe?**

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<sup>25</sup> Atherosclerosis Supplements 7 (2006), 1–4

#### Generate data:

- The use of biomarkers to assess TFA levels in blood (TFA in plasma) was considered an interesting approach both for increasing knowledge, and as a more practical and reliable way to assess TFA intakes than using traditional dietary assessment methodologies.
- A very important issue discussed by the participants was the need for updated and more complete FCDB to enable calculation of more accurate TFA intakes.
- A challenge identified refers to the fact that the large majority of foods in relevant food groups today are very low in TFA, while a few remaining products in (some parts of) the European market still contain high levels. This means that the TFA content does not follow or approach a normal distribution so that statistics assuming normal distribution cannot be applied when describing TFA content of a food or food group. Rather, alternative approaches, such as those used in exposure/risk assessment of certain toxicants (*e.g.* mycotoxins) should be preferred.
- The appropriateness of calculating and presenting average TFA intakes was discussed within the context of identifying population groups at high risk of exposure (average may not reflect differences in TFA daily intakes between social groups with different consumption patterns). Participants then went on to question whether estimating the number of people consuming the (few remaining) high-TFA products is close to an impossible task.
- In the absence of robust TFA intake data in many countries, a smaller number of foods that typically contained iTFA in the past, could be used as indicators of whether iTFA containing PHVO are still used in that respective market. This could eventually lead to raising the necessary public awareness.
- Generating data for rTFA intakes was considered less of a priority because rTFA levels in the relevant food products cannot be changed by industry/policy intervention. Moreover, it is considered more pragmatic to promote low fat products (milk, dairy and meat products) which would also reduce rTFA intakes.
- Participants also raised a philosophical/ethical question on the number of people needed to be exposed to high-TFA foods to justify stronger measures such as a legal limit (a 'ban').

#### Other important points raised during the discussions:

- A legal limit on TFA is a strict but effective measure.
- It should be ensured that the issue of TFA is included in other relevant initiatives (*e.g.* nutrient profiling) and nutrition action plans.
- Addressing TFA together with consumption of SFA was recommended.
- Collaboration and dialogue with the private sector and especially the food industry is important.
- Need for raising awareness among public, policy makers and other stakeholders.
- Labelling generally seen as useful; consumer has the right to be informed; present format (small font and contrast) of lists of ingredients on many pre-packaged foods makes the information unreadable

## **Brainstorming session B**

This session focused on pragmatic approaches to reduce or eliminate iTFA from the food chain. iTFA reduction implies its replacement by other fats and the health and sustainability profiles of the replacement alternatives are of great importance. All stakeholders such as consumers, the food industry, and governments have a role to play in motivating food reformulation to reduce iTFA in the European food chain. These topics were actively discussed and a brief summary of these discussions is presented below.

### **Question B1: What are the approaches to decrease iTFA in foods and how do the different TFA replacement options and reformulated foods compare to each other in terms of costs, health effects, environmental issues etc.?**

The participants indicated that replacement options are many. The discussion centred mostly on palm oil fractionation and full hydrogenation accompanied by inter-esterification of rapeseed oil as alternatives to PHVO. The alternative based on rapeseed oil is favoured in Norway for example, because of the negative sustainability perception associated with palm oil in this country.

#### Environment and sustainability aspects:

- Yields for palm oil production vs other oils are at least 3 times higher per acre of land. Participants were unaware of concrete data to favour palm oil or rapeseed regarding environmental aspects.
- Production of oils in algae was discussed but this option appears to be far from yielding the amounts needed for industry and scaling up currently remains an issue.

#### Health aspects:

- Replacement options must ensure that the levels of saturated fats in the end product do not increase so as to offset any benefits from reducing TFA. In this regard, application of oils and fats modification toolbox (*e.g.* fractionation/full hydrogenation/rearrangement/blending) for tropical fats (*e.g.* palm/coconut) and seed/bean oils (*e.g.* sunflower, rapeseed, soybean) enables manufacturing of both very low-TFA and low-SFA food products. By using oils/fats modification toolbox, food companies can maximize the efficiency of SFA use for structuring of their product formats.
- There are differences in the fatty acid profiles of palm and rapeseed oils that are relevant. Hydrogenated palm oil mainly contains palmitic acid whereas hydrogenated rapeseed oil mainly contains stearic acid. Palmitic acid appears to have a less favourable health profile than stearic acid.
- It was also pointed out that often reduction of fats is accompanied by increased sugar content (*e.g.* yogurts in US) and this may be a concern.

- Highlighting the complexity of the issue, a case was presented where in order to comply with a legal limit of 2 g/100 g iTFA content, reformulation of the product would be made by replacing PHVO with butter. In this example, the reformulated product had higher levels of rTFA and of saturated fats than the original.

#### Costs:

- For substitution with palm oil the costs of replacement appear to be neutral. New hard stocks, as replacement for iTFA containing PHVO, may be more expensive and a long term vision is needed in this case.

### **Question B2: What is the role of the consumer both for the industry and for governments in the attempt to reduce TFA intakes and motivate food reformulation?**

The discussions made clear that consumers drive product reformulation and their perceptions and choices are highly considered by the food industry. On the other hand, consumers have the right to and the need for information and in this case the role of public health authorities is important in terms of consumer education.

#### Industry:

- The power of the consumer is actually very high as their perceptions and choices drive product reformulation sometimes ahead of regulatory measures.
- The consumer plays a big role for the industry *e.g.* local production of rapeseed oil in Sweden is favoured, and full hydrogenation is not well accepted in some countries (fear and lack of understanding) while it is favoured in others.
- The industry would welcome the possibility to communicate reformulation efforts (TFA reduction) more clearly to the consumer. The current European legislation allows for this; a product can claim '*this product contains no **partially hydrogenated oils***' (ingredient). However, it cannot claim '*this product contains no **trans-fats***' (nutrient).
- The question of how final price to the consumer changes with reformulation and whether price changes affect overall dietary patterns was left unanswered in this session.

#### Education:

- Public health authorities have a big role to play in terms of education of the consumer. Much attention is needed to make sure that information reaches the whole population, particularly lower income or disadvantaged groups. On the other hand, concerns were raised regarding the need to educate consumers about TFA given that i) consumption levels are on average low, ii) the fat issue is already complex (saturated, mono- and poly-unsaturated fatty acids), and iii) restricted funds for public health campaigns may be spent more efficiently elsewhere.

- Education in schools is a positive measure towards promoting healthy eating in general and several participants discussed their experiences.
- An interesting example was discussed that highlights the important message that any nutritional campaigns on TFA should not come in isolation but must be put in the full context of fats (including SFA) otherwise they may be counterproductive. The example refers to a current reversal of the steady decrease that Norway had been observing in SFA consumption. The Norwegian participants referred to 2 possible causes for this 1) the promotion of low carbohydrate diets and 2) the increased attention on *trans* fats and their 'dangers' taking the attention away from saturated fats.
- Role of the media and the entertainment industry is very important in (mis-)informing/educating consumers.
- There were discussions on the right to and the need for information by the consumer. The provision of information to consumers through labels allows them to make a decision. Reducing or banning iTFA by companies or authorities, respectively, does not require education of the public but can also be seen as limiting public's choice.

Other important points raised during the discussions:

- Nutritional campaigns on TFA should not come in isolation but must be put in the full context of fats (including SFA) otherwise they may be counterproductive.
- Very little knowledge about consumer perception of iTFA vs rTFA and associated impact on consumption of food sources of these.

## **Brainstorming session C**

### **Question C1: How do the different approaches towards reducing presence of TFA in foods and dietary TFA intakes compare and what are the criteria to be considered for decision makers?**

This session focused on the criteria that need to be considered when deciding between various approaches to reduce the presence of TFA in foods and diets in Europe. The approaches to be considered were legal limits, mandatory or voluntary labelling of TFA and voluntary reformulation. These options were then compared between each other and were matched against the status quo. The identification of the criteria and their preliminary discussion was initiated during the workshop in Croatia. Following the workshop, the JRC team further elaborated on the various criteria and how they perform in each of the approaches. The overall comparison is presented in Table 1.

Any considerations on the different TFA reduction measures are the result of an exercise within the scope of the workshop and do not represent the opinion of the European Commission or the Joint Research Centre. Moreover, the exercise was carried out considering possible measures to be implemented at EU level in the context of the Regulation (EU) No 1169/2011 on the provision of

food information to consumers, *i.e.* considering '*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*' (see introduction). The results of such an exercise likely differ when applied to other contexts, such as at national level either within the EU or countries in the E&IA context or where TFA exposure is still comparatively high.

Table 1. **Comparison of different approaches to further reduce TFA in foods and diets in Europe.** The table lists four different approaches to reduce TFA in foods and diets in Europe and compares them to status quo (approach 5). The comparison is based on over 20 different criteria identified by the workshop participants and the authors of this report.

Criteria		Approach	Legal limits (Approach 1)	Mandatory Labelling of TFA (Approach 2)	Voluntary Labelling of TFA (incl. claim "TFA-free") (Approach 3)	Voluntary Reformulation (agreement)* (Approach 4)	Keep status quo ** (Approach 5)	Comments
1	Does this measure apply to all products?		Yes	No	No	No	No	Labelling in both forms does not guarantee maximum possible reduction of TFA
2	Does this measure apply to out-of-home eating?		Yes	No	No	Yes	N/A	
3	Does this measure apply to packaged foods?		Yes	Yes	Yes	Yes	Yes	
4	Does this measure apply to non-packaged foods?		Yes	No	No	Yes	No	
5	Distinction between rTFA and iTFA		Measure does not apply to rTFA	No distinction, which may affect consumption of dairy and other labelled ruminant-derived products	No distinction. However, dairy and meat products as well as products containing rTFA (butter) would likely not be labelled voluntarily	N/A. If accompanied by labelling see approach 3	N/A	
6	Phasing out of iTFA-containing products from the market 1. Completeness 2. Speed		1)Complete 2)Depends on the timeline given in the legislation (e.g. 1 yr in Denmark)	1)Incomplete 2)Depends on timeline for labeling enforcement given in the legislation and potential reformulation efforts by the industry	1)Incomplete 2)Requires a short time needed for changes to current legislation. It then depends on potential reformulation efforts by the industry	1)Incomplete 2)Depends on reformulation efforts by the industry	1)Incomplete 2)Depends on potential reformulation efforts by the industry	
7	What are the costs for the consumer?							
7a	Food price		Reformulation costs may shift to the consumer (however, current experience from Denmark suggests very little effects on final food price to the consumer)	Possibility of price disparities between reformulated products and cheaper alternatives	Possibility of price disparities between reformulated products and cheaper alternatives	Possibility of price disparities between reformulated products and cheaper alternatives	Price disparities exist	Price disparities may lead socially disadvantaged consumers choosing the cheaper and potentially higher TFA alternatives; this in turn may increase health inequalities
7b	Time		None	Yes	Yes	None, unless accompanied by labelling	Yes	Consumer needs to invest time in reading the labels. Approaches 3-5 are possibly

							more time-consuming
Criteria	Approach	Legal limits (Approach 1)	Mandatory Labelling of TFA (Approach 2)	Voluntary Labelling of TFA (incl. claim "TFA-free") (Approach 3)	Voluntary Reformulation (agreement)* (Approach 4)	Keep status quo ** (Approach 5)	Comments
8	What are the costs for the industry?						
8a	Costs of R&D (reformulation-research on the new product)	Reformulation costs incurred by all	Not applicable unless followed by reformulation	Not applicable unless accompanied by reformulation	Reformulation costs incurred by those who reformulate	Reformulation costs incurred by those who reformulate	
8b	Cost of alternative process	Too speculative	Too speculative	Too speculative	Too speculative	Too speculative	Too speculative because of the lack of information on costs of alternative process
8c	Costs of labelling (including analysis)	No	Yes	Yes	No, unless accompanied by labelling	None	
9	What are the costs for the government?						
9a	Costs of implementation	Yes	Yes	Yes	No	N/D	Approach 3 has implementation costs but not as high as approach 2
9b	Costs of enforcement incl. sampling and analysis	Yes	Yes	Yes	Yes, if accompanied by labelling	No	Costs of enforcement will be probably highest in option 1
9c	Cost for raising consumer awareness (campaigns and education)	No	Yes	Yes	Yes, if accompanied by labelling	Yes, consumers should be educated on ingredients PHVO or FHVO	
10	Does it foster competition?	No	Yes	Yes	Little, if not accompanied with labelling	No	
11	Does it foster innovation?	Yes	Yes	Yes	Yes	No	
12	What are the possible issues related to TFA information to consumers?	None	<ul style="list-style-type: none"> <li>Only the knowledgeable consumer is empowered to make healthy (low TFA/TFA free) choices of packaged foods; however, labelling of an additional nutrient in labelled foods may be to the detriment of other relevant information</li> <li>Too much focus on the</li> </ul>	<ul style="list-style-type: none"> <li>Labelling of an additional nutrient in labelled foods may be to the detriment of other relevant information.</li> <li>Too much focus on the level of TFA in the label may take attention away from other nutrients (e.g. saturated fats or sugars), in particular in combination with TFA</li> </ul>	<ul style="list-style-type: none"> <li>If accompanied by labelling see approach 3</li> <li>If not accompanied by labelling – no information to the consumer at point of purchase except for PHVO mention in the ingredient list; the knowledgeable consumer would be able to avoid packaged products containing</li> </ul>	<ul style="list-style-type: none"> <li>Information present on ingredient list as PHVO or FHVO</li> <li>Only the knowledgeable consumer is able to avoid packaged products containing PHVO</li> <li>Possible difficulty in identifying the presence of PHVO in ingredients' list. (small font size, variable</li> </ul>	

			<p>level of TFA in the label may take attention away from other nutrients (e.g. saturated fats or sugar), in particular in combination with TFA nutrient claims</p> <ul style="list-style-type: none"> <li>- The consumer will have no information about TFA on non-packaged foods</li> <li>- Possibility of TFA nutrient claims, such as "low in TFA", "reduced TFA", "TFA-free"</li> </ul>	<p>nutrient claims</p> <ul style="list-style-type: none"> <li>- The consumer will have no information about TFA on non-packaged foods</li> <li>- The consumer will have no information on the presence of TFA when TFA labelling is absent except from PHVO mentioned in the ingredient list</li> <li>- Possibility of TFA nutrient claims, such as "low in TFA", "reduced TFA", "TFA-free"</li> </ul>	PHVO	<p>position in the list of ingredients)</p> <ul style="list-style-type: none"> <li>- Difficulty in evaluating the difference between PHVO and FHVO</li> <li>- No legal definition of PHVO; absence of PHVO should guarantee absence of iTFA, however, presence of PHVO does not allow estimation of TFA content</li> <li>- The consumer has information about TFA on non-packaged foods</li> <li>- Possibility of PHVO-free claims</li> </ul>		
<b>Criteria</b>		<b>Approach</b>	<b>Legal limits (Approach 1)</b>	<b>Mandatory Labelling of TFA (Approach 2)</b>	<b>Voluntary Labelling of TFA (incl. claim "TFA-free") (Approach 3)</b>	<b>Voluntary Reformulation (agreement)* (Approach 4)</b>	<b>Keep status quo ** (Approach 5)</b>	<b>Comments</b>
13	Are there potential disadvantages for more vulnerable groups?	No	<p>Yes</p> <ul style="list-style-type: none"> <li>- TFA containing-products available in the market</li> <li>- Less informed consumers more vulnerable</li> <li>- Any price disparities might affect mostly low income populations</li> </ul>	<p>Yes</p> <ul style="list-style-type: none"> <li>- TFA containing-products available in the market,</li> <li>- Less informed consumers more vulnerable</li> <li>- Any price disparities might affect mostly low income populations</li> </ul>	<p>Yes</p> <ul style="list-style-type: none"> <li>- TFA containing-products available in the market,</li> <li>- Any price disparities might affect mostly low income populations</li> </ul>	<p>Yes</p> <ul style="list-style-type: none"> <li>- TFA containing-products available in the market,</li> <li>- Price disparities affect mostly low income populations</li> </ul>		
14	Public health benefits	Yes Highest	<p>Yes but</p> <ul style="list-style-type: none"> <li>- Measure targets only packaged foods</li> <li>- Depends on reformulation by industry</li> <li>- Depends on nutrition literacy of population</li> </ul>	<p>Yes but</p> <ul style="list-style-type: none"> <li>- Measure targets only packaged foods</li> <li>- Depends on reformulation by industry</li> <li>- Depends on nutrition literacy of population</li> <li>- Depends on consumer preference for products carrying TFA free claims</li> </ul>	<p>Yes but</p> <ul style="list-style-type: none"> <li>- Measure depends on Industry participation</li> <li>- Coverage of food products on the market</li> </ul>	N/A		

Criteria		Approach	Legal limits (Approach 1)	Mandatory Labelling of TFA (Approach 2)	Voluntary Labelling of TFA (incl. claim "TFA-free") (Approach 3)	Voluntary Reformulation (agreement)* (Approach 4)	Keep status quo ** (Approach 5)	Comments
15	Does it affect the well-functioning of the internal EU market?		No (or positively as it provides the same rules everywhere in the common market)	No but it counteracts some existing national policies (see below)	No	No	Different regulatory measures affect internal market negatively	
16	Can it affect World Trade Organisation agreements?		Yes	No	No	No	No	
17	Does it counteract existing national measures?		No	Yes, – Countries with legal limits will enforce a senseless measure – Additional burden to the industry in countries with far reaching voluntary agreements	N/A	N/A	N/A	
18	Proportionality of the measure***: 1) Legitimate aim for measure? 2) Suitable to achieve the aim? 3) Necessary to achieve the aim (any less onerous way of doing it)? 4) Measure reasonable (considering the competing interests of different groups at hand)?		1) Yes, the TFA health issues are still present to some extent at EU level, alternatives to the use of TFA (PHVO) exist, protection of citizens' health will be improved by providing (only the) healthier options 2) Yes, highly effective to entire population and covering all foods 3) Aim can in principle be achieved also by voluntary reformulation; if voluntary agreement is taken up by all food products within a short time 4) With the wide availability of alternatives to PHVO it may be reasonable to ask industry to apply alternative solutions; nevertheless, this last issue would probably need a consultation with stakeholders	1) Yes, the consumer has a right for information on TFA and for being empowered to make healthy (TFA free/ low TFA) choices should products containing iTFA not be restricted 2) Only to a certain extent because the measure does not cover all iTFA containing food products and does not guarantee widespread reduction of TFA in foods nor that consumers will make the healthy (TFA free/low TFA) choice; consumers may also be unable to cope with the task of making overall healthy dietary choices based on complex nutrition information 3) Yes, providing the consumer with a basis to make an informed decision to avoid/reduce iTFA intake from packaged foods can NOT be achieved through a voluntary labelling scheme	1) Yes, allowing TFA labelling, and in particular TFA nutrient claims ("low in TFA", "zero TFA", "free of TFA"), may provide the necessary incentives to the industry to reformulate and market the healthier options to the consumer 2) Measure can in principle lead to reduction of iTFA on packaged foods; however, wide coverage of food products would only be achieved in case reformulated products gain a clear market advantage (so that other food producers have to follow); unclear outcome 3) Less onerous would only be status quo (PHVO in ingredients list), which is also less effective in incentivising industry to reformulate 4) Since the measure would introduce voluntary labelling there is no obligation and	1) Yes, the TFA health issues are still present to some extent at EU level, alternatives to use of TFA (PHVO) exist, and protection of citizens' health will be improved 2) Yes, in principle can be highly effective if a high percentage of industry participates and a high coverage of food products on the market is achieved 3) Less onerous would only be status quo, which is also less effective than an additional clear pledge and action by the food industry 4) Alternatives to PHVO are now widely available and are also already promoted to end users of vegetable oils; it seems more than reasonable (in particular in the absence of legal measures) to call on that part of the food industry that hasn't yet implemented alternatives or reduced TFA		

			<p>because products still containing iTFA would likely not be labelled</p> <p>4) Given the current requirements of the FIC regulation (1169/2011), in particular labelling of total and saturated fat, it seems reasonable to require labelling of TFA as analysis should not require high additional costs; again a consultation would help answering this point</p>	therefore no burden imposed	contents to engage in reformulation on a voluntary basis		
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\* Agreements promoting reformulation of foods. No specific labelling or claim agreements contemplated in this case.

\*\* Status Quo: As it stand, in Europe different member states have different approaches in place. Status quo also reflects the implementation of the EU Regulation 1169/2011 in which the, expression 'fully hydrogenated' or 'partly hydrogenated', must accompany the indication of hydrogenated oil (animal or vegetable origin) or fat, when present as part of the ingredient list.

\*\*\* Four stages of a proportionality test according to Craig C & de Burca G, EU Law: Text, Cases, and Materials, Oxford University Press, USA; 5 edition (2011)

Abbreviations: FHVO: Fully Hydrogenated Vegetable Oils, NA: Not applicable, N/D: not defined, PHVO: Partly hydrogenated vegetable oils, TFA: *Trans* fatty acids

## Conclusions

There is now sufficient evidence to support an adverse relationship between increased iTFA intakes and CVD risk. As a response to this evidence several measures including national or local bans of TFA in foods have been implemented throughout the world demonstrating that reduction of TFA in foods is feasible. At European level, four governments -Austria, Denmark, Iceland and Switzerland- have so far addressed this issue through restrictive legislation. Because of these pioneering regulations and other less strict measures the levels of iTFA in foods in Europe have been decreasing. Indeed the data presented at this workshop indicate that the vast majority of the products in the European market do not contain iTFA or contain relatively low levels, below 2% of total fat (the legal limit set for example by Denmark). The average amount of TFA consumed in Europe lies within the WHO-recommended maximum of 1% of total daily energy intake. Nevertheless, recent data on TFA levels in foods and its consumption/intake are still lacking for many European countries, highlighting the need for a systematic and standardised data collection to better inform practice. Also, an important message reinforced at several occasions during this workshop is that a low iTFA intake at population level does not rule out subpopulations exceeding the recommended threshold. Indeed, there are still high-TFA foods available in the market and therefore there are still individuals that, at least occasionally, consume high levels of TFA. A case in point was presented by Steen Stender; in the Balkan Peninsula there are still particular products containing high levels of iTFA. The population exposed to these is not however limited to these countries' residents. The same products could be found in Nordic countries sold for example in small Balkan speciality corner shops.

The need for keeping the TFA intakes low as possible is consensual and the topic of its replacement in foods deserves great attention. Caution must be exerted when choosing alternative fats bearing in mind that saturated fat has been associated with CVD risk too. Issues such as the sustainability of the alternative oil sources and their acceptance by the population must also be taken into consideration. Another important outcome of this workshop was related to emerging research needs. The evidence on the specific effects of rTFA on health is sparse. Nevertheless, the available evidence indicates that TFA from ruminant sources have similar adverse effects on blood lipids and lipoproteins to those from industrial sources. Given the relatively low levels of rTFA in foods, it is debatable whether further elucidating these effects should constitute such a high priority. The effects of iTFA on other health conditions than CHD are also less obvious but again given that the clear detrimental effects on health through the increased CHD risk argue for their reduction in our diets, the need for investing further resources to assess their health effects on other conditions is a matter of discussion. Specific gaps in our current knowledge of TFA exposure should be further investigated, e.g. TFA intake in specific population groups such as children, distortions arising from incomplete and often out-of-date food composition data and, more broadly speaking, limitations of current dietary assessment methods. The use of a biomarker approach (TFA in plasma) could be helpful in this regard. Along these lines, a standardised and systematic data collection to inform practice is desirable.

A final objective of the workshop was to discuss possible policy measures for providing healthier dietary options to consumers by reducing TFA consumption. The discussions highlighted 4 different options: legal limits, mandatory labelling of trans fats (as nutrients), voluntary agreements towards labelling of TFA in the nutrients table and voluntary product reformulation. These options were then compared with each other and were also matched against the status quo. Table 1 lists the most relevant criteria for this comparison. These are, for example the costs incurred by the different actors, the breadth of the coverage of the measure, the public health benefits derived from the measures or the speed and ease of implementation and several others. The table further details how each of these criteria performs for each of the policy measures considered, making it a valuable resource for the analysis of the different policy options. The data and all the discussions that evolved during this workshop will be taken into consideration in the preparation of an upcoming more comprehensive report dealing with the issue of TFA in the diets of the EU population. The authors of this report welcome any additional comments or suggestions on the topic so as to guarantee the provision of the healthiest and safest possible food choices across the EU.



# **ANNEX I**

## ***Trans Fatty Acids in Diets: Health and Legislative Implications***

*a workshop organised by the Institute for Health and Consumer Protection  
and the Institute for Reference Materials and Measurements  
in the framework of the Joint Research Centre Enlargement and Integration Action.*

**Programme of the workshop  
Workshop participants  
Evaluation**



**Joint Research Centre**  
The European Commission's in-house  
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Joint  
Research  
Centre



## Trans Fatty Acids in Diets: Health and Legislative Implications

9-10 April 2013 - Zagreb, Croatia

A workshop organized by the Joint Research Centre, Institute for Health and Consumer Protection (IHCP), and the Institute for Reference Materials and Measurements (IRMM) in the framework of the Joint Research Centre' *Enlargement and Integration Action*

Joint  
Research  
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## Background

Trans fatty acids (TFAs) are unsaturated fatty acids that have at least one double bond in the trans configuration. There are 2 predominant sources of dietary TFAs in the food supply (i) industrially produced (IP)-TFA formed during the manufacture of partially hydrogenated vegetable oils and (ii) ruminant-produced (RP)-TFA synthesized via the bacterial metabolism of polyunsaturated fatty acids (PUFA) and mono-unsaturated fatty acid (MUFA) in the rumen, and found in ruminant-derived milk and meat products. Their consumption has been linked to adverse health effects including increased risk of coronary heart disease in both men and women.

Several countries worldwide have implemented measures to reduce the presence of TFAs in foods, such as legislative limits on (IP)-TFA (Denmark, Austria etc.), mandatory TFA labelling (in most of the American continent) or partnerships with the private sector to reduce TFAs in foods (e.g. Germany and The Netherlands).

There is limited information on TFA intakes in many countries and recent evidence suggests that in the absence of measures targeting TFAs, specific population groups may be at risk. Within this context, the Institute for Health and Consumer Protection is gathering evidence on TFAs consumption in the EU27 countries and the workshop will extend this effort to the E&IA countries. Participation of acceding, candidate and potential candidate countries is important when considering the possibility of implementing future TFA-related measures for providing healthier dietary options to consumers at EU level.

**Location: Palace Hotel Zagreb**  
Trg J.J. Strossmayera 10, 10 000 Zagreb (Croatia)  
[www.palace.hr](http://www.palace.hr)

## Objectives

Take stock on the availability of data regarding TFAs presence in foods and diets in the Enlargement & Integration Action (E&IA) countries

Present and generate discussion of TFAs presence in foods and diets in EU27

Present existing initiatives on TFAs reduction in the EU27 and the New Member States, Candidate Countries, Potential Candidate Countries, non-EU FP7 Associated Countries as well as European Neighbourhood Policy Partner Countries and Russia

Present methodologies and related knowledge in assessing TFA in foods and diets

Generate a discussion on possible policy measures for providing healthier dietary options to consumers by reducing TFAs

## Programme

### Tuesday, 09 April

09:00 – 09:30

Welcome and opening of the workshop  
**JRC-IHCP and JRC-IRMM**

09:30 – 10:15

Health implications of trans fatty acid consumption  
**I.A. Brower, VU University Amsterdam**

10:15 – 10:45

Presence and intake of trans fatty acids in the EU27  
**JRC-IHCP**

10:45 – 11:20

*Coffee break*

11:20 – 12:00

Sampling and measurement of trans fatty acids  
**F. Ulberth, JRC-IRMM**

12:00 – 12:40

Reduction of trans fatty acids in processed food: challenges and opportunities  
**S. Melnikov, Unilever**

12:40 – 14:15

*Lunch break*

14:15 – 15:00

Trans fatty acids presence in foods and diets  
**S. Stender, Copenhagen University Hospital**

15:00 – 15:30

Outcome of the JRC-IHCP survey data  
**JRC-IHCP**

15:30 – 16:00

*Coffee break*

16:00 – 17:30

Parallel working groups

### Wednesday, 10 April

09:00 – 09:40

Legislation and regulatory aspects of trans fatty acids presence in foods  
**S. Bodenbach, DG SANCO**

09:40 – 11:00

Parallel working groups (cont.)

11:00 – 11:30

*Coffee break*

11:30 – 12:30

Discussion and conclusions

12:30 – 14:00

*Lunch and end of the workshop*

## Speakers



### **Stephanie Bodenbach • DG-SANCO, Belgium**

Stephanie Bodenbach joined the European Commission in 2006, where she is dealing as a policy officer with nutrition labelling and related nutrition issues as well as with the implementation of the White Paper on a Strategy for Europe on Nutrition, Overweight and Obesity related Health Issues focussing specifically on reformulation. Previously, she held positions as researcher and scientific coordinator in the coordination office of the Public Health Association of Saxony and as technical and scientific consultant in the European sales branch of a Japanese pharmaceutical and fine chemicals company. She holds Master degrees in Nutritional Science from Bonn University and Public Health from the University of North Carolina at Chapel Hill.



### **Ingeborg A Brouwer • VU University Amsterdam, The Netherlands**

Ingeborg A Brouwer is an Associate Professor at the Department of Health Sciences, VU University Amsterdam. She received her MSc in Human Nutrition from Wageningen University and obtained her PhD in Medical Sciences from the Catholic University Nijmegen. She has a number of peer-reviewed publications in the field of fatty acids consumption including trans fatty acids, lipid profile and health outcomes. Her research interests include nutrition and cardiovascular disease, fatty acids, folic acid and vitamin B12 and dietary patterns. In 2008 Ingeborg A Brouwer was awarded the International Fellowship of the American Heart Association and the council of Epidemiology and Prevention.



### **Sergey Melnikov • Unilever, The Netherlands**

Dr. Sergey Melnikov is a Lead Technologist and Oil Processing and Fat Blends Team Leader at the Spreads Global Design Centre of Unilever R&D in Vlaardingen, Netherlands. He earned dual doctorates in biophysical chemistry (Nagoya University) and polymer chemistry (Moscow State University), followed by a postdoctoral position at Lund University, Sweden. During his 13 years at Unilever, he held various R&D management position, including creation and leadership of the Food-Body Interactions group. He is a co-author of 10+ patents and patent applications and his key technical interests include food lipid functionality, emulsion technology, design of processed functional foods for tailored in-use and in-body functionality, controlled delivery of food actives.



### **Theodora Mouratidou • EC, DG Joint Research Centre (JRC), Italy**

Theodora Mouratidou is a scientific/technical project officer in the JRC-IHCP focusing on policy support in the field of Nutrition and Public Health. She holds degrees in Human Nutrition and in 2007 obtained her PhD from the University of Sheffield on dietary assessment of pregnant women. Since then she held positions as a post-doctoral researcher at the University of Sheffield and at the University of Zaragoza, Spain, where she worked in several obesity related projects such as the FP7-funded HELENA, IDEFICS and ToyBox.



### **Steen Stender • Copenhagen University Hospital, Denmark**

Steen Stender is Lab Director at Department of Clinical Biochemistry, Copenhagen University Hospital, Gentofte, Denmark and a medical doctor and professor in prevention of heart disease. A major research area has been the measurement of the in vivo transfer of plasma lipoproteins from plasma into the arterial wall of humans. Another area has been the biological effect of trans fat in human diet and as a consequence also the presence of trans fat in various types of popular foods in various countries. Steen Stender has served as a chairman of the trans fat working group in the Danish Nutrition Council from 1993 to 2005.



### **Franz Ulberth • EC, DG Joint Research Centre (JRC), Belgium**

Franz Ulberth is Head of the Standards for Food Bioscience Unit at the JRC-IRMM. Franz graduated (PhD) in "Food Science and Biotechnology" from the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna, Austria and after graduation joined the Department of Food Science and Technology at the same university, specialising in the chemistry and biochemistry of lipids, including trans fatty acids and conjugated linoleic acids. He is member of the editorial board of the international journal Food Additives and Contaminants, and represents the Joint Research Centre in relevant Technical Committees of standards developing organisations such as the European Committee for Standardization, International Organization for Standardization, AOAC International and the Codex Alimentarius.

## Participants



### **Hava Altman • Ministry of Health, Israel**

Hava Altman trained as a dietician at the Hebrew University of Jerusalem, Israel where she also undertook her MPH. She currently holds the position of the Principal Public Health Dietician at the Ministry of Health, Israel working as dietician at the municipal public health services in Jerusalem. She also works as a nutrition supervisor at the geriatric branch of the ministry of health also coordinates the district dieticians in Israel.



### **Mihaela Armanu • Ministry of Health, Romania**

Maria-Mihaela Armanu is a medical doctor, specialist in food hygiene and nutrition. She has a MPH from the "Carol Davila" University of Medicine and Pharmacy of Bucharest. She works in the Ministry of Health at the Public Health and Control in Public Health Department. Her main responsibilities are in the field of nutrition and food safety. She is also the representative of the Ministry of Health at the High level Group on Nutrition and Physical Activity at the European Commission in Brussels.



### **Snezana Barjaktarović Labović • Bar Health Care Centre, Montenegro**

Snezana Barjaktarovic Labovic, a mother of three children, lives and works at the Health Centre of Bar, a small town on the coast of Montenegro. She is a specialist of Hygiene and is currently enrolled in a Doctoral study in the field of Public Health with a special focus in the field of Nutrition.



### **Sandra Caldeira • EC, DG Joint Research Centre (JRC), Italy**

Sandra Caldeira is a Project Manager in the area of Nutrition and Health at the JRC-IHCP. She holds degrees in Microbiology and Biotechnology and a PhD in Biomedical Sciences. Prior to her current position she worked as a researcher in the areas of cancer, virology and molecular biology, as an invited professor of Genetics at the University of Lisbon and after as a science editor at the European Molecular Biology Organisation (EMBO) where she worked in the areas of Molecular Biology and Molecular Medicine.



### **Irena Colic Baric • University of Zagreb, Croatia**

Irena Colic Baric is a professor at the Faculty of Food Technology & Biotechnology, University of Zagreb. She has established, coordinates and teaches undergraduate and graduate and PhD studies in Nutrition Science, supervising more than ten doctoral and master thesis. She is also a coordinator/participant in national/international scientific and professional projects and author/coauthor of scientific papers and book chapters. She is the president of the Panel on dietetic products, nutrition and allergenic in the Croatian Food Agency and member of the Expert group on food consumption data, EFSA.



**Selma Čorbo • University of Sarajevo, Bosnia and Herzegovina**

Selma Čorbo is currently a professor at the Faculty of Agriculture and Food Sciences of the University of Sarajevo. Her working area is food technology and she has obtained her PhD at the Faculty of Agriculture and Food Sciences of the University of Sarajevo. Her main interests are in the areas of technology vegetable oils and animal fats, modification of oil and fats, cold pressed vegetable oils and in technological processes in the food industry.



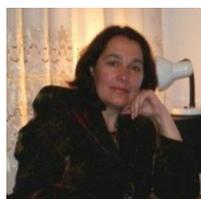
**Maja Dimitrovska • Institute of Public Health, Former Yugoslav Republic of Macedonia**

Maja Dimitrovska graduated with a degree in Food Technology and Biotechnology at Ss. Cyril and Methodius University in Skopje. She received her MSc degree in food sciences at the same University and currently she is awaiting her PhD thesis defence in May 2013 related to anthocyanin profile of red wines. Maja is employed as a senior food analyst in the Institute of Public Health. She has a long time experience in food analyses using liquid and gas chromatography. Among other tasks, she is responsible for analytical method development and their implementation in the laboratory EN 17025 system. She has attended numerous courses related to food analytics and actively participated in many congresses.



**Ines Drenjančević • University of Osijek, Croatia**

Ines Drenjančević is a professor at the University of Osijek and an honorary professor of the University of Pecs, Hungary. She has obtained both her MD and MSc degrees in the Faculty of Medicine of the University of Zagreb. In 2004, she obtained her PhD degree from the Medical College of Wisconsin, Milwaukee, USA. At her current post she is involved both in teaching and research activities acting as principal investigator and project coordinator in national and international projects.



**Vesselka Duleva • National Center of Public Health and Analyses, Bulgaria**

Currently Prof. Duleva is the Head of the Department of Food and Nutrition at the National Center of Public Health and Analyses, Sofia, Bulgaria. Amongst other acts as the WHO National Nutrition Focal Point and participates in the development of the National Food and Nutrition Policy plan. She is the national representative in several working groups of the European Commission. She graduated from the Higher Medical Institute in Sofia and obtained her PhD in Nutrition and Vitaminology of the Institute of Nutrition of Moscow, Russia. She leads and participates in many national and international projects related to the assessment of dietary intake and nutritional status of different population groups.



**Dominique Durrer • Swiss Medical Association (FMH), Switzerland**

Dominique Durrer (MD) is a General Internist Practitioner FMH specialized in Nutrition, Obesity & Eating Disorders and Diabetes. She comes from Switzerland (French part). Professional activities: Nutrition, obesity and eating disorders (Postgraduate Diploma from Paris Univ. Hospital (adolescent Obesity), and Lausanne University (Human Nutrition). Delegate (EUROPREV) to the European Union Platform "Nutrition Physical Activity & Health.



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**Mirjana Gurinovic • University of Belgrade, Serbia**

Mirjana Gurinovic works at the Centre of Research Excellence in Nutrition and Metabolism, Institute for Medical Research, University of Belgrade. She engages in research on nutrition, food composition, public health nutrition and nutrition epidemiology actively involved in co-coordinating national projects and in international/ European dimension as the research team leader in several EC FP6 NoE projects, including EURRECA, EuroFIR, EFSA projects, and FP7 BaSeFood project, EuroFIR-Nexus, and EURODISH. She chairs the Network for Capacity development in Nutrition in Central and Eastern Europe.



**Seniz Ilgaz • Ministry of Health, Turkey**

Seniz Ilgaz works as a technical program officer at the Institution of Public Health of the Turkish Ministry of Health. She holds both a Bsc and a MSc in nutrition and dietetics obtained from Hacettepe University. She recently obtained her PhD looking into the Baby Friendly Initiative Program in Turkey. Her research interests include global nutrition, public health and public health nutrition and childhood nutrition.



**Lars Johansson • Norwegian Directorate of Health, Norway**

Lars Johansson is born in Sweden 1948 and resident in Norway since 1979. He holds a Dr. philos in nutritional epidemiology and is a registered dietician. He works as senior adviser at Norwegian Directorate of Health since 2002, and earlier at the National Nutrition Council of Norway and Sahlgrenska Hospital, Gothenburg, Sweden. He has participated in several Nordic and European working groups and projects. Main interests include dietary surveys, nutritional surveillance, dietary guidelines, nutrition policy. Regarding trans fatty acids he has been co-author of several publications concerning dietary intake of trans fatty acids and guidelines regarding intake of trans fatty acids since 1994. He participated in the European project TRANSFAIR.



**Bente Kirkhus • Nofima - Norwegian Institute for Food, Fisheries and Aquaculture Research, Norway**

Bente Kirkhus is a Senior Research Scientist at the Norwegian Institute for Food, Fisheries and Aquaculture Research. She has obtained a Master of Science (Physics, Medical Technology and Biophysics) from the Norwegian University of Science and Technology and her Dr.Philos, from the University of Oslo. Her main research fields include food and health, bioactive lipids. She has worked as a research scientist for The Norwegian Cancer Society and was involved in studies of carcinogenesis, cell kinetics, tumour biology and infertility. She was also Research Manager in Mills DA involved in the reformulation to trans free margarines.



**Olivera Koprivnjak • University of Rijeka, Croatia**

Olivera Koprivnjak graduated in food engineering and nutrition sciences from the Faculty of Food Technology and Biotechnology, University of Zagreb in Croatia and she holds a PhD in food technology from the University of Udine, Italy. She currently works as professor at the Department of Food Technology & Control, Faculty of Medicine, University of Rijeka. She is a member of the Scientific Committee of the Croatian Food Agency.



**Greta Krešić • University of Rijeka, Croatia**

Greta Kresic is an associate professor and head of the Department of Food and Nutrition, University of Rijeka, Croatia. She received her B.A., M.A. and Ph.D. in food technology and nutrition from the University of Zagreb. The fields of her scientific interest are emerging food processing technologies (*i.e.* high hydrostatic pressure, ultrasound, pulsed-electric fields etc.) and human nutrition (dietary intake, dietary habits, maternal and child nutrition).



**Carlos Martin Saborido • EC, DG Joint Research Centre (JRC) , Italy**

Carlos Martin Saborido, recently joined the IHCP nutrition and health team, is a Health Economist with a PhD in Biomedical research in the area of Health Economics at Universidad Europea de Madrid. The last 5 years he has been working at the University of Liverpool, doing Health Economics Appraisals on behalf of the National Institute for Health and Clinical Excellence (NICE, UK) and Universidad Potificia Comillas. In the latter, he shared his time between lecturing research methods and half-time working as an external health economics modeller for the Ministry of Health in Spain and the Regional Ministry of Health in Madrid. His area of expertise is the economic evaluation of drugs, devices and health programmes through mathematical modelling.



**Danijela Ristic-Medic • University of Belgrade, Serbia**

Danijela Ristic-Medic (MD, MSc, PhD Nutrition, Specialist in internal medicine) is working at the Centre of Research Excellence in Nutrition and Metabolism, Institute for medical research, University of Belgrade, Serbia. She is Assistant research Professor, actively engaged in clinical and epidemiology nutrition research in the national/international scientific and professional projects. Fatty acid intake and fatty acid status as biomarker of intake is a field of her long-standing interest in the health prevention area and also through the metabolic aspects of obesity, cardiovascular disease and cancer, and nutrition therapy. She is Member of the Serbian Medical Society, Serbian Physiological Society, the Serbian Association for the Study of Obesity and the Serbian Nutrition Association.



**Igor Spiroski • Institute of Public Health, Former Yugoslav Republic of Macedonia**

Dr. Igor Spiroski is Medical Doctor and holds a Master in Public Health. He works as Senior Researcher at the Department of Physiology and Monitoring of Nutrition, Institute of Public Health of the MK. His main professional occupation is health risk assessment related to nutrition. He is a member of several national and international professional networks and has worked in implementation of number of projects funded by the EC and UN agencies. Complementary, Dr. Spiroski is teaching at the Faculty of Medicine, Ss. Cyril and Methodius University in Skopje, for the subjects of Public Health. Since 2013, he is the WHO National Nutrition Focal Point.



**Darija Vranešić Bender • University Hospital Zagreb, Croatia**

Darija Vranešić Bender, BSc, PhD, is an associate professor at the Faculty of Food Technology and Biotechnology and Zagreb School of Medicine. She is the head of a nutritional consulting company, active member and president of several Societies in the country and region. She organised several educational courses and congresses in the field of nutrition and participated at numerous national and international scientific conferences. Also, she is active in organisation and implementation of several projects aimed at children's nutrition in kindergartens and elementary schools in Croatia.



**Vesna Vucic • Institute for Medical Research, Serbia**

Vesna Vucic received her PhD in biochemistry and physiology from the University of Belgrade. She works at the Institute for Medical Research, Centre of Research Excellence in Nutrition and Metabolism in Belgrade. After 10-years of experience in cancer research by cell culture and immunochemistry methods, in the last few years her primary area of interest is research of relationships between nutrition, cancer and physical activity, with emphasis on fatty acids. She has been involved in several national and EU funded projects and published many articles in peer reviewed international journals.



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**Jan Wollgast • EC, DG Joint Research Centre (JRC), Italy**

Jan Wollgast graduated in nutrition and home economics from Justus Liebig University, Giessen, Germany in 1998. He subsequently carried out research on the health effects of polyphenols in chocolate and concluded this project by obtaining his PhD at Giessen University in 2005. Since 2002 he has been working as a scientific officer in the JRC's Institute for Environment and Sustainability (until 2009) and Institute for Health and Consumer Protection, where he is currently working in the area of nutrition and health providing scientific and technical support to EU policy makers in the field.

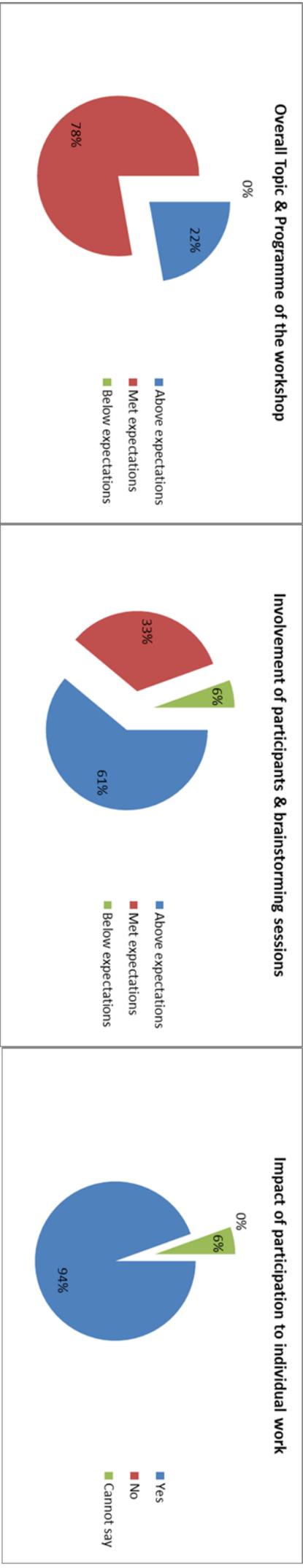
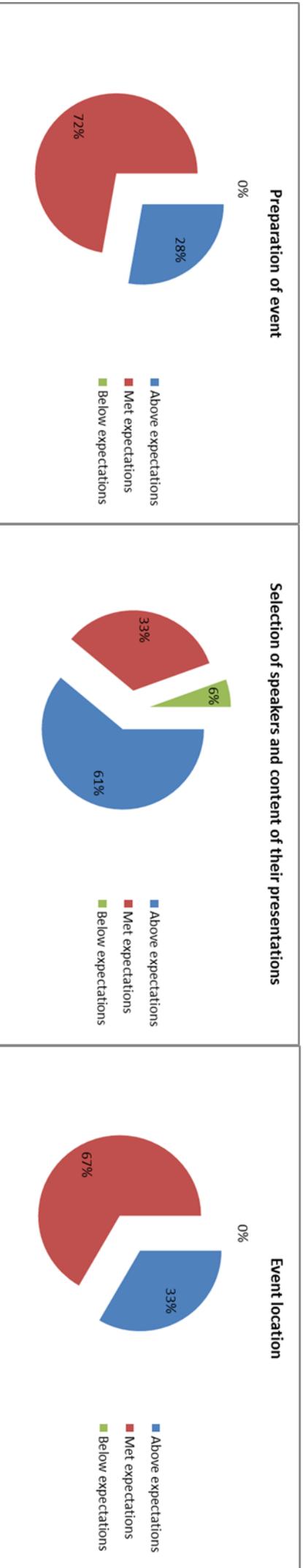


**Corina-Aurelia Zugravu • National Institute of Public Health, Romania**

Corina-Aurelia Zugravu is a senior lecturer with the "Carol Davila" University of Medicine and Pharmacy of Bucharest and heads the Department of Nutrition and Environmental Health at the Nurses&Midwifery Faculty. Holding a PhD in Medical Sciences and a MD in Public Health and Preventive Medicine and having an extensive experience in assessment of lifestyle hazards in relation to non-communicable diseases, evaluation of food intake and nutritional status, health promotion through behavioural changes in population risk clusters, also acts as consultant to the National Centre for Environmental Hazards Monitoring within the Romanian National Public Health Institute. In the last two years, she is also a governmental expert at the workgroup on Food Additives, Flavourings and Enzymes of DG Sanco.



**Participant feedback from the workshop on  
 "Trans fatty acids in diets: health and legislative implications"  
 Zagreb, Croatia 9-10 April 2013**





## **ANNEX II**

# ***Trans Fatty Acids in Diets: Health and Legislative Implications***

*a workshop organised by the Institute for Health and Consumer Protection  
and the Institute for Reference Materials and Measurements  
in the framework of the Joint Research Centre Enlargement and Integration Action.*

**Survey Questionnaire**

One of the aims of this workshop is to take stock of the availability of data regarding the presence of *trans* fatty acids (TFA) in foods and the intake levels of the population diet, but also to obtain useful country-specific information on associated issues. Your support in this task is vital. We would like to kindly ask to complete the following questions and return back the completed questionnaire by the 22<sup>nd</sup> of March 2013

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### *Presence of trans fatty acids in foods*

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**1. Are you aware of a legal maximum limit of *trans* fatty acids (presence in food in terms of % TFA per 100 g or % TFA per 100g of fat) in foods in your country?**

- No
- If yes, please provide the following information

Link/sources of information: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

Target food (s): \_\_\_\_\_

**2. Does your country host a national food composition database?**

- No
- Yes (please provide the link).....

**3. Does it include information on TFA?**

- No
- If yes, please provide the following information

Link/sources of information: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

Food (s) with the highest concentration of TFA: \_\_\_\_\_

**3a) Are you aware of any survey determining the TFA content in a range of (processed) foods in your country?**

- No
- If yes, please provide the following information

Date of the survey (food sampling): \_\_\_\_\_

Food or food groups analysed: \_\_\_\_\_

Total TFA or single TFA analysed: \_\_\_\_\_

Analysis of other fatty acids (e.g. total fat, saturates etc, please specify which): \_\_\_\_\_

Link or Reference \_\_\_\_\_

3c) If possible could you please provide us with TFA contents (g/100g food or g/100g fat) of the food or food groups analysed?

---

### *Population intake of trans fatty acids*

---

4. Is there a current daily recommended (maximum) intake level of *trans* fatty acids in your country (as a fraction of energy intake)?

- No
- If yes, please provide the following information

Link: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

5. Are you aware of any academic study, report or analysis that addresses the population level intake of *trans* fatty acids?

- No
- If yes, please provide the following information

Link: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

If possible, could you please provide the following information?

Population group	Level (intake of TFA)	Comments
Adults		
Adolescents		
Children		
Other		

---

## *Existing/planned policies/actions on trans fatty acids*

---

### 6. Are there established food based dietary guidelines in your country?

- No
- If yes, please provide the following information,

Link: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

### 7. Are you aware of any available national initiatives (public, private or public-private), of *trans* fatty acid level reduction (in foods) and consumption?

- No
- If yes, please provide the following information

- is it a national initiative focusing only on trans fatty acid***

Link: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

- is part of a broader program***

Link: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

### 8. Which of the following elements does the national initiative comprise of?

- Actions to raise public awareness and to enable informed choice i.e. food labelling, educational campaigns, media coverage etc.***

Link: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

- Actions to encourage industry/catering to reformulate products***

Link: \_\_\_\_\_  
Name of the report/directive: \_\_\_\_\_  
Institute in charge: \_\_\_\_\_  
Date in effect: \_\_\_\_\_

**Monitoring and evaluation actions and reformulation**

Link: \_\_\_\_\_  
Name of the report/directive: \_\_\_\_\_  
Institute in charge: \_\_\_\_\_  
Date in effect: \_\_\_\_\_

**Legislative limits on the presence of TFA in food**

Link: \_\_\_\_\_  
Name of the report/directive: \_\_\_\_\_  
Institute in charge: \_\_\_\_\_  
Date in effect: \_\_\_\_\_

**Other (please specify)**

Link: \_\_\_\_\_  
Name of the report/directive: \_\_\_\_\_  
Institute in charge: \_\_\_\_\_  
Date in effect: \_\_\_\_\_

**9. Are you professionally involved in this initiative?**

- No
- Ye

**10. Are you aware of any study where this initiative has been evaluated?**

- No
- If yes, please provide the following information,

Link/sources of information: \_\_\_\_\_  
Name of the report/directive: \_\_\_\_\_  
Institute in charge: \_\_\_\_\_  
Date of publication: \_\_\_\_\_

**11. Are you aware or are there any future plans for national initiative addressing *trans* fatty acid levels (presence in foods) and consumption?**

- No

- If yes, could you please share more information on them (messages, target population, media channels...).

Link/sources of information: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

**12. Are you aware of existing or planned approaches in terms of monitoring presence of *trans* fatty acids in foods and level of intake data?**

- No
- If yes, please provide the following information,

Link/sources of information: \_\_\_\_\_

Name of the report/directive: \_\_\_\_\_

Institute in charge: \_\_\_\_\_

Date in effect: \_\_\_\_\_

---

***Other***

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**13. Please add any additional information considered to be of importance and is not covered by the questionnaire**

**Please return back the completed questionnaire by the 22<sup>nd</sup> of March 2013**

**Thank you for taking the time to complete the questionnaire**

**The JRC Nutrition team**

European Commission

EUR 26198 – Joint Research Centre – Institute for Health and Consumer Protection and Institute for Reference Materials and Measurements

Title: **Trans Fatty Acids in Diets: Health and Legislative Implications**

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## **Abstract**

Increased consumption of trans fatty acids (TFA) is associated with increased risk of cardio-vascular disease (CVD). The European Commission's Joint Research Centre (JRC) organised a workshop on the 9th and 10th April in Zagreb, Croatia entitled 'Trans fatty acids in diets: health and legislative implications'. The workshop brought together around 30 European experts on fats, food science and technology, public health and nutrition and aimed to 1) present and discuss recent data on the presence of TFA in food and their consumption in Europe and 2) to exchange ideas and practices on how to reduce exposure to TFA.

This report summarises the data presented and the discussions held at this workshop. The known negative health implications of industrial trans fatty acids (iTFA) consumption were re-emphasised but it was also made clear that in contrast with the worrying situation seen in many European countries ten to fifteen years ago, the vast majority of the food products analysed for TFA content in recent years do not contain high levels of TFA. This improved situation is likely due to efforts from several stakeholders in reducing iTFA levels in foods, both voluntarily or enforced in some member states by regulatory measures. Nevertheless, data presented at the workshop showed that products with high levels of TFA can still be found on the market in some countries and depending on their frequency of consumption these may represent a cause for public health concern. The participants also discussed the need for further data collection on the presence of TFA in foods and how to best collect these data as well as the different technological options to reduce and replace iTFA in foods along with their costs and health benefits. Participants also noted that any public health measures related to TFA in this regard must not neglect the health implications of overconsumption of other nutrients such as saturated fats (SFA), salt (sodium) and sugars.

During the last session of the workshop, the participants discussed different public health approaches to further reduce TFA intake in Europe, such as legislative limits on TFA content in foodstuffs, mandatory and voluntary TFA labelling schemes and voluntary food reformulation pledges. The outcome of this session is presented in this report in the form of a table including relevant criteria to be considered when comparing these different approaches.

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and international community.

Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.

