



Comments and remarks of the Brazilian FIL/IDF SCNH regarding the new WHO draft guidelines on saturated fat intake for children and adults.

For decades, the medical community and public health authorities around the globe have recommended a limited consumption of total fat (<30% of daily energy intake), saturated fat (<10% or even as low as <7% of daily energy intake), and cholesterol (<300 mg/day) to reduce the risk of obesity and cardiovascular diseases (CVD).

As dairy fat has a high content of saturated fat (about two-thirds of total fatty acids), the consumption of fat-free or low-fat milk and dairy products instead of their full-fat versions has been advocated as part of a healthy diet (WHO, 2015).

Although the most recent USDA dietary guidelines ([2015-2020 Dietary Guidelines for Americans](#)) acknowledged that there was no convincing evidence to keep the long-lasting recommendations of limiting the intakes of total fat and cholesterol (the latter has never been included in the UK guidelines), they still decided to keep the warning on saturated fat intake, thereby skirting the current body of controversial evidence - particularly as regards saturated fat from dairy (Astrup et al., 2016; Guo et al., 2017; Lovegrove & Givens, 2016; Grasgruber et al., 2016; Harcombe et al., 2016).

A number of meta-analysis of epidemiological and RCT studies published over the last decade have shown that intake of full-fat dairy products is not associated with a higher risk of CVD, with growing evidence even pointing to a lower risk of obesity, metabolic syndrome and type-2 diabetes, which are major risk factors for cardiovascular diseases (Kratz et



al., 2013; Mozaffarian, 2014; Astrup, 2014; Yakoob et al., 2014). These findings are consistent with mounting evidence showing that:

- 1) Saturated fat is not a homogeneous group either chemically or biologically; instead, it refers to a number of individual fatty acids (even or odd-numbered, straight or branched-chained) which elicit quite different physiological effects on key biomarkers of CVD such as circulating levels of plasma lipids and lipoproteins (Kris-Etherton & Yu, 1997; Gómes-Cortés et al., 2018).
- 2) Dairy fat, particularly, is the most complex lipid in human diet as it contains more than 400 individual fatty acids (Jensen, 2002; Delmonte et al., 2012). Among saturated fatty acids, only three (C12:0, C14:0, and C16:0) are hypercholesterolemic (i.e. increases plasma levels of total cholesterol and LDL-cholesterol), which would be expected to increase the risk of CVD (USDA, 2010). On the other hand, these saturated fatty acids also increase HDL-cholesterol when substituted for carbohydrates in the diet (the most common situation in real life), which is expected to reduce CVD risk (Mensink et al., 2003). Moreover, it is now well-established that LDL-cholesterol can exist in mainly two forms in blood: small and dense LDL particles or large and buoyant LDL particles. Interestingly, studies have shown that dairy fat raises predominantly the latter, which appears not to be associated with a higher CVD risk (Siri-Tarino et al., 2010).
- 3) A growing body of research has also indicated that the association of saturated fat with CVD is far more complicated than previously thought. For instance, some studies showed that the concentrations of even-chained and odd-chained fatty acids in plasma lipids are differently associated with coronary and type-2 diabetes risk: while C15:0 and C17:0 (odd-chained) were found to be inversely associated with the risk of both diseases, a positive association was found for C16:0 and C18:0 in relation to coronary risk, and for C14:0, C16:0 and C18:0 in relation to type-2



diabetes risk (Chowdhury et al., 2014; Forouhi et al., 2014). Furthermore, the concentrations of C15:0 and C17:0 in plasma phospholipids were strongly correlated with dairy consumption in Forouhi et al. (2014), which is consistent with the use of these two odd-chain FA as biomarkers of dairy fat intake (Gama et al., 2017).

- 4) By using varying plasma or erythrocyte levels of C15:0, C17:0 and *trans*-9 C16:1 as biomarkers of dairy fat intake (which is expected to overcome major issues associated with dietary assessment methods that rely on self-report, such as food frequency questionnaires), several epidemiological and interventional studies have shown either neutral or positive effects on biomarkers, or hard-endpoints of CVD (Liang et al., 2018). Although higher plasma LDL-cholesterol levels are normally associated with dairy fat consumption in most studies, increased HDL, lower TG, and improved insulin sensitivity are also common observations (Mozaffarian et al., 2013; Kratz et al. 2014; Drehmer et al., 2016). Also, a recent systematic review of 52 clinical trials showed anti-inflammatory activity in subjects consuming dairy products (either low or high fat) as long as they have no allergy to milk (Bordoni et al., 2017). Taken together, the findings above are consistent with a substantial body of current expert opinion, which purports that reliance on a single biomarker, such as LDL-cholesterol, may not be sufficiently reliable to characterize cardiovascular risk.
- 5) As pointed out in an article written by several renowned experts, "The effect of particular foods on CHD cannot be predicted solely by their content of total SFAs because individual SFAs may have different cardiovascular effects and major SFA food sources contain other constituents that could influence CHD risk" (Astrup et al., 2011). Thus, the neutral or positive effects of dairy fat intake on CVD risk observed in several studies (contrary to what could be expected based on its high saturated fat content) may be explained by the highly complex and unique

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nature of dairy fat. Accordingly, there is growing scientific consensus pointing to dairy fat as a natural source of bioactive components with potential beneficial effects on human health (e.g. butyric acid, rumenic acid, vaccenic acid, phytanic and other branched FA, oleic acid, α -linolenic acid, etc.), some of which are not found in significant amounts in other foods (Kratz et al., 2013; Shingfield et al., 2008). It should also be noted that oleic acid is the second most abundant FA in dairy fat, accounting for 20-25% of total FA. Oleic acid is the major FA in olive oil, one the main ingredients of the Mediterranean diet, which is widely considered as the epitome of a healthy diet.

- 6) As for the trans FA content in dairy fat, scientific evidence to date indicate that ruminant TFA intake in moderate to slightly high amounts (up to 4 g/day) have neutral effects on CVD risk (Jakobensen et al., 2008; Uauy et al., 2009). Accordingly, a recent review (Kuhnt et al., 2016) found that only extremely high ruminant TFA intakes would cause negative changes in blood lipids. These findings are consistent with *trans*-11 C18:1 (vaccenic acid) being the predominant *trans*-C18:1 isomer in milk fat under most ruminant diets (Shingfield et al., 2013).
- 7) Rather than categorizing "healthy" and "unhealthy" food choices per se, the current literature stresses the importance of balanced diets as part of optimum public health standards. Moreover, different life cycles may require specific nutritional needs, mostly for infants and the elderly.
- 8) Since 2004, the World Health Organization (WHO) has established ***the Global Strategy on Diet, Physical Activity and Health*** (http://apps.who.int/iris/bitstream/handle/10665/43035/9241592222_enq.pdf;jsessionid=316BE39B9D1D06A81DC2E046EA82BE5D?sequence=1), which establishes four main objectives:

- **Reduce risk factors for chronic diseases** that stem from unhealthy diets and physical inactivity through public health actions.



- **Increase awareness and understanding** of the influences of diet and physical activity on health and the positive impact of preventive interventions.
- **Develop, strengthen and implement global, regional, national policies and action plans** to improve diets and increase physical activity that are sustainable, comprehensive and actively engage all sectors.
- **Monitor science and promote research** on diet and physical activity.

For diet, recommendations for populations and individuals should include the following:

- achieve energy balance and a healthy weight
- limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans fatty acids
- increase consumption of fruits and vegetables, and legumes, whole grains and nuts and limit the intake of free sugars
- limit salt (sodium) consumption from all sources and ensure that salt is iodized

9) Although the WHO Guidelines about **Global Strategy on Diet, Physical Activity and Health**, has set forth recommendations for reduced dietary intakes of sugar saturated fats, and mainly from processed foods, it also stressed that a balanced diet is to be sought, in lieu of specific foods to be avoided. Similar recommendations are also current at the Codex Alimentarius, **with its** e-working group on Food Labeling having brought the topic to its agenda.

10) In Brazil and other Latin America countries, the “front of pack” (FOP) labeling is under discussion. However, some countries, such as Ecuador, Chile and Uruguay have already published their specific FOP regulations, specifically considering sodium, sugar and saturated fat as associated with

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non-communicable chronic diseases (NCDs). Therefore, these countries have specified recommendations for limited intake of those nutrients and have defined specific colors as warnings to account for health concerns as applied to such nutrients.

- 11) In Brazil, labeling regulations (based on a 2000 Kcal diet) have limited a recommended daily intake of 55 g for total fat, from which 22 grams saturated fat (RDC 360/2003- ANVISA). Additionally, RDC 54/2012 has established that claims of “low in saturated fat” shall be limited to 1,5 g per serving.

ADDITIONAL REMARKS:

- 1) There is evidence that the effects of full-fat dairy on CVD risk vary according to the product, with fermented products such as cheese and yogurt being apparently more beneficial than butter and milk (De Goede et al., 2015; Guo et al., 2017). This suggests that the whole dairy matrix (and therefore nutrients other than fat) are important to determine the overall effect of dairy consumption on human health (Givens & Soedamah-Muthu, 2016; Thorning et al., 2017).
- 2) It should also be kept in mind that reduced consumption of dairy fat as result of dietary guidelines to avoid full-fat dairy products will reduce not just SFA intake as intended, but also all the fat-soluble bioactive components present in dairy fat, such as the potentially beneficial FA previously mentioned in this document, as well as carotenoids (notably β -carotene) and vitamin E, whose contents in milk fat are higher in grazing cows.
- 3) Finally, it should be stressed that, contrary to salt and sugar - arguably chemically-defined food ingredients - it is not currently possible to add, or reduce, saturated fat as single or even multiple ingredient to foods,

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since butterfat, or palm or coconut oils are not exclusively composed of saturated fats. Even if such addition could be made possible in the future, the fatty acid composition of such ingredient sources would require careful nutritional consideration in light of the evidence hereby presented

- 4) It is very important to consider the dairy product in a context of healthy balanced diet, and not to determine healthy and unhealthy foods, which is well- addressed in e-working group of Food Labeling in Codex Alimentarius.
- 5) It is also relevant to consider the milk lipid profile, which is not so far from human milk lipid profile and might be compose a healthy diet for different human life cycles.
- 6) The Brazilian labeling regulation defines daily value for saturated fat which may the achieved from different food in the diet, but the dairy matrix besides saturated fat also deliveries bioactive peptides and essential fatty acids to promote healthy diet.

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