CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

Viale delle Terme di Caracalla, 00153 Rome, Italy - Tel: (+39) 06 57051 - Fax: (+39) 06 5705 4593 - E-mail: codex@fao.org - www.codexalimentarius.org

Agenda Item 2 **MAS/36 CRD/19**

Original Language Only

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING

36th Session

Budapest, Hungary, 23 – 27 February 2015

MATTERS REFERRED TO THE COMMITTEE BY THE CODEX ALIMENTARIUS COMMISSION AND OTHER SUBSIDIARY BODIES

(Comments of AOAC)

COMMENTS ON DETERMINATION OF *TRANS* FATTY ACID ANALYSIS

These comments cover those already submitted to the 36th session of CCNFSDU as CRD 14 and further expand on the precision data contained in AOCS Ce 1j-07 on a number of different matrices covering food and feed.

"Methods of Analysis

AOCS Ce 1h-05 was developed in response to the need to determine the level of *trans* fatty acids in refined vegetable oils and fats, both hydrogenated and non-hydrogenated. The method allows the quantification of saturated, and *cis* and *trans* isomers of monounsaturated and polyunsaturated fatty acids present in common vegetable oils and fats. It was published with full precision values for the oils and fats analyzed. It was not intended for use to determine *trans* fatty acid levels in finished foods. The method describes the chromatographic conditions necessary to obtain repeatable results.
It is to be noted that the method requires that methyl esters of fatty acids are prepared in a prior step. Suitable methods are listed as AOCS Ce 2-66 and ISO 5509.

Subsequent to the development of Ce 1h-05, a method (Ce 1j-07 Determination of *cis, trans,* saturated, monounsaturated and polyunsaturated fatty acids in extracted fats by capillary GLC) was developed to determine the levels of saturated and *cis* and *trans* isomers of monounsaturated and polyunsaturated fatty acids in food samples. This method requires the direct preparation of fatty acid methyl esters according to Ce 2b-11 or Ce 2c-11. Method performance data were developed for 24 complex food/feed matrices taken from the AOAC food composition triangle and are given for both methylation methods when coupled with Ce 1j-07. The use of these method pairs allows the analyst a direct path to the determination of *trans* fatty acids in food products where the source of the fat may be of dairy, marine or vegetable origins.

AOCS would recommend the use of these method pairs (Ce 1j-07 plus either Ce 2b-11 or Ce 2c-11) when determining *trans* fatty acid content in finished foods.

As detailed in the reports of previous meetings, CCMAS decided to wait for the outcome of the above-mentioned method performance studies before deciding on the acceptability of any method for the determination of *trans* fatty acids in foods. At the time, AOCS was unable to share the performance data as they had not been approved by the Uniform Methods Committee for publication. From the associated method performance data it is now clear that the determination of *trans* fatty acids in finished foods requires a skilled

laboratory with much expertise in the identification of individual *trans* fatty acid isomers from a variety of oil/fat sources. Misidentification of members of the *trans* fatty acid family is a major problem encountered by analytical laboratories.

The AOCS is concerned that low level of *trans* fatty acids cannot be routinely determined by the average laboratory with any high degree of reproducibility. This situation may lead to confusion in the marketplace and in general trade where products may be deemed to be "*trans*-free" by one laboratory and above the threshold for this claim in another."

Performance data from Ce 1j-07 may be summarized as follows:

matrix	Total fat content (FA%)	Mean *trans* isomer content %	SD Reproducibility	Relative SD R %
Anhydrous milk fat	88.93	5.11	0.67	13.14
Tallow	95.21	7.14	0.30	4.20
Chocolate cake mix	10.34	0.90	0.07	7.43
Cheese powder	28.38	7.27	0.37	5.04
DHA/EPA fortified infant formula	27.58	0.15	0.12	78.47
Extruded dog food	21.06	0.31	0.11	34.97
Oatmeal cookie	18.33	0.05	0.02	44.84
Evaporated milk	5.97	0.33	0.05	15.89
Peanut butter	51.69	0.06	0.04	75.73
Yoghurt (plain)	5.51	0.32	0.03	7.94
Canned cat food	5.44	0.05	0.03	49.55
Butter blend	67.76	2.49	0.43	17.29
Whole egg powder	38.47	0.43	0.06	12.99
Full fat soy flour flakes	22.05	0.02	0.01	73.10
DHA/EPA	53.66	0.68	0.23	33.82
Creamy ranch dressing	44.16	0.24	0.16	65.50

Potato chips	34.44	0.22	0.14	62.69
Cheese powder (dupl)	28.69	7.20	0.31	4.27
Frozen cheese pizza	7.66	0.37	0.07	18.70
Peanut butter (dupl)	49.29	0.05	0.05	85.63