Individual trans-16:1 isomers in cow, goat and ewe cheese fats, including data on the newly found "natural" trans-3 16:1 acids

Oléagineux, Corps Gras, Lipides. Volume 7, Numéro 1, 105-2, Janvier - Février 2000, Dossier : actes des Journées Chevreul "Corps gras, nutrition et santé, questions d'actualité" (Bordeaux, Pessac)

Auteur(s) : Frédéric DESTAILLATS, Dietz PRECHTH, Joachim MOLKENTIN, Robert L. WOLFF, Institut des sciences et techniques des aliments de Bordeaux, Talence, France.

Résumé : * FD is an ISTAB student engineer funded by an Adera grant for his training period at the Bundesanstatt für Milchforschung

ARTICLE

* FD is an ISTAB student engineer funded by an Adera grant for his training period at the Bundesanstatt für Milchforschung

Some earlier papers on the possible health effects of *trans* fatty acids consumption tended to suspect dietary *trans*-16:1 isomers as a possible cause for ischaemic heart diseases. Such isomers may indeed be present in partially hydrogenated fish oils and in ruminant fats, but hardly in partially hydrogenated vegetable oils, because the native oils contain only very minor amounts of unsaturated C16 acids. However, the overlap of *trans*-16:1 isomers and branched 17:0 acids (iso and anteiso forms) during gas-chromatography on polar columns is a pitfal that is well known by gaschromatographers, and that obviously precludes any serious conclusions to be drawn from single chromatographic runs of fatty acids containing both *trans*-16:1 isomers and branched 17:0 acids. In addition to these analytical difficulties, little is known on the nature (position of the ethylenic bonds) and the distribution of individual *trans*-16:1 isomers in ruminant fats, that are non-negligible dietary sources of *trans* fatty acids in many European countries. For example, *trans*-18:1 isomers from ruminant fats may account for as much as 55-65% (e.g., in France and Germany) of total ingested *trans*-18:1 acids, the remainder essentially coming from hydrogenated vegetable oils. We report here on the detailed *trans*-16:1 isomer profiles of fat from French cheeses manufactured with cow, goat, and ewe milk (12 samples for each category). The analytical methods used for this purpose involved bidimensional chromatography, *i.e.*, a combination of argentation thin-layer chromatography and gasliquid chromatography on 100-m CP-Sil 88 capillary columns operated under optimal temperature and carrier gas pressure. We also give evidences for the first time on *trans*-3 16:1 acid occurring in ruminant milk fats, likely originating from the animals feed (green parts of vegetables). Quantitative profiling of *trans*-16:1, as well as of *cis*-16:1 isomers was done for each species, indicating little interspecific variations, and hence a similar biochemical origin. A two carbon-atoms shortening of the *trans*-18:1 acids by P-oxidation might be a possible mechanism to explain the formation of *trans*-16:1 isomers. However, we hypothesize that biohydrogenation of 7,10,13-16:3 acid (present in the feed) is a more probable route for their biosynthesis.

Article disponible sur le site http://www.ocl-journal.org ou http://dx.doi.org/10.1051/ocl.2000.0105b

BIBLIOGRAPHY

MOLKENTIN J, PRECHT D (1997). *Mitchwissenschaft,* 52: 380-5.

PRECHT D, MOLKENTIN J (1999). *Nahrung*, 43: 233-44.

DESTAILLATS F (1999). Mémoire de 2^{e} année d'ingénieur ISTAB, ISTAB, Université Bordeaux 1.

PRECHT D, MOLKENTIN J (1999). *Lipids,* 34, in press.