

ERRATUM

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DOSSIER

Organisation structurale et moléculaire des lipides dans les aliments : impacts possibles sur leur digestion et leur assimilation par l'Homme

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Abstract: From the nutrition point of view, lipids are primarily considered as energy suppliers, their dietary intake having to be limited. In fact, lipids are sources of various fatty acids, and dietary recommendations include the required daily intakes in different fatty acids (fatty acid profile). Beyond these quantitative aspects, fatty acids are part of larger molecules, mainly triacylglycerols (TAG), that are organized in supramolecular structures as for example fat crystals and lipid droplets. Recent advances in nutrition research have demonstrated that these structures, and lipid organization in food matrices, influence digestibility and metabolism of fatty acids. Therefore, the members of the technological network Listral propose a synthesis of the knowledge about the influence of molecular and supramolecular structures of lipids on digestion and metabolic fate of dietary fatty acids originating from the main food industry sectors. Fatty acids are mainly provided in the diet in the form of TAG, or phospholipids (PL) where they are esterified in external (sn-1, sn-3) or internal (sn-2) position of the glycerol backbone. They can also be found as ethyl esters (EE) in specific formulations. These molecular characteristics of the lipid molecules affect their hydrolysis and their absorption rate but also their metabolism in indifferent organs, as assessed in studies often using inter esterified fat sources. The results depend on the types of fatty acids (saturated or polyunsaturated fatty acids) but also on the model used for the studies: in vitro or in vivo studies ; animal model, human newborn or adult, either healthy or exhibiting some diseases. Among others, it was found that the crystal form and fat melting point as affected by the fatty acid profiles and the lipid molecular structures directly impact fatty acid absorption kinetics through modifications of lipolytic enzyme activities. However, in these studies, the relative effect of the thermal properties of lipids and the proportion of saturated fatty acids chains in sn-2 position were hardly distinguished. Supramolecular structures, namely type and size of the fat droplets and their interfacial composition, of lipids, either in their native forms or obtained after food