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Mini Review

Bioactive Properties of The Lipids of Cow Milk on Human Health

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Cow milk is an emulsion predominantly composed of water and lipids. Some lipids when they are consumed in great quantities are associated with an increase in disease risk in human beings [1]. However, many of these have neutral or positive effects on health, and the majority of the people do not know the benefits of these lipids to health and nutrition [2]. It is for this reason that the aim of this work was to review in literature concerning the health effects of lipidics components found in cow milk.

Lipids are groups of compounds that contain carbon, hydrogen, oxygen, phosphorus and nitrogen, and integrate aliphatic aromatic hydrocarbon chains and due to this chemical structure, can be classified as simple, which are made up of esters of fatty acids and alcohols (triacyl glycerides); compounds, which are constituted by simple lipids and conjugated with non-lipid molecules (phospholipids, glycolipids and lipoproteins); and the associates or derivatives, which are all those that are not within the aforementioned subdivisions (free fatty acids, carotenoids, fat-soluble vitamins, cholesterol, among others) [3].

Biochemically, lipids perform structural functions in cell membranes; they are indispensable and insulators because they preserve the equilibrium of homeostasis and maintain stable temperature of organisms respectively. They are pigments and are a source of energy for the muscles, heart, liver, kidneys, blood platelets and nervous system [4].

In general, the short and medium chains fatty acids [butyric ($C_{4:0}$), caproic ($C_{6:0}$), caprilic ($C_{8:0}$) and capric ($C_{10:0}$) and lauric ($C_{12:0}$), miristic ($C_{14:0}$), pentadecanoic ($C_{15:0}$), palmitic ($C_{16:0}$) and stearic ($C_{18:0}$) respectively] do not pose an obesity risk. They prevent ulcerative colitis, cancer, atherosclerosis and hypertension, they have anti-inflammatory and antibacterial effects, and they boost natural immunity. However, it has been reported that an increased amount of $C_{12:0}$ decreases the relationship between total cholesterol and high density lipoprotein cholesterol; while $C_{14:0}$ and $C_{16:0}$ affect this proportion but minimally and $C_{18:0}$ reduces it lightly [5,6].

The monounsaturated and polyunsaturated fatty acids [miristoleic ($C_{14:1}$), palmitoleic ($C_{16:1}$) and oleic ($C_{18:1}$) and linoleic ($C_{18:2}$) and linolenic ($C_{18:3}$) respectively], contribute to the prevention of coronary diseases, cancer, inflammatory, thrombotic and autoimmune diseases, as well as hypertension, type II diabetes, kidney diseases, rheumatoid arthritis, ulcerative colitis and Crohn's disease [7]. In addition, the $C_{18:2}/C_{18:3}$ ratios are considered a key factor for the balanced synthesis of eicosanoids [8-10].

On the other hand, in studies with conjugated linolenic acid in animals, trans fatty acids such as have been shown to play an important role in inhibition of carcinogenesis and atherosclerosis as well as immunostimulation [1,11]. The fat-soluble vitamins (A and E) are antioxidant, and present tumor suppressing activities. Phospholipids (sphingolipids, ceramides and sphingosines) have antibacterial properties, anticarcinogenic and immune stimulation properties [12]. The cholesterol component stabilizes and stiffens cell membranes, and moreover it protects nerve fibers and acts as a precursor of steroid hormones, bile acids and vitamin D3 [2]. However, the concentration of each of these constituents is mainly related to livestock feeding [1,2].

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