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CHARACTERIZATION OF LIPID COMPOSITION OF MILK OF DIFFERENT QUALITY

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Milk has been used by humans for thousands of years and today remains one of the most common food products.

The nutritional value of cow's milk is determined by the presence of many dietary significant components: high-quality proteins, especially high-grade whey proteins; unsaturated fatty acids, especially omega 3 omega 6, linoleic. CLA, EPA and DHA; phospholipids [5] and phosphosteols [(Martini et al., 2021a, b)]; mineral elements (calcium, phosphorus, magnesium, zinc, iodine, potassium), vitamins A, D, B_{12}, B_2 and others [3], [4].

The content of certain components in milk is highly determined by a large number of factors: Among them, there is also the influence of animal housing systems [1] (El Qassim L. et al., 2022) Cow milk obtained under different production systems has different quality and chemical and biological characteristics [2] (T.J. Wester et al., 2014).

Differences in the composition of organic milk and milk of traditional production systems are confirmed by the results of the experiments of many scientists.

Particular attention is paid to milk lipids. But in addition to the fairly widely studied fatty acids, differences in the content of phospholipids have been established. Compared to the butterfat of conventional milk, the butterfat of organic milk had significantly higher concentrations of all phospholipids studied: phosphatidylethanolamine, phosphatidylinositol, phosphatidylcholine, phosphatidylserine, and the sphingophospholipid sphingomyelin [5].

An interesting and not fully studied issue is the presence of sterols in milk, the dominant among which is cholesterol. In cow's milk, cholesterol makes up about 94% of the total sterols (Jensen & Newburg, 1995; Jensen, 2002; Fauquant et al., 2007), and its content changes during lactation.

High cholesterol content in food is traditionally considered a risk factor for human health. However, it should be noted that in recent years, data have emerged that do not establish a link between the consumption of dairy products and cardiovascular diseases and do not reveal significant changes in relevant risk biomarkers, such as blood pressure, total cholesterol and LDL cholesterol in people's blood [Javier Fontecha, 2019, 6]. In addition, there is a shift in the emphasis of fear from alimentary cholesterol as a factor in hypercholesterolemia, to a genetic predisposition.

In addition to cholesterol, cow's milk also contains small amounts of minor sterols such as desmosterol (25.6 µg/mg cholesterol), latosterol (17.8 µg/mg cholesterol), dihydrolanosterol (3.3 µg/mg cholesterol) and lanosterol (Fauquant et al., 2007). These minor sterols are intermediates in cholesterol synthesis (Goudjil et al., 2003). Desmosterol, for example, is a direct precursor of cholesterol and one of the minor sterols most present in human and cow's milk (Fauquant et al., 2007). The importance of minor sterols is related to their role in colon cancer prevention and has been extensively studied (Fassbender et al., 2008).

In addition, phytosterols (or plant sterols) may also be present in milk. They are natural components of plant cells. Phytosterols belong to the group of phytoestrogens [7, Hendrich S., 2009]. This is the reason for their functional manifestations in the human body, where, due to their structural similarity to estradiol (17-β-estradiol), they have the ability to cause estrogenic or antiestrogenic effects. But the absorption rate of phytosterols in the intestine is lower compared to cholesterol (GonzálezLarena et al., 2011). The most common phytosterols in human nutrition are β-sitosterol, campesterol, and stigmasterol;

Cow's milk, however, does not contain significant amounts of phytosterols (Homberg & Seher, 1980), in fact according to the IDF (International Dairy Federation) (IDF, 1992; Goudjil et al., 2003) cow's milk fat would contain less than 1%, about 0 12 mg/100 g milk (Duong et al., 2019), EFSA recommends a daily intake of 1.5–3 g (EFSA, 2008) for individuals with hypercholesterolemia.

However, given the feeding route of phytosterols to milk (Martini et al., 2021a, b), the question of comparing its content in milk, which was obtained using the technology of traditional intensive and organic production (in organic milk, milk of high and standard quality) is relevant.

An interesting issue is the change in the characteristics of milk of different quality and production technology during heat treatment, in particular, with the most common today - during pasteurization.

The nutritional value and nutraceutical characteristics of three types of milk have been studied. This study focused on additional components such as phytosterols and tocopherols. We found that the content of bioactive sterols in milk was independent of the presence of pasteurization process. The sterol profile of all commercial milk was similar. Minor differences were found in the fatty acid profiles, namely, high quality milk had higher n-3. The minor differences that were identified in the fatty acid profile were presumably related to the feed used to formulate the cows' diets. The issue requires further investigation.

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ВПЛИВ ТЕХНОЛОГІЇ КОПЧЕННЯ НА БЕЗПЕЧНІСТЬ ХАРЧОВИХ ПРОДУКТІВ ТВАРИННИЦТВА ТА РИБНИЦТВА

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Виробництво та переробка продуктів тваринництва та рибництва відграє суттєву роль у стабільності економіки будь-якої країни. Звісно, такі процеси повинні здійснюватися з врахуванням вимог щодо зниження споживання енергії, мінімальної кількості відходів та заборони до використання шкідливих для здоров'я людини речовин. Більшість продуктів харчування отримують піддавши вихідну сировину певним термічним процесам, що надають продуктам властивостей, які роблять їх смачними та не шкідливими для вживання: