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Commentary

Reduced-Fat Cheeses: A New Source of Healthy Nutrients for Overweight and Obesity

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DESCRIPTION

Overweight and obesity are a major concerned for health officials, medical experts, scientists, and food producers alike because they are a worldwide pandemic linked to numerous adverse effects on human health. According to recent data, if appropriate action is not taken, around 2030 twenty per cent and forty per cent of the world's population could be overweight and obese, respectively. From the nutritional context, these illnesses have been partially associated to a high-fat diet; thus, the food industry has been developing products with low and reduced fat contents as replacements to various highly consumed products, such as cheese.

Cheese is a staple of the human diet and a concentrated source of protein, fat, calcium, and other essential nutrients; however, as some consumers look for what they consider to be healthier options, reduced-fat cheeses have gained popularity. The global market for these cheeses was valued at 93.9 billion USD in 2018 and is expected to increase by 3.8% annually from 2019 to 2025.

Any cheese that has less fat than its full-fat equivalent is referred to as a reduced-fat product, however there are no universal standards that have been established to categorise cheeses as either RFC or low-fat, thus a categorization must be determined for each unique type. Compared to conventional cheese, the fat in RFC has been reduced by at least 25%, while the fat content of LFC is 5-6%. In RFC and LFC, cheese structure, functioning, and related sensory characteristics may be affected since fat is a crucial factor in the formation of cheese quality attributes.

When evenly distributed throughout the cheese matrix, fat acts as a plasticizer for texture, giving a smooth, creamy mouthfeel while preventing the formation of an excessively tight casein network. The texture of RFC and LFC can be described as firm, rubbery, stiff, crumbly, and grainy due to the lack of fat and relatively high protein-to-fat ratio. Additionally, their modified microstructure also affects technological features like microbial resistance. Since fat is a source of the fatty acids that give cheese its flavour or can be converted into new flavour compounds, RFC is expected to exhibit poor sensory qualities, such as weaker flavours and even off-flavors.

Numerous methods, such as formulation- or process-based approaches, can be utilised singly or in combination to ameliorate the flaws of RFC and LFC. These methods frequently target at boosting cheese moisture content. The addition of fat substitutes, such as inulin, corn dextrin, polydextrose, maltodextrin, and other starch-based substances gums like sodium alginate, konjac glucomannan, and pectin, as well as emulsions stabilised by gelatin and gum Arabic or rice and pumpkin seed proteins, is the most popular practise in the first category. Dairy components such as rennet casein, microparticulated whey protein, whey protein isolate, and whey protein concentrate are preferred, however most of these ingredients are not permitted in cheese recipes.

The process-based approaches, on the other hand, involve either changing the way that cheese is typically made (using adjunct cultures, accelerating acidification, lowering the curd cooking temperature, lengthening the stirring time, and lowering the salt concentration, for example) or applying specific nonthermal technologies to cheesemilk or some cheese ingredients in order to change the RFC and LFC characteristics. In order to produce the RFC, it was investigated whether cream that had undergone high-pressure homogenization should be added to skim milk with or without sodium caseinate. Compared to their untreated reduced fat alternative forms, cheeses made with pressure-treated cream and sodium caseinate had higher yields, better textural characteristics, and greater sensory acceptability.

Power ultrasound (US) and/or heat treatment were recently used to create protein aggregates from WPCs, and the effects on specific cheesemaking properties of a nonfat model cheese system were evaluated. The more hydrophobic aggregates created through the combined US/heat treatments showed enhanced protein retention in cheese while avoiding an excessively compact microstructure, thus showing promise as alternatives to avoid some of the common problems found in LFC, texture-wise.

Panela cheese is a popular dairy product in Mexico and some regions of the United States. It is a soft, unripened, pasteurised cow-milk cheese. PC, which is often a starter-free product that yields 13–14 kg per 100 L of milk, is coagulated with rennet. The

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whole milk type must have a maximum moisture content of 59% and a minimum protein and fat content of 17 and 20%, respectively. Panela cheese typically contains 1.3-1.8% salt and pH values of 5.6 to 6.4. According to Mexican regulations, Panela cheese may be prepared with whole, partially skimmed, or skimmed milk. The moisture content of reduced-fat PCs is higher (up to 64%) but the fat content is lower (11–17%). There are no reports on thermosonicated partially skimmed milk-WPC blends for producing reduced fat PC, despite quality issues related to fat reduction in PC having previously been addressed and PC elaborated with US-treated milk or dairy ingredients having recently been found.