

Stabilising Ice Creams with Unsaturated Fat

For consumers, a healthy lifestyle is becoming increasingly important. But that doesn't mean we shouldn't enjoy a sweet treat once in a while — doing so is good for our wellbeing. This article explains how, by adjusting recipes and applying the right combination of emulsifiers and stabilizers, manufacturers can produce healthier ice cream.



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These days, to maintain a healthy lifestyle and still enjoy indulgent foods, all consumers need to do is choose products with more wholesome profiles. However, just being healthier isn't enough. Healthy products must also have high-quality sensory and storage properties for consumers to view them as suitable alternatives.

Less is better

Traditionally, ice cream is made from dairy cream, but nowadays, manufacturers usually use vegetable fat, which typically contains 80 – 90% saturated fat — the type nutritionists say we should eat less of.

Fat is, of course, a vital source of energy. So, it shouldn't be entirely excluded from diets — our bodies need fat to absorb vitamins and minerals, and to structure cell membranes.

When it comes to general health, however, some fats are certainly better than others. For example, nutritionists consider mono- and polyunsaturated fats to be good, while they view saturated fats, and especially fats containing trans-fatty acids, to be unhealthy.

Consequently, due to its well-documented contribution to disease, primarily cardiovascular, health authorities in many countries recommend that consumers decrease the amount of satu-

rated fat in their diets. In fact, FAO/WHO recommends consumption should be restricted to a maximum of 10% of daily energy intake.

Stable shelf life

Saturated fat has long been an important ingredient in ice cream production. It contributes not only to a creamy, smooth texture and pleasant mouth-feel, but, together with milk proteins and emulsifiers, saturated fat is also a primary structuring ingredient. Note that ice cream is, effectively, frozen foam, so its stability is crucial for maintaining quality throughout its shelf life.

Reducing the level of saturated fatty acids in the fat used when making ice cream will, other factors being equal, compromise the ice cream's structure, mouth-feel and stability. This is because there is less crystalline fat available for building structure.

Making ice cream

During mix production, proteins cover the fat globule surface, but during age-

ing, they are displaced by an emulsifier, destabilising the fat globule membrane formed during homogenisation.

Such destabilisation is necessary for the agglomeration and coalescence of fat globules when whipping (and freezing) the mix. During the whipping and freezing process, from the fat globule membrane, the emulsifier facilitates the formation of a three-dimensional structure of fat crystals around air cells. This stabilises air bubbles in the ice cream and produces a smooth and creamy texture. It also influences the ice cream's melting behaviour and heat-shock stability.

However, as already mentioned, when the level of saturated fat is reduced, there is less crystalline fat available for structure building; hence, adjustments in the recipe — especially in the composition of emulsifier — are necessary to ensure good structure and storage stability.

Emulsifiers in ice cream

The most common emulsifiers used in ice cream are mono- and diglycerides



(MDG), which are produced from vegetable fats. Mono- and diglycerides can be further esterified into, for example, lactic acid esters of mono- and diglycerides (LACTEM).

Compared with MDG, LACTEMs are more hydrophilic, and they are relatively uncommon in ice cream production. However, in combination with MDG, LACTEMs have a significant influence on foam stability and texture. Manufacturers can utilise this fact to produce ice cream with lower levels of saturated fat. As always in ice cream production, stabilizers are added together with the emulsifier. The stabilizers are then hydrated and dispersed during the water phase. This reduces the amount of free water in the ice cream, which lessens the

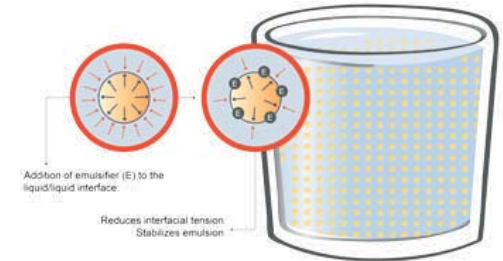
risk of ice crystals growing and improves the ice cream's sensory properties.

Better health ahead

With much of today's ice cream containing 80 – 90% saturated fat, and lifestyle diseases on the rise, the task is clear: Manufacturers must change their products to protect both consumers and their business viability.

We're hard at work in Palsgaard's

state-of-the-art laboratories around the world, optimising blends of emulsifiers and stabilizers to create ice cream recipes that can counterbalance lower crystalline levels. For consumers, this means they can enjoy high-quality, healthier ice cream treats with only 40 – 50% saturated fat. And it enables ice cream manufacturers to keep up with market priorities while supporting sustainability goals, too. ■



Emulsifiers, stabilizers and know-how in ice cream put to work



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- Moulded ice cream
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