How vegan diets and sustainable food choices are changing ice cream

In this interview, Torben Vilsgaard, Ice Cream Academy Manager at Tetra Pak, describes the effect that vegan diets and the search for sustainable food choices are having on the nature of ice cream.

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Vegan and flexitarian diets are rising in popularity and consumers are even becoming increasingly aware of the environmental footprint of the food they eat. There is a growing interest to try alternative ingredients and different ice cream products with plant-based options and other health benefits, such as probiotics.

Ice cream makers are responding. For example, we are seeing plant-based alternatives being established in a growing number of forms – from pea-protein and oats to almonds and soybean. Ice cream makers are using a range of different alternatives to milk depending on the functional requirements they have.

For example, the number of pea-protein based ice cream launches in 2019 was more than twice that of the previous year according to data from Mintel. Globally, plant-based ice creams have doubled their share of the market over the last five years.

Q: Did the impact of Covid-19 broaden ice cream from an indulgence into a healthy dessert choice?

The pandemic encouraged consumers to seek out healthier foods as they made the link between gut health and improved immunity – 40% of Australian consumers say eating healthily became a higher priority since the initial outbreak and 35% of UK consumers are interested in ice creams that improve gut health. To capitalise on this trend, ice cream makers are trying to broaden out the food's image by launching healthy, pre/probiotic options.

Q: How do plant-based innovators continue to extend appeal to a broader cross section of consumer?

Ice cream innovators are increasingly realising that producing plant-based ice cream for a mainstream customer-base means delivering flavours and textures that can match those of traditional ice cream. Viscosity is a key parameter in dairy ice cream making. So too for plant-based frozen desserts. Optimal viscosity is essential for a smooth process as well as for product texture and mouthfeel. Working with plant proteins can present unique challenges with mix viscosity, with both low and excessively high viscosities being observed.

Across the ice cream category, 'permissible treats' are a growing phenomenon. Some ice cream manufacturers are adding big chunks of healthy ingredients like fruit and nuts into their products. We can provide them with the technology to dose ingredients accurately, ensuring every mouthful of ice cream contains a tasty surprise. Others are developing low fat ice cream products. This is where our low temperature freezers really come into their own. They make it possible to reduce the size of the ice crystals and air bubbles in ice cream products, ensuring it ends up with a nice creamy texture regardless of the amount of fat in the ice cream mix ingredients.

Q: What is the best source of plant protein for your product?

Until relatively recently, soy was the staple protein source for plant-based frozen desserts. But in recent years manufacturers have expanded their horizons to a host of alternatives, from almonds to rice and coconut to oat. New options – such as hazelnut, cashew, pea, avocado and banana – are constantly entering the fray. Hot on their heels are future sources like potato, hemp, chia and chickpea.

Not only do all plant proteins have different tastes, they also have different properties in a recipe. To add more complexity, these properties can vary considerably between different suppliers of any given protein. This makes it important for manufacturers to experiment with a range of protein samples before making a choice. Extended trials are advisable when developing a plant-based frozen dessert. These trials will reveal any need to alter the mix preparation process to ensure effective and complete mixing of raw materials. As your search narrows, it can be beneficial to work with an expert partner in larger scale testing.

Tetra Pak's Ice Cream Academy in Denmark, for example, can test in semi-commercial conditions to establish how a product works prior to commercialisation. Ice cream specialists can determine important parameters such as how it behaves during freezing and how to optimise for good extrusion.

Q: How do you optimise the freezing of your frozen dessert?

Ice cream and frozen desserts are prepared using a continuous freezer. The freezer adds air to the mix in accordance with the selected overrun and freezes a large part of the water into ice crystals. Since the freezing process is designed for handling conventional dairy raw materials, extra attention is needed when handling plant-based products. High mix viscosities, excessively fast freezing of water in the cylinder, a non-balanced mix freezing point and insufficient whipping properties are just a few of the pitfalls you risk encountering during the freezing process.

Running a high-viscous mix can easily cause over-churning of fat content, whereby added fat agglomerates in clumps that deposit in the cylinder and the filling line. Over-churning also reduces end-product quality. It is therefore important to have the right setup for the continuous freezer, focusing on reducing mechanical shear. Options such as a variable dasher speed and selecting the right beater is crucial for success when working with plant-based frozen dessert. Moreover, optimising process parameters will reduce potential defects.

Formulating your plant-based frozen dessert mix correctly is vital for avoiding problems during mix preparation and freezing.

A well-balanced mix freezing point and sufficient total solids is crucial for successful freezing, as is choosing plant proteins with the proper whipping properties and water binding capacity. ■