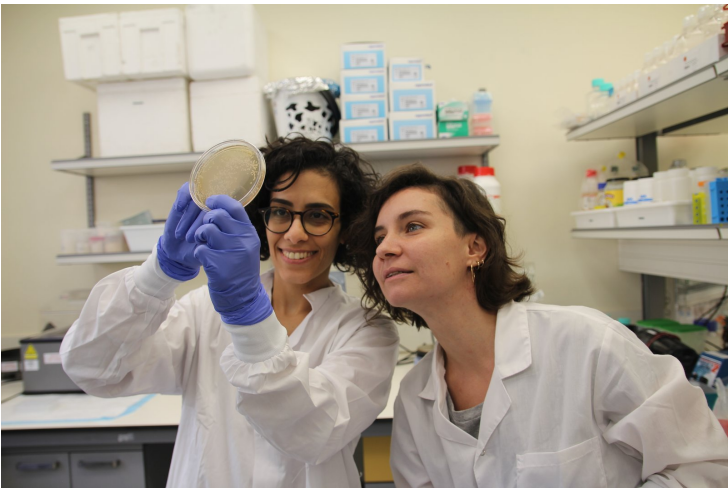


Israel's DairyX crafting next-gen casein micelles using precision fermentation

25 September 2024 | News

Paving the Way to Making Stretchy, Protein-rich, Dairy Cheese – Cow-free



Paving the Way to Making Stretchy, Protein-rich, Dairy Cheese – Cow-free

DairyX Foods Ltd. announces a major advancement in creating authentic milk proteins without cows, using precision fermentation. The food-tech start-up has developed a method to produce casein proteins that can self-assemble into micelles. Micelles are the primary building blocks of dairy products, such as cheese and yogurt.

DairyX has also refined a complementary technology to enhance the gelation of its casein micelles, considered the holy grail of the industry. DairyX's gelating micelles enable manufacturers to produce firm, stretchy and creamy products using their traditional dairy-making processes.

Galit Kuznets, Head of Strain Development and Fermentation discusses DairyX's proprietary technologies and protocols, saying, "We have achieved several key objectives with our solutions. Our biological design genetically manipulated yeast to produce functional caseins that we organized into micelles. We developed a fast-tracked screening process that simulated evolution to locate super-producers of protein from among millions of yeast strains. Our machine-learning models simulated fermentation to determine optimal fermentation conditions. We have proven our ability to create a gel from reconstituted casein micelles. All these ingenuities have helped us work smarter and faster to create highly functional micelles."

Creating a smarter casein with precision fermentation

Casein micelles are key to the appealing sensory profile of dairy products.

DairyX's precision fermentation technology uses microorganisms (specifically yeast) to produce smart casein proteins. "Not all caseins produced using precision fermentation are alike," explains Maya Bar-Zeev, PhD, Head of Product Development and Downstream Processing. "We trained yeast to produce the next generation of casein. DairyX's patent-pending casein is an advanced form created to precisely and effectively organize into micelles."

"The industry knows quite well that caseins are extremely hard to produce using precision fermentation, so our initial goal was to solve this problem. Once we successfully crafted caseins, the next major challenge was to upgrade caseins so they could self-assemble into gelating micelles to produce the dairy properties manufacturers are seeking," explains DairyX CEO and founder Arik Ryvkin, PhD.

DairyX casein eliminates the need for hormones and antibiotics applied in dairy farms and Maximizes efficiency

Currently, manufacturers of animal-free dairy products use additives, like stabilizers, emulsifiers and thickeners, which don't perform as well as cow's milk and can add unpleasant aftertastes. These fail to satisfy consumer cravings for a real dairy experience.

"DairyX caseins have amino acid sequences identical to those of their animal counterparts, making them, in fact, non-genetically modified," explains Galit Kuznets, Head of Strain Development and Fermentation.

DairyX addresses taste with its innovative caseins while also making non-animal dairy affordable. The company is creating yeast strains that produce exceptionally high casein yields in short timeframes. This approach ensures that DairyX's ingredients are cost-effective – a crucial factor for adoption by dairy manufacturers.

"Another significant challenge that dairy companies face is adapting their production facilities to use new ingredients," Bar-Zeev explains. "This is why we created a drop-in replacement for milk that does not require process changes or retooling."