Purification of Beta Casein from Milk

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a novel, low-cost separation protocol for removing functional beta-casein from milk.

Overview

Beta-casein, a normal component of milk, is a potent emulsifier suitable for use in a variety of food products. Although reducing the concentration of beta-casein in milk prior to cheese making improves the meltability of cheese, no commercially feasible method of removing soluble beta-casein from milk has been developed.

The Invention

UW-Madison researchers have developed a novel, low-cost separation protocol for removing functional beta-casein from milk without adding unwanted by-products. This process allows a significant amount of highly soluble beta-casein to be extracted from milk, while also improving the cheese-making properties of the milk. Beta-casein is separated from other milk serum components using non-ceramic, cross-flow polymeric microfiltration membranes to form a permeate enriched in beta-casein. Milk may be cooled prior to microfiltration to enhance the separation. Beta-casein is then easily purified from this enriched permeate through demineralization. Cheese formed using the milk partially depleted of beta-casein has enhanced meltability and reduced bitterness, while the purified beta-casein exhibits improved yield, purity and solubility; excellent foaming and emulsification properties; and is suitable for use as a food product additive.

Applications

- Provides enriched, highly soluble beta-casein for use as an emulsifier/foaming agent in various food products
- Enables production of a new generation of whey protein products that contain beta-casein
- Enables production of milk protein concentrates with various casein ratios, which could be used as an ingredient in nutritional products or as a substitute for casein/caseinate
- Allows dairy plants to continuously separate and purify beta-casein

Key Benefits

- Substantially less expensive and more efficient than current protocols using ceramic membranes
- Removes beta-casein from milk without contaminating the milk or beta-casein
- Uses fewer steps than existing protocols for fractionating milk
- Uses standard dairy industry equipment
- Enhances the properties of milk used in cheese making

Additional Information

For More Information About the Inventors

- John Lucey

Tech Fields

- Animals, Agriculture & Food : Food ingredients & additives
- Animals, Agriculture & Food : Food processing

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842