

Microfiltration

Raw Milk

01

Bacterial Reduction

The process of microfiltration is an integral part of producing Extended Shelf Life (ESL) milk, that has properties similar to HTST treated milk. Raw milk is preheated and separated, with the resulting skim milk then being microfiltered, during which the skim milk is then separated into a bacteria poor skim milk (permeate) and a bacteria-rich skim milk (retentate). The retentate can be removed from the process or it can be mixed with a standard quantity of cream. The mix is then sterilized by high heat and reintroduced to the permeate. The blended milk is homogenized, pasteurized and packaged. The product can have up to a 45-day shelf life when stored below 43°F.

Whey

02

Fat Removal for WPI Production

The Whey Protein Isolate (WPI) Process Train transforms pre-treated (pasteurized, clarified, separated) feed whey into WPI. This process consists of three membrane systems placed in a series: Ultrafiltration #1, Microfiltration, and Ultrafiltration #2. In the process of Microfiltration of the whey feed stream there is separation of fat and phospholipids from whey, Non-Protein Nitrogen (NPN), lactose and minerals of a lower molecular weight. This MF retentate stream is an additional source of income since it is a raw material for specific phospholipids, which have cosmetic, nutritive, and pharmaceutical applications.

Discard Streams

03

Solids Recovery

Effluent within the wastewater treatment industry can be effectively treated through the process of microfiltration to concentrate rejected particulates for disposal. Suspended particles and microorganisms are filtered down to a particle size of 0.2 microns within this process. This allows for the receiving water source to be disinfected and protects the water if it is to be used as a recreational source or for surface water discharge.

Protein Fractionation

04

Separating Casein from Serum Protein Fractions

Microfiltration has proven to be an effective method of separating free B-casein protein, along with whey proteins and small micelles from a skim milk fraction. This microfiltration process requires cooling the feed stream to about 4°C, at which point the B-casein dissociates from the casein micelles after a period of time. The feed is then passed through a microfiltration system using membranes at the 0.1 to 0.2 micron pore size. The resulting permeate product is a modified milk protein fraction which closely resembles human breast milk and can be used as a protein base for infant formulas.



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