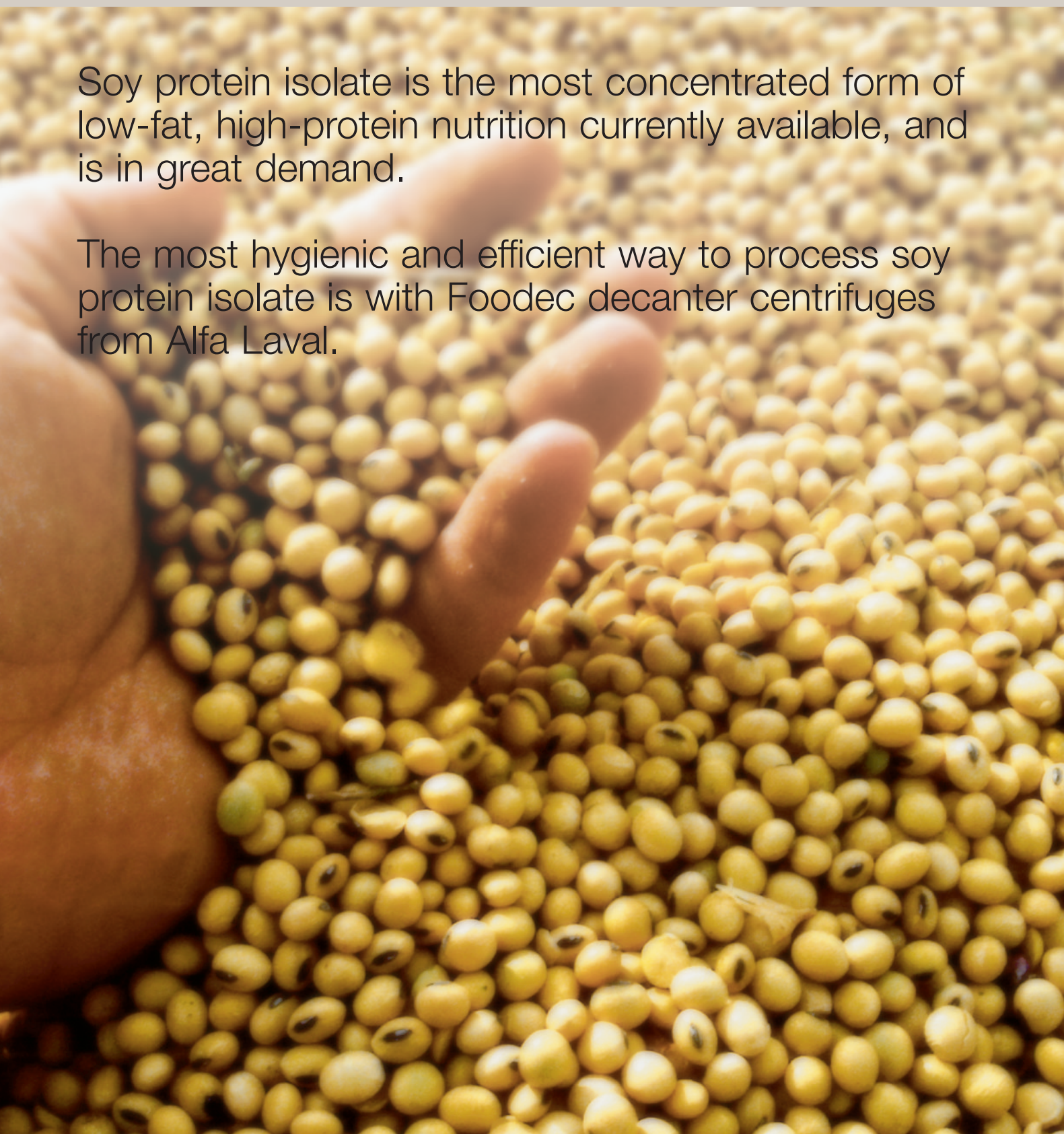




Soy protein isolate is the most concentrated form of low-fat, high-protein nutrition currently available, and is in great demand.

The most hygienic and efficient way to process soy protein isolate is with Foodec decanter centrifuges from Alfa Laval.



Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineered solutions. Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

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Soy protein isolate – the growing alternative

Alfa Laval Foodec decanter centrifuges for processing soy protein isolate



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Complete protein profile



Unlike most other beans, soybeans provide a “complete” protein profile. Soybeans contain all the essential amino acids that we need from our diet, because our bodies are simply not capable of synthesizing them.

This means that soy protein products are excellent substitutes for animal products and animal-based foods. These, too, are a good source of complete proteins, but they have the disadvantage of containing more fats, especially those of the saturated kind.

Soy protein is now one of the major sources of protein for both livestock and human consumption. With a protein content of 90% (based on dry weight), soy protein isolate (SPI) is the most concentrated form of soy protein available.

Improving, updating and expanding
Because soy protein isolate has such a highly desirable protein profile, the world market for this product is growing extremely rapidly – in some regions by as much as 30–40% each year.

This means that manufacturers have a substantial need to

- replace older, less efficient and less hygienic equipment with a new generation of high-quality units that eliminate production bottlenecks and optimize the overall processing flow
- install new high-efficiency processing equipment that ensures a boost in capacity, maximum flexibility and tip-top levels of hygiene.



The Foodec benefits for SPI include

- up to 25% greater solids handling capacity, at no extra cost
- unparalleled hygiene standards, which mean better product value
- reduced power consumption, which means lower operating costs
- better control, which means greater process efficiency and increased profits.



2 Alfa Laval Foodec decanter centrifuges

The process

The principles used in the production of soy protein isolate are basically simple. Using defatted soy flour or flakes as the starting material, the protein is first dissolved in water. The resulting solution is then separated from the solid residue. Finally, the protein is precipitated from the solution, and then separated and dried.

The objectives

For companies in the soy protein industry, the prime objectives are to improve both product purity and yield. These depend on many different parameters, including alkalinity, extraction time, temperature, the ratio of water to soy meal, heat treatment and agitation.

Alfa Laval and soy processing

One of the key features of the soy protein isolate production process is the separation of the protein from the solid soybean residue. The Alfa Laval Foodec range of decanter centrifuges is particularly well suited for dealing with this. Foodec decanter centrifuges are specially designed to meet the hygiene requirements of soy protein manufacturers and other quality-conscious food industry companies.

Protein extraction

The soy meal is mixed with water and isoelectrically adjusted so that the majority of the protein goes into solution. This protein-rich solution must then be separated from the solid matter (known as okara). A traditional configuration for doing this features extraction consisting of vibrating and rotary screens, followed by optional purification and concentration.

However, Alfa Laval Foodec decanter centrifuges are ideal as a replacement for such traditional systems, because of their extreme efficiency and high solids handling capacity.

Protein precipitation

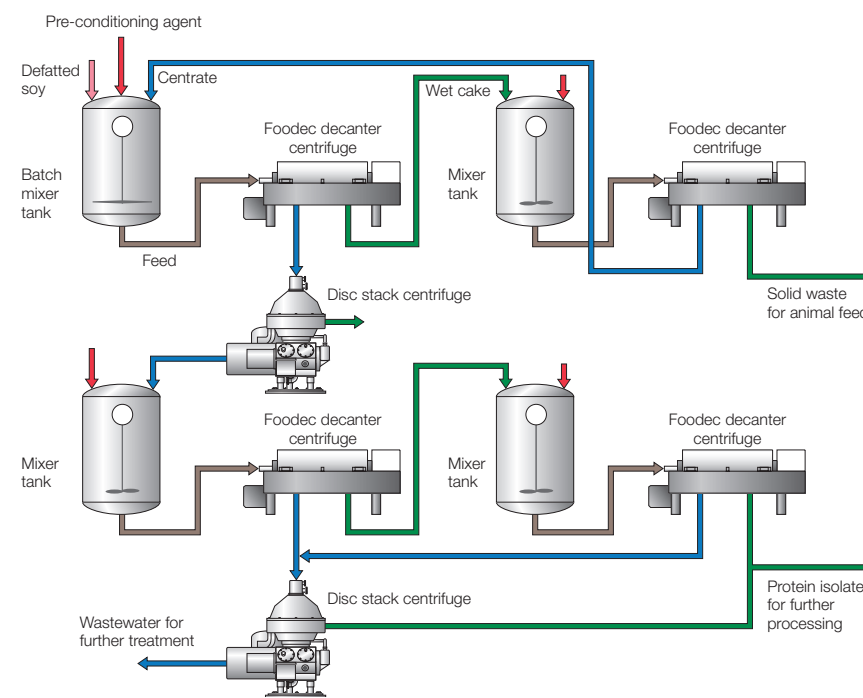
The protein solution is now isoelectrically adjusted still further so that the protein can be precipitated. The solidified protein (known as curd) must then be separated out.

Alfa Laval Foodec decanter centrifuges are widely considered the preferred choice for this process. This is due to their exceptional solids handling capacity, high standards of hygiene and low cleaning and maintenance requirements.

Curd washing

The precipitated protein (curd) is separated from the supernatant (whey) using a decanter centrifuge. This curd must then be washed in order to remove any whey residues. Thorough washing is an important step in obtaining soy protein isolate of high purity.

High-efficiency process flow chart – soy protein isolate



This is achieved by re-suspending the curd in water and then using a decanter centrifuge to separate the two components. Recovery can then be improved still further using an Alfa Laval disc stack centrifuge. The washed “isoelectric soy protein isolate” can then be spray-dried, or neutralized and then spray-dried to form so-called proteinates.

Benefit from Foodec decanter centrifuges in your SPI processing

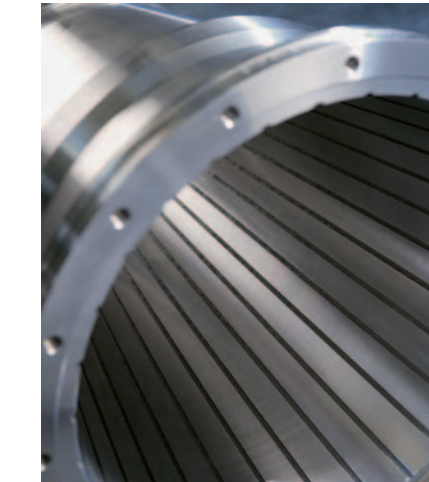
The unique design of the Alfa Laval Foodec range features a series of built-in advantages that provide you with substantial processing benefits. These include

- better solids transportation that enables you to boost solids handling capacity by up to 25% compared with all other designs currently available – at no additional cost
- special sanitary design that enables you to match stringent FDA, 3A and USDA standards. The Foodec design also focuses on ease of cleaning



- an advanced drive system that enables you to operate at any given capacity with significantly lower power consumption than other current designs
- a new drive and control system that reduces your operating costs and gives you even better control over the separation process. This makes it possible to reduce production costs as well as boosting the quality and value of the end product.

Soybeans – a long time under way
After extensive studies, the US Food and Drug Administration (FDA) authorized the use of the following health statement on soy protein products in 1999: “Diets low in saturated fat and cholesterol that include 25 grams of soy protein a day may reduce the risk of heart disease.”



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