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.
Unlike most other beans, soybeans provide a "complete protein profile." One of the reasons is the presence of bitter taste substances, which are acids that we need from our diet, but the body is unable to synthesize them.

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

Soy protein is now one of the major sources of proteins for both livestock and human consumption. With a protein content of 40% based on dry weight, soy protein isolate (SPI) is the most concentrated form of soy protein (based on dry weight), soy protein isolate (SPI) is the most concentrated form of soy protein 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.

However, Alfa Laval Foodec decanter centrifuges are 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.

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.
- to install a new high efficiency processing equipment that ensures a closed in capital maximum flexibility and tip top levels of hygiene.

The Foodec benefits for SPI include:
- up to 25% greater solids handling capacity, at the same cost.
- higher efficiency, including better extraction time, temperature, the ratio of water to soy meal, and better treatment and optimization.

High efficiency process flow chart – soy protein isolate

Alfa Laval and soy processing

One of the key features of the Alfa Laval Foodec range is the separation of the protein from the soy meal 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.

The process
The principles used in the production of soy protein isolate (SPI) are essentially the same. Using defatted soy flour or flakes as the starting material, the protein is first decanted in water. The resulting sludge 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 operating extraction time, temperature, the ratio of water to soy meal, heat treatment, and optimization.

Protein precipitation
The protein solution is now isoelectrically adjusted in order to precipitate the protein. The additional protein (known as curd) must then be separated out.

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

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

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 "soyflake" soy protein isolate can then be spray-dried, or neutralized for further treatment.

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 meet the most stringent hygiene requirements (e.g. 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 improves your flexibility for further treatment.
- the separation process. This makes it possible to reduce production costs as well as boosting the quality and value of the end product.

Skybeans – a long time under way
The United States Food and Drug Administration (FDA) authorized the use of the following health statement on soy protein products in 1999: "Skybean is a saturated fat and cholesterol that include 65 grams of soy protein in a day may reduce the risk of heart disease."