

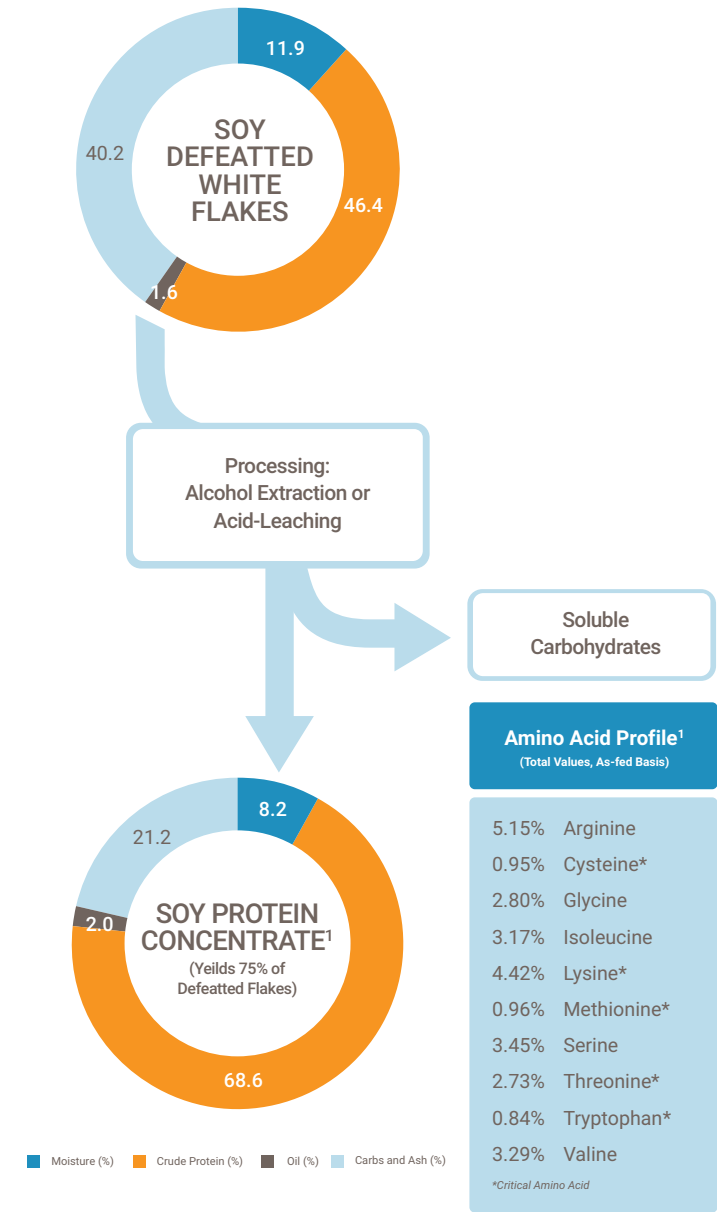
SOY PRODUCT FACT SHEET: SOY PROTEIN CONCENTRATE

Overview

Soy Protein Concentrate (SPC) is produced by further processing defatted soy flakes to obtain an ingredient with a minimum of 65% crude protein on a moisture-free basis. Unlike the flakes used for feed-grade soybean meal, SPC production typically begins with flakes that have been desolventized without direct moisture, called white flakes. They have little protein denaturation or loss in solubility and remain enzyme active. These white flakes are then treated with a solution of alcohol or acid, making the soy proteins less soluble than carbohydrates such as sucrose and oligosaccharides. These soluble carbohydrates are leached away with the solution, increasing the resulting product's protein concentration. Given the use of white flakes, SPC can be further heat-processed to reduce anti-nutritional factors. SPC undergoing this additional step is referred to as low-antigen SPC.

Form & Functional Properties







SPC is available in powders or granular forms. Re-fatted or lecithinated forms are also available. Given its fat- and water-binding, SPC is commonly used as a moisture retainer and emulsifier in processed meats. These properties also make SPC well suited in aquaculture feeds, helping to produce a pellet that dissolves slowly in water.



Nutritional Attributes

High protein concentration makes SPC well-suited for inclusion in nutrient-dense diets such as those used for aquaculture. SPC is an increasingly common replacement for fish meal in these diets. Its low anti-nutritional factors, oligosaccharides, good protein, and energy digestibility are particularly valuable in diets for young animals.

Soy Protein Concentrate Nutritional Properties¹

 Gross Energy	4665 kcal/kg	 Oligosaccharides	<3.5%	 Trypsin Inhibitors	2.0-3.0 mg/g
Species	Metabolizable Energy (kcal/kg) ²	Σ5 Critical AAs (SID Values) ²	Maximum Recommended Inclusion Rate ¹	Feeding Advantage	
 Poultry	3080	9.46	7%	Has been used in starter feed for chicks Can be used in diets for weanling pigs Removes much of the anti-nutritional risk of soybean meal	
 Swine	4275	9.46	7%		
 Aquaculture	3756	9.64	5% ³		

Product Market

SPC is available globally but predominantly used in North America, Europe, and Asia. Further replacement of fish meal in aquaculture diets and increased human consumption of soy proteins should continue to spur demand for value-added soy protein products like SPC.

¹Van Eys, J. E. and Ruiz, Nelson. 2021. *Quality Manual and Analysis for Soybean Products in the Feed Industry. Third Edition, U.S. Soybean Export Council, Chesterfield, Missouri, pages 23, 26-27.* Note that this source reports the oligosaccharides and trypsin inhibitors of alcohol-extracted SPC of several SBMs.

²The International Aquaculture Feed Formulation Database, *Feed Ingredient Composition Database (FICD)*, has composition information for an array of generic SPCs at various levels of crude protein along with several commercially available SPCs. While there are slight differences in composition between the SPC ingredients provided by this database, the average composition of two generic SPCs, one with 65% crude protein and the other with 70% crude protein, is reported. The database containing these composition data can be accessed at <https://www.iaffd.com/home.html?v=4.1.2>.

³Higher inclusion rates of SPC may be used for salmon and trout growing and finishing diets.

To learn more about how U.S. Soy can enable your business, please contact your U.S. Soybean Export Council (USSEC) region or country representative; or submit your contact details via <https://ussec.org/contact/>.

ABOUT THE U.S. SOYBEAN EXPORT COUNCIL (USSEC)

Soybeans are the United States' number one food and agricultural export. The U.S. Soybean Export Council (USSEC) is devoted to building preference, improving the value, and enabling market access for the use of U.S. Soy for human consumption, aquaculture, and livestock feed in 82 countries across the world. USSEC is a dynamic partnership of U.S. soybean producers, processors, commodity shippers, merchandisers, allied agribusinesses, and agricultural organizations; and connects food and agriculture industry leaders through a robust membership program. USSEC is farmer-funded by checkoff funds invested by the United Soybean Board, various state soybean councils, the food and agriculture industry, and the American Soybean Association's investment of cost-share funding provided by U.S. Department of Agriculture's (USDA) Foreign Agricultural Service (FAS). To learn more, visit www.ussoy.org and www.ussec.org, and engage with us on [LinkedIn](#), [Twitter](#), [Facebook](#), [Instagram](#) and [YouTube](#).