

Soy Goes Mainstream

By Ilona Fordham RD

East Asia first introduced the soybean to Europe and the United States in the 1700's where it was originally produced for hay. In 1936, the world's first manufacturing plant for isolating industrial grade protein was developed and the first use for this new, but unrefined, product was for paper coatings. It wasn't until almost 20 years later that food grade soy protein was developed (1). Today, we see soy protein and its derivatives in many food products, including cheeses, imitation meat, non-dairy drinks, infant formula, desserts and cereals; soybeans are an important global crop, providing both oil and protein.

Proteins are made up of long chains of amino acids. There are 20 amino acids in the human body, nine of which are considered essential to our health since the human body does not manufacture them. While the body can synthesize the non-essential amino acids, we cannot live without the essential amino acids which are derived from the foods we consume. There are many dietary sources of protein to choose from and many are considered better than others. Animal protein provides a complete complement of both essential and non-essential amino acids and is thus considered a complete protein. On the flip side, animal protein also provides a significant source of dietary cholesterol and saturated fat – two aspects of an omnivorous diet detrimental to our health.

Non-animal or vegetarian sources of protein, such as beans and nuts for example, often lack some necessary essential amino acids but are always cholesterol free and usually low in saturated fat. By consuming vegetarian protein with other foods, like eating a delicious serving of protein rich beans with rice, helps deliver the full spectrum of essential and non-essential amino acids. However, soy protein is unique in the field of vegetarian protein because it is the only non-animal protein that contains all essential amino acids, as well as being cholesterol free and low in saturated fat. Because of this unique profile, soy protein is an excellent protein choice in many instances. But don't take my word for it, the Food and Drug Administration (FDA), and the Food and Agricultural Organization of the United Nations/World Health Organization (FAO/WHO) have scientists who evaluate proteins for their quality and rate them accordingly.

There are a couple of ways of evaluating the quality of a protein; one method is measuring the Biological Value (BV) of the protein and another is the Protein Digestibility Corrected Amino Acid Score (PDCAAS). The BV of a protein is a measurement of how well the body can absorb and utilize a protein, the higher the BV then the better the protein. Whey protein has the highest BV at 104; egg protein has a BV of 100, and Beef a BV of 80. Plant-based proteins, such as beans, only rate a 49, but soy protein has a BV of 74 which is closer to

that of an egg or beef than to its vegetarian counterparts (2). However, according to the FDA and FAO/WHO, the preferred and best method for evaluating protein quality, as adopted by these 2 groups in 1993, is the Protein Digestibility Corrected Amino Acid Score (PDCAAS). The PDCAAS is a method of evaluating protein quality based on the amino acid requirements of humans. In this method, whey and soy both receive an assigned value of 1.0 (1.0 being the highest possible score) (3). However you slice it, soy protein is an excellent protein and equivalent to animal protein based on its amino acid profile.

There are various forms of soy in the marketplace, depending upon the manufacturing technique applied. These forms include: isolate, concentrate and powders. Soy isolate is the most concentrated source of soy protein and the most versatile. It is manufactured by a water extraction process from defatted and dehulled soybeans while retaining soy's natural beneficial properties. Isolates are used to add juiciness, cohesiveness and viscosity to a variety of meat, seafood, and poultry products. Isolates can be used to enhance both the nutritional quality and taste of meat products. This is especially true for soy used to enhance the flavor and nutritional quality of tough meat. Soy isolate is excellent for improvement of sensory attributes of whole meat products. Roasts and hams that contain soy isolates are juicier and more nutritional. Another common form of soy protein used in food manufacturing is textured soy protein (TSP). TSP is made by forming dough from defatted soy flour and water in a screw-type extruder. The dough can be dried into various shapes, such as granules, flakes or chunks. Because of the similarity in texture and protein content to meat, TSP can be used as a replacement for ground beef in most recipes, completely or partly.

In 1999 the FDA granted a health claim for soy protein based upon research conducted on the numerous health benefits of soy protein. A health claim describes a relationship between a food, a food component, or dietary supplement ingredient, and reducing risk of a disease or health-related condition (4). In regards to soy protein the health claim states "25 grams of soy protein a day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease." The FDA further clarifies, "In order to qualify for this health claim, a food must contain at least 6.25 grams of soy protein per serving, the amount that is one-fourth of the effective level of 25 grams per day. Because soy protein can be added to a variety of foods, it is possible for consumers to eat foods containing soy protein at all three meals and for snacks."

Below is a brief list of the protein content of some soy foods ⁴.

- One soy "sausage" link provides 6 grams of protein.
- One soy "burger" includes 10 to 12 grams of protein.
- An 8-ounce glass of plain soymilk contains 10 grams of protein.

Along the same lines, in 2006, the American Heart Association released the results of a decade long study of soy protein. In their conclusion they state “soy products such as tofu, soy butter, soy nuts, or some soy burgers should be beneficial to cardiovascular and overall health because of their high content of polyunsaturated fats, fiber, vitamins, and minerals and low content of saturated fat. Using these and other soy foods to replace foods high in animal protein that contain saturated fat and cholesterol may confer benefits to cardiovascular health.” (5)

Soy protein is a very high quality and versatile protein that can be used in many forms to add nutrition, enhance flavor and juiciness to a product. Packed full of heart healthy properties, soy protein is an excellent addition to the mainstream westernized diet. From burgers, to cereal and baked goods, it’s no surprise that soy protein has become such a mainstay of our modern lives.

References:

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