

# Soy Protein Ingredient Technology

Larry W. Hand

Soy proteins have come a long way from the early products of the 60's and 70's, or even the 90's. The changes made in flavor and functional technology have been revolutionary. These changes provide soy protein products that are valuable tools in the toolbox of the product developer, when they are faced with developing new innovative items or redesigning those items they already manufacture. In order to be successful, a product developer must be aware of the consumer response to soy proteins, as well as, the forms and functional properties of the different soy protein products.

Although meat industry traditionalists have long been negative in regards to inclusion of soy protein as an ingredient, consumers have a much different outlook in regards to the foods that they purchase. In a consumer attitude study (Prima Marketing Group, 1996), it was found 82.5% of consumers have no issue with a food manufacturer using soy protein in their food and meat products. In the same study 56% of consumers expected no taste difference and 27% expected better taste in products containing isolated soy protein. Since the FDA approved a health claim for foods containing at least 6.25 g soy protein per serving (Federal Register 1999), the interest in soy protein as an ingredient in meat products has increased. With this interest in soy protein, the meat product developer needs to be aware of the functional properties of soy protein that can impact their products.

With the myriad of soy protein products available and their different functional attributes, the selection of the appropriate soy protein is critical to product success. Soy protein comes in three basic categories, soy flours (50% protein), soy concentrates (70% protein) and soy isolates (90% protein). These all can come in different forms such as powdered, textured, and colored. The functional properties of soy proteins impact their performance in a meat system. Some of the properties of concern are water and fat stabilization, solubility, viscosity, gelation, emulsification, flavor and texture. Because of their functional properties, we can achieve economic benefits, product

improvement or product differentiation through their use.

Soy proteins have unique attributes that allow them to complement meat proteins in meat products. Soy proteins are more hydrophobic than meat, have thermoreversible gels, retain water when heated, and when denatured can be highly soluble and functional. In comparison to meat trimmings, soy proteins are much less variable as they are manufactured to specific tolerances. Soy protein inclusion can improve eating qualities by making the meat products juicier, firmer, and more tender. The moisture retention properties of soy proteins allow better performance upon reheating, especially upon microwave reheating. Cost reduction through soy protein inclusion occurs by replacement of lean meats, the utilization of lower value cuts or trimmings and the reduction of certain processing steps. These functional properties can impact finished product performance - through increased cook yields, better slicing yields and reduced package purge. The use of soy proteins can also have dramatic effects on texture. Soy protein can be developed to have almost any texture that you desire. Therefore, one can manipulate the texture of a meat product in a myriad of ways - from making something loose and crumbly to very tightly bound.

Understanding the characteristics of the soy protein of choice is important, but the selection is predicated on good project definition. An understanding of the business objectives and strategies of the company is important to position the new or improved product. Before a project begins, the technical objectives need to be defined, with constraints identified. As there is no "magic" ingredient that solves all issues and constraints, the knowledge of the benefits and liabilities of all ingredients available is critical to developing a solution to the project objectives. Only after these are well understood can the product developer develop the appropriate solution and select the correct soy protein or proteins for the project at hand. This way the project will successfully meet the identified product and project specifications.

## References

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L.W. Hand  
The Solae Company  
P.O. Box 88940  
St. Louis, MO 63188

lhand@solae.com

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