



ABSTRACT

Food technology to process plant-based food (soy protein isolate formula)

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Commonly, soybean derived products, such as soy protein has received growing an attention due to its chemical composition, functional properties, and multiple applications in food industries. According to Codex Standard, soy protein products are classified based on their dry base protein contents, namely soy flour (40–50% of protein), soy protein concentrates (70 – <90% of protein), and soy protein isolate ($\geq 90\%$ of protein). Each type of soy protein has different application in products according to their functional properties. Soy protein has a good supply of essential amino acids compared with other plant proteins. Soy protein has high lysine, which is normally lacking in other cereal, but low in cysteine and methionine.

Soy protein isolate (SPI) is obtained by extracting the soluble protein and removing non-protein material such as fat and carbohydrates. Because of this process, it has a neutral flavor and cause less flatulence than soy flours. Furthermore, SPI has higher Protein Digestibility Corrected Amino Acid Score (PDCAAS) compared to soymilk, which is 100% and 92.6% respectively. It shows that PDCAAS of SPI is equivalent to animal proteins quality, suggested that SPI is essential as alternative protein source to support growth of infant.

Infant formula is designed to be a supplement to breast milk, and may be also used as a substitute if breastfeeding is not feasible. Infant formula is made by mixing proteins, fats, carbohydrates, minerals, vitamins, and other components. The mixture is then blended, pasteurized, homogenized, and condensed, then either spray-dried (powder-base) or sterilized (drink-base). Soy-protein based infant formulas in the United States are nearly 25% of the formula market, 13% in New Zealand, 7% in the United Kingdom, 5% in Italy, and 2% in France, which use SPI as their main ingredients.

The use of SPI can be beneficial for infant formula by resulting better appearance and flavor, lower phytate content, higher protein digestibility, and higher mineral absorption and availability due to protein isolation process, compared to soy-based infant formula using soymilk.

Keywords: soy protein isolate, infant formula, protein digestibility, soymilk

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