FOOD PRODUCT DESIGN®

The Whey to Better Health

6 days ago

By Marie Spano, M.S., R.D., Contributing Editor

The nutrition benefits of whey protein make it an ideal ingredient for functional food and beverage formulations. Whey stimulates muscle protein synthesis and facilitates muscle-tissue repair after exercise. In addition, whey is satiating and can therefore assist with weight management. However, whey isn't just one protein, but instead describes various types of proteins that differ in composition and, therefore, food applications.

Composition differences

There are three main types of whey protein, whey protein isolate, whey protein concentrate and whey protein hydrolysates. Whey protein isolate contains 90% or more protein, very little fat and a minuscule amount of lactose. Whey protein concentrates vary in protein (29% to 89%, but typically from 34% to 80%), fat and lactose content; whey protein concentrates with a greater percentage of protein typically have less fat and lactose.

Whey protein hydrolysates are produced from purified protein heated with acid or broken down by enzymatic reactions into shorter chains for easier digestion and decreased allergenicity. Due to the different methods of production and degree of hydrolysis, the composition of whey hydrolysate ingredients vary based on their mixture of peptides and free amino acids. Hydrolysates are not only different from isolates and concentrates in composition, nutritionally they also produce a greater spike in insulin after ingestion in comparison to intact proteins (*British Journal of Sports Medicine*, 2006; 40: 900-905).

Whey proteins are made up of a number of individual protein components: beta-lactoglobulin (50% to 55% of the whey protein), glycomacropeptide (GMP), alpha-lactalbumin, lactoferrin, immunoglobulins, lactoperoxidase, bovine serum albumin (BSA) and lysozyme. These individual proteins can be commercially isolated and purified.

Research in brief

"Whey protein is a natural, high-quality dairy protein derived from milk, and a complete protein that contains all the amino acids the body requires for muscle protein synthesis," according to Matthew Pikosky, Ph.D., R.D., FACN, vice-president, scientific affairs, Dairy Research Institute, Rosemont, IL. "It also has a high biological value, which means that the protein is easily absorbed and used by the body." Whey proteins have a protein digestibility-corrected amino acid score (PDCAAS) of 1.14 and a biological value (BV) of 100.