

# Dairy for Global Nutrition

## PHYSIOLOGICAL EFFECTS OF VARIOUS PROTEIN FRACTIONS FOUND IN WHEY PROTEIN

Protein Fraction	Biological Role or Function
$\beta$ -lactoglobulin	$\beta$ -lactoglobulin comprises about 50% of whey protein content. Although the specific biological role of $\beta$ -lactoglobulin is not known, $\beta$ -lactoglobulin binds to minerals (e.g., zinc, calcium, etc), fat soluble vitamins (e.g., Vitamin A & E), and lipids and is therefore important for a number of physiological processes [Horton, 1995, Nakajima et al., 1997]. Contains a high concentration of BCAA.
$\alpha$ -lactalbumin	$\alpha$ -lactalbumin comprises about 25% of whey protein and has been reported to have anticancer [Svensson, 1999], antimicrobial [Horton, 1995, Pellegrini, 2003], and immune-enhancing properties [Horton, 1995, Montagne et al., 1999]. Research has also suggested that $\alpha$ -lactalbumin increased serotonin production in the brain, improved mood, and decreased cortisol levels [Markus, 2000].
Peptides	Whey derived peptides are believed to reduce cholesterol [Poullain et al., 1989], blood pressure [Korhonen, 2003, Shah, 2000, Abubakur et al., 1998], and protect against some forms of cancer [Tsai, 2000, Bounous, 2000].
Albumin	About 5% of whey protein consists of bovine serum albumin (BSA). BSA is believed to have antioxidant [Tong et al., 2000] and antimutagenic properties [Bosselaers et al., 1994]. Binds free fatty acids avidly; chelates pro-oxidant transition metals.
Immunoglobulins	Immunoglobulins (e.g., IgA, IgM, IgE, and IgG) support passive immune function. Although most of this research has been conducted on infants, research is now examining whether older adults may also benefit from increasing dietary intake of bovine immunoglobulins.
Lactoferrin	Lactoferrin is a protein that binds to iron and therefore has a number of potential applications [Layman, 2003]. Additionally, lactoferrin is believed to have anticancer [Tsuda, 2000, Tsuda, 20002], antimicrobial [Clare et al., 2003, Valenti et al., 1999, Cavestro et al., 2002, Caccavo et al., 2002] and antioxidant properties [Wong et al., 1997]. Anti-inflammatory and immune modulation.
Lactoperoxidase	Lactoperoxidase is an enzyme that breaks down hydrogen peroxide and has antibacterial properties. Lactoperoxidase has been used as a preservative and in toothpaste to fight cavities. Lactoperoxidase has also been reported to have antioxidant and immuno-enhancing properties [Wong et al., 1997].

Source: *Reference Manual for U.S. Milk Powders*. Arlington, VA: U.S. Dairy Export Council, 2005. p44.

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