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BOVINE BETA-LACTOGLOBULIN: THE ROLE IN COW MILK ALLERGY OF INFANTS

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Hypersensitivity to cow milk proteins is frequently observed during infancy and is believed to be an immunological response to milk proteins that are absorbed through the immature intestinal mucosa. This hypothesis has been verified by identifying the proteins following *in vitro* digestion of milk and determining the presence of such proteins in serum of infants with cow milk allergy.

In Sri Lanka, over 80 per cent of milk consumption is in the form of powdered milk in contrast to other countries where fresh milk consumption is popular. The high keeping quality, availability, and the popular notion that powdered milk is less of a health hazard compared to fresh cow milk has led to this increased powdered milk consumption.

Fresh cow's milk, human milk and six cow milk formulae were subjected to *in vitro* proteolytic digestion in pepsin (1%) at pH 2 and trypsin (1%) at pH 8. Following the initiation of the *in vitro* digestive process, aliquots were collected at 0, 0.5, 1, 2, 3, 4, 6 and 24 hour and subjected to SDS-PAGE. Protein analysis by SDS-PAGE indicated that most cow milk proteins were completely digested by 4 hours but beta-lactoglobulin remained undigested even after 24 hours. Human milk was devoid of beta-lactoglobulin. All human milk proteins were completely digested by the proteolytic enzymes.

Immunoblotting studies using rabbit anti-bovine antibodies against beta-lactoglobulin indicated the presence of bovine beta-lactoglobulin in the sera of infants with cow milk allergy and not in sera of individuals without allergy despite consumption of cow milk. Beta-lactoglobulin was not present in the serum of infants on human milk. The results indicated that the cow milk whey protein, beta-lactoglobulin is poorly digested and its entry into circulation may play a role in the hypersensitive reaction in infants.