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## Cow's milk and immune-mediated diabetes.

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### Abstract

Cow's milk-based infant formulas and cow's milk consumption in childhood have been suggested to promote the development of type 1 diabetes mellitus and other immune-mediated or neurological diseases. Epidemiological studies in man have led to the hypothesis that introduction of cow's milk-based infant formula within the first 3 months of life is associated with increased risk of type 1 diabetes mellitus. Furthermore, in animal models of type 1 diabetes mellitus, cow's milk proteins have been proven to be 'diabetogenic'. However, the issue seems far from being resolved. Several epidemiological studies and, more importantly, the first prospective trials did not show an association between early exposure to cow's milk and type 1 diabetes mellitus. In animal models, cow's milk proteins are modestly and variably diabetogenic, wheat or soybean proteins in the diet cause higher rates of autoimmune diabetes. In both man and rodents there is increasing evidence that the gut-associated immune system plays a major role in disease development, probably because of disturbed oral tolerance mechanisms. Oral tolerance depends on immunological homeostasis and normal maturation of the gut. These factors are influenced by growth factors and cytokines from breast milk, normal bacterial colonization, infections and diet. All these factors have been proposed as risk factors for type 1 diabetes mellitus. Hence, cow's milk proteins may provide mimicry epitopes relevant in autoimmunity, as well as destabilizing oral tolerance mechanisms by biologically active peptides. The concept of dietary regulation of autoimmunity does not apply only to cow's milk protein, but also to other dietary proteins.

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