Enhancing the health and nutritional properties of milk.

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Cow's milk is a rich source of highly nutritious ingredients and peptides with beneficial properties. Some of these are known and have been identified, but there are many more active components in milk yet to be discovered. In order to participate constructively in the global trend towards functional foods and complementary medicines, DPI Victoria and MGNutritionals have combined expertise to utilise the bovine genome and recent advances in biotechnology to identify and enhance bioactive components of milk. As part of a dairy genomics project aimed at increasing the profitability of the dairy industry, we have developed methods to identify and validate anti-microbial peptides, anti-inflammatory peptides, growth factors, and other active proteins in milk. New health enhancing activities identified in milk can be scientifically validated and developed as potential products more rapidly with the availability of advanced separation technologies. This Industry Government partnership includes large-scale chromatography, membrane filtration technology and diverse manufacturing capability at Murray Goulburn Co-operative. We have developed methods to identify anti-inflammatory peptides. These methods include 1) using advanced databases and bioinformatics approaches that maximise the use of the completed mammalian (eg wallaby, bovine, human) genome projects 2) high-throughput biology experiments incorporating microarrays, proteomics, and 3) pharmaceutically relevant bioassays. Candidate molecules are evaluated by using milk as a resource for their extraction, or by using recombinant versions of the molecules. Advanced separation technologies compatible with milk processing systems has facilitated the pilot production of niche dairy products.