PA Milk Marketing Board
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Just What Is A2 Milk?

Some individuals experience gastrointestinal distress when drinking cow's milk and many of these problems are eliminated with consumption of lactose-free milk, readily available in retail outlets across the commonwealth. However, not all people find relief when changing from milk that contains lactose to lactose-free products.

For just over 20 years, some medical professionals and researchers have blamed the digestive issues with regular milk on proteins.

Milk is considered to be a major source of high-quality protein, providing about 38 percent of the solids-not-fat portion of milk and 21 percent of whole milk energy. Ninety five percent of the proteins in milk can be divided into two major categories: serum proteins (found in whey) and casein proteins.

Proteins are defined as long chains made up of amino acids. The protein chains are "snipped" by enzymes during digestion into shorter amino-acid chains known as peptides. The arrangement of the amino acids in the protein chains, as well as how the proteins are broken up during digestion, determines how they act, biologically, in a myriad of chemical reactions.

A1 and A2 are names that have been given to just two of the casein proteins. The only difference between the two is that the #67 amino acid in their chains is different. When each is digested, the peptide segments created by enzyme action at that 67th amino acid result in how A1 and A2 work in the body.

When the A1 casein protein is split, there is a resulting peptide known as the BCM-7 peptide. It is not produced with the breakdown of the A2 protein.

What does this mean? Is it this difference that causes issues according to the proponents of A2 milk? Better yet, according to available research?

Some research has been conducted and published in credible refereed journals to indicate that consuming milk that contains the A1 protein does create digestive problems in some people, but the research on benefits of A2 milk is very inconclusive. Human studies have been small.

Results of one study found that humans that ingest milk that contains both A1 and A2 proteins may take longer to digest the proteins, a situation that would cause bloating and abdominal pain. The journal, Nutrition, conducted a literature review of research related to A2 proteins and found that, while this result is confirmed, the majority of additional research was conducted using rodents.

It is very possible that the A1 protein creates digestive issues in some people, just as lactose may, but not enough research on humans—large-scale human true experiments—has been done to provide conclusive evidence.

Researchers at the University of Vermont have stated that, based on their studies, there are many more proteins that vary in cow's milk that may be at play and that may also contribute to the small percent of individuals' gastric issues. According to one professor, her team examined two types of cows and found over 40 proteins that were different between them. It is possible that any one of those could be causing differences in symptoms, as well.

I often jokingly say that "all things in life can be explained by a bell curve," but I also believe there is some truth to that statement. A bell curve, by definition, is a graph that shows the distribution of a set of chosen values. When drawn it resembles the shape of a bell. Using the statistics applied to the bell curve of a normal distribution, approximately 68 percent of the human population would have no symptoms when drinking milk containing A1 protein and only 5 percent would have serious issues and symptoms. The only way to know if this is a correct representation would be to conduct appropriately designed research.

PMMB supports experimentally designed research to examine any claims of nutritional or health related issues or benefits associated with the consumption of dairy products. Valid and reliable research helps the industry grow and improve its consumer offerings.

We also support efforts of our Pennsylvania processors, manufacturers, and retail outlets to provide dairy-based alternatives such as lactose-free and A2 milk so that all individuals have access to nutritious dairy beverages. I can be reached at 717-210-8244 or by email at chardbarge@pa.gov to discuss any questions and concerns.