



What is A2 Milk?

A2 milk is currently marketed as a healthier choice over “regular milk”. It is purported to provide explicit benefits including easier digestion for those who are lactose intolerant and reduced risk for several disorders. But what is the difference between these products and are the claims actually true? It all comes down to the breed of the cow from which the milk came from, and consequently the type of casein protein(s) found in the product. Casein is the predominant form of protein in milk (constitutes about 80%), and there are several types. One type is beta-casein which exists in at least 13 different forms; the most common include:

- **A1 beta-casein:** Found in milk from breeds of cows that originated in northern Europe such as Holstein, Friesian, Ayrshire and British Shorthorn
- **A2 beta-casein:** Found in milk from breeds of cows that originated in the Channel Islands and Southern France such as Guernsey, Jersey, Charolais and Limousin

Scientists believe the difference in casein content in milk from different breeds originated as a mutation that occurred between 5,000-10,000 years ago as cattle were being taken north into Europe. While African and Asian cattle continue to produce only A2 beta-casein today, the A1 version of the protein is common among cattle in the western world. Today “regular milk” most commonly consumed in the US contains both A1 and A2 beta-casein, while A2 milk contains solely A2 beta-casein. A2 milk is produced and marketed by the A2 Milk Company™ which was founded in New Zealand in 2000. It is primarily sold in Australia, New Zealand, China, some regions of the United States and the United Kingdom.

Interestingly, A1 and A2 beta-casein only differ by one amino acid. But that amino acid, found in A1 milk, results in the release of a specific peptide chain known as beta-casomorphin-7 (BCM-7) during digestion

in the stomach. A few research groups have concluded BCM-7 to negatively affect the digestive system. Some studies seem to indicate that A1 beta-casein can be harmful among certain individuals, but findings within research starting as early as the 1980s have varied greatly. Its precise health relevance remains somewhat unclear even though research has been conducted to examine the relationship between A1 vs A2 milk and diabetes, heart disease, sudden infant death syndrome (SIDS), autism, digestive disorders and other issues.

Select scientific evidence summary:

- **Risk for type I diabetes:** Several observational studies suggest a link between A1 milk consumption during childhood and an increased risk of type 1 diabetes - but the evidence is mixed and more research is needed.
- **Risk for heart disease:** There is no strong evidence that A1 milk increases the risk for heart disease. Only one animal study using rabbits showed a notable increase in fat buildup among injured blood vessels with intake of A1 beta-casein when compared to A2.
- **Risk for SIDS:** One study found high levels of BCM-7 in the blood of infants who temporarily stopped breathing during sleep (apnea), which is linked to an increased risk of SIDS. It is theorized that some children may be sensitive to A1 beta-casein but further studies are needed before any firm conclusions can be reached.
- **Risk for autism:** In theory, peptides such as BCM-7 might play a role in the development of autism. However, studies do not support all of the complex proposed mechanisms. Autism is a complicated issue and the relationship needs to be studied further to come to any clear conclusions.
- **Digestive health:** The amount of lactose found in A1 and A2 milk is the same but anecdotal evidence and research surveys indicate some people feel A2 milk causes less bloating and gas. A recent trial showed A1 milk to cause softer stools (risk for diarrhea) than A2 milk in some individuals. Additionally, studies in rodents indicate that A1 beta-casein may significantly increase inflammation in the digestive system. There appears to be growing evidence that A1 beta-casein can affect digestive function in an unfavorable manner when compared to A2 beta-casein but further clinical trials are needed.
- **Hypertrophy:** Research has not yet investigated how ingestion of A1 vs A2 milk may differently impact protein synthesis and/or hypertrophy in response to resistance training.

Interestingly, a 2009 European Food Safety Authority (EFSA) review of scientific literature available at that time found there was insufficient evidence to prove that bioactive peptides in A1 milk have any negative effect on health or digestion. As part of their evaluation, the EFSA looked at the laboratory studies that have been done up to that point on BCM-7. They found that most were performed on animals and the BCM-7 was not administered orally, the way humans are exposed to it, but rather via injection into the peritoneal cavity, spinal cord or brain. This made the research unfavorable for understanding how BCM-7 might affect humans. On the other hand, a 2016 independent study published in the *Nutrition Journal* (prominently detailed on the A2 Milk Company™ website) showed A1 milk to be associated with increased gastrointestinal inflammation, higher levels of digestive discomfort,

delayed fecal transit time in the intestines and decreased cognitive processing speed and accuracy following ingestion when compared with A2 milk. The authors of this study concluded that some common symptoms associated with lactose intolerance may stem from the inflammation that A1 milk triggers, and this can be avoided by consuming milk containing only the A2 type of beta-casein.

So what is the take-home message from the vast quantity of available information on the subject? It appears that the A1-A2 milk debate is still unsettled - much like some people's stomachs after consuming cow's milk. A few studies indicate A1 beta-casein may have adverse effects among certain individuals, but the total evidence at this time is too weak for any conclusive determinations.