

# A2 milk – What is it all about?

Generally cow milk is regarded as food with a high nutritional value. Over recent years, however, scientific evidence has linked certain milk components to a variety of health issues.

Besides water and fat, milk contains proteins. Most of these proteins belong to the so called caseins. There are different types of caseins, one of them is beta-casein.

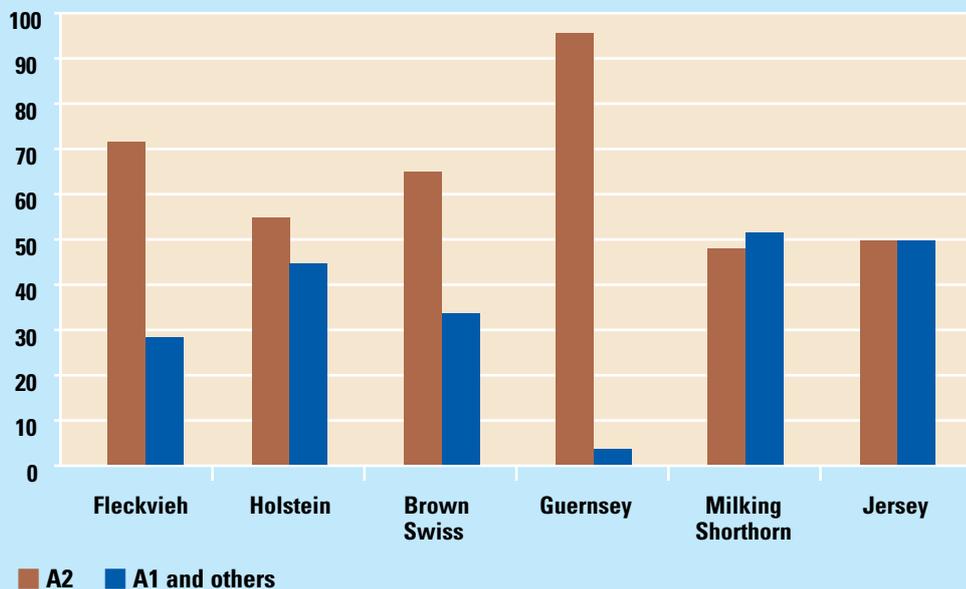
A1 and A2 beta-casein are genetic variants of the beta-casein milk protein with different chemical structures. Although they differ only by one amino acid, the A1

protein digests differently to the A2 protein in the human intestinal tract. A cow is capable of producing either the A1 type, the A2 type or both, A1 and A2, depending on

her genetic constitution. Research done in several countries has suggested that there might be a link between the consumption of A1 milk to diseases of modern man like diabetes, cardiovascular diseases, autism and schizophrenia. However, these theories are based on statistical correlations, animal research or anecdotal reports. Nevertheless, the health conditions that have been postulated to be affected by the A1 beta-casein content of milk are important and reasonably common. Therefore, if the composition of milk is a causative factor for these conditions, it has major public health implications. The most common type found in cow's milk in Europe, the US, Australia and New Zealand is the A1 beta-casein type. The A2 form of beta-casein is estimated to be the original form of beta-casein that would have been produced by cows thousands of years ago. At some point in history, owing to natural genetic mutation, the A1 form appeared in dairy cattle and was spread throughout dairy herds across Europe, beco-

◆ Image 1:

**Allelic frequencies of  $\beta$ -Casein genotypes of different breeds**



	Fleckvieh	Holstein	Brown Swiss	Guernsey	Milking Shorthorn	Jersey
A2	71 %	55 %	66 %	96 %	49 %	50 %
A1 and others	29 %	45 %	34 %	4 %	51 %	50 %

Source: Milk Protein Polymorphisms in California Dairy Cattle, Journal of Dairy Science, Volume 74, Issue 5, May 1991 and Comparison of Influence Markers CSN3 and CSN2 on Milk Performance Traits in Czech Spotted and Holstein Cattle tested at first, fifth and high lactation, Nitra, Slovaca Universitas Agriculturae Nitrae, 2006.

ming the common form of beta-casein in many breeds of cows. Traditional cattle breeds such as Zebu, the native Asian cattle and closely related animals such as the Water Buffalo and Yak all still only produce the A2 type of beta-casein.

### A2 in Fleckvieh

Fleckvieh has a high percentage of A2 milk, which is supposed to be the „good“ type. Studies done to date in 10 countries and across 7 dairy breeds between 1982 and 2006 show, that Fleckvieh had the 2<sup>nd</sup> highest frequency of the A2 beta-casein protein of all breeds after Guernsey. Six studies included Holstein, three studies included Jerseys and one study each one Ayrshire, Guernsey, Brown Swiss, Milking Shorthorn and Fleckvieh.

The Fleckvieh study was published in the Czech Journal of Animal Science in 2006 and was conducted on 440 animals of the Czech Fleckvieh Breed. Of the 440 Fleckvieh animals tested:

- 67 % tested A2A2
- 30 % tested A1A2
- 3 % tested A1A1

The graph on page 8 shows results on tests done to date to compare between breeds and from it can be seen the high incidence of A2 beta-casein gene in Fleckvieh. The scientific results obtained to date are very promising for Fleckvieh. Should the additional health benefits of A2 milk prove true, this

would be another big advantage for Fleckvieh. A2 milk is already being sold in Australia, New Zealand, the US and the UK and it is attracting more and more interest from the health conscious consumers. However, further research is needed before there is a definitive answer to the benefits of drinking A2 milk. If the A1/A2 hypothesis is proved correct, changing dairy herds to more A2 producing cows may significantly improve public health. In the meantime A2 milk is highly unlikely to do harm and therefore the idea of using A2 bulls to eventually change the herd to A2 one day is definitely worth considering.

As a result of all this interest, Bavarian Fleckvieh Genetics began to test their bulls to find out whether they carry the 'desirable' A2 gene. Here is the list of bulls that are homocygous A2:

Valuta	10/188933
Rosskur	10/179513
Mangope	10/188528
Romty	10/172695
Ralmes	10/170336
Ilion	10/185090
Mercator	10/172474
Wallenstein	10/192421
Malsaf	10/189159
HolzMichl	10/192011
Sylt	10/179031
Haertsfeld	10/188759
Hagwirt	10/192627
Zasport	10/172305

### Three bulls that carry the desired A2 alleles:



◆ Haertsfeld 10/188759



◆ Rosskur PS 10/179513



◆ Wallenstein 10/192421

## A2 milk – Fact or Fiction?

◆ George Cassar, Australia

**Since the publication of Keith Woodfords book, „The Devil in the Milk“ in September 2007, there has been a growing awareness to the claimed benefits of drinking milk containing only the A2 Beta Casein protein. This awareness also stems from the exposure by the media and many positive comments and testimonials by users of A2 milk.**

In Australia, A2 milk is marketed through the A2 Corporation and commands a premium price. It sells for around \$3.95 for 2 Litres, with other branded milks like „Dairy Farmers“ retailing for about \$3.65 for 2 Litres and

Supermarket „Home Brand“ milk selling for \$2.00 for 2 Litres. Even with this premium price, A2 Milk sales now claims a 6.8 % market share of all fresh milk sold in supermarkets and stores in Australia. Sales of A2 milk

now exceeds the combined total of all organic, lactose free, goat, and soya milks. This has helped to raise the profile of milk as a quality product and is also helping the dairy farmer, as a premium gate price is also passed

on to the producer, which ensures the viability of the dairy farm. As a result to the interest surrounding the benefits of drinking A2 milk, more and more health professionals, including doctors and nutri-



◆ Rosskur-daughter Lilli.  
**Production: 1. La, 100 days:  
 2.952 kg milk – 3,51 % butterfat – 3,16 % protein.**

tionists are prescribing A2 milk to sufferers of milk intolerance conditions. Whilst currently there is no Scientific studies proving beyond doubt that there are health risks involved with drinking A1 milk, it is the consumer that is doing the talking, with sales of A2 milk increasing tenfold over a 5 year period from September 2007 to June 2013 and a doubling of sales in the past 18 months.

The following is a testimonial and is typical of what users of A2 milk have to say:

„When my son was born he had a very immature gut. He suffered from griping pains and colic which was why I continued to exclusively breastfeed him for as long as possible. When he was around 6-12 months old, I started to slowly introduce him to solids, pureed

vegies, fruit, yogurt and an occasional drink of cow's milk. He seemed to handle the fruits and veggies quite well but when it came to all dairy products he suffered from stomach pains and the occasional episode of constipation. I took him to the doctors to make sure that he wasn't lactose intolerant or had any dairy allergies and all the tests came back negative. So as a last

resort I was recommended to try A2 milk from another mum who has twin boys, both suffering from lactose intolerances. I tried it with my son and he absolutely loved it. He easily digests it, loves the taste and now never gets stomach pains and he drinks it by the bottle. I would and do recommend it to anyone“.

◆ Kelly Burke, Australia

◆ **Rosskur-daughters carry at least one allele of the „desirable“ A2 gene since Rosskur PS is homozygous for A2.**



◆ **Rosskur-daughter Zyprese.**  
Production: 1. La, 100 days: 2.712 kg milk – 4,16 % butterfat – 2,99 % protein.