Cow's milk protein is composed of whey and casein\(^1\)-\(^5\). A2 milk is a milk that does not contain A1 casein.

Full cream cow's milk

80% Casein
aS1-casein (40%) \(\beta\)-casein (35%) aS2-casein (12.5%) \(\kappa\)-casein (12.5%) 20% Whey

Among cow's milk casein, there are several \(\beta\)-caseins, of which A1 and A2 \(\beta\)-caseins are the most prevalent ones.

- There are 13 genetic variants of \(\beta\)-casein in cow's milk.\(^6\)
- The most prevalent ones are A1 and A2 \(\beta\)-caseins.\(^7\)

A2 \(\beta\)-casein is the original variant in cow's milk, found thousands of years back.

- Originally, cow's milk did not contain A1 \(\beta\)-casein.\(^8\)
- This A1-\(\beta\)-casein variant appeared 5,000 to 10,000 years ago from the A2 variant, because of cows' domestication and genetic selection.\(^8\)

Cow's milk A1 and A2 \(\beta\)-casein variants have identical structure, except 1 amino acid, at position 67 of amino acid chain.\(^6\)

Depending on the amino acid at position 67 (histidine in A1 and proline in A2 \(\beta\)-casein) there will be a release of specific amino acid during digestion: \(\beta\)-casomorphin-7 or -9 (BCM-7 or BCM-9).\(^9,10\)

Human milk \(\beta\)-casein and cow's milk A2 \(\beta\)-casein have proline in the position 67.\(^7-11\);

- Limiting the release of BCM-7 peptides.\(^11,12\)
- Hence they may have a similarity from a digestive point of view.\(^9-17\)

Compared with A1 milk, emerging science shows A2 milk may provide some benefits*.

For digestion:
- Less severe gastrointestinal symptoms such as.\(^18,19\)
- Flatulence
- Bloating
- Abdominal pain

For immunity:
- Lower serum concentrations of some inflammatory biomarkers.\(^19\)
- Lower increase of BCM-7 plasma concentration.\(^20\) BCM-7 may have some adverse effects on health outcomes in infants\(^21-24\).
- Increases natural production of the antioxidant glutathione (GSH).\(^20\)

References