

## A2A2

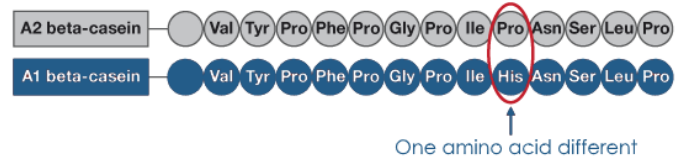
The market for A2A2 milk is growing and many farms are looking towards A2A2 status in search of achieving a bonus on the milk price.

It is currently thought that around 50% of the average herd<sup>1</sup> has cows with the A2A2, but genetic testing of your herd is advisable to establish your own level. Even using A2A2 sires it can take over 10 years to conventionally convert a herd to A2 status (lack of any A1 beta-casein). Using sexed semen as part of a conversion strategy can reduce the conversion period to less than 5 years.

### WHAT IS A2?

Part of milk protein is the casein. This is constructed from groups of bound amino acids. Two of these groups are classed as A1 beta casein and A2 beta casein. The only difference between these two groups is a single amino acid\*.

Protein chain showing amino acids in A1 and A2 beta-casein

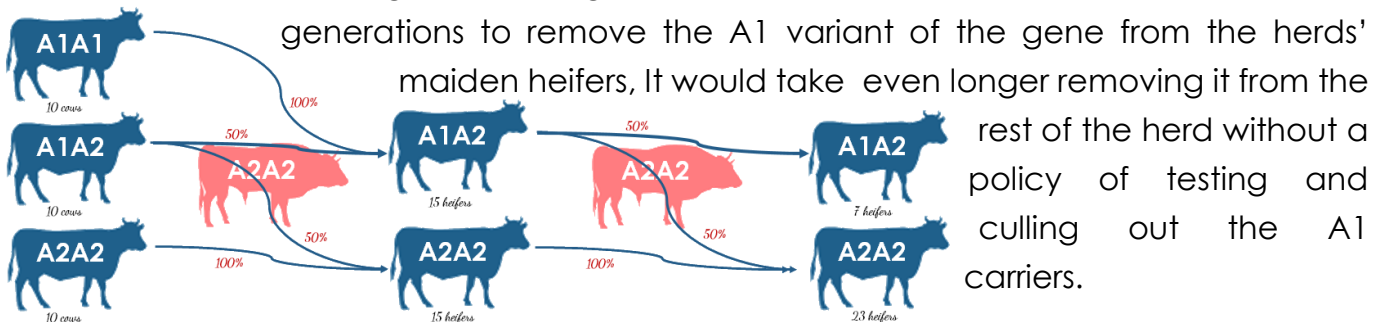


\*Proline replaces Histidine at position 67 on the chain

Because milk protein is formed in the udder it is the genetic sequencing built into the cow's DNA that determines whether the cow produces A1, A2 or both variants in the milk.

### A2 IN YOUR HERD

Cows carry two sets of the beta-casein gene within their DNA. The possible combinations being A1&A1, A1&A2 and A2&A2. As it is the A1 that the market now doesn't want, using an A2A2 sire will guarantee that at least one A2 gene will be transmitted to the offspring. In practice this means that an A1A1 dam, produces an A1A2 calf, which if bred again to an A2A2 sire, may then have a 50% chance of giving birth to an A2A2 calf, as the dam may still pass on the A1 gene. If using all A2A2 bulls this way, it would take quite a few



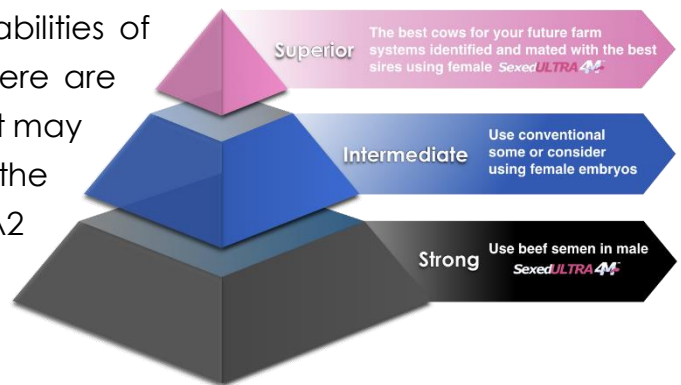
<sup>1</sup> Breed differences apply. Guernsey, Ayrshire and Jersey breeds are likely to have higher proportions of A2A2

## GETTING TESTED

Testing for A1 and A2 genes can be done through taking ear clips or hair samples. The cost of testing at around \$23 - \$37 per animal can be prohibitive. If testing a 300-cow herd the cost would be \$6,900 - \$11,100, plus another \$1,700 - \$2,775 for the R2's.

Strategic testing is therefore preferable.

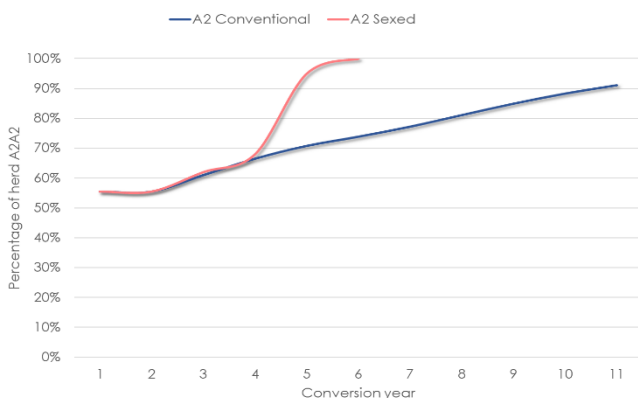
Using STgenetics pyramid approach, by testing the Superior animals you will gain an understanding of the A2 transmitting capabilities of the best animals in your farm system. If there are insufficient A2A2 or A1A2 in this group then it may be worth considering using some of the Intermediate group as recipients for A2A2 sexed embryo's rather than continue poorer bloodlines just because they will produce an A2A2 calf.



Cows that are likely to be culled in the next year or two may also not be worth testing.

## THE ROAD TO A2A2

Removing the A1 variant from the herd to create an A2A2 milk supply can be achieved through a combination of breeding, replacement and culling.



The chart shows the percentage of the herd that become A2A2 given the use of A2A2 bulls and a breeding and culling regime to maintain herd size.

For a conventional system of breeding and culling the results show that the herd still doesn't quite make 100% conversion, even after 10 years.

Where sexed semen is used, this allows for greater selection of A2A2 replacement heifers and more aggressive culling policy to achieve A2A2 status within 5 years. The use of sexed A2A2 embryo's could accelerate this conversion faster.

N.B. Consideration should be given to the productivity of the heifers coming into the herd if increased culling is to be undertaken. Improved performance of heifers in their first lactation will be needed to minimise the lost productivity from more aggressive culling.

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*Your STgenetics New Zealand Breeding Advisor can help you review your herd and develop optimal strategies to achieve A2 status*

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