

Beta casein A1 and A2 in milk and human health: Lay Summary

About 25-30% of the protein in cows' milk is β -casein and it comes in several forms depending on the genetic make up of the cows. One of the forms is called A1 β -casein and it has been suggested that it might cause or aggravate one type 1 diabetes (which is the type seen most commonly in children), heart disease, schizophrenia, and autism. The other main form of β -casein is called A2 and it has not been not been implicated in these diseases. The evidence to support the hypothesis that the A1/A2 composition of milk is a causative or protective factor in these diseases is reviewed in the report.

The strongest evidence is for type 1 diabetes and heart disease. The main study supporting a relationship with the type of milk consumed was a comparison of 20 countries. Those countries with the highest consumption of A1 β -casein had the highest rates of type 1 diabetes and heart disease. The relationship was very strong indeed, but these types of comparisons between countries can be difficult to interpret. There are many other factors that contribute to these diseases and the information is only averaged for the whole country's population. There have been a few other human and animal studies which provide some limited support for the hypothesis. Further research, especially involving human trials, is needed before it can be said with confidence that the A1/A2 composition of milk is important in human health.

The evidence in relation to an effect of A1 β -casein on schizophrenia or autism is much less. Some individuals with autism seem to improve on special diets that are free of both casein and gluten.

The A1/A2 hypothesis is both intriguing and potentially very important for population health if it is proved correct. It should be taken seriously and further research is needed. In addition, the appropriate government agencies

have a responsibility to communicate the current state of evidence to the public, including the uncertainty about the evidence. Further public health actions, such as changing dietary advice or requiring labelling of milk products, are not considered to be warranted at this stage. Monitoring is also required to ensure that any claims made for A2 milk fall within the regulations for food claims.

Changing the dairy herds to more A2 producing cows is an option for the dairy and associated industries and these decisions will undoubtedly be made on a commercial basis. Changing dairy herds to more A2 producing cows may significantly improve public health, if the A1/A2 hypothesis is proved correct, and it is highly unlikely to do harm.

As a matter of individual choice, people may wish to reduce or remove A1 β -casein from their diet (or their children's diet) as a precautionary measure. This may be particularly relevant for those individuals who have or are at risk of the diseases mentioned (type 1 diabetes, coronary heart disease, autism and schizophrenia). However, they should do so knowing that there is substantial uncertainty about the benefits of such an approach.