

D is for DD, Doom and Disorders.

On August 12, 2013 the American and Australian Angus Breed Societies released press statements that a test had been developed for a genetic condition identified in Angus cattle referred to as Developmental Duplication (DD).

In 2004 a calf with polymelia (multiple limbs) was reported to the Angus Society. Anecdotally the condition has been present in cattle of different breeds in Australia for many years. Between 2004 and 2013 there had been no official information from any source that this or any other genetic condition was being investigated. I knew that some work was being done on this issue. Like most members of the two societies concerned I had not been kept informed about the problem or what was being done about it.

Over the last ten years we had on occasion seen calves with unusual conditions – including two with multiple limbs. One was effectively dead on arrival. The other had a small leg where a unicorn would have had a horn. We referred to it as our little chook, as it had a black ‘leg/horn’ that was gently amputated. Within a few days of the publicity in August I heard of a two headed calf near us and a black baldy calf with a very large leg on its shoulder elsewhere in the district.

In our breeding programme we used 036 and 1407 intensively and in the last few years we used Africa. Once we knew the DDC status of these bulls we knew that we must have a high incidence of the condition. We were not sure whether it was a simple recessive, nor whether it was lethal (like AM and NH) or what the effects were. We did not know whether it was a disaster or a damp squib. Most importantly we could not tell you very much at all as we knew very little. We did not know what the incidence in your herds might be and we did not know how you would be affected by using carrier bulls – of which we had a lot to sell on August 23.

Our priority then was to learn as much as we could as fast as we could about DD so as to manage it in our own herd and advise you about how to manage it in your herds. We are better informed and more aware that other genetic variations **are** (not might be) already here but not **yet** identified. We know that more genetic variations are being created all the time.

The genetics behind DD is well known – an excellent summary is given on the American Angus Association website. It can be located at

<http://www.angus.org/pub/dd/videos/videos.aspx?vid=DDinCattle>

A good introduction to terms used here is at

<http://sbts.une.edu.au/pdfs/UnderstandDNA.pdf>

Angus Australia brought both of these links to our attention.

DD is a simple recessive genetic condition – like red coat colour and horns. AM, NH and CA are also simple recessives. If an animal has one copy of the gene it is unaffected. A black baldy from a horny Hereford is black and polled.

These conditions also all have one phenotype (expression) when the animal has two copies of the relevant gene. With coat colour homozygotes are all red, with the horn gene homozygotes are all horned. With AM, NH and CA the homozygotes are all dead. **The symptoms (phenotype) shown by an affected (homozygous) animal are always the same.**

In all the cases above carrier (heterozygote) animals show no symptoms of the disorder. They are ostensibly normal.

There is (sorry) no economic cost associated with coat colour. There are some costs associated with horns (which is why we have ‘bred them out’). There are major costs associated with AM, NH and CA.

DD has one major different feature from the other genetic conditions above – **the symptoms (phenotype) shown by an affected (homozygote) animal are NOT always the same.**

Some affected animals are completely normal. We have three older cows in our herd that are homozygotes and which have had a live calf every year. We used Rennylea Digger in our AI program a few years ago – he is a homozygote for DD.

I think (I have no evidence for this statement) that **some** affected animals are born apparently normal but die young of unexplained causes.

Some animals are clearly non-functional at birth.

Some animals are aborted. If this happens very early in pregnancy then even with a three cycle joining the cow may get back into calf and in this case the only cost of DD is a delayed pregnancy.

Some is sometimes a weasel word. I do not know of any accurate estimate of how many affected animals are in each category and until I do I cannot give you very clear advice about how to react to DD. In particular you need to decide how much cheaper a carrier bull must be than a clean one if you are to buy it.

In August I was very stressed by DD. I now think it is just a nuisance. We made a mistake in calling a genetic condition a Genetic Defect. We jumped to the conclusion that DD would be another lethal recessive. On a positive note we have been reminded that there are many genetic variations out there. We have to live with them and we have to learn how to control the variations that have costly effects.

D is also for Damp Squibs.

A, B and C are under Breeding Programme/Objectives and Strategies/Personal Opinions on this website.

December 18, 2013