

CHONDRODYSPLASIA

At the 2013 AGM, it became obvious that there are some members who have limited or no knowledge of Chondrodysplasia, or how to manage it. So here is a brief overview for the benefit of those interested in what the gene is, how it originated, and how to manage it.

Chondrodysplasia / Bulldog / Short Leg / Carrier – all terms that have been used to describe the dwarfing gene carried by some Dexters. This is an inherited lethal gene but these days it can be managed quite easily.

Prior to around the year 2000 there was no technical way of confirming that your cow or bull was a carrier of the gene. Basically all that was known was that it was the short legged Dexters that carried the gene and that mating two short legged Dexters may result in a deformed calf being produced.

In NZ there are 2 mutations of the gene: Type 1 and Type 2.

- **Type 1** is the original mutation that has always been present in Dexters and came about through the selection of the smallest animals in the original Dexter herd back in the late 1800s.
- **Type 2** is a NZ mutation that came about through the original grading up program in NZ where a Jersey X Red Poll was used in the grading up program in the Meadowpark Herd. Alec Meades was completely unaware that this mutation had occurred at the time of establishing the breed in NZ and it wasn't until some years later that the Type 2 mutation was recognised. This is present only in some NZ Dexters and some progeny of Meadowpark Charles in Australia, as semen from this bull was exported to Australia prior to the mutation being recognised. The original UK bulls used in the NZ grading up program are non-carriers so it was identified that the gene had been inherited from the dam. Research confirmed that Meadowpark Pollie Jnr was the first registered female Dexter known to carry the Type 2 gene. Her progeny through embryo transplant, and her purebred sons, were a large part of the original Dexter Herd in NZ, although not all were carriers.

Extensive research was done at the University of Sydney and the gene was identified. A test was then developed to identify carriers of the gene. Prior to the availability of testing it was believed that the gene was quite a problem. It was the discussion topic of many meetings and phone conversations. Members were trying to figure out how this gene was passed on, how to manage it and how to avoid unnecessary stock losses. Once the test was established, many breeders invested in testing to know exactly how to manage their studs. Large studs went to great expense to have their herds tested and now have the ability to pass on to clients the knowledge that has been obtained about their own herds for future breeding decisions.

These days there is not a lot of talk about the gene as most established breeders know the status of all of the cattle in their herds. New members seem to be less informed so hopefully this information will help these members to make their own breeding decisions.

Chondrodysplasia is not always seen as a negative attribute and many believe that without the gene the Dexter breed would eventually become a herd of Kerrys (all long legged). Some believe that it is the gene that keeps the breed what it is – the smallest natural breed of European cattle.

If you are concerned that your stock may be carriers of the gene then it is a good idea to test them. Testing is the ONLY way to be certain if an animal is a carrier or not, however Chondrodysplasia testing is NOT A DCSNZ REQUIREMENT under our current regulations.

Prior to testing, the only way to know, was if any had produced a bulldog calf, or to guess if the cattle were short legged. It should also be mentioned that the term 'bulldog' is a term used loosely by many vets to describe a deformed calf displaying bulldog-like features. This may not necessarily be caused by the Chondrodysplasia gene of Dexters. There are other causes of such deformities in the cattle world such as BVD & similar genes in other breeds of cattle, and PHA (water babies) – another lethal gene carried by Dexters. When using this term to others it must be established exactly what is being discussed.

Note: PHA is a gene carried by Dexters, and until recent times has been relatively unheard of. It is inherited the same way as Chondrodysplasia but the main point of difference is that there are no visual characteristics that can even begin to distinguish which Dexters may be carriers of this gene. The only true way to know is to test for this one. There have been a few reported cases of what is suspected to be PHA in NZ.

These days, testing is available for both genes by collecting the tail hairs. The roots must be included as this is where the DNA is. **Do not cut the hairs with scissors!** They must be pulled from the switch of the tail. About 20 clean, dry hairs is all that is necessary and are quite easy to pull. Details on what to do with the hairs are at the end of this article.

Once you know the status of your cow then you will need to know the mathematics of the inheritance of the gene.

- **The simplest mating is the Non-Carrier X Non-Carrier mating** – this will only produce a non-carrier. These cattle are generally the long legged Dexters but there are smaller cattle at the shorter end of the long legged range that are also non-carriers. It was this size of Dexters that Beryl Rutherford of the Woodmagic Herd in the UK, used to establish her herd of smaller non-carrier Dexters.
- **The next mating is a Non-Carrier X Carrier mating.** With this mating, there is a 50/50 chance of producing either option – i.e: you will have a 50% chance of producing a carrier and a 50% chance of producing a non-carrier. This mating will not produce a deformed calf, but it is good to know the status of the animals involved, so future breeding plans can be made. If this mating produces a carrier, then this is the animal that will need to be managed, in such a way that you are aware of the possibilities later on. There are a lot of breeders that are happy to use this method, as they may produce the smaller carrier (and sometimes popular) Dexter, but will not produce an actual bulldog calf.
- **The third option is the Carrier X Carrier mating.** The maths is slightly more complicated but worth knowing. This will result in a 50% chance of producing a carrier, a 25% chance of producing a non-carrier, and a 25% chance of producing a deformed or bulldog calf. Whether or not to use this option is the breeder's choice. Some make this choice intentionally as they like the smallest Dexters. Whether it is right or wrong is not for DCSNZ council to decide. It is completely up to the individual breeder. There are also slightly bigger cattle at the taller end of the short legged range that are non-carriers. These are also a popular size, but will need testing to be sure of their status.

The key to it all is having the knowledge, and knowing what to expect no matter what breeding option you choose, and accept the results, whatever that may be, at the end.

Dexters that fall within the taller short leg or smaller long leg categories, can be quite difficult to guess if they are carriers or not. The photos below show 2 bulls of the same age. One tested positive for Chondrodysplasia and one tested clear. Can you pick which is which? (the answer will be published in the Winter 2013 Dispatch).



If a bulldog calf is produced, this can be quite traumatic and distressing for the cow and the owner. This may result in the cow having a very difficult birth due to the distorted calf. A Type 1 bulldog is generally aborted at around 7 months gestation, so may deliver relatively easily due to being early, however the birth could still be difficult due to the shape of the foetus. A Type 2 bulldog is usually born full term so may be bigger than the Type 1.

Either type could result in the cow having to have a caesarean section to deliver the calf. It may even result in the death of the cow due to the difficulty of the birth. Some will deliver the calf without too much trouble, but the calf will be grossly deformed. Both types of Chondrodysplasia bulldog calves are always either born dead or die within a few minutes of delivery. This is a huge loss for the majority of Dexter Breeders as they may only have a few cows to begin with.

The key to managing the gene is knowledge. If you are buying or leasing a bull, always ask if the bull is tested for the genes relevant to its blood lines. If you choose to use a carrier bull, at least you know the risks and can accept the results accordingly.

If you are having your Dexters tested, and they turn out to be non-carriers, then **the progeny of Non-Carrier X Non-Carrier do not need to be tested**. They will always be non-carrier by heritage. If you introduce a carrier to your herd, then the breeding of this animal and its progeny are the ones that will need to be monitored and tested in the future.

There is a lot of information on the internet that may be of interest and value to our members. Searches for Dexter Chondrodysplasia will produce many results from other Dexter societies and individual breeders throughout the world.

If you have a bulldog calf born on your property, please report it to a person on council. Record the name of the dam & sire and the date the calf was born. It is worthwhile photographing an abnormal calf and also supplying a copy to council for research and/or recording purposes. Since testing for the gene has been available, very few bulldog calves are reported to council these days, so council is unaware if there is in fact a great problem within the society at present.

Here are some photos of bulldog calves:



Chondrodysplasia testing is available in New Zealand, at Massey University, Palmerston North. Submission forms are available for downloading from the DCSNZ website with contact details and pricing. Results may take up to 4 weeks from the time the University receives the submission form and hair sample.

If any member would like to discuss this further, please don't hesitate to contact the author, or any other member of council. There are also many other breeders that have knowledge they are happy to share with anyone wanting to know more.

Note: Testing is not a requirement for DCSNZ members when registering stock (unlike DNA and Sire Verification for bulls). This is voluntary for stud management and information only.

If you are selling Dexters that you know or suspect are carriers, and/or have been mated to a carrier bull, please do let any prospective buyer know exactly what they may be dealing with. By withholding such information, you may be seen to be in breach of the society's code of ethics, and could be subject to a formal complaint being lodged, so please be a responsible breeder.

— Robyn Snelgar