SHORTHORN SB BEEF

technical brief

"Minimising Calving Problems through Selection"

Technical Specialist, Bob Freer

After cow fertility, calving ease is next in line as a profit driver for the commercial cattleman.

Difficult calving costs - both directly and indirectly, particularly if you enter your time into the equation. Labour and veterinary expenses in attending to difficult births is up-front "red ink", but like the proverbial "tip of the iceberg" is only a small part of a much larger cost.

There is the profit foregone on dead calves and heifers which is a blow to next years balance sheet but research has shown another hidden cost that can affect herd profitability over the longer-term. About 20% of cows that have assisted births will not conceive again. Those that do re-breed will generally conceive later in the joining period, and will have late season calves for the rest of their breeding lives.

Calving problems have been around a long time – carvings in Egyptian tombs dating back to 2000 BC depict cows being assisted at birth**. This tells me that whatever we have been doing about reducing calving problems over the last few thousand years hasn't been very effective!**

Why? We haven't been tough enough with our selection and culling. I bet the Egyptian in the rock carving scene kept both the cow and the assisted calf for future breeding – if so, that's where the problem started. We need to select replacement breeders, both male and female, on their ability to be born unassisted, and avoid or remove those animals that give us grief.

Going back to basics, what causes the problem? Apart from abnormal presentations, the answer is fairly straight-forward. Either the calf is too big for the cow's pelvis or the cow's pelvis is too small for the calf. So our efforts have generally been directed towards getting a bigger pelvis or a smaller calf. Both methods are flawed.

Selecting for larger pelvic area will increase pelvic area in future generations. So far, so good. However few people measure pelvic area, rather relying on visual estimation of the external pelvic dimensions to predict the internal area. Research shows us that there is a very low correlation between internal and external pelvic measurements, so your cows might be getting bigger hips but not necessarily a bigger internal pelvic area. Research also shows us that if you do increase internal pelvic area, the cow will carry a bigger calf to fill it.

Not a lot of gain selecting for measured pelvic size it seems, but the practice can be useful in high risk herds for identifying and culling heifers with very small pelvises.

Next, we can select for smaller calves, and here the water gets a bit muddied - birth weight or calf shape?

Research tells us that birth weight is the single most important cause of calving problems. Analysis of some 160,000 Australian Hereford calving ease scores revealed that the average birth-weight of non-assisted calves was 39kg; calves requiring moderate assistance averaged 41kg and calves requiring traction or veterinary assistance (but excluding mal-presentation) averaged 45.5 kg. A clear message here.

Conventional wisdom would tell us to select for low birth weights – a *win one, lose one* situation. Because birth weight and later growth are genetically correlated traits, when you select for low birth weight you are indirectly selecting for low growth rate.

Progeny of low birth weight sires are generally easy born, however this needs to be balanced against the fact that the resulting easy born heifer calves will be smaller at calving, with smaller pelvises, and therefore more likely to have increased calving problems when they calve – that is why Breedplan gives you two Calving Ease EBVs; DIRECT (sire effect on calving ease of his progeny) and MATERNAL (sire effect on daughters ability for easy calving) so that you can avoid a possible conflict of these two independent traits.

There are two issues here.....

(1) Keeping the lid on birth-weight is sensible. I prefer to use birth-weight EBVs to avoid high birth weights rather than to select for low birth weights. Selection of the fittest requires that some selection pressure be applied, and it is reasonable to expect that a well grown heifer should be able to calve unassisted to a breed average birth-weight bull.

(2) There are some individual animals that haven't read the text book and therefore don't follow the rules of genetic association. These animals have a genetically low birth-weight and a genetically high growth rate. These are known as *curve-benders*. They are out there, albeit in small numbers, and the only way you will find them is to weigh calves **at birth** and **at 400/600** days of age and have the data converted into Birth Weight EBVs.

You can get a Birth-Weight EBV as a correlated trait calculated from post-birth growth alone but these EBVs are of lower accuracy than EBVs calculated directly from measured birth weight, and they will not pick up the curve-benders. There is no option but to weigh the calves at birth.

Next on the list is calf shape. There is certainly some credence that calf shape is an important factor in the calving ease story. Although the fact has never really stood up to scientific scrutiny there can be significant sire differences in calf shape relative to birth weight.

Some of my records show the effect of sire difference most markedly. In one field trial the progeny of Sire A had an average birth weight of 42 kg and measured 76 cm around the chest girth, whilst the progeny of Sire B also averaged 42 kg birth weight but measured 80 cm around the chest girth, that is, the calves were a bit shorter and thicker. Heifers would be at more risk calving to sire B than to sire A.

However selecting for predicted calf shape appears a fallible skill, at least some of the time. Again it is a case of avoiding extremes - certainly you need to avoid those short bodied, thick/straight shouldered sires, or those big raw-boned sires, but my records show that even if you are working in mid-stream there can be a big difference in calf shape/weight relationship between progeny of the same sire – a mixture of genetic variation and the dam effect.

Too often we forget that the dam contributes 50% of the genes that will influence birth weight, calf shape and calving ease. I often raised eyebrows when investigating calving problems when I asked about the sire of the problem cows, as well as the sire of the calves. Joining low birth weight bulls to high birth weight heifers can still cause you grief as the sire effect is cancelled out by the dam effect.

Is it all doom and gloom, or can we better the odds of our Egyptian cowboy?

Yes we can. All the above factors mentioned, that is birth weight, calf shape and heifer pelvic size are heritable traits and contribute in some way to the calving outcome, but they are indirect measurements of the real problem. Better to measure the problem directly.

Direct selection is always more effective than indirect selection – *that is the reason we have trouble with the milk EBV where we use calf weaning weight as an indirect measure of milking ability. There are many other factors that affect weaning weight other than milk, eg growth genes, which is why the heritability for milk is so low (10%). If beef producers got up a bit earlier of a morning and milked their cows, Breedplan would be able to give you better Milk EBVs !!*

Likewise with calving ease – we need to measure the trait directly rather than relying on indirect (indicator) **traits to solve the problem**.

The best long-term way to minimize calving problems within herd is to remove from the herd gene pool animals that have been assisted. If a heifer has a difficult calving, cull the heifer and the surviving calf from the herd replacement breeding program – not necessarily from the herd as such but don't keep any progeny from them. Whatever the problem was, or wherever it came from, you just got rid of it.

This "survival of the fittest" regime works well within herd but you can run into problems when introducing sires from outside herds – you might be introducing a few wild cards that you don't know about, unless you have a means of predicting the relative calving ease of the sires you introduce.

The good news is that you can..... if you are buying your bulls from a breeder who is recording calving ease scores.

If the bull breeder records calving ease scores in his herd, Breedplan can calculate Calving Ease EBVs (both direct and maternal). These EBVs give an estimate of the difference that you can reasonably expect in the calving ease of a sire's progeny compared to other sires or the breed average, when run under similar circumstances.

Calving ease score can be recorded at birth using a 1 to 5 scale...

1 non assisted – observed or noting unassisted calved cows *
2 assisted – easy pull (one person without mechanical assistance)
3 assisted – hard pull (2 people or 1 with mechanical assistance)
4 assisted – veterinary assisted
5 mal-presentation, breech etc.

**Note - if this score is left blank, it is recorded as non- observed and the information is not used in the analysis.*

For the purpose of calculating the Calving Ease EBV, scores 3 and 4 are grouped together, and score 5 is excluded from the analysis as these problems are considered non-genetic in origin.

Calving Ease EBVs are reported in percentage terms, with positive EBVs meaning more easy calving, and negative EBVs meaning less easy calving. The trait is reported as two EBVs...

Calving Ease EBVs are reported in percentage terms and given as...

Calving Ease (direct) – an estimate of the difference in ability of a sire's calves to be born unassisted from 2 year old heifers, compared to breed average and all other conditions being equal.

Calving Ease (maternal) – an estimate of difference in the ability of a sire's two year old daughters to calve without assistance, compared to breed average and all other conditions being equal.

For example; if Bull A has CE (direct) of -2% and Bull B has CE (direct) of +4%, the progeny of bull A is expected to require 3% more assisted births than the progeny of Bull B from two year old heifers managed similarly (half the 6% difference between the two bulls).

In calculating the calving Ease EBV, Breedplan also uses Birth Weight and Gestation Length information where available Like all EBVs, the more information you have, the better the estimate that you get.

Using modern jargon, it is time for affirmative action if we are to get on top of calving problems. That 4000 year old technology needs a serious update.

If you want to help yourself, help your clients and help the breed, then you should be measuring Calving Ease in your herd.

Note - This information is of a general nature and does not take into account your personal needs and circumstances and you should decide whether or not it is appropriate for you. You should discuss this information with your veterinarian before changing your current management and/or selection practices as a means of reducing the incidence of dystocia in your herd.