The importance of mature cow weight in UK suckler beef production

Introduction

Within the UK beef industry, a tendency exists among breeders to select for larger framed animals A major driving force behind this policy is the positive relationship (typically a correlation of 0.76-0.80) between mature size and the growth rates of offspring. In beef systems where feed and cost of production are without limit, and output is the only goal – it is likely that bigger is indeed better - **within the same breed type**. However, with fluctuating beef prices out of the hands of the individual farmer, controlling inputs is likely the most effective method of maintaining a hold on profits.

Big cows: what's the issue?

The John Nix Farm Management Pocketbook states that the best performing spring calving lowland suckler herds in the country will be making gross margins £269 greater than average performers per forage hectare. The best performing herds have less forage costs per cow, less purchased feeds per cow and a higher stocking density of cows. A suckler herd is inherently inefficient, with a cow producing one calf per year at best, at a cost of £450-800 per cow per year. A large portion of variable costs will be down to feeding - the feeding of cows is expensive, particularly during the winter months. Whereas feed used by calves for growth or by cows for milk production generates a financial return, 70-75% of the total energy consumed by a suckler herd is used for maintenance, which produces nothing (it simply maintains the cow's body condition). This maintenance requirement is significantly altered by a cow's mature size.

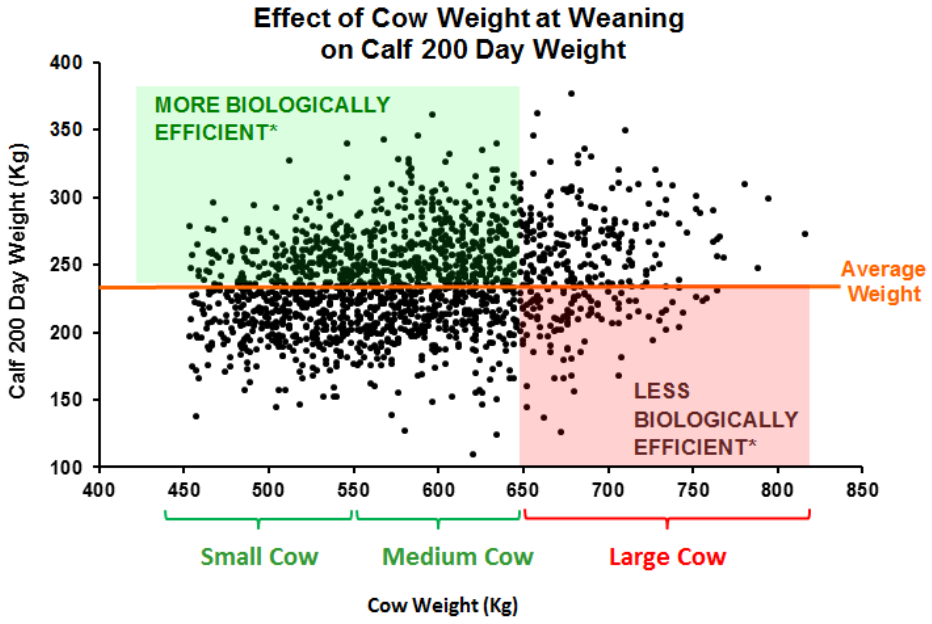
- A large cow (700kg), as opposed to a medium-sized cow (600kg), will require the energy equivalent of an additional 540kg moderate quality silage over a 175 day winter housing period to meet maintenance requirements.
- In a 150 cow herd, this is an additional 12 acres of first cut silage, or 20 acres of second cut silage that is used only to maintain cows.
- As the size of the cow increases, so do protein requirements; this increases the probability of having to supplement cows to prevent loss of condition.

With the increasing cost of silage production, along with the high cost of supplementation, it is clear to see how excessively large cows could reduce stocking density and eat away at a herd's profits.
When visually appraising animals for retention or purchase, selecting for larger animals has been perceived as an effective method of breeding leaner, faster growing animals. Unfortunately, as illustrated above, repeated selection for these larger animals has resulted in cows with dramatically higher maintenance costs. One definition of a biologically efficient cow is one that will produce the heaviest calf possible whilst requiring minimal inputs herself*.In the majority of cows within the UK suckler beef herd, biological efficiency is far from optimised.

Would breeding for smaller cows hinder calf performance?

Figure 1 shows the 200 day weights (adjusted for age) of calves from the Birdsall Stabiliser herd, along with the mature weights of their mothers at weaning. It should be noted that the data presented is raw data, with information from cows at a variety of parities over the course of several years.

Figure 1



Definition of biological efficiency described by Morris & Wilton (1976) – the ratio of output to input.

The information shown in Figure 1 demonstrates 3 key messages.

- A relationship is seen between cow weight at weaning and the growth rates of their calves, with the larger cows producing a greater proportion of their calves above the average group weight at 200 days old.
- However, a substantial group of small and medium sized cows are producing calves that exceed the average 200 day weight, these are highlighted in green as the more biologically efficient.
- A minor group of large cows are producing calves lighter than the group average, these are highlighted in red as the least biologically efficient.

It is evident from the information seen above that reducing cow mature weight will have little detrimental effect on calf performance if the most biologically efficient cows are selected.

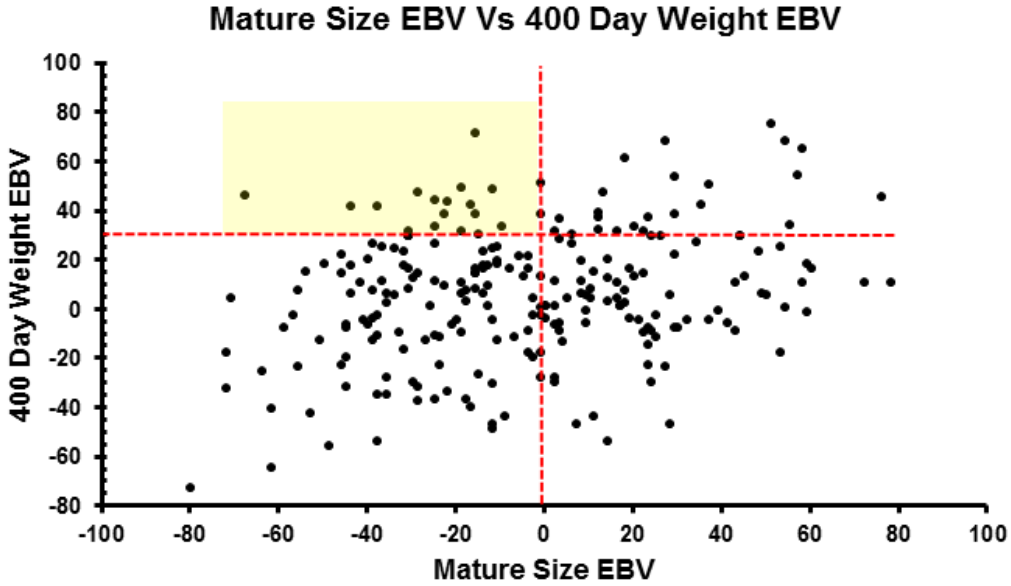
The most inefficient cow of all doesn't rear a calf

Fertility is not only a pressing issue in the UK Dairy Industry, beef herds are also struggling to produce a calf per cow every 365 days. Conception rates are another factor affected by cow mature size. Research states that when energy availability is limiting in mature beef cows, larger cows suffer more severe energetic restriction due to their increased energy requirements. This severe energetic restriction causes a severe drop in reproductive performance. In a study by Taylor and colleagues (2008); measurements taken from small, medium and large frame sized cows show that smaller cows calve earlier, at a higher conception rate than larger cows, which resulted in greater kg calf weaned per cow exposed to bull when on a restricted diet.

Can EBVs be used to act on this information

When breeding for biologically efficient cows, raw data such as that used above will not give sufficiently accurate information to make informed breeding decisions due to environmental impacts such as diet and age of the cow. Estimated Breeding Values (EBVs) isolate the genetic merit of an animal for certain traits, allowing the use of breeding decisions to fulfil specific targets. Growth Trait EBVs and Mature Weight EBVs are currently produced for some cattle breeds. These EBVs allow identification of breeding animals with the genetic potential for lower mature weight but greater calf growth rate, which are beneficial in a suckler beef system due to reasons previously stated. Similar to the relationship seen in Figure 1, a relationship can also be seen between 400 Day Weight EBVs and Mature Weight EBVs – this can be seen in Figure 2. The animals in Figure 2 are Stabiliser bulls which all have high accuracies for 400 Day Weight EBV and Mature Size EBV.

Figure 2

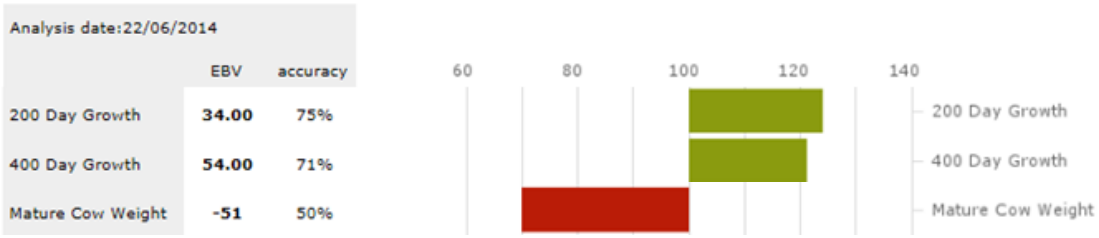


As can be seen in Figure 2, not all animals with Low Mature Weight EBVs have Low 400 Day Weight EBVs. The animals highlighted in yellow have…

- Negative Mature Weight EBVs
- But 400 Day Weight EBVs in the top 25% of the breed.

Animals such as these are commonly known as “curvebenders”, and are easily identifiable using EBVs. An extract from the EBV chart of a “curvebender” bull can be seen in Figure 3.

Figure 3



Information such as that shown in Figure 3 means that we no longer need to select for larger mature cows in order to produce calves with high growth rates. The identification of these “curvebender” animals is now simple and easy using EBVs.

What can cattle breeders do to optimise and utilise this information?

In breeds where Mature Cow Weight EBVs (or their equivalent) are available, breeders should strive to collect information. All breeding cows should be weighed and condition scored when their calves are weaned, cows should be weighed every year to maximise the accuracy of their measurements. This will allow breeders to identify and target biological efficiency with their herds. Additionally, breeders should consider prioritising the ratio of mature size to growth rates when using EBVs to select breeding bulls.

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