

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. However, with fluctuating beef prices, controlling inputs is 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 that are £269 greater than average performers per forage hectare. The better-performing herds have less forage and purchased feed costs per cow and a higher stocking density. A suckler herd is inherently inefficient, with a cow producing one calf per year at best, the cost of which can be between £450 and 800 per cow per year. The feeding of cows is expensive, particularly during the winter months, and a large proportion of a farm's variable costs will be seen here. Whereas energy from feed is used in calves for growth and cows for milk production, 70-75% of the total energy consumed by a suckler herd goes towards maintaining a cow's body condition alone. This maintenance requirement is significantly influenced by a cow's mature size.

- A large cow (700kg) will require the energy equivalent of an additional 540kg moderate quality silage over a 175-day winter housing period to meet maintenance requirements compared to a medium-sized cow (600kg),
- In a 150-cow herd this is an additional 12 acres of first cut silage, or 20 acres of second cut silage
- As the size of the cow increases, so do protein requirements, which means it is more likely that supplementation will be required to prevent loss of condition.

With the cost of silage production increasing, along with the high cost of supplementation, it is clear to see how maintaining 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. Repeated selection for these larger animals has resulted in cows with dramatically higher maintenance costs. Biological efficiency of a cow was defined by Morris and Wilton (1976) as one that will produce the heaviest calf possible while requiring minimal inputs herself. Biological efficiency is far from optimised for the majority of cows within the UK suckler beef herd

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

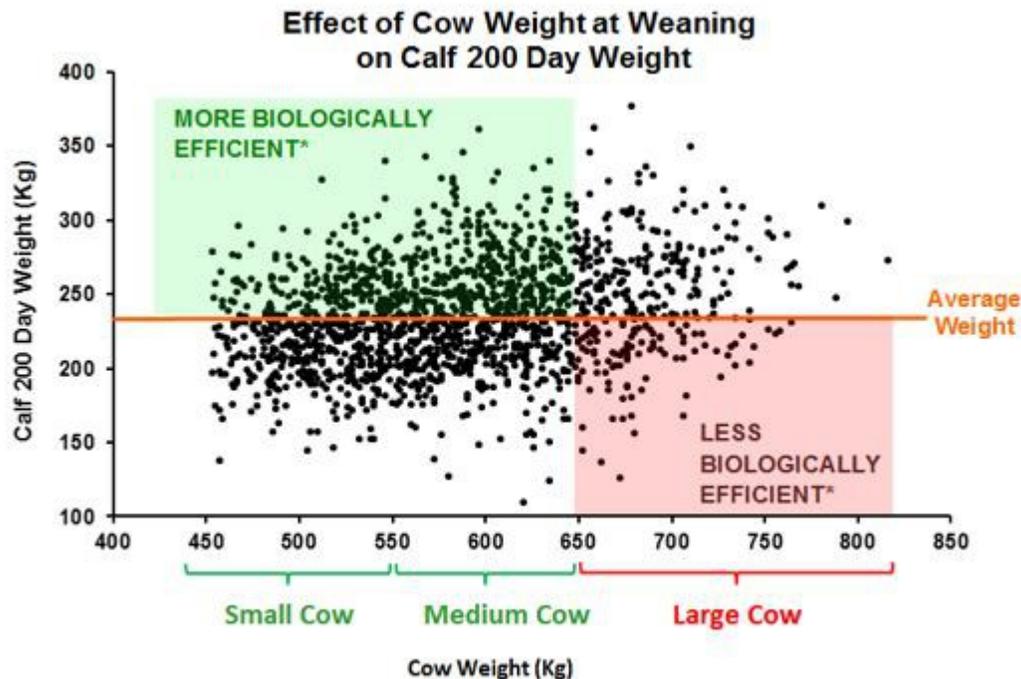


Figure 1 demonstrates three key messages.

- 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.
- A substantial group of small and medium-sized cows are producing calves that exceed the average 200-day weight. These are more biologically efficient animals and are highlighted in green
- A small group of large cows are producing calves lighter than the group average. These are the least biologically efficient animals and are highlighted in red

The figures demonstrate 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

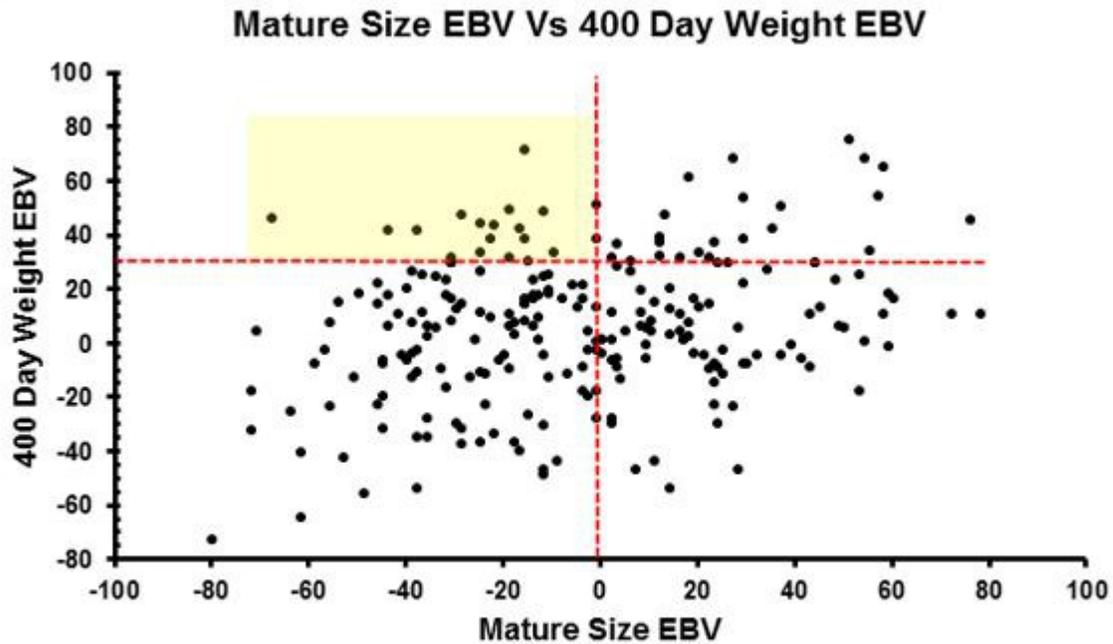
Fertility is not only a pressing issue in the UK dairy industry. Beef herds are also struggling to produce a calf per cow every 365 days and cow mature weight has an effect on conception rates. Research states that when energy availability is limited, larger cows suffer more from energetic restriction due to their increased energy requirements. This restriction causes a severe drop in reproductive performance. In a study by Taylor et al (2008), measurements taken from small, medium and large-framed cows show that smaller cows calve earlier and at a higher conception rate than larger cows. This 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 like that in figure 1 will not give sufficiently accurate information to make informed breeding decisions, because environmental factors such as diet and age of the cow are not considered. Estimated Breeding Values (EBVs) isolate the genetic merit of an animal for certain traits, enabling breeding decisions to be made that fulfil specific targets. At present, EBVs for growth and mature weight are produced for the Stabiliser breed. These help identify breeding animals with the genetic

potential for lower mature weight but greater calf growth rate. Figure 2 shows the relationship between 400-Day Weight EBVs and Mature Weight EBVs. The bulls all have high accuracies for 400-Day Weight EBV and Mature Size EBV.

Figure 2

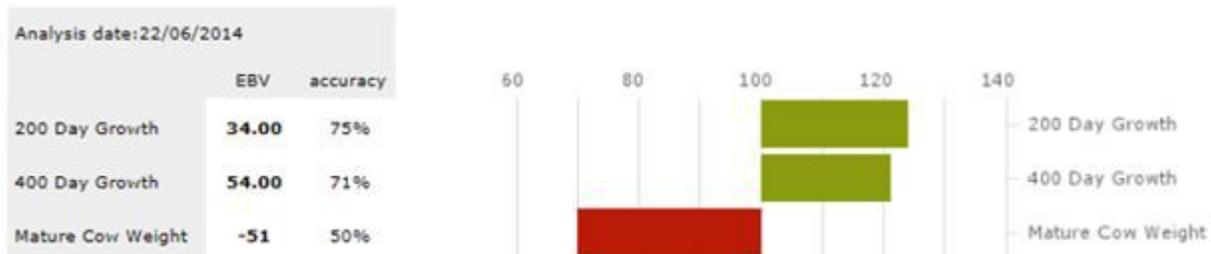


Not all animals with Low Mature Weight EBVs have Low 400-Day Weight EBVs. The animals highlighted in yellow have:

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

These animals are known as “curvebenders” and can easily be identified using EBVs. An extract from the EBV chart of a “curvebender” bull can be seen in Figure 3.

Figure 3



This information 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 made simple by using EBVs.

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

In order to improve the accuracy of Mature Cow Weight EBVs breeders should strive to take as many weight measurements as possible. All breeding cows should be weighed and

condition scored when their calves are weaned and cows should be weighed every year to maximise the accuracy of the measurements. This will allow breeders to identify biological efficiency within their herds and selectively breed for this. Additionally, breeders should consider prioritising the ratio of mature size to growth rates when using EBVs for selecting breeding bulls.

References:

1. Morris, C.A. and Walton, J.W. (1976). Influence of body size on the biological efficiency of cows: a review. *Canadian Journal of Animal Science*, 1976, 56(4): 613-647
2. Taylor, G. J., Swanepoel, F. J. C., Webb, E. C. and Stroebel A. (2008). Effect of heifer frame size on their subsequent reproductive performance and pre-weaning performance of their calves. *Australian Journal of Experimental Agriculture* 48(7) 945–949

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