

# THE VALUE OF MUSCLING AND YIELD

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The Beef CRC has a significant commitment to lifting the proportion of saleable meat (retail yield) in Australian beef carcasses. There is substantial existing knowledge about yield in the industry but it has been poorly understood and applied by producers because market signals for yield are not clear.

This article explains why muscling is important, while others outline the CRC's research projects which aim to build on existing live assessment skills and the new genetic technologies. CRC Partnership projects with commercial supply chains are being used to validate the technologies and facilitate adoption.

## **Muscling or conformation?**

For quite some time in the 1980s and 90s a minor controversy bubbled away in the beef cattle research and extension communities. The issue was the merit of visually assessing conformation and using it in selection.

Many researchers felt conformation was at best overused and usually a waste of time leading to selection for fatness. Some extension people, meatworks buyers and stud breeders argued that carefully used, it was a good indicator of retail beef yield. Adding a little curry to the debate, was the feeling of some Queenslanders, that some southerners in

supporting the value of thicker conformation animals, were denigrating Bos indicus stock! As is often the case, both parties were probably partly right at the time.

Certainly many people when assessing conformation, were favouring fatter animals that have more waste fat and lower yield. They were making little progress in their selection for yield.

One group of extension people, led by Bill McKiernan and Sandy Yeates in NSW Department of Primary Industries, argued that conformation was indeed a confusing term and that those who believed in visual selection were really assessing muscle score (see box).

## **Validating Muscle Score**

Bill McKiernan, Sandy Yeates and a research colleague Diana Perry, set out to define the value of muscle score in domestic and export steers. Using large lines of slaughter cattle, they proved conclusively that:

- Experienced and/or well-trained assessors could repeatably assess muscling.
- Visual muscle score, when assessed by such people, was closely linked to retail beef yield percentage and dressing percentage.
- For every increase in muscle score, at the same liveweight and fatness, an increase of one muscle

score raised dressing percentage by 1.5 – 1.7% and retail yield by 1.5 – 2.0% of carcass weight. There was also a trend towards increasing proportion of hindquarter cuts.

- The same advantages also held for Bos indicus (tropical) breeds, i.e. even though Bos indicus have a higher dressing percentage than Bos Taurus (British) breeds, the better muscled Bos indicus lines are further ahead of poorly muscled lines.

These results have also been replicated in the US.

The work improved understanding of the fact that extra muscling increases both dressing percentage and retail yield in the carcass. But while extra fatness also increases



advances in meat quality

**Muscle Score** describes the thickness of the muscles after allowing for fatness. There are five Muscle Scores from A (very heavy) to E (light). Each score is sometimes split for further accuracy into plus and minus.

See "Muscle Scoring Beef Cattle" Primefact available on NSW Department of Primary Industries web site [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au).

**Dressing percentage** is the percentage of carcass weight recovered from the live animal.

**Retail Yield** is the proportion of saleable meat recovered from the carcass.



Fullness of the “eye” of meat shows why a carcass with light muscling (left) yields less beef than the heavily muscled carcass on the right

dressing percentage, higher levels of trimming mean it decreases retail yield in the carcass.

In southern Australia, this work led to new muscle/fat descriptions being adopted by the saleyard market reporting systems. By reporting muscle score (A-E) as well as fat score (1-6) they effectively separated the two key predictors of yield.

### **Breeding for better muscling**

Bill McKiernan continued his strong interest in muscling research with NSW Department of Primary Industries, in particular the positive and negative aspects of improving muscling by breeding.

More recently his experiments have been included in the CRC’s program for further in-depth studies. The questions being looked at

include:

- The effect of muscle score selection on female traits such as calving ease and fertility.
- Further clarification of the effects on carcass yield and muscle distribution such as proportion of hindquarter cuts.
- What is the role of the so-called, ‘double muscling genes’? Are they so deleterious in normal commercial production system to be dangerous or can we use gene marker technologies to develop safe systems for using them in selection?
- How do these genes work, and can we modify the way they are expressed?

These questions are being investigated in other CRC

work and in BREEDPLAN, the National genetic evaluation program that produces Estimated Breeding Values (EBVs) for traits including yield in most Australian breeds. BREEDPLAN utilises considerable CRC research in its methodology.

For more information see related articles –

- Visual selection for muscling in a breeding herd (pg 25)
- The Myostatin gene promises better yield (pg 27)
- Muscle scoring beef cattle – NSW DPI Primefact available at [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)

In dollars to the producer...for a typical 450kg steer worth \$2.00/kg liveweight:

- An extra 1% dressing percentage is worth about \$15 per head in extra carcass
- An extra 1% retail yield is worth about \$13 in extra beef