



### **Breeding Values and the Skill of the Breeder.**

#### **Best Linear Unbiased Predictions (BLUP) should be used as a guide and not an absolute that enforces compliance.**

Our skill and effectiveness as breeders has been weakened by the over-emphasis on breeding values. Without realising it, breeders have allowed their better judgement to be undermined by a selection index based on breeding-values (EBV's), and in many cases the skill of the breeder has been replaced by enforcing obedience to a rule. Animal status has been elevated on the performance or gross financial return without the deductions or consideration for food consumption or production per hectare. Another major factor is that the gross weight of an animal is being considered exclusive of skeletal and physiological differences that influence functionality, longevity and birthing ease, to create animals that are not fit for purpose.

Where is the science or logic in continuing to breed animals that do not hold the ability to illustrate economic fitness? A recent report stated that only 25% of farmers use the BLUP system to effect, which in turn means that 75% of farmers are in limbo or using other methods of livestock selection.

There is no doubt that the technology now available for animal breeding has been taken to extremes. To some extent we have lost our respect for what nature has already done and that the human perception has contributed too much. When we focus exclusively on improving a particular characteristic, we unbalance that which natural selection has given us, which was optimal for surviving and reproducing. If we regained that respect, then it would put the whole context of animal breeding in perspective which would enhance genetic predictability.

We need to be careful as to what is measured and encouraged or enforced on breeders. It is important that stud breeders consider the needs of the commercial client by paying attention to adaptability, fertility, productive and carcass traits. BLUP should not be used slavishly. It is just one of the tools for optional use with an animal being evaluated as a whole. It is a cluster of main traits in balance that are required to judgementally, through defined measurement, select the more optimal animals. By denying the correct criteria for measuring production and efficiency in accordance with the kilogram live-mass on a herd/flock basis, all interpretations by the animal science world are rendered irrelevant. It is easy to produce an animal with good figures, it is far more difficult to produce a good animal, and it takes astute focus and time.

Bulls with very high EBV's for growth, milk or mass (say in the top 20%) will breed big cows requiring a higher feed intake to perform. Big growthy cattle with high performance figures tend to fail in New Zealand's hill country grass fed grazing system, whilst incurring an unnecessary high cost production regime. It is also interesting to note that the results from a recent sheep dissection trial, that the best quality carcass was only the fourth heaviest live-weight sheep from the 7 head dissected. However, it provided the highest slaughter percentage, the most prime-cuts, with the total retail value 16% above the average and \$13.97 more than the heaviest sheep. This comprehensive trial was conclusive.

The cost of growth is often ignored as the higher growth rate will increase the mature dam size, decrease fertility and increase the age to marketing, therefore decreasing profitability. In practice, any growth gained is often offset by higher feed costs. The discerning commercial farmer always considers what a sire is going to produce under their environment. Common sense suggests that as breeders, the best procedure is to select those animals with phenotypes expressing the economically best combination of production and environmental fitness over a suitably long productive life on farm.

The inherited characteristics that make an animal adapted to one environment, is the same that make it unadapted to another. Body condition, the vital component of practical dam fertility, is determined by adaptation. There is no way that BLUP analysis can bridge this gap. In my opinion, it is the linear predictions in isolation that are at fault. The theory and assumptions that produce EBV's hold no capacity to consider that physiology per se is the central influence that impacts every trait. No credence is given to structural correctness that dictates functionality, longevity and birthing ease. Holistic balanced selection verse single trait bias?

It has been learnt, that while the basic genetic code may be fixed, expression and heritability can alter according to environmental conditions and these changes can occur throughout an animal's lifetime. Scientists are now learning that epigenetic changes that occur in inheritance are significant, and this knowledge is redefining a respect with the interface of animal selection and what happens naturally.

In chasing after genetic extremes, there has been a narrowing of the gene pool as fewer sires with the "best" figures are overused, sometimes by AI or embryo transfer, and the gene pool has thus contracted with so-called genetic pinnacling occurring. Most breeders, in the cases where EBV's and pedigrees are required, are unable or unwilling to introduce genetic material from commercially-run animals into their stud operation. This superior genetic material generally comes from far bigger groups of animals that are less pampered and usually far better adapted. The loss of this genetic material is extremely serious and already impacting the national flock and herd by way of a proven commercial financial and genetic measure.

What is required in animal selection is a holistic, balanced, multi-trait system, geared to 'Economic Fitness'. The combination of production fitness and biological fitness, give the best commercial return on the resources available within any particular environment. The genetics of profitability!!

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