AGBU
ANIMAL GENETICS AND BREEDING UNIT
A joint unit of NSW DPI and UNE

Pig Genetics Info

EBVs are a better predictor of genetic differences between pigs than performance records

Susanne Hermesch

The value for breeding

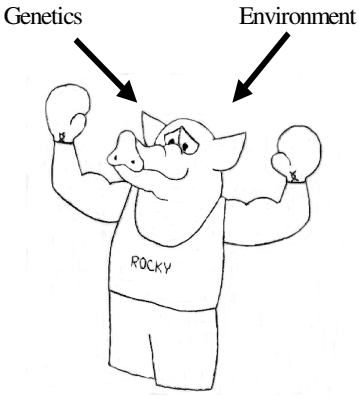
The value of a pig for breeding is determined by its genes, which are passed on to its offspring. Estimated Breeding Values (EBVs) describe genetic differences between animals more accurately than performance records because they are based on information from a wider range of sources.

Which factors influence the performance of a pig?

In general terms, the performance of a pig is influenced by its genetic make up and environmental factors.

Therefore, the high performance of a pig may be due to either good genetics or a good environment or a combination of both. The environment component includes management practices.

It is imperative for genetic improvement to use all available information in order to separate the effects of the genes (genetic make up) of an animal from the effects of the environment on performance.



Performance (Phenotype)

Sources of Information

Genetic evaluation systems like PIGBLUP use a wide range of sources of information to estimate breeding values (EBVs) including:

Performance of the animal. The animal's performance is influenced by its genetic merit and environmental influences. Therefore, the animal's own performance is a valuable source of information to predict its EBVs for different traits.

Performance of relatives. The pedigree information allows genetic relationships between animals to be taken into account. A pig receives half of its genes from its father and half of its genes from its mother. From this basic principle it follows that relatives have a proportion of their genes in common. For example, full-sibs have on average half of their genes in common and half-sibs have on average a quarter of their genes in common. It follows that performance records of close relatives provide valuable information for the EBVs of a specific animal.

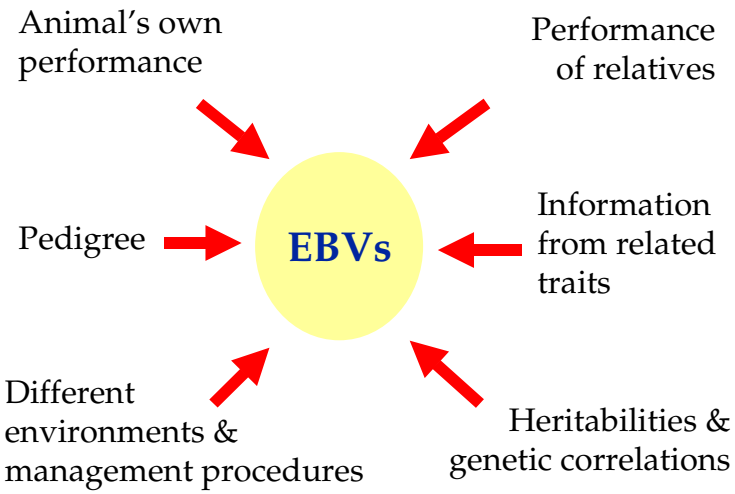
Systematic effects. The information that is required to account for environmental effects is specific to each trait. The date of birth and date of testing, the weight of the animal at recording or the parity of the sow are all examples of the type of information that is used in genetic evaluation systems like PIGBLUP for the adjustment of environmental effects.

Heritabilities and genetic correlations. Genetic improvement is only possible for traits that are affected by genetics. The proportion of differences between animals that is due to the genes it carries is described by the heritability. The heritability differs between traits. For example, backfat is a highly heritable trait in contrast to litter size, which is a lowly heritable trait.

The same group of genes may influence a number of traits simultaneously. These genetic relationships between traits are described through genetic correlations.

Heritabilities and genetic correlations are available from research studies for a vast range of traits including reproduction traits of the sow, growth, feed intake and feed efficiency traits as well as carcase and meat quality traits.

Putting it all together



EBVs are a better predictor of genetic differences because:

- EBVs are based on information from all recorded animals
- EBVs are adjusted for environmental factors
- EBVs incorporate knowledge about heritabilities and genetic correlations.

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Australian Pork

Producer 1

AGBU, University of New England, Armidale, NSW, 2350 Ph: (02) 6773 2055,
Fax: (02) 6773 3266, http://agbu.une.edu.au