



Genetic parameters for lean meat yield, meat quality, reproduction and feed efficiency traits for Australian pigs

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Aim

To create a set of performance records which will allow a complete and joint analysis for all economically important traits of pig production including reproduction, growth, carcass and meat quality traits.

Background to research

Ongoing genetic improvement is an integral component of the industry's efforts to improve productivity and product quality. Reliable estimates of all genetic parameters associated with the traits of economic importance are essential for maximising genetic gains in production and product quality from modern breeding programs.

Past studies in Australia had obtained estimates only for the minority of traits of economic importance, usually only those which were easily measured eg. live weight and fat depth. The only means of producing a complete set of the necessary estimates had been to combine those from different studies. This can be both difficult and often not valid because of the differences between studies in population, management operations, measuring techniques, analytical procedures and the models fitted to obtain the estimates. A complete recording exercise of all relevant traits is of benefit to Australia's pig breeding programs. The complete set of estimates obtained from this project has been made available for use throughout the breeding industry and recommendations for their best use have been made.

Methodology

Performance recording was undertaken at Bunge Meat Industries (BMI), Corowa. Over a two and a half year period 5000 boars were performance recorded for production, carcass and meat quality traits. In addition, information about reproductive performance records was available for all sows in the BMI breeding herd. Data collection and management of the animals was supervised by Dr. Brian Luxford.

All performance data was analysed at AGBU by Dr. Susanne Hermesch as part of her PhD candidature. The appropriate models were developed using SAS GLM procedures and genetic parameters were estimated using Restricted Maximum Likelihood Procedures (REML).

Main Conclusions

This work provides a complete set of genetic parameters for reproduction, production, carcass and meat quality traits which are used in genetic evaluations programs in Australia. Differences in feeding regimes and slaughter procedures, however, will have to be taken into account. It was shown that meat quality traits are moderately heritable and further research has to address the question of how to incorporate meat quality in breeding programs in regard to the Australian situation. Special emphasis will have to be put on the possibilities of measuring meat quality traits on the live animal.

Another area of high importance is efficient lean meat growth. Due to the test procedure,

results for feed efficiency are not applicable to other situations but show the need for further research in this area. Aspects that should be investigated are feed intake capacity in relation to maximum protein deposition and possible differences in genetic parameters for different sexes.

This data set also gave the opportunity of estimating genetic parameters between reproduction traits and other performance traits. It was shown that litter size is negatively correlated with average daily gain which might explain the lack of genetic improvement in this trait since evaluation programs assume no genetic relationship between these two traits. Significant relationships were also found between litter birth weight and average piglet weight at birth with other performance traits.

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