

## MEASUREMENT IN PIG IMPROVEMENT

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The aim of this statement is to stimulate discussion on important aspects of measurement in pig improvement. In so doing, it will raise many questions and offer very few answers. It is to be hoped that the answers will come readily from the ensuing discussion.

### IDENTIFICATION SYSTEMS

A breeding program can not be operated without individual identification of at least some animals. Thus the need for identification systems is accepted by all breeders. The main point for debate in this area involves deciding which system is best.

The most common system of pig identification, both in Australia and in other countries, is a system in which a number is given to each pig soon after birth. Since numbers are usually allocated in numerical sequence, the number of any particular pig does not usually in itself provide any accurate information about that pig; at best the number provides a rough guide as to when the pig was born, so that a comparison of identification numbers of different pigs indicates the relative age of different pigs. The widespread acceptance and use of this system indicates that it must work well in practice, but that is not to say that there is no room for improvement. Would it be useful if identification numbers were allocated in a more informative way? Some breeders, for example, use a system in which the identification number includes the number of the week in which the pig was born. In some breeding programs, this can result in a saving of labour in relation to measurement. Depending on the maximum number of digits available, it may be possible to include other information such as dam identification as well. To what extent is the use of more informative identification systems practicable or desirable?

### STANDARDIZATION BEFORE MEASUREMENT

The common environment shared by litter mates until weaning is a potentially important source of variation between pigs in pre-test environment. The gradual trend towards earlier weaning during the last decade has helped to reduce this source of variation, but in practice it still remains as a factor that must be taken into account. Final selection on a within-litter basis is obviously one way of overcoming this problem, but for other reasons this may not be the best solution in practice.

Other problems in this area include deciding on the number of animals in a pen, and allowing for the effects of competition among pigs in group feeding.

## METHODS OF MEASUREMENT

The main criterion in determining the best method of measurement must be cost. And in this regard, the best method for one breeder may not be the best for another. For example, Treacy (1976) estimated that the overall cost of an ultrasonic backfat measuring device is \$0.18 per pig tested in a 200 sow herd, compared with \$1.44 per pig tested in a 50 sow herd. If the smaller herd can not share the use of an ultrasonic device with other herds, then it may be better off to use, for example, a mechanical backfat probe. Which of these alternatives should be encouraged?

Individual food intake is very costly to measure, in terms of equipment and labour. Its measurement traditionally involves individual housing, although systems do exist where this is not necessary. Allocation of food and recording of intake are usually not automated. However, electronic systems which enable the automatic allocation and recording of food to individual animals without the need for individual housing, are now being developed. Will there be any place for such systems in future pig breeding programs?

To the extent that carcass characters are included in selection criteria, the methods of measuring them are relevant to the present discussion. In general, however, these measurements are outside the direct control of the breeder, as they are performed at the abattoir. The national carcass classification scheme should provide useful information for breeders on a standard basis throughout Australia, and should remove the necessity for any breeder to ask the abattoir to provide, at the breeder's expense, specific carcass information. Will this be so?

## CENTRALIZED MEASURING SERVICES

There are two levels at which centralized measuring services can operate.

### 1. On-farm Performance Tests

On-farm performance tests can, of course, be run without the aid of a centralized measuring service, and there are many examples of this in Australia. However, it is common practice in this country for the various state Departments of Agriculture to act as a centralized measuring service, providing stimulus, advice and technical assistance to individual breeders who embark upon an on-farm performance testing program. The involvement of state Departments of Agriculture in these schemes obviously requires the expenditure of public funds. It is important, therefore, that the taxpayer sees a return for the money expended, if not directly, then at least in terms of continuing genetic improvement in the participating herds. This brings us to the potential weakness of on-farm performance testing schemes conducted by a centralized measurement service. In most if not all schemes, the final decision as to the use of superior stock in a breeding program is left to the breeder; at best the Department of Agriculture official can only advise the breeder on the most appropriate course of action. It is possible therefore, that the Department of Agriculture could be providing an excellent service but still see little or no improvement in the participating herds, if the breeders do not follow the advice provided. How can this situation be avoided without unduly interfering with the rights of individual breeders? Should breeders, for example, agree to slaughter all animals with below-average performance? Should the services of the

various state organizations be made available only to those breeders who agree to follow the advice provided, at least in general terms?

## 2. Central Testing

With the increasing trend towards on-farm performance testing throughout Australia, there is not likely to be any need for new forms of central testing in this country in the near future. However, to the extent that we in Australia are following in the footsteps of countries such as England, it behoves us to keep a close watch on the newest form of central testing to be used in that country: Commercial Product Evaluation (CPE). Despite some widely publicized criticism (Hill, 1978), which has generally been accepted as valid by most of the breeding companies concerned, CPE continues to be very popular, with most companies (including breeder co-operatives) trying very hard to gain a place in the test, and with the winners of the test having substantially increased sales of seed-stock. Is there ever likely to be a need for something similar to CPE in Australia? If so, who would conduct it, and more importantly, who would finance it?

## COST AND ECONOMICS OF MEASUREMENT

Measurement in pig breeding programs is a costly business, as recent surveys such as those by Treacy (1976) and Mills (1978) have shown. The unequal distribution of resources inherent in a centralized measuring service providing part or most of the labour and equipment for on-farm testing to a necessarily small number of breeders is well recognized. The tyranny of distance, and the desire to spread resources more evenly across a larger section of the pig breeding industry is gradually leading the various state authorities to concentrate on the provision of back-up facilities and advice, rather than labour and equipment. Given their limited resources, how best can the various state authorities provide a service to a large majority of breeders? And what service can they provide to breeders who are already conducting their own on-farm performance testing program independently and completely at their own expense?

## CONCLUSION

Of the questions raised above, perhaps the most important ones involve the future role of government departments in providing encouragement and facilities for measurement. The Australian pig breeding industry has several features unique to this country, but at the same time, shares many problems in common with other countries. The future success of pig improvement in Australia will depend on our ability to apply the lessons already learnt by these other countries to our own industry.

## REFERENCES

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