RECORDING IN PIG IMPROVEMENT

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INTRODUCTION

The main purpose of a recording scheme in animal breeding is to enable the producer to select his replacement breeding stock as accurately and efficiently as possible according to his breeding objectives. A scheme may have other advantages in that it enables the producer to check the correctness of any selection decisions and to plan his management more effectively. The discussion here is concerned with the scheme achieving its main purpose.

DEVELOPING A SCHEME

The main considerations in developing a recording scheme are:

* Characters to be measured.

* Need for correction factors.

* Use of information from relatives.

* Proportion of animals that will be selected.

* Integration of measurement and recording.

1. Characters to be Measured

The characters to be measured were discussed in the previous sections. They are important here on account of their effect on the recording scheme. A producer selecting only on growth rate and backfat thickness needs fewer records than one selecting for feed conversion or litter size. Initially, I will assume the producer is measuring growth rate and backfat only. Modifications will be considered with the other characters.

2. Correction Factors

There is little or no need for correction factors for growth rate and backfat thickness. For example, Standal (1973) found that parity and litter size accounted for only 3% of the variation in weight at 180 days. There is no need to have information on parity and litter size available when measuring growth rate or backfat thickness.

3. Information from Relatives

Both growth rate and backfat thickness are considered to be sufficiently heritable to obtain reasonable response when replacements are selected on their own measurements. There is no need to consider information from relatives.

4. Proportion of Animals to be Selected

In a pig herd less than 10% of gilts and 1% of boars need to be kept as replacements. This enables the producers to have large selection differentials but it also means that the amount of labour per selected replacement can be high. Most producers want to streamline measurement, recording and selection as much as possible. Alternatively, they may measure fewer individuals. This reduces the selection differential, although an efficient nucleus scheme (Treacy, personal communication) can be established which reduces response to selection only slightly.

5. Integration of Measurement and Recording

The need to minimize labour requires that a producer integrate measurement, recording and also selection as efficiently as possible. Mills (1978) found that it took 8.5 to 11.5 minutes per pig-tested to measure and record performance in a number of Queensland herds. He found that a poor identification system was the major problem in herds with above-average times.

SCHEME IN PRACTICE

I will discuss the recording scheme required with a system used in Victoria which selects replacements on an index.

$$\text{Index} = \frac{67 \times \text{Weight (kg)}}{\text{Age (days)}} - P_2 \text{ (mm)}$$

where P_2 is fat depth at a position 6.5 cm off the midline and over the last rib

1. Identification

The first essential feature is rapid determination of day of birth. Ear notching and tattooing are both effective and quick means of identification. Treacy (1977) describes an effective ear-notching system. The system can allow for immediate recognition of the day (or week) of birth. Alternatively, a litter number can be used and information on the litter would be recorded on the score sheets to be used. Records need to be set out clearly so that no time is lost in determining day of birth. Recording day of birth rather than date enables age to be calculated rapidly. Recording day rather than week enables animals to be compared more fairly but response will be reduced by less than 5% where age is calculated in weeks rather than days.

2. Measurement and Estimation of Index

If day of birth is readily determined, the index can be calculated with a cheap electronic calculator as soon as the pig is measured. The bulk of the pigs can be culled at this stage. The identification numbers or the index value can be written on the back of potential replacements and these drafted off. Final rankings are determined when all the batch has been measured. It is important to remember that maximum rate of genetic improvement is made when similar proportions are selected from all batches. It is not possible to have the same cut-off level of the index for all batches. Variation in feed, temperature and disease will cause the index to vary between batches.

3.   Need for Permanent Records

As selection decisions are made soon after measurement, permanent records are not necessary. Their main value would be to check mistakes. Recording pedigree enables the producer to avoid mating close relatives. Some producers avoid such matings by dividing the herd into "families" with boars being rotated between families.

4.   Centralized Recording

As correction factors are unnecessary and individuals are selected on their own performance, a centralized recording scheme is not recommended.

SELECTION FOR FEED CONVERSION

In some large herds, and in some seed-stock herds, boars are fed individually and feed conversion is measured. Here more detailed recording is warranted. Weight at the beginning and the end of the test, feed consumed and backfat at end of test are measured and recorded for each pig. In most cases only a portion of the herd will be measured. Often these will have been selected on growth rate to a younger age. Final selection would be on an index combining feed conversion, backfat thickness and growth rate. Inclusion of growth rate makes little difference to the ranking. The records are useful to assess prices for sale boars as well as in selecting replacements.

SELECTION FOR LITTER SIZE

Again more records are needed if litter size is to be improved. However, these records are fairly simple and are ones that will be of assistance to the producer in making management decisions. The main ones are the number of piglets born and weaned for each litter.

In selection, the producer needs to compare gilts and mature sows separately. The number of pigs born per litter increases by about 2 from the first to third litters (Anderson and Melampy, 1972). Selection could be on an index combining litter size, growth rate and backfat. A simpler approach is to cull those from small litters at weaning. The remainder are then measured and selected on growth rate and backfat thickness.

CONCLUSION

For most situations a simple recording scheme is sufficient. The producer will need to use his own ingenuity to minimize labour associated with measurement and recording. Integration of measurement and recording is essential.

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