THE ANALYSIS OF THE USE AI IN PIG BREEDING

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There are many methods adopted by commercial pig producers to obtain replacement stock—some involve purchase only while others include breeding and selection within the herd itself. The major systems used in Britain have been studied in terms of the genetic lag times and the economic consequences for each system. In particular, the use of AI as an alternative to natural service has been considered.

Some results and problems of this approach are presented. The comparison of AI and natural service has been considered in terms of the breakeven economic situation, either by reference to the difference in lag time required when using AI boars, or by reference to the maximum by which AI farrowing rates can be poorer than those achieved using natural service.

THE EVALUATION OF GROUP BREEDING SCHEMES IN RELATION TO THE STRUCTURE OF THE BREEDING SYSTEM

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A group breeding scheme of the " open nucleus " type in operation for improvement of the *Llyn* breed is compared with its nearest practical equivalents in two forms. One is a " closed nucleus " scheme where the nucleus is closed to other breeding animals after its foundation. The other scheme is a cooperative non nucleus structure where rams selected from members' flocks are pooled and distributed for general use. The analysis indicates, that over a ten year period the existing open nucleus scheme could increase prolificacy and milk yield in the breed by a substantial amount (0.27 lambs per ewe/annum and 1.38 kg per lamb at 8 weeks).

The closed nucleus is estimated to give only 80 p. 100 and the non nuclear scheme only 60 p. 100 of the progress.

The open nucleus scheme also has additional advantages in the ease of avoiding inbreeding and in providing a better focus of integration for the members and their flocks.

COMPARISON OF TWO SELECTION METHODS FOR SHEEP

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Two selection methods, indices and independent culling levels for three characters with different genetic parameters, have been compared for efficiency. Experimental material consisted of 1,684 ewes of the *Polish Merino* sheep.

Greater genetic advance was achieved by the index method than by the method of independent culling levels. A still greater advantage of the index method over the independent culling levels method is to be expected in cases of heritability of the characters showing a greater differentiation, of high genetic correlation and low phenotypic correlation. Intensity of selection for two characters applying these two methods is hardly lower than intensity of selection for a single trait.

THE OPTIMISATION OF GROUP BREEDING SCHEMES

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Beef and sheep improvement programmes suffer from low reproduction rates and long generation intervals. In an effort to overcome the problem, Open Nucleus Group Breeding Schemes have been developed. A central nucleus is formed from base herds and there is a