

AUSPIG: A COMPUTER PROGRAM FOR THE OPTIMAL MANAGEMENT OF PIGS

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The economic efficiency of pig production is affected by many factors and the interactions between them often make it difficult for a producer to determine the most profitable management strategies. To assist decision making, current knowledge has been integrated into a computer package called AUSPIG that simulates animal performance and predicts enterprise profitability. The package has been developed for microcomputers and contains three major components integrated through a user-friendly interface (Black et al. 1987). These are a model that simulates animal growth and performance, a least-cost diet formulation module and a linear-program for determining market strategies that maximize piggery profit.

Animal performance is predicted by simulating energy and amino acid utilization in a pig of any age or reproductive state in response to its intake of nutrients and to its physical and social environment (Black et al. 1986). This model predicts live weight change, body composition, back-fat thickness and the weight and value of the carcass for entire males, females and castrates of several strains of pig. Weaning to conception interval and litter size are predicted, as are the growth of conceptus, birth weight of piglets and production of milk. Diets are evaluated for factors determining feed intake, energy utilization, biological value of available nitrogen and the order of limitation of essential amino acids. Requirements for digestible energy and available amino acids can be estimated for any level of production. Results of a simulation may be displayed in tabular or graphical form.

A major advance of the AUSPIG package is integration of the growth and production model with a least-cost diet formulation linear-program. Amino acid and digestible energy requirements of pigs are generated by the growth model. The cheapest diet from the feedstuffs available can be formulated to satisfy the specific requirements of any strain, sex or weight of pig for maximum growth, maximum lean meat gain or any level of production.

The package also predicts the most profitable production and marketing strategy consistent with the resources available to a piggery. The profit maximization module uses information generated by the simulation model on the feed and production costs, floor area requirements and carcass values for the grower herd, along with details of the breeder herd performance, to determine the production and marketing strategy that maximizes profit subject to constraints on fixed resources such as capital investment in stock and housing, permanent labour, total pen area, number of breeding sows and breeding herd accommodation.

Examples of use of the AUSPIG package and its limitations have been described (Black et al. 1986, 1987). The package is currently being evaluated in industry prior to commercial release.

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