APPLICATION OF LINEAR PROGRAMMING TO FARM MANAGEMENT ANALYSIS: INTENSIVE BEEF GRAZING SYSTEMS

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ABSTRACT

In the absence of quantitative data from the practical farm situation, Linear Programming (L.P.), was used as a framework for collecting research information on an intensive beef grazing system.

Three hundred pasture production activities were defined so that pasture was available for grazing at two grazing severities in each of 30 periods throughout the year, after a range of spelling lengths. Seventeen supplementary feedmaking activities allowed hay or silage to be made over the late spring, early summer period. Supplementary feed could be fed out in any period of the year subject to the constraint that per animal intake of supplementary feed did not exceed maintenance requirement.

Animals considered by the model are Friesian bulls purchased at three months of age, and 100 Kg. liveweight, and grazed within the system for 12 - 18 months, until they reached a liveweight of 380 Kg. Animal requirements were calculated as a function of liveweight and level of liveweight gain. These requirements were expressed in terms of pasture dry matter per animal, and were adjusted for assumed changes in the available energy (M.E.) content of pasture throughout the year.

Although the model could not be verified in relation to the real-life situation, due to lack of quantitative data, the capability of the model for solving farm management problems was investigated. An iterative procedure for solving the stocking-rate decision was developed, and results presented and analysed. The use of the model for investigation of beef farm management problems was discussed.