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Optimal beef cattle management under agricultural policy reforms in Finland

Keywords beef cattle, diet, dynamic programming, subsidies,

## Abstract

The supply for domestic beef has been decreasing sharply since Finland joined the European Union (EU) because profitability of beef production has been low. The goal of this study is to search for optimal beef management practices that increase returns on beef production. Numerical dynamic programming (DP) is used to simultaneously optimise feeding and timing of slaughtering. The DP-algorithm is solved for three alternative subsidy, output price, and silage price scenarios. At 1998 prices and subsidies, the optimal carcass weight is estimated to be 250 kg. The European Agenda 2000 reform is predicted to decrease the optimal carcass weight to 200 kg, which is 50 kg lower than under 1998 prices and subsidies. This reform will increase farmer returns significantly and its income effect depends crucially on the price of silage. The results indicate also that the reform will result in adjustment of feeding. Particularly, farmers having high silage production will substitute feed concentrates for roughage in the diet. A farmer is entitled to a premium subsidy of FIM 200 (€33.63), provided the carcass weight of a culled animal exceeds 270 kg. But when the Agenda 2000 reform is fully implemented, this premium subsidy is not enough to supply carcasses heavier than 270 kg. The results suggest that carcass weights of at least 270 kg would require a premium of FIM 400-800 (€67-134). Rearing heavy animals will significantly increase production costs and, therefore, most of the subsidy will be taken away from the farm in terms of increased costs.

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