

Estimating the total costs of rearing a dairy young stock using a simulation model that accounts for calf diseases

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Rearing a dairy young stock provides the future dairy cows. Most dairy farmers are not aware of the rearing costs, consequently the rearing of dairy young stock does not often get the attention it requires. Calculating the distribution of the rearing costs is difficult as the costs interrelate with biological processes. In this study, a calf level simulation model was built (using @Risk add-on in Excel) to estimate the distribution of the rearing costs in the Netherlands from two weeks of age until first calving. The uncertainties related to calf diseases (calf scours and bovine respiratory disease) such as temporal effects on the growth were included. In addition, growth was modelled stochastically and in a detailed manner by using a two phase growth function. All input for the model was based on scientific literature and expert knowledge (veterinarians and nutritionists). Costs were estimated using 20,000 simulations. The output of the model consisted of non-economic output such as birth weight, first calving age and weight. In addition, the economic output consisted of healthcare costs (prevention costs and treatment costs), feed costs, barn costs, breeding costs and labor costs. The total costs of rearing a dairy young stock were estimated as €1,567 per successful reared heifer and varied between €1,423 and €1,715. Reducing the age of first calving with one month, reduced the total costs ranged between 2.6% and 5.7%. Although the average expenditures for diseases were not high, the rearing costs of a heifer that experienced disease (20% of the simulated heifers) were on average €95 higher than of a healthy heifer. In conclusion, the total costs of rearing a dairy young stock are high. The average costs for healthcare and mortality costs are relatively low. However, the costs for disease cases are considerable, making prevention of diseases during young stock rearing important.

Animal health and environmental pollution

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Animal production, like all land-based industries needs to satisfy societal demands for pollution control. We have examined the areas of greatest concern of environmental pollution arising from either lack of animal health or measures to improve animal health in sheep, cattle, pigs and poultry. In particular we have focussed on: veterinary pharmaceutical products such as acaricides; pathogens – (antibiotic resistance, VTEC, Johnes, listeria, toxoplasmosis and *Salmonella*); eutrophication (especially nitrogen enrichment from slurry); and greenhouse gases. We present an overview of the pollution problems associated with animal production in Scotland, compare animal production as a source of pollution with other sources of pollution in Scotland to provide context, and consider possible mitigation measures. In the process of reviewing this topic we have interviewed practicing vets to establish what they perceive the most important pollution from production animals and we present a summary of their responses.