

A framework for the economic analysis of rabies control

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To inform decisions on resource allocation and add to evidence on rabies control, the World Society for the Protection of Animals needed a comprehensive economic assessment tool. Control of rabies, that causes spillovers from its animal host into human populations, requires not only technical means of control, but also understanding of economic gains and the role of human behaviour in disease transmission. A conceptual framework was developed including economic, dog welfare, epidemiologic, and social acceptability assessments as basis for making an ethical judgement on the control process. It was applied to a rabies control programme in Colombo City, Sri Lanka. The rabies control programme included vaccination and sterilisation of owned and unowned dogs; education to prevent dog bites; dog managed zones; and training of dog handlers. The impact of rabies and control efforts on dog welfare was assessed using a qualitative scoring system that combined field records, literature data and expert opinion. Surveys and focus groups were conducted to assess changes in acceptance of dogs in society and control options. Monetary outcomes of the programme were calculated considering medical costs related to post-exposure treatment (PET) and control expenditures. Non-monetary benefits were the change in disability-adjusted life years (DALYs) caused by psychological distress due to dog bites. Burden of human death was near zero as PET was provided by hospitals at no cost to the individual. From July 2007 to June 2011, 133 DALYs were avoided, acceptance of dogs increased, and the impact on dog welfare was reduced at a net cost to society of US\$ 1.05 m (compared to the counterfactual). The lower number of dog rabies cases and estimated dog bites, and improvement in reporting and treatment of people indicated that the intervention was effective and the risk of people to contract rabies decreasing.

Estimating the financial consequences of a milk dioxin contamination in the Dutch dairy chain

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The aim of this study was to quantify the financial consequences of a milk-dioxin crisis on the stages of the dairy chain involved. The milk dioxin contamination impact model was designed for this purpose and also was used to estimate the net costs of control measures limiting the impact. Results obtained based on the assumption of the worst-case scenario in which the entire daily production of each business unit from feed supplier to milk processor is contaminated suggested that the financial impact of one dioxin incident would be J141.2 million. Another assumption was that the dioxin contamination started at one feed processing plant and was detected 2 weeks after initial contamination (the high-risk period), which would result in the involvement of 714 dairy farms, 26 milk processors, and 2,664 retailers. The stages of the chain that contributed most to the total net costs were the milk processor (76.9%) and the dairy farm (20.5%). If the high-risk period were shorter, i.e. 3 days, the estimated total financial impact decreases to J10.9 million. Thus, early detection of the contamination is crucial for decreasing the number of food businesses involved and lowering the total financial impact. The most influential inputs of the model were the sale price of milk at the processing stage, the daily amount of milk processed per processing plant, the farm-blocking period, and the daily amount of milk produced per farm. However, the effect of these inputs on the total financial impact was less than 10.0%. These results can be used to establish priorities in the application of control measures to limit the financial and public health impacts of a possible food safety incident.

Identifying critical management decision points in the heifer rearing process using individual animal-based bioeconomic modelling

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Replacement dairy heifers should have minimal mortality, with an age at first calving (AFC) of 24 months currently recommended. Recent focus in UK dairy herds has been on the economic impact of youngstock losses and delayed AFC. A reduction in reproductive efficiency, increasing calving intervals and high replacement mortality rates have all contributed to a decreasing availability of dairy heifers and a tightening in heifer replacement prices. Producers are therefore reluctant to remove replacements that show poor growth, repeated incidences of disease or suboptimal fertility. Most current models of dairy farm production systems are single component models primarily focusing on the milking herd. Multi-component models that include the replacement herd, or those specifically constructed to model an aspect of the replacement herd fail to incorporate the fundamental economic elements of the rearing period. Neither do they account for the effect of management decisions and genetic selection on the underlying biology of the heifer and the effect this has on herd dynamics and profitability. Our replacement herd model was developed in Microsoft Visual Basic with Microsoft Access as the database management system and user interface. It models individual heifers through stages of growth and development over a decision horizon of birth to first calving. This allows factors such as bodyweight, age and genetic merit (which impact on subsequent production, longevity and reproductive success) to be evaluated under UK conditions and practises. The model identifies critical decision points based on biology, health and genetics allowing the producer (1) to determine the likelihood of that replacement heifer reaching her AFC target; and (2) to estimate her longevity and milk production potential. This provides the producer with an evidence base for decision making on youngstock rearing production and health management and the monitoring and evaluation of the system.

Baseline study of infringement level of welfare regulations in Danish pig herds

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In order to secure the animal welfare in production animals, the Danish Food and Veterinary Administration (DVFA) decided to establish the proportion of pig herds in which welfare regulations were violated in 2011. This species has been subject to campaigns to improve compliance with welfare regulations in recent years (e.g. culling at farms). The objective of this study was to establish the proportion of Danish pig herds not complying with animal welfare regulations. To assess this, a random sample of 300 pig herds with at least 10 pigs was visited by veterinary officers from DVFA from August through December 2011. Veterinary officers were used for visits because herd owners cannot deny them access. A list of 380 regulation points was evaluated and for each point the herd could receive four marks: (1) no marks; (2) warning; (3) enforcement notice; or (4) police reporting. In total 150 herds received one of the four marks. Of the 300 herds, 127 (42%) herds receiving a warning, 42 (14%) an enforcement notice and 16 (5%) a police reporting. The most commonly noticed infringement of regulation was access to rooting material; pigs did not have access to rooting material in 72 (24%) herds. Providing soft bedding in sick pens for injured and diseased animals and isolation and treatment of injured and diseased animals received marks in 58 (19%) and 56 (19%) herds, respectively. Results from this study can be compared with future studies to evaluate if infringements of welfare regulations changes over time. It needs to be kept in mind that a control of compliance with welfare legislation cannot replace a full welfare assessment, but it is still an important indicator of the minimum standards.