

ECONOMIC EVALUATION OF AN ERADICATION PROGRAM OF VIRULENT FOOTROT IN NORWEGIAN SHEEP

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Abstract. In 2008 virulent footrot was detected in Rogaland, a county in south-west Norway. This first known outbreak since 1948 was linked to import of live sheep from Denmark in 2005 (Gilhuus et al., 2014). Footrot is caused by *Dichelobacter nodosus*, where the virulent strains may cause severe disease with large impact on animal welfare and production. An eradication program, “Healthy feet”, financed by the agricultural agreement scheme and marketing fees, was initiated (Vatn et al., 2012). A corps of especially trained inspectors, supported by field veterinarians and farmers, carried out more than 6000 flock examinations. A substantial proportion of the infected sheep were located at the island Rennesøy. In total 130 flocks fulfilled sanitation including ten flocks infected with benign strains that had severe disease symptoms. In 64 flocks all animals were culled while medical sanitation, involving footbaths of animals with limited symptoms and culling of animals with severe symptoms, was performed in the remaining flocks. More than 4000 sheep were culled. Footrot is a notifiable disease, and several restrictions, such as prohibition of trade in living animals and dispatching animals to common pastures, were imposed on infected flocks. The program ended in 2014 and is followed by surveillance and control by the Norwegian Food Safety Authority from 2015. The purpose of the study is to investigate the economics of the program to Norwegian farmers and the sheep industry.

A simulation model has been developed to portray a likely geographical spread of footrot without the eradication program but assuming farmers undertake some measures themselves (Grøneng et al., 2015). The model is based on probabilities for spreading footrot among farms within each county, mainly depending on climatic factors and distance between sheep farms. The model calculates likely spread of the disease across county borders through transport of sheep and cattle and use of common pastures. Use of common mountain pastures creates a risk of direct contagion in about 100 days annually, mostly during the gathering process in the end of the season. Outdoor feeding on pastures in the winter and use of improved local pastures in the summer increases the risk. The disease may also spread through common breeding operations like “ram circles”, animal exhibitions and selection shows while a strict limitation on trade of sheep from one county to another slows the spread. The model was parameterized with data in national databases, literature and data from the eradication program.

Footrot is well known in Europe and in the UK 86% of the sheep farms reported footrot (Wassink et al., 2003). The most likely scenario, in which the number of infected flocks in Norway increases from 0.1% to 52.6% in 25 years, was selected to calculate the Net Present Value (NPV) of the eradication program. The inflation adjusted eradication costs, including associated costs and losses by the sheep holders, insurance companies, and the Food Safety Authority, aggregated to nearly NOK 70 million. The main benefits of the program consist in avoided production losses and saved costs on treatments and control of the disease. Control measures, such as footbaths and trimmings, may be expensive and laborious. Footrot may result in lameness, however, animal welfare effects have not been assessed. The accumulated NPV was positive after approximately twelve years after start of the program in a main alternative with production losses set to 1% in affected herds or by using the 30% effects on production and reproduction in affected sheep as assessed by Nieuwhof and Bishop (2005). Using their low assessment of 6.7% resulted in positive NPV after 17 years. The results are in agreement with those of Carmody et al., (1984) who reported positive NPV and benefit-cost ratios for a footrot eradication scheme in the New England region of New South Wales in Australia.

Key words: sheep, net present value, Norway, eradication program, ovine footrot.

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