

Estimating the costs of mastitis in goats using stochastic simulation modeling

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Few studies have investigated the economic aspects of mastitis in goats. The aims of the current study were (1) to estimate the total costs associated with clinical and subclinical mastitis in a dairy goat herd; and (2) to estimate the costs of a subclinical infection with *Staphylococcus aureus*, with and without interventions. Two stochastic simulation models were constructed. Model 1 simulated a herd of 1,000 goats and the prevalence and incidence of subclinical and clinical mastitis were drawn from distributions. The corresponding subclinical and clinical cases were modeled and the monetary effect of mastitis in the herd was calculated. Model 2 simulated one subclinical *S. aureus* infection, including effects of transmission. The case could either stay subclinical ($P=0.8$) and infect other goats, or have a clinical flare-up ($P=0.2$). A clinical flare-up could result in death or survival. In case of survival, it became subclinically infected again and could again infect other goats. Three scenarios were calculated for goats that became clinically ill but did not die: treatment, no treatment, or culling. The total costs of mastitis in a herd of 1000 goats were estimated at around €3,200 per year, but could vary between €800 and €7,000 per year. The incidence of clinical mastitis was an important factor driving these costs, mainly because of lost milk revenues of goats that died. The costs of one case of subclinical mastitis (including transmission) were around €80. Differences between treatment, no treatment and culling were small. The transmission parameter and the probability of clinical flare-up had large effects on the total costs associated with a subclinical mastitis. This study shows that mastitis in goats causes economic losses, which are mainly driven by the number of clinical mastitis cases. Infection dynamics of *S. aureus* in goats are influential on the estimated costs.