

Effects of control strategies against *Salmonella Dublin* infections in dairy herds estimated by the Dublin-Simherd model

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Control strategies against *Salmonella Dublin* infections in dairy herds were evaluated in the ‘Dublin-Simherd’ model – a dynamic, stochastic and mechanistic Monte-Carlo simulation model of *S. Dublin*. The model simulated infection dynamics and production losses in a dairy herd with additional young stock over a period of 10 years in weekly time steps. Control strategies were applied one year after the infection was introduced to the herd by one infectious heifer purchased into the herd four weeks before calving. The effect of 19 control strategies on incidence rate was evaluated in three herd sizes (85, 200 and 400 cows). The control strategies involved test-&cull, vaccination of preweaned calves and improved hygiene and management in one or more of 6 different age-groups (3×calves, 2×heifers and cows). The only control strategies that reduced incidence rate effectively involved improved hygiene and management in all six age groups. Second best strategy was improved hygiene and management in cow and breeding heifer barns, while improving hygiene and management only for the calves had a very small effect. Culling strategies based on detection of infectious animals using ELISA tests and bacterial culture in different combinations with a frequency of 1 or 3 times per year had almost no effect on the incidence rate. Culling had a minor additional reducing effect on the incidence rate when combined with improved hygiene and management only among cows and heifers. In some scenarios culling strategies increased the incidence rates because old resistant animals testing false-positive were replaced by younger and more susceptible animals. Vaccination of preweaned calves had a negligible effect on the incidence rate. With decreasing herd size most control strategies became more incidence-reducing.