Milk quality assurance for paratuberculosis: effects of infectious young stock.

Maarten F Weber¹, Huybert Groenendaal²

¹ GD Animal Health Service, Deventer, The Netherlands
² Vose Consulting US LLC, Boulder, CO, USA

INTRODUCTION

A bulk milk quality assurance program (BMQAP) for paratuberculosis in Dutch dairy herds was initiated in 2006, aiming at a reduction of the concentration of Mycobacterium avium subsp. paratuberculosis (Map) in milk delivered to the milk factories (Weber and van Schaik, 2007). The development of the program was supported by various modeling studies (van Roermund et al., 2005; Weber et al., 2005; Franken, 2005; Velthuis et al., 2006), in which it was assumed that cattle do not become infectious before adulthood. However, shedding of Map in young stock has been described in several studies (Rankin, 1959; Rankin, 1961; McDonald et al., 1999; Waters et al., 2003; Weber et al., 2005; van Roermund et al., 2007), and transmission of Map amongst young stock was found in an experimental study (van Roermund et al., 2007). Therefore, we evaluated the effect of transmission amongst young stock on key output parameters of the BMQAP in simulated dairy herds.

MATERIALS AND METHODS

Closed dairy herds participating in a BMQAP were simulated with a stochastic simulation model, JohneSSim. Transmission of Map amongst young stock was simulated, assuming various probability distributions for the age at onset of infectiousness and various contact rates between individuals.

RESULTS

Transmission amongst young stock resulted in an increased average within-herd prevalence, and a decrease of the beneficial effect of preventive management measures directed at a separation of adults and young stock on herd-level and within-herd prevalence’s. When including transmission amongst young stock, infected herds were detected earlier within the simulated BMQAP. Consequently, the proportion of certified herds (‘green’ herds, i.e. status A in the Dutch BMQAP) decreased. Moreover, the beneficial effect of preventive measures on the proportion of certified herds was reduced. However, the effect of transmission of Map amongst young stock on the concentration of Map in milk from certified herds was small and became negligible beyond year 10 after the start of the program.

CONCLUSION

It is concluded that transmission of Map amongst young stock does not affect the quality assurance of milk from certified herds. However, the proportion of herds that are certified in a BMQAP is decreased by transmission of Map amongst young stock.

REFERENCES


