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MODELLING VACCINATION AGAINST BOVINE BRUCELLOSIS

M. Amaku[1], *R. A. Dias* [1], *J. S. Ferreira-Neto*[1], *F. Ferreira* [1]

[1]Faculdade de Medicina Veterinária e Zootecnia,
Universidade de São Paulo, São Paulo, Brazil, amaku@vps.fmvz.usp.br

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Female bovines, due to their important role in the transmission and maintenance of brucellosis, were the target of the serological surveys of the Brazilian Program to Control and Eradicate Bovine Brucellosis and Tuberculosis.

Based on information obtained in Brazilian states where the serological surveys were carried out and prevalences higher than 2% were observed (e.g. [1]), we have developed a compartmental model [2] to simulate the dynamics of brucellosis in herds of female bovines, to analyse the effects of vaccination strategies.

The model assumptions were: routine vaccination scheme; no vaccinated animals at time t = 0; homogeneous mixing for the transmission of brucellosis; and vaccination of newborn calves.

The following results were observed:

a) for low vaccination coverage (around 30%), the time to reduce the prevalence to 2%, adopted as a reference, may be long, approximately twice as long as the time observed for a higher coverage (90%);
b) the time to reduce the prevalence to levels of 1% or 2%, adequate to start the eradication phase, may reach a decade;
c) a high proportion of vaccinated females in calf-bearing age is reached after approximately 10 years of vaccination, because only newborns are vaccinated.

We therefore recommend an intensification of the effort to vaccinate females, aiming at attaining high vaccination coverages. In addition, vaccination of adult animals (using, for instance, a rough *Brucella abortus* strain RB51 vaccine) may reduce the prevalence faster than observed in our simulations.

References

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