Impact on sensitivity of a commercial iELISA test for brucellosis, when serological samples are pooled

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Uruguay has an eradication program for *Brucella abortus*. The susceptible population is approximately 6 million cattle and 25% of it is tested annually with a high cost for farmers and government alike. With a farm prevalence of 1% and a cattle prevalence of 0.26%, an increase in surveillance is needed to eradicate the disease and maintain the cost at a reasonable level. The objective of this study was to assess the dilution effect in test sensitivity when using pool samples, in order to determine the viability of this type of sampling. 18 serum samples were selected from animals with positive diagnosis to *B. abortus* and 100 serum samples from animals in farms without a history of Brucellosis. Previously, all samples were tested with Bengal Rose, FPA, and ELISA to corroborate their status. Each positive serum was diluted to half 10 times and tested with a commercial iELISA. Each dilution was classified by iELISA as positive or negative to develop a probit model with a base 2 logarithm of the dilution. The model was significant with a constant value of 2.275(EE=0.292) and the coefficient log(dilution) -0.300 (EE=0.043). The test sensitivity (Se) for each dilution was estimated with the probit model.The dilution are: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, and the respective sensitivities (Se) are: 99%, 98%, 95%, 92%, 86%, 78%, 68%, 57%, 45%, 33%, 23%. With this information, in a hypothetical case of positive farms with a herd prevalence of 10% and a random sample of 32 cows, the herd sensitivity changes from 96% with individual samples to 93% if we process all the samples in one pool. In conclusion, it is possible to increase the surveillance and keep costs at reasonable level.