

Heat Detection, Conception and Pregnancy Rates of Holstein Cows in Central Chile

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Introduction

The central area of Chile is a typical agricultural region with Mediterranean climate. The Holstein is the most popular dairy breed. Average herd size is 150 cows. The cattle industry in this area must compete with other more profitable sectors such as fruit and winery industries. Consequently, dairies have to be extremely efficient to survive. Most of these dairies utilize AI, and TAI programs are barely used; thus, reproductive efficiency depends entirely on heat detection. Monitoring and benchmarking heat detection, conception and pregnancy rates will allow producers to take more efficient management decisions in order to improve fertility of the herd. The objective of this study was to characterize the heat detection, conception and pregnancy rates of Holstein dairy herds from the Central area of Chile during 2004.

Materials and Methods

Records from six dairy herds (~ 10,000 kg ME 305 d, 2X, per lactation) were obtained for a period of one year. Cows had similar management, housed under confinement and milked 3X/d. Cows were fed diets based on alfalfa hay, corn silage and commercial concentrate to meet or exceed recommendations of NRC 2001. Reproductive management consisted of a VWP of 50 d, periodic visual estrus detection and AI. The study was conducted using records between December 1, 2003 and November 30, 2004, and the data set consisted of 2269 lactations. A period of heat detection of 63 d after the VWP was established; therefore, 3 potential estrous cycles for heat detection were considered (50 to 70 d pp; 71 to 91 pp; 92 to 112 d pp), assuming an average estrous cycle length of 21 d. Heat detection, conception and pregnancy rates at first, second and third eligible period, and overall during the entire study period, were calculated. Heat detection and conception rates at each period were analyzed by logistic regression. Explanatory variables considered for all the models were farm (1 to 6); parity (1, 2, 3 +), accumulated milk yield to 100 d pp (kg); season (summer, fall, winter, spring) and po-

tential two-way interactions. Overall pregnancy rate was analyzed by survival analysis. Data analysis was conducted using SAS 9.01.

Results

Heat detection rate for period 1, 2 and 3 was 48.4% a, 52.8% b and 52.9% b, respectively ($P \leq 0.05$). Results within parity within periods showed no differences ($P > 0.05$). Results within season within periods showed that HDR was lower on fall than the rest of seasons. Conception rate for period 1, 2, and 3 was 42.2%, 41.8%, and 39.2%, respectively ($P > 0.05$). Results within parity within periods showed no differences for CR for period 1 ($P > 0.05$), and lower CR for parity 2 and 3+ than parity 1, for period 2 (40.1%, and 36.6% for parity 2 and 3+ respectively vs. 47.8% for parity 1) and period 3 (34.6%, and 35.5% for parity 2 and 3+ respectively vs. 45.3% for parity 1). Results within season within periods showed differences only in period 3, with lower CR in summer (32.9%) than fall (40.0%), winter (39.1%) and spring (43.9%). Pregnancy rate for period 1, 2, and 3 was 17.3% a, 20.5% b and 19.7% b, respectively ($P \leq 0.05$). Results within parity within periods showed no differences for PR for period 1 ($P > 0.05$), and lower PR for parity 3+ than parity 1 and 2, for period 2 (17.3% for parity 3+ vs. 20.5% for parity 2 and 23.7% for parity 1 respectively) and higher PR for parity 1 than parity 2 and 3+ for period 3 (24.1% for parity 1 vs. 17.4% for parity 2 and 17.0% for parity 3+, respectively). Results within season within periods showed differences only in period 3, with higher PR in spring (24.4%) than summer (15.7%), fall (18.8%), and winter (20.5%).

Significance

An overall HDR of 51.1% was determined, which is in the upper limit of values reported by US and Canadian studies. Although the HDR of this particular Chilean cattle population may be considered good, there is still room for progress in order to improve fertility of Chilean dairy herds.