

## Impact of timed AI use on reproductive performance and culling rate in Wisconsin dairy herds

A. H. Souza\*<sup>1,2</sup>, P. A. Carvalho<sup>1</sup>, R. D. Shaver<sup>1</sup>, M. C. Wiltbank<sup>1</sup>, V. Cabrera<sup>1</sup>

Department of Dairy Science, University of Wisconsin-Madison, 53706, USA<sup>1</sup>; Ceva Sante Animale, Libourne, 33500, France<sup>2</sup>

We examined the use and impact of synchronization programs on reproductive performance and culling rates in dairy herds in WI. Backups (n=200) from herds using DC305 were collected from 2009 to 2012. Average lactating cows per herd was 660 (51-7,273) and 305ME production was 12,427kg (9,476-16,112). Service rate (SR) and pregnancy rate (PR) calculations used either the actual voluntary waiting period (VWP) in the herd or were set at 50DIM. Culling rate was defined as the number of culled cows (sold plus dead) over 12 mo divided by the average number of mature cows in the herd. Percentage of breedings done with timed AI was assessed by recorded breeding codes in DC305. Overall, 91% of the herds reported more than 10% of their breeding codes associated with a timed AI protocol, and 52% of all breedings happened following a synchronization program. Herds were divided in quartiles in terms of percentage of breedings by timed AI (Q1=0-36%; Q2=37-55%; Q3=56-69%; Q4=67-99%). Average VWP was 57.4d and % pregnant to 1<sup>st</sup> AI (P/1<sup>st</sup>AI) was 36.6%. As expected, herds using more timed AI delayed 1<sup>st</sup> post partum AI (VWP: Q1=49.6 d vs. Q4=67.5 d;  $P<0.01$ ) but had improved P/1<sup>st</sup> AI (Q1=34.9% vs. Q4=39.9%;  $P<0.01$ ). In addition, PR increased from 15.8% to 20.0%, for Q1 and Q4 respectively ( $P<0.01$ ) with a greater proportion of herds having outstanding reproductive performance (PR > 20%; Q1=12.3% vs Q4=55.7% of herds;  $P<0.01$ ). Increased milk production was associated with increased use of timed AI ( $r = 0.39$ ,  $P<0.01$ ), increased SR ( $r = 0.36$ ,  $P<0.01$ ), no change in P/AI ( $r = -0.04$ ,  $P=0.53$ ), increased PR ( $r = 0.24$ ,  $P<0.01$ ), and lower early cullings ( $r = -0.24$ ,  $P<0.01$ ). Regardless of the proportion of breedings performed with timed AI, PR was not associated with overall culling rate ( $r=0.008$ ,  $P=0.91$ ), but was negatively correlated with later (>300 DIM) cullings ( $r = -0.32$ ,  $P<0.01$ ). Younger age at first calving in heifers was associated with greater culling rates in the lactating herd ( $P<0.01$ ). Thus, timed AI appears to be a critical part of reproductive management programs in WI dairies, particularly in high-producing herds.

### KEYWORDS

Dairy farms

Synchronization programs

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