J. Dairy Sci. 96:8075–8080
http://dx.doi.org/10.3168/jds.2013-6910

Reproductive performance of dairy farms in western Buenos Aires province, Argentina

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ABSTRACT

The objective of this study was to describe the reproductive performance of 23 grazing-based dairy farms from western Buenos Aires province in Argentina. The data set included data from the breeding season starting in May 2011 and ending in March 2012. Submission, conception, and pregnancy rates ranged from 42.4 to 70.2%, 20.1 to 44.9%, and 10.3 to 24.5%, respectively. No correlation was observed between conception and submission rates, suggesting that dairy farms with poor submission rates but with relatively high conception rates might increase pregnancy rates by simply putting more effort into increasing estrus detection and submission rates. Decreases in submission and conception rates were observed among 21-d cycles, indicating seasonal variation. A greater number of cows in estrus at the beginning of the breeding period could have facilitated estrus detection and therefore increased submission rates. In addition, restarting the breeding activities with timed artificial insemination programs may explain the highest submission rates at the beginning of the breeding period. A first decrease of 5.1 percentage units in conception rate was observed during the spring (October–November) and an additional decrease of 2.4 percentage units in conception rate was observed during the summer (January–February). Decreases in conception rates could be related to high intakes of high-protein diets, heat stress, or a combination of both. Attenuating heat stress during the summer may be critical for maximizing conception rates in grazing systems from western Buenos Aires province.
Key words: reproductive performance, conception rate, grazing

INTRODUCTION

High milk yield and good reproductive performance are essential to ensure the profitability of dairy farms. Pregnancy rate is an overall measure of reproductive performance (de Vries et al., 2010; Ferguson and Skidmore, 2013), and it is calculated as the number of cows that become pregnant divided by the number of cows eligible to become pregnant within a certain time period. Poor pregnancy rates can be attributed to poor estrus detection and submission (i.e., insemination) rates, a poor conception rate, or a combination of both (Ferguson and Skidmore, 2013).

Reproductive performance has declined while milk yield has increased in the last few decades. López et al. (2004) observed a shorter duration of estrus for high-producing cows than for low-producing cows (6.2 and 10.9 h, respectively). Efficiency in the detection of estrus is crucial so that AI can be performed at an appropriate time relative to ovulation (Walsh et al., 2010). Data from Ferguson and Skidmore (2013) not only showed that conception rate at first service does not decrease with very high submission rates at first service ($P < 0.75$), but also showed that conception rates at first service >35% can be obtained even with submission rates at first service >74%.

Benchmarking permits visualization of how dairy farmers are performing relative to their peers. In Argentina, the nonprofit organization Asociación Argentina de Consorcios Regionales de Experimentación Agrícola (**AACREA**; Buenos Aires, Argentina) stimulates benchmarking among producers so that they can see where they are regarding performance, set new goals, and improve their production practices. The objectives of this paper were (1) to describe the reproductive performance of dairy farms belonging to AACREA and located in western Buenos Aires (**BA**) province in Argentina; (2) to describe relationships between submission and conception rates; and (3) to show whether exist seasonal variations of reproductive performance exist on these farms.

MATERIALS AND METHODS

Dairy Farming Systems

Twenty-three dairy farms (farms A to W) belonging to AACREA within western BA province were included

Received April 9, 2013.
Accepted August 19, 2013.
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in this study. All herds were composed of Holstein cows, except one that had Jersey cows (farm D, Table 1). Herd size ranged from 180 to 1,900 cows. Cows from almost all farms (n = 21) grazed pastures (e.g., ryegrass and alfalfa pastures) in intensive grazing systems supplemented with silages and concentrates. Cows from 2 farms were housed in open lots and had no access to pasture paddocks; on these farms, forages other than corn silage were provided as alfalfa or grass silages or green-chopped alfalfa.

Most farms provided shade in small pens or at the milking parlor to some or all lactating cows during the summer (Table 1). Shade typically consisted of black mesh shade or tree plantations. When present, ventilation or water sprinklers were only available in the waiting area of the milking parlor (Table 1).

Estrus detection was based on visual observation of estrus behavior (n = 11), on disappearance of paint from the tail head of the cows (n = 8), or on a combination of both (n = 2; Table 1). Except for 2 farms that inseminated lactating cows with sex-sorted semen (farms V and W), all farms inseminated lactating cows with conventional semen. No synchronization or timed AI (**TAI**) programs were used on a majority of the farms (n = 11). Five farms used TAI programs alone and 3 farms used both synchronization and TAI programs (Table 1).

Data Collection and Management

Data from farms were retrieved using commercial reproductive management software (DairyComp 305, Valley Agricultural Software Inc., Tulare, CA; Syscord-Tamb, Lincoln, Argentina; Protambo Master 3.0, DIRSA SH, Gonnet, Argentina; SW Dr. Sola, SW Agropecuaria SRL, San Carlos, Argentina). On 20 farms, breeding was discontinued from mid-March to mid-May to avoid calving during the warm season (mid-December to mid-February); on 3 farms, breeding was practiced all year round. The experimental data

Table 1. Descriptive management of dairy farms from the western region of Buenos Aires province in Argentina

				Heat stress management		Breeding management			
Dairy	System	Supplementation[1]	RHA[2]	Pens[3]	Waiting corral[4]	Period[5]	VWP[6]	Estrus detection[7]	Program[8]
A	Grazing	C + S	18,122	TP	BMS	305 d	50	Paint	SYN/TAI
B	Grazing	C + S + H	18,121	NA[9]	NA	305 d	50	Paint	SYN/TAI
C	Grazing	C + S	19,515	TP	BMS + V + S	305 d	50	Visual	TAI
D	Grazing	C + S	13,717	TP	BMS	Continuous	45	Visual	SYN/TAI
E	Grazing	C + S + H	16,970	NA	NA	305 d	50	NA	NA
F	Grazing	C + S	19,517	TP	BMS + V + S	305 d	50	Visual	TAI
G	Grazing	C + S	19,383	TP	BMS + V + S	305 d	50	Visual	TAI
H	Open lot	C + S + H + A	16,131	BMS	R	Continuous	45	Visual	None
I	Grazing	C + S	18,432	TP	BMS + V + S	305 d	45	Visual, paint	None
J	Grazing	C + S	16,217	TP	None	305 d	60	Paint	NA
K	Grazing	C + S	15,506	BMS	BMS	305 d	45	Visual, paint	None
L	Grazing	C + S	16,436	None	BMS + V + S	305 d	45	Paint	None
M	Grazing	C + S	18,744	TP	NS + V + S	305 d	50	Visual	None
N	Grazing	C + S + H	16,629	BMS	BMS + V + S	305 d	50	Paint	TAI
O	Grazing	C + S	17,573	TP	BMS	305 d	50	Paint	NA
P	Grazing	C + S	16,572	None	BMS + V + S	305 d	45	Visual	None
Q	Grazing	C + S	16,021	None	BMS + V + S	305 d	45	Visual	None
R	Grazing	C + S	17,679	None	BMS + V + S	305 d	45	Paint	None
S	Grazing	C + S	18,917	None	BMS + V + S	305 d	45	Paint	None
T	Open lot	C + S + H	17,545	BMS	BMS + V + S	305 d	50	Visual	TAI
U	Grazing	C + S + H	18,870	NA	NA	Continuous	NA	NA	NA
V	Grazing	C + S + H	11,648	None	BMS	305 d	80	Visual	None
W	Grazing	C + S + H	15,130	TP/BMS	BMS + V + S	305 d	80	Visual	None

[1]Major supplements utilized: C = concentrate; S = silages (mainly corn, sorghum, and grass silages); H = hay; A = green-chopped alfalfa.

[2]Rolling herd average (lb/cow per year).

[3]Shading system while not in the milking parlor: BMS = black mesh shade; TP = tree plantations.

[4]Heat stress abatement system at waiting area of the parlor: BMS = black mesh shade; R = roof; V = ventilators; S = water sprinklers; NS = natural shade.

[5]Continuous = all-year breedings; 305 d = breedings for only 305 d (starting typically around mid-May).

[6]Reported voluntary waiting period.

[7]Main method for estrus detection.

[8]Program = implementation of synchronization (SYN) or timed AI (TAI) protocols.

[9]NA = not available.