

Effect of different calving classes in the first calving on subsequent milk production in Holstein dairy cows

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Introduction Revenue from dairy farms is directly dependent upon reproductive efficiency because it affects milk production and the number of calves born (Thurmond *et al.*, 1990). Pregnancy loss can have devastating effects on economical success in dairy farms. Normal annual abortion risks have been cited to be 3–5%, once cows are beyond 42 days of pregnancy (Hovingh, 2002), or similarly an observable 2–5% in most dairies (Kirk, 2003). Although, there is little or no indication that milk production is a risk factor for increased pregnancy losses in dairy cattle (Santos *et al.*, 2004), there is little information on the effect of pregnancy losses on subsequent milk production. The aim of this study was to evaluate the impact of different calving classes including eutocia, dystocia, stillbirth and abortion in the first calving on subsequent milk production in Iranian Holstein dairy cows.

Materials and methods Data regarding to all first calving of cows were collected during 1987 until 2006 from a large commercial Holstein farm. During the period the median number of cows in the study herd was 1000. Farmer has recorded information about all existing and culled cows. Each cow has been characterized by demographic data (birth date and first calving date), production data (cumulative first 60 and 100 days milk productions as well as the 305 day milk yield), and reproduction data (calving class and sex of calf at calving). Collected data were checked for consistency of data. Finally, during the study period, a total of 2490 culled cows (females having calved at least one) were used. The dependent variables analyzed were the cumulative first 60 and 100 days milk production as well as 305 d milk yield. The model included calving class with 4 levels (including eutocia, dystocia, stillbirth and abortion), calf sex, and calving year and season. Data were analyzed by procedure GLM of SAS (2001).

Results In overall, probabilities of eutocia, dystocia, stillbirth and abortion in the first calving during the study period were 0.83, 0.09, 0.05, and 0.02, respectively. The rate of abortion in this study was in agreement with previous reports in most dairies (Kirk, 2003). Table 1 shows the effect of calving class on subsequent milk production. The milk yields increased over time ($P < 0.0001$). The first cumulative 60 d milk production was affected by the calving class, and also calving year and season ($P < 0.01$). Calving season impacted the 60 d milk yield and cows calved in winter produced more milk in their first 60 days of milking ($P < 0.002$; 1505.3±22, 1530.6±22, 1554.6±23, and 1584.1±23, respectively for spring, summer, autumn and winter). The first cumulative 100 d milk production was also affected by calving class, calving year and season ($P < 0.05$). The trends were similar to the first 60 d milk yield. Calving year and season impacted the 305 d milk yield ($P < 0.001$). Cows calved in winter had the greatest milk yield in their first lactation compared with the other seasons ($P < 0.001$).

Table 1 Least squares means (±SEM) of production parameters in the first lactation of cows calved under different classes.

Parameters	Calving class				P value
	Eutocia	Dystocia	Stillbirth	Abortion	
First cumulative 60 d milk production, kg	1600.3±11	1583.8±23	1545.2±32	1445.2±55	0.008
First cumulative 100 d milk production, kg	2639.5±19	2650.5±38	2586.4±51	2384.9±87	0.02
305 d milk yield, kg	7004.7±53	7114.6±113	6960.1±153	6998.1±264	0.77

Conclusions The results of this study demonstrated that the calving classes impacted the first 60 and 100 days milk yields with no apparent effect on subsequent 305 d milk yield. Besides on the calving classes other factors impacted the first lactation production parameters. Therefore in practical terms increase incidence of abortion in herd reduces milk production in the first 100 days of lactation period.

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References

- Hovingh, E., 2002. Abortions in dairy cattle. II. Diagnosing and preventing abortion problems, Pub. no. 404-289, Virginia Coop. Ext., Reg. Coll. Vet. Med., Virginia Tech.
- Kirk, J.H., 2003. Infectious abortions in dairy cows, <http://www.vetmed.ucdavis.edu/vetext/INF-DA/Abortion.html>
- Santos, J.E.P., Thatcher, W.W., Chebel, R.C., Cerri, R.L.A., and Galvão, K.N. 2004. The effect of embryonic death rates in cattle on the efficacy of estrus synchronization programs. *Anim. Reprod. Sci.* 82-83, 513-535.
- Thurmond, M.C., Picanso, J.P., and Jameson, C.M. 1990. Considerations for use of descriptive epidemiology to investigate fetal loss in dairy cows. *J. Am. Vet. Med. Assoc.* 197, 1305–1312.