

Pregnancy maintenance in heat stressed dairy cows with gonadotropin-releasing hormone and human chorionic gonadotropin

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Introduction

Heat stress is one of the main factors associated with low reproductive performance in dairy cows and causes economic losses in high-producing dairy herds throughout the world, especially in tropical areas. Although the exact mechanisms by which heat stress affects fertility is unknown, some theories propose that excessive heat has detrimental effects on follicular development and on progesterone production during the luteal phase of the estrous cycle, which subsequently results in increased rates of early embryonic death (EED). Thus, increasing progesterone concentration could increase fertility in heat stressed dairy herds. One way to achieve an increased progesterone concentration is to support the corpus luteum (CL), the source of progesterone secretion, by means of gonadotropin-releasing hormone (GnRH) or human chorionic gonadotropin (hCG). The objective of this study was to determine whether injection of either two doses of GnRH or a single dose of hCG would increase pregnancy survival in high-producing, heat-stressed dairy cows.

Materials and Methods

Data from a large dairy herd (3,800 lactating cows; mean daily milk yield, 68 lb (31 kg)/cow) during June and July, 2010, were collected and investigated. Cows > three unsuccessful inseminations were randomly assigned to one of three treatment groups; a control group (n = 109), GnRH group (n=192), or hCG group (n=48).

Cows in the control group received no treatment after insemination. Cows in the GnRH group were administered two injections of GnRH (buserelin acetate; 2.5 mL of Receptal® 0.04%); one at the time of insemination and the second 12 days after insemination. Cows in the hCG group were administered a single dose of hCG (3,000 U; Chorulon®,) five days after insemination. The mean temperature in Tehran province of Iran in June and July are 81.5° F (27.5° C) and 86.7° F (30.4° C), respectively. Heat stress is one of the major problems affecting reproductive performance of dairy herds in this region, and heat abatement measures include fans and sprinklers. The conception rates were analyzed with chi-square analysis.

Results

The conception rates for the GnRH (29.2%) and hCG (31.2%) groups were significantly ($P < 0.05$) higher than the conception rate for the control group (15.6%). However, the conception rates of the GnRH and hCG groups did not differ significantly.

Significance

The GnRH and hCG protocols evaluated in this study improved reproductive indices for repeat-breeder dairy cows during a period of heat stress, presumably by support of the CL and increased production of progesterone such that the EED rate was reduced.