A new ovulation synchronization protocol (Estradoublesynch) improves fertility in heat-stressed lactating Holstein cows

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OBJECTIVES

It is well known that lactating dairy cows inseminated during heat stress have impaired ovarian follicular dynamics and decreased fertility (Dirandeh, 2014). These negative effects on follicular steroidogenesis and oocyte quality were still manifest during early autumn, with fertility not restored until early winter (Badinga et al., 1985) when temperatures had moderated (Dirandeh et al., 2015). The Doublesynch protocol (PGF2α 2d before the Ovsynch protocol) resulted in acceptable pregnancy per AI (P/AI) in both cyclic and anestrus dairy cows (Öztürk et al., 2010). Most recently, a new ovulation synchronization protocol (Estradoublesynch) that utilizes 1 mg of estradiol benzoate (EB) in lieu of 100 µg GnRH for synchronizing ovulation in a Doublesynch protocol improved pregnancy rate in both cycling and anestrus buffaloes (Mirmahmoudi et al., 2014). Therefore, the objectives of this study were to compare pregnancy per AI (P/AI) and pregnancy loss between Doublesynch and Estradoublesynch protocols in lactating Holstein cows during heat stress.

MATERIALS AND METHODS

This preliminary study was conducted at a commercial dairy farm in Iran between July and October 2014 (THI= 76-82). Cows were housed in free-stall barns with fans and bedded with sand. Diets were fed twice daily (07:00 and 16:00) for ad libitum intake (10% of refusals on as fed basis). Main ingredients were silage (corn and alfalfa), grain (barley or corn), hay (alfalfa or grass), and mineral supplements. All cows participating in this experiment were milked thrice daily at approximately 8-hour intervals and monitored daily for signs of diseases. If any health issues occurred, animals were moved to hospital pens, and appropriate treatments were performed (following standard treatment protocols) until their total recovery.

Multiparous (3.3 ± 0.91 lactations) Holstein cows yielding 28.9± 0.4 kg of milk/d were randomly assigned into one of two timed-AI (TAI) protocols at 30 ± 4.5 DIM: 1) Doublesynch (n=80), PGF2α-2d-GnRH-7d-PGF2α-56h-GnRH or 2) Estradoublesynch (n=80), PGF2α-2d-GnRH-7d-PGF2α-24h-EB (Figure 1). Cows were TAI by two AI technicians 16 h after second GnRH treatment (Doublesynch) or 48 h after EB treatment (Estradoublesynch). Pregnancy diagnosis was performed by ultrasonography at 32 d after TAI. Cows diagnosed pregnant at 32 d were re-examined at 60 ± 2 d after TAI to confirm pregnancy. Pregnancy loss was considered to have occurred when a cow was diagnosed pregnant at 32 d after TAI and not pregnant at 60 d. Data were analyzed using the GLIMMIX procedure of SAS.

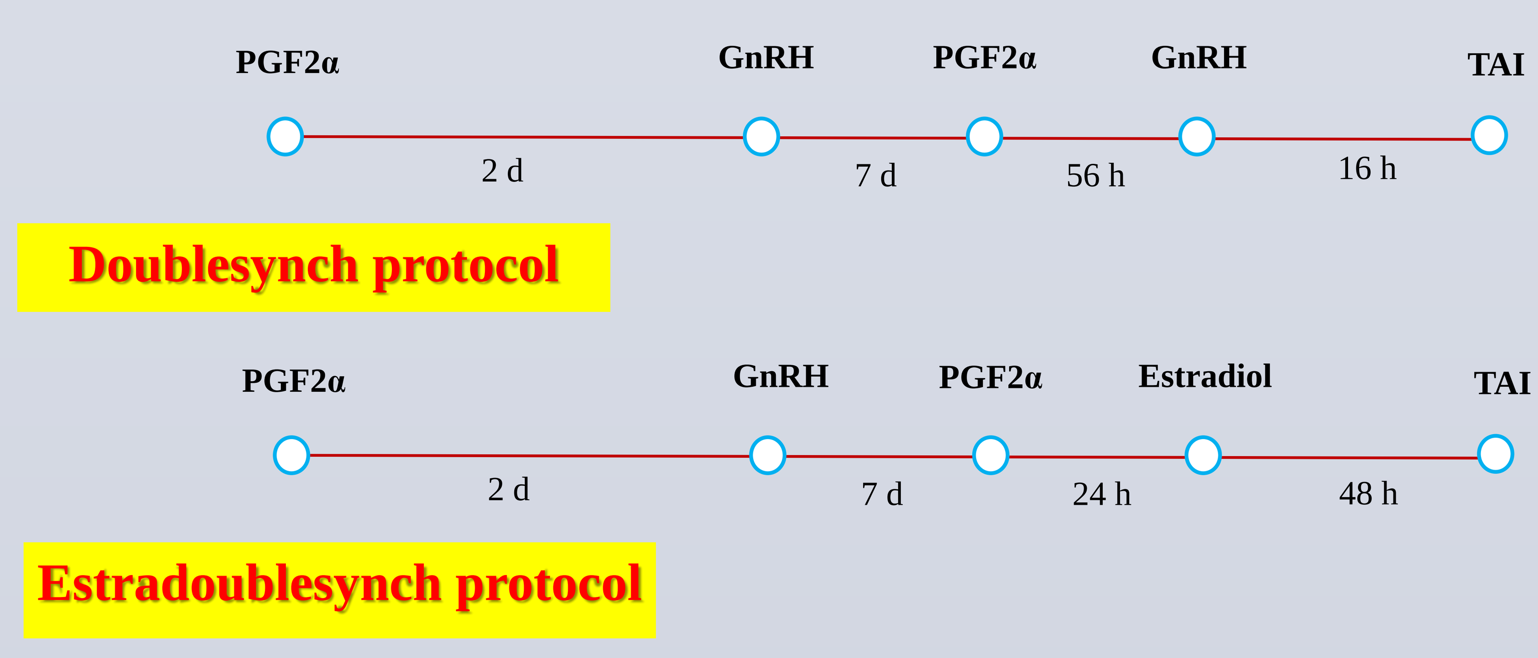

Fig. 1. Diagram of activities and treatments during the study. Lactating Holstein cows (n=80) were randomly assigned to 1 of the 2 timed-AI protocols; Doublesynch and Estradobulesynch.

RESULTS AND CONCLUSIONS

Timed-AI protocol affected the percentage of cows diagnosed pregnant at 32 and 60 d after AI (P<0.05). Pregnancy per AI was greater in Estradoublesynch compared to Doublesynch protocol at 32 (26.2 vs. 18.7 %) and 60 d (22.5 vs. 16.2 %) after TAI (Figure 2). However, pregnancy loss did not differ between TAI protocols (P>0.05; 13.3 vs. 14.2 % for Doublesynch and Estradoublesynch protocols, respectively).

In conclusion, Estradoublesynch resulted in improved P/AI in heat-stressed lactating Holstein cows. Although this finding is interesting, it needs to be tested in a large number of animals from more than one herd to produce a reliable recommendation.

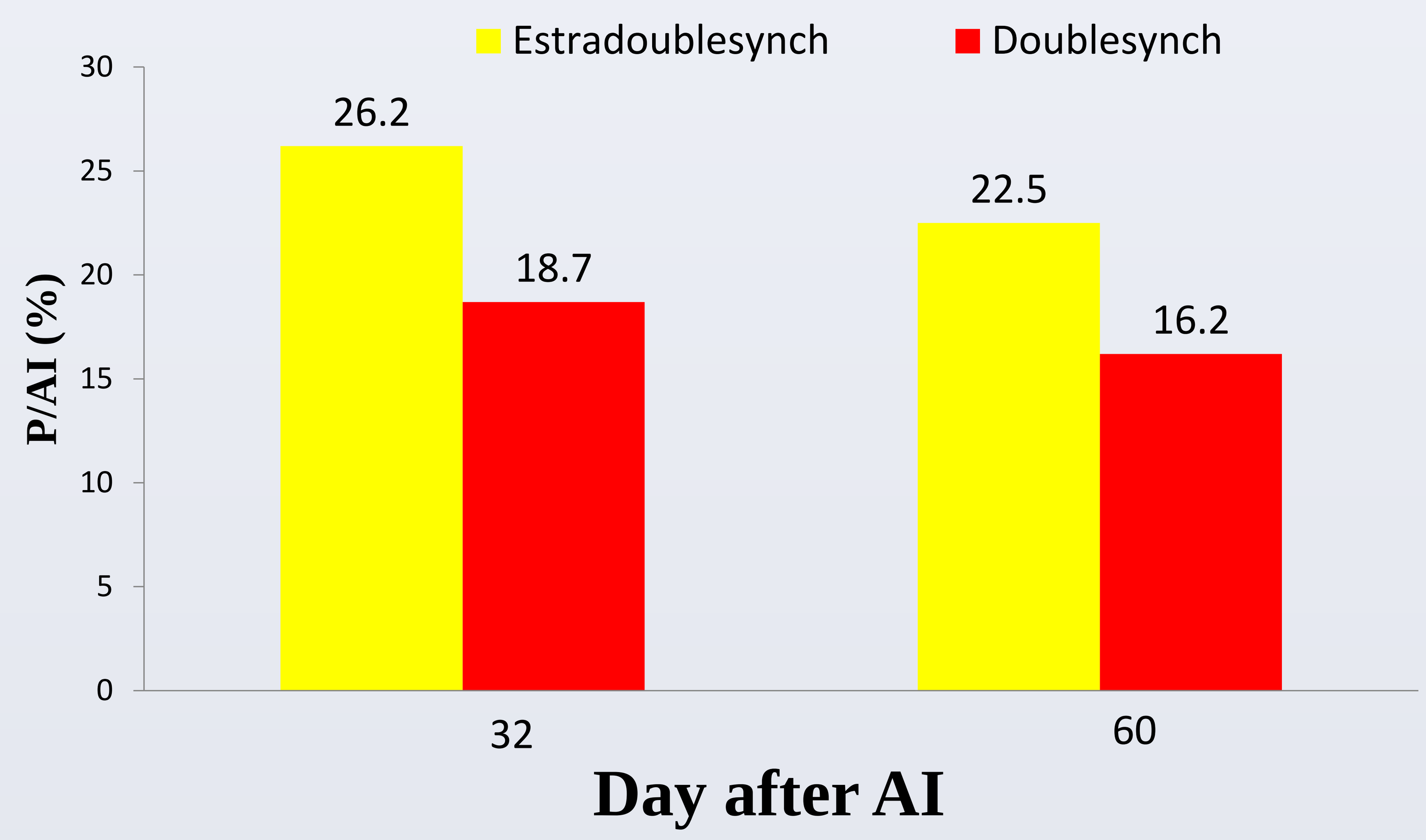

Fig. 2. Percentage of cows diagnosed pregnant at 32 and 60 d after AI.

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