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Plasma LH concentrations and CL function in Holstein cows given porcine LH, GnRH, or estradiol benzoate

M.G. Colazo*[1], T.O. Ree[2], A.G.A. Lamont[3], J.P. Kastelic[4], R.J. Mapletoft[5], D.J. Ambrose[1,3]

[1]Alberta Agriculture and Rural Development, Edmonton, [2]Lakeland College, Vermilion, [3]University of Alberta, Edmonton
[4]Agriculture and Agri-Food Canada, Lethbridge, [5]University of Saskatchewan, Saskatoon, Canada

Government of Alberta
Agriculture and Rural Development

Objectives

To compare LH concentrations and CL function in nonlactating Holstein cows following treatment with porcine LH (pLH), GnRH, estradiol benzoate (EB), or no treatment in proestrus.

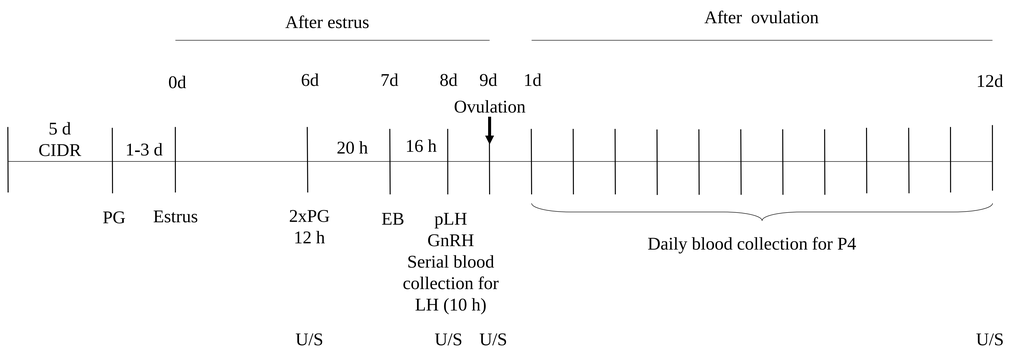
Materials & Methods

- Nonlactating, Holstein cows (n = 28) after prostaglandin (PG, Estrumate, Schering-Plough Animal Health) were randomly allocated to 1 of 5 treatments:

1) 12.5 mg pLH (Lutropin-V, Bioniche Animal Health)
2) 25 mg pLH
3) 100 µg GnRH (Fertiline, Vetoquinol Canada Inc.)
4) 1 mg EB (Sigma Chemical) [or]
5) No treatment (Control)

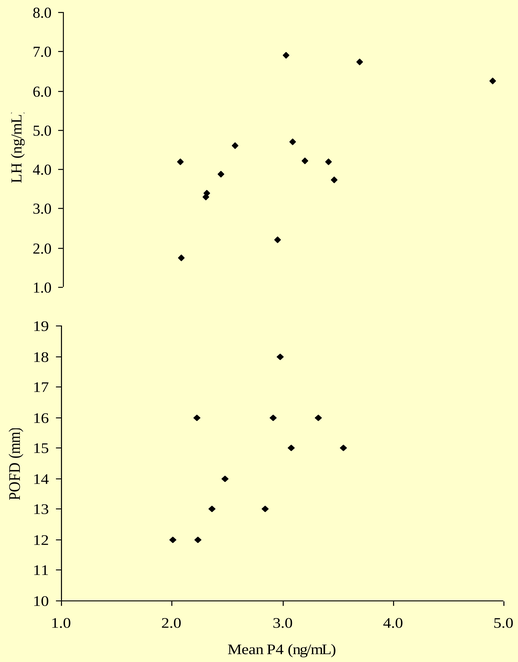
- Ovulation (d 0), follicles and CL diameter assessed by transrectal ultrasonography (U/S).
- LH (for 10 h) and P4 (daily from 1 to 12 d after ovulation) determined in plasma.

Fig 1. Experimental protocol.



Results

Fig 2. Association between mean LH concentration and preovulatory follicle diameter (POFD) with plasma P4 concentration in cows given 12.5 or 25 mg pLH or 100 µg GnRH 36 h after PG treatment. The Pierson coefficient of correlation was r = 0.51 (*P* = 0.06) and r = 0.61 (*P* < 0.02), respectively (only pLH and GnRH treated cows).



- Preovulatory follicle diameter was largest in Control cows (Table 1).
- On d 12, CL diameter was largest in Control cows, intermediate in pLH and EB cows, and smallest in GnRH cows, but CL area did not differ among treatments (Table 1).

Table 1. Ovulatory response, preovulatory follicle diameter, LH and P4 concentrations, and CL attributes among 28 nonlactating Holstein cows given pLH (12.5 or 25 mg), GnRH (100 µg), EB (1 mg) or no treatment (Control) following PG administration.

	12.5 pLH	25 pLH	GnRH	EB	Control
No. of cows	5	6	5	6	6
Ovulatory response					
No. of cows	4	6	5	5	4
%	80.0	100.0	100.0	83.3	66.6
Preovulatory follicle					
Diameter (mm)	13.7 ± 1.0^{b}	15.2 ± 0.8^{b}	14.3 ± 1.0^{b}	15.6 ± 0.8^{b}	18.4 ± 0.9^{a}
Luteinizing hormone					
Mean	2.7 ± 0.5^{b}	5.0 ± 0.5^{a}	3.8 ± 0.5^{ab}	4.1 ± 0.5^{ab}	0.6 ± 0.5^{c}
Corpus luteum					
Diameter (mm)	22.8 ± 1.3^{ab}	22.7 ± 0.9^{ab}	20.4 ± 1.2^{b}	22.5 ± 1.0^{ab}	25.1 ± 1.2^{a}
Area (mm^2)	335.9 ± 51.9	451.0 ± 36.7	356.9 ± 44.9	392.8 ± 40.2	364.0 ± 44.9
Progesterone (ng/mL)					
Mean	2.3 ± 0.2^{b}	3.1 ± 0.2^{a}	3.0 ± 0.2^{a}	2.0 ± 0.2^{b}	2.9 ± 0.2^{a}

^{a,b,c} Within a row, means without a common superscript differed (*P* < 0.05).

Fig 3. Mean plasma LH was greater (P<0.05) in cows treated with 25 mg pLH than in those given 12.5 mg pLH; it was intermediate in those given GnRH.

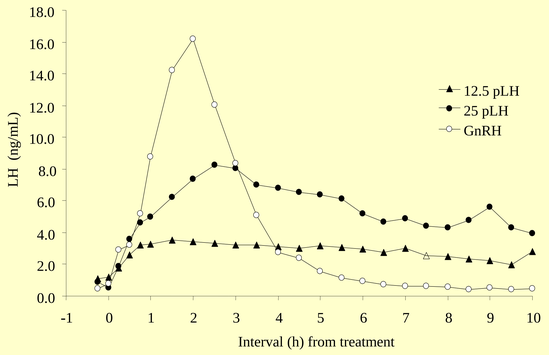
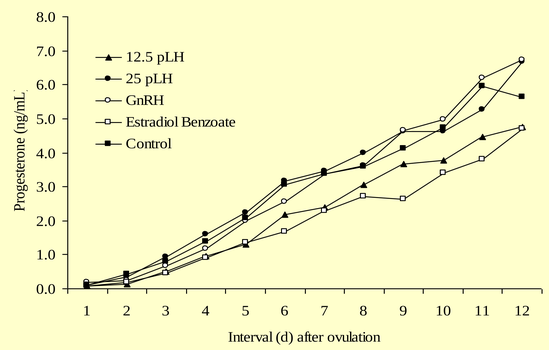


Fig.4. Mean plasma P4 in cows given either 25 mg pLH or GnRH did not differ from that in Control cows, but 12.5 mg pLH or EB resulted in lower plasma P4 after ovulation.



Conclusion

- Cows given 25 mg pLH had greater LH concentrations.
- Control cows had larger preovulatory follicle diameter and CL diameter.
- P4 concentrations did not differ among cows given 25 mg pLH GnRH or Control, but were greater than in EB or 12.5 mg pLH cows.

Acknowledgements

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