Acta vet. scand. 1991, *32*, 377-386.

Post-Partum and Post-Conceptional Ovarian Activity of Dairy Cows: Evaluation Based on Progesterone Profiles

By *Jón Eldon*

Institute for Experimental Pathology, University of Iceland, Keldur, Reykjavík

Eldon, J: Post-partum and Post-conceptional ovarian activity of dairy cows: Evaluation based on progesterone profiles. Acta vet. scand. 1991, 32, 377-386. – The progesterone level of milk was measured daily in 20 Icelandic dairy cows cows for 50-90 days post-partum and for 30-50 days post-conception by radioimmunoassay. In 40% of the cows the 1st post-partum ovarian cycle was shorter and the progesterone level lower than in normal cycles. The average duration of the 1st post-partum luteal phase was significantly shorter and the progesterone values lower than in the 2nd and 3rd phases. The progesterone level rose to a plateau at the onset of luteal function within 5±2 (mean±s.d.) days, whereas the decrease in progesterone at the end of the luteal phase was more rapid i.e. 3±1 days. The progesterone value for a normal interluteal phase was 1.5±1.3 nmol/l. However in 9 of 48 interluteal phases the progesterone values did not decline below 3 nmol/l. The average progesterone concentration was significantly increased during the first 30 days post-conception. In 4 of 20 cows a significant drop in progesterone concentration was found 15-19 days post-conception.
The results indicate that the luteal activity of the 1st post-partum ovarian cycle is inferior to that of the following cycles. There is a significant correlation in the intensity of the luteal activity between cycles. Ovarian cyclicity continues in early pregnancy in, at least, 20% of cows. The sampling frequency is of importance in studies concerning the luteal activity.

luteal phase; interluteal phase.

Introduction

The importance of luteal function for conception and maintenance of pregnancy in ruminants is well established. The progesterone environment on the days around oestrus influences the success of insemination in the ewe (*Ashworth et al.* 1987, 1989, *Diskin & Niswender* 1989) and in the cow (*Folman et al.* 1973). Sustained high oxytocin concentration can extend the luteal life-span in cattle and sustained high progesterone concentration will block oestrus and ovulation (*Gilbert et al.* 1989, *Nanda et al.* 1988). Prostaglandin ($PGF_{2\alpha}$) induces premature luteolysis, terminates pregnancy in inseminated animals and alters the interval between oestrus periods (*Kindahl et al.* 1976, 1980, *Lafrance & Goff* 1988, *Copelin et al.* 1989).

As the concentration of progesterone in blood and milk is an indicator of ovarian activity, survey of progesterone levels are of importance in reproductive studies. Earlier studies of the post-partum ovarian function of Icelandic dairy cows (*Eldon* 1988) were based on samples collected every 5th day. This sampling frequency was too low for establishing accurately the length of the ovarian cycle, luteal phase, inter-luteal phase and changes in progesterone concentration during the oestrus cycle. The objective of this study was to establish the length of the oestrous phases and changes occurring in the concentration of progesterone post-partum and early post-conception in the Icelandic dairy cow.

Materials and methods

Animals

Twenty Icelandic dairy cows were randomly selected from a herd of 70 cows. The age of the cows was 3-11 years (2nd-10th calving). During the study the animals were housed in tie stalls and fed hay, silage, concentrates and minerals. The cow shed was bright, warm and well ventilated. The calvings were normal and without any complicating diseases.

Milk sampling

Milk samples were taken daily for 90-100 days from calving. The milk was collected in 10 ml plastic vials. Each vial contained as a preservative 10 mg 2-bromo-2-nitro-1,3-propanediol (Sigma Chemical Co., St. Louis, MO). The samples were kept frozen at -20°C until assayed.

Progesterone assay

Progesterone was assayed by a radioimmunoassay technique as described by *Eldon & Olafsson* 1986. The hormone was determined in the fat free part of the milk. The tracer used was (1, 2, 6, 7, 21-^{3}H(N))-progesterone (7 TBq/mmol; NEN Research Products, Kastrup, Denmark). An antibody raised in sheep against 11α-hydroxyprogesterone-hemisuccinate conjugate (*Castellanos & Edqvist* 1978) was applied. Cross-reactivity was 100% with progesterone, 9.5% with 17α-hydroxyprogesterone, 3.5% with 11α-hydroxyprogesterone and less with other steroids. Diluted 1:20.000 the antibody bound 45% of the ^{3}H-progesterone. Free hormone was separated from bound by dextran coated charoal 0.25% Activekohle (Merk) and 0.1% dextran T70 (Pharmacia, Uppsala, Sweden) in PBS buffer without gelatin). The samples were analyzed on a Packard 1600 CA Tri-Carb Liquid scintillation Analyzer. Inter-assay coefficient of variation (CV%) was 12.2 for a sample containing 6.0 nmol/l of progesterone (n = 50; mean±s.d., 5.9±1.2). Intra-assay CV% for duplicate samples was 6.7%. The sensitivity of the assay was 0.5 nmol/l and average recovery was 98%.

Progesterone profile analysis

The length of an ovarian cycle was evaluated from the day before progesterone rose above 3 nmol/l to the same day of the subsequent cycle (short cycle ≤15 days; normal cycle ≥16 days) and the length of the luteal phase from the day before progesterone rose above 3 nmol/l to the day it fell below the same value. The interluteal phase was estimated as the interval between the luteal phases. The area under the curve during luteal phase was evaluated by drawing the curves on a millimeter paper and then counting the mm^2.

Statistical analysis

The data were analysed using Single classification analysis of variance, analysis of variance for repeated measures, Student's t-test and test of significance for correlation coefficients as described in *Sokal & Rohlf* (1981).

Results

The average duration of 1st, 2nd and 3rd post-partum ovarian cycle is shown in Table 1. In 8 of 20 cows (40%) the 1st post-partum ovarian cycle was short (8-13 days), leading to a significantly lower average of the 1st (17 days) as compared to the 2nd (20 days) and 3rd (21 days) ovarian cycle.

At the beginning of the luteal phase the concentration of progesterone rose above 3 nmol/l, to a plateau. This rise took 5±2

Table 1. The length of 1st, 2nd and 3rd post-partum ovarian cycles.

	No. of obs.	Mean±S.D. (days)	Range (days)	Stat. sign.
1st pp ovarian cycle				
Normal	12	19.5±2.7	16-26	***
Short	8	10.7±1.7	8-13	
All	20	16.5±4.9	8-26	
2nd pp ovarian cycle	17	20.1±2.8	14-25	*
3rd pp ovarian cycle	9	20.9±2.5	17-22	ns

pp = post partum; No. of obs. = Number of observations; Mean±S.D. = Mean±1 Standard Deviation; Stat. sign. = Statistical significance between means according to Student's t-test, ns = not significant, * = $p<0.05$, *** = $p<0.001$.

Table 2. The length of 1st, 2nd and 3rd post-partum luteal and interluteal phases.

	No. of obs.	Mean±S.D. (days)	Range (days)	Stat. sign.
1st pp luteal phase				
Normal cycle	12	15±1.4	14-18	
Short cycle	8	10±2.4	6-13	***
All	20	13±3.2	6-18	
2nd pp luteal phase	17	17±1.3	14-18	
3rd pp luteal phase	11	17±1.6	14-19	ns
1st pp inter-lut. ph				
Following Short luteal ph.	8	4±1.1	2- 5	
Following Normal luteal ph.	12	5±1.4	3- 8	ns
All	20	5±1.8	1- 8	
2nd pp inter-lut. ph.	17	5±1.9	1- 8	ns
3rd pp inter-lut. ph.	11	4±1.0	3- 6	ns

Interlut. ph. = interluteal phase. pp = post partum; No. of obs. = Number of observations; Mean±S.D. = Mean ± 1 Standard Deviation; Stat. sign. = Statistical significance between means according to Student's t-test, ns = not significant, * = $p<0.05$, *** = $p<0.001$.

(mean±s.d.) days. The plateau values, 13±3.3 nmol/l, lasted 8±2.6 days. The decline below 3 nmol/l took 3±1 days which was significantly faster ($p < 0.05$) than the rate of increase. No difference was found in the rate of rise or decline between 1st, 2nd and 3rd luteal phases. Interval from calving had no effect on this activity.

The average length of 1st, 2nd and 3rd post-partum luteal phases is shown in Table 2. The 1st post-partum luteal phase was significantly shorter (13 days) than 2nd and 3rd luteal phase (17 days).

There was no significant difference between the average length of the 1st, 2nd and 3rd interluteal phase (means = 4 and 5 days, Table 2). The length of the interluteal phase varied from 2-8 days and was not significantly shorter following a short luteal phase. Figure 1 shows progesterone profiles where the interluteal phases are 8 and 2 days, respectively.

The progesterone values assayed during the luteal phases are shown in Table 3. The values of a short cycle were significantly lower than those assayed during a normal cycle. The average value of 1st post-partum luteal phase was significantly lower than those of the 2nd and 3rd luteal phase.

The area under the curve of the progesterone profile during the luteal phase increased from 572±281 mm^2 during the 1st post-partum luteal phase to 1138±162 mm^2 during the 3rd. The area of the 2nd post-partum luteal phase correlated significantly with the area of the 1st post-partum luteal phase ($y = 0.54x + 807$, $r = 0.62$). During normal interluteal phase average progesterone values were 1.5±1.3 nmol/l. During 9 of 48

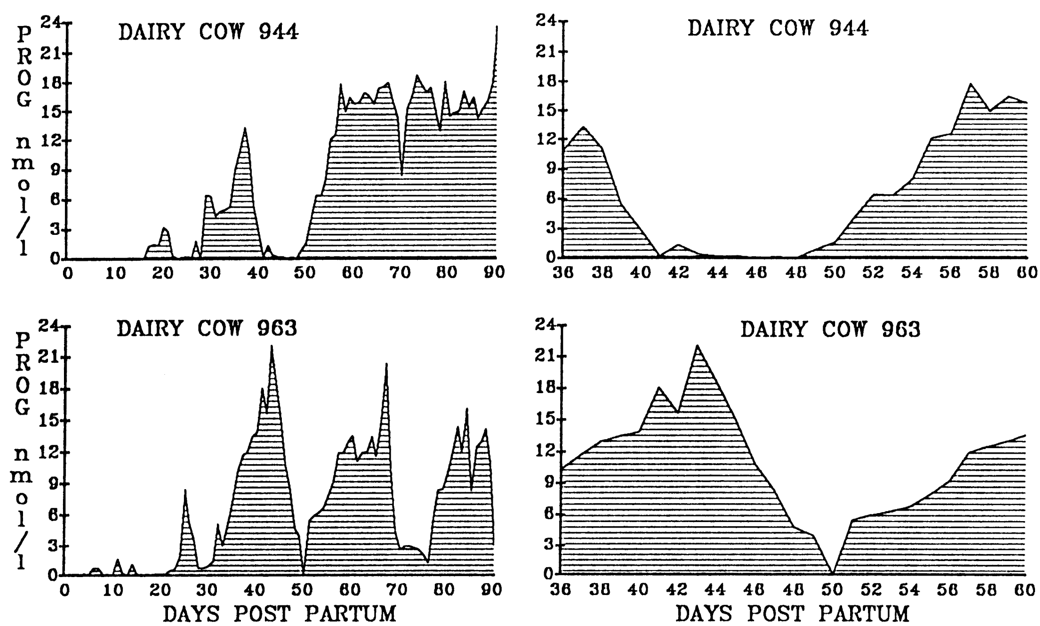

Figure 1. The duration of 2 interluteal phases. The profile from dairy cow 944 has interluteal phase of 8 days duration 41-49 days post-partum. The profile from dairy cow 963 has interluteal phase of 2 days duration 49-51 days post-partum.

Table 3. Progesterone values assayed during the luteal phase.

	No. of obs.	Mean±S.D. (nmol/l)	Range (nmol/l)	Stat. sign.
1st pp luteal phase				
Normal cycle	169	8.7±3.5	3.0-12.5	
Short cycle	119	6.3±2.8	3.0-19.0	***
All	288	8.0±3.6	3.0-19.0	
2nd pp luteal phase	289	11.0±4.6	3.0-19.5	***
3rd pp luteal phase	187	11.0±5.2	4.0-30.0	ns

pp = post partum; No. of obs. = Number of observations; Mean±S.D. = Mean ± 1 Standard Deviation; Stat. sign. = Statistical significance between means according to Student's t-test, ns = not significant, * = $p<0.05$, *** = $p<0.001$.

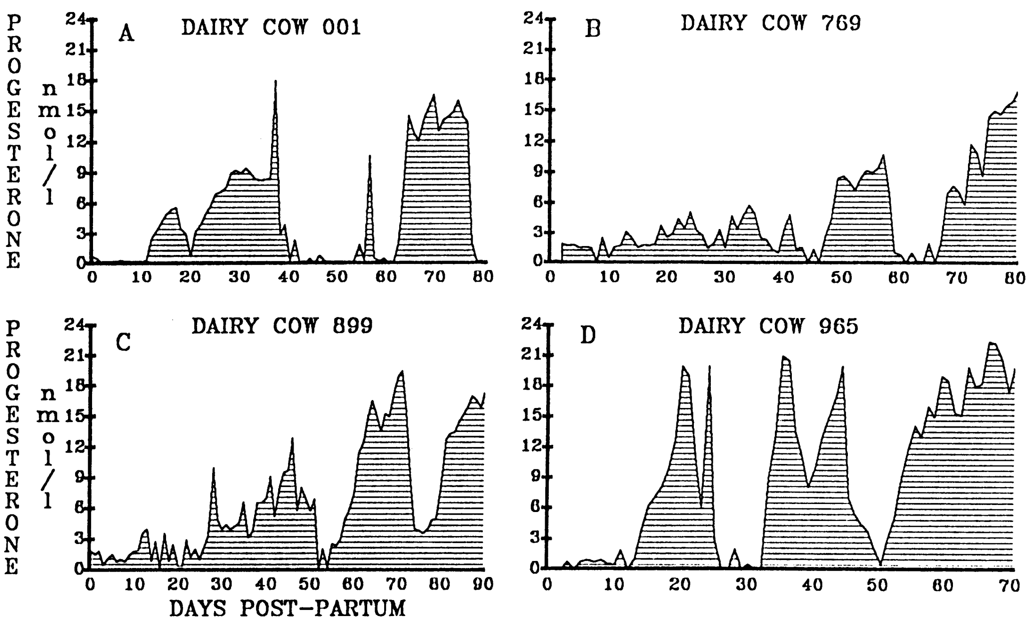

Figure 2. Irregularities in progesterone profiles. A. Sporadic progesterone production, cessation of luteal activity 40-56 days post-partum. - B. Suppressed luteal function during the first 45 days post-partum (luteal cyst?). - C. Prolonged luteal activity 25-52 days post-partum. High progesterone interluteal phase (>3 nmol/l) 74-79 days post-partum. - D. A temporary drop (14 nmol/l) in progesterone concentration during 2 consecutive luteal phases.

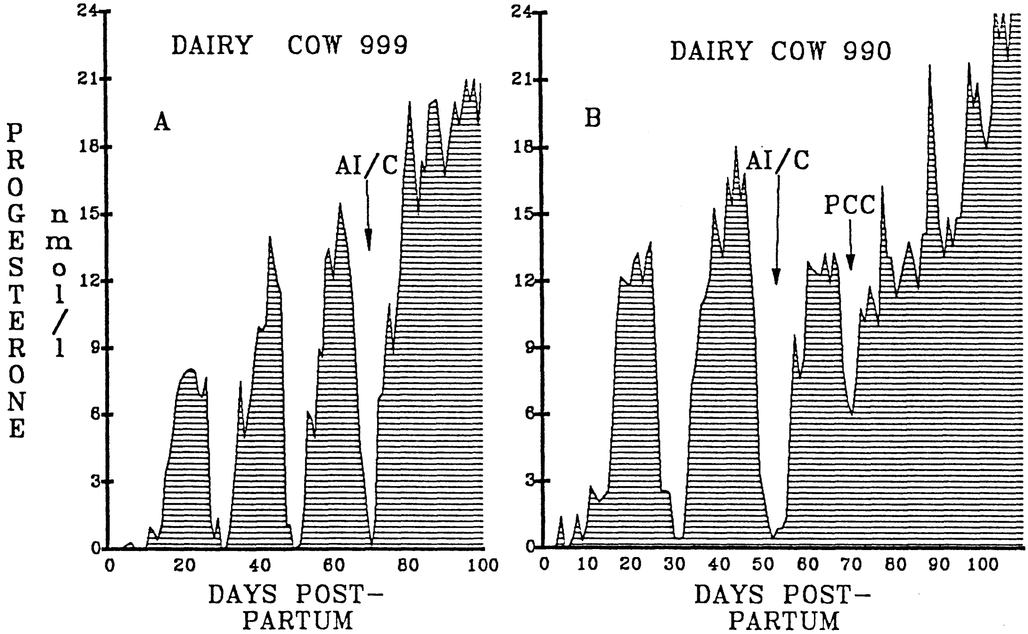

Figure 3. A. The progesterone profile from dairy cow 999. The profile shows increased luteal activity from 1st to 3rd luteal phase and increased luteal activity post-conception compared to 3rd luteal phase. – B. The progesterone profile from dairy cow 990. The profile shows continued cyclic activity 16 days post conception. The profile also shows increased progesterone concentration post-conception. AI/C = time of artificial insemination and conception; PCC = drop in progesterone concentration signifying cyclic activity post-conception.

interluteal phases the progesterone values did not decline below 3 nmol/l (Fig. 2 C).
Fourteen of 20 (70%) progesterone profiles showed regularity in pattern of progesterone concentrations during the luteal phases. Five profiles showed irregularity in luteal patterns. These irregularities were sporadic progesterone production, temporary cessation of cyclicity, suppressed and prolonged luteal function and a temporary drop in progesterone concentration of 14 nmol/l during 2 consecutive luteal phases (Fig. 2).
A significant increase ($p<0.01$) in average progesterone concentration was detected during the first 30 days post-conception as compared to the last luteal phase preceding conception (Fig. 3 A). Comparable increase was not seen in non-pregnant cows during the same time post-partum. The progesterone values dropped significantly ($p<0.05$) in 4 profiles for 1-2 days, 15-19 days post-conception. The drop in progesterone concentration was 6-10 nmol/l. Values below 6 nmol/l were not observed (Fig. 3 B).

Discussion

In the present study 1st post-partum ovarian cycles were shorter than normal in 40% of cows, whereas the 2nd and 3rd were of normal length i.e. ≈21 days (*Morrow et al.* 1969, *Eldon* 1988, *Copelin et al.* 1989). The results are in accord with earlier studies both in Icelandic dairy cows (*Eldon & Olafsson* 1986, *Eldon* 1988) and other cow breeds (*Mather et al.* 1978, *Larsson* 1984). The short cycle was mainly due to a significantly shorter luteal phase though variations in the rate of granulosa cell luteinization and onset of progesterone production after ovulation; variations in the time of onset and rate of luteolyzis; the rate of folliculogenesis, time of onset and length of oestrus and time of ovulation decide the overall length of the ovarian cycle (*Kindahl et al.* 1980, *Dieleman et al.* 1986, *Gustafsson et al.* 1986, *Spicer & Echternkamp* 1986). Furthermore the progesterone level was significantly lower in the 1st as compared with the 2nd and 3rd luteal phase. The cause of the reduced functional capacity of the 1st luteal tissue formed post-partum have been reported to be incomplete restoration of luteinizing hormone (LH) release leading to altered follicular development and/or premature, prolonged or increased release of $PGF_{2\alpha}$ from the involuting uterus (*Braden et al.* 1989, *Copelin et al.* 1989, *Schirar et al.* 1989).

The mean values for luteal phase progesterone concentrations found in this study were higher than the findings in earlier studies of Icelandic dairy cows (*Eldon & Olafsson* 1986, *Eldon* 1988). This is probably due to differences in feed quality as dietary intake has been shown to alter progesterone concentrations in peripheral blood (*Gombe & Hansel* 1973, *Carrol et al.* 1988, *Knutson & Allrich* 1988).

The increasing duration and progesterone concentration from 1st to 3rd post-partum luteal phase and the increase in progesterone concentration post-conception found in this study is similar to the findings of *Mather et al.* (1978), *Lee et al.* (1985) and *Robinson et al.* (1989) and do reflect an increased activity of corpora lutea. The development of full luteal function from the beginning of progesterone production was slower than luteolysis and cessation of progesterone production. The progesterone level of the 1st post-partum luteal phase rose to a lower plateau than in the 2nd and 3rd luteal phases. But in contrast to the findings of *Schirar et al.* (1989), who found that progesterone secretion increased at a slower rate early post-partum than later, at the resumption of ovarian activity in ewes, the rate of increase was similar in all luteal phases studied.

In 5 (25%) profiles irregularities in the progesterone concentrations were observed. This is an indication of hormonal imbalance which may lead to formation of ovarian cysts and ovulation failure (*Eyestone & Ax* 1984, *Kassa et al.* 1986, *Stevenson & Call* 1988). Another explanation for the luteal dysfunction may be bacterial infection of the uterus (*Fredriksson et al.* 1985, *Paisley et al.* 1986).

The variation in the duration of the 1st, 2nd and 3rd post-partum interluteal phases was not statistically significant. However this variation could affect the reproductive performance of the cows. During an interluteal phase lasting 2 days oestrus is inevitably short and may be hard to detect. A long interluteal phase increases the danger of too early service (*Gustafsson et al.* 1986). The cause for high progesterone (>3 nmol/l) during the interluteal phase is not clear. The progesterone was not high enough to hinder folliculogenesis, ovulation and formation of a new corpus luteum though low circulating concentrations of exogenous progesterone (e.g. Prid's) are known to do so.

A continuation of the cyclic pattern seen in 4 profiles 15-19 days post-conception is in accord with the report of *Claus et al.* (1983), *Eldon* (1988) and *Schallenberger et al.* (1989). The cyclic patterns are probably due to interruption of luteolysis by luteotrophic and antiluteolytic effects of the conceptus (*Garrett et al.* 1988, *Putney et al.* 1988, *Diskin & Niswender* 1989, *Wallace et al.* 1989). *Dobson* (1989) reported oestrus behaviour in cows at all stages of pregnancy. However, he did not observe hormonal changes comparable to those associated with oestrus in non-pregnant cows. Another possibility is that $PGF_{2\alpha}$ produced in the uterus may play a role (*Zarco et al.* 1988). The question is still open whether the cyclic pattern of progesterone concentrations seen in pregnant cows is preceded by a rise in uterine production of $PGF_{2\alpha}$ and whether this cyclic pattern can be seen in later stages of pregnancy.

It can be inferred from these results that the luteal activity of the 1st post-partum ovarian cycle is inferior to that of the following cycles; the intensity of the luteal activity is significantly correlated between cycles; ovarian cyclicity can be seen early post-conception in at least 20% of dairy cows. The sampling frequency is of importance in studies concerning the luteal activity, too infrequent sampling can lead to erroneous results.

Acknowledgement

I want to thank the farmers V. Ásgeirsson and S. Ásgeirsson for the milk sampling. I'm indebted to Dr. G. Georgsson, Institute for Experimental Pathology, University of Iceland, Keldur, for reviewing the manuscript. This study was supported by the Icelandic Science Fund.

References

Ashworth CJ, Wilmuth I, Springbett AJ, Webb R: Effect of an inhibitor of 3β-hydroxysteroid dehydrogenase on progesterone concentrations and embryo survival in sheep. J. Endocr. 1987, *112,* 205-213.

Ashworth CS, Sales DI, Wilmut I: Evidence of an association between the survival of embryos and the periovulatory plasma progesterone concentration in the ewe. J. Reprod. Fert. 1989, *87,* 23-32.

Braden TD, King ME, Odde KG, Niswender GD: Development of preovulatory follicles expected to form short-lived corpora lutea in beef cows. J. Reprod. Fert. 1989, *85,* 97-104.

Carroll DJ, Barton BA, Anderson GW, Smith RD: Influence of protein intake and feeding strategy on reproductive performance of dairy cows. J. Dairy Sci. 1988, *71,* 3470-3481.

Castellanos R, Edqvist L-E: Evaluation of radioimmunoassay technique for the measurement of progesterone. Stencil. Dept. of Clinical Chemistry, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden, 1978, pp. 1-27.

Claus R, Karg M. Zwiauer D, Butler I von, Pirchner F, Rattenberger E: Analysis of factors influencing reproductive performance of the dairy cow by progesterone assay in milk fat. Brit. vet. J. 1983, *139,* 29-37.

Copelin JP, Smith MF, Keisler DH, Garverick HA: Effect of active immunization of pre-partum and post-partum cows against prostaglandin $F_{-2\alpha}$ on lifespan and progesterone secretion of short-lived corpora lutea. J. Reprod. Fert. 1989, *87,* 199-207.

Dieleman SJ, Bevers MM, Van Tol HTM, Willemse AH: Peripheral plasma concentrations of oestradiol, progesterone, cortisol, LH and prolactin during the oestrous cycle in the cow, with the emphasis on the perioestrous period. Anim. Reprod. Sci. 1986, *10,* 275-292.

Diskin MG, Niswender GD: Effect of progesterone supplementation on pregnancy and embryo survival in ewes. J. Anim. Sci. 1989, *67,* 1559-1563.

Dobson IT: Oestrus during pregnancy in the cow. Vet. Rec. 1989, *124,* 387-390.

Eldon J, Olafsson TH: The post-partum reproductive status of dairy cows in two areas in Iceland. Acta vet. scand. 1986, *27,* 421-439.

Eldon J: The post-partum ovarian activity of the Icelandic dairy cow. J. vet. Med. A 1988, *35,* 277-284.

Eyestone WH, Ax RL: A review of ovarian follicular cysts in cows, with comparison to the condition in women, rats and rabbits. Theriogenology 1984, *22,* 109-125.

Folman Y, Rosenberg M, Herz Z, Davidson M: The relationship between plasma progesterone concentration and conception in post-partum dairy cows maintained on two levels of nutrition. J. Reprod. Fert. 1973, *34,* 267-278.

Fredriksson G, Kindahl H, Sandstedt K, Edqvist L-E: Intrauterine bacterial findings and release of $PGF_{2\alpha}$ in the post-partum dairy cow. Zbl. vet. Med. A 1985, *32,* 368-380.

Garrett JE, Geisert RD, Zavy MT, Morgan, GL: Evidence for maternal regulation of early conceptus growth and development in beef cattle. J. Reprod. Fert. 1988, *84,* 437-446.

Gilbert CL, Lamming GE, Parkinson TJ, Flint APF, Wathes DC: Oxytocin inducion from day 10 after oestrus extends the luteal phase in non-pregnant cattle. J. Reprod. Fert. 1989, *86,* 203-210.

Gombe S, Hansel W: Plasma luteinizing hormone (LH) and progesterone levels in heifers on restricted energy intakes. J. Anim. Sci. 1973, *37,* 728-733.

Gustafsson H, Larsson K, Kindahl H, Madej A: Sequential endocrine changes and behaviour during oestrus and metoestrus in repeat breeder and virgin heifers. Anim. reprod. Sci. 1986, *10,* 261-273.

Kassa T, Ahlin K-Å, Larsson K: Profiles of progesterone in milk and clinical ovarian findings in post-partum cows with ovarian dysfunction. Nord. Vet.-Med. 1986, *38,* 360-369.

Kindahl H, Edqvist L-E, Bane A, Granström E: Blood levels of progesterone and 15-keto-13, 14-dihydro-prostaglandin $F_{2\alpha}$ during the normal oestrous cycle and early pregnancy in heifers. Acta Endocrinol. 1976, *82,* 134-149.

Kindahl H, Lindell J-O, Edqvist L-E: On the control of prodtaglandin release during the bovine estrous cycle. Effects of cloprostenol injections. Nord. Vet.-Med. 1980, *32,* 467-473.

Knutson RJ, Allrich RD: Influence of nutrition on serum concentrations of progesterone, luteinizing hormone and estrus behaviour in dairy heifers. J. Anim. Sci. 1988, *66,* 90-97.

Lafrance M, Goff AK: Effects of progesterone and oestradiol-$_{17\beta}$ on oxytocin induced release of prostaglandin F-$_{2\alpha}$ in heifers. J. Reprod. Fert. 1988, *82,* 429-436.

Larsson K, Janson L, Berglund B, Edqvist L-E, Kindahl H: Post-partum reproductive performance in dairy cows. I. Influence of animal breed and parity. Acta vet. scand. 1984, *25,* 445-461.

Lee CN, Critser JK, Ax RL: Changes of luteinizing hormone and progesterone for dairy cows after gonadotrophin-releasing hormone at first post-partum breeding. J. Dairy Sci. 1985, *68,* 1463-1470.

Mather EC, Camper M, Vahdat F, Whitmore HL, Gustafsson BG: Assessment of ovarian activity in the post-partum dairy cow by use of milk progesterone assay. Theriogenology 1978, *10,* 119-129.

Morrow DA, Roberts SJ, McEntee K: Post partum ovarian activity and involution of the uterus and cervix in dairy cattle. I. Ovarian activity. Cornell Vet. 1969, *59,* 173-190.

Nanda AS, Ward WR, Dobson H: Effect of endogenous nad exogenous progesterone on the oestradiol-induced LH surge in dairy cows. J. Reprod. Fert. 1988, *84,* 367-371.

Paisley LG, Mickelsen WD, Anderson PB: Mechanisms and therapy for retained fetal membranes and uterine infections of cows: a review. Theriogenology 1986, *25,* 353-381.

Putney DJ, Gross TS, Thatcher WW: Prostaglandin secretion by endometrium of pregnant and cyclic cattle at day 17 after oestrus in response to in-vitro heat stress. J. Reprod. Fert. 1988, *84,* 475-483.

Robinson NA, Leslie KE, Walton JS: Effect of treatment with progesterone on pregnancy rate and plasma concentration of progesterone in Holstein cows. J. Dairy Sci. 1989, *72,* 202-207.

Schallenberger E, Schams D, Meyer HHD: Sequence of pituitary, ovarian and uterine hormone secretion during the first 5 weeks of pregnancy in dairy cattle. J. Reprod. Fert. Suppl. *37,* 277-286.

Schirar A, Meusnier C, Paly J, Levasseur MC, Martinet J: Resumption of ovarian activity in post-partum ewes: Role of uterus. Anim. reprod. Sci. 1989, *19,* 79-89.

Sokal RR, Rohlf FJ: Biometry, 2nd ed., W. H. Freeman and Company, New York, 1981, 859 pp.

Spicer LJ, Echternkamp SE: Ovarian follicular growth, function and turnover in cattle: A review. J. Anim. Sci. 1986, *62,* 428-451.

Stevenson JS, Call EP: Reproductive disorders in the periparturient dairy cow. J. Dairy Sci. 1988, *71,* 2572-2583.

Wallace JM, Robinson JJ, Aitken RP: Does inadequate luteal function limit the establishment of pregnancy in the early post-partum ewe. J. Reprod. Fert. 1989, *85,* 229-240.

Zarco L, Stabenfeldt GH, Basu S, Bradford GE, Kindahl H: Modification of prostaglandin F-$_{2\alpha}$ synthesis and release in the ewe during the initial establishment of pregnancy. J. Reprod. Fert. 1988, *83,* 527-536.

Sammanfattning

Äggstocksaktiviteten hos mjölkkor efter partus och tidigt i dräktigheten: Evaluering baserad på progesteronprofiler.

Progesteronnivån i mjölk från 20 isländska mjölkkor studerades. Hormonmätningen gjordes fortlöpande under tiden från förlossningen i mjölkprov som samlades dagligen i 50-90 dagar efter partus och i 30-50 dagar efter dräktighetspunkten. Hos 40% av korna var längden på den första brunstcykeln efter partus kortare och progesteronnivån lägre en i normal brunstcycel. Den första lutealfasen var signifikant kortare och progesteronnivån var lägre än den andra och den tredje lutealfasen. Vid början av lutealfasen höjdes progesteronkurvan til en jämn nivå på genomsnitt mindre end 5±2 dagar men sjönk ved lutealfasens slut på 3±1 dagar. Progesteronnivån under en normal interlutealfas var i genomsnitt 1.5±1.3 nmol/l, men i 9 av 48 interlutealfaser sjönk progesteronnivån inte under 3 nmol/l. Progesteronnivån var i genomsnitt significant ökad under de första 30 dagarna i dräktigheten. Den sjönk significant 15-19 dagar efter dräktighetspunkten hos 4 av 20 kor. Resultaten visar at den första brunstcykelns aktivitet er förminskad relativt till de följande. Signifikant korrelation hittades för luteal intensitet mellan cykler. Brunstcykelns påverkan märkes even tidigt i dräktigheten hos, åtminstone, 20% av korna. Prövtagningsfrekvensen er av stor vigtighet när luteal aktiviteten studeras.

(Accepted October 8, 1990).

Reprints may be requested from: Jón Eldon, Institute for Experimental Pathology, University of Iceland, Keldur, P. O. Box 8540, IS-128 Reykjavik, Iceland.