ewes treated on G9. In conclusion, ewes with rapid and complete luteal regression, ovulation occurred from the dominant follicle of wave 2 when the animals are treated on days 7 and 9.

Key Words: follicles, prostaglandin, ultrasonography

T234 Endocrine function and follicular growth in sheep treated with exogen progesterone. L. F. Uribe Velásquez*[1], M. I. Lenz Souza[2], and A. Correa Orozco[1], [1]*University of Caldas*, *Manizales, Caldas, Colombia*, [2]*Federal University of Mato Grosso do Sul*, *Campo Grande, MS, Brazil*.

The effects of progesterone (P_4) on ovarian follicular growth and reproductive endocrinology were studied. Fourteen ewes, synchronized using prostaglandin ($PGF_{2\alpha}$), were randomly divided in two groups (n=7/group); control group and progesterone-treated group (CIDR) after ovulation (day zero). From one day before PG injection until day 10, ultrasonic scanning was carried out transrectally while the animals were fixed in a standing position using an Aloka SSD-500 with a 7.5 MHz for to establish follicular growth. Blood samples were collected from one day before PG until day 10 post-ovulation and serum concentrations of P_4 were determined by radioinmmunoassay. For profile of luteinizing hormone (LH) pulses, blood samples were collected at 30-min intervals for a period of 8h on days one and six. LH were determined by previously validated radioinmmunoassay. The growth rate was different between groups (P<0.001), being 0.91±0.15 and 0.70±0.16mm/d for control and treated group, respectively. Mean concentrations of P_4 (P<0.001) were different between treatments, with values on the day of maximum follicular growth of 3.82±0.17 ng/ml (control) and 5.56±0.56 ng/ml (treated). Mean plasma LH concentration and LH pulse amplitude there were no significant differences between groups (P<0.05). Differences in LH pulse frequency on day one (P<0.01) and day six (P<0.05) were observed (Table1). These data suggest that the inhibitory effects of exogen P_4 on the diameter of dominant follicle was mediated by reduced LH pulse.

Table 1. Mean LH concentrations (µg/L) and LH pulse frequency (pulse/8h) and amplitude (µg/L) on day one and day six of the estrous cycle (Mean ± SD).

Day	Group	Concentration	Pulse amplitude	Pulse frequency
1	Control	0.66±0.11 a	0.33±0.30 a	2.55±0.09 a
1	Treated	0.56±0.27 a	0.42±0.21 a	1.49±0.11 b
6	Control	0.68±0.11 A	0.87±0.30 A	2.20±0.09 A
6	Treated	0.58±0.27 A	0.70±0.21 A	1.22±0.11 B

Mean with different letters within columns differ: a vs b (P<0.01) y A vs B (P<0.05)

Key Words: follicular dynamic, LH, progesterone

T235 Real time PCR quantification of mRNA expression in the corpus luteum of cows induced to ovulate following different hormonal treatments. P. Ponce Barajas*[1,2], M. G. Colazo[1], J. P. Kastelic[3], M. K. Dyck[2], and D. J. Ambrose[1,2], [1]*Alberta Agriculture and Rural Development*, *Edmonton, AB, Canada*, [2]*University of Alberta, Dept of Agricultural Food and Nutritional Science*, *Edmonton, AB, Canada*, [3]*Agriculture and Agri-Food Canada*, *Lethbridge, AB, Canada*.

The objective was to determine if the expression of genes involved in steroidogenesis (StAR, P450scc) or otherwise relevant to CL function (NR3C1, VEGFA, FAS, EP2, PGHS2, SREBP1, OCT4, OXTR, and PGFR) differed among CL formed spontaneously or after ovulation induced with GnRH, porcine LH, or estradiol benzoate (EB). Twenty-four cows were induced to ovulate naturally without any treatment (Control; n=4) or with 1 of 4 treatments [12.5 mg pLH (n=4), 25 mg pLH (n=6), 100µg GnRH (n=5) or 1 mg EB (n=5)]. On Day 12 post ovulation, ovaries were surgically removed for the total RNA (1µg) purification from CL tissue sections using TRIzol®Plus kit for a two-step real-time Q RT-PCR analysis with Power SYBR® Green PCR Mix in a 7900HT Fast Real-Time PCR System. Data obtained as cycle threshold (C_T) value, were normalized in the comparative C_T method using a normalization factor of the geometric mean of three selected house keeping genes (H2AFZ, G3PDH and SDHA). Data were transformed with control group mean as calibrator (Vandesompele et al. 2002; Genome Biol. 3/7/research/0034). GLM procedure was used to analyze the data and comparison of means performed using the pdiff option in SAS. No statistical differences were evident in the expression of most genes analyzed. The expression of StAR in CL of cows induced to ovulate with 12.5 mg pLH tended (P<0.07) to be greater than in Control (1.94 vs. 1.00), whereas the expression of OXTR gene was lower in CL induced after EB and GnRH treatments, relative to Control (0.33 and 0.29 vs. 1.00; P<0.05).

Key Words: corpus luteum, gene expression

Production, Management and the Environment: Dairy

T236 A stochastic decision support system tool for dairy expansion. J. Janowski* and V. E. Cabrera, *University of Wisconsin*, *Madison*.

Study objectives included addressing specific producer needs during periods of herd growth and developing a stochastic decision support system tool employed for risk management in dairy production and expansion. Three million lactations from the past five years have been compiled in a database which includes monthly recordings of milk and component production, pregnancy status, and culling decisions. Simulation based on those records will guide the development of best management practices using identified performance measures as benchmarks.

Markov chain simulation assigns probabilities to predicted performance levels of individuals or groups of cattle within specific time periods. Creation of a decision support system tool with functions designed for modeling herd structure and production over time will allow users to run "what-if" analyses adapted to a wide variety of herd management and economic conditions. Four bred heifer purchasing strategies were evaluated over a 54-month period and income over variable cost calculations were conducted to identify optimal herd growth strategies for a herd that grew from 150 to 300 cows. A strategy which involved purchasing 98 bred heifers within the first three months of the expansion phase

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produced a 14% higher income over variable cost compared to mean values of all scenarios evaluated. Sensitivity analysis was conducted to further validate these results using price levels 10% above and below past five year averages for milk, culling, and bred heifer prices. Mean total income over variable costs for the optimal purchasing strategy during the 54-month term was $1,743,282 (SD = 457,117) or $5,267 (SD = $1,380) per cow. Although initial results indicate strong positive gains in income over variable costs for all growth strategies, facility and other capital investments were not considered in this study. Inclusion of these costs is subject to further development.

Key Words: decision support system, simulation, dairy expansion

T237 Airborne endotoxin concentrations at a large open lot dairy in Southern Idaho. R. S. Dungan and A. B. Leytem*, *USDA-ARS, Kimberly, ID*.

Endotoxins are derived from Gram-negative bacteria and are a potential respiratory health risk for animals and humans. To determine the potential for endotoxin transport from a large open lot dairy, total airborne endotoxin concentrations were determined at an upwind location (background) and five downwind locations on three separate days. The downwind locations consisted of the edge of the lot, 200 and 1,390 m downwind from the lot, and downwind from a manure composting area and wastewater holding pond. When the wind was predominantly from the west, the average endotoxin concentration at the upwind location was 24 (SE = 11) endotoxin units (EU) m^{-3}, while at the edge of the lot on the downwind side it was 259 (SE = 68) EU m^{-3}. At 200 and 1,390 m downwind from the edge of the lot, the average endotoxin concentrations were 168 (SE = 27) and 49 (SE = 9) EU m^{-3}, respectively. Airborne endotoxin concentrations downwind from the composting site and wastewater holding pond, and 1,390 m from the edge of the lot, were not significantly different than the upwind location. In addition, there were no significant correlations between ambient weather data collected and endotoxin concentrations over the experimental period. The downwind data show that the airborne endotoxin concentrations decreased exponentially with distance from the lot edge. Decreasing an individual's proximity to the dairy should lower their risk of airborne endotoxin exposure and associated health effects.

Key Words: endotoxin, dairy, lipopolysaccharide

T238 Iodine levels in Canadian bulk-tank milk. S. I. Borucki-Castro*[1], R. Berthiaume[1], S. Turcotte[2], A. Robichaud[2], and P. Lacasse[1], [1]*Dairy and Swine R&D Centre*, *Sherbrooke, QC, Canada*, [2]*Health Canada, Food Directorate, Health Products and Food Branch*, *Longueil, QC, Canada*.

A study was conducted, to determine concentration of iodine in bulk-tank milk and its relationship with milking and feeding management practices. Milk samples were collected from the bulk-tank of 501 farms across all provinces of Canada. In order to obtain further information about the farm's management, a questionnaire was completed by each of the selected farms. Total iodine concentration (organic and inorganic) of milk was determined using inductively coupled plasma mass spectrometry. Descriptive statistics and the analysis of the relationship between management practices and iodine levels were done using Student- t and ANOVA statistic tests. The mean iodine level in Canadian bulk-tank milk was 304 ± 8.4 µg/kg. There was a wide range of iodine concentrations (54 to 1,902 µg/kg), with a high coefficient of variation (61.7%). Analysis of the questionnaire′s data suggests that farms using

total mixed rations instead of component feeding produced higher milk iodine (340 vs. 269 µg/kg; P <0.001). Interestingly, neither usage of mineral supplementation nor the form of the supplementation affected iodine levels in milk. Washing the teats before milking was associated with lower concentrations of iodine (314 vs. 286 µg/kg; P = 0.09). Teat dipping before milking resulted in higher levels of iodine in bulk-tank milk (328 vs. 274 µg/kg; P< 0.001), but the form of application of the teat sanitizers appears important as spray applications (in line or hand spray) were associated with higher levels compared with the dip cup procedure (408 vs. 312 µg/kg; P < 0.05). As the vast majority of farms used teat dipping after milking, no significant association was found. However, its form of application appears important (P<0.01) averaging 296, 447 and 328 µg/kg for dip cup, in line spray and hand spray respectively. In conclusion, Canadian bulk-tank milk iodine concentration varies considerably and appears to be influenced by feeding and milking practices. *This research was supported by the Dairy Farmers of Canada.*

T239 Sicilian dairy herd demographics with a focus on culling. D. Galligan*[1], G. Azzaro[2], A. Pozzebon[2], S. Ventura[2], and G. Licitra[2,3], [1]*University of Pennsylvania, School of Veterinary Medicine*, *Kennett Square*, [2]*CoRFiLaC, Regione Siciliana*, *Ragusa, Italy*, [3]*D.A.C.P.A., University of Catania*, *Italy*.

Measuring culling is an important metric in managing a dairy herd. Basic, herd demographic data (number of cows, age, reproductive status, etc) and culling information (date of culling, reason for culling) was collected from 1999-2008, on the CoRFiLaC computer record system for dairy farms in the Hyblean region, Province of Ragusa, Sicily. Over the study period, a total of 403 dairy farms participated with 388 herds starting in 1999. Complete culling records (27,714) from 32,819 culled cows were examined and comparisons made to similar records from the US dairy NAHMS (2007) report. The top ranking reasons for culling (% of culled cows), reproductive inefficiency (28.8%), and mastitis (13.1%) matched in ranking the findings of the NAHMS for US dairy herds. Other reasons for culling included traumatic reticulitis 10.9%, low production 6.2%, and lameness 2.4%. Eight percent of culls occurred before 42 days in lactation. Four methods were used to estimate the annual culling rate/ herd: A) culled/calving per year, B) number culled/ (average of starting and ending population), C) number culled/(average of starting and ending + culls), and D) based on the average age of cows and heifers calving. These methods were compared to an epidemiological rate based on the (number annually culled/(sum of total cow days in the herd/365)). Equation B was symmetrical to the epidemiological rate, reflecting the limitations of estimating the average annual population on a beginning and ending point. Equation A over-estimated the culling rate, reflecting the fact that many cows have calving intervals greater then 12 months thus reducing their measured presence in the denominator. At very low culling levels, equation C was symmetrical around the epidemiological calculation but then underestimated the rate at higher levels.

Key Words: culling rate, management, dairy cattle

T240 The effect of pregnancy on milk fat percent. C. D. Dechow*[1], J. E. Vallimont[1], J. S. Clay[2], and C. G. Sattler[3], [1]*The Pennsylvania State University*, *University Park*, [2]*Dairy Records Management Systems*, *Raleigh, NC*, [3]*Select Sires, Inc.*, *Plain City, OH*.

The objective of this study was to estimate the effect of pregnancy on test day milk fat percent (TDFAT). Dairy Records Management Systems, Raleigh, NC, provided lactation records for 12,726 Holstein cows with

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