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## **Dry-off facilitator cabergoline hastened the GLUT-1 decrease and lactoferrin increase in the mammary tissue during drying-off in dairy cows**

Marion Boutinaud, Naomie Isaka, Audrey Deflandre, Sandra Wiart, Philippe Lamberton, Ana Isabel de Prado Taranilla, Vanessa Lollivier

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thelial and blood vessels within mammary tissue of cattle, sheep and goats, with distribution of subtype varying by cell-type and species. Furthermore, distribution of the receptors on mammary epithelial cells changes between lactating and nonlactating states.

**Key Words:** serotonin receptors, mammary gland, immunohistochemistry

### **T266 Effect of the supplementation of a functional additive in prepartal cows of two breeds on the level of IgG in colostrum.**

Angela Moreno and Claudia Ariza-Nieto\*, *Corporacion Colombiana de Investigacion Agropecuaria CORPOICA, Bogota, Colombia.*

The purpose of this study was to estimate the effect of supplementation of a functional additive during the last third of gestation in cows on the level of IgG in colostrum. Twenty-eight (28) Holstein and White Orejinegro (WON) cows were assigned to a randomized complete block design with 2 factors (breed and supplementation) with repeated measures (i.e., days of lactation). The supplementation factor included 3 treatments: CTL) Control without supplementation, S0) Supplement without additive, S1) Supplement with additive. Colostrum samples were obtained during the first 3 d of lactation for the determination of crude protein (CP), immunoglobulin G (IgG) and Brix grades. A correlation analysis between Brix grades and IgG was performed. Concentrations of IgG determined by the ELISA technique were strongly correlated with the percentages of Brix grades ( $n = 82$ ,  $r = 0.954$ ,  $P < 0.0001$ ), indicating that it can be used as an estimate of the concentration of IgG. The concentration of crude protein in colostrum was affected by the breed  $\times$  day interaction ( $P < 0.05$ ), it was lower in WON cows (10.3%) than Holstein cows (11.5%) on d 1, whereas on d 2 and 3 WON cows had greater concentrations of protein (5.9% and 6.5%, respectively) compared with Holstein cows (4.8% and 4.1%, respectively). There was a breed  $\times$  day  $\times$  supplementation interaction on colostrum IgG ( $P < 0.05$ ). On d 1, S1 cows of both Holstein (55.1 mg/mL) and WON breeds (47.3 mg/mL) had greater concentrations of colostrum IgG than CTL Holstein (44.4 mg/mL) and WON (32.5 mg/mL) cows. The decrease in colostrum IgG from d 1 to d 3 was greater in Holstein (95%) than in WON (86%) cows. It can be concluded that dietary supplementation with functional additives increased the colostrum concentration of IgG in both cow breeds.

**Key Words:** feed additive, cow, colostrum

### **T267 The effects of cabergoline administration at dry-off of lactating cows on udder engorgement, milk leakages, lying behavior, and udder health at calving.**

Alex Bach\*<sup>1,3</sup>, Naomi Isaka<sup>2</sup>, Audrey Deflandre<sup>2</sup>, and Anna Aris<sup>3</sup>, <sup>1</sup>ICREA (*Institució Catalana de Recerca i Estudis Avançats*), Barcelona, Spain, <sup>2</sup>CEVA Santé Animale, Libourne, France, <sup>3</sup>Department of Ruminant Production-IRTA, Celdes de Montbui, Spain.

Cabergoline is an ergot-derivative with high affinity for the D<sub>2</sub> dopamine receptors whose dopaminergic effects cause inhibition of prolactin (PRL) secretion, and thus it could be considered a molecule that acts as a potential dry-off facilitator. One hundred ninety-nine Holstein cows (102 primiparous; 97 multiparous) producing  $\geq 18$  kg/d at dry-off were split in 2 treatments with the objective of evaluating the effects of cabergoline at dry-off (between 70 and 50 d before the expecting calving date) on PRL secretion, udder engorgement, milk leakages, udder health at calving, and cow wellbeing after dry-off. Treatments consisted of a single i.m. injection of 5 mL of a solution containing 5.6 mg of cabergoline (CAB) or 5 mL of saline solution as a placebo (CTRL). Each animal was evaluated for presence or absence of milk leakages during the 4 d following

drying-off and udder engorgement determined using a digital algometer. Lying behavior was recorded during 10 d after drying-off. Twenty-five cows from each treatment were randomly chosen and blood sampled at 3 and 15 d after dry-off and at 5 and 3 d before the expected calving date to determine serum PRL concentrations. Data were analyzed using a mixed-effects model for repeated measures. Cows on CTRL had greater ( $P < 0.05$ ) serum PRL concentrations than cows on CAB at 3 and 15 d after dry-off. Cows on CTRL had a greater ( $P < 0.01$ ) udder engorgement ( $24.0 \pm 0.33$  Newtons) than cows on CAB ( $22.4 \pm 33$  Newtons) throughout the 4 d following dry-off, and it decreased ( $P < 0.05$ ) as days since dry-off increased. The overall incidence of milk leakage in cows on CAB ( $3.1 \pm 0.88\%$ ) was 73.5% of that obtained in cows on CTRL ( $11.7 \pm 1.64\%$ ); and cows on CAB had 0.2 lesser odds ( $P < 0.001$ ) to incur in milk leakage than cows on CTRL. The day following dry-off, CTRL cows lied about 1.5 h/d less ( $P < 0.05$ ) than cows on CAB. It is concluded that an i.m. administration of 5.6 mg of cabergoline at dry-off effectively reduces PRL secretion, udder engorgement, milk leakages, and improves lying time the day following dry-off.

**Key Words:** involution, mammary gland, prolactin

### **T268 Dry-off facilitator cabergoline hastened the GLUT-1 decrease and lactoferrin increase in the mammary tissue during drying-off in dairy cows.**

Marion Boutinaud\*<sup>1,2</sup>, Naomi Isaka<sup>3</sup>, Audrey Deflandre<sup>3</sup>, Sandra Wiart<sup>1,2</sup>, Philippe Lambert<sup>1</sup>, Ana Isabel De Prado Taranilla<sup>3</sup>, and Vanessa Lollivier<sup>1,2</sup>, <sup>1</sup>INRA UMR1348, Saint Gilles, France, <sup>2</sup>Agrocampus Ouest UMR1348, Rennes, France, <sup>3</sup>CEVA Santé Animale, Libourne, France.

In ruminants, the early phase of drying-off is a period of mammary gland involution where lactose secretion is inhibited and lactoferrin is stimulated. GLUT-1 is a glucose transporter that has a key role in supplying substrate for lactose synthesis. The analysis of the changes in lactose and lactoferrin contents in mammary secretions and in GLUT-1 and lactoferrin contents in the udder can provide valuable information about the speed of the mammary involution. To assess the effect of prolactin inhibition by cabergoline on udder involution, 14 Holstein dairy cows were injected with a single i.m. administration of 5.6 mg cabergoline ( $n = 7$ ) or placebo ( $n = 7$ ) within 4 h after the last milking the day of drying off (D0). After D0, hay and water ad libitum was supplied to the cows for 10 d. Mammary secretion samples, collected during lactation (D-6) and at D1, D2, D3, D4, D8 and D14 after the drying-off, were used for lactose and lactoferrin analysis. Mammary biopsy samples, collected at D-6, D1 and D8, were used for GLUT-1 mRNA and lactoferrin analyses. Lactose content of mammary secretions progressively decreased during involution, whereas their lactoferrin content increased. The change in lactose content was associated with paralleled change in GLUT-1 mRNA level in the udder. These decreases were faster in cabergoline treated cows compared with controls with lower lactose content in cabergoline treated cows already by D1 than in controls ( $P < 0.05$ ) and significant decrease in GLUT-1 mRNA levels at D1 and D8 respectively for cabergoline and control treatments compared with D-6 ( $P \leq 0.05$ ). The rise of lactoferrin content in mammary secretions was significant starting at D4 in the cabergoline treated cows ( $P \leq 0.05$ ) whereas it only happened at D8 in controls ( $P < 0.05$ ). Overall, cabergoline treatment decreased GLUT-1 mRNA level ( $P < 0.05$ ) and increased lactoferrin content ( $P = 0.10$ ). Similarly, lactoferrin immunostaining intensity in the mammary tissue was higher at D1 than at D-6 in cabergoline treated cows ( $P \leq 0.05$ ), whereas it tended to be higher only at D8 in controls ( $P < 0.10$ ). Our results indicate that cabergoline treatment was efficient to hasten the udder involution and therefore facilitates the dry-off.

**Key Words:** cow, drying-off, prolactin