# The Repeat Breeder Syndrome and its Associated Risk Factors in Québec Dairy Cows

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The repeat breeder syndrome has a major impact on herd reproductive performance. In Québec, reproductive problems are the most important causes of culling in the dairy industry. The objective of this study was to evaluate the occurrence and the risk factors associated with the repeat breeder syndrome (RBS) in Québec dairy cows and heifers.

Individual records of cows and heifers first bred in1996 from dairy herds on a computerized herd health program (DSA, version 4.2; Dossier de Santé Animale; *Animal Health Record*) were considered. Data were gathered from the ASTLQ (Amélioration de la Santé des Troupeaux Laitiers du Québec; *Quebec Dairy Herd Health Improvement*) data bank from all herds with acceptable data collection for reproduction and diseases over a 3-year period (for heifers, n=751) and with milk production data (for cows, n=330).

The RBS was defined as a pregnancy failure after three services. A cow was classified as repeat breeder if one or more of the following events was reported in the cow record after the third service: insemination, estrus, prostaglandin administration or non-pregnancy confirmed by a veterinarian. Animals culled or lost to follow-up before the third service were excluded, as well as individuals inseminated three times but lacking information about conception. The remaining animals were, by definition, at risk to become a repeat breeder. For inclusion in the analysis , cows had to be between 40 and 200 days in milk at first service and with available milk production records for the current lactation. Heifers included were between 10 to 26 months-old at the first insemination.

For cows, the diseases factors evaluated for potential association with RBS were dystocia, milk fever, retained placenta, ovarian cyst and uterine infections. For dystocia, cases included abnormal presentation of calf, calf extraction by producer or veterinarian, caesarean and foetotomy. For uterine infections, cases included endometritis, acute and chronic metritis, pyometra, mucometra and purulent discharge. Parity, calving season, days in milk (DIM) at first insemination and milk production were also examined and treated as categorical variables in a multiple regression logistic model. For heifers, age, season at first service and ovarian cyst were considered as independent variables.

Records from 11,105 cows and 8041 heifers were considered. Total incidence of RBS in cows and heifers were 14.6% and 4.4%, respectively. Table 1 shows variables that were significantly associated with RBS for cows. According to our results, cows with uterine infec-

**Table 1.** Variables significantly associated with the repeat breeder syndrome in dairy cows (n = 11,105)

| Variables | p | Odds ratio |
|---|---|---|
| Uterine infection | >0.01 | 1.90 |
| Ovarian cyst | >0.01 | 2.22 |
| Calving season | | |
| winter[a] | reference level | |
| summer[b] | 0.39 | 1.06 |
| fall[c] | 0.05 | 1.16 |
| Days in milk at 1st service | | |
| 40 to 79 | reference level | |
| 80 to 119 | >0.01 | 0.76 |
| > 119 | >0.01 | 0.38 |
| Milk production (kg/305days) | | |
| 5000 to 6500 | reference value | |
| 6500 to 8000 | >0.01 | 1.42 |
| 8000 to 9500 | >0.01 | 1.80 |
| >9500 | >0.01 | 2.55 |

[a] From January 1st to April 30th.
[b] From May 1st to August 31th.
[c] From September 1st to December 31th.

tions or ovarian cyst were twice as likely to become repeat breeder than others. Cows who calved in the fall were slightly more at risk than those who calved in the winter. Also, the risk of becoming a repeat breeder decreased as DIM at first breeding increased and was positively associated with milk production. No direct association was detected between RBS and complications at parturition, parity, milk fever and retained placenta. For heifers, all of the three independent variables considered influenced the occurrence of RBS (Table 2). Heifers first inseminated between 20 to 26 months of age were at lesser risk to develop RBS than those who were first bred between 10 to 14 months of age. Our results also suggest that heifers first bred during summer have more chances to become repeat breeder than those first bred in winter. As with cows, ovarian cyst diagnosis was strongly associated with RBS in heifers.

Considering that the average conception rate is around 45%, we should expect that approximatively 15% of cows will require three or more services to conceive. Therefore, to significantly reduce the impact of RBS in a herd, emphasis should be put on herd management to improve conception rate, more specifically by decreasing uterine infections and ovarian cysts.

**Table 2.** Variables significantly associated with the repeat breeder syndrome in dairy heifers (n = 8041).

| Variables | p | Odds Ratio |
|---|---|---|
| Age at first service (months) | | |
| 10 to 14 | reference level | |
| 14 to 20 | 0.1128 | 0.7 |
| 20 to 26 | 0.0015 | 0.4 |
| Season at 1st service | | |
| winter[a] | reference level | |
| summer[b] | 0.0335 | 1.3 |
| fall[c] | 0.2047 | 1.2 |
| Ovarian cyst | 0.0001 | 5.0 |

[a] From January 1st to April 30th.
[b] From May 1st to August 31th.
[c] From September 1st to December 31th.