



Evolution of mature size, mature production, and the relative maturity and performance during the first two lactations of DHI-registered Holsteins in Quebec

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Introduction

Average milk production per cow has risen progressively in past years (Brito et al., 2021).

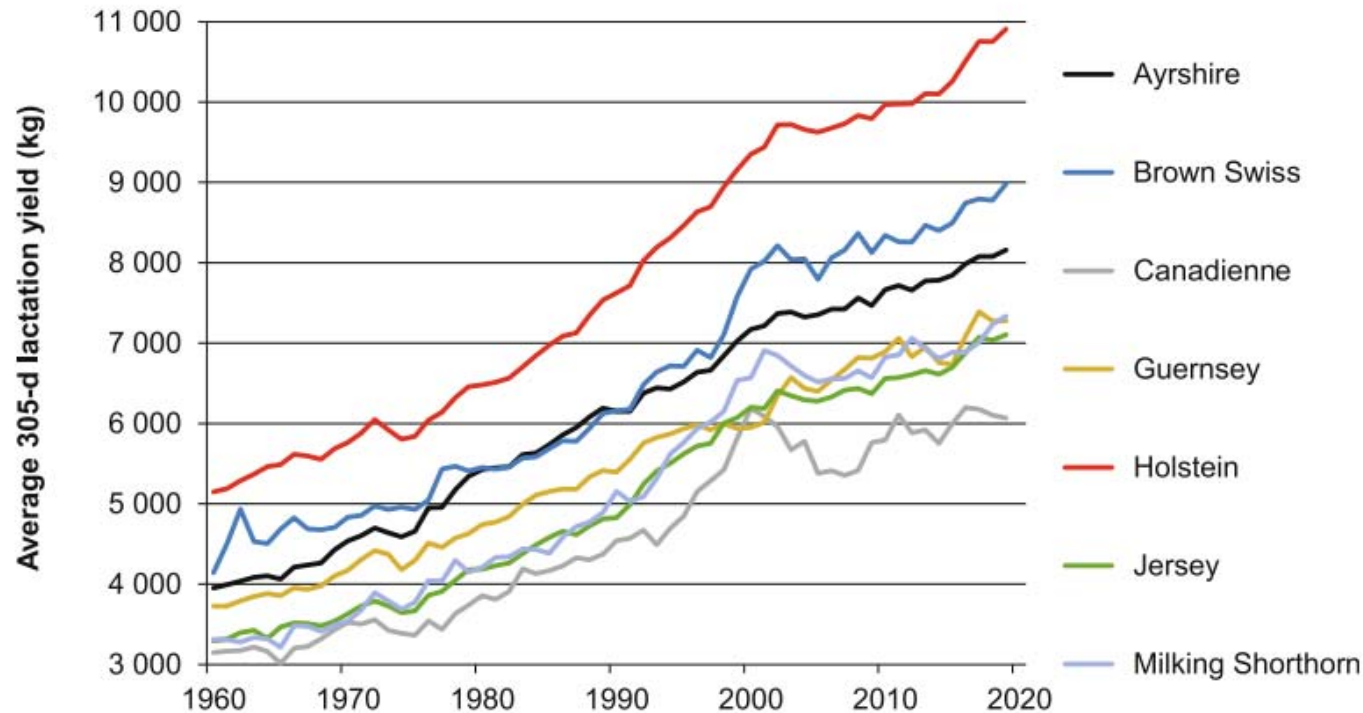
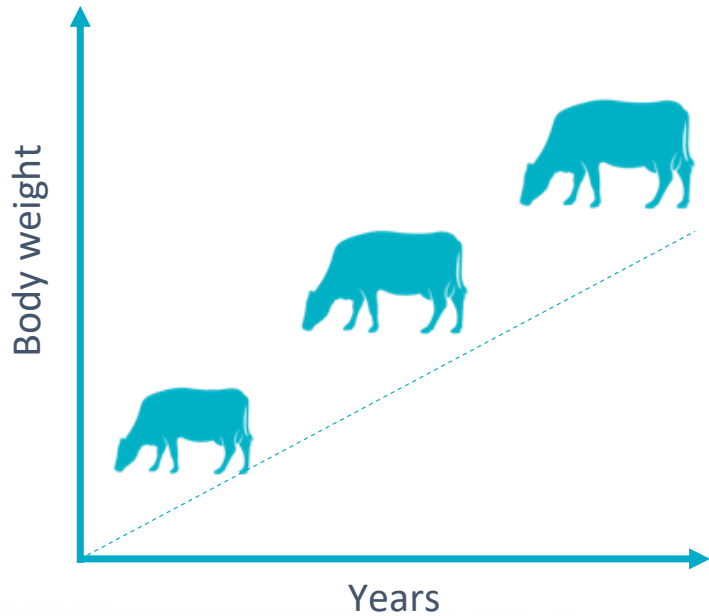


Fig. 2. Average 305-d lactation milk yield (kg) in dairy cattle breeds in Canada (thicker lines indicate the main worldwide dairy breeds). Data source: Canadian Dairy Information Centre, 2020 (www.dairyinfo.gc.ca).

Introduction



- Size of dairy cows has also increased over the years.
- Magnitude of the increase in BW and its relationship with productivity has been little studied.

Objective

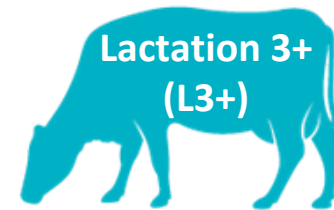
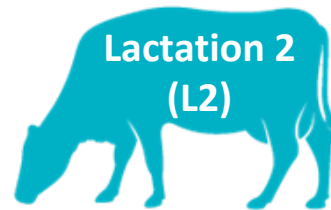
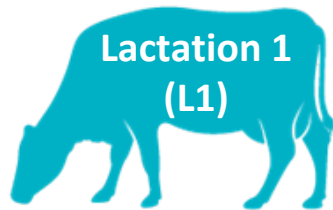
To describe the evolution over the last two decades of the mature body weight and production and the relative maturity (RMAT) and performance (RPER) during the first two lactations of Holstein cows.



Material and methods



- Data from 2002 to 2021 was extracted from Lactanet database



✓ Age at first calving (AFC)

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- ✓ 305-d adjusted milk and component yields
 - ✓ Body Weight (BW)

Material and methods

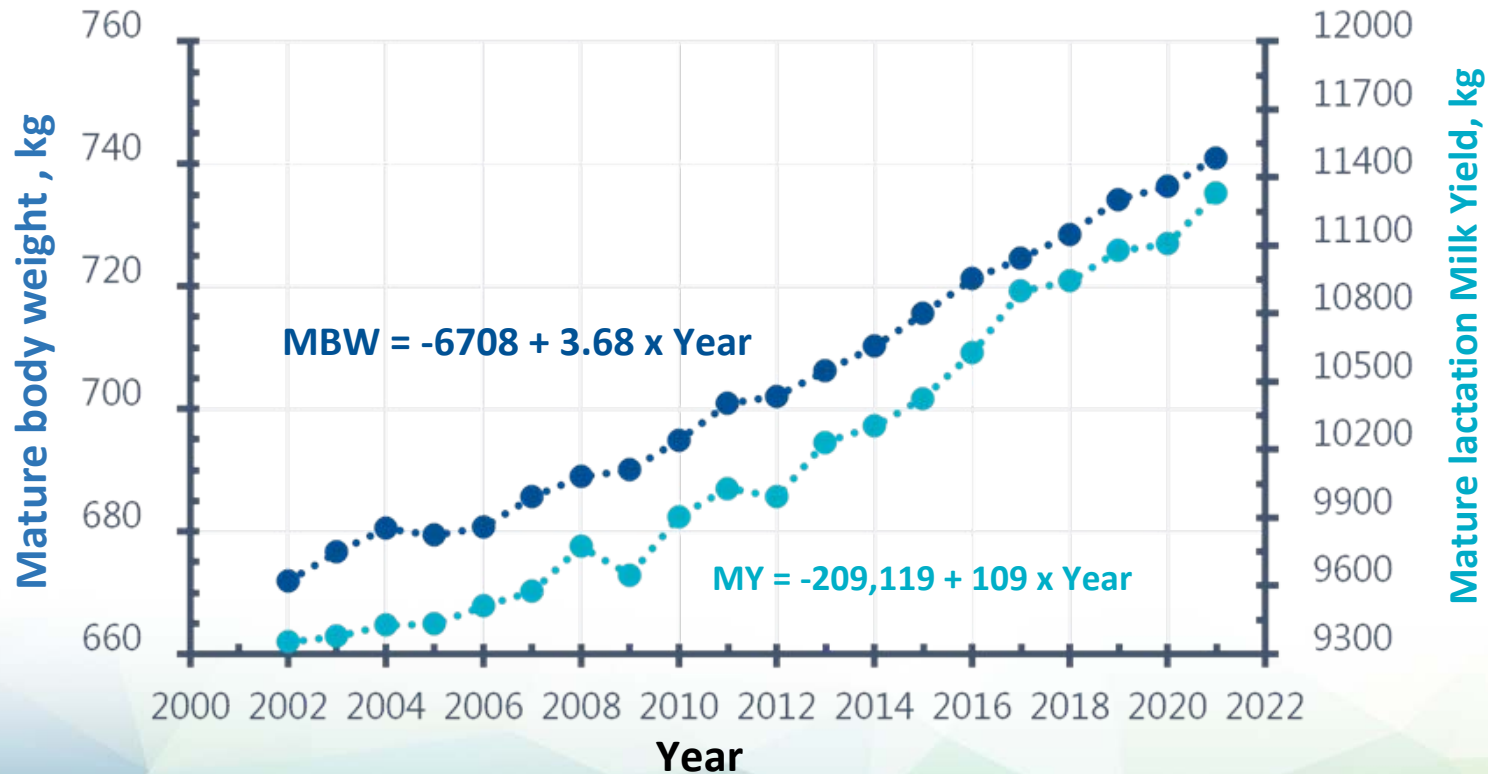
Table 1. Total number of records per variable and parity

Variable	L1	L2	L3+
AFC	1,413,772	-	-
BW	565,710	713,668	1,152,530
305-d yields	1,334,433	1,031,024	1,538,492

- The L3+ cows were considered as mature and used as the reference to evaluate the relative maturity (**RMAT**) and performance (**RPER**) of L1 and L2 cows.
- Data from L3+ cows and AFC were regressed against time while RMAT and RPER were analyzed using a fixed effect model including year, parity, and their interaction.

Results

Evolution of body weight and milk production



2021 averages



BW = 738 ± 1.2 kg



MY = $11,184 \pm 56$ kg

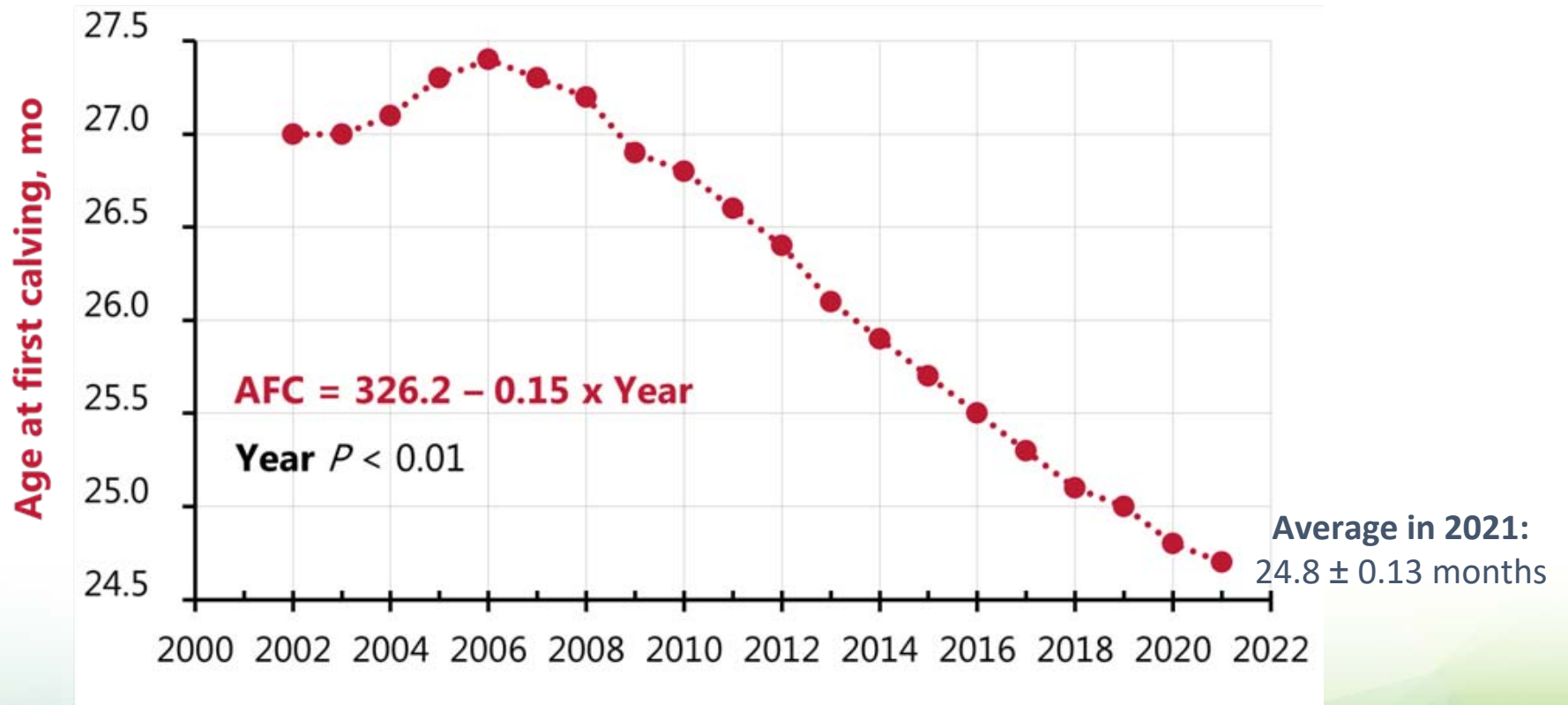


FY = 447 ± 2.6 kg

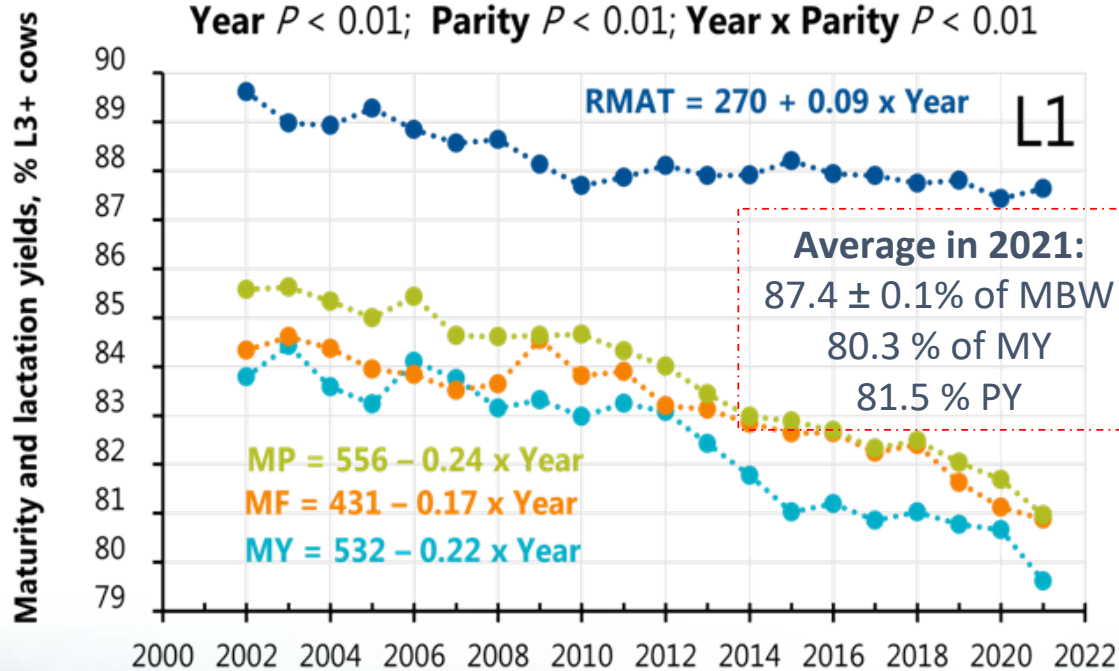
PY = 364 ± 2.8 kg

Results

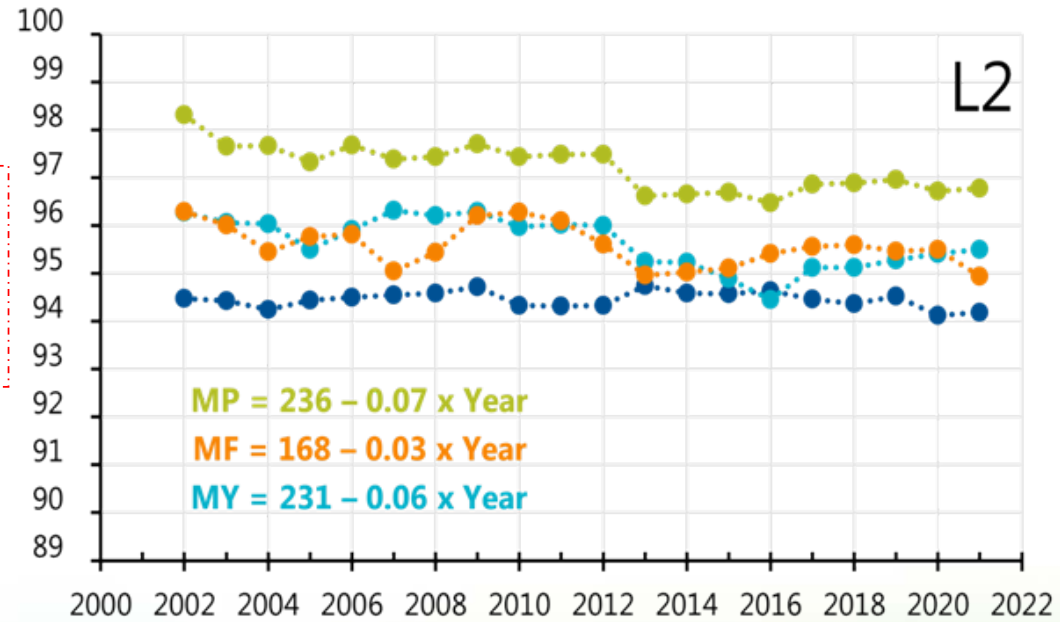
Evolution of age at first calving



Results



Relative maturity decreased over time for L1 cows
Faster decline for MY and PY



Relative maturity did not change over time for L2 cows

Conclusion and implications

- Significant progress has been made on AFC and mature lactational performance.
- The increase in mature performance has been accompanied with an increase in mature BW.
- The RPER has declined over time, especially PY and MY for L1
- The decline in RPER of L1 and L2 cows does not correspond to the evolution of their RMAT.
- The decrease in RMAT of L1 cows does not follow the same pattern as that of AFC.
- The decline in RPER should be further explored and addressed. Management and nutritional factors could be limiting the performance of L1 and L2 cows.

Acknowledgements



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Thank You

