# Maternal age but not parity affected daughter's fertility during first lactation



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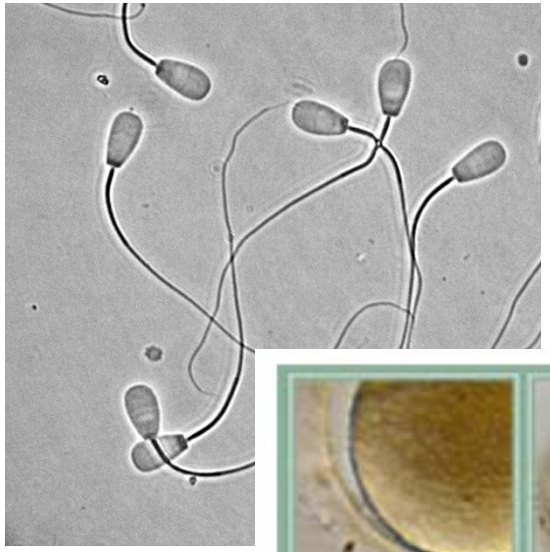
# INTRODUCTION

-Lack of nutrients
-Healthy/diseased progeny?



DNA methylation

Embryo differentiation

(Reik 2007)

Pregnancy

+

Milk production

**High nutrient demands**

Epigenetic effects?

# MATERNAL EFFECTS

**Younger vs older cows**

*Cows born from younger mothers*

*- greater milk production*

(Astiz et al., 2014)

**Lactating vs non lactating cows**

*Cows born to mothers that were lactating while pregnant*

*- lower milk production*
*- shorter productive life*
*- lower metabolic efficiency*

(Gonzalez-Recio et al., 2012)

**… on reproductive efficiency ?**

The **aim** was to determine impacts of maternal parity (heifer *vs* cow) and age (AGE) or days in milk (DIM) at conception on:

- reproductive performance
- 305-d milk yield (mature equivalent) of first-lactation female offspring

# MATERIAL & METHODS

- Retrospective observational study
- Edmonton, Canada (DRTC)
- Data obtained from female offspring of 599 dams (214 heifers and 385 cows).



- *Independent variables:*

  maternal parity (cow vs heifer)
  dam's DIM (cows) or AGE (heifers) at conception.

- *Dependent variables* for each female offspring:

**Reproductive performance**

prior to and during first lactation

conception rate to first AI
interval from { birth to conception
calving to conception

**Milk production**

305-d ME of first lactation



Data were analyzed using ANOVA, $Chi^2$ and Kaplan-Meier survival analysis

# RESULTS

**Reproductive performance**

Table 1. Effect of maternal parity (heifer vs cow) on reproductive performance of Holstein female offspring.

| | HEIFERS (n=599) | |
|---|---|---|
| DAM | CR after first AI (%) | Birth to conception (d) |
| Heifer | 59.8 | 455.3± 4.2 |
| Cow | 64.2 | 448.5± 2.9 |

# However, when AGE was considered…

**Reproductive performance**

Table 2. Effect of maternal AGE (heifers) and DIM (cows) at conception on fertility of offspring during first lactation.

| DAM | | FIRST LACTATION | |
|---|---|---|---|
| | | Pregnant after first AI (n=171) | Non-pregnant after first AI (n=311) |
| Heifer | Maternal AGE at conception (d) | **421.7±4.1[a]** | **437.6±3.5[b]** |



[a,b] Within category, values without a common superscript differed ($p<0.01$)

Milk production

# Effect of maternal parity

8995.2±128.2 kg vs 8655.2±88.9 kg

Heifer's offspring

Cow's offspring

(p=0.02)

**1.1 kg/d**

# CONCLUSIONS

- No significant effect of maternal parity on reproductive performance.

- **Primiparous offspring of younger heifers were more likely to become pregnant after first AI during first lactation.**

- **Daughters of heifers produced more milk during first lactation.**

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