Impact of post-weaning feeding management during the growing phase on growth performance of Holstein steers and beef × Holstein steers and heifers

Erika E. Cornand[1,2*], Stephanie A. Terry[2], and Gregory B. Penner[1]

*PhD student; [1]Department of Animal & Poultry Science, University of Saskatchewan, Saskatoon, SK

[2]Lethbridge Research and Development Centre, Agriculture and Agri-Food Canada, Lethbridge, AB

Background

- Crossbreeding beef sires to dairy cows:
  - Greater market value compared to straightbred Holstein calves (McCabe et al., 2022)
  - Improvements in growth, feed efficiency, and carcass characteristics compared to Holstein steers (Foraker et al., 2022); however, greater proportions of liver abscesses have been reported

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Beef x dairy calves born with no GHG contribution.

Potential C-transfer credits available but we need to quantify the difference

Rearing of calves

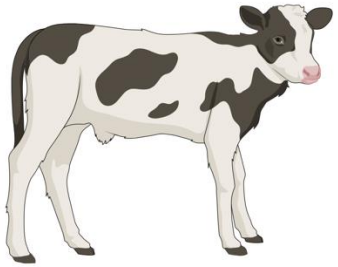
- Producers may choose to retain ownership, selling backgrounded or finished calves
  - Opportunity to sell TMR to the calf rearing operation
    - Providing a slow growth period may increase carcass size
    - Dressing percentage concerns with dairy-influenced beef (Foraker et al., 2022)
  - Feeding high grain diets are likely to increase growth and feed efficiency
    - May be related to high rates of liver abscesses in dairy and dairy-influenced cattle
- Little data available comparing calf performance and carcass characteristics

Objectives

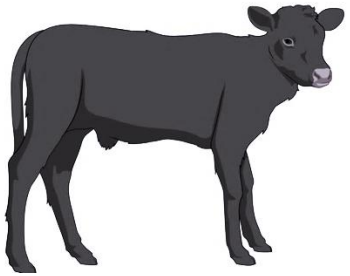
1. Determine the effects of rate of gain, breed, and sex on:
   - ❖ Feed intake and efficiency
   - ❖ Growth
     - ○ ADG and body measurements (hip height and body length)
   - ❖ Welfare indicators
   - ❖ Days on feed

Treatments

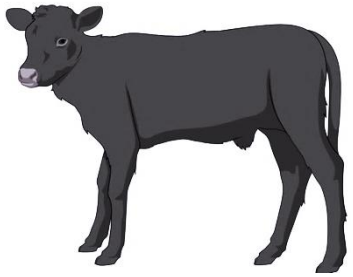
40 Holstein
Steers



40 beef × Holstein
Steers

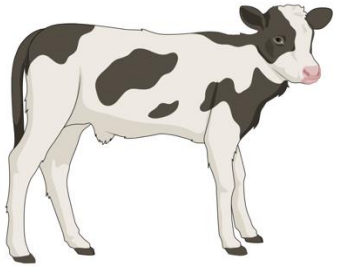


40 beef × Holstein
Heifers



Treatments

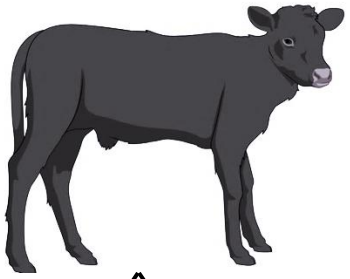
40 Holstein
Steers



n = 20
Moderate Gain
BWi = 194 ± 25

n = 20
Rapid Gain
BWi = 191 ± 22

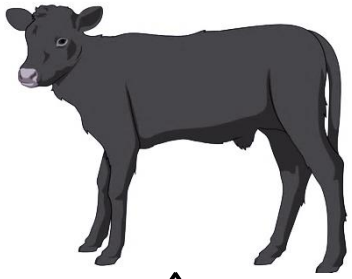
40 beef × Holstein
Steers



n = 20
Moderate Gain
BWi = 215 ± 22

n = 20
Rapid Gain
BWi = 215 ±21

40 beef × Holstein
Heifers



n = 20
Moderate Gain
BWi = 201 ± 14

n = 20
Rapid Gain
BWi = 206 ± 17

Treatments

- Moderate growth (MG) group:
  - Target growth rate – **1.2 kg/d** during the growing phase
    - Until 70% reach 350 kg BW
  - 17% barley, **63% corn silage**, 15% canola meal, and 5% supplemental mash
    - 28% starch, 15% CP
- Rapid growth (RG) group:
  - Target growth rate – **1.9 kg/d** during the growing phase
    - Until 70% reach 350 kg BW
  - **78% barley**, 12% corn silage, 5% canola meal, and 5% supplemental mash
    - 48% starch, 15% CP

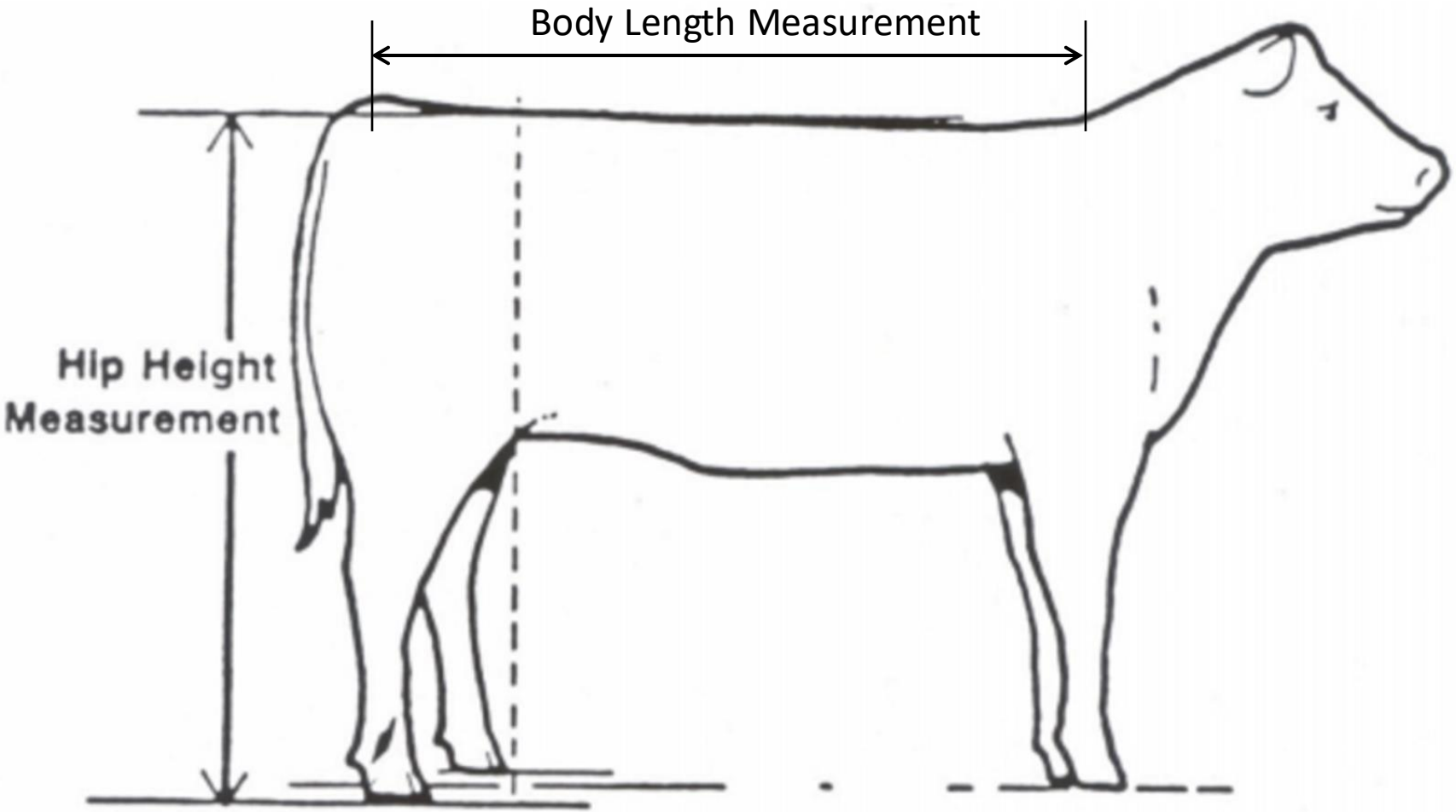
Materials & methods

Moderate growth group

Rapid growth group

- Weekly feed intake
- BW + body measurements (hip height & body length) every 28 d

Body measurements



Source: (Fuerniss et al., 2023)
Image: https://guidelines.beefimprovement.org/index.php/Hip_Height/Frame

Preliminary Results
Growing Phase

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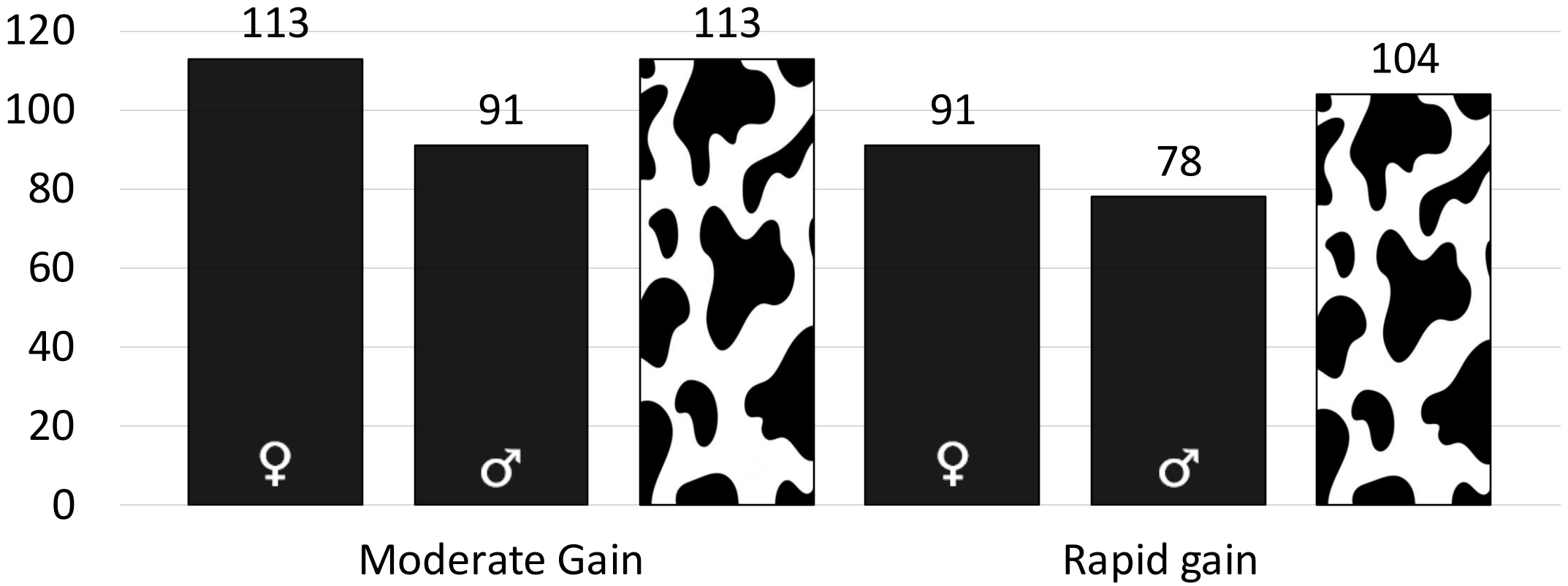
Rapid growth reduces days to 70% of calves reaching 350 kg BW and steers are faster than heifers



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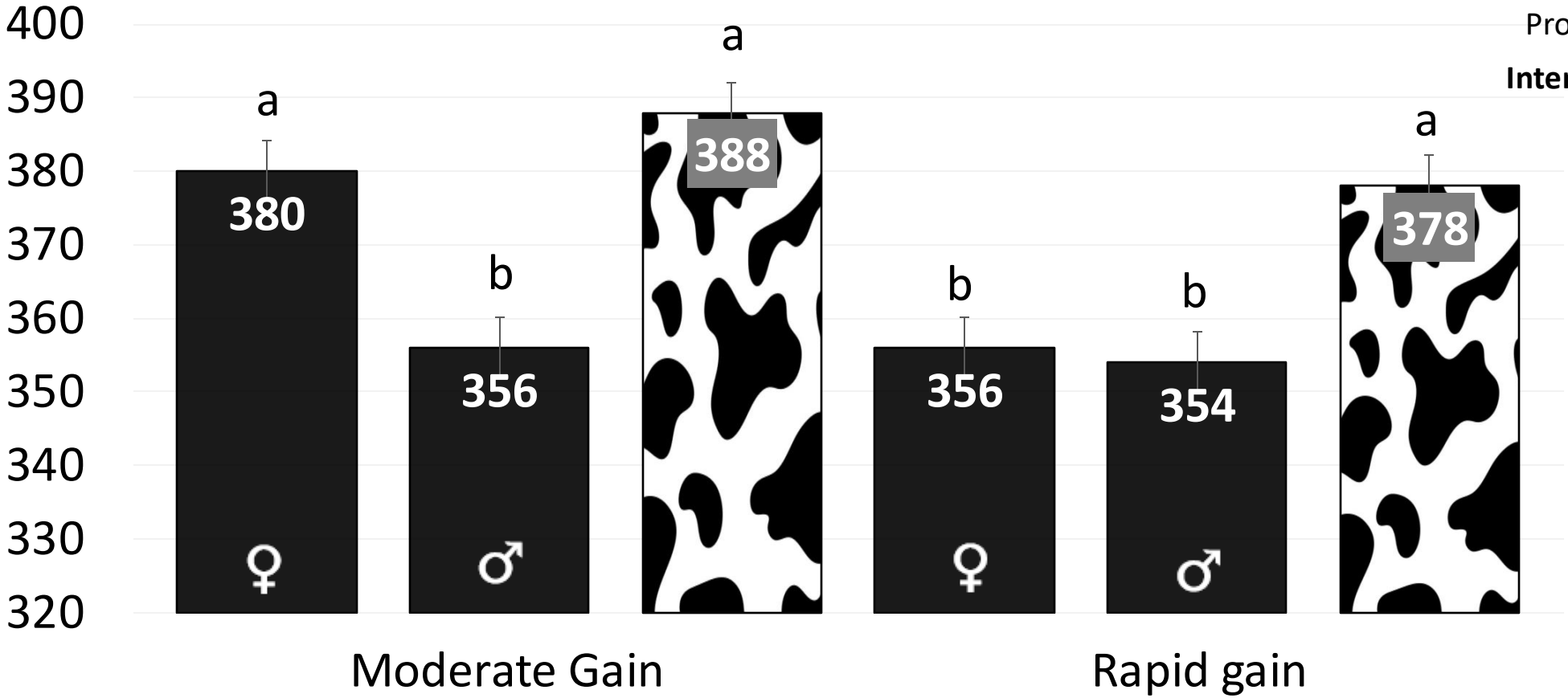
While we targeted 70% of the calves achieving 350 kg, there were differences in the average weight at the end of the growing phase.

Breed/sex, $P < 0.01$

Program, $P < 0.01$

Interaction, $P = 0.03$



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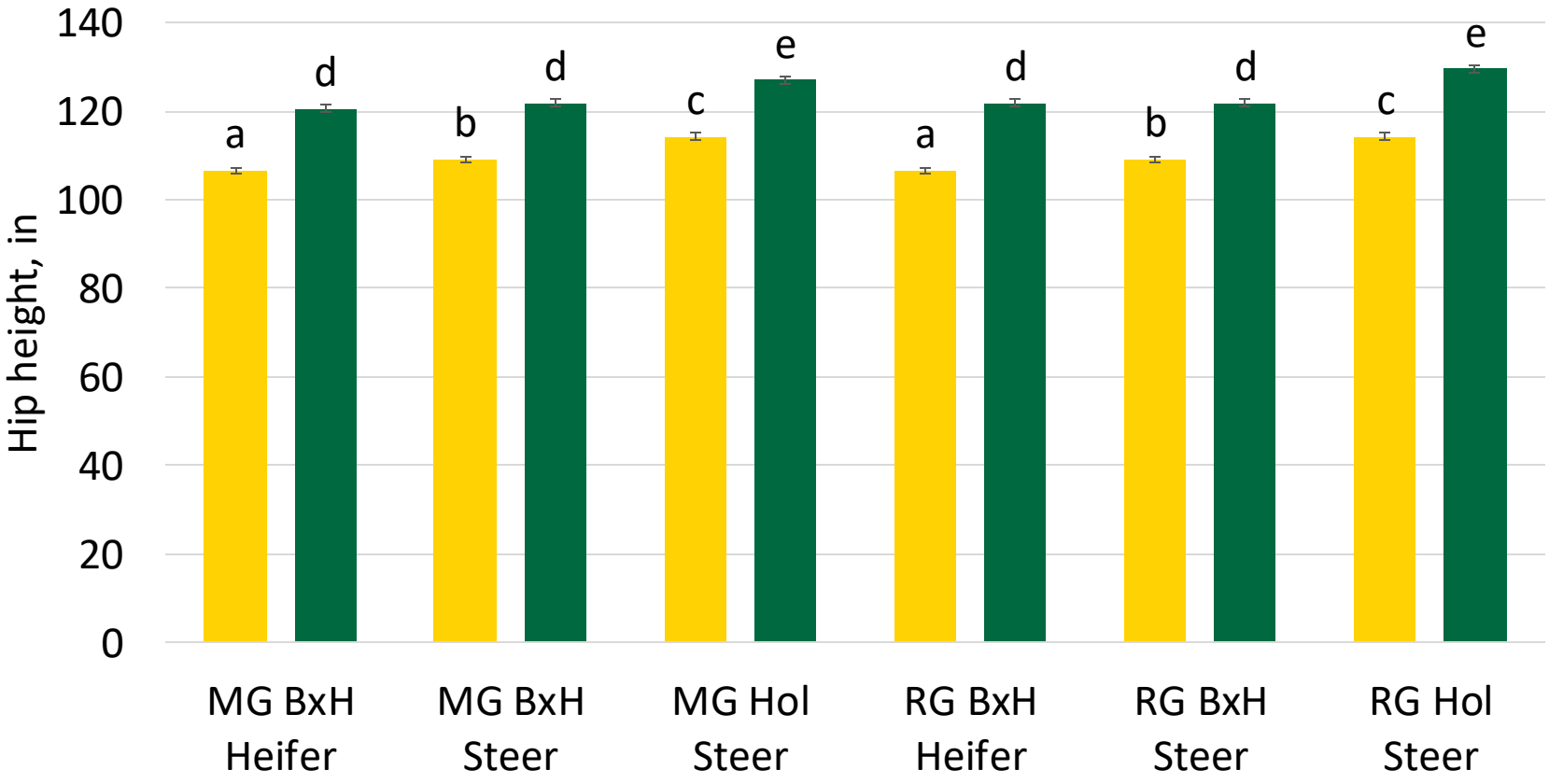
Holstein steers had taller hip height than beef × dairy calves



Start hip height:
Breed/sex, *P* < 0.0001
Program, *P* = NS
Interaction, *P* = NS

End hip height
Breed/sex, *P* = 0.0018
Program, *P* = NS
Interaction, *P* = NS

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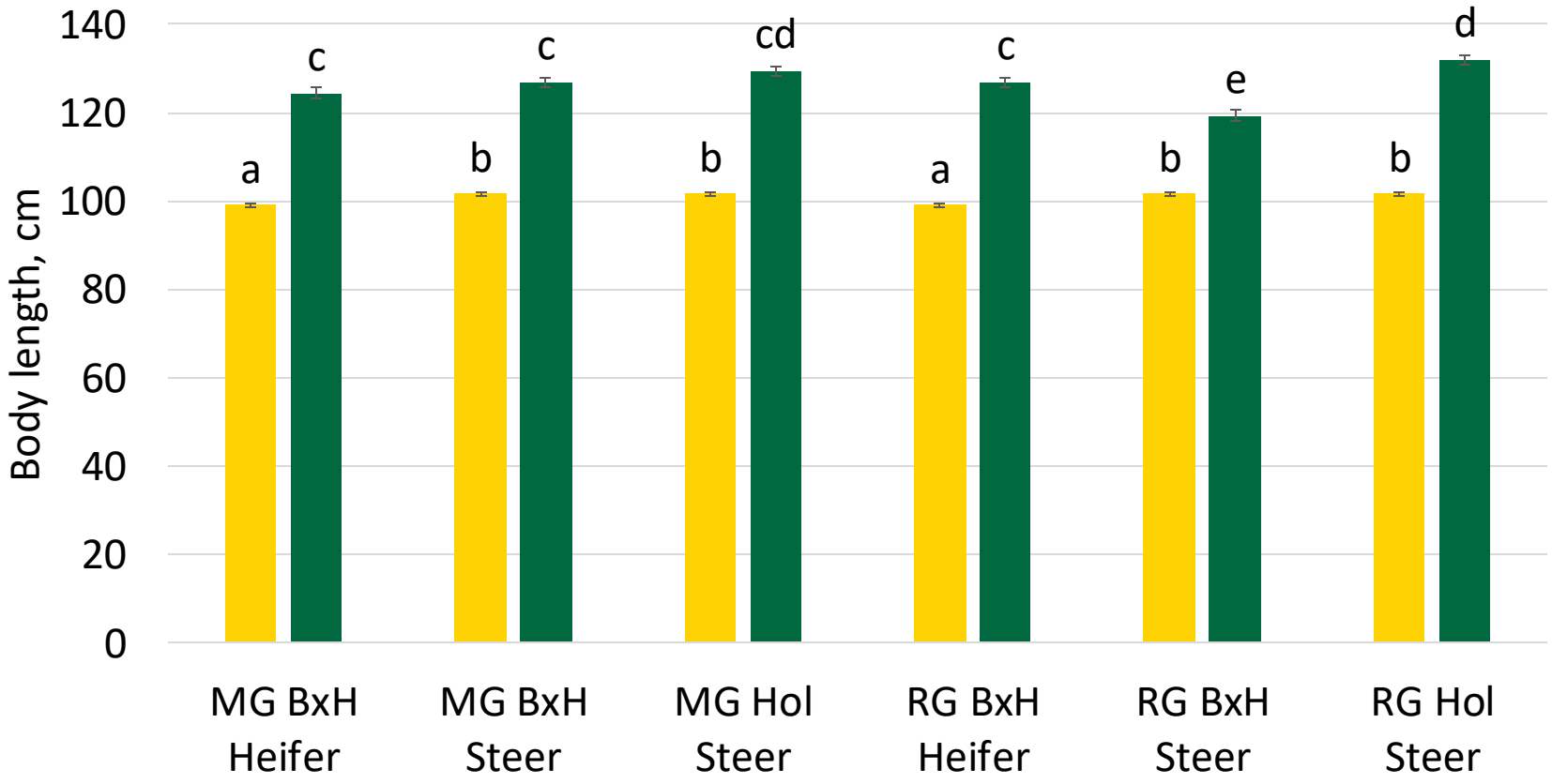
Within rapid growth, beef × dairy steers had the shortest body length while Holstein steers had the longest



Start body length:
Breed/sex, *P* < 0.0001
Program, *P* = NS
Interaction, *P* = NS

End body length:
Breed/sex, *P* < 0.0001
Program, *P* = NS
Interaction, *P* < 0.0001

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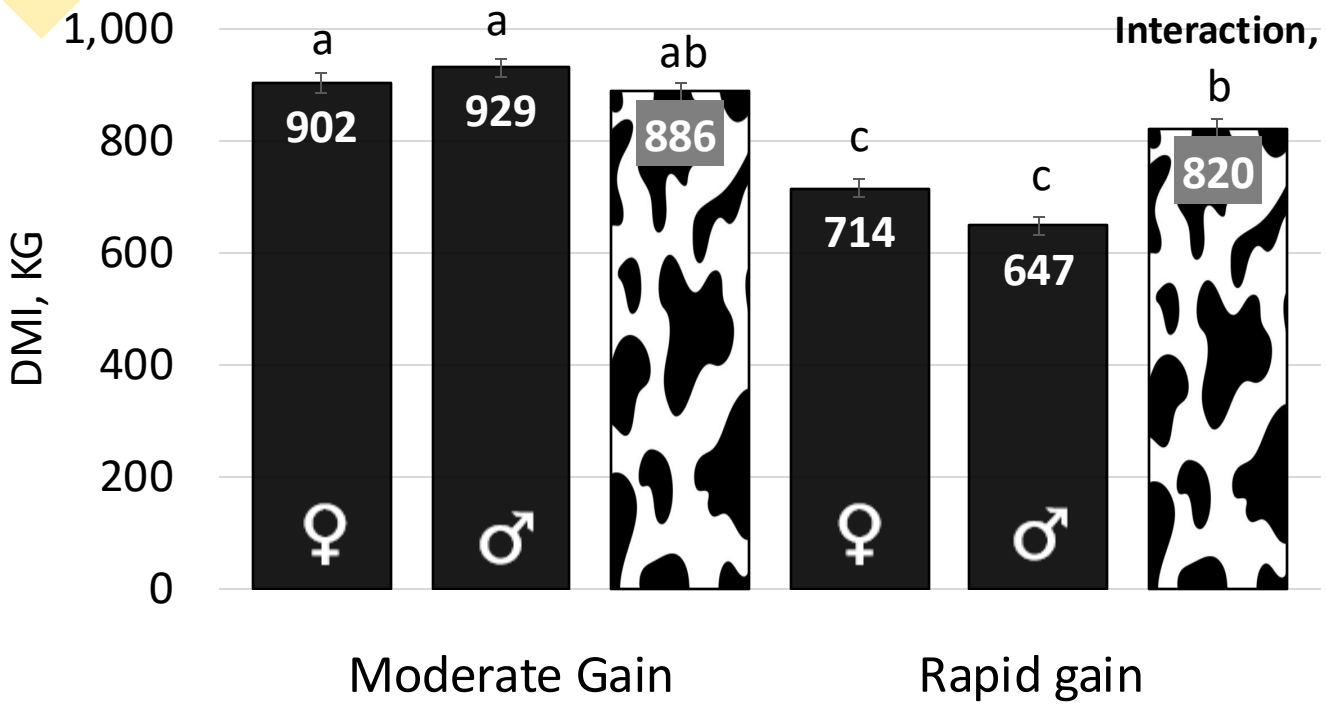
Cumulative Dry Matter Intake

Breed/sex, $P < 0.01$

Program, $P < 0.01$

Interaction, $P < 0.01$

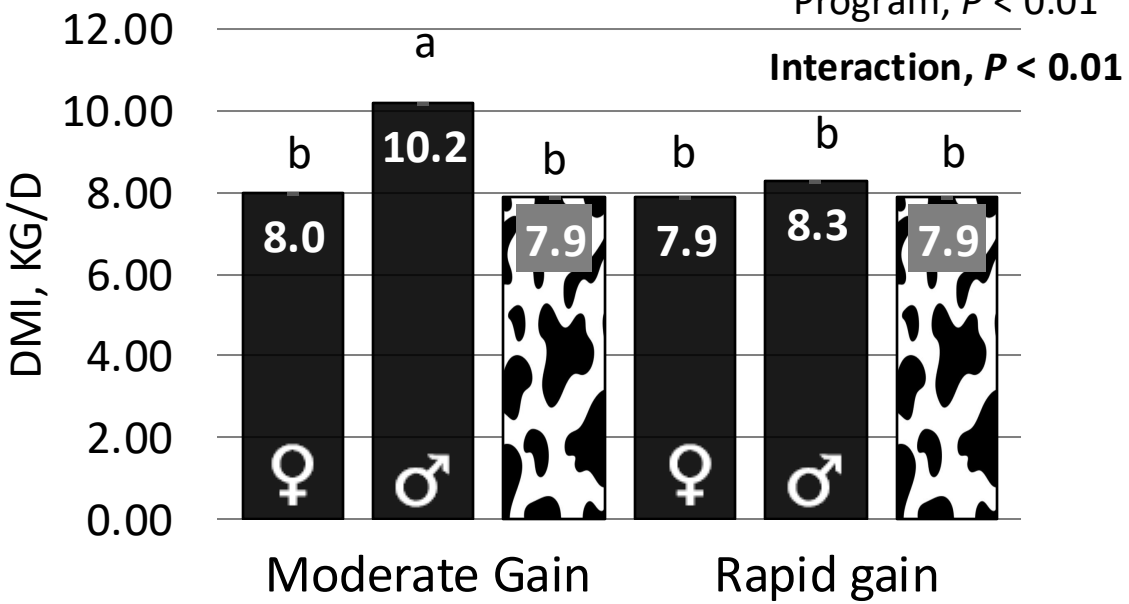


Beef × dairy steers eat more than other calves on MG

Breed/sex, $P < 0.01$

Program, $P < 0.01$

Interaction, $P < 0.01$



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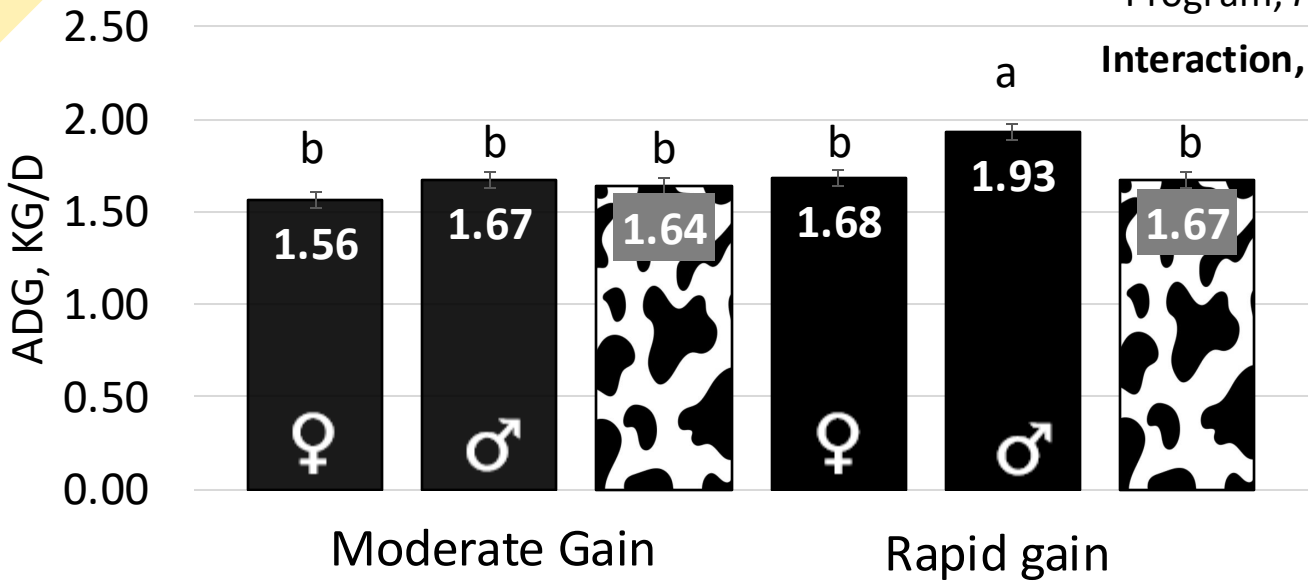
Average Daily Gain

Breed/sex, $P < 0.01$

Program, $P < 0.01$

Interaction, $P = 0.03$

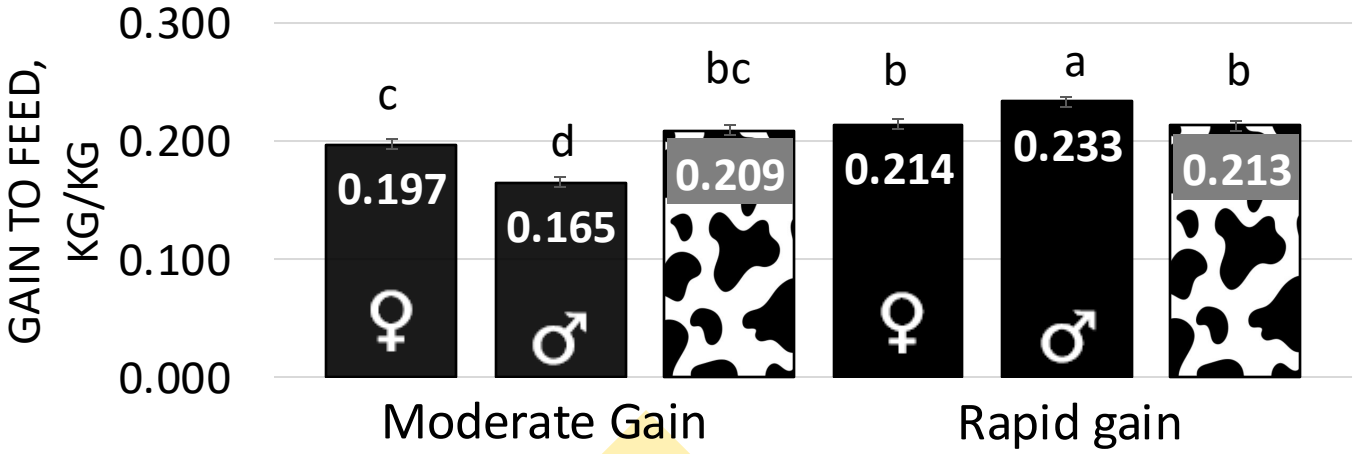


Gain to Feed ratio

Breed/sex, $P = 0.02$

Program, $P < 0.01$

Interaction, $P < 0.01$



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Cost Analysis

Group	MG BxH steer	MG BxH heifer	MG Hol steer	RG BxH steer	RG BxH heifer	RG Hol steer
Feed, $/hd/d	$2.11	$1.67	$1.66	$1.80	$1.64	$1.78
Yardage, $/hd/d	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53
Total cost, $/hd/d	$2.64	$2.20	$2.19	$2.33	$2.17	$2.31
Total cost, $/hd	$240.61	$248.95	$247.84	$181.63	$197.61	$239.98

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Implications

- Feeding RG reduced DOF during the growing phase (until 70% breed/sex reached 350 kg BW)
  - Value of TMR/forages
  - Space in barns
- Stay tuned for finishing phase and carcass trait results

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Questions?

Erika Cornand, MSc
PhD student
Department of Animal & Poultry Science,
Usask; Research Affiliate Program,
Lethbridge RDC, AAFC Lethbridge

erika.cornand@agr.gc.ca
erika.cornand@usask.ca

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