

Does low RFI in the drylot mean low RFI on pasture?

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Objectives:

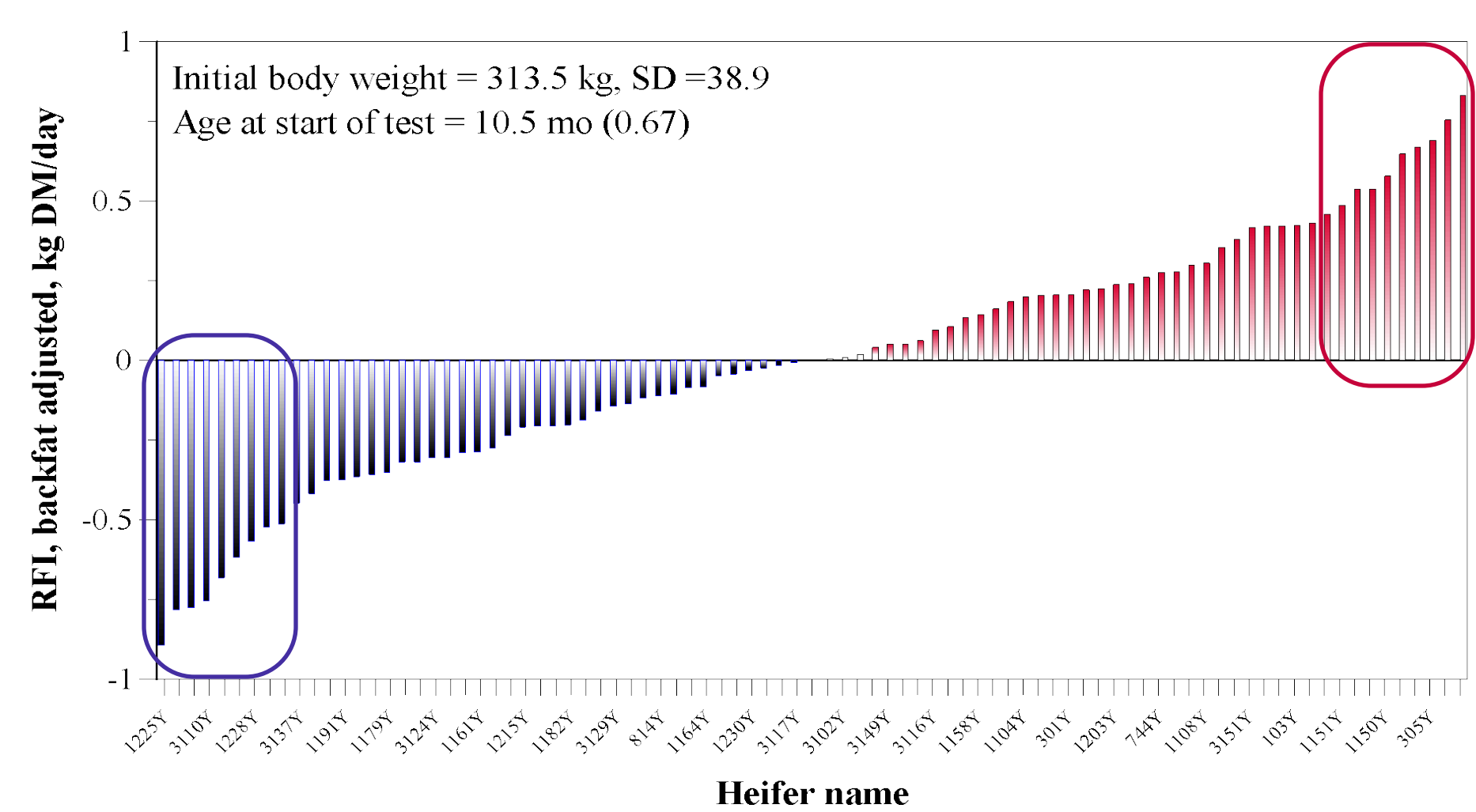
- To determine if RFI_{fat} measured in replacement heifers under drylot conditions relates to their feed intake and performance as bred heifers under summer grazing conditions.
- To measure enteric methane emissions from low and high RFI_{fat} bred heifers under summer grazing conditions.

Background:

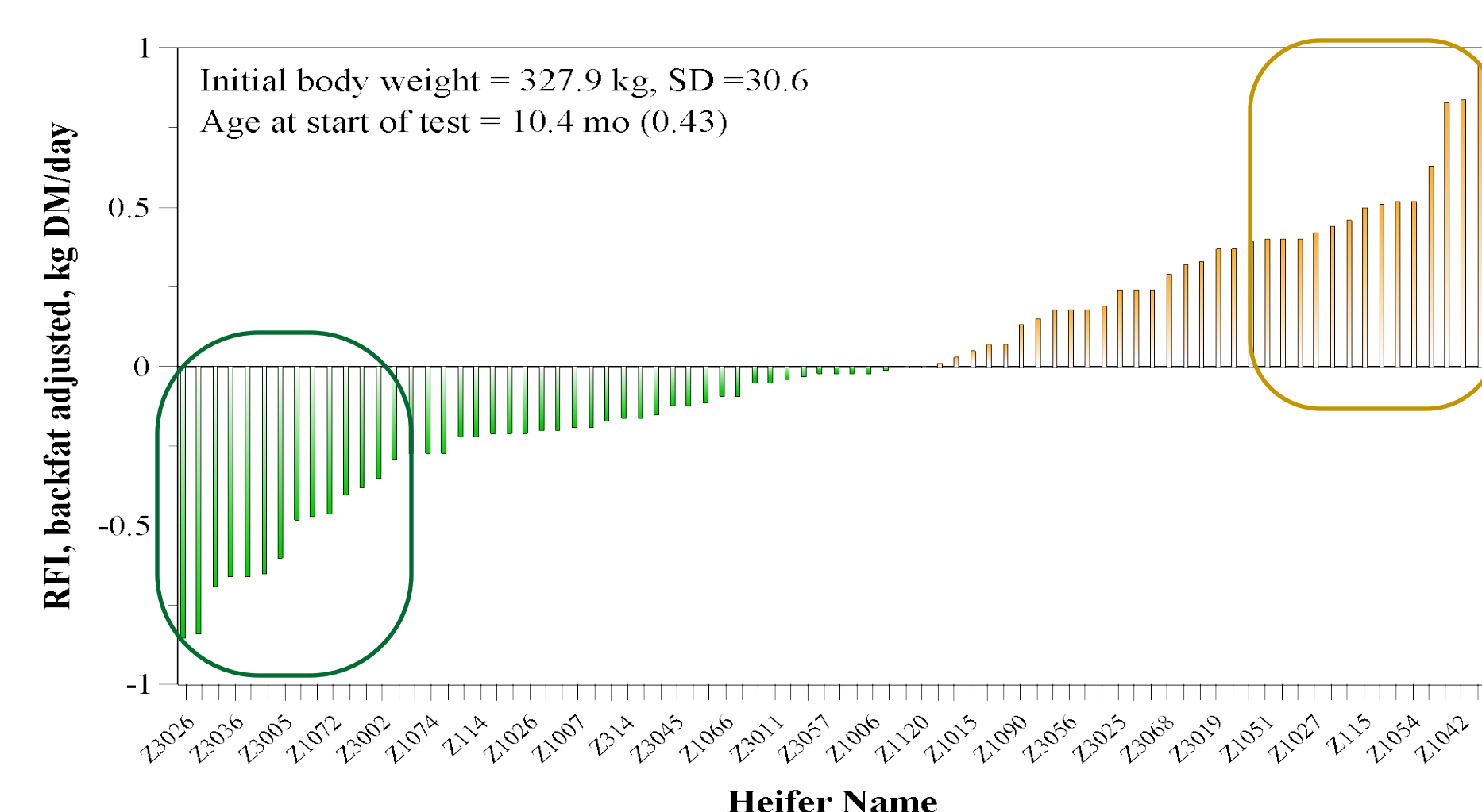
- The majority of cow/calf production costs are associated with feed, bedding and pasture (56 – 71%; ARD, 2005) and 65 – 85% of the greenhouse gas emissions from beef production are from the cow herd.
- Improving feed efficiency provides an opportunity to reduce both feed costs and methane emissions.
- Using residual feed intake correct for body fatness (RFI_{fat}) to identify feed efficient animals is preferred because it identifies animals that consume less at equal body size, growth and body fatness.
- Presently, RFI_{fat} is measured on young bulls and heifers in the drylot and they are fed different rations from what is consumed when out on pasture.

Materials and Methods:

Distribution of residual feed intake (RFI, backfat adjusted) in 87 crossbred beef heifers tested at the Lacombe Research Centre in 2012



Distribution of residual feed intake (RFI, backfat adjusted) in 80 crossbred beef heifers tested at the Lacombe Research Centre in 2013



RFI_{fat} was determined on all replacement heifers in the drylot. Heifers with high and low RFI_{fat} were selected for the grazing trial.



Heifers were dosed twice daily with n-alkane labeled pellets from Day 0 – 12 and fecal sampled twice daily from Day 8 – 12.



Daily dry matter intake on pasture was calculated based on forage, fecal and n-alkane pellet content of C31 and C32 and intake of n-alkane pellet and dose rate of C32.



On Day 13 – 17 in 2013, high and low RFI_{fat} heifers were separated and methane emissions from both pens were measured simultaneously.



Heifers grazed meadow brome grass pasture. Representative forage samples were collected twice daily on Day 8 – 12.

Results:

Table 1. Performance traits of bred heifers selected for low and high residual feed intake (RFI_{fat}) during summer grazing of meadow brome grass in 2012 and 2013.

| Trait | High RFI_{fat} | Low RFI_{fat} | P-value |
|---|------------------|-----------------|---------|
| Number of heifers | 24 | 24 | ... |
| Birth weight, lbs | 82.9±2.4 | 83.8±2.0 | 0.722 |
| 200-d wean weight, lbs | 573.2±18.1 | 586.9±15.2 | 0.478 |
| Pre-wean ADG, lbs per day | 2.45±0.09 | 2.51±0.07 | 0.501 |
| RFI_{fat} , Kg of DM per day | 0.529±0.053 | -0.495±0.045 | <0.001 |
| Day 0 of grazing trial weight, lbs | 980.8±19.0 | 993.4±16.1 | 0.594 |
| Day 0 of grazing trial weight to off pasture ADG, lbs per day | 1.65±0.11 | 1.74±0.09 | 0.508 |

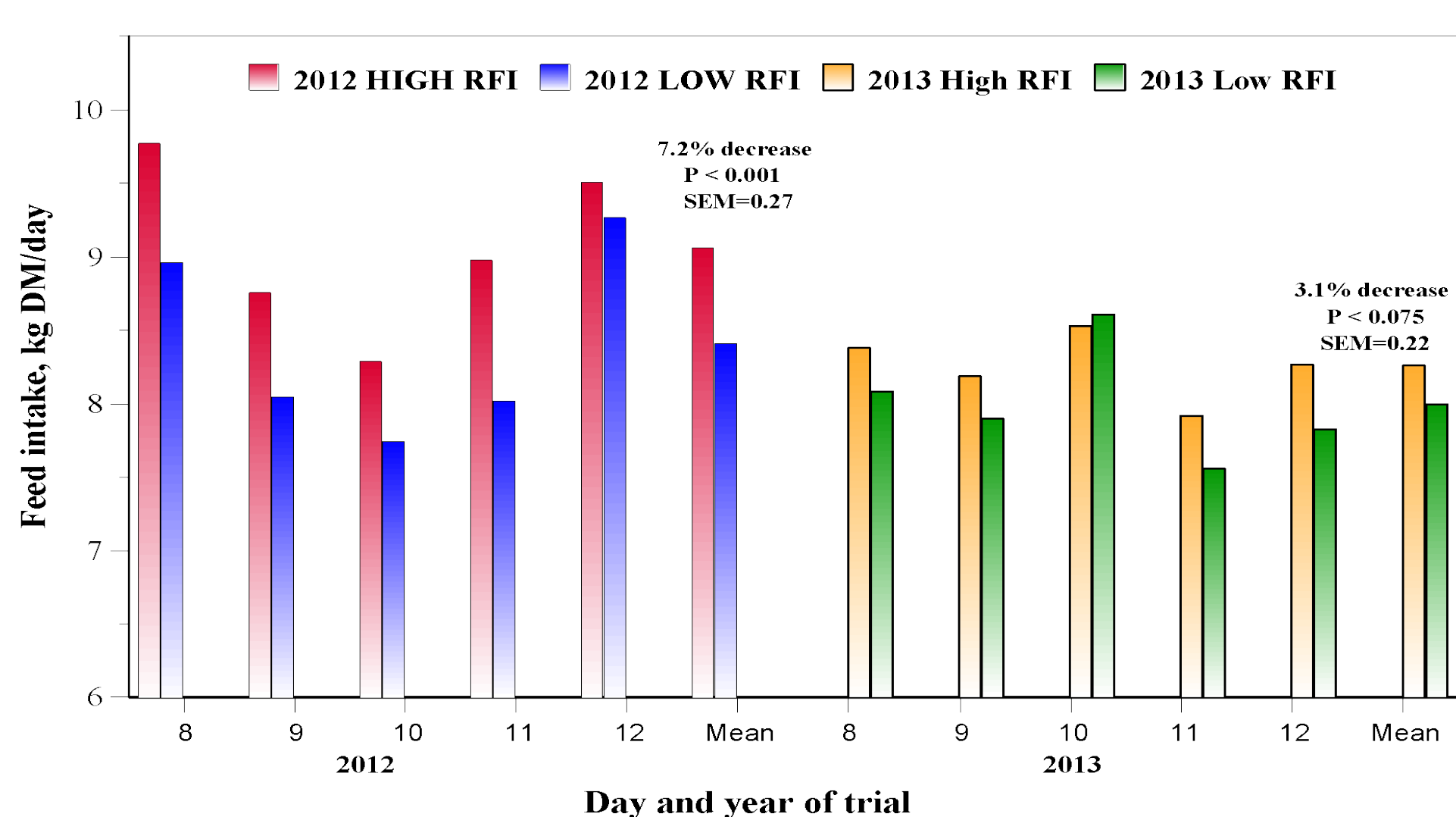


Figure 1. Forage intake of high and low RFI_{fat} heifers while grazing meadow brome grass pasture in 2012 and 2013 ($n=20$, 2012; $n=28$, 2013).

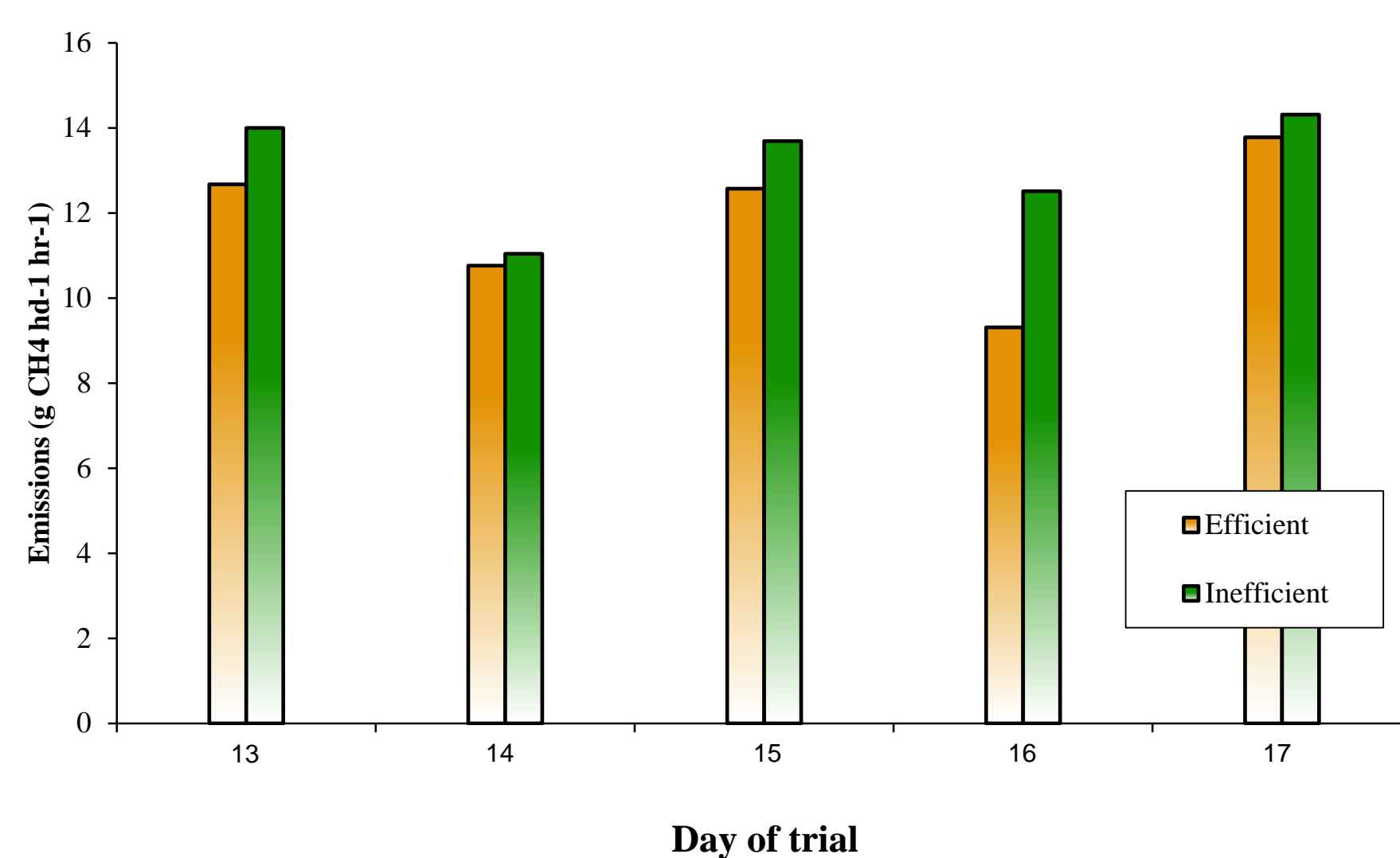


Figure 2. Methane emissions from high and low RFI_{fat} heifers while grazing meadow brome grass pasture in 2013 ($n=20$).

Summary:

- Heifers in the grazing trial were divergent in RFI_{fat} , but similar in birth weight, 200-d weaning weight and ADG.
- Low RFI_{fat} heifers consumed 5% less forage than high RFI_{fat} heifers at equal metabolic weight.
- Low RFI_{fat} heifers emitted 9% less methane than high RFI_{fat} heifers.

Conclusion:

- Heifers classified as low RFI_{fat} in the drylot maintain their efficiency on pasture with no adverse effects on body weight or growth rate, as well as emit less methane when compared to their high RFI_{fat} herd mates.

Acknowledgements:

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