

Feeding behavior, methane emission and digestibility of crossbred heifers along compensatory growth



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Introduction

On mountain pastures, heifers have a lower average daily gain due to variable grass availability, nutritive value and higher maintenance requirements. Once refed at barn, compensatory growth (CG) occurs and is characterized by high feed intake.

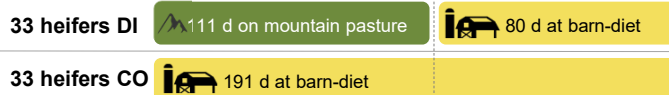


Aim was to study feeding behavior, enteric methane (CH₄) emission and digestibility during CG in beef-on-dairy crossbred heifers.

Material and methods

Heifers [♀ Brown Swiss × ♂ Angus, Limousin or Simmental] were used from 271 to 527 kg body weight (BW). 33 heifers were grown discontinuously (DI) and 33 continuously (CO).

Compensatory growth and measurement period



Barn-diet was composed of 65% grass silage, 20% hay, 8% maize silage and 7% concentrates in DM basis.

Feeding behavior and individual intake
measured with automatic weighing troughs

Enteric methane emission
measured with Greenfeed system

Organic matter digestibility (dMO)
measured over 5 consecutive days using insoluble ashes as indigestible marker

Results

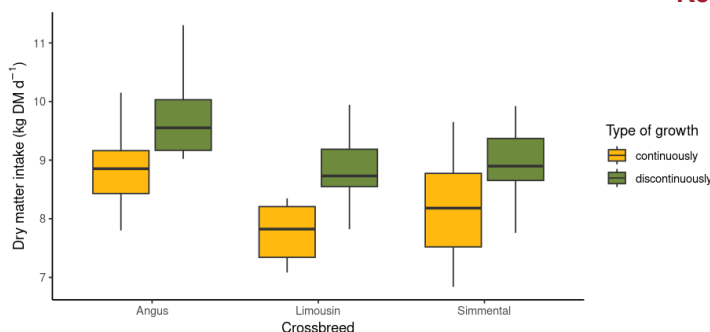


Figure 1: Effect of compensatory growth on daily dry matter intake depending on growth itinerary and crossbreed (means over CG)

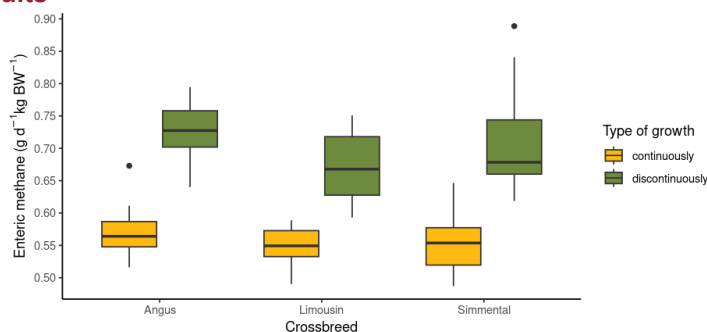


Figure 2: Effect of compensatory growth on daily enteric methane emission per kg body weight depending on growth itinerary and crossbreed (means over CG)

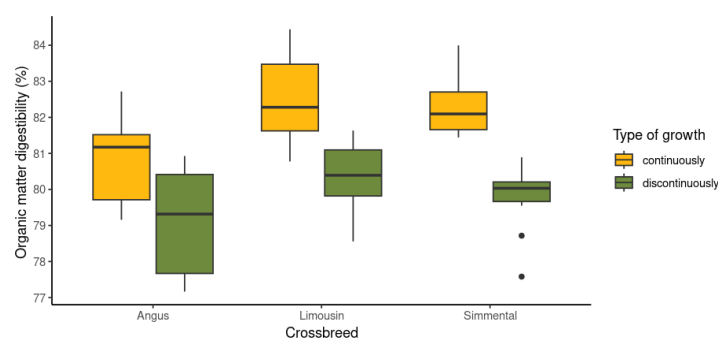


Figure 3: Effect of compensatory growth on organic matter digestibility depending on growth itinerary and crossbreed (means over CG)

- DI had a higher dry matter intake (DMI) than CO heifers and compared to Limousin and Simmental, Angus heifers had higher DMI (fig. 1).
- DI had higher duration per meal and DMI per meal.
- DI had higher daily enteric methane emission (g d⁻¹ kg BW⁻¹) than CO and higher for Angus than Limousin (fig. 2).
- DI had a lower organic matter digestibility than CO and compared to Limousin and Simmental, Angus heifers had lower dMO (fig. 3).
- DMI was positively correlated with enteric methane yield ($|r|=+0.60, P \leq 0.05$) and negatively with dMO ($|r|=-0.50, P < 0.001$).

Summary

Broad adaptive processes during compensatory growth concomitant with increased feed intake: increase in enteric methane emissions (g d⁻¹ kg BW⁻¹) and reduced digestibility of organic matter. The Angus crossbreed had the highest intake and methane production with the lowest digestibility compared to Limousin and Simmental. Feeding behavior was also impacted during compensatory growth: increase in meal duration and intake per meal.