

MILK YIELD, WEIGHT GAIN, FEED INTAKE, AND FEED EFFICIENCY IN SECOND LACTATION HOLSTEIN X RED DAIRY CATTLE F1 CROSSBREDS COMPARED TO HOLSTEIN AND RED DAIRY CATTLE

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AIM

Investigating long term effect of heifer feeding on

- Energy corrected milk yield, *ECM*
- Drymatter intake, *DMI*
- Feed efficiency, $FE = \text{kg } ECM / \text{kg } DMI$
- Protein efficiency, $PE = (\text{kg protein yield} + 0.2 * \text{body weight gain}) / \text{kg } DMI$

Breed differences

- HOL
- HOLxRDCF1
- RDC



WHY IS HEIFER FEEDING RELEVANT?

The feeding level during the prepubertal period influences the milk yield of HOL cows. Previous studies from Denmark concluded that increasing the energy concentration in feed during the prepubertal may have permanent detrimental effects on mammary development (Sejrsen & Purup, 1997).

Excessive mobilization, especially in overfed or over-conditioned heifers, poses health risks like ketosis (Daros et al., 2022).

Some farmers in Denmark have observed differences in body condition when rearing HOL and RDC heifers together.

HEIFER FEEDING TRIAL

62 Heifers born in August and September 2019



STD group was fed following the NorFor recommendations for HOL heifers

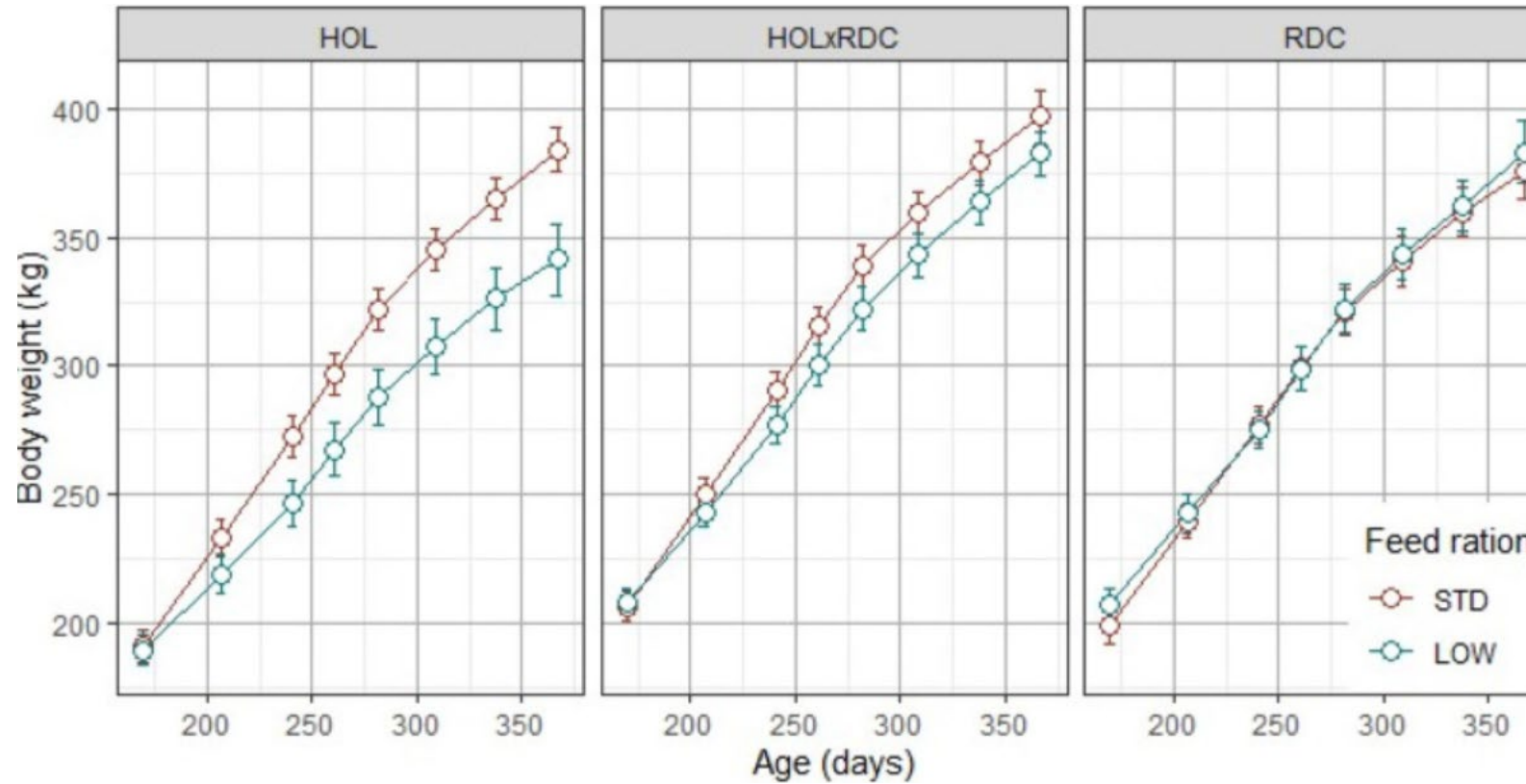
- 11 HOL
- 10 HOLxRDC F1
- 10 RDC

LOW group was fed a ration with a 15% lower net energy intake than the STD group

- 10 HOL
- 11 HOLxRDC F1
- 10 RDC

Animals had ad libitum access to the feed ration assigned to their group

HEIFER GROWTH RATE



Johansen et al. 2024

DATA

All cows fed a standard ration for HOL using Norfor
33 first lactation cows
First part of second lactation

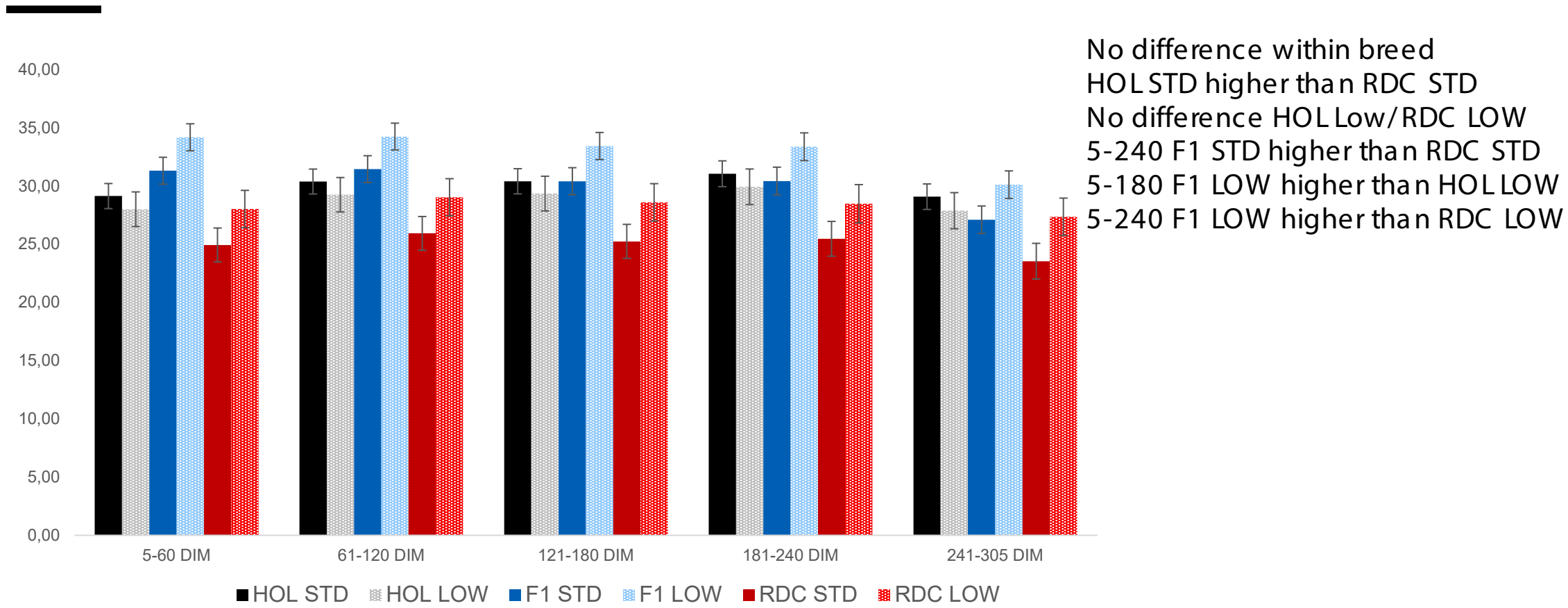
		First lactation	Second lactation			
		5-305 DIM	5-60 DIM	61-120 DIM	121-180 DIM	
HOL	STD	8	8	8	8	
	LOW	4	4	4	2	
RDC	STD	5	5	4	4	
	LOW	4	4	4	4	
F1	STD	6	6	5	5	
	LOW	6	6	5	3	

METHOD

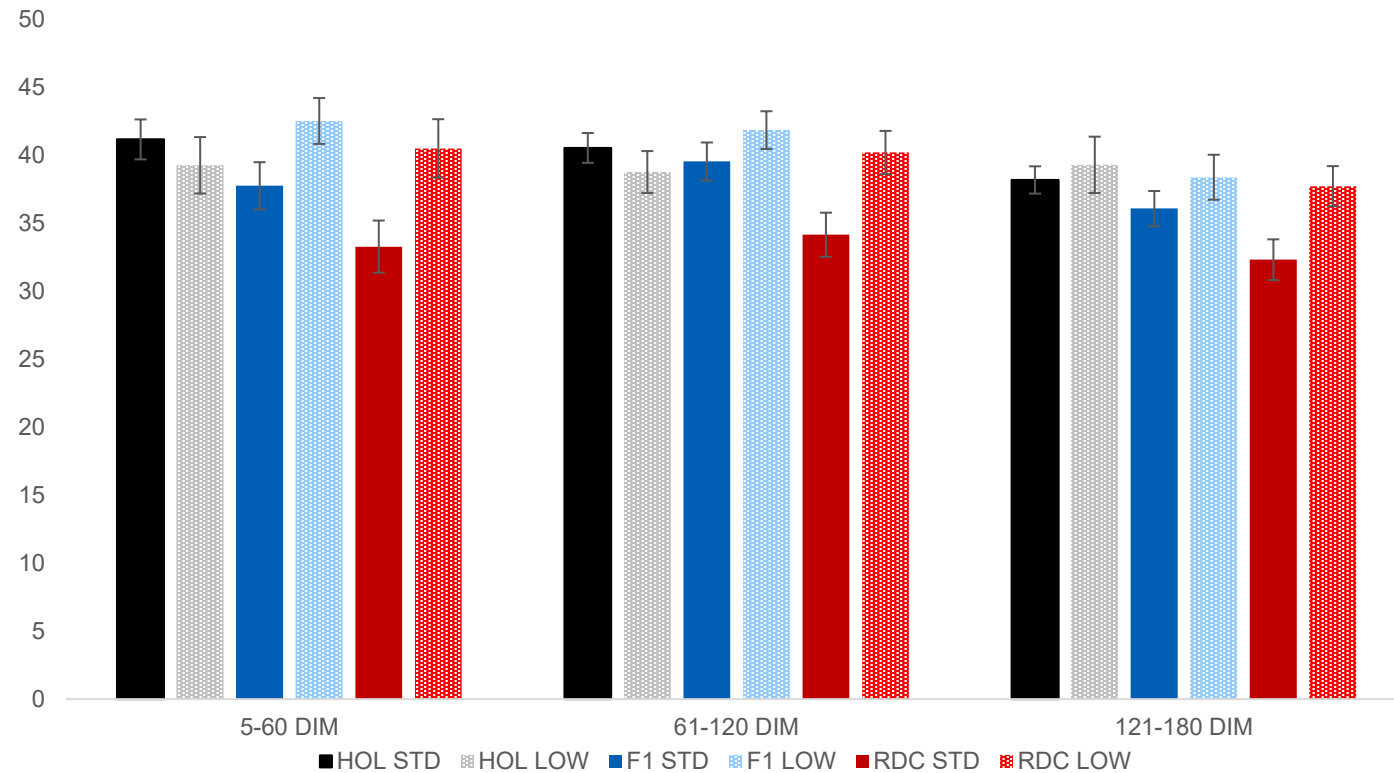
Data analysed in SAS with HPmixed

trait = breed (fixed)
 + feed ration (fixed)
 + calving age
 + breed*feed ration (fixed)
 + ckrdyrn(breed) (random)
 + e (random)

ENERGY CORRECTED MILK YIELD FIRST LACTATION

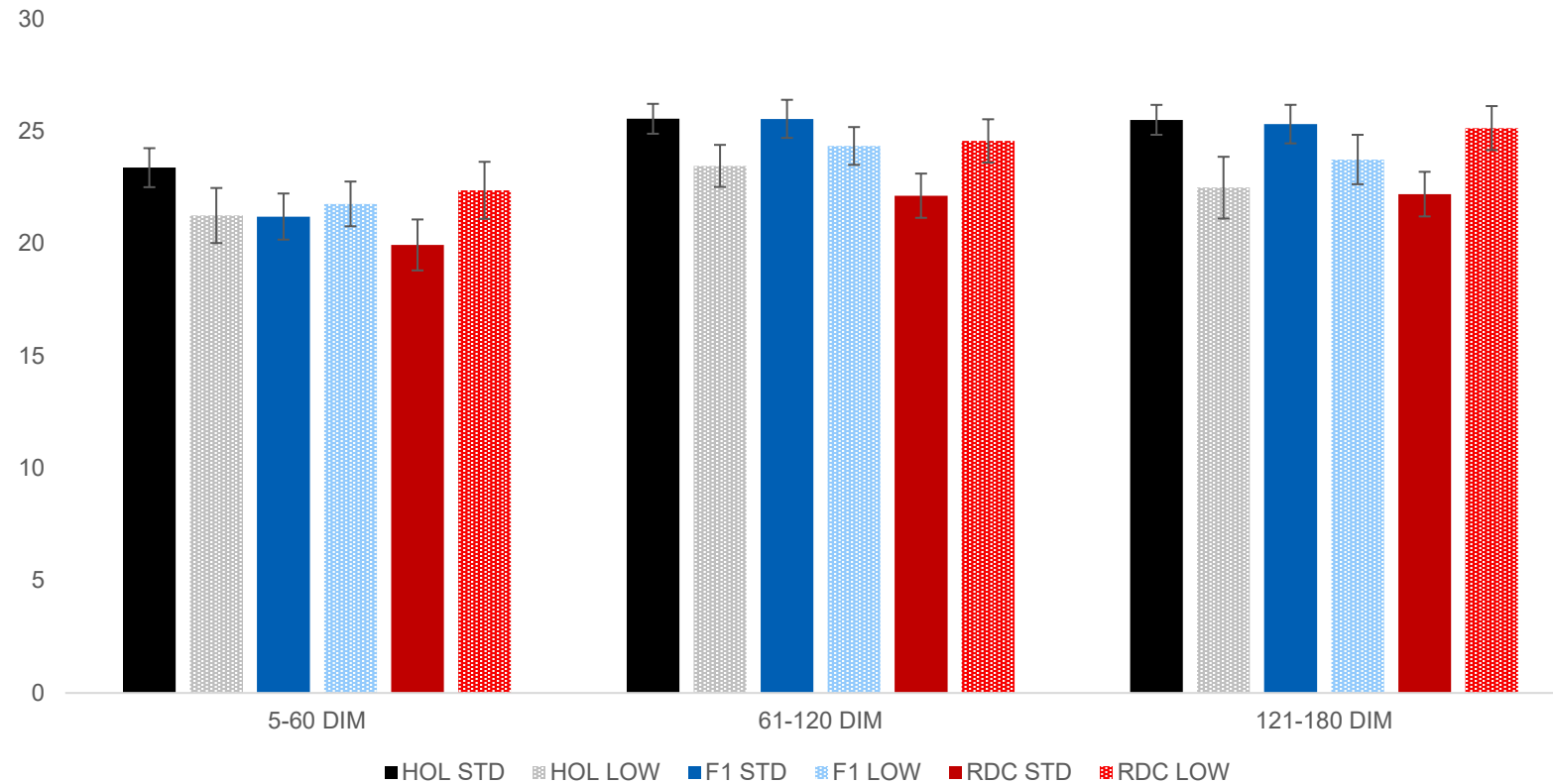


ENERGY CORRECTED MILK YIELD SECOND LACTATION



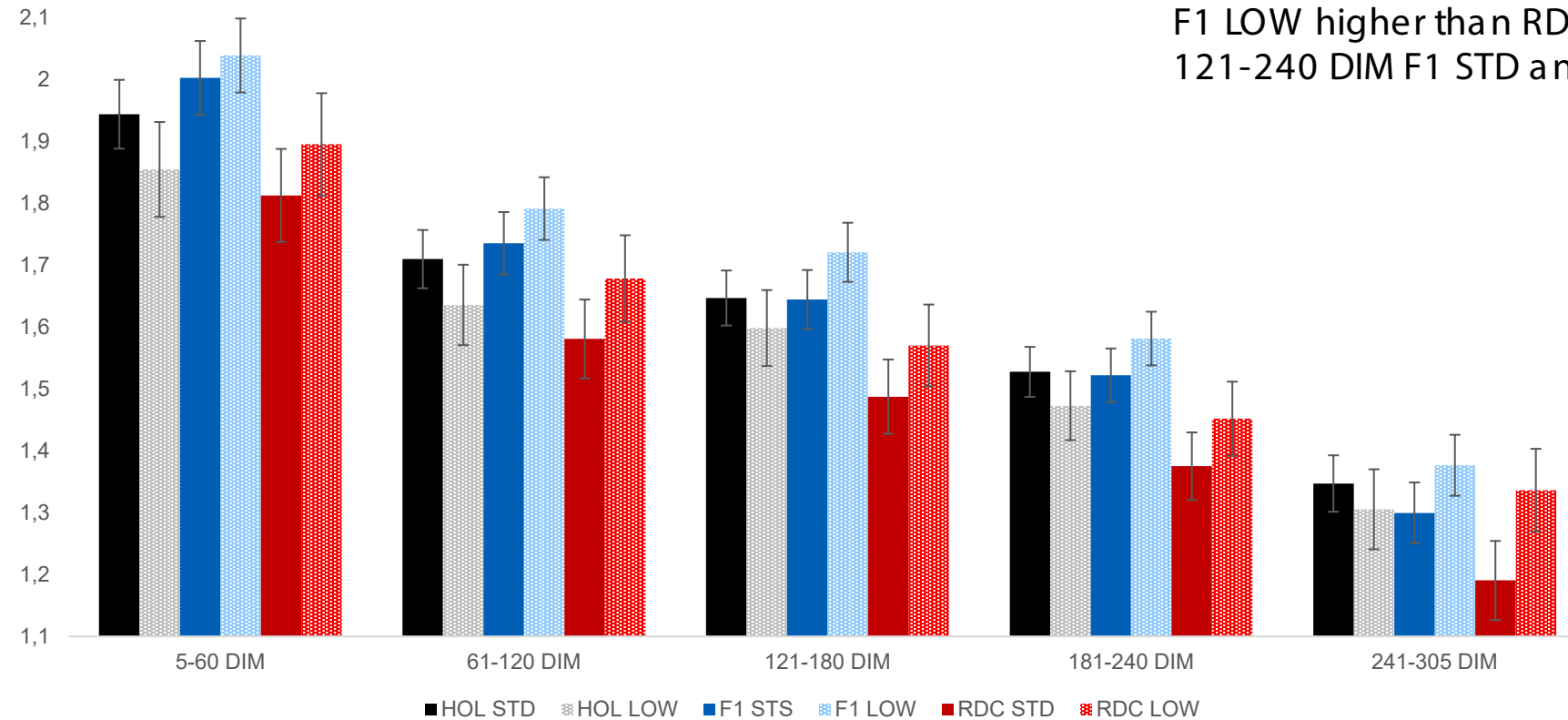
RDC LOW higher yield than STD
F1 5-60 DIM LOW higher yield than STD
HOL STD higher than RDC STD
No breed differences for LOW

DRY MATTER INTAKE SECOND LACTATION



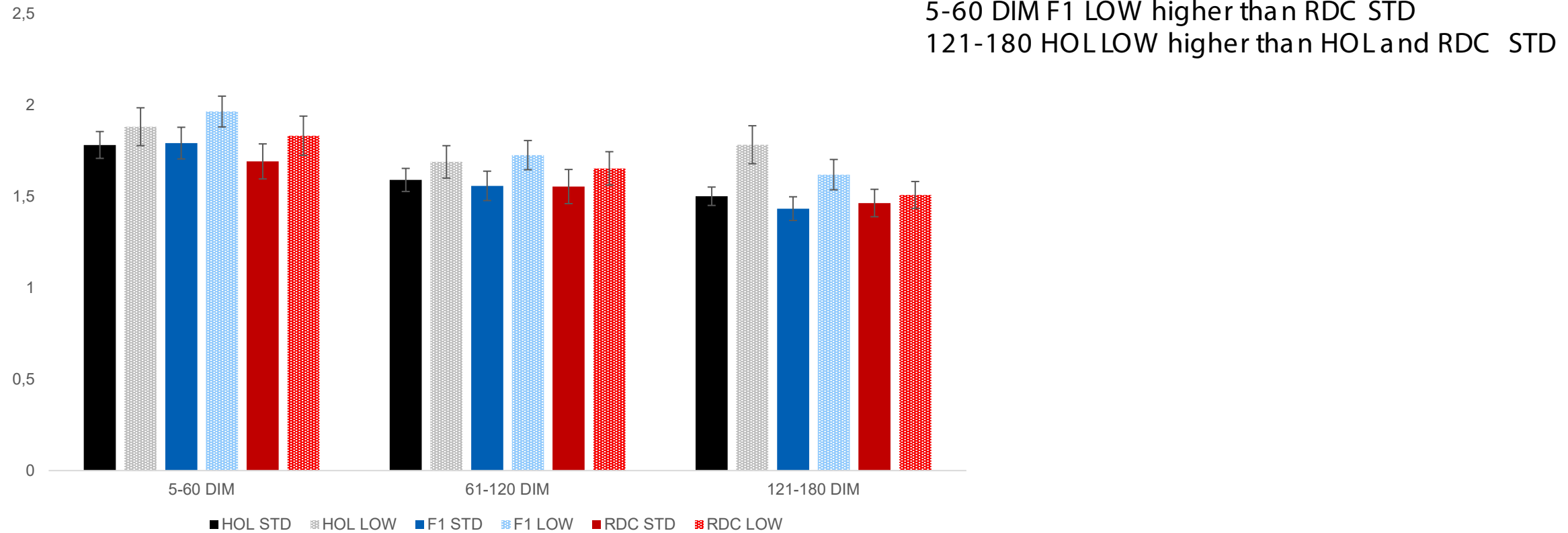
HOL STD higher than RDC STD
61-120 DIM F1 STD higher than RDC STD
121-180 DIM difference within breed for HOL and RDC

FEED EFFICIENCY FIRST LACTATION



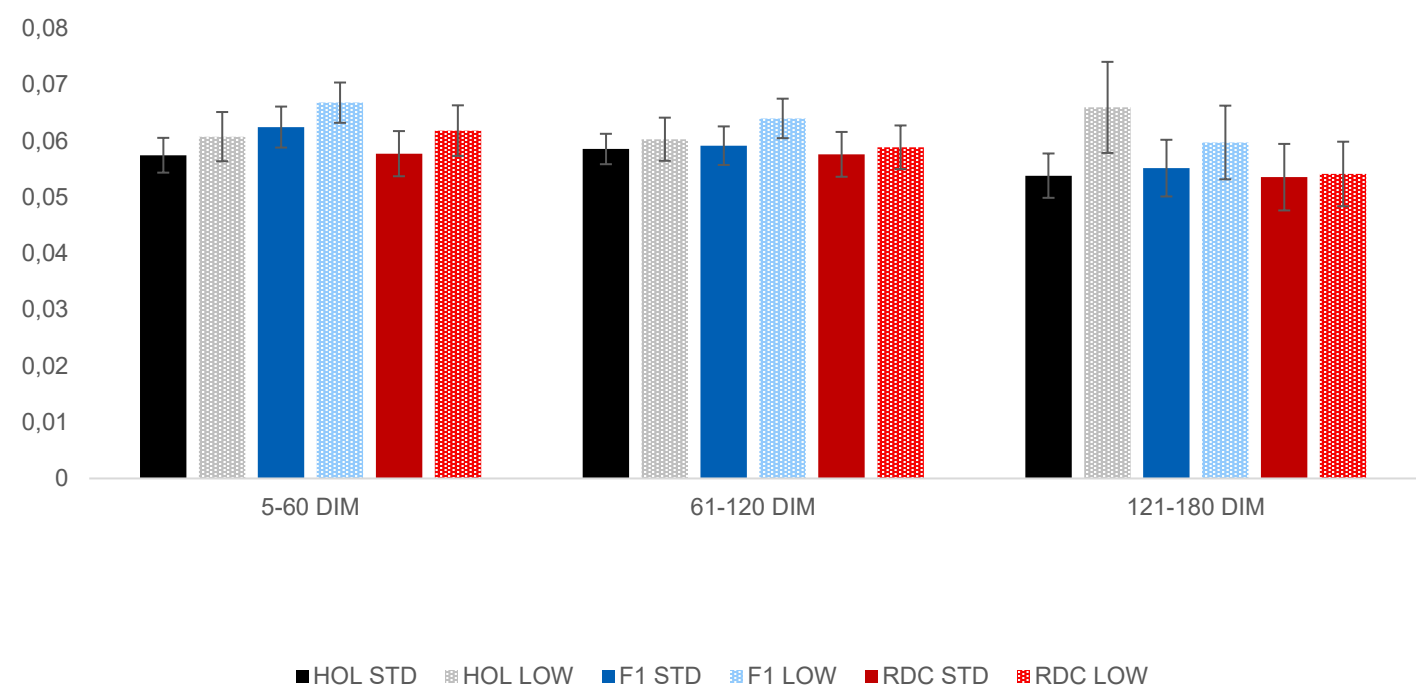
No difference within breed
F1 LOW higher than RDC STD
121-240 DIM F1 STD and HOL STD higher than RDC STD

FEED EFFICIENCY SECOND LACTATION



PROTEIN EFFICIENCY SECOND LACTATION

5-60 DIM F1 LOW higher than HOL STD



CONCLUSION

Difference in milk yield for second lactation RDC fed STD or LOW as heifer

No significant differences in yield between HOL and RDC fed LOW ratio as heifer

Few significant results

- RDC x HOL F1 tendency to have a higher yield and feed efficiency when fed LOW ration as heifer

PERSPECTIVE

Investigations on G by E for feeding management times breeds are needed

Already now feeding advisors need to realize that different genotypes need to be feed differently



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