



AFGOLDNINGSTRATEGI EFFEKT AF REDUCERET FODERNIVEAU ELLER MALKEFREKVENNS

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CAMILLA TOLDEVAR OG MARLENE T. CLAUSEN





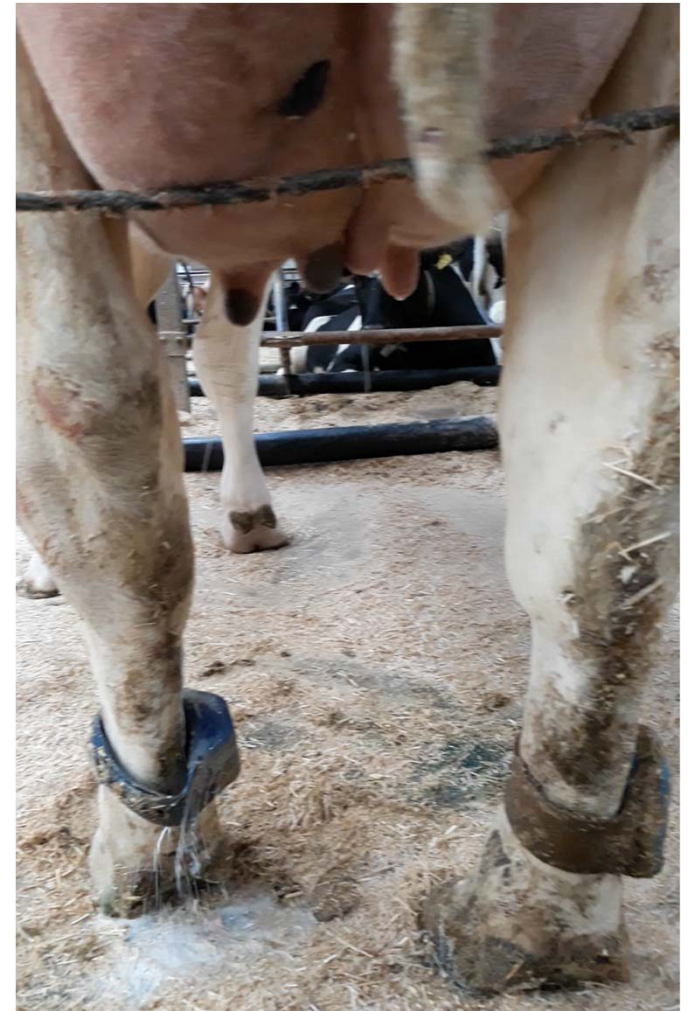
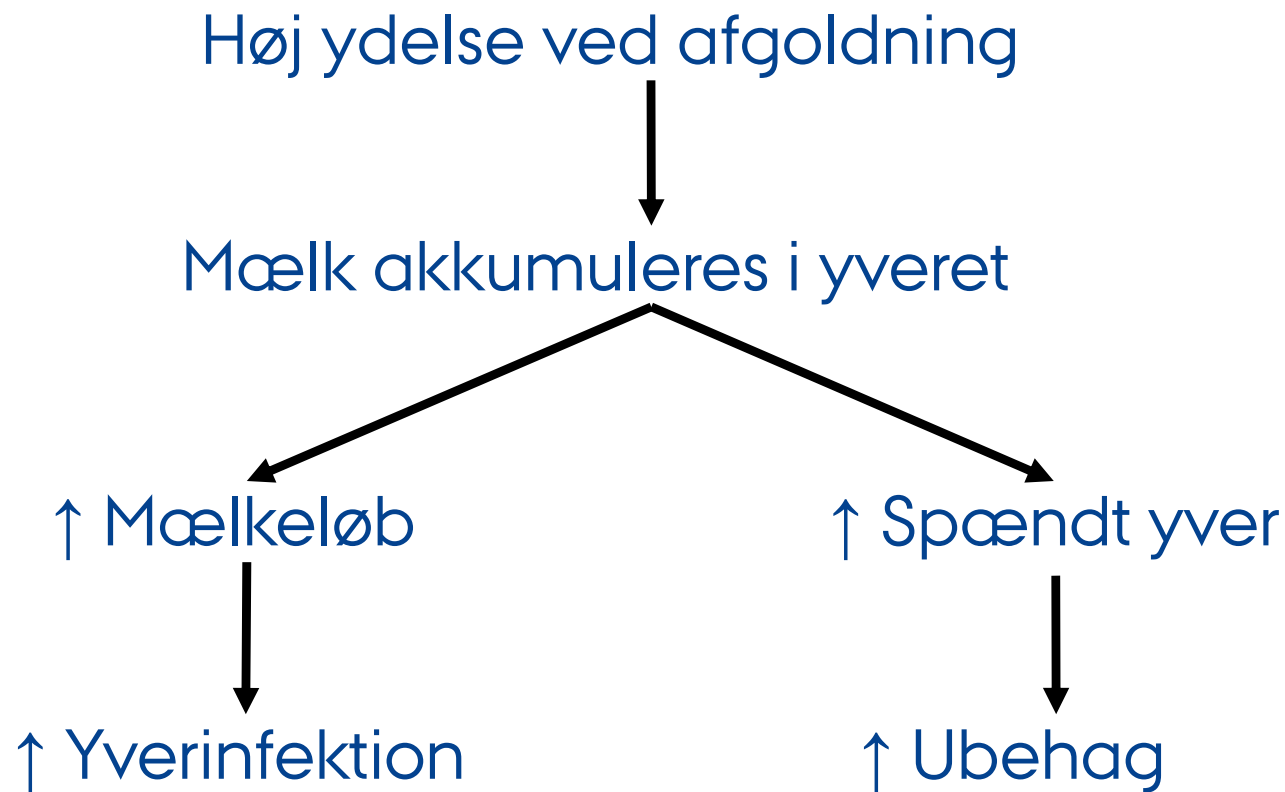
FORLØB AF PRÆSENTATION

- › Mogens Larsen
- › Baggrund og forsøgsdesign
- › Produktion og stofskifte

- › Guilherme Franchi – in English
- › Spændt yver og mælkeløb
- › Ædeadfærd og ædemotivation

- › Mogens Larsen
- › Konklusion

AFGOLDNING VED HØJ YDELSE





AFGOLDNING VED HØJ YDELSE

- › Der bliver afgoldet på mange måder
 - › Brat eller gradvis
 - › Gradvis med reduceret foder og/eller malkning
- › SEGES anbefaling
 - › Ingen kraftfoder i automater/AMS sidste 2-3 uger
 - › 3-4 kg TS laktationsfoder/græsensilage + halm ad lib. + Ca-rig mineral
 - › Stop malkning brat
- › Eksisterende viden
 - › Nogle udenlandske; en del med lav ydelse; ingen danske forsøg



FORMÅL

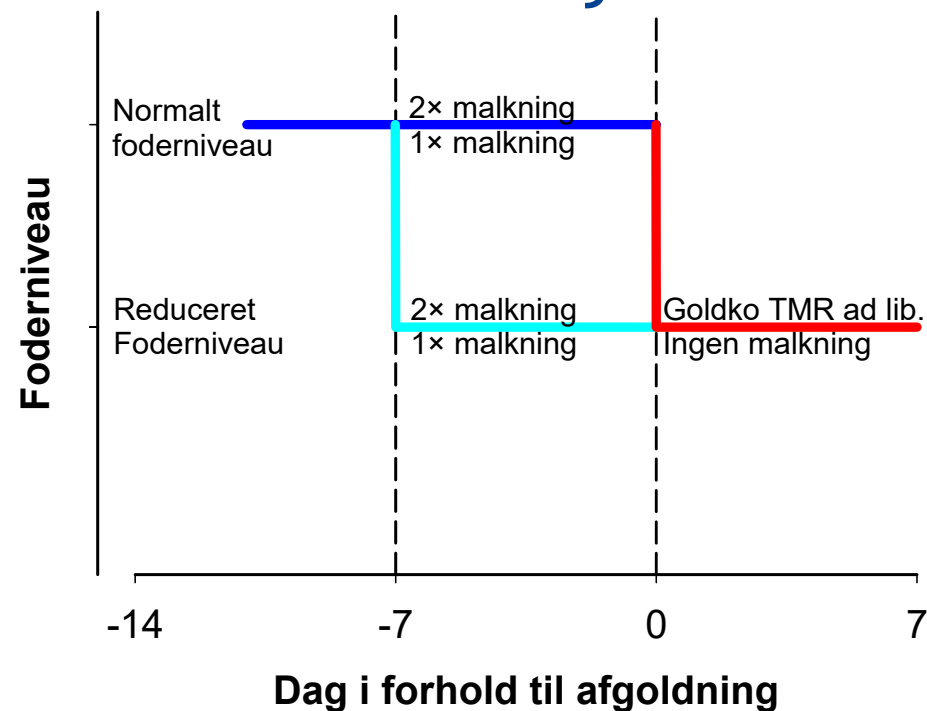
- › At undersøge afgoldning af højtydende køer med typisk anvendte strategier og deres virkning på stofskifte, spændt yver, mælkeløb og sultfølelse

FORSØGSDESIGN

- › Randomiseret blokforsøg med 60 Holstein
 - › Blokket efter paritetsgruppe, 1. eller 2.+3. kalvs
 - › Min. 15 kg mælk/dag 2 uger før afgoldning
 - › Køerne løbende med i forsøg
 - › Køer kun i forsøg én gang
-
- › AMS besætning med Insenteckasser
 - › Tidligere KFC

FORSØGSDESIGN

› 2×2 faktorielt = 4 behandlinger => 15 køer per beh.



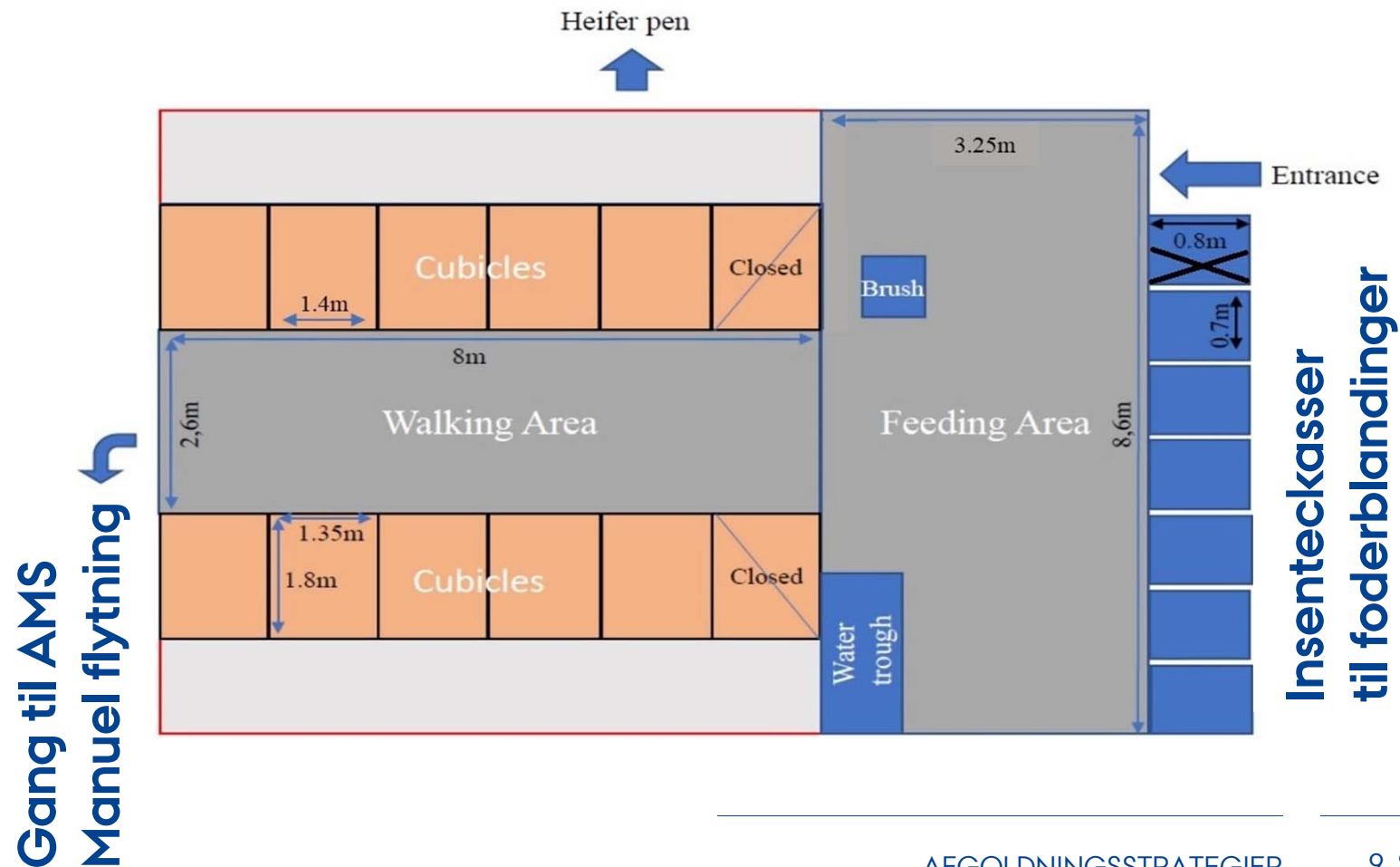
- › Foderniveau: Normalt vs. Reduceret (begge ad lib.)
- › Malkefrekvens: 2x vs. 1x dagligt (kun morgen)
- › 7 dages periode

RATIONER

g/kg TS	Normal	Reduceret	Goldko TMR
Majsensilage	276	169	524
Kl.græsensilage	233	142	157,1
Byghalm		294	227
Byg, valset	126	77,1	
Rapskage	77	47,2	35
Sojaskrå	77	47,2	35
Roepiller	68	42	
AMS kraftfoder	131	110	
Mineraler	12	71,5	22
NEL, MJ/kg TS	6.75	5.73	5.71

STALDINDRETNING

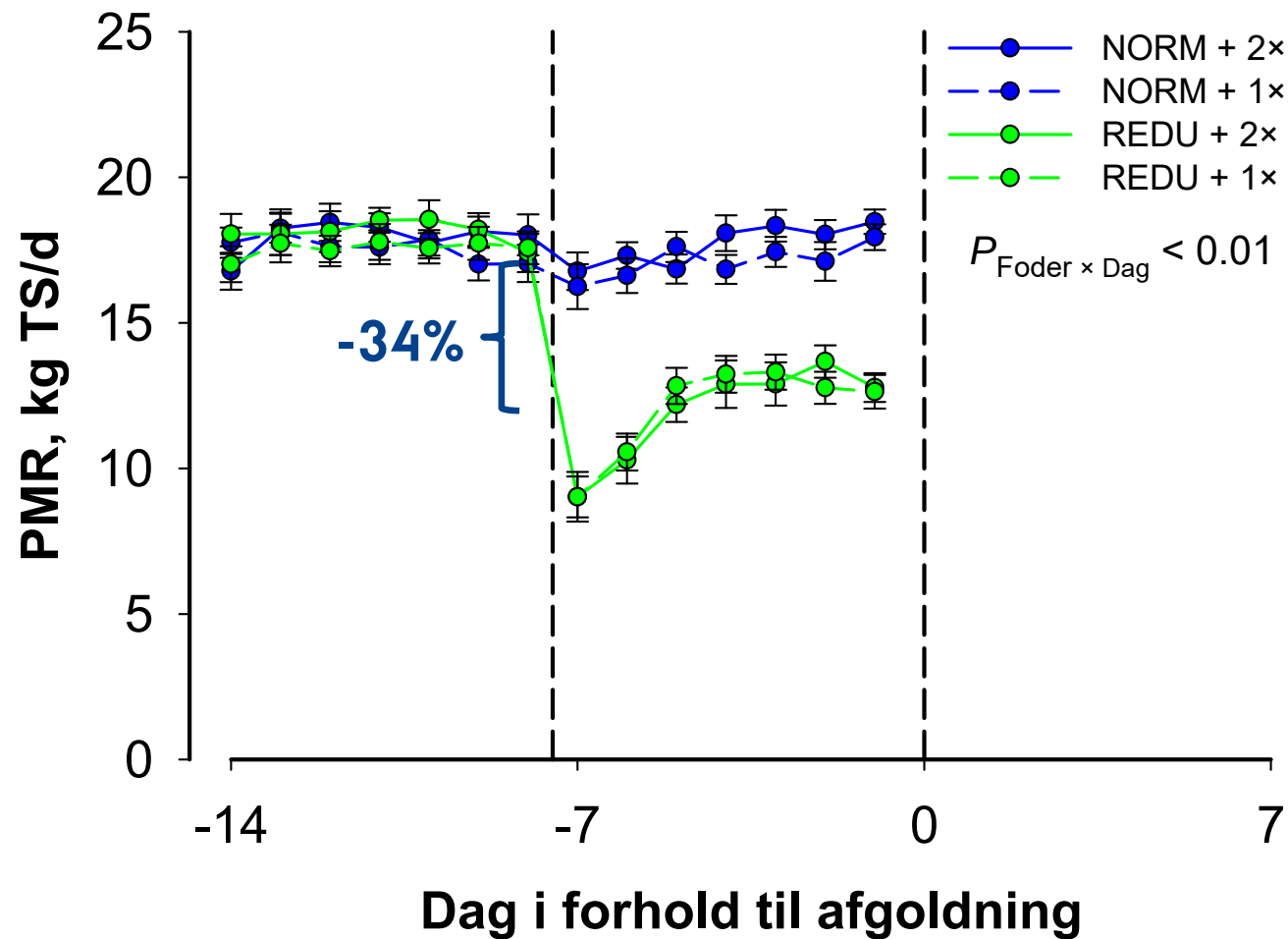
› Køer flyttet til afgoldningshold 7 dage før afgoldning



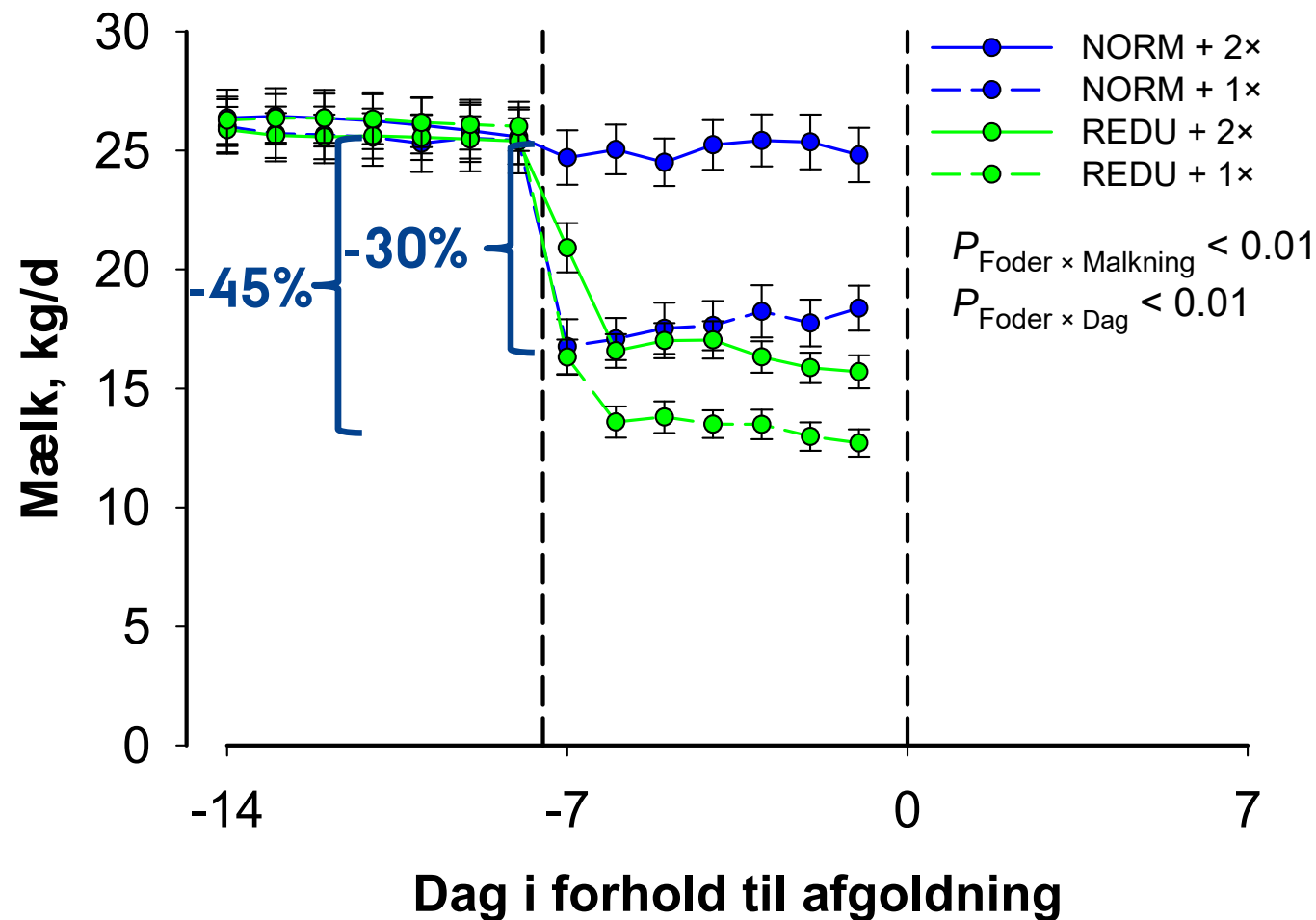
OBSERVATIONER I DE TRE UGER

- › PRODUKTION: foderoptagelse, mælkeydelse, vægt
- › YVER: spændt yver, mælkeløb
- › BLOD: glukose, frie fedtsyrer, BHB og Ca
- › ADFÆRD: ædeadfærd og ædemotivation

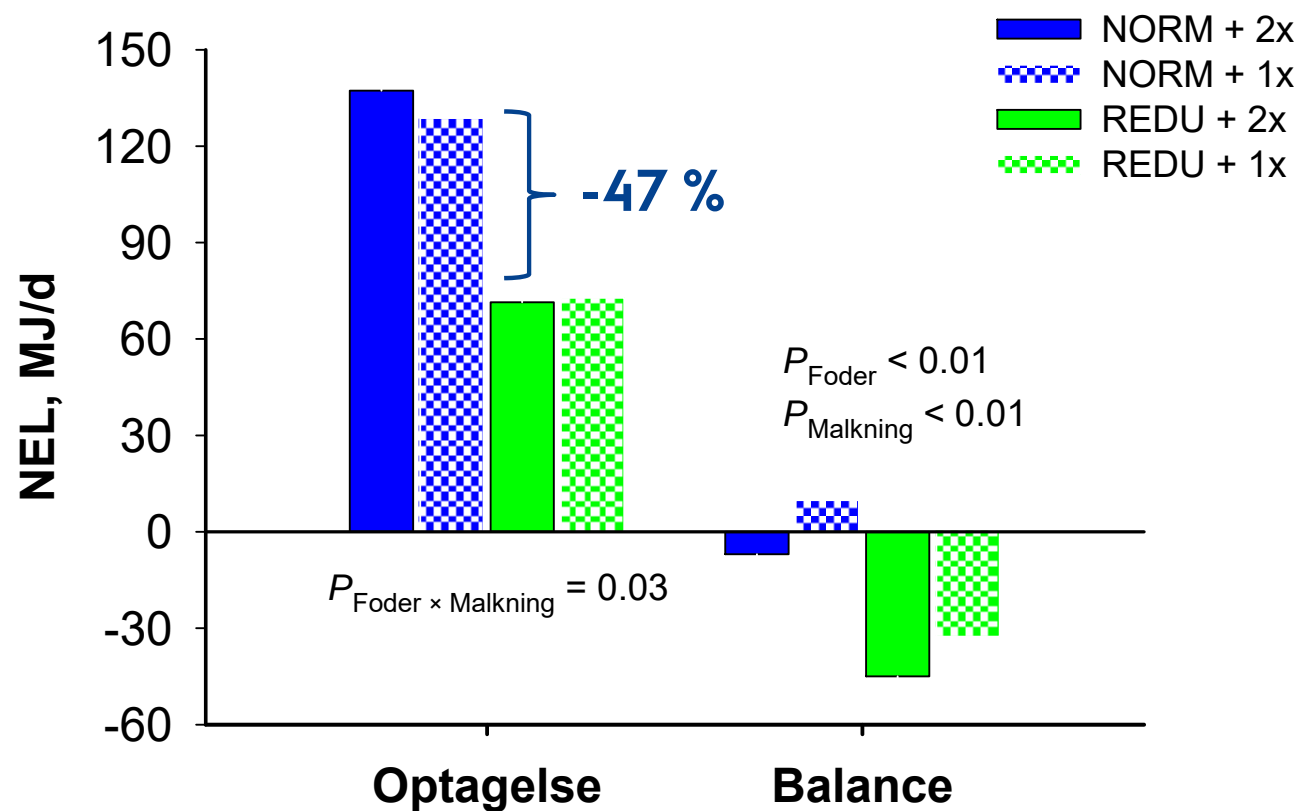
FODEROPTAGELSE PMR (INSENTEC)



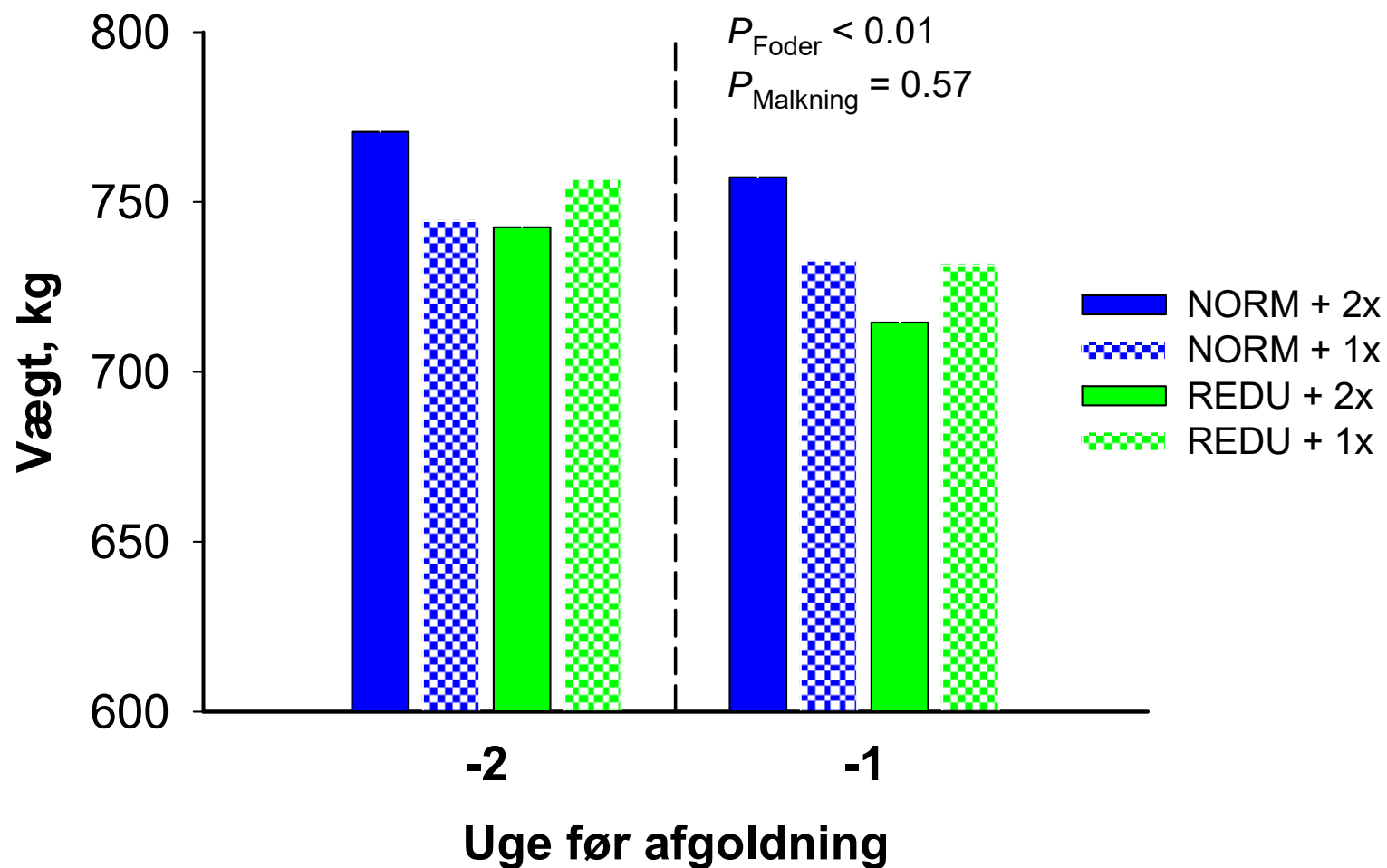
MÆLKEYDELSE



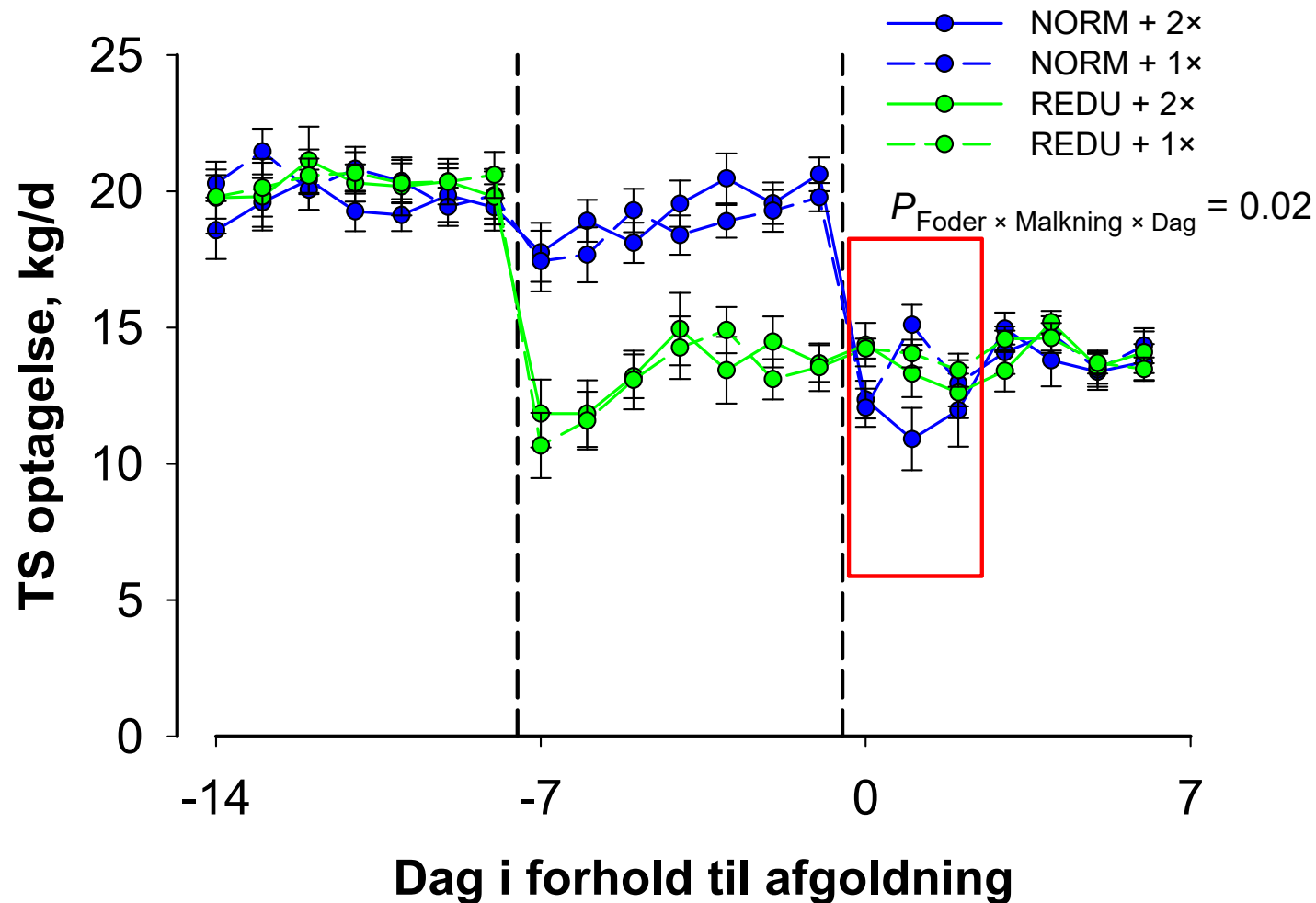
ENERGI FØR AFGOLDNING



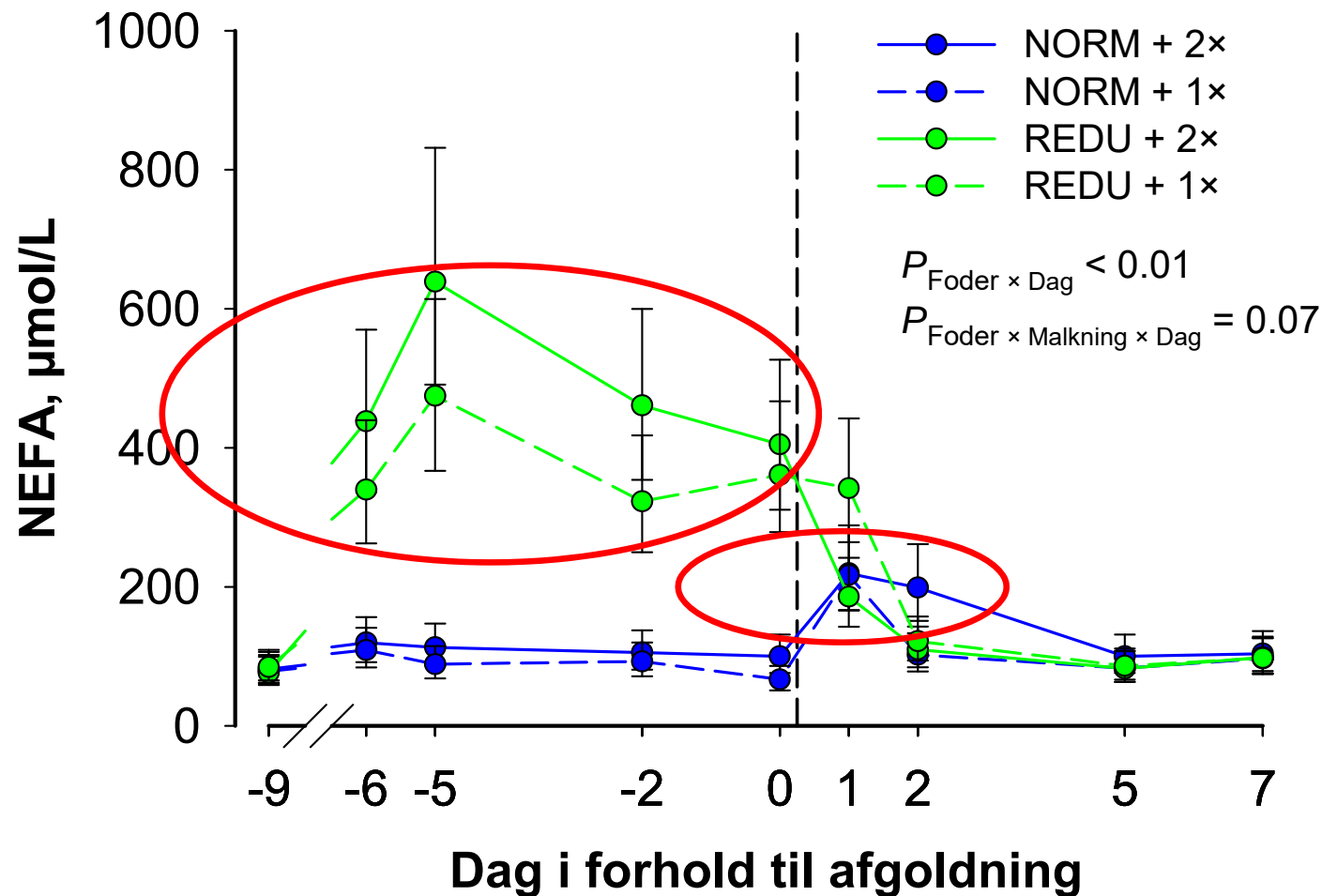
VÆGT



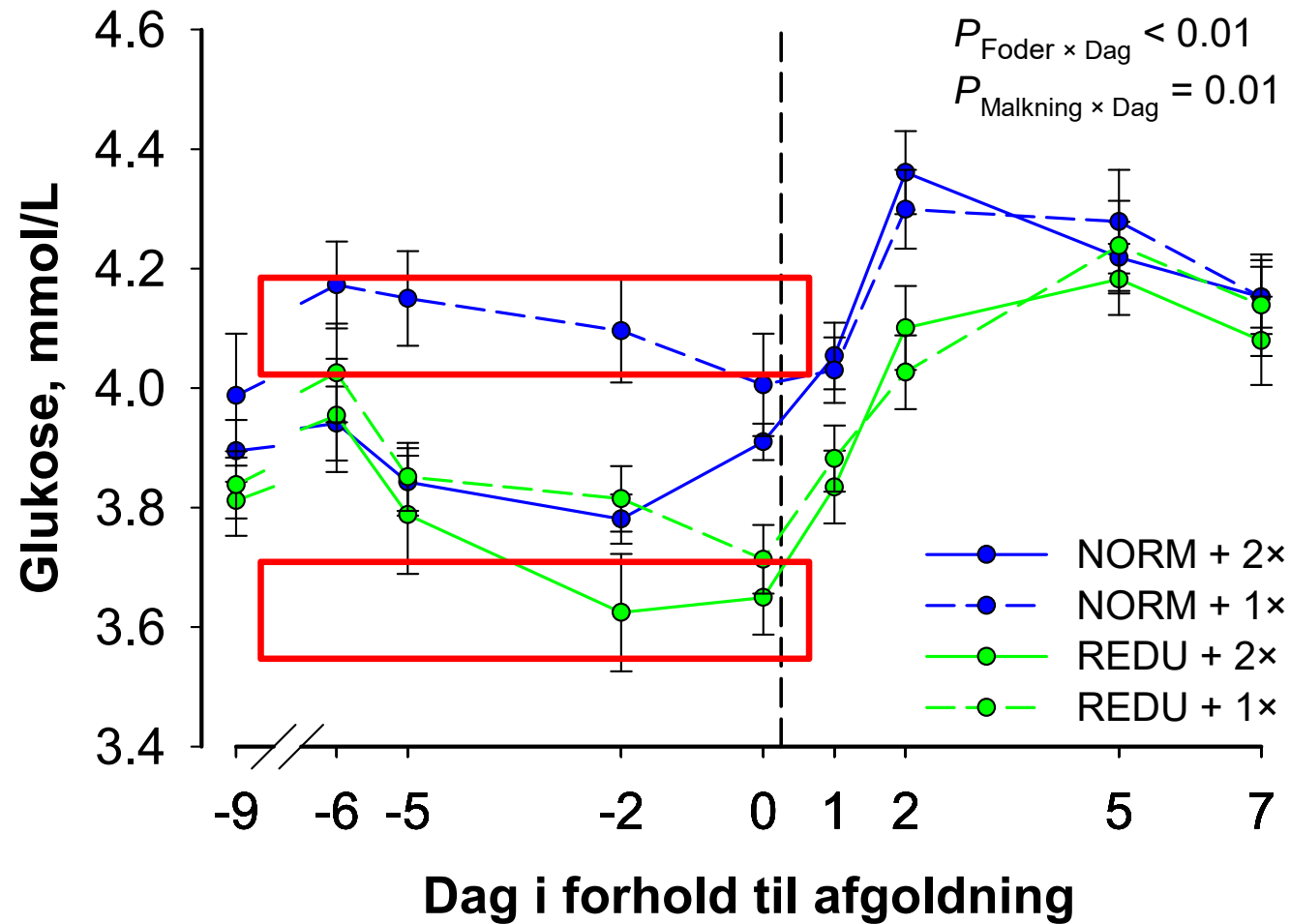
FODEROPTAGELSE EFTER AFGOLDNING



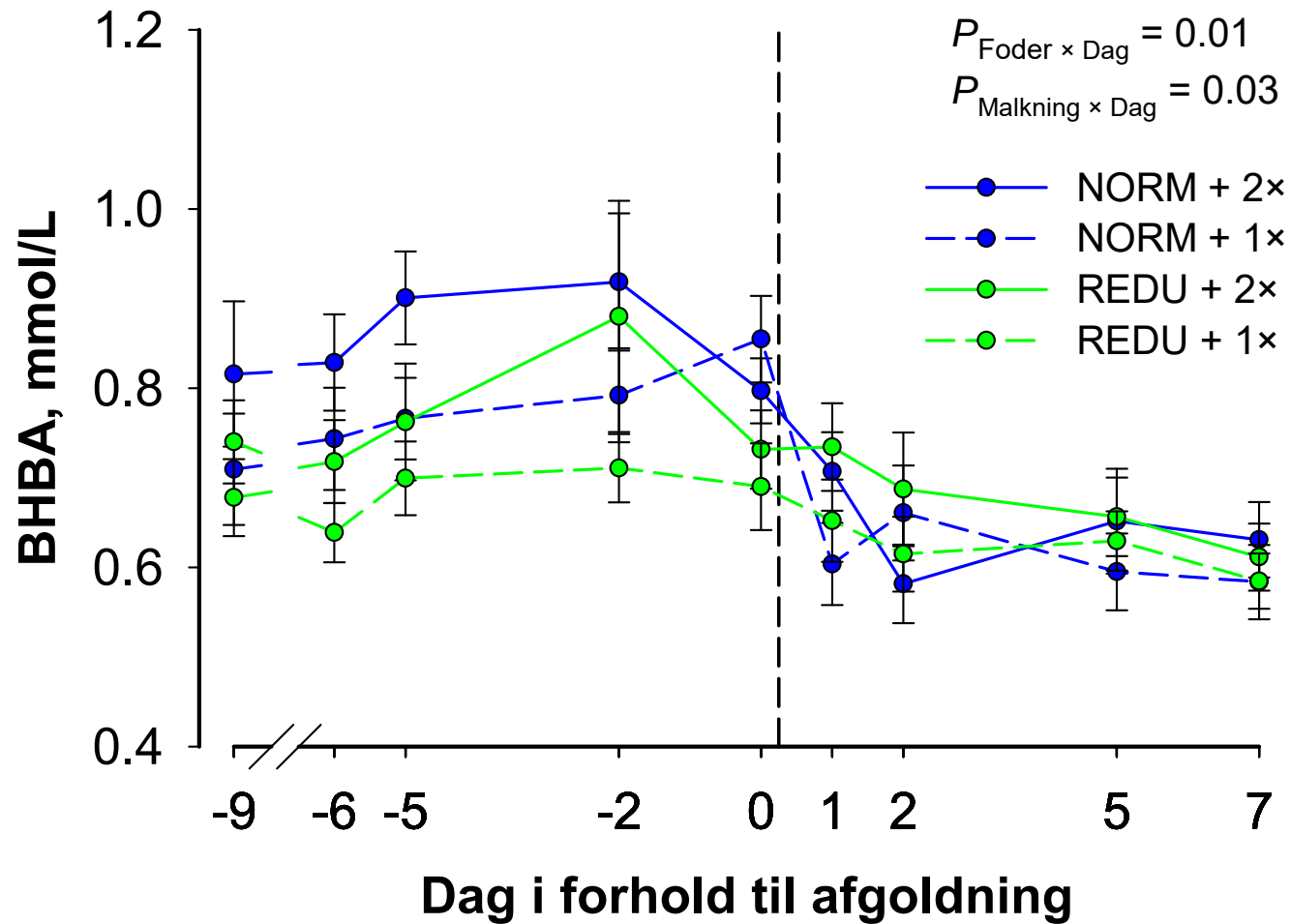
FRIE FEDTSYRER I BLOD



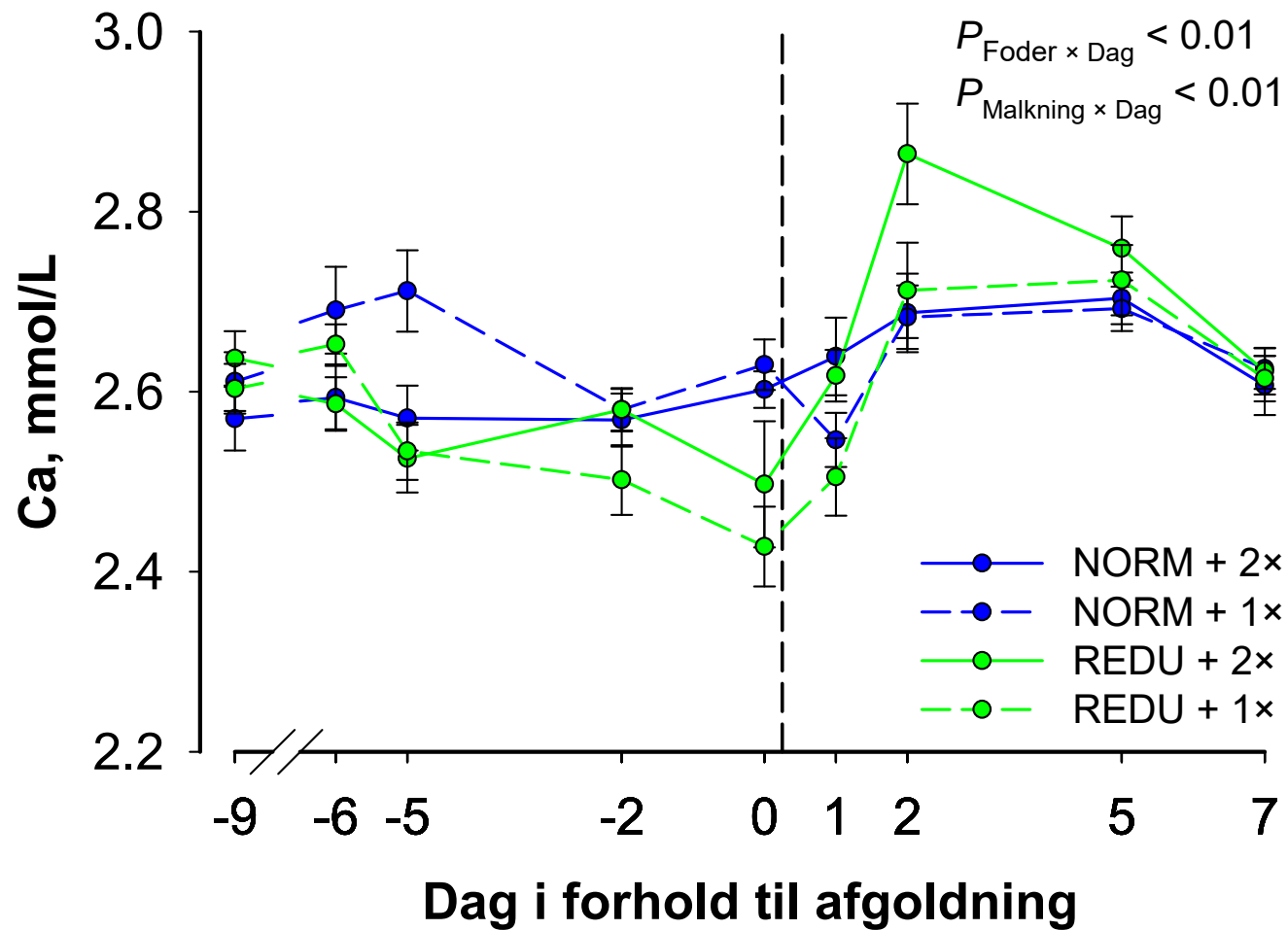
GLUKOSE I BLOD



KETONSTOFFER I BLOD



CALCIUM I BLOD



OPSUMMERING

Før afgoldning

- › Energioptagelse reduceret ca. 50% med 30% halm i rationen
- › Foderoptagelse var ikke påvirket af malkefrekvens
- › Mælkeydelsen faldt 30% med hver faktor alene
- › Kombineret faldt mælkeydelsen 45%
- › Høj NEFA i hele perioden med reduceret foderniveau

Efter afgoldning

- › Kortvarig let forhøjet NEFA for køer ved normal foderniveau

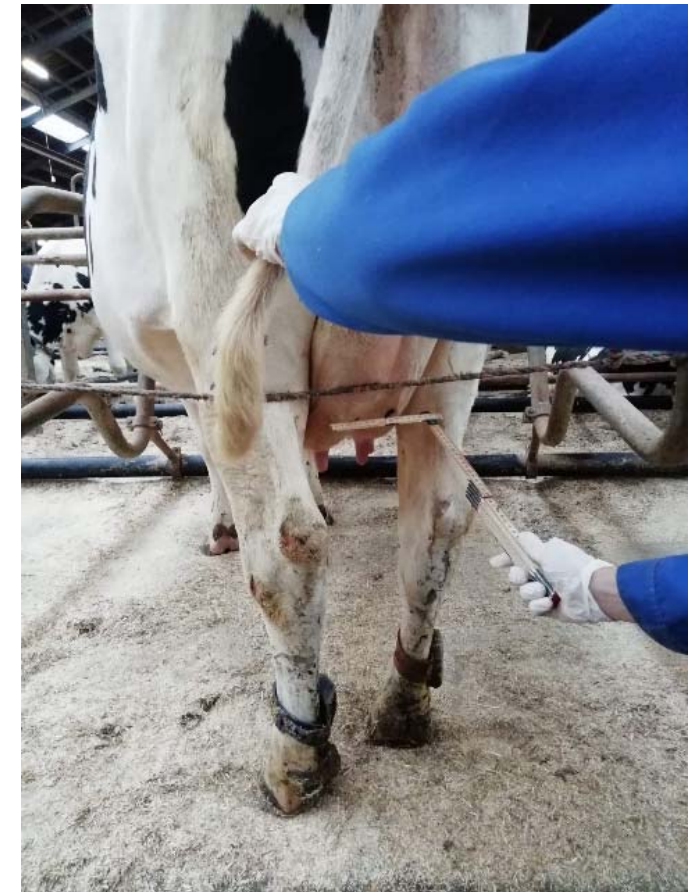
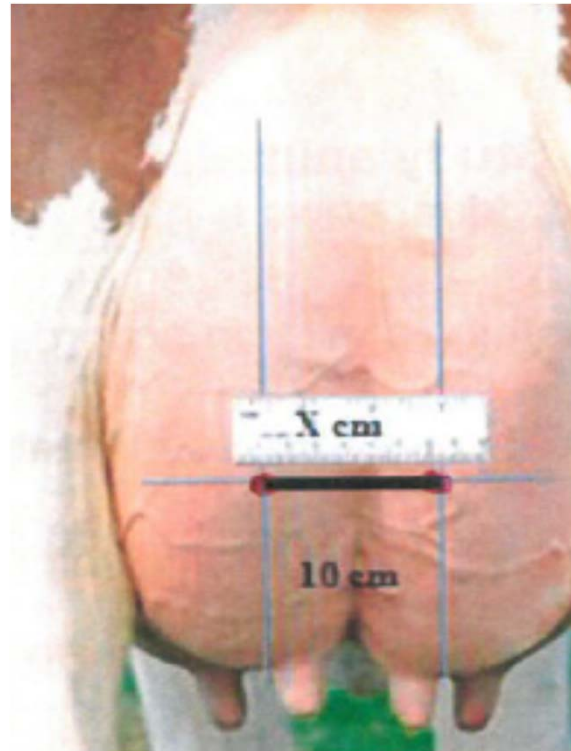
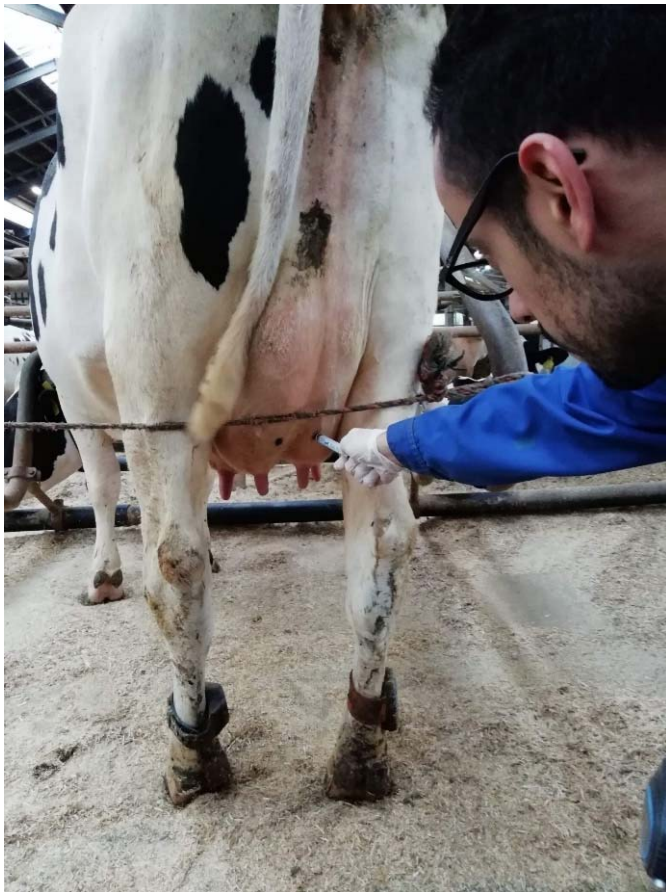


CLINICAL EXAMINATION OF THE UDDER

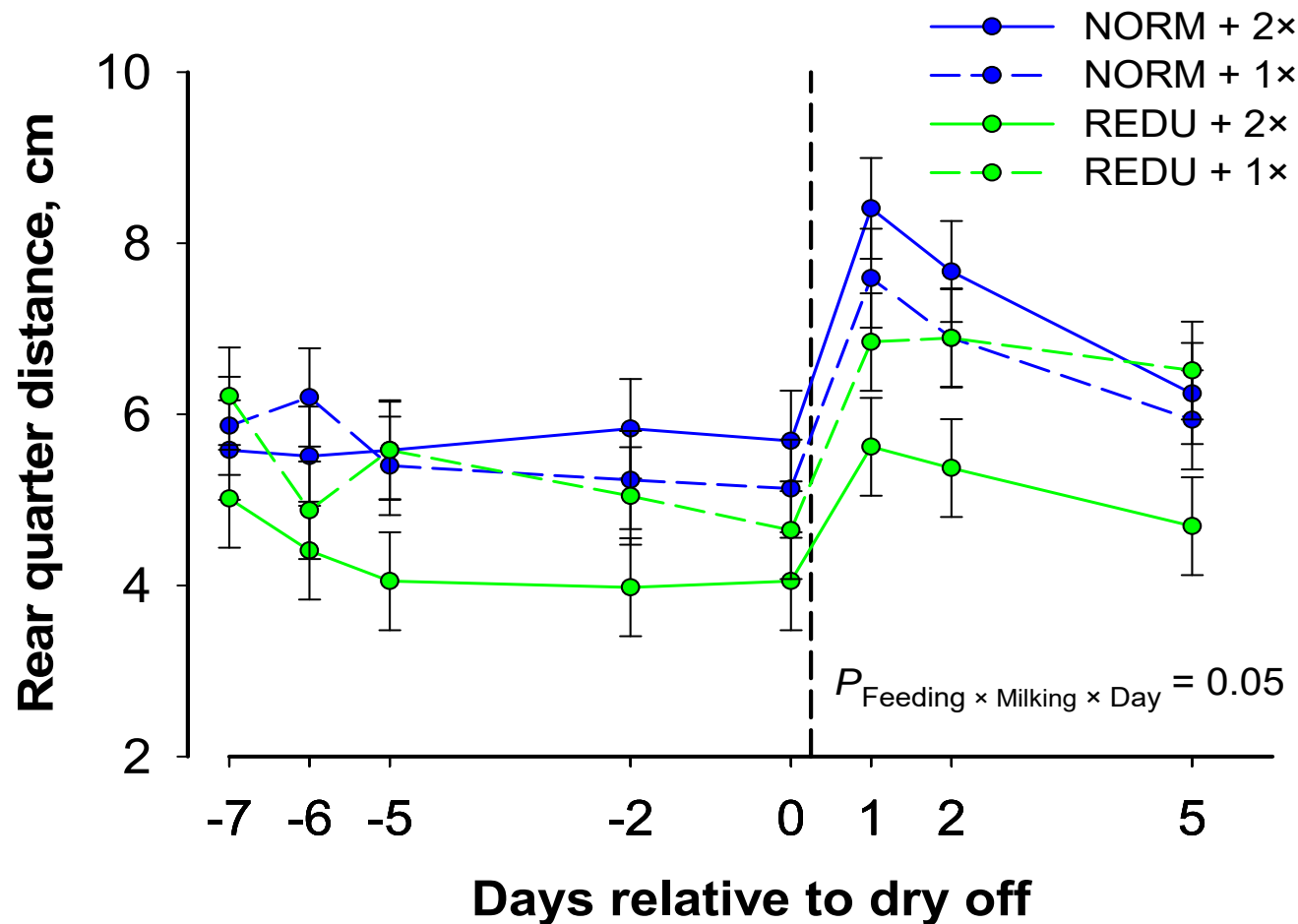
- › When: days -7, -6, -5, -2, 0, 1, 2 and 5 relative to dry-off
- › Time: between 08.15 and 10.15h
- › Where: cubicles in the experimental home pen

- › Measures:
 - › 1. Distance between rear quarters
 - › 2. Teat perimeter
 - › 3. Udder firmness
 - › 4. Signs of milk leakage

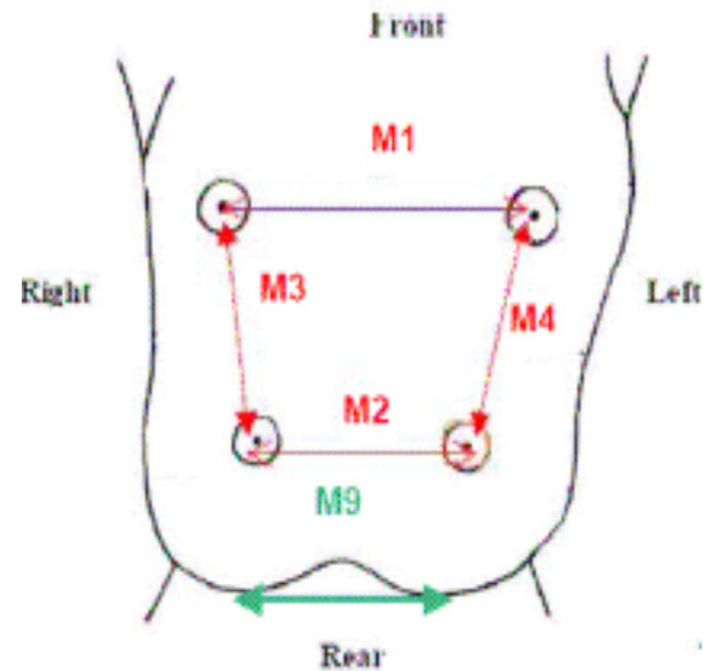
DISTANCE BETWEEN REAR QUARTERS



DISTANCE BETWEEN REAR QUARTERS

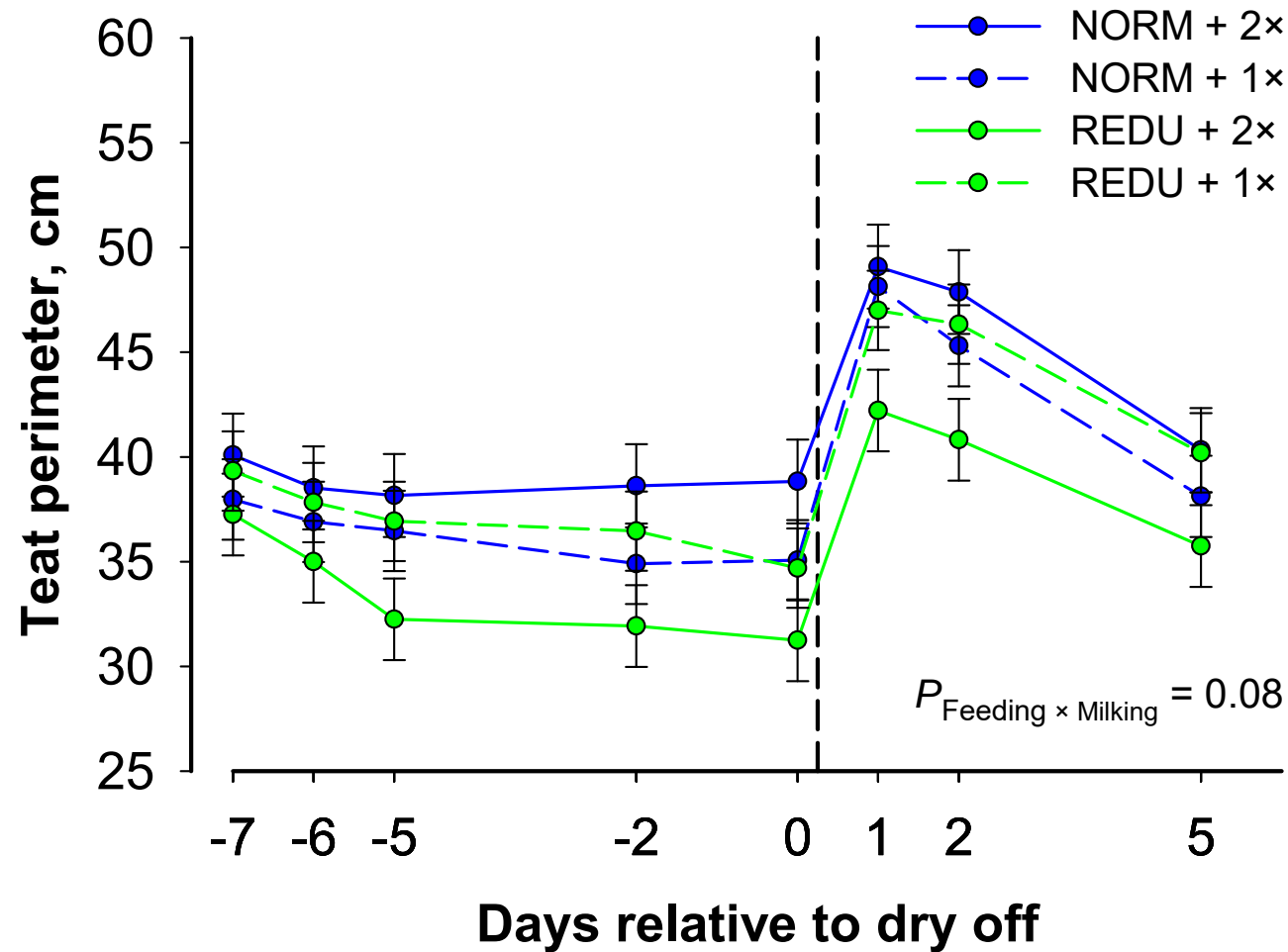


TEAT PERIMETER



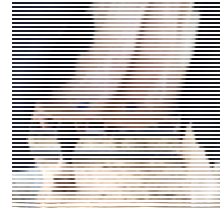
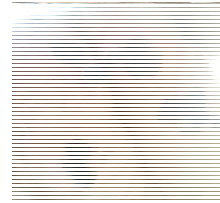
$$\text{Perimeter} = M1 + M2 + M3 + M4$$

TEAT PERIMETER

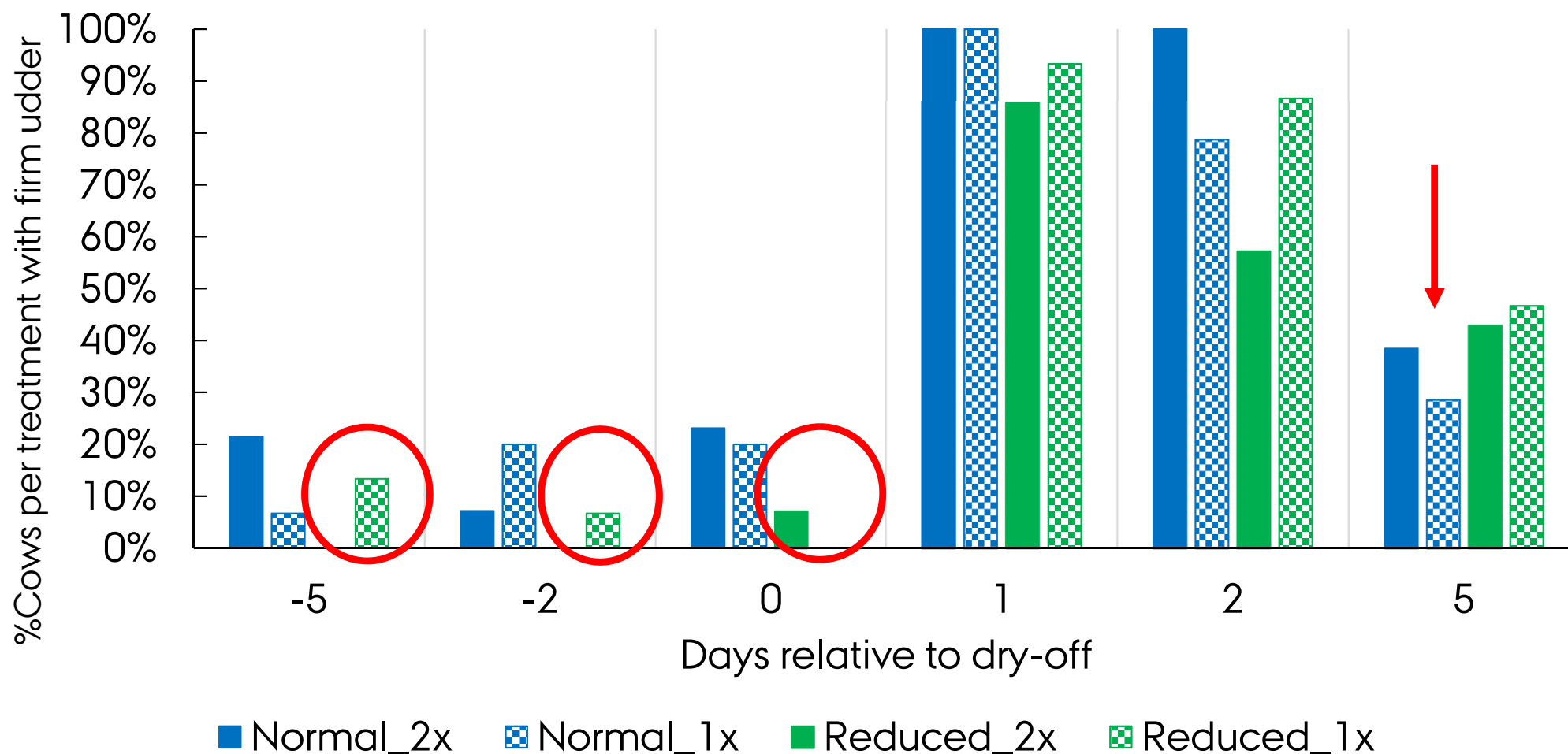


UDDER FIRMNESS



Criteria	Normal	Firm
		
		
Quarters easily separable	YES	NO
Quarters moving	YES	NO
Quarters compressible	YES	NO
Teat tip follow the direction of palpation	YES	NO

UDDER FIRMNESS

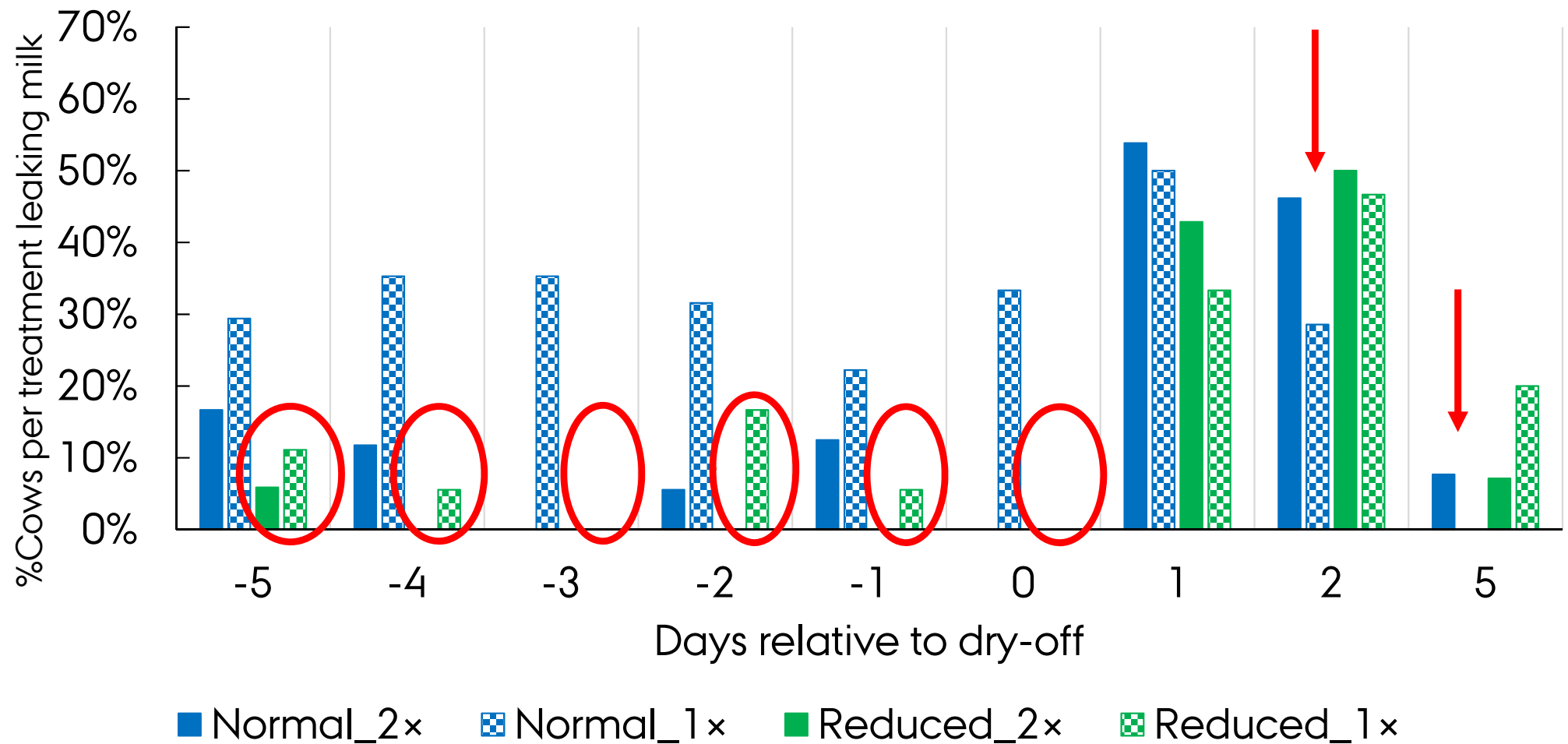


SIGNS OF MILK LEAKAGE



Sign of milk leakage =
Drop of milk hanging; milk
leakage or milk flow in at
least 1 of the teats.

SIGNS OF MILK LEAKAGE



SUMMARY

- Reducing the feeding level was the main factor to reduce variations in udder size, udder firmness and milk leakage before dry-off.
- At a lower extent, reducing milking frequency reduced udder firmness and milk leakage.
- The benefits of reducing feeding level or milking frequency to the udder were less clear after dry-off.

DRY-OFF × DEGREE OF HUNGER

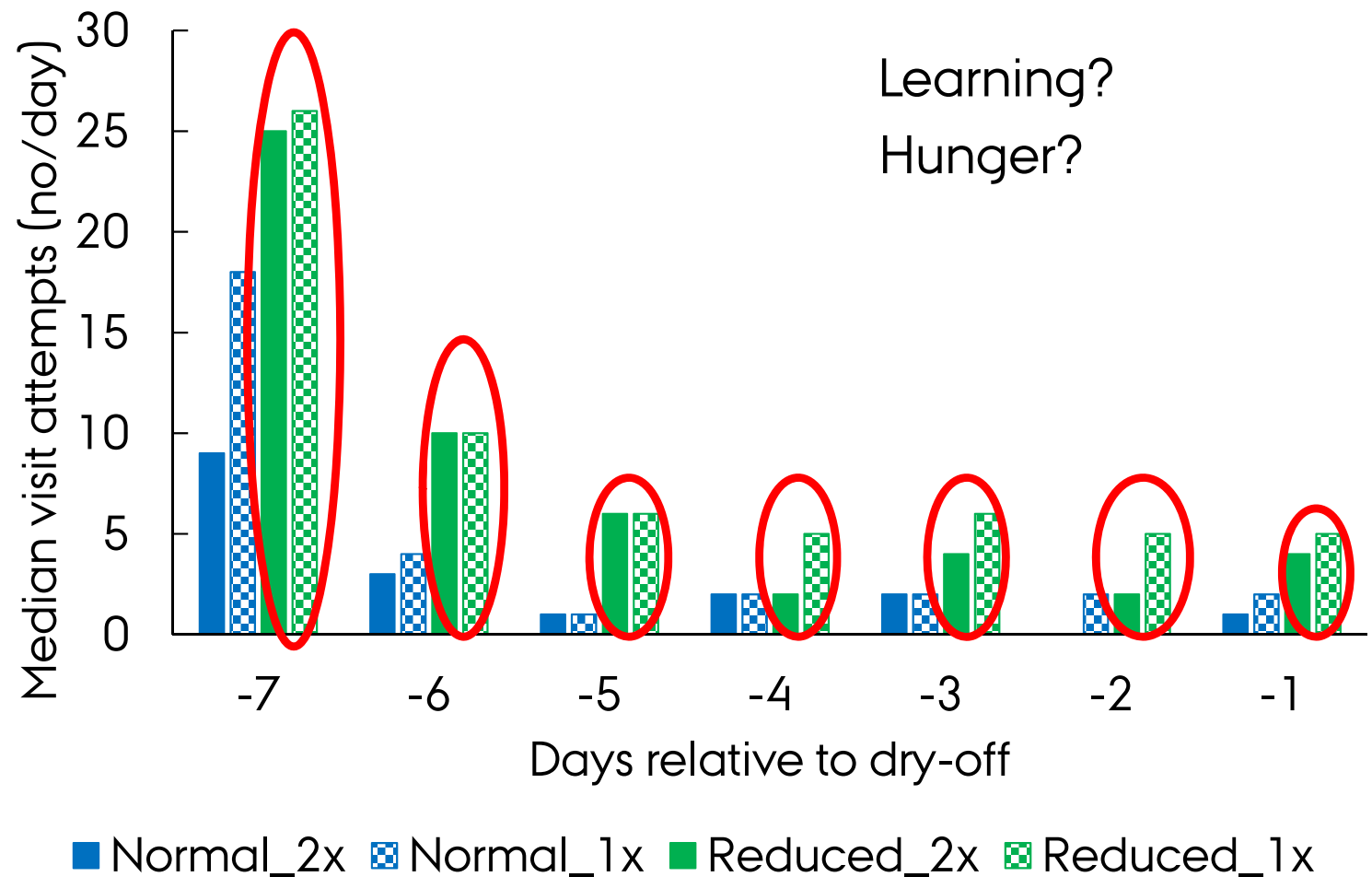
Cows fed restrictively, compared to non-restricted cows, showed:

- › 1. Higher plasma cortisol (“stress hormone”)
- › 2. Higher frequency of vocalisations

- › Do these measures indicate hunger?

- › Hunger = negative emotional state caused by undernourishment and lasting beyond the period between meals or feed deliveries.

ANOTHER EXAMPLE...



FEEDING MOTIVATION TEST

- › Rationale:

Work harder to keep access to the fixed resource

- › Examples:

Walk long distances or press a lever to obtain additional fixed rewards

- › Goal:

- › Stimulate behaviours that meaningfully relate to the alleviation of hunger.

OPEN

Dairy cows fed a low energy diet before dry-off show signs of hunger despite *ad libitum* access

Guilherme Amorim Franchi, Mette S. Herskin  & Margit Bak Jensen

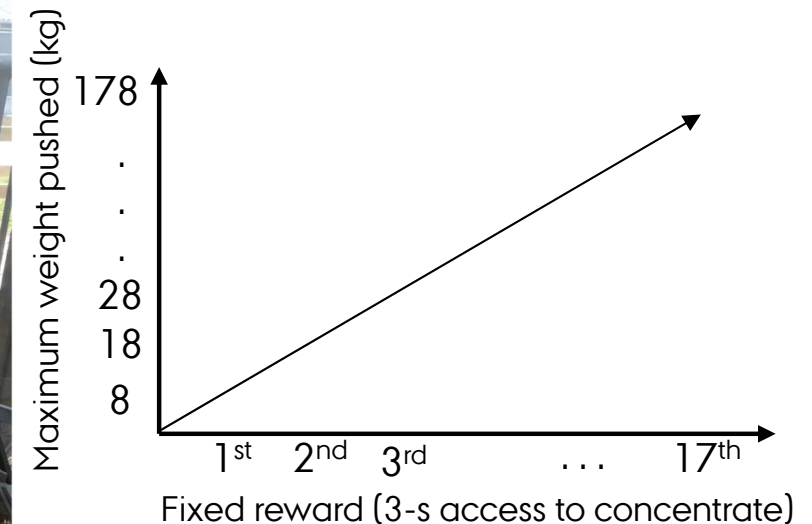
Drying-off is one important management step in commercial dairy farms and consists of ceasing milk production artificially at a specific point in time, generally 2 months before the next calving. Drying-off typically comprises dietary changes as well as gradual or abrupt changes in daily milking frequency, which may challenge the welfare of high-yielding cows. This study investigated the isolated and combined effects of different feed energy densities (normal lactation diet versus energy-reduced diet, both offered *ad libitum*) and daily milking frequencies (twice versus once) on the feeding motivation of dairy cows on two separate days prior to dry-off (i.e. the day of last milking) using a push-gate feeder. During both days, cows on the energy-reduced diet pushed more than five times more weight to earn the final feed reward and were nearly ten times faster to feed on the first reward than cows on the normal lactation diet. Illustrating the importance of developing more animal welfare-friendly dry-off management, these results illustrate that cows show signs of hunger prior to dry-off when provided a diet with reduced energy density, although offered for *ad libitum* intake.

STUDY DESCRIPTION

Day -7 relative to dry-off
(Habituation and training)



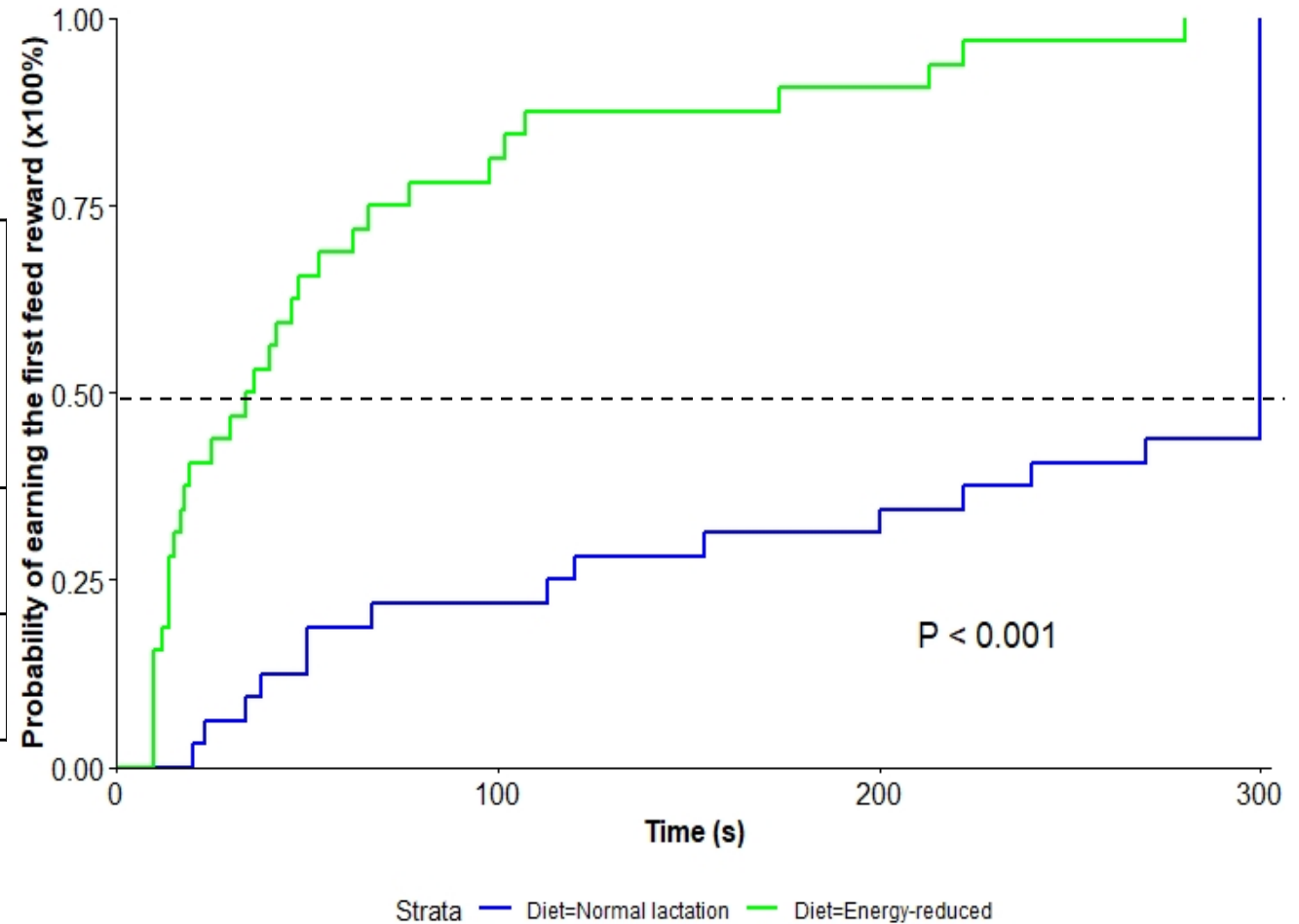
Days -5 and -2 relative to dry-off
(Testing)



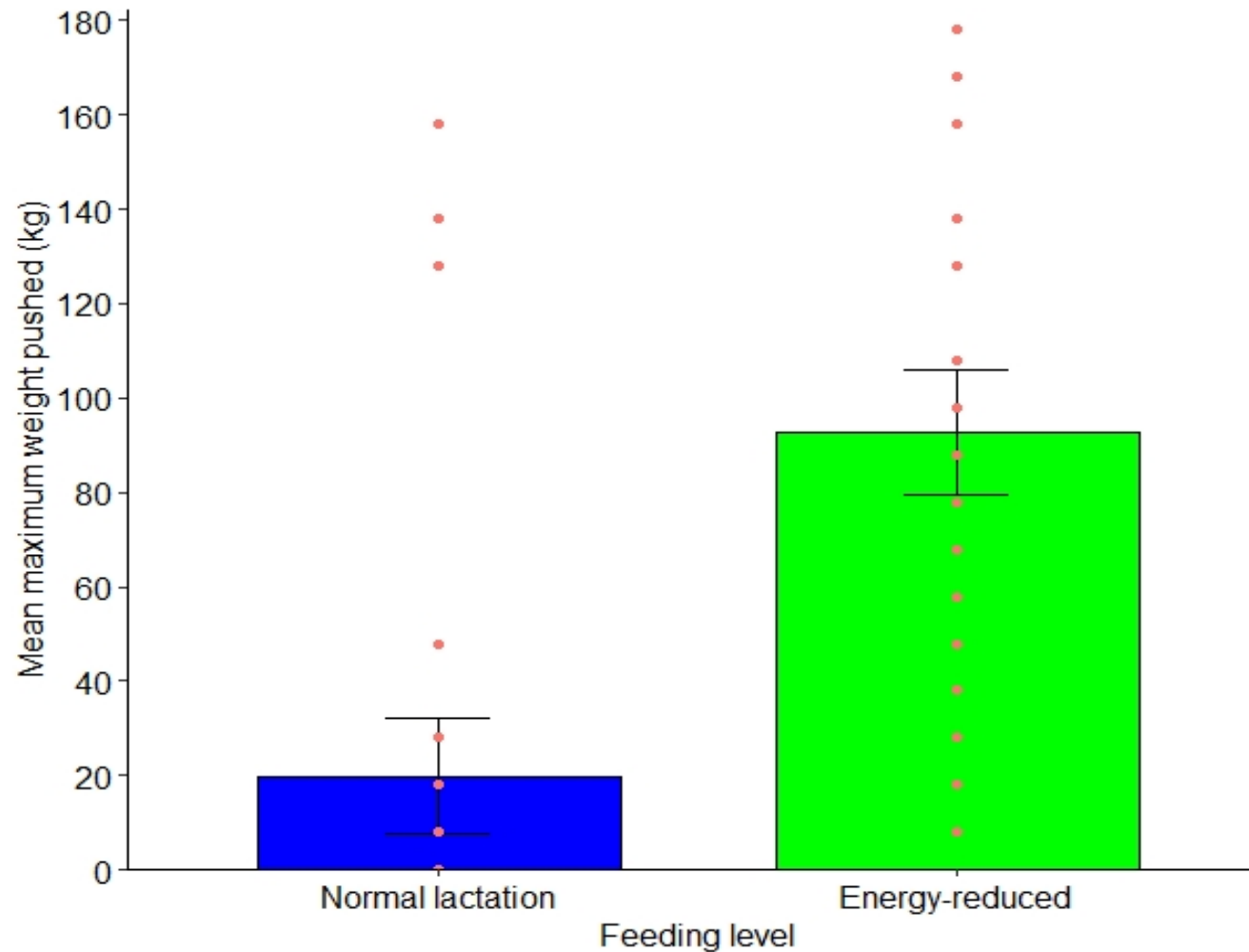
1. Latency to earn the first feed reward (≤ 5 min)
2. Maximum weight pushed (up to 178 kg)

FEED-RESTRICTED COWS WERE QUICKER TO EARN FEED

Feeding level	Latency to earn the 1 st feed reward (median, IQR)
Normal	300; 118 to 300 s
Reduced	35, 14 to 69 s



FEED-RESTRICTED COWS WORKED HARDER TO FEED



SUMMARY

- Reduced feeding level before dry-off = high feeding motivation
- Changes in milking frequency had no impact on feeding motivation.
- The prolonged, enhanced feeding motivation can be interpreted as hunger.



KONKLUSION – GRADVIS AFGOLDNING

- › Alle sænkede mælkeydelsen
- › Tegn på mindre mælkeløb og spændt yver
- › Men forhindrede det ikke

- › Reduceret foderniveau gav metabolisk stress og tegn på sult (bemærk at det var moderat foderreduktion)

- › Reduceret malkefrekvens vil være en bedre måde at sænke mælkeydelse ved afgoldning
- › Efter 2-3 dage var der fuld virkning på mælkeydelse



KONKLUSION – BRAT AFGOLDNING

- › Mere mælkeløb og spændt yver i det første døgnstid
- › Men ingen store forskelle hvis man summerer over de første 5 dage
- › Svært at bedømme det akkumulerede ubehag som koen oplever
- › Milde og korte tegn på metabolisk stress og sultfølelse i det første døgnstid

ANBEFALING

- › Gradvis afgoldning
- › Reducér **IKKE** foderniveauet (nok OK at fjerne det sidste kraftfoder i automater/AMS)
- › Reducér malkning til 1 × dagligt i ca. 3 dage

- › Brat afgoldning
- › Ser interessant ud
- › Svært at vurdere forskellen i det akkumulerede ubehag som køerne oplever ved spændt yver
- › Virkning på mastitis (goldperiode og næste laktation)?

TAK FOR OPMÆRKSOMHEDEN

SPØRGSMÅL?

FINANSIERET AF MÆLKEAFGIFTSFONDEN OG AARHUS UNIVERSITET

