

STØTTET AF

Mælkeafgiftsfonden

PHASE FEEDING OF DRY COWS



AARHUS
UNIVERSITET
INSTITUT FOR HUSDYR- OG VETERINÆRVIDENSKAB

NIELS BASTIAN KRISTENSEN
LEKTOR



FEEDING AND MANAGEMENT OF DRY COWS DEFINES HERDS

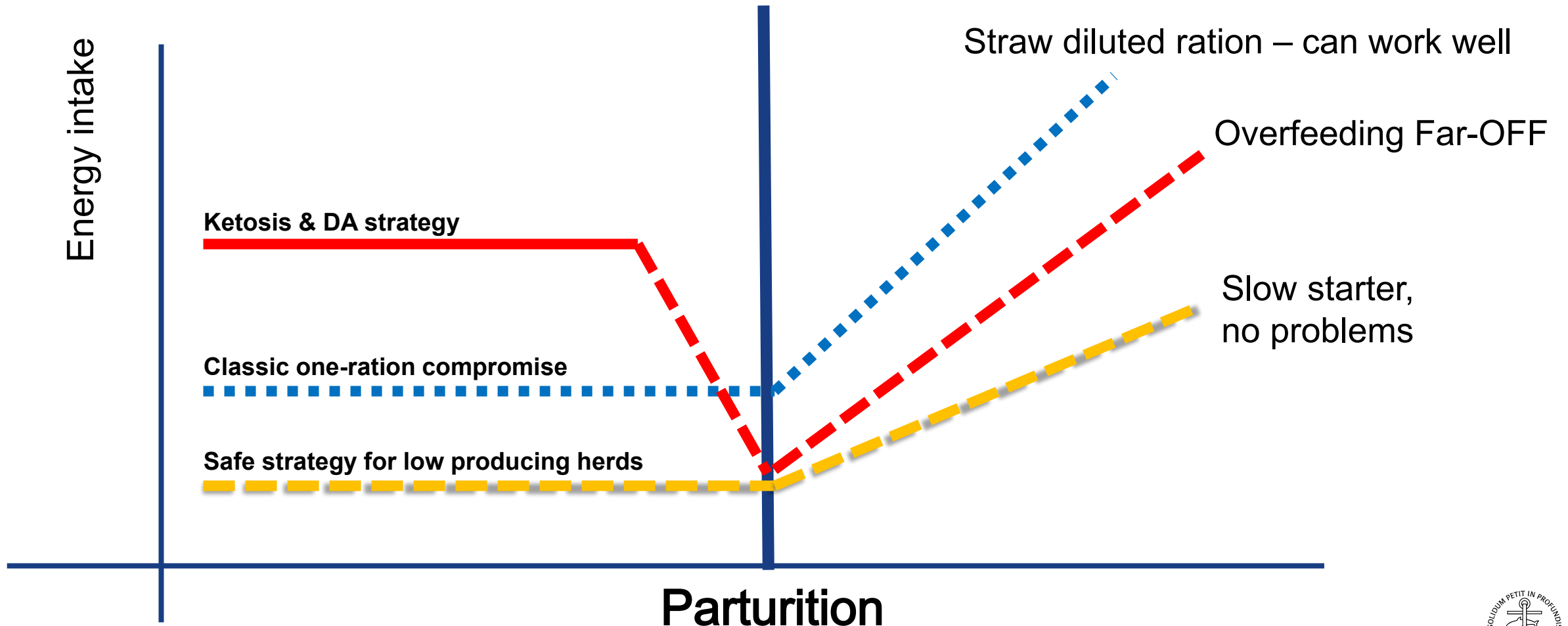
OPTIMUM STRATEGY WILL DIFFER WITH AMBITIONS AND CONDITIONS

- There are several successful recipes for dry cows feeding
- Many more recipes with variable success
 - Difficult transition cows
 - Hypocalcemia, ketosis, displaced abomasum, excessive negative energy balance
 - Cow mortality
 - Underutilization of production potential



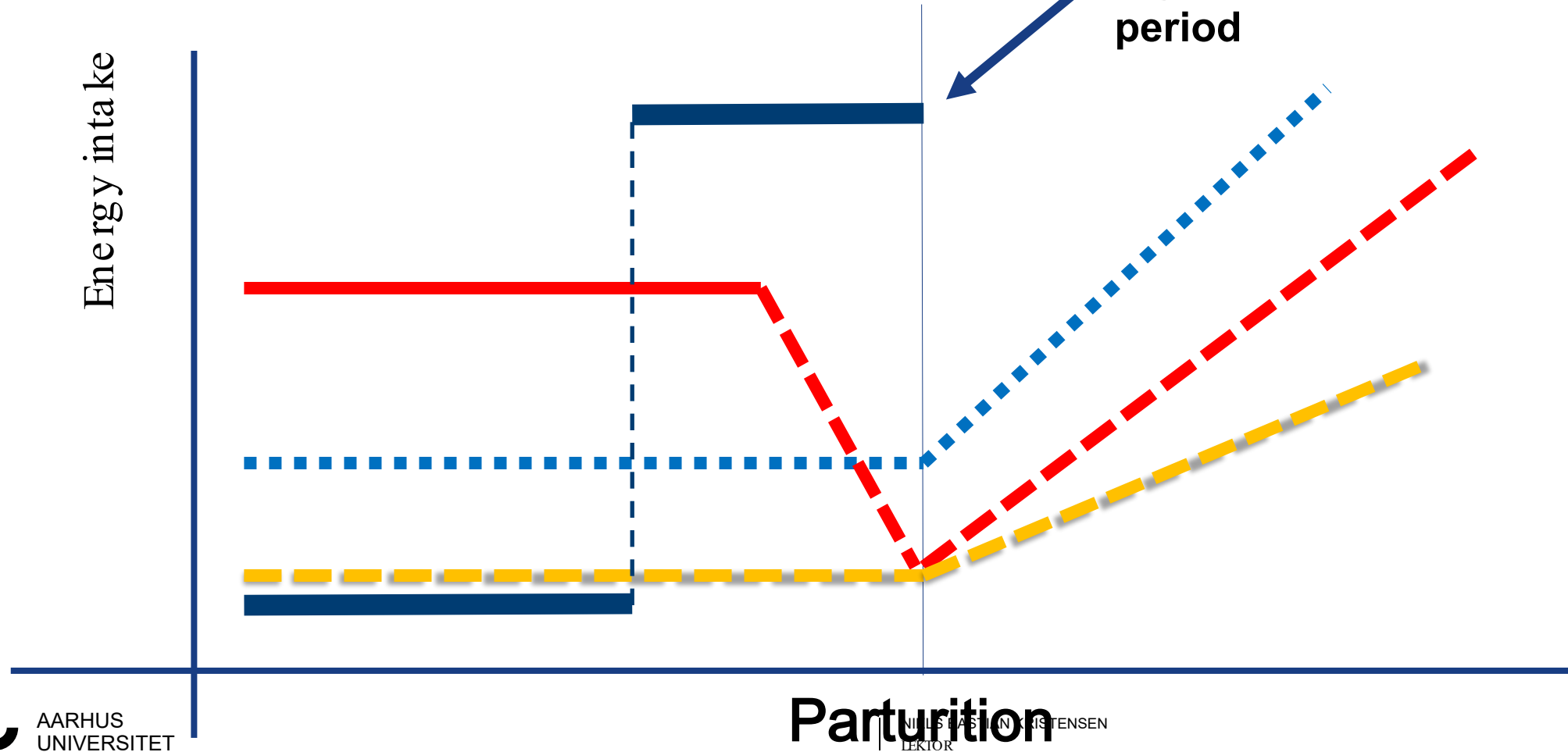
DRY COW FEEDING MAP

ALL EVALUATIONS OF NUTRITION RELATED TRANSITION COW PROBLEMS STARTS HERE!

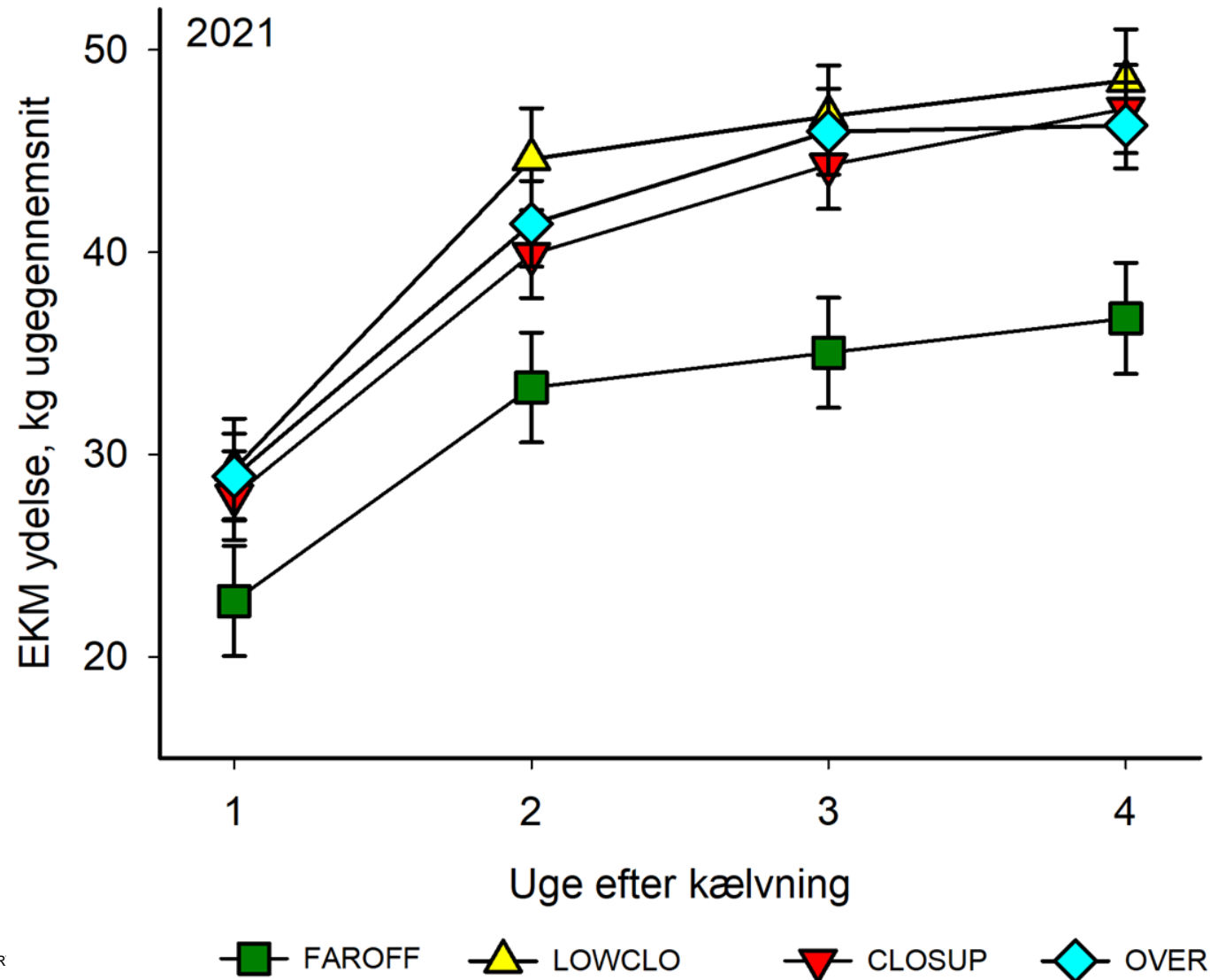


Phase feeding is cutting the Gordian knot

Combining benefits of low and high plane of nutrition in the dry period



DATA FROM 2021 TRIAL SHOW RESPONSE TO HIGH DENSITY CLOSEUP RATION COMPARED WITH LOW DENSITY CLOSEUP RATION



THE FUNDAMENTAL PHASE FEEDING RECIPE IS SIMPLE, HOWEVER, DETAILS AND PRACTICALITIES MATTERS

WK	-9	-8	-7	-6	-5	-4	-3	-2	-1	K
Day	-63	-56	-49	-42	-35	-28	-21	-14	-7	0
Far-OFF										
Close-UP										

Far-OFF

Fill controlled low plane of nutrition
 Ketogenic grass based ration
 Simple mineral supplementation

Close-UP

High plane of nutrition – typical corn silage based
 High AAT (+1000 g/dag)
 Need milk fever prevention e.g. by acidification, negative DCAD
 Supplement Mg, Na and vitamin E

SIMPLICITY IS AN OFTEN USED ARGUMENT AGAINST IMPLEMENTATION OF PHASE FEEDING

However;
many herds
will not end up
with more
rations when
implementing
phase feeding
of dry cows



Far-OFF
ration

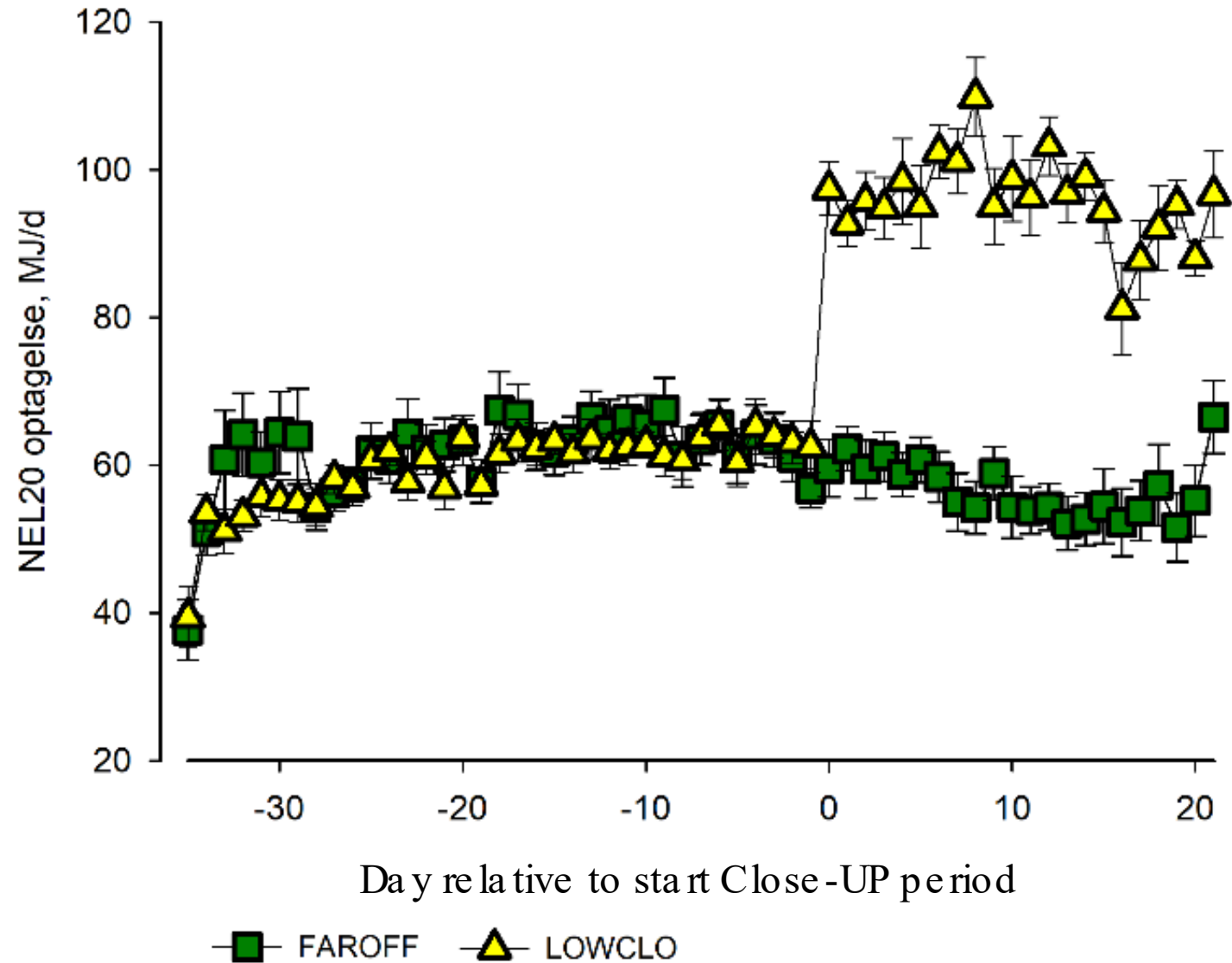
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effective
Dryoff feed

REQUIREMENTS FOR SUCCESSFUL IMPLEMENTATION OF DRY COW PHASE FEEDING

- A. Understand the essential principles behind the feeding strategy you chose.
- B. Discuss the feeding strategy with your vet and feed advisor and make an agreement on how to follow up on cows and make sure to agree on who will be responsible for routine adjustment of rations.
- C. Educate everyone that comes near the cows and feed –robust procedures are of critical importance.
- D. Evaluate, and if necessary, adjust housing of dry cows and heifers for phase feeding.
- E. Evaluate your feed mixer and mixing procedures.
- F. Formulate rations and buy the right minerals and eventual additives.

WITH A SUCCESSFUL PHASE FEEDING PROGRAM COWS HAVE HIGHER METABOLIC ACTIVITY AT CALVING

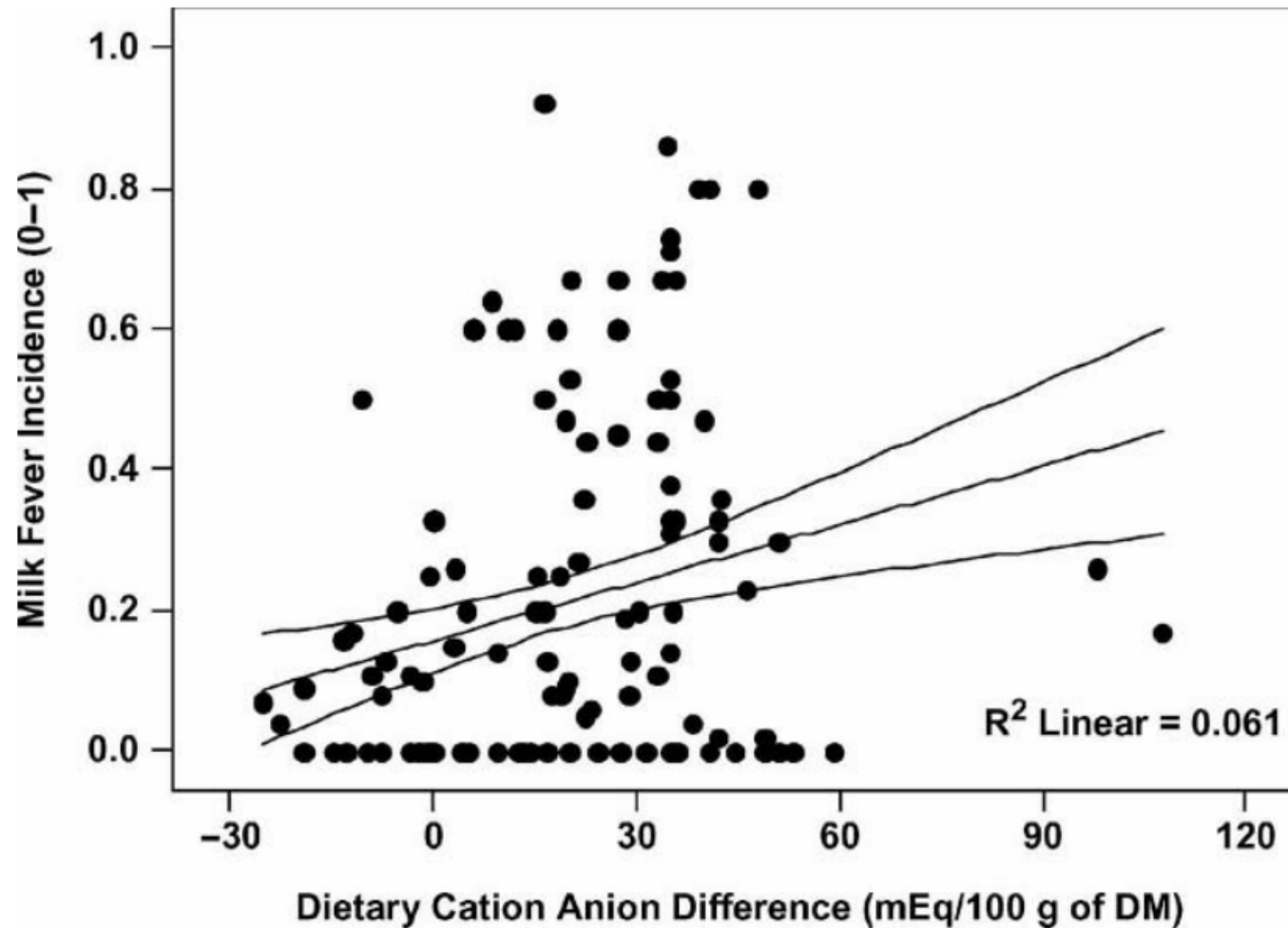


MILK FEVER BECOMES A MAJOR PROBLEM FOR COWS ON HIGH INTAKE BEFORE CALVING IF MF IS NOT EFFECTIVELY PREVENTED



High metabolic activity before calving and inefficient milk fever prevention will cause many severe cases of milk fever and far too many cows to be hauled out of the barn

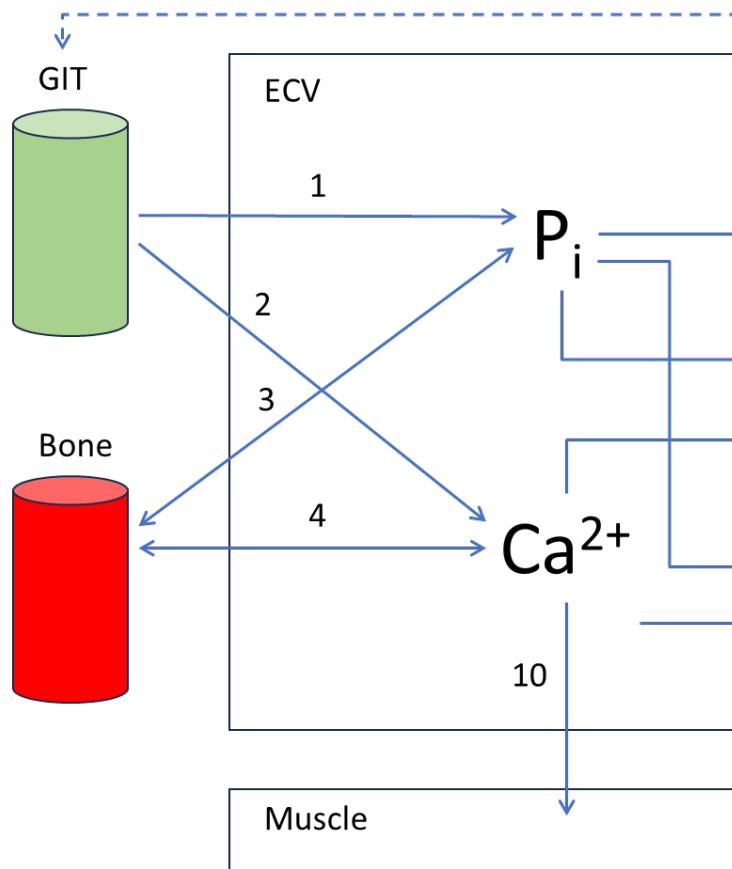
HIGH DCAD (CAB) INCREASES RISK FOR MILK FEVER



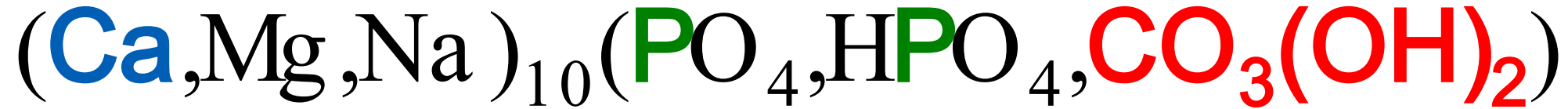
Lean et al., 2006

ACTIVATION OF BONE CALCIUM IS THE PRIMARY STRATEGY FOR DECREASING MILK FEVER RISK AT CALVING

Periparturient hypocalcemia

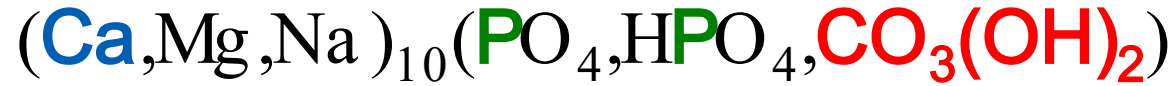


CALCIUM IN BONE IS MAINLY STORED AS CARBONATED APATITE



Bone resorption is induced by conditions making the cow deficient in either calcium or phosphate or by inducing a metabolic acidosis that is partly buffered by buffer base stored in bone.

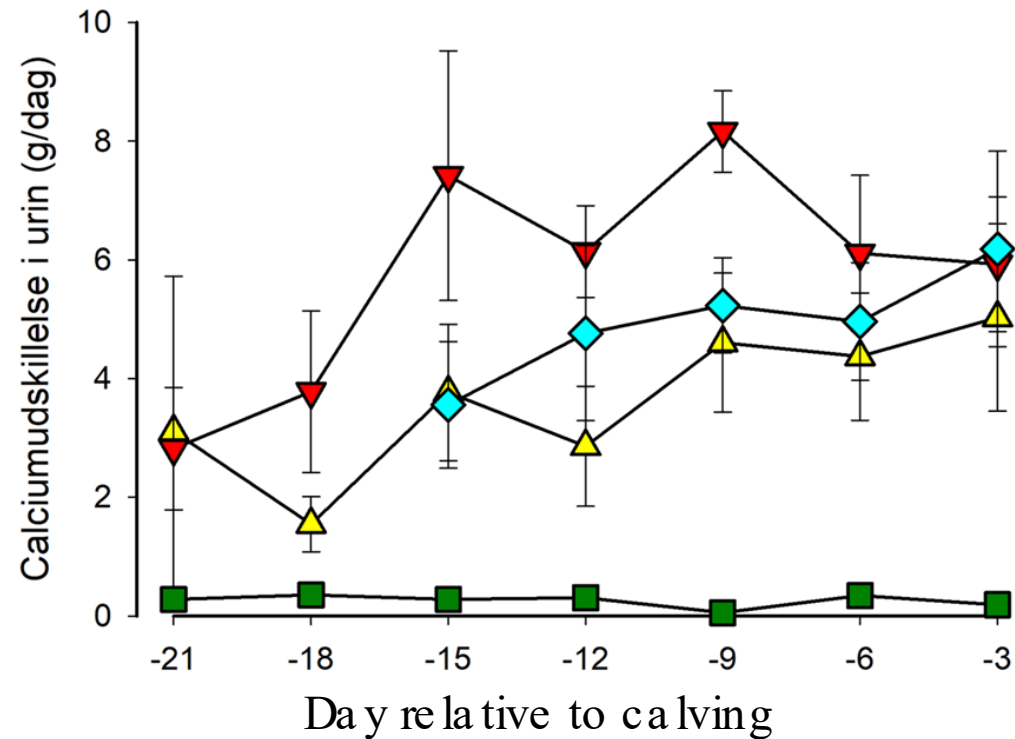
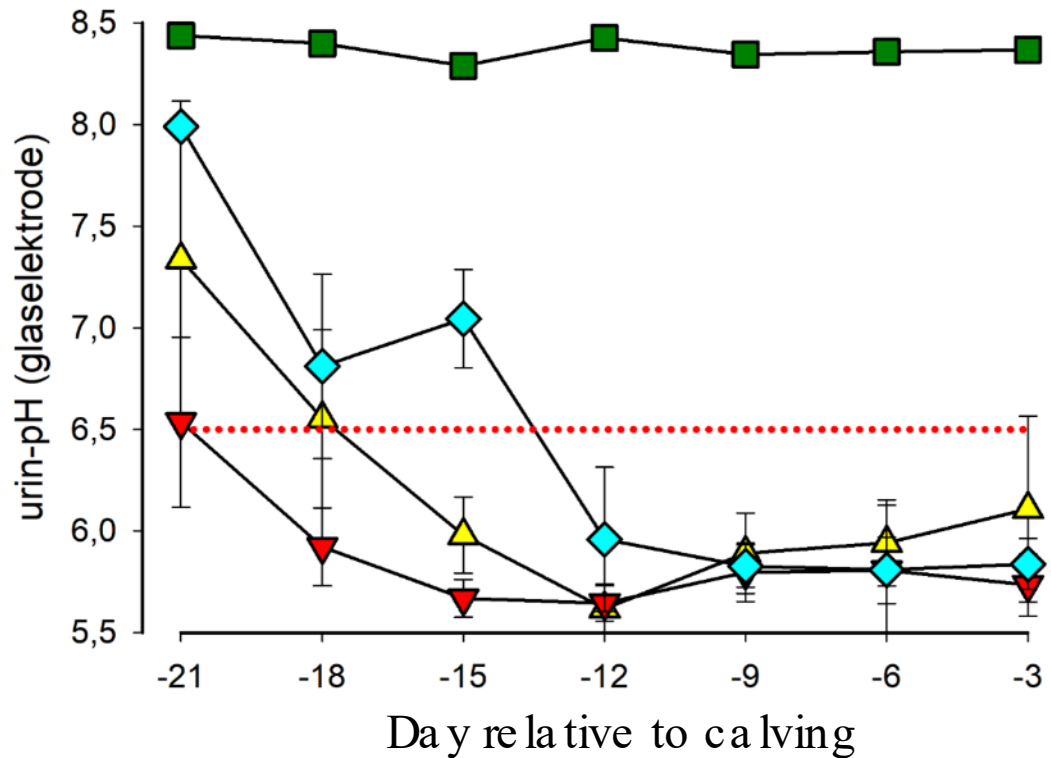
CALCIUM IN BONE IS MAINLY STORED AS CARBONATED APATITE



- Feeding rations deficient in calcium is very difficult, so it is not a safe strategy.
- Feeding rations high in protein and deficient in phosphorus is difficult.
- The P strategy is primarily an option with low plane of nutrition (e.g. grass / hay) or with supplementation of phosphate binders.
- Phosphate binders are expensive and tend to work less efficient with canola supplemented Close-UP rations and therefore this approach is not the first choice.

ACIDIFICATION OF CLOSEUP DRY COWS BY FEEDING A NEGATIVE DEAD / CAB RATION IS A STANDARD SOLUTION TO THE MILK FEVER PROBLEM

The metabolic acidosis observed as low urinary pH (below 6,5) is followed by increased renal excretion of calcium from bone



ACIDIFICATION PROTOCOLS

- If possible, use low DCAD (CAB) feedstuffs for Close-UP diets
 - Corn silage
 - Canola cake or meal
- Don't use soybean meal or cake (high DCAD)
- If you use grass, find a low DCAD / CAB source or produce washed grass fibers
- If you use whole grain silage analyze DCAD / CAB

A WHOLE CHAPTER ON PRODUCING WASHED GRASS FIBERS TO BE USED IN ORGANIC CLOSEUP DIETS - FOR ANOTHER DAY



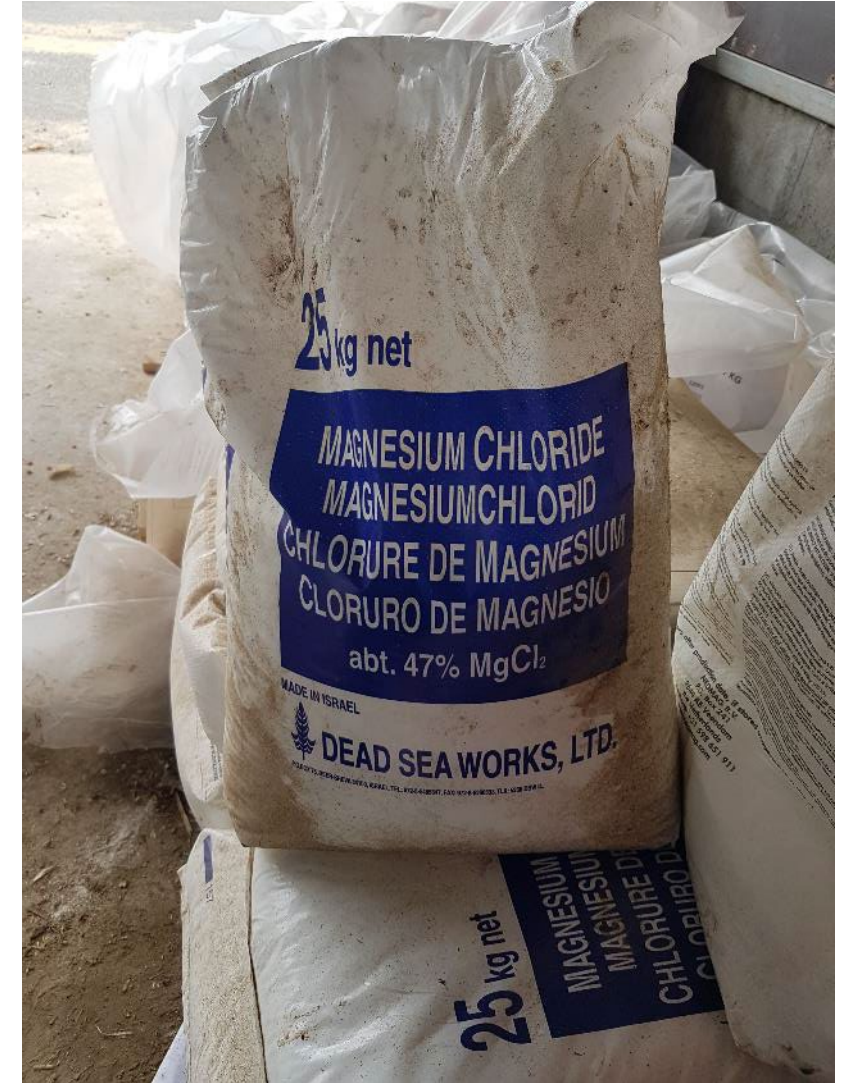
MAGNESIUM CHLORIDE

For organic herds $MgCl_2$ is the only option
(a problem for organic farmers because they
often struggle to find low DACD/ CAB feedstuffs)

$MgCl_2$ is used as part of the acidification package
in conventional herds.

Product most common as hexhydrate in flakes.

Typical dose is 100 to 250 grams per cow per day.



CALCIUM CHLORIDE

CaCl_2 cannot be used in organic herds.

CaCl_2 is a powerful acidifier comparable with HCl.
Use in combination with MgCl_2 don't use CaCl_2 as only product.

Be aware of two formulations. The product is available as the anhydrous product and as dihydrate.
The effect is the same, however, the concentration is different.

Typical dose 50 to 100 grams per cow per day



AMMONIUM CHLORIDE

NH_4Cl cannot be used in organic herds.

NH_4Cl is a powerful acidifier comparable with HCl .

NH_4Cl is not to be added in pure form, is purchased as part of a mineral premix.

Typical dose 30 to 40 grams per cow per day



CHLORIDES AND SULFATES ARE NOT EQUALLY SOLUBLE

In the past MgSO_4 (magnesium sulfate) was recommended by some nutritionist. Don't use it!

The product is less soluble compared with the chloride and cows fed canola are in no need for sulfur.



TO PREVENT MILK FEVER, FORMULATE CLOSE UP RATIONS WITH DCAD (CAB) BETWEEN 75 AND 100 MEQ/KG DM



Use low DCAD feedstuffs in combination with either:

- $MgCl_2$
- $MgCl_2$ and $CaCl_2$
- $MgCl_2$ and NH_4Cl
- $MgCl_2$, $CaCl_2$ and NH_4Cl

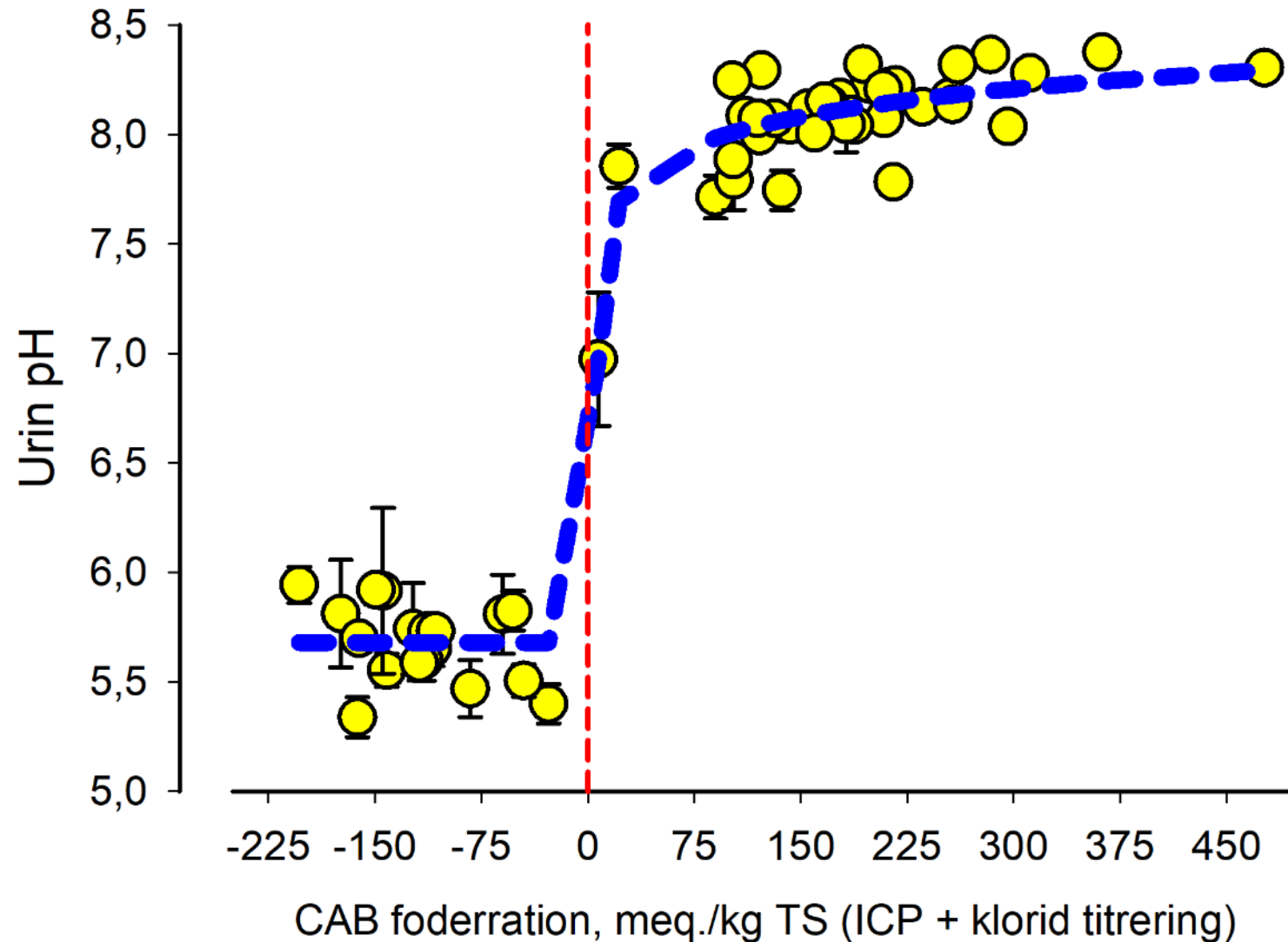
SAMPLE MID STREAM URINE BY STIMULATING THE COW TO URINATE FORCATHETERS



UNTIL YOU ARE SURE THE WHOLE SYSTEM IS WORKING TEST URINARY VERIFY ACIDIFICATION

Urinary pH is a simple and robust method to verify acidification of Close-UP dry cows

Verify that urinary pH is well below 6,5 – strongly advice to have all cows at 6 or lower



REQUIREMENTS FOR SUCCESSFUL IMPLEMENTATION OF D COW PHASE FEEDING

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MAKE SURE TO THAT YOUR HERD VETERINARIAN, NUTRITIONIST, AND FEED COMPANY ARE ALIGNED

- Are all on the same page regarding the feeding strategy and the requirements for running it?
- Who will follow up on urinary pH and at which interval?
- Who will follow up on feed intake and cow performance?
- Who take responsibility for optimizing the ration?
- How will maintain the ration when changing silages and commodities in the future?
- Organized or random communication between herd management, veterinary support, nutritionist, and feed supplier?

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- C. Educate everyone that comes near the cows and feed –robust procedures are of critical importance.

REALLY IMPORTANT THAT EVERYONE HANDLING FEED AND COWS UNDERSTAND THE REQUIREMENTS FOR STRICT SEPARATION OF COWS IN DIFFERENT GROUPS

We can't trust cows understand the importance



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- D. Evaluate and if necessary, adjust housing of dry cows and heifers for phase feeding.

WITH PHASE FEEDING FEEDING GROUPS MUST BE COMPLETELY SEPARATED

Far-OFF

Close-UP

Move cows to Close-UP at least once a week (day 17 –24 before calving), or two times pr week, or every day.

Chose a frequency that can be maintained for a longer period.

If space in Close-UP is limited reduce time in Close-UP pen, a void overstocking.



OFTEN BEEN TOLD THAT PHASE FEEDING CAN'T BE DONE BECAUSE OF LIMITED NUMBER OF PENS

Very often phase feeding is possible if you are willing to split a pen in two and establish a water supply.



HEIFERS ARE A CONCERN IN THE PHASE FEEDING SYSTEM

Never put your
heifers here !



Far-OFF

It is not ideal to
put heifers here –
though possible



Close-UP

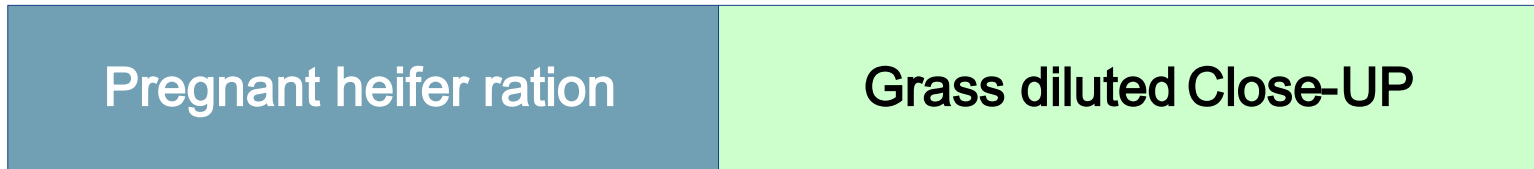


PREFERED SYSTEM-THREE RATIONS

Cows



Heifers



Mix oversize load of Close-UP and dilute with 20 to 25% dry matter of a grass silage. This result in a DCAD neutral ration.



CLOSEUP COWS STEALING FEED, JEOPARDIZE ACIDIFICATION TRY TO FORESEE WHERE YOUR SYSTEM COULD BE VULNERABLE TO ACIDIFICATION OR UNINTENDED EATING / STEALING



FRESH WATER IS EXTREMELY IMPORTANT TO ACIDIFIED COWS

If the cows cannot keep up diuresis (urine volume) they will stop to eat, and the positive effects of phase feeding and acidification will be lost

Clean water for Close-UP cows at least one-time pr day –every day!



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- E. Evaluate your feed mixer and mixing procedures.

MIXING SMALL BATCHES OF DRY COW MIX MORE ABOUT ABILITY TO LIMIT CARRY OVER IN THE MIXER THAN THE SIZE OF THE MIXER

Mixing a Close-UP TMR of 1.200 kg here is not optimal, however, its not impossible



MIXING 1.200 KG CLOSEUP TMR WITH THIS CARRY OVER FROM A PREVIOUS MIX IS A MAJOR PROBLEM



MAKE A REALISTIC ASSESSMENT OF YOUR FEED MIXING SETUP BEFORE YOU DECIDE IF YOU NEED A SMALL MIXER FOR DRY COWS



The small mixer might be a good business case if it solves a problem.

It will require a closer look at local conditions to know.

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EXAMPLES FAROFF

Ingredient	Far-OFF
Ration size, kg DM	12,5
Sugar beet pulp – meal, % of DM	0 – 12
Grass clover silage, % of DM	55,2 – 71,1
Barley straw, % of DM	28,0 – 32,0
Kvæg basis / Type-3 mineral, % of DM	0,8
Hygiene4Feed, % of DM	0 – 0,1

Key variables:

- Formulate for 12,5 kg DMI (large breeds) monitor intake, Far-OFF DMI should not be greater.
- Formulate for organic matter digestibility of 65 %.
- Formulate for 115 – 130 g crude protein / kg DM – use eventually sugar beet pulp and extra straw to keep CP.
- Never add starch containing feedstuffs.
- Mix for a homogenous TMR.

EXAMPLES CLOSE UP

Ingredient	Close-UP
Ration size, kg DM	13,5
Canola cake, % of DM	23,1
Corn silage, % of DM	75,1 – 75,2
Vilomin 41856 or equivalent, % of DM	0,4
MgCl ₂ , hexhydrate, % of DM	0,7
CaCl ₂ , anhydrate, % of DM	0,6
Hygiene4Feed, % of DM	0 – 0,1

Key variables:

- Formulate for 13,5 kg DMI (large breeds) monitor intake, DMI should not be less.
- Formulate for at least 130 g crude protein / kg DM.
- Starch level typically 200 to 240 g/kg DM.
- Formulate for DCAD (CAB) between
- -75 to -100. Test urinary pH.
- Mix for a homogenous TMR.

DO NOT BUY AN OLD CONVENTIONAL DRY COW MINERAL PREMIX IF YOU USE MAGNESIUM CHLORIDE

Use a mineral premix formulated for use with $MgCl_2$
Acidification adapted mineral premixes do not include Mg, those listed below all contain NH_4Cl .

List from KvægInfo #2578:

- ◊ Mosegården Boviflex 23401 Close-UP Ammon
- ◊ Vilomix Novamin Gold NBK
- ◊ DLG Goldko Close UP Ammon
- ◊ NutriMix Gold Ammon CloseUp 25 kg

SUMMARY

- Low density ketogenic feeding in the Far-OFF dry period reduce post partum metabolic imbalance.
- Major impact of nutrient density of Close-UP rations on intake in a two or three phase system with low density Far-OFF.
- Milk yield of fresh cows affected by Close-UP intake.
- High intake before calving increases risk for milk fever and the risk need to be balanced by activation of bone resorption before calving.
- Rations for phase feeding of dry cows (and heifers) are simple to formulate and mix, however, attention to details are mandatory and test of urine pH is strongly recommended during implementation.

SUMMARY

- In herds with transition cow problems there is no excuse for not trying to optimize feeding and housing of dry cows.
- There are several functional strategies for feeding dry cows, find the right strategy for your herd.
- Need help – seek advice.

STØTTET AF

Mælkeafgiftsfonden

Thank you for your attention



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KvægInfo på Facebook:

<https://www.facebook.com/groups/1464001797517663/>