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COMPACT TMR – FOR IMPROVED FEED EFFICIENCY

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CONTENTS



- Definition of the Compact TMR concept
- Compact TMR mixing process
- Monitoring feed mixers and adjust feed mixers to the Compact TMR challenge
- Feed bunk management and behavior of cows at the feed bunk
- Effects of Compact TMR on production and efficiency



THE COMPACT TMR CONCEPT



The formulated ration for the entire herd 24 x 7

- Orts minimum 2% (1 kg/cow)
- Compact TMR



PHYSICAL CHARACTERISTICS OF COMPACT TMR



- Mix with grass silage, grass is the skeleton of the mix
- Grass chunks/balls have to be mixed away
 - (impact of chop length)
- All feedstuffs have “disappeared”
- No pellets or small particles on the floor or in the feed
- Moist and adhering mix
- Homogenous and short “skeleton”



THE STANDARD COMPACT TMR PROTOCOL

VERTICAL AND HORIZONTAL AUGER MIXERS



Mix phase	Ingredients	Time
I SOAKING	Pelleted feedstuffs and commodities + Water 1:1	+1 hour Typically over night soaking
II STRUCTURING	Mineral premix, grass silage, other fibrous feedstuffs	Mixing time 15-20 min
III FINISHING	Corn silage	Mixing time 15-20 min

Dry matter of mix:

Vertical auger 36%
Horizontal auger 39%





ADDING WATER +/- ACID

1



2



3

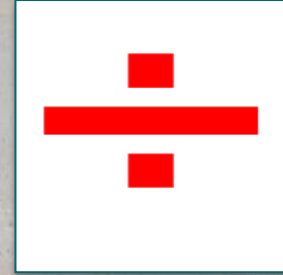


Be prepared for a warm summer with acid on stock

4



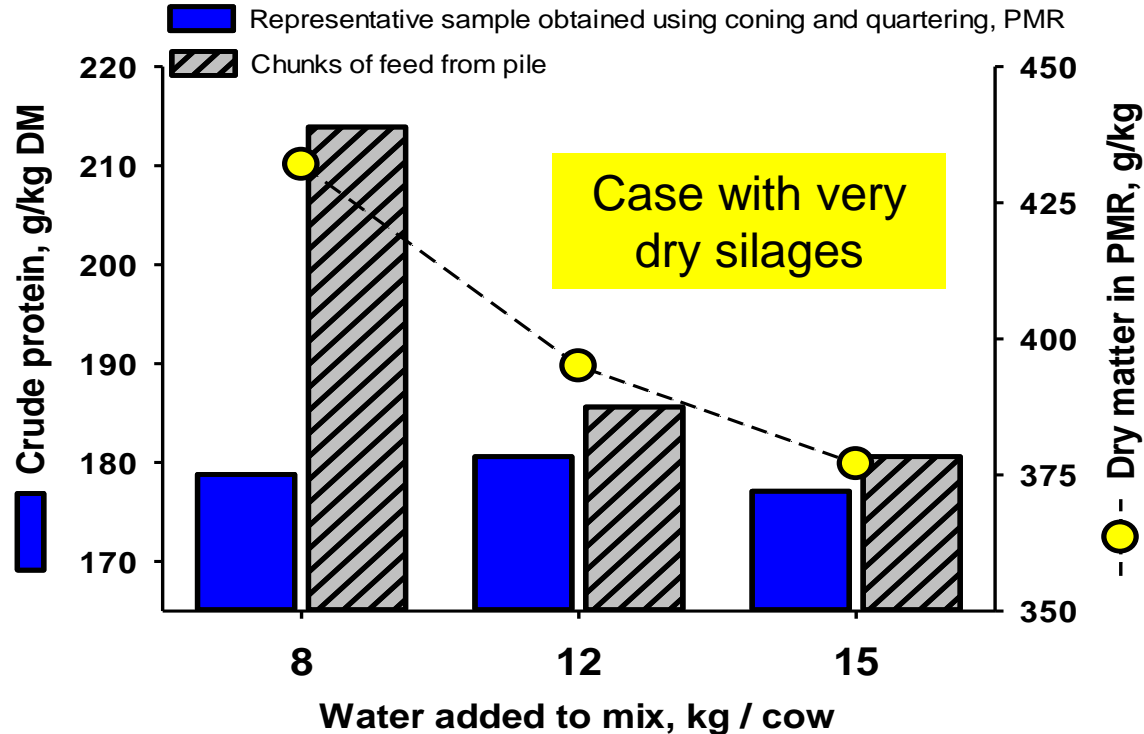
DON'T ADD WATER TO MIXER ON HOLD



RUN MIXER WHILE ADDING WATER



WHEN ADDING WATER, ADDING TOO LITTLE, IS VERY DANGEROUS



Adding too much water is far less dangerous - just making the feed wet

WITH GRASS + MAIZE RATIIONS OVER-MIXING IS NOT A CONCERN – ONLY UNDER MIXING



1X TMR

Soaking over night
Structuring 20 min
Finishing 45 min



3X TMR

Soaking over night
Structuring 20 min
Finishing 45 min
Extra mixing 90 min



CORMALL MIXER



THE COMBINATION OF PHASE II AND PHASE III MIXING ENSURES AN EFFECTIVE STEPWISE BLENDING



REMEMBER TO CONTINUE TO MIX LONG ENOUGH TO ENSURE A COMPLETELY UNIFORM AN NON-SEPARABLE PRODUCT



Mixing time for finishing phase should be 15 to 20 min with vertical auger mixers

Always 20 min with horizontal auger mixers

PROTECT MIXER AND TRACTOR DON'T STOP MIXER BEFORE UNLOADING



Use wide-angle PTO shaft





BE AWARE OF CARRY OVER IN MIXER

DRY COW RATIONS
AEROBIC STABILITY

Problem depends on
auger design and max
speed of auger during
unload

RESTRICTOR PLATES ARE TO BE USED WHEN CUTTING STRAW



Don't use restrictor plates when mixing Compact TMR for lactating cows, you risk to block the flow in the mixer

MONITORING FEED MIXERS AND ADJUST FEED MIXERS TO THE COMPACT TMR CHALLENGE



"FROZEN" MIX = DANGEROUS



THE COMMON PROBLEM WITH VERTICAL AUGER MIXERS



PROBLEM SOLVERS

SIMPLE, BUT ABSOLUTELY CRITICAL



NOW THE MIXER IS MIXING





IN PRACTICE, MAINTENANCE IS SOME TIMES “FORGOTTEN” – THE MIXER LOOSES IMPACT



FEED BUNK MANAGEMENT AND BEHAVIOR OF COWS AT THE FEED BUNK



MANY ASSUMED TMR'S HAVE NEVER BEEN MIXED PROPERLY

This is not 
Compact TMR



- Long straw
- Grass silage
- Pellets and small concentrate particles

Corn silage



UNDER MIXED RATIONS INDUCE SORTING BEHAVIOR

This is not 
Compact TMR



**COWS ATTRACTED BY SORTING POSSIBILITY AND
REMAIN AT FEED BUNK DUE TO LONG EATING TIME**

**This is not
Compact TMR**



LEFT OVERS (ORTS) ARE CRITICAL TO CONTROL COW BEHAVIOR

This is not 
Compact TMR



Orts outside the reach of cows are only waste

Minimum 2% orts evenly distributed along the feed bunk is a requirement in the Compact TMR concept

THIS IS THE BEHAVIOR YOU AIM FOR

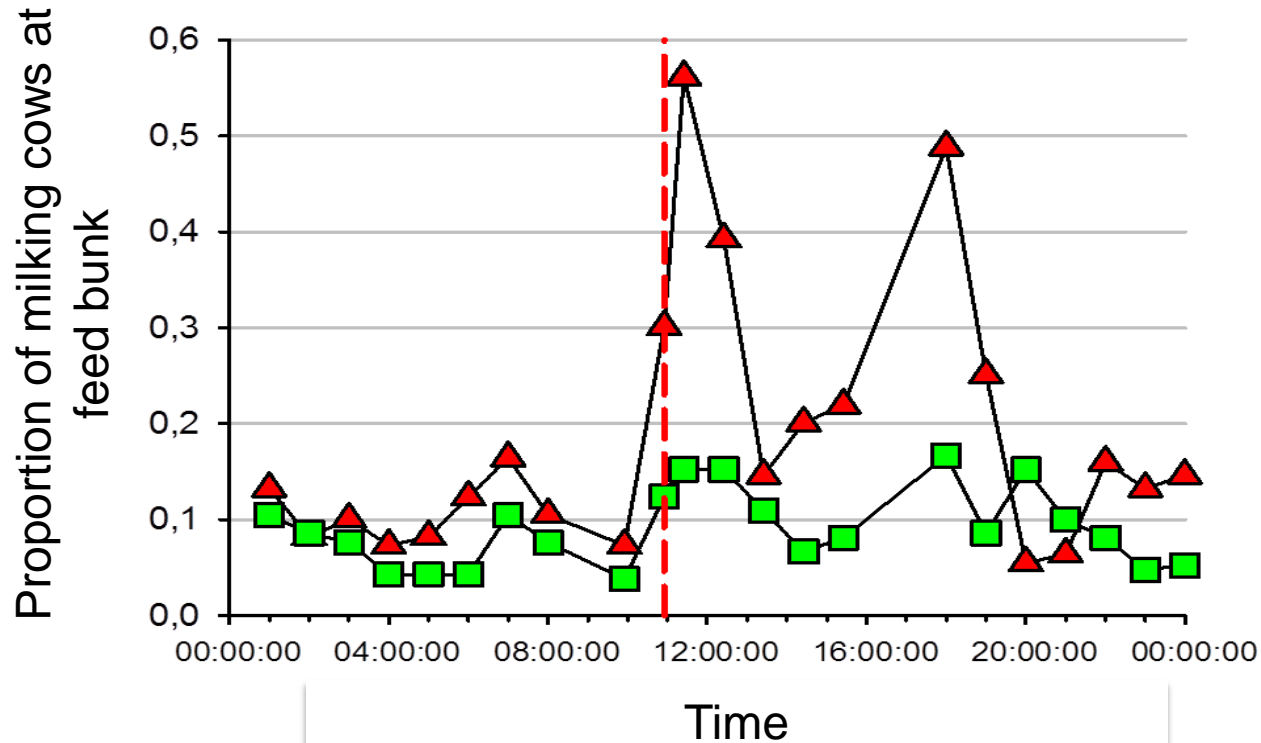


COWS RESPOND IMMEDIATELY TO MIXING QUALITY

— EXAMPLE FIRST COMPACT TMR FEEDING IN HERD



FEED BUNK MANAGEMENT AFFECT BEHAVIOR



YOUR COWS DON'T LIE CONTINUE TO OBSERVE THE BEHAVIOR AT AND AROUND THE FEED BUNK TO EVALUATE THE MIXING QUALITY



- Cows are eating from the top of the pile, not on the floor!
- Feed stays in the pile
- No reaction (minimum) from cows during feed out
- No reaction (minimum) from cows when pushing up feed
- Orts and feed mix identical upon inspection



3 CRITERIA TO EVALUATE BEFORE YOU CAN MAKE ANY JUDGEMENT ON IMPLEMENTATION OF COMPACT TMR



1. Evaluate the feed mix
2. Evaluate the behavior of the cows
3. Evaluate the flow in the mixer

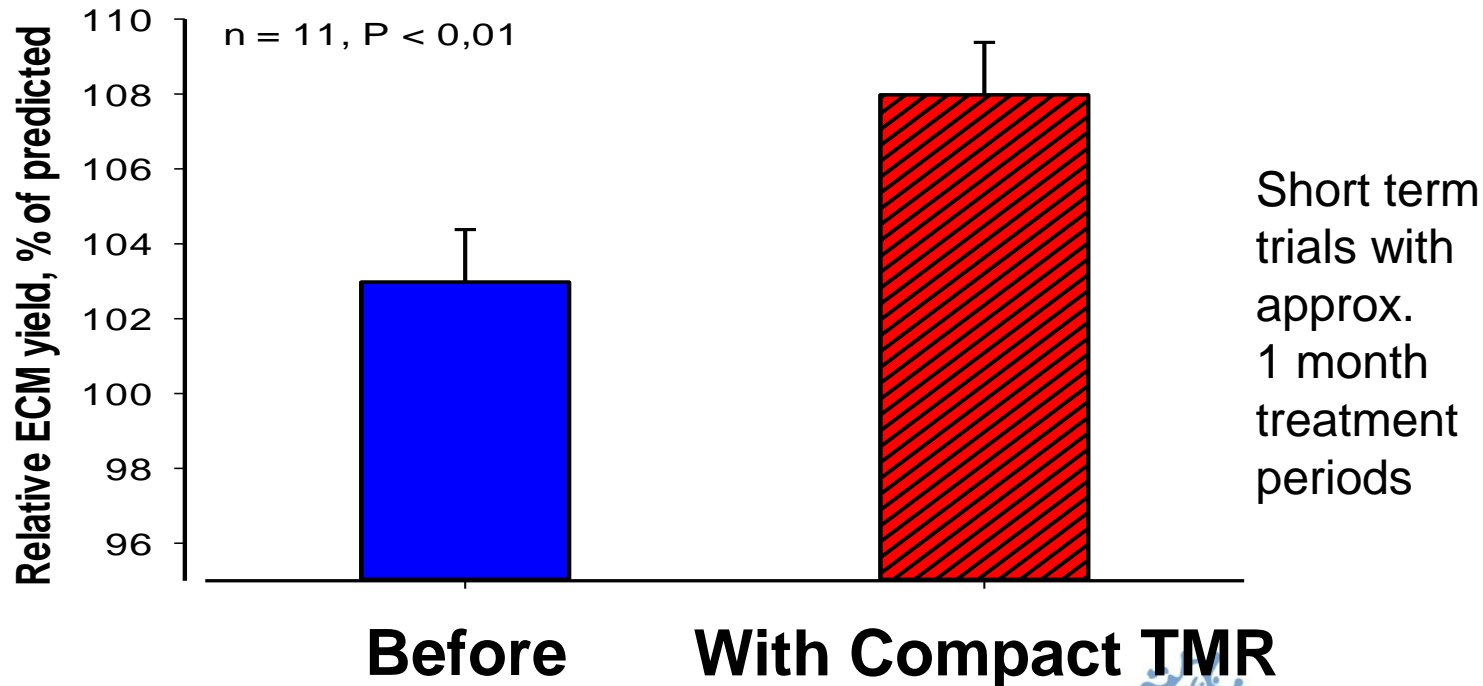


EFFECTS OF COMPACT TMR ON PRODUCTION AND FEED EFFICIENCY



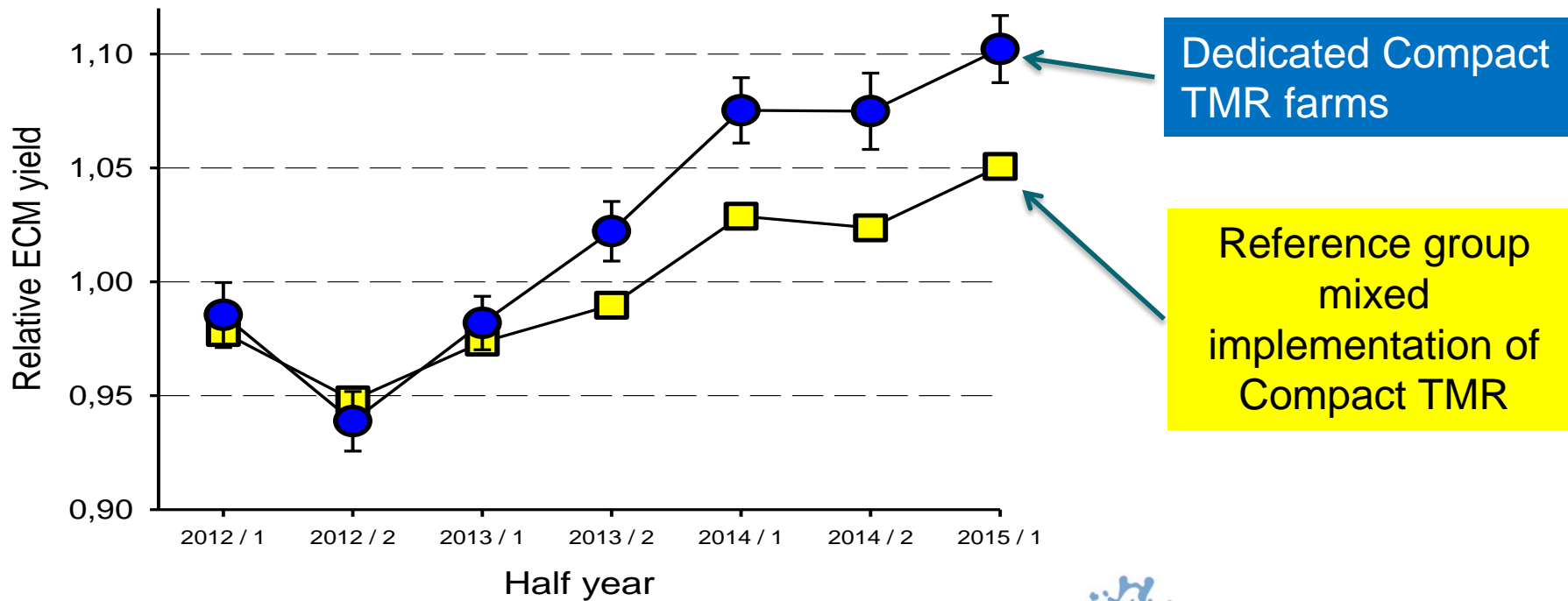


FARM LEVEL SHORT PERIOD

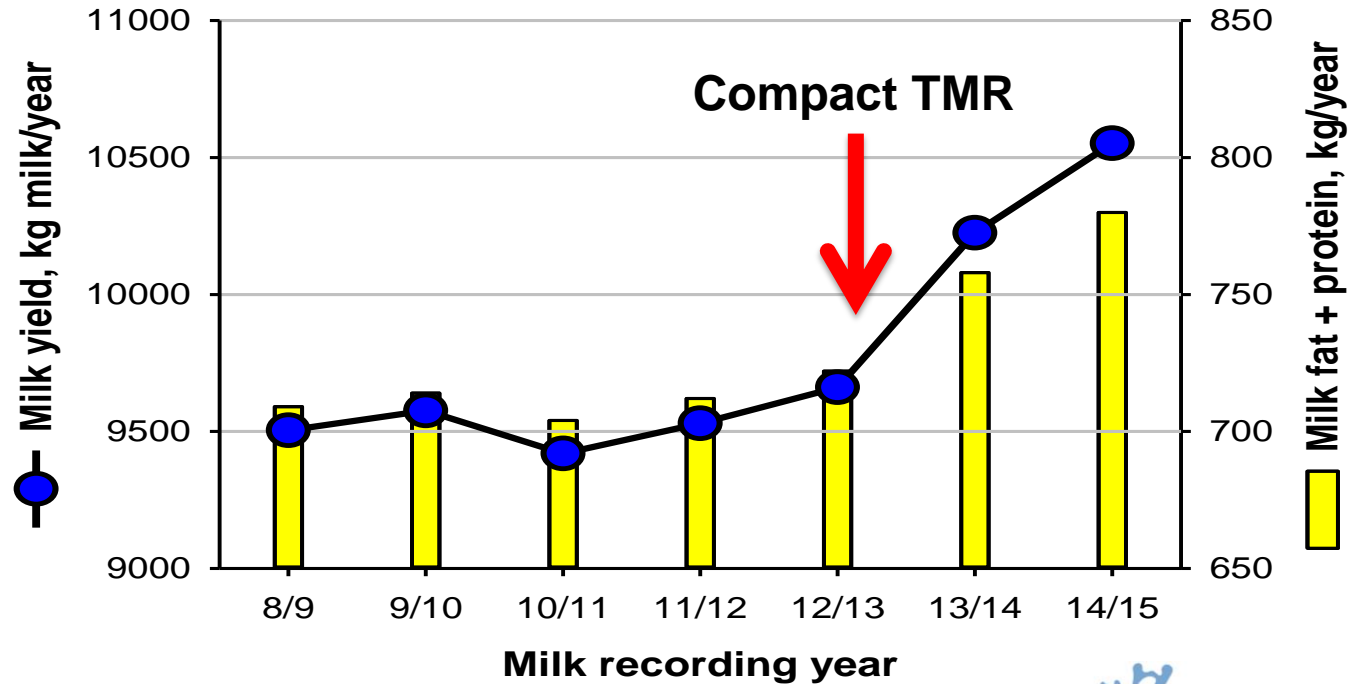




FARM LEVEL + 2 YEARS

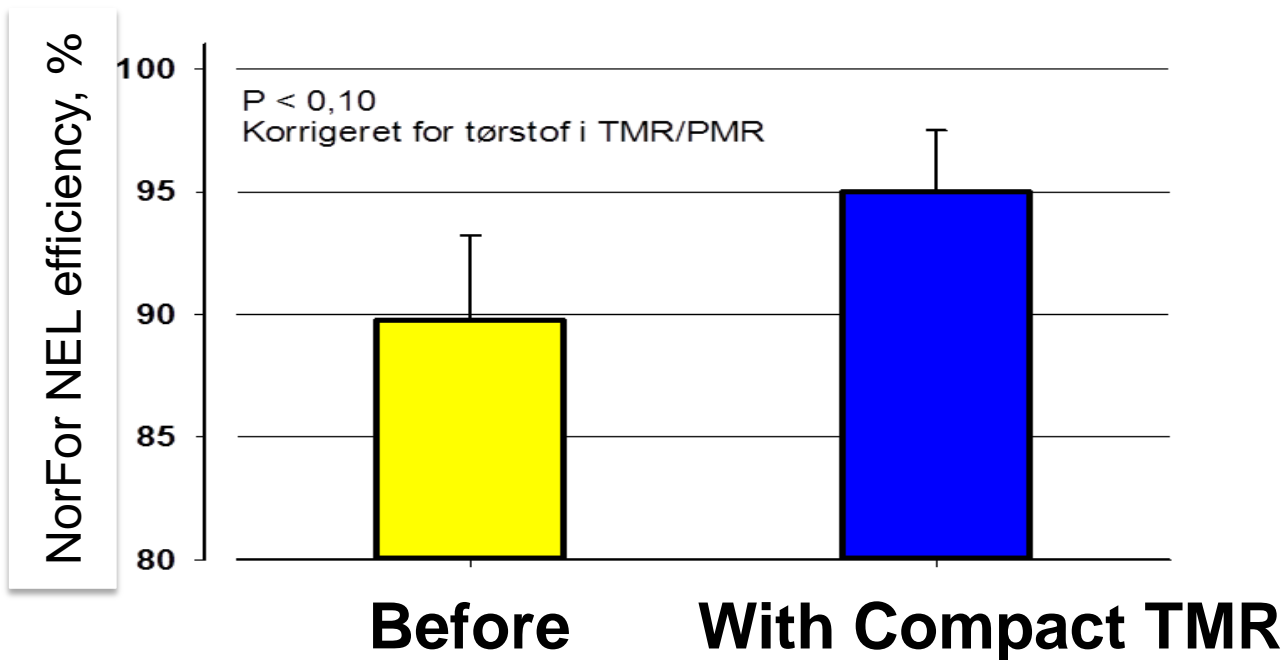


NATIONAL LEVEL MILK PRODUCTION BY DANISH HOLSTEIN





FEED EFFICIENCY (NORFOR NEL-EFFICIENCY)



LONG TERM PERSPECTIVE



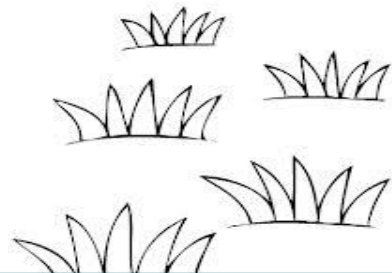
The Compact TMR Analyzer (CTA) is closing the big nutritional loop in dairy production



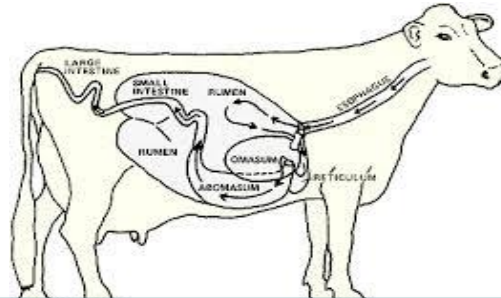
Feed MIX

Ingested ration

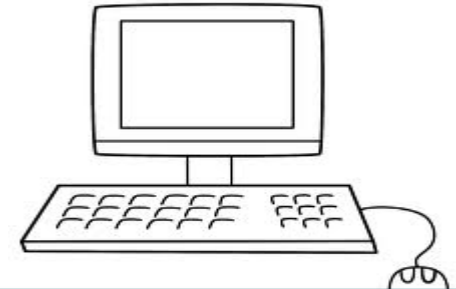
Analysis



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Compact TMR/PMR



EURODAIRY



This project has received funding from the European Union's Horizon 2020 research and innovation programme (ISIB-2015-1 programme) under grant agreement No 696364