



MANAGING THE RUMEN THROUGH TRANSITION WEBINAR

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In this webinar we cover:

- Overview of rumen function, cause and affect
- Seasdonal changes and pressures on the rumen
- Cow signals, wearable data, milk data: what to look for
- Solutions and tools

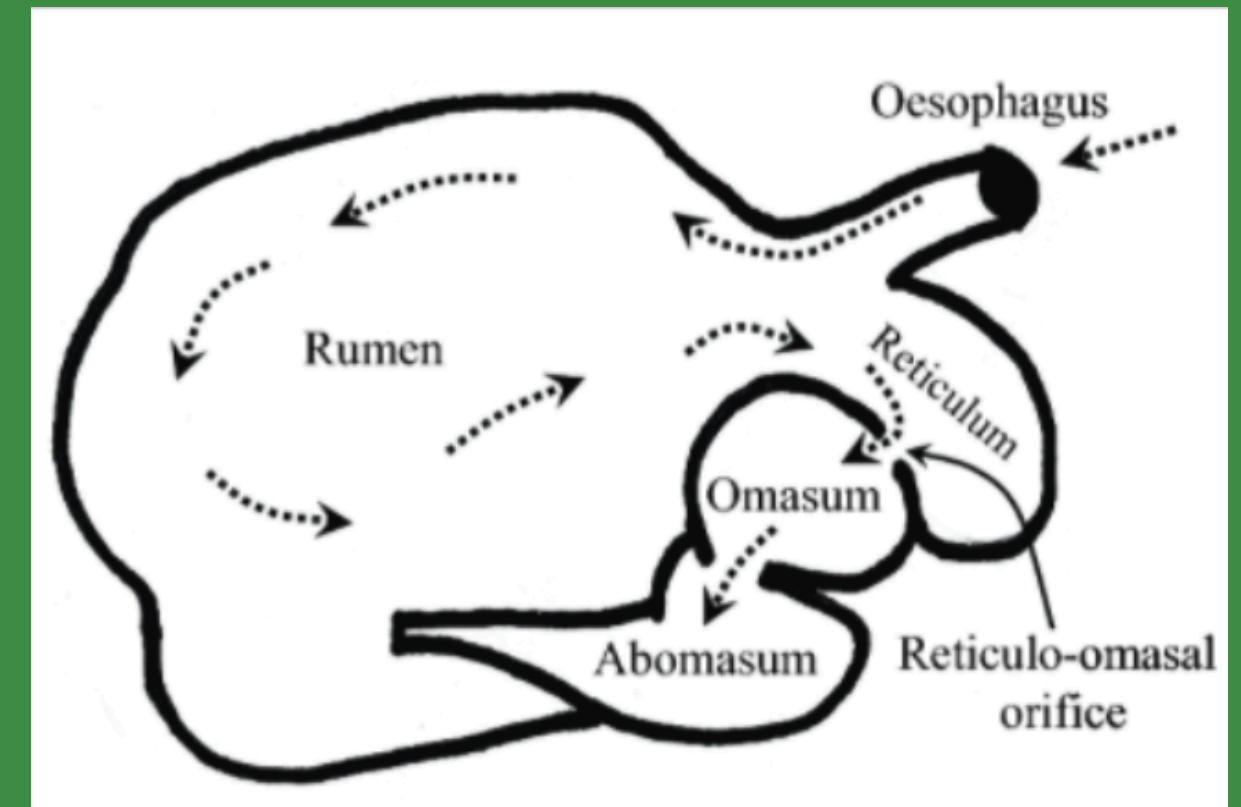
Why balance/tune the rumen?

- Better condition gain
- More energy at calving
- Improved calving recovery
- Increased appetite
- Less condition loss post-calving
- Improved feed conversion efficiency
- Better peak milk
- Better cow health
- Reduced lameness
- Support reproductive function

Rumen overview

Like any ecosystem, the rumen must stay
IN BALANCE to PERFORM

- The rumen is a 75-100L FERMENTATION chamber
- Made up of BACTERIA, FUNGI, PROTOZOA, and ARCHEA
- Rumen wall is made up of PAPILLAE which increase the ABSORPTIVE area/capacity
- Rumen microbe type and population change with FEED TYPE and pH RANGE
- How quickly feed moves through the rumen is called flow rate, and impacts DIGESTION EFFICIENCY (FCE)
- Uses muscles in the rumen wall for contraction and mixing
- Contains stretch receptors that influence appetite



**THE COW FEEDS
THE RUMEN**

**THE RUMEN
FEEDS THE COW**

Healthy rumen cycle

- ◆ Cow eats feed
- ◆ Microbes use sugar + ammonia first to reproduce
- ◆ Microbes release VFA, synthesis AA, and other metabolites
- ◆ VFAs, AA, and other metabolites start being absorbed
- ◆ Fibre movement stimulates rumination
- ◆ Cow chews, producing saliva and neutralising acid

Adequate fibre to stimulate rumination

Balanced feed source for rumen microbes

Minimal stress on the cow



Microbial protein

B vitamins + other metabolites

Volatile fatty acids (VFAs)

Amino acids (AA)

Rumen performance

MAINTAINING RUMEN STABILITY

- Managing stress
- Feed allocation
- Effective NDF
- Transitions
- Buffers, yeasts, antioxidants, minerals

FEEDING THE RUMEN

- Protein
- Starch
- Fibre/carbohydrates
- Soluble sugar
- Minerals, buffers, yeast, antioxidants

Cow signals to rumen instability

- ◆ Changes to manure consistency
- ◆ Changes in cow grazing behaviour
- ◆ Changes in cow demeanor and energy levels
- ◆ Drop in milk production and drop in fat%
- ◆ Decreased appetite and eating minutes
- ◆ Decreased rumination minutes
- ◆ Ketosis: rapid weight loss, sweet smell in shed
- ◆ High rumen passage rates
- ◆ Increased SCC, metritis, lameness
- ◆ Increased days to first cycle

Issues seen that are often associated with SARA



milkmap.nz

Cow signals to rumen instability...

- ◆ RUMEN FILL is a key signal giving us an indicator of APPETITE
- ◆ Changes in COW BEHAVIOUR tell us a lot about what is happening in the rumen
 - % of cows grazing vs resting/ruminating vs WALKING or IDLE
 - Cows seem to lack energy when walking to the shed
 - Not cleaning up feed breaks or inconsistency



Milk components

Downward trend in fat %

- Fat % volatility = depressed protein % & depressed kg/MS
 - Can also affect milk urea
- Fat % volatility = rumen performance drop
 - Delayed drop in protein %
 - Can also affect milk urea

Tools for rumen stability

EFFECTIVE FIBRE (effNDF)

Long fibre (physical fibre, not chemical fibre), width of cow's mouth - straw, hay, baleage etc.

CALSEA RUMEN BUFFER

Slow-release rumen buffer and calcium source, proven to stabilise pH for up to 8hr.

Neville et al., 2022, Cruywagen et al., 2015, Nocek, 1997, Oetzel, 2000

LIVE YEAST

Encapsulated live yeast, proven to help improve rumen environment/performance and feed rumen microbes yeast metabolites.

Bach et al., 2019, Zu et al., 2017, Guedes et al., 2008, Erasmus et al., 2005

Tools for rumen stability continued...

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Tools for rumen stability continued...

BETAINE

Amino acid proven to help improve rumen microbe digestion and liver function and energy metabolism

Zhang et al., 2014, Raheja et al., 2019, Peterson et al., 2012, Fedota et al., 2017

ANIONIC SALTS, MINERALS, VITAMINS E & H

Acid salts proven to help improve blood calcium levels and rumen papillae development

DeGaris 2008, Martinez et al., 2012, Phillippo et al., 1994, Gelfert et al., 2008, Lean et al., 2006

PROTEIN, SOLUBLE SUGAR, STARCH

Key feed components for the proliferation and feeding of rumen microbiota

What happens when balance shifts?

TRANSITION ON/OFF CROP

Key levers: Fibre, Calsea, and time.

DRY COW TO SPRINGER COW

Key levers: Condition management, diet management, cow management, fibre, Calsea, minerals, Betaine, and yeast.

CALVING STRESS

Key levers: Management, fibre, Calsea, and minerals.

CALVING RECOVERY

Key levers: Diet management, cow management, fibre, Calsea, and yeast.

PEAK MILK

Key levers: Diet management/balance, Calsea, fibre, C16 & C18:1 fat, Betaine, minerals, and yeast.

Transition on/off crop

CAUSES

- Rapid feed change
- 6-21 days for rumen to fully adapt
- LWG lower while in transition
- FCE lower while in transition
- Poor transition can damage rumen, effecting cow performance
- Low pH causes microbes to stress increasing toxins/inflammation

SOLUTIONS

- Slow introduction of new feed proportionate to feed type
- Higher sugar/starch/lower NDF the longer the transition (14-21 days)
- Low sugar/starch/high NDF the longer the transition (6-14 days)
- Higher fibre (NDF) the shorter the transition (7 days)
- Fill up on fibre first

Supplement solution

TRANSITION ON/OFF CROP

CALSEA RUMEN BUFFER

- Dose at 30-40g/cow
- Provides stability buffer
- Good palatability - can be used in free-choice lick

Dry cow to calved cow

CAUSES

DIET CHANGES

- Can involve multiple diet changes
- Low and/or high LWG can be problematic
- Energy, protein, NDF & mineral balance must be carefully managed

STRESS

- Diet changes, nitrates, soil ingestion, inconsistent allocation, weather events
- Stress from herd changes
- Metabolic stress: Ca/Mg and ketosis
- Springing, calving, and colostrum
- Bad inflammation

SOLUTIONS

- Fibre is critical through the dry period and transition period
- It is important to fully feed the cow to stretch out the rumen and maintain rumination muscle motility
- Fibre is critical to provide rumen fill but help to keep ME level in check
- Calculate ME, CP, DCAD, mineral balance, and add fibre to fill

Supplement solution

TRANSITION ON/OFF CROP

CALSEA RUMEN BUFFER

- Dose at 30-50g/cow through transition
- Provides stability buffer
- Efficient calcium supply
- Good palatability

ANIONIC SALTS AND MINERALS

- Dosed at 200-400g as per calc's
- Increase PTH activity, increasing CA and P levels
- Stimulate rumen papillae development

BETAINE

- Dosed at 10-20g/cow through transition
- Helps rumen microbes deal with stress from pH and toxin challenges
- Helps improve microbial digestion efficiency

LIVE YEAST

- Removes oxygen from rumen environment
- Feeds yeast metabolites to fibre digesting microbes
- Promotes competition to help keep bad microbes from growing in numbers

Calving stress

CAUSES

- Inadequate transition period length
- Stress causes a direct drop in appetite, reduced rumination, and low rumen pH
- Over-conditioned cows
- >0.5 BCS gained over winter
- Springers under-fed
- Springers calving in herd over 100 cows
- DCAD and mineral nutrition not corrected, balanced, or fed
- Low appetite and low energy
- Difficult calving, high inflammation
- Pre-calving condition loss - NEFA >0.4umol

SOLUTIONS

- Manage groups sizes (<100), moving to close-up group if needed
- Ensure cows are on the transition diet for 21 days
- Ensure transition cows have access to a free-choice fibre source...fully fed
- Manage energy and protein levels carefully

Supplement solution

CALVING STRESS

CALSEA RUMEN BUFFER

- Dose at 30-50g/cow through transition
- Provides stability buffer
- Efficient calcium supply
- Good palatability

ANIONIC SALTS, MINERALS, VITAMINS E & H

- Dosed at 200-400g as per calc's
- Increase PTH activity, increasing CA and P levels
- Stimulate rumen papillae development
- Increase antioxidant activity

BETAINE

- Helps rumen microbes deal with stress from pH and toxin challenges
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LIVE YEAST

- Removes oxygen from rumen environment
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Calving recovery

CAUSES

- Inadequate transition period length
- High level of inflammation
- Over-conditioned cows
- >0.5 BCS gained over winter
- Springers under-fed fibre
- Over feeding energy, under feeding protein
- DCAD and mineral nutrition not corrected, balanced, or fed
- Low appetite and low energy
- Difficult calving
- Pre-calving condition loss - NEFA >0.4umol

SOLUTIONS

- ME is at cow maintenance: 90-130ME (around 25% of LWT)
- CP minimum 14%, ideally 16%
- Ensure luxury calcium, phosphorus, magnesium, and salt supply
- Ensure efficient Cu, Zn, Se, I, Co, B, Cr supply
- Ensure cows are on the transition diet for 21 days
- Blood test, springers, clob-up cows, colostrums and milkers: Ca, Mg, P, Se, Zn, NEFA (pre) & BOHB (post)
- Make sure same feeds given to transition cows are made available to the colostrums
- Poor recovery can indicate a poor transition, make changes in springers

Peak milk

CAUSES

- Slow cow recovery post-calving
- Mobilising too much cow condition
- Inadequate feed quantity or quality
- Inadequate diet balance
- Volatile rumination/eating minutes
- Poor appetite

SOLUTIONS

- Get bloods, investigate transition
- Betaine in combination with by-pass fat
- Soluble sugar, protein, fat levels, and fibre vary a lot in pasture. Know what's in your feed and balance accordingly.
- Calsea can be helpful tool when rumination and fat % is volatile BUT energy density of diet is critical