DAIRY VETERINARY CONSULTANCY LTD

*Making lives better for cows and the people who care for them*

*Supported by*

GLYCALFORTE®

FOR A HEALTHY TRANSITION AND BEYOND

# The transition cow

## …her wants and needs

## …and the feed balance dilemma


Owen Atkinson BVSc DCHP MRCVS

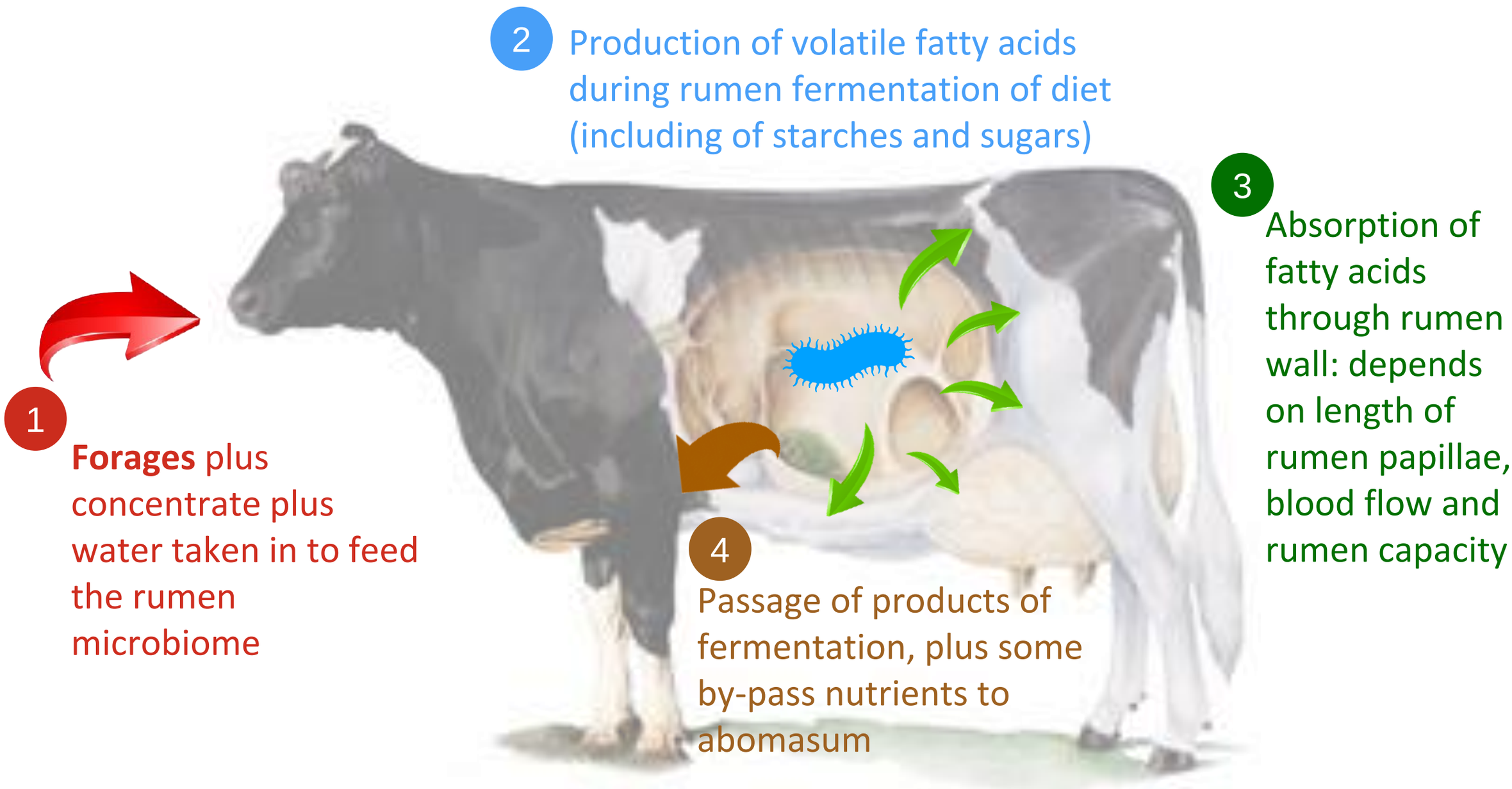
*RCVS Specialist in Cattle Health and Production*

www.dairyveterinaryconsultancy.co.uk

@Owen_the_vet

# Supplying energy to a cow

# Supplying energy to a cow




Volatile fatty acids from rumen fermentation should normally meet ≈ 70-80% of a cow's energy requirements (acetate, butyrate, propionate)

If you take a diesel-engined tractor…

…and fill it up with petrol

What’s going to happen?

If you take a ruminant cow…

…and feed her like a simple-stomached animal

What’s going to happen?

# Consider the energy challenge:

1) How much energy will this cow need to produce 30 litres of milk per day?

≈ 80 MJ maintenance + ≈ 5.5 MJ/ litre milk

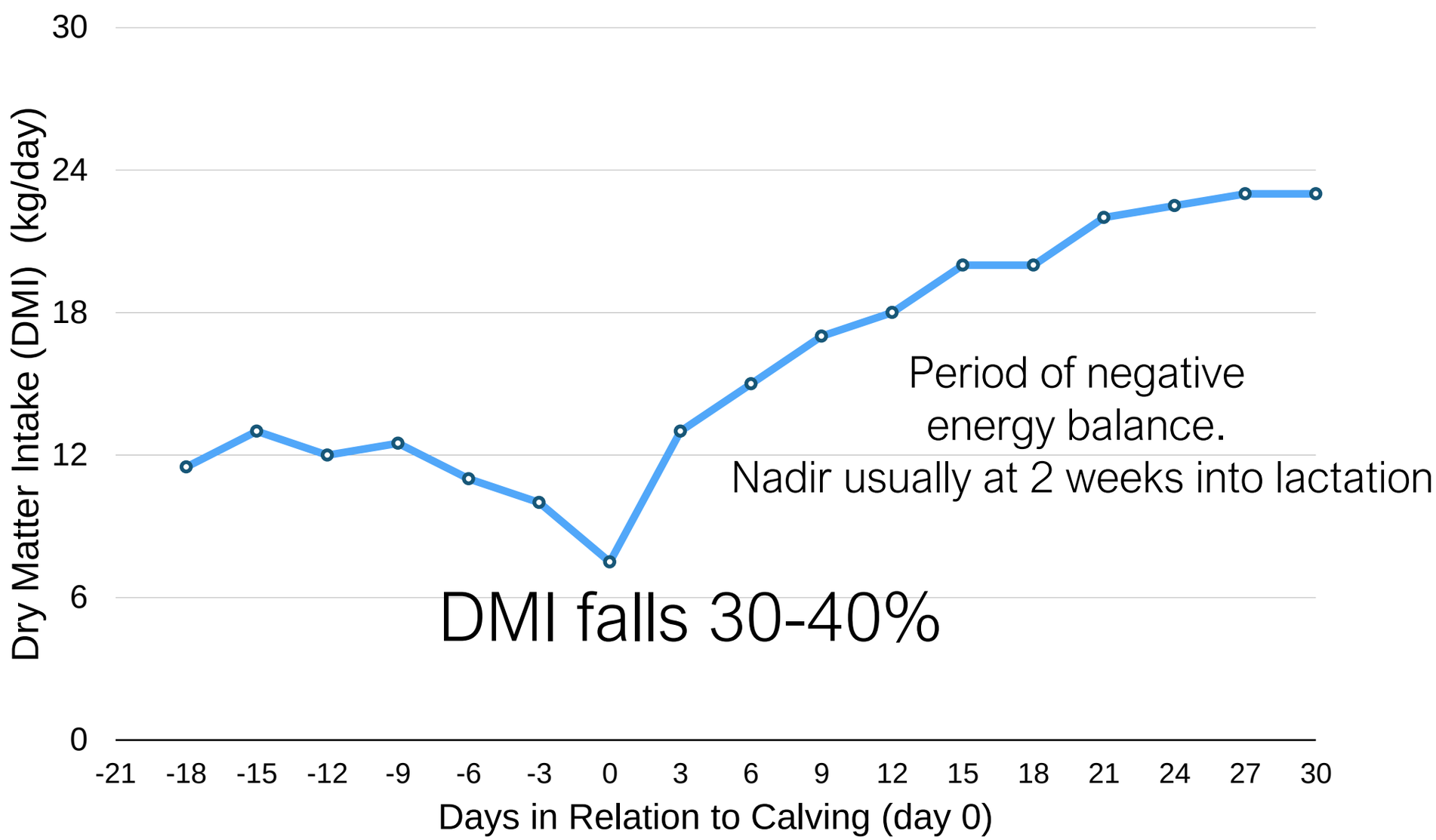
*Answer: ≈245 MJ*

2) How much feed will this cow need to consume to meet her energy requirement?

≈ 12.0 - 12.5 MJ/kg DM, without “blowing the socks off” and causing acidosis

*Answer: ≈20 Kg DMI*

# But what is her realistic Dry Matter Intake?




*An inherent Dry Matter Intake drop occurs around calving*

Data from Bertics SJ, Grummer RR, Cadorniga-Valino C, Stoddard EE, 1992. Effect of prepartum dry matter intake on liver triglyceride concentration and early lactation. Journal of Dairy Science 75:1914–1922

# Consider the energy challenge:

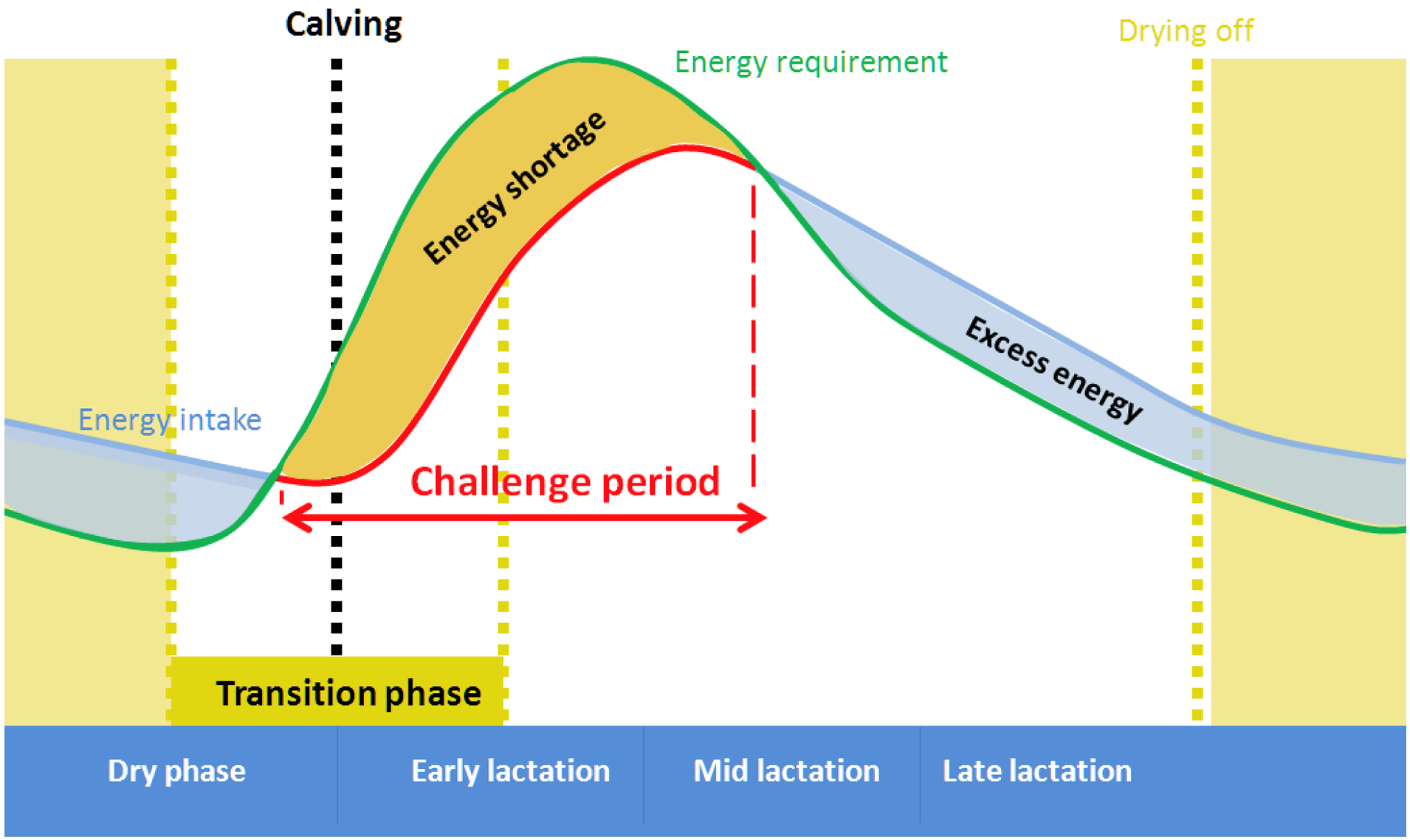
- The likely energy gap in the first few of weeks of lactation is going to be around **25-50 MJ/day**

- A loss of 1 kg/day releases around 28 MJ/day

- If this is sustained over 70 days, its approximately equivalent to a drop of 1 BCS

(1BCS ≈ 55-75kg for a 700kg Holstein cow)

# The “energy gap”




Shaumann (2015)

…how can we help the cow plug the gap?

1. Reduce the demand (lower yields)
2. Increase energy density of diet
3. Increase dry matter intakes
4. Catabolism: mobilise her body reserves

NEB after calving is usually inevitable; using ketones *to some extent* as an energy source is normal

But it is *abnormal* and *unhealthy* if ketone bodies accumulate to excess

**Clinical ketosis** is usually when ≥ 3.0 mmol BHB/ litre

Incidence 0.5 - 1.0% (low)

**Sub-clinical ketosis** is usually defined when ≥ 1.0 - 1.4 mmol BHB/ litre

Incidence 30-50% of all cows (high)

# Ketosis: a classic iceberg disease

Clinical ketosis

Sub-clinical ketosis

# Sub-clinical ketosis (SCK) - a “gateway” condition

SCK associated with:

1. Increased risk (4.4 x) of DA, metritis or clinical ketosis (Ospina et al, 2010)
2. Reduced milk yield (393kg) and poorer fertility (risk of pregnancy 13% less) (Ospina et al, 2010)
3. Increased risk of metritis (1.5 x), clinical ketosis (9.5 x), DA (5.0 x) and lameness (1.8 x) (Suthar et al, 2013)
4. Increased risk of DA (3.3 x), clinical ketosis (5.4 x), early culling and death (1.9 x), metritis (1.8 x), RFM (1.5 x), mastitis (1.6 x), lameness (1.4 x) and doubling of SCC (1.4 x). Reduced milk yield (251 kg) and longer calving – conception (16-22 days (Raboisson et al, 2014)SCK associated with (cont):
5. Extended median time to pregnancy (by 16-22 days) (Walsh et al, 2007)
6. Increased risk of DA (2.1 x, week 1 PP and 6.2 x, week 2 PP) and reduced milk yield (loss up to 3.3kg/day) (Duffield et al, 2009)

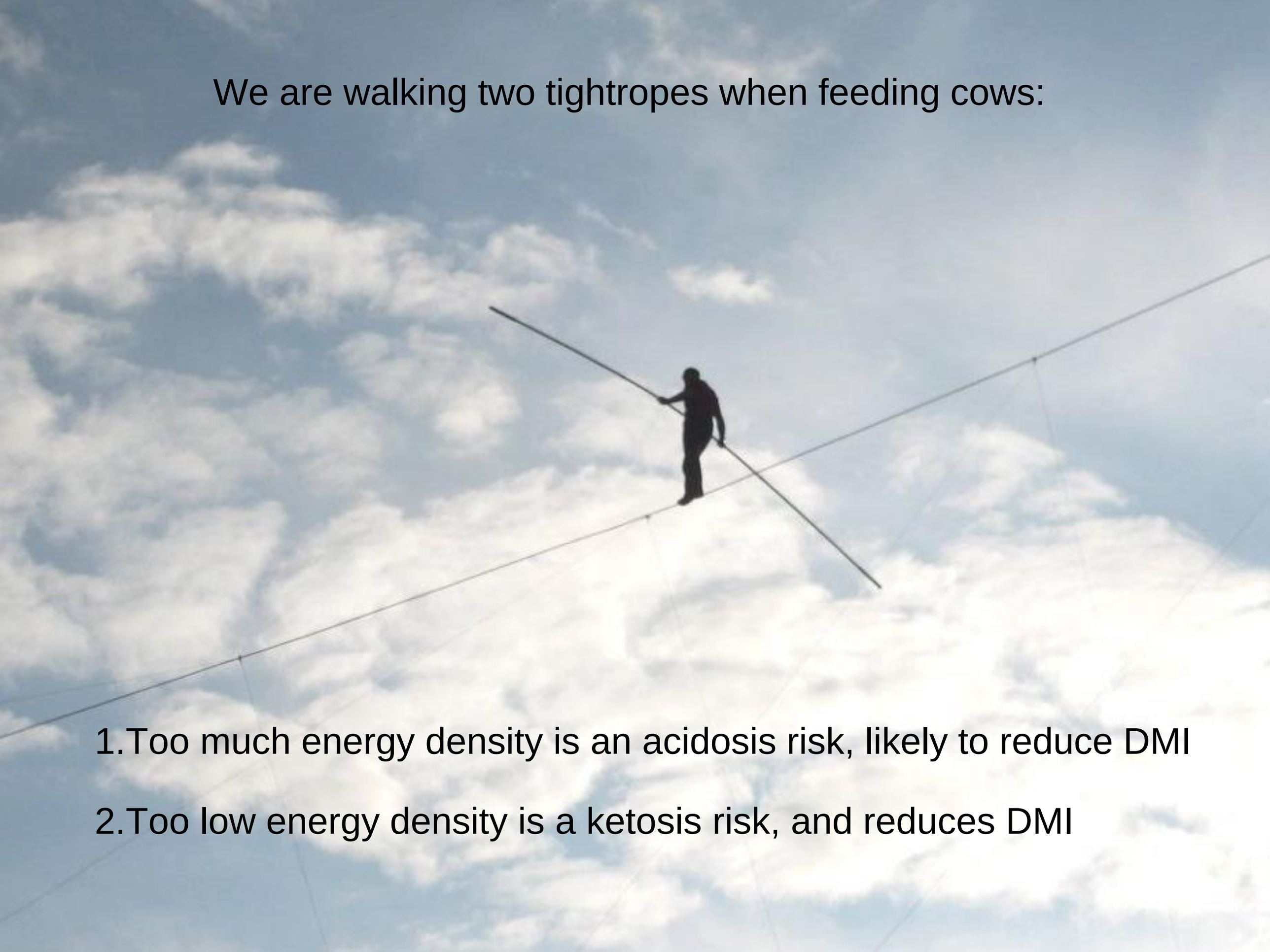
Statistical thresholds vary with study, condition and days post-calving.

1. Reduce the demand (lower yields)
2. Increase energy density of diet
3. Increase dry matter intakes
4. Catabolism: mobilise body reserves

# Maintaining rumen pH stability

…the feeding balance dilemma

We are walking two tightropes when feeding cows:



1. Too much energy density is an acidosis risk, likely to reduce DMI
2. Too low energy density is a ketosis risk, and reduces DMI

# Rumen buffering is *also* very dependent on having a good match between acid production (VFAs) and acid absorption through rumen wall

This is done by having:

- Good feed access and feed space
- Little and often feeding bouts (“trickle feeding”)
- Well designed sheds and feed barrier; no over-crowding
- Good feed management (e.g. timings; % refusals; palatability)
- Twice-daily fresh feed provision
- ≥ 5x per day push-ups
- Avoiding sorting
- Excellent access to <u>clean</u> water

# Rumen buffering is very dependent of surface area of rumen

Rumen papillae before adaptation

Rumen papillae after adaptation

…providing some starch to the dry cow diet (last 2 weeks) is critical for rumen papillae development

# How common is sub-acute acidosis?

…it depends on how you define it and choose to diagnose it

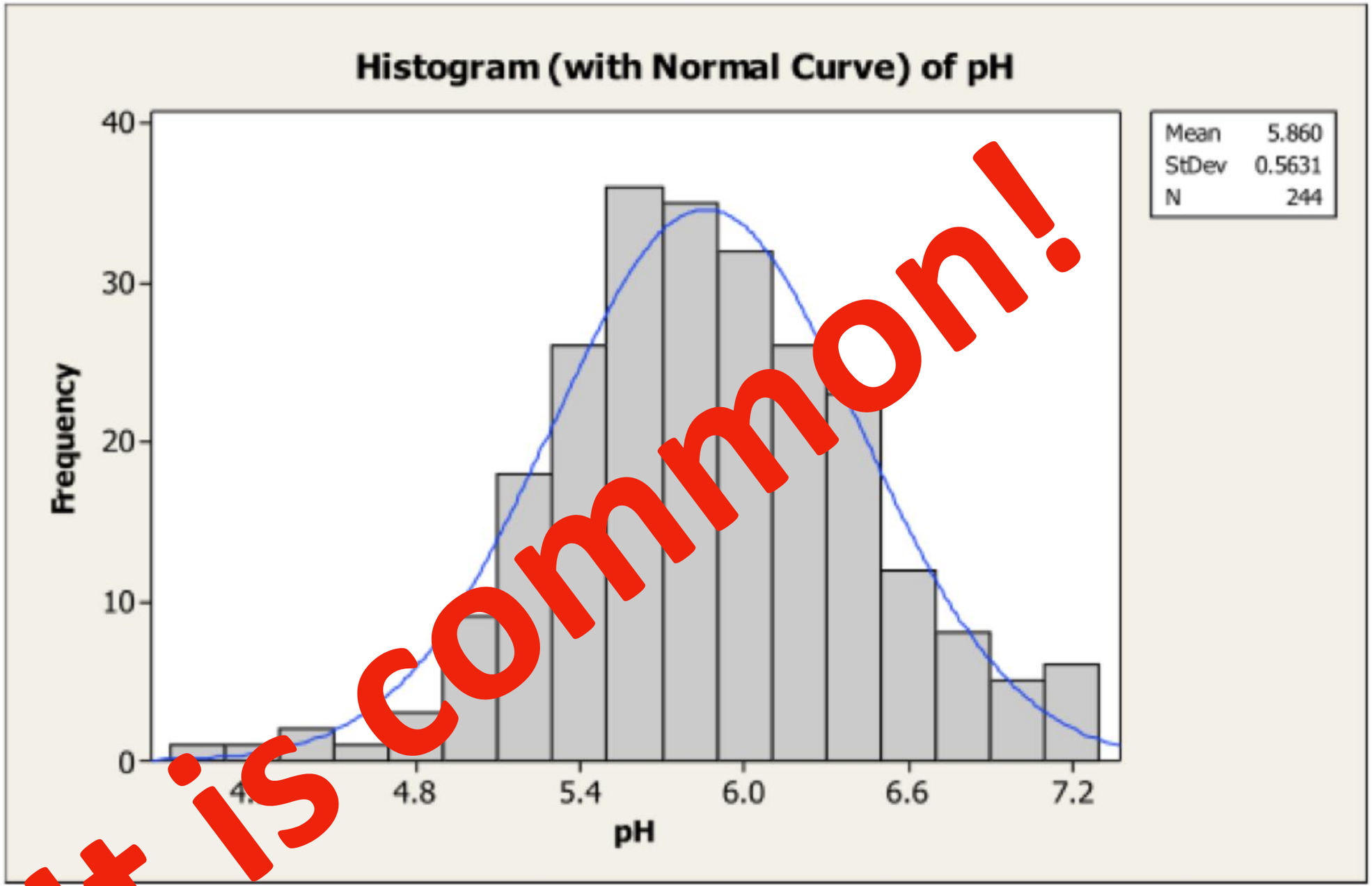
pH fluctuates throughout the day

Possibly best defined as when pH drops to between 5.2 and 5.6 for at least three hours per day

Or

≥ 5/12 cows sampled by rumenocentesis have pH ≤ 5.5

tion of pH measurements of rumen fluid collected by rumenocentesis in 244 m




It is common!

26% of cows had a rumen pH ≤ 5.5

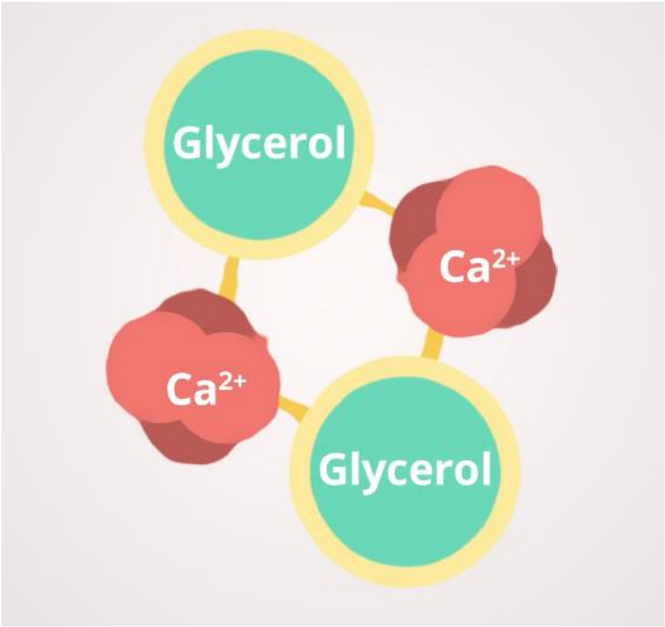
Source: O Atkinson, 2013. DCHP dissertation

# What are the effects of SARA?

Alters balance of microbiome population → promotes lactate-producing bacteria (esp. *lactobacillus* spp) → further pH drop → reduced fibre digestion → less efficient rumen fermentation → more severe energy deficit!

- Rapid disappearance down the plughole of poor rumen health
- More feedstuffs by-pass the rumen: NEB↑
- Carbohydrate overload of small and large intestine
- Thin cows; +/- scour; +/- ↓immunity (↑hind-gut fermentation→↑lipopolysaccharides); +/- anoestrus
- Lameness: claw horn disease (e.g. sole bruising/ ulcers)

# What is Glycal Forte® and how can it help?




- It is a direct source of energy
- Some of it is released in the rumen, some of it in the abomasum
- It is less risky than drenching with propylene glycol or glycerol (which can be toxic to the rumen microbiome in larger amounts)
- It releases Calcium Hydroxide when broken down: a rumen buffer
- It provides a biological available source of calcium (calcium chloride) when broken down in the abomasum
- It is a good way of helping to plug the energy gap

# Thank you!

DAIRY VETERINARY
CONSULTANCY LTD

*Making lives better for cows and the people who care for them*

DAIRY VETERINARY CONSULTANCY LTD

*Making lives better for cows and the people who care for them*

*Supported by*

GLYCALFORTE®

FOR A HEALTHY TRANSITION AND BEYOND


Owen Atkinson BVSc DCHP MRCVS

*RCVS Specialist in Cattle Health and Production*

www.dairyveterinaryconsultancy.co.uk

@Owen_the_vet