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PART 1: MAXIMISING COW RECOVERY POST-CALVING

WEBINAR

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In this webinar we cover:

- What is post-calving cow recovery?
- Measuring post-calving recovery: 10 days pre to 21 days post-calving

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Why is post-calving recovery important?

- *Minimise* condition loss post-calving
- *Earlier* peak milk production
- *Higher* peak milk production
- *Less* days to first cycle
- *Better* in-calf rates
- *Reduce* animal health issues

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What is calving recovery?

- In positive energy balance (PEB)
- Optimum appetite
- Achieving score of 3 rumen fill
- Rumination about 400min/24hr period for 3 days
- Eating minutes tracking up
- Blood tests showing mineral balance and good liver performance

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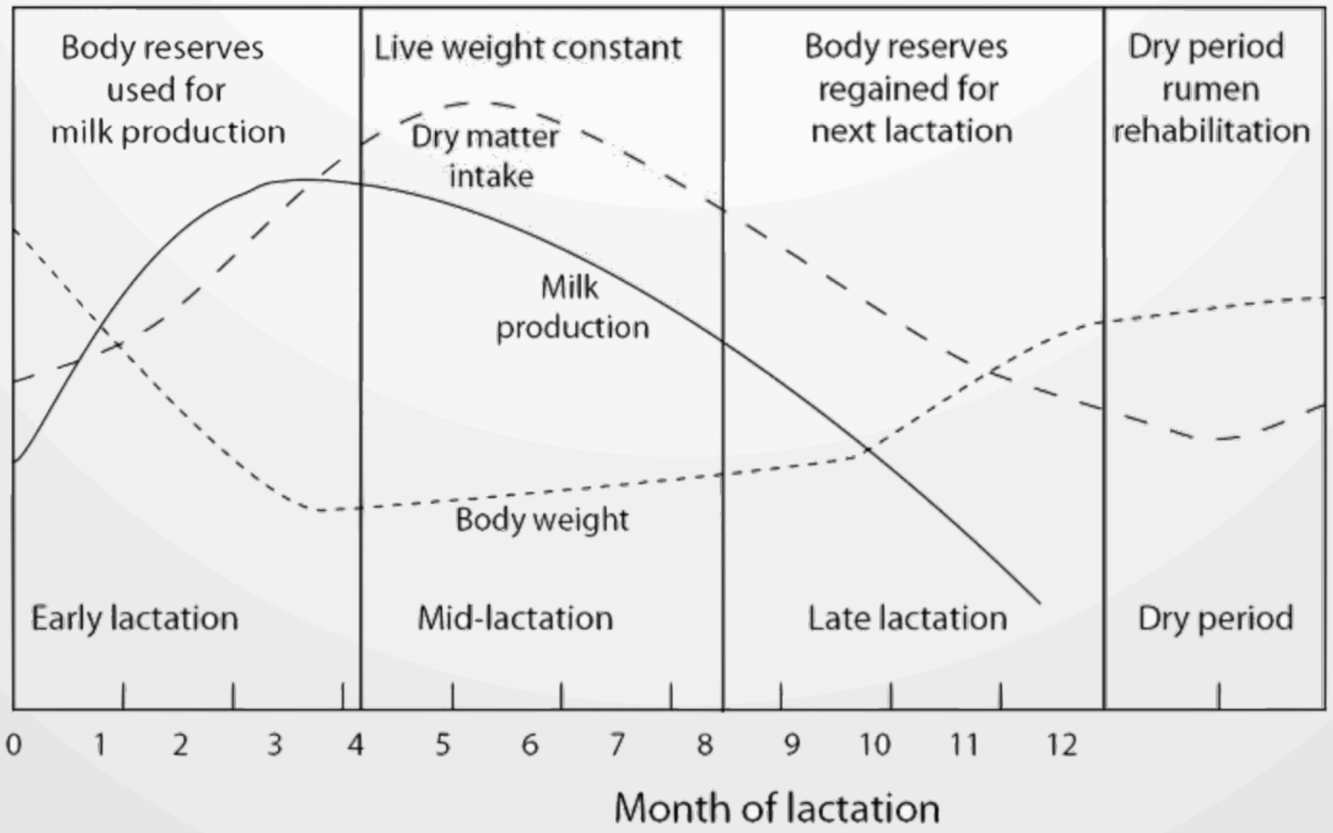
What is calving recovery?



Adapted from Goff et al., 1997

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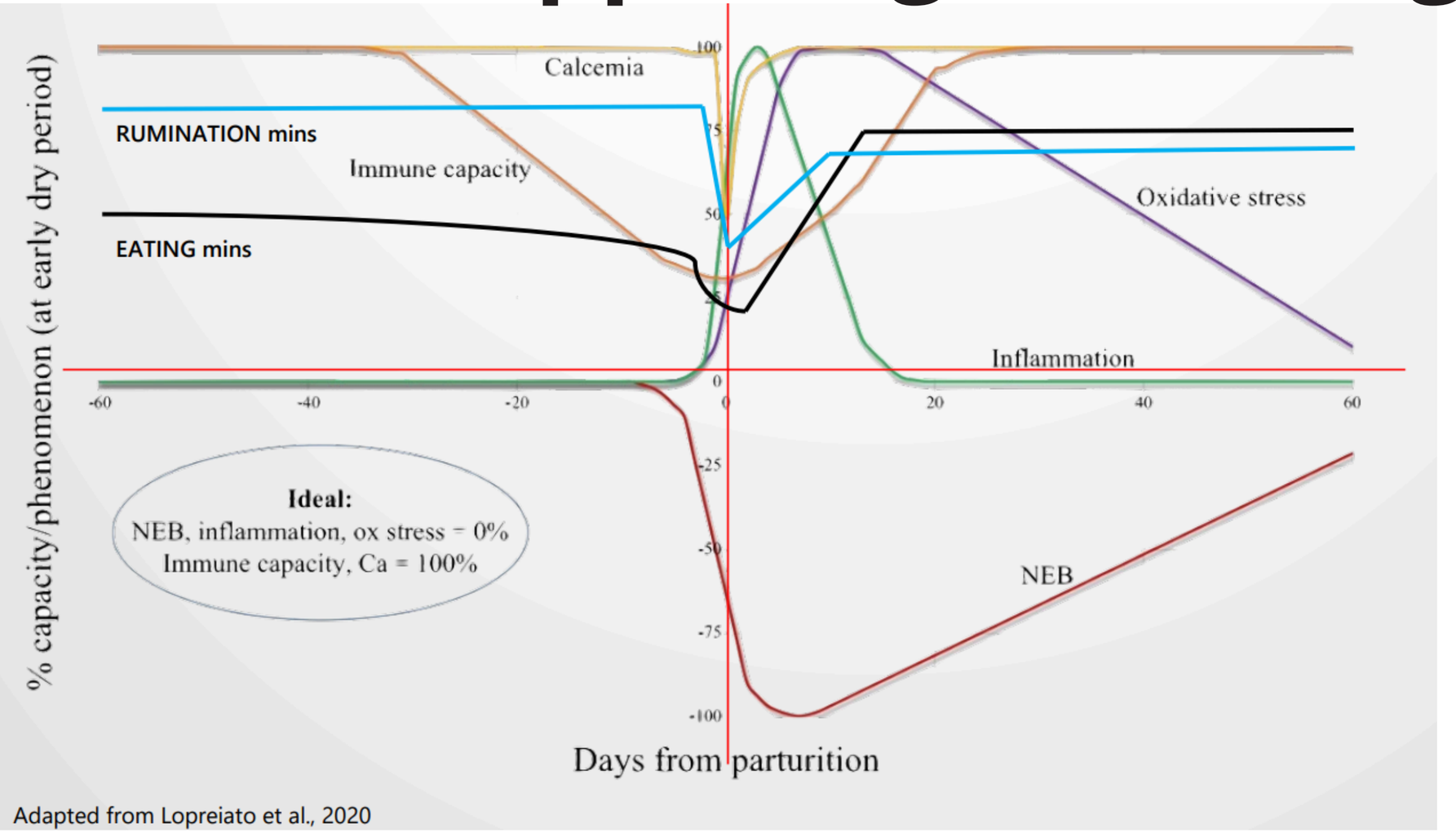
What is happening at calving?



Adapted from Lopreiato et al., 2020

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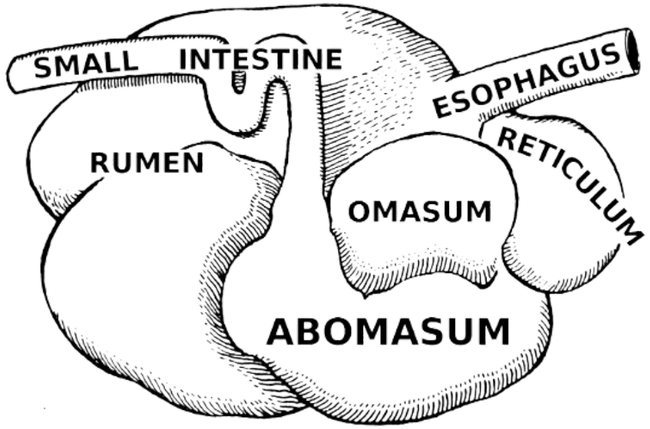
What are we trying to achieve?

Increasing appetite



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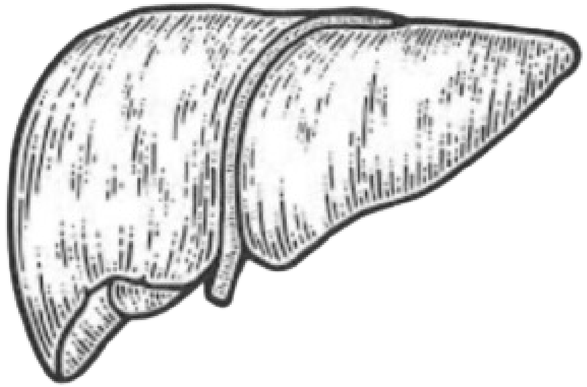

1. Increase rumination minutes - FEED FIBRE
2. Increase rumen VFA release - FEED ENERGY
3. Increase rumen performance - STABILISE

1. Increase cow appetite - GLUCOGENESIS
2. Increase liver capacity - SUPPORT
3. Decrease inflammation - SUPPORT

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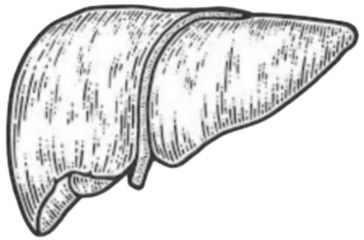
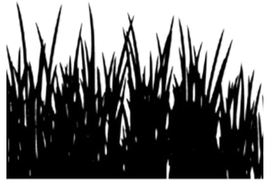
Increasing appetite



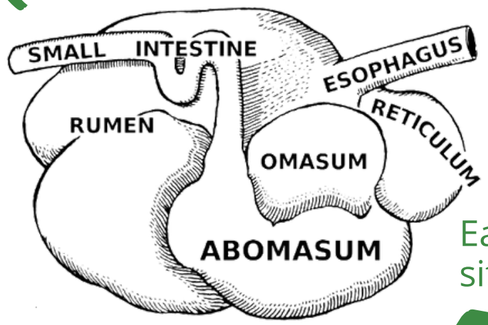
Stimulates release of opioids

Opioids stimulate more production through oxytocin & glucocorticoids

Heaps of food available - eats more



Eats until she feels full, sits down, and ruminates



Sends digested amino acids, VFAs, lactate etc. via PDV

Produces insulin which stimulates increased glucogenesis / Appetite decreases fat mobilisation

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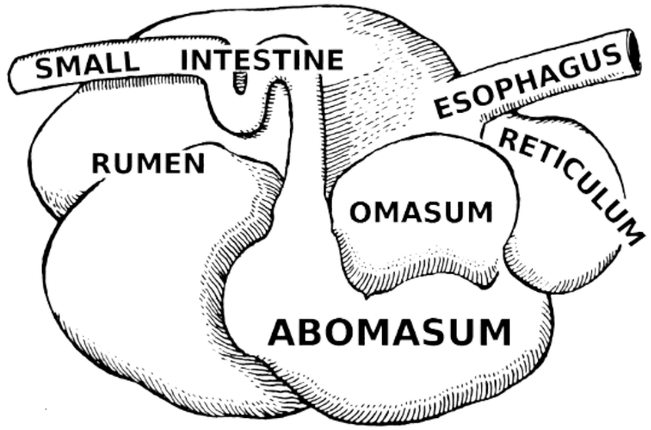
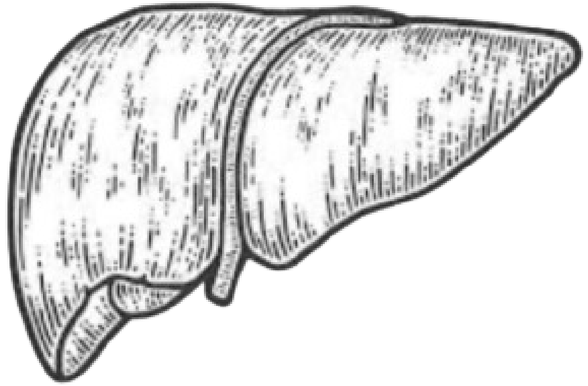
Increasing appetite





FEED THE LIVER MORE

- Feed quality/balance
- Stabilise rumen
- Maximise volume

INCREASE LIVER FUNCTION

- Support liver
- Manage cow condition
- Correct energy timing

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Measuring calving recovery

COW WEARABLES:

Rumination & eating minutes

Rumination above 400min for 3 days and eating up ideally above rumination (confirmed viusally)

VISUAL ASSESSMENT:

BCS, appetite & rumen fill

No longer losing condition. Cow behaviour shows good appetite & PLF on left-side score 3 or above.

BLOOD TESTS:

Mineral balance & liver performance

Bloods confirm the mineral balance & liver performance is consistent from transition to colostrum to milker groups

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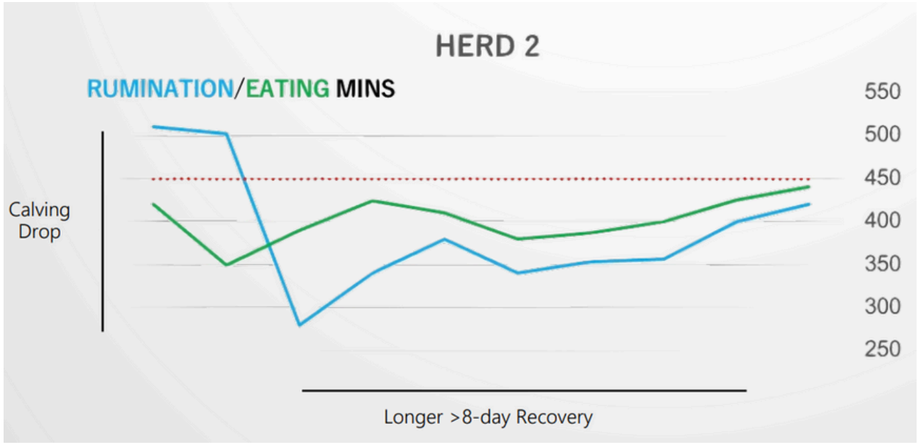
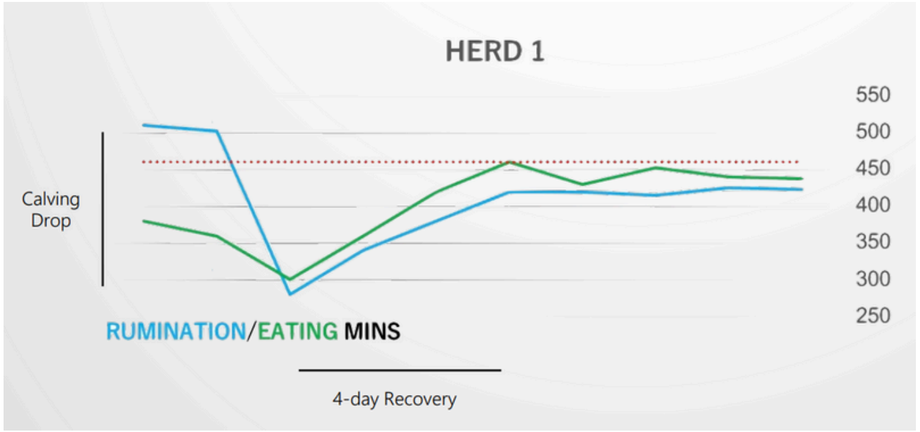
Cow wearables

Measuring calving recovery

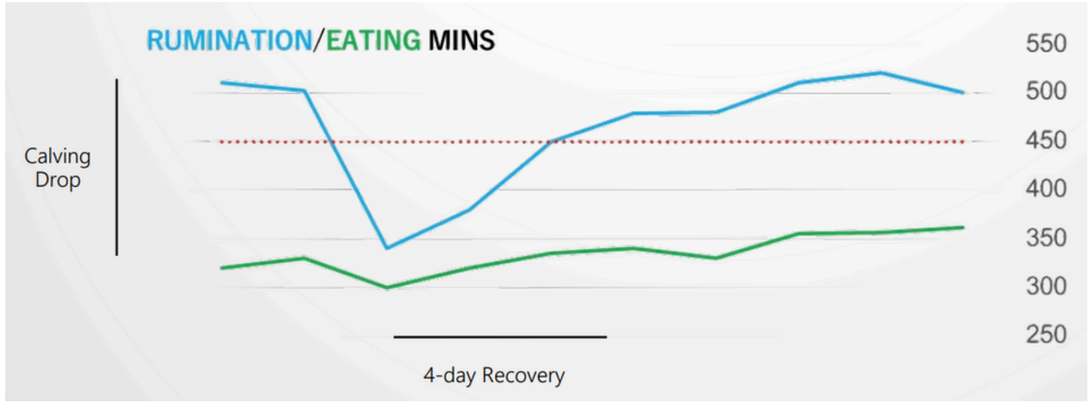


POOR RUMINATION + APPETITE RECOVERY



GOOD RUMINATION + APPETITE RECOVERY

GOOD RUMINATION BUT POOR APPETITE RECOVERY



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Measuring calving recovery

Visual: Body scoring

- Scoring cows pre- and post-calving is important to gauge recovery.
- Make sure cows are not losing weight pre-calving.
- Getting a gauge as to how many days until the cows stop losing weight - should be less than 21 days.
- Testing blood for NEFA (pre-calving) and BHOB (post-calving) can be a helpful back-up measurement.

Visual: Body scoring

- Assessing how well the colostrum/OAD herd are eating int he paddock, on the feed pad, or in the shed.
- Watching how well the miling herd clearn up their breaks and cross-checking this information against any rumination and eating minute data.
- Appetite is closely linked to liver glucose production, therefore good quality feed means more VFAs and protein(5) the rumen digests which in turn drives appetite (rumen stability is also key in this process.

Visual: Rumen fill

SCORE 1 - VERY EMPTY: PLF cavity more than a hand's width.

SCORE 2 - LOW FILL: PLF cavity around one hand's width.

SCORE 3 - OK: PLF cavity less than a hand's width at top but bulges at the bottom of PLF (ideal for fresh cows).

SCORE 4 - FULL: Skin arches towards the bottom of PLF with little to no cavity (ideal for dry/transition cows).

SCORE 5 - VERY FULL: PLF not detectable, rumen is very distended, LR and TP not visible.

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Blood tests: Mineral balance

TRANSITION

- > 6 days from calving
- Test Ca, Mg, P, Se, Zn, and NEFA

CLOSE UP

- < 4 days from calving
- Test Ca, Mg, P, and NEFA

COLOSTRUMS

- 1-4 days calved
- Test CA, Mg, P, and BHOB

MILKERS

- > 6 days calved
- Test Ca, Mg, P, Se, Cu, Zn, and BHOB

Tests Requested:
4 x Serum - Beta Hydroxybutyrate (Trace)
4 x Serum - Serum Copper

Trace Elements

	Serum Copper µmol/L	Serum Selenium nmol/L	B-OHB mmol/L	Calcium mmol/L	Magnesium mmol/L
769	8.0	768	0.41	2.37	0.97
582	13.0	874	0.74	2.17	0.84
145	12.0	878	0.54	2.32	0.93
619	17.0	805	0.43	2.15	0.69
Means	12.5	831	0.53	2.25	0.86
Adequate Range	7.0 - 20.0	140 - 2000	0 - 1.00	2.00 - 2.70	0.59 - 1.08

	Phosphate mmol/L
769	2.48
582	1.57
145	1.60
619	1.17 L
Means	1.71
Adequate Range	1.30 - 3.30

COW	Ca (mmol/L)	Mg (mmol/L)	P (mmol/L)	Se (nmol/L)	Zn (umol/L)	Cu (umol/L)	NEFA (mmol/L)	BHOB (mmol/L)
Transition	>1.8	0.8-0.96	1.7-2.5	>800	10-20		<0.4	
Close-Up	>2	0.8-0.96	1.7-2.5	>800	10-20		<0.4	
Colostrum	>2.2	0.8-0.96	>2	>800	10-20			<0.6
Milker	>2.2	0.8-0.96	>2	>800	10-20	>12		<0.6

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Blood tests: Liver performance

CLOSE-UP COWS

- **NEFA - Non-esterified fatty acids**: Indicator of level of fat mobilisation.
- **GGT - Gama-glutamyl transferase:** Gives an indication of livers ability to process fat, particularly bile function.
- **BUN - Blood urea nitrogen:** Gives an indication of protein sufficiency in the diet.

MILKERS

- **BHOB - Beta-hydroxy butyrate:** Indicator of fat mobilisation and the efficiency of NEFA conversion into glucose.
- **GLU - Glucose:** How much glucose the liver is producing.
- **GGT - Gama-glutamyl transferase:** As above.
- **CK - Creatine kinase:** Can indicate injury from metabolic disease and likelihood of recovery.
- **ALT - Alanine amino-transferase:** Indicating liver damage from fatty liver or abscess.

Table 1. Mean values and standard deviation (SD) of analytes and body condition score (BCS) on days 3 and 28 postpartum (N = 51) of Holstein cows in southern Brazil.

Analyte (units)	Reference value*	Day 3 postpartum	Day 28 postpartu
Albumin (g/L)	27-35	32.94 ± 2.49	34.04 ± 2.18
BHB (mmol/L)	<1.4	0.51 ± 0.20	0.47 ± 0.17
Bilirubin (mg/dL)	<0.54	0.11^{a} ± 0.07	0.06^{b} ± 0.02
Cholesterol (mg/dL)	80-120	54.57^{b} ± 11.43	109.90^{a} ± 26.47
AST (U/L)	<132	49.74 ± 17.34	48.68 ± 19.78
ALP (U/L)	<196	138.01 ± 51.58	81.13 ± 24.55
GGT (U/L)	<39	27.60 ± 9.79	26.96 ± 5.34
NEFA (μmol/L)	<700	577 ± 371	364 ± 234
Objective BCS (camera)	1-5	3.16 ± 0.24	2.99 ± 0.24
Subjective BCS (visual)	1-5	3.10 ± 0.20	2.91 ± 0.20

* Reference values from González et al. (2011) and Cozzi et al. (2011). ^{a,b} Different superscripts in the same row indicate significant difference ($P < 0.05$). AST, aspartate aminotransferase; BHB, β-hydroxybutyrate; ALP, alkaline phosphatase; GGT, gamma-glutamyl transferase; NEFA, non-esterified fatty acids; BCS, body condition score.

Adapted from Batista et al., 2021

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Management tools

1. Transition length
2. Transition cow feed and supplement
3. Stress management
4. Colostrum/OAD length
5. Colostrum feed and supplement

Supplement tools

1. Trace minerals/vitamins: Se, Vit E, Biotin, Cu, Zn, Co, Cr, B
2. Macro minerals: Ca, P, Mg, Na, Cl
3. Calsea rumen buffer
4. Bypass fats
5. DCAD salts
6. Betaine

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References

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