



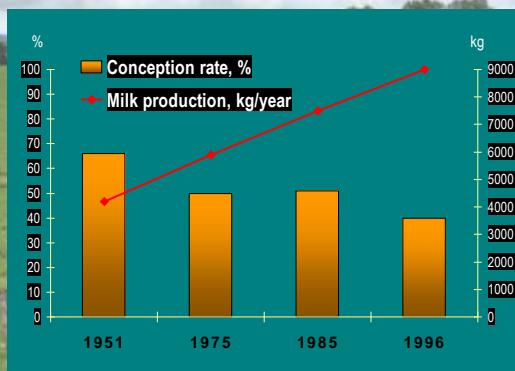
Key Nutritional Principles for Profitable Dairy Farming

Condition Management - Can it help fertility?

Nigel Meads



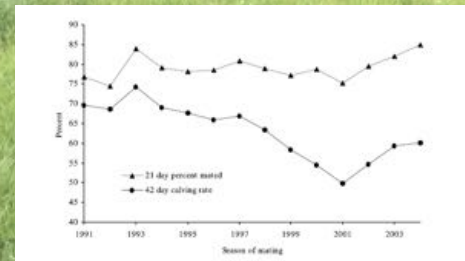
Influence of increasing milk production on conception rate



From Butler

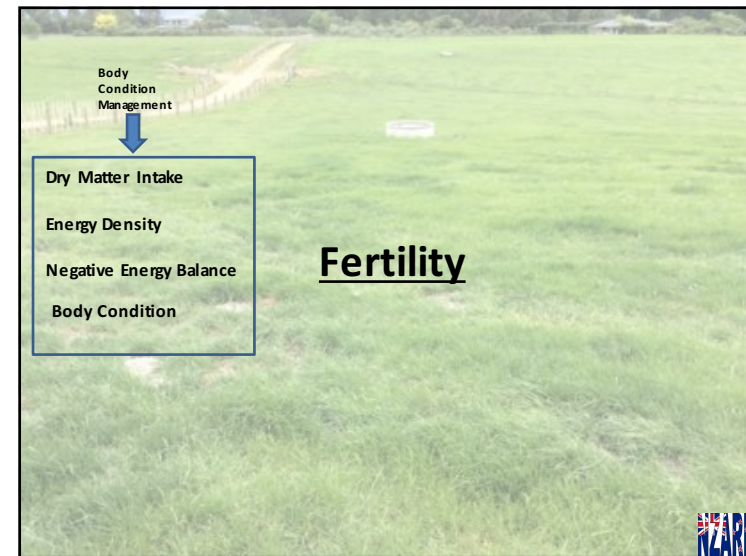
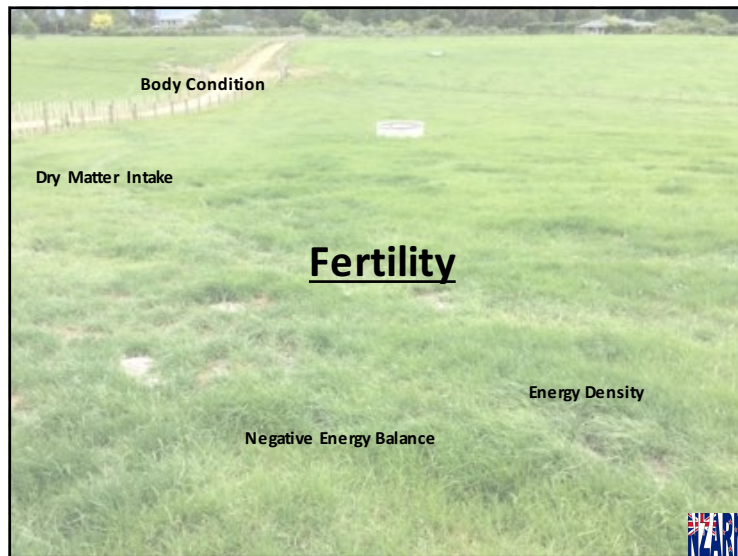
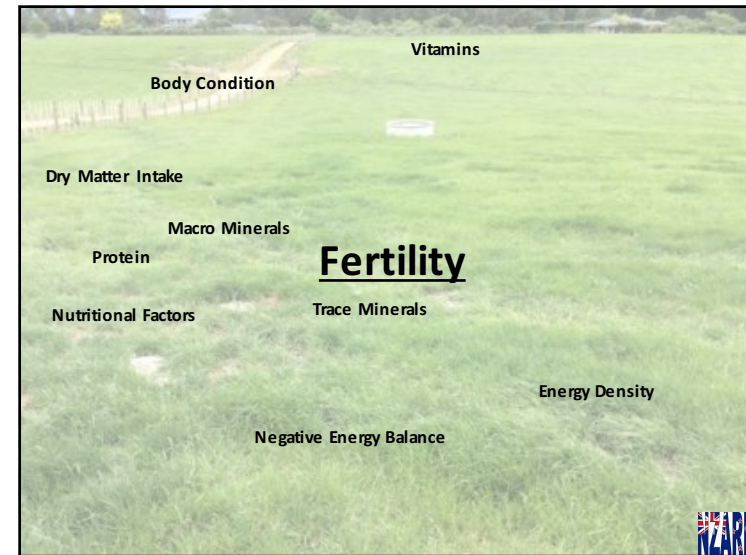


Declining reproductive performance



Harris *et al*, 2006





What causes poor conception rates?

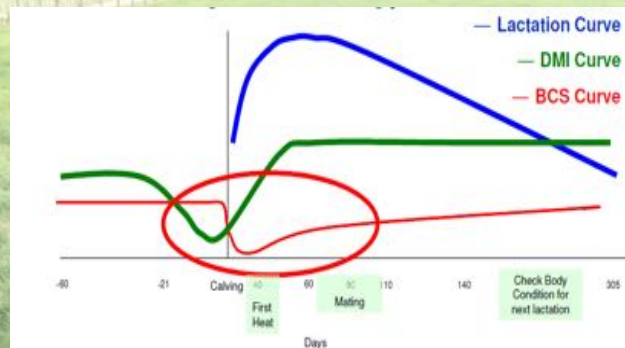
1. Excessive body condition loss (single biggest) 43%
2. Reproductive disease and heat detection 22%
3. Genetics 3%

Mossman, PhD Thesis

Key Messages

1. Nutrition has a huge influence on fertility
2. Body Condition Score (BCS) is a valuable tool to monitor the success of the nutrition programme

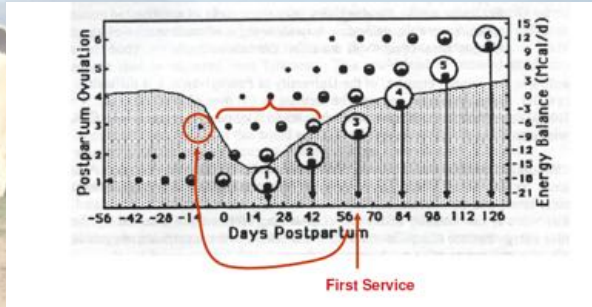
Negative Energy Balance



Negative Energy Balance (NEB)

- NEB has negative effects on follicle and corpus luteum
- NEB reduces hormone (LH) secretion
- NEB results in lower progesterone by corpus luteum at 2nd and 3rd ovulation.

Egg Development



Britt, J. *The Bovine Proceedings* – No. 24, Jan 1992

What that means in practice

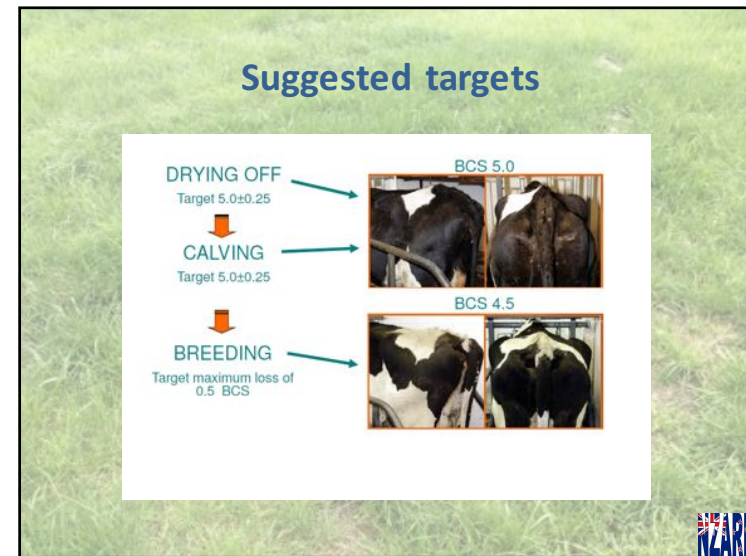
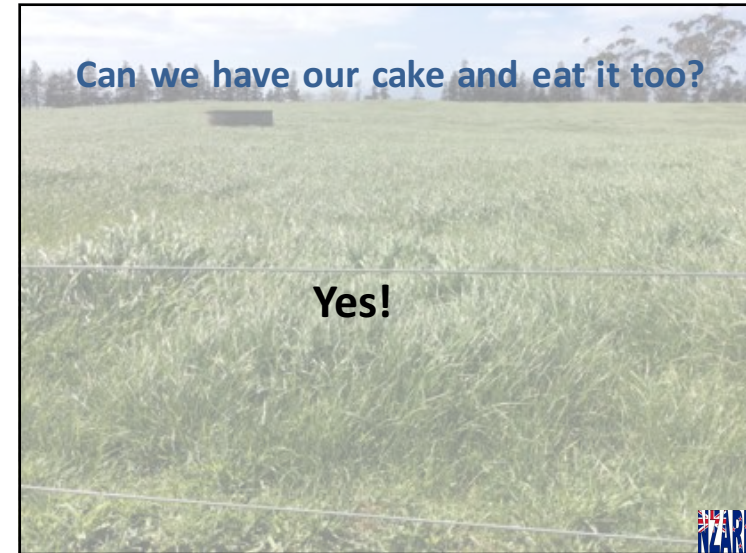
BCS changes over lactation

- Efficient, high producing cows do not necessarily experience large changes in body condition
- Inefficient, low producing cows tend to increase in BCS over a lactation
- Most cows are between these extremes
 - BCS decreases to about 100 days
 - Then increases until dry-off

Relationship between BCS loss in first 5 weeks after calving and reproduction

Item	Body Condition Loss		
	< 0.5	0.5 to 1.0	> 1.0
Days to first ovulation	27 ^a	31 ^a	42 ^b
Days to first heat	48 ^{ab}	41 ^a	62 ^b
Days to first service	68 ^a	67 ^a	79 ^b
First service conception rate, %	65 ^a	53 ^a	17 ^b
Services per conception	1.8	2.3	2.3

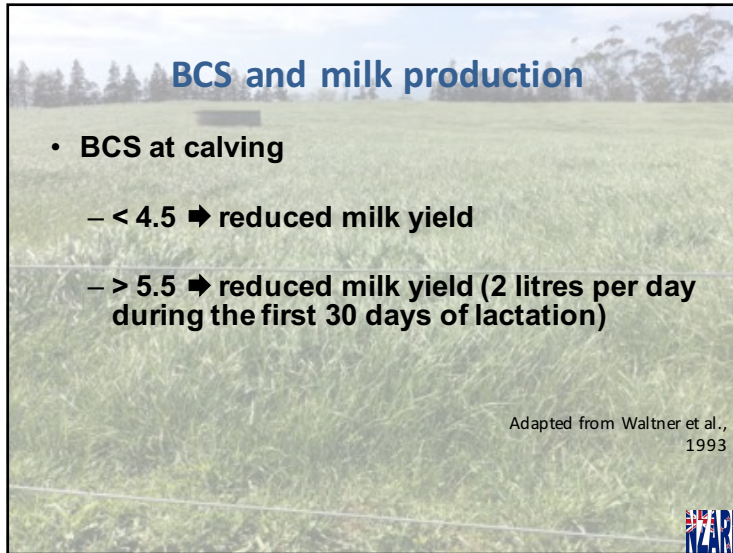

Means in a row with different superscripts differ $P < 0.05$



BCS and milk production

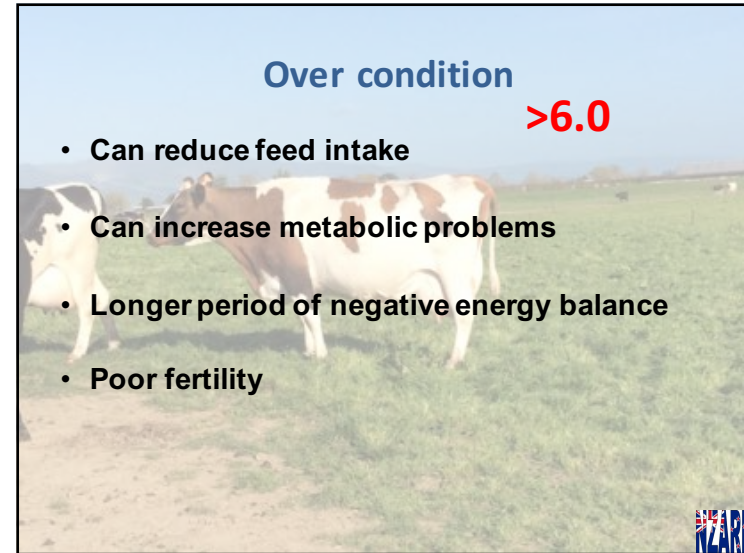

- BCS at calving
 - < 4.5 ➔ reduced milk yield
 - > 5.5 ➔ reduced milk yield (2 litres per day during the first 30 days of lactation)

Adapted from Waltner et al., 1993

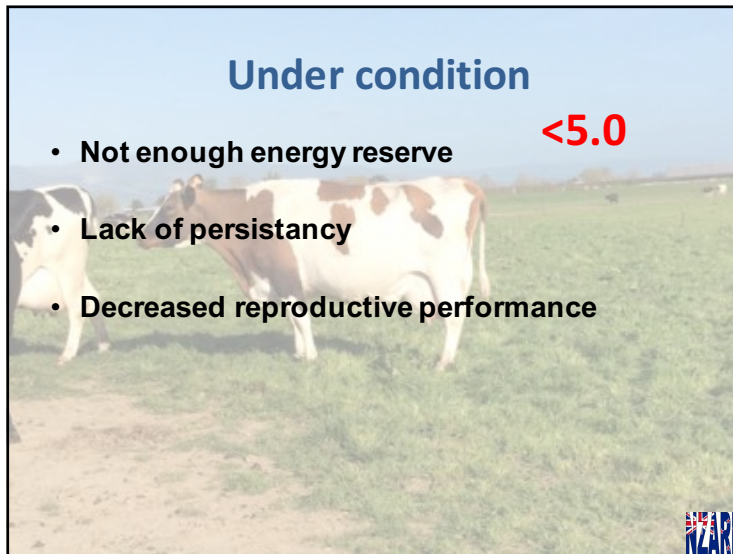

Over condition >6.0

- Can reduce feed intake
- Can increase metabolic problems
- Longer period of negative energy balance
- Poor fertility

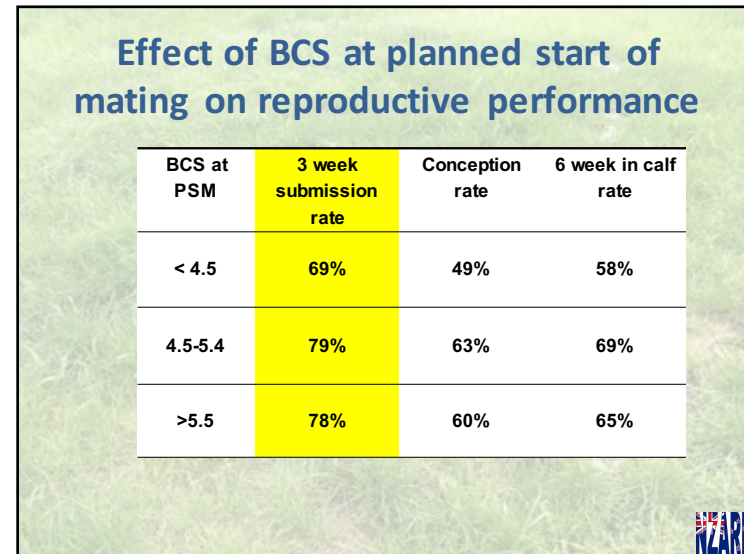

Under condition <5.0

- Not enough energy reserve
- Lack of persistency
- Decreased reproductive performance

Effect of BCS at planned start of mating on reproductive performance

BCS at PSM	3 week submission rate	Conception rate	6 week in calf rate
< 4.5	69%	49%	58%
4.5-5.4	79%	63%	69%
>5.5	78%	60%	65%

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Effect of BCS score at 1st service on reproductive performance

BCS loss 5 wk PP	42 day pregnancy rate
4.0	50
4.5	57
>5.0	66

Buckley et al, 2001



Suggested BCS by stage of lactation

Stage of Lactation	BCS Goal
Calving	5 – 5.5
Calving Heifers	5.5
Mating	4.5
Dry Off	5
No excessive body condition change during dry period	



Maximise early lactation feed intake 1

- Mitigate pre calving DMI drop
- Use straw during the dry period to increase rumen capacity
- Use a palatability enhancer
- Have a plan to manage rumen pH
- Have a plan to maximise fibre digestibility

Maximise early lactation feed intake 2

- Energy intake must be increased in early lactation. This is a combination of intake and energy density.
- High producing cows will struggle on grass alone. Addition of a concentrate is recommended.

Maximise early lactation feed intake 3

- Feed extra energy in early lactation to offset negative energy balance
- Consider bypass oils/fats, particularly C18 omega 3 fats

A two pronged management

Feed rationing goals should focus on
OPTIMISING RUMEN FUNCTION

Feeding management should focus on
MAXIMISING DRY MATTER INTAKE

Both are required to achieve
Target BCS

Nutritional strategies to manage BCS: mid lactation 1

- Focus on condition at mid lactation
- Plan what is required to be at CS 5.0 by dry off
- Implement the plan from mid- lactation



Nutritional strategies to manage BCS: mid lactation 2

- Aim to dry off in the target calving condition
- Condition gain during the dry period takes more feed than condition gain during lactation
- Condition gain during the dry can be a very high fat proportion that goes on easily and comes off easily



Summary 1

- BCS changes can cause problems when they are
 - Too great (positive or negative change)
 - Changing too rapidly (positive or negative change)



Summary 2

- Mobilising body condition is expensive
- Replacing the lost condition is even more expensive
- Managing weight loss post calving assists in increasing reproductive performance

