Nutritional management to get more milk from lactating cows

Presented by

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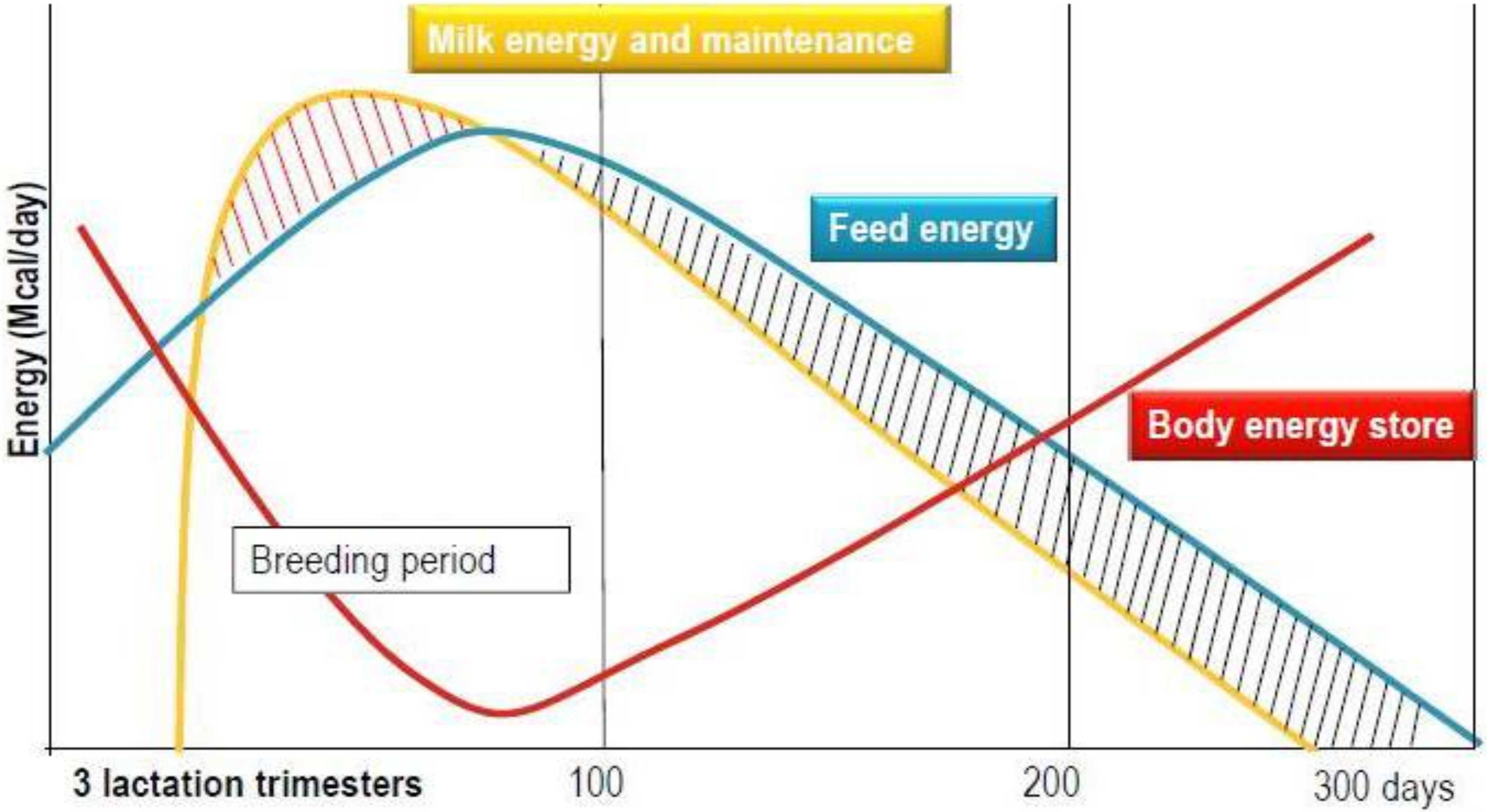
Genetic improvement

Typical energy curves of the lactating cow



Climbing the peak milk mountain

1- Set Benchmarks

2- Think Long Term

3- Invest In Pre-peak Nutrition

4-Support Fresh Cow Health

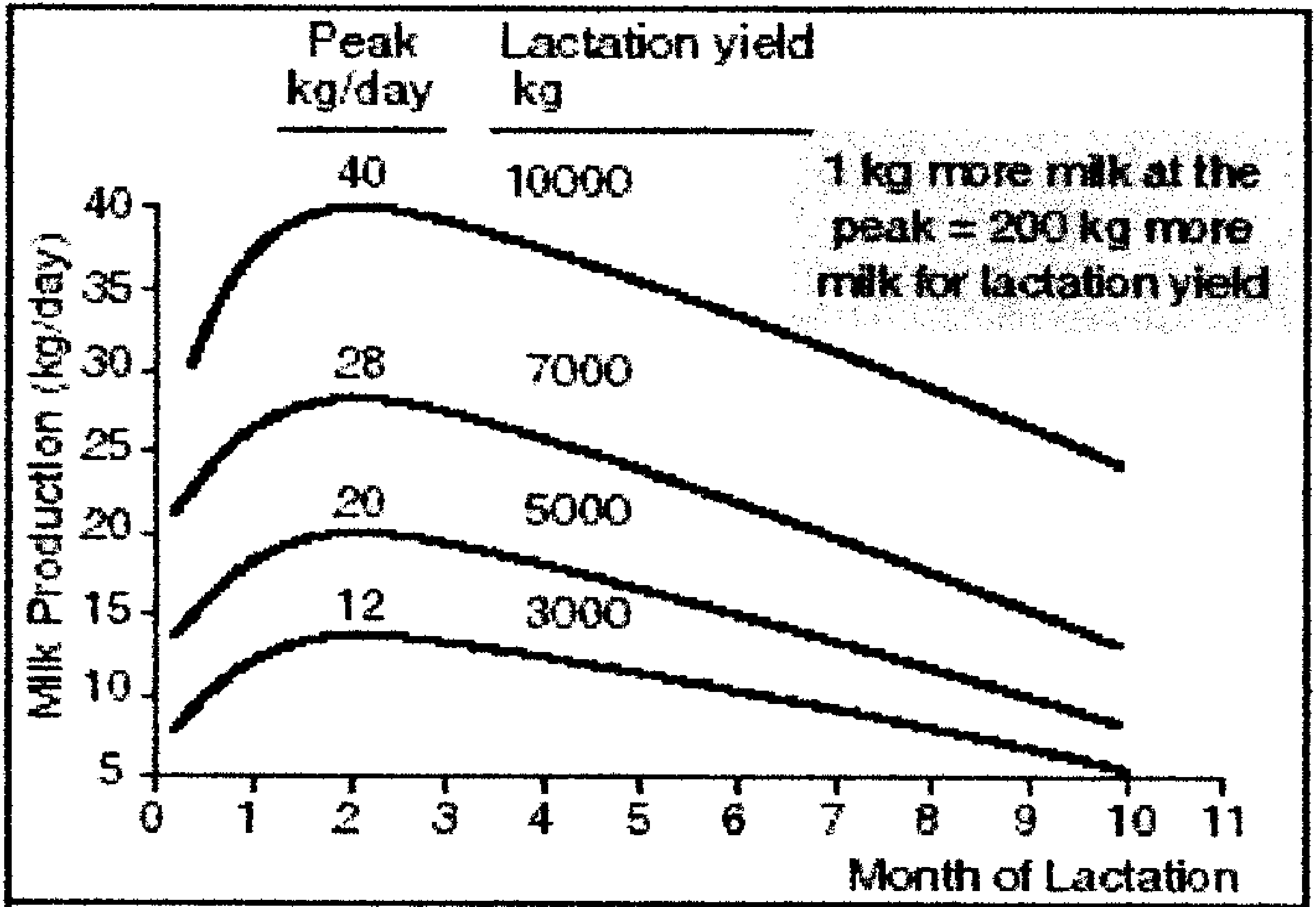
5- Manage Body Reserves

Climbing the peak milk mountain

1- Set Benchmarks

- Set peak milk goals based on your herd’s tank average goal

- The timing to reach your goal
  - First- calve heifers 60-90 day
  - Second –lactation cows 30 -60 day



1 kg more milk at the peak = 200 kg more milk for lactation yield

Climbing the peak milk mountain

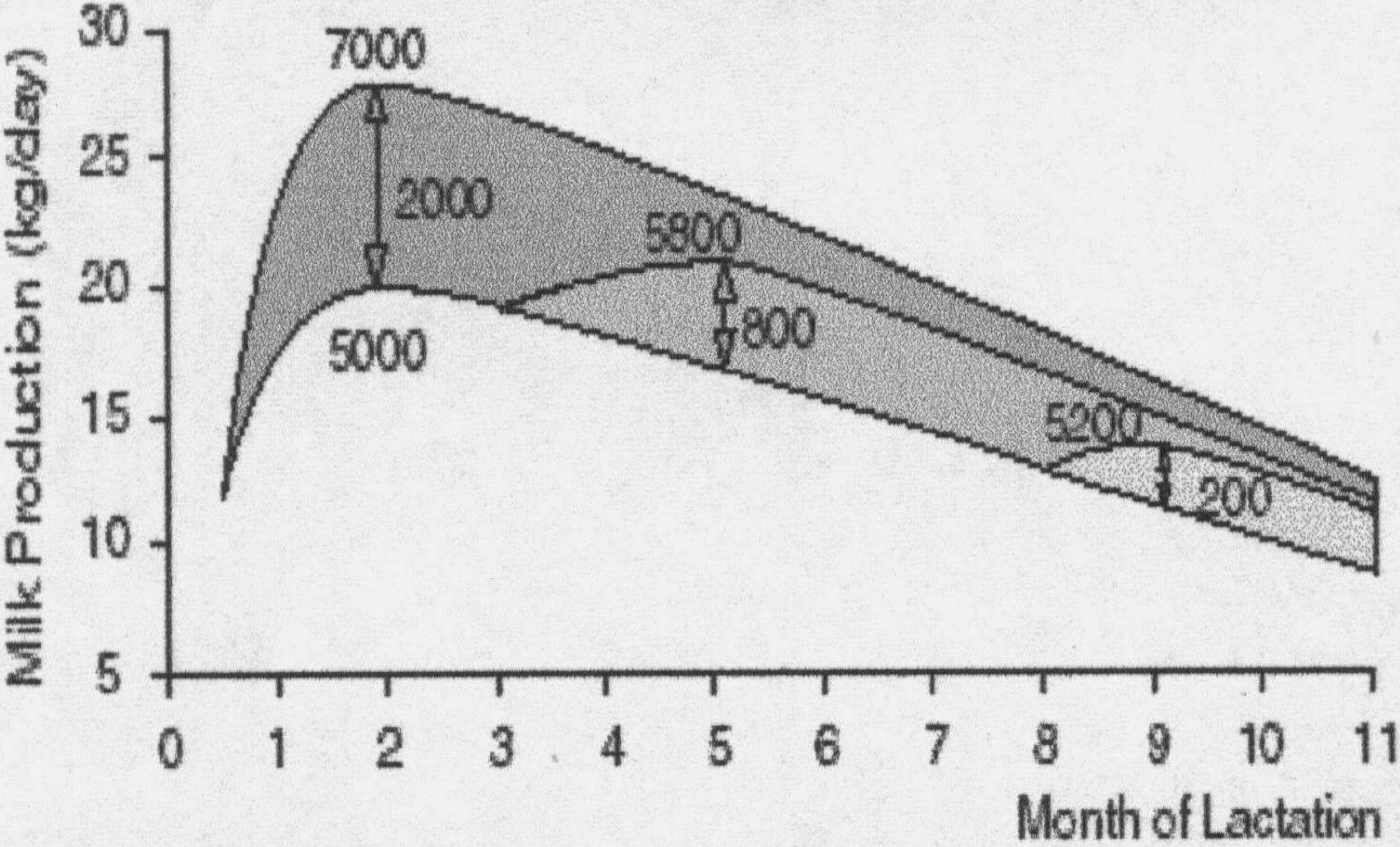
2- Think Long Term

- * When to invest
- *How much to invest

Don’t shoot for 2-1 return on investment (ROI) in the pre-peak period but long term perspective help to achieve additional value

You only invest in nutrients to support higher peak milk for about 45 days for mature cows, then the cow have 300 days or more post-peak to pay back that investment

High energy diets are needed right from the beginning of lactation



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3- Invest In Pre-peak Nutrition

- A 2.4 – 1 ROI over the full lactation starts with feeding the right nutrition pre-peak

- Fresh cows have low feed intake which require a more nutrient-dense diet to support milk production

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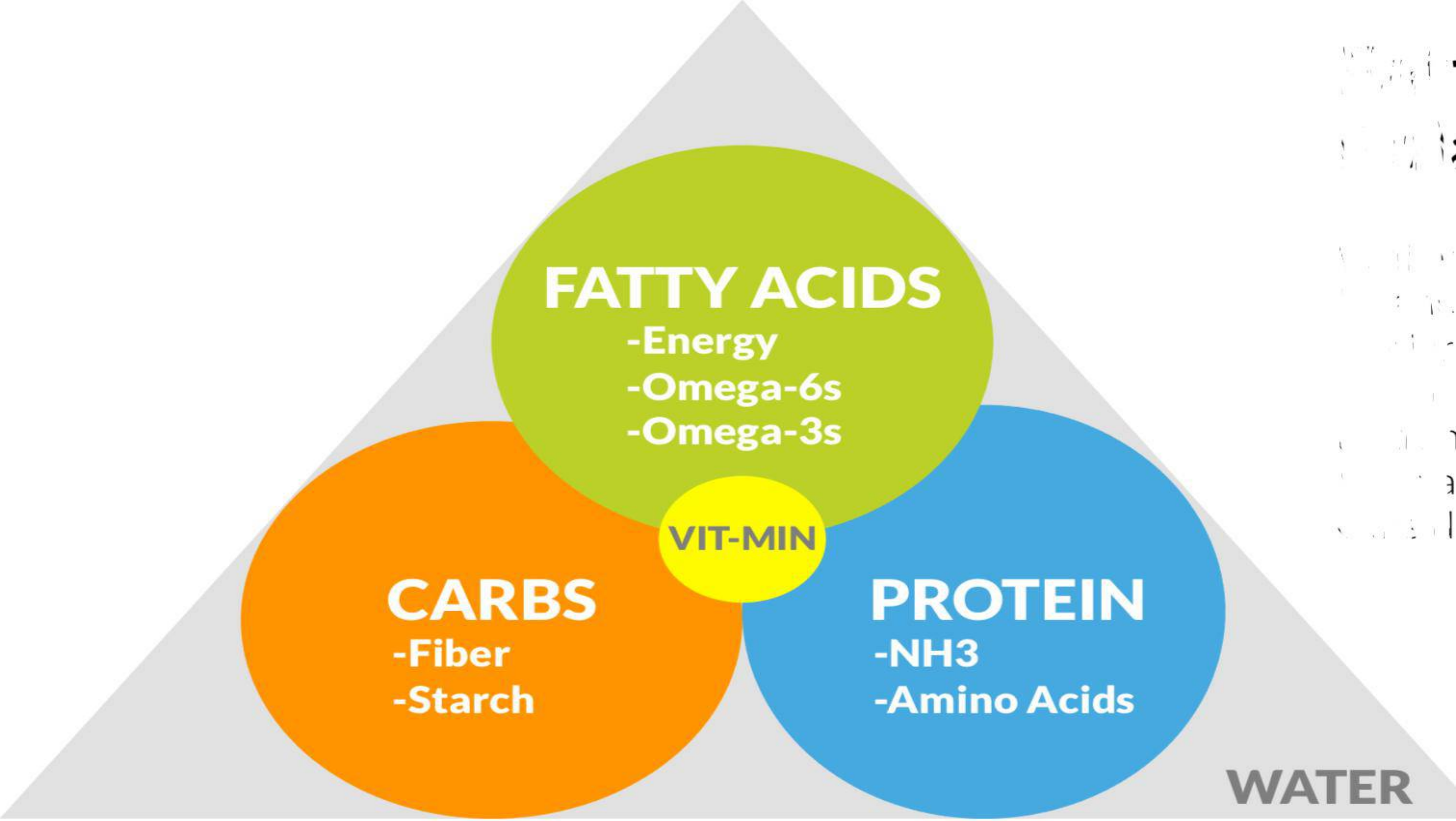
3- Invest In Pre-peak Nutrition

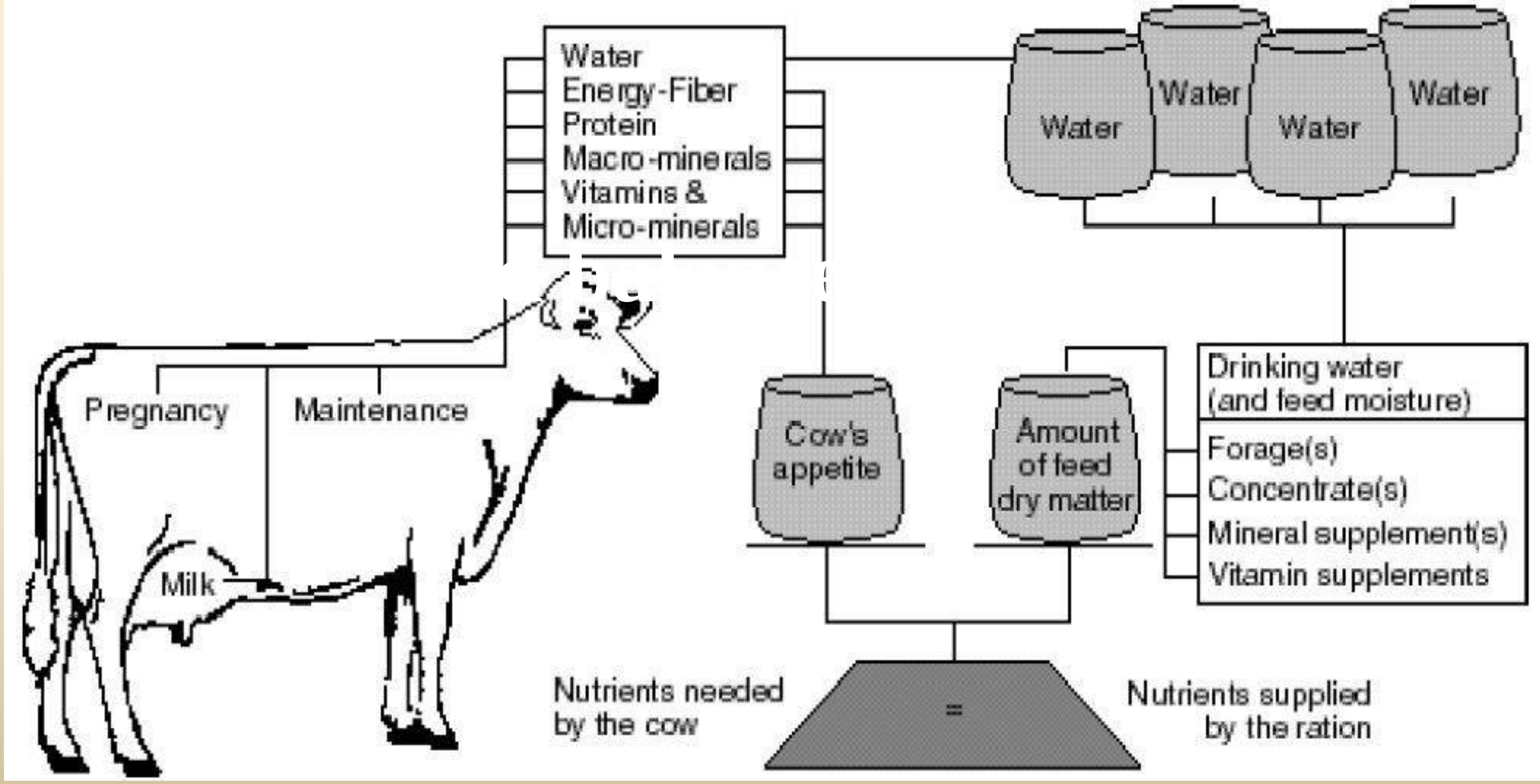
- Starch, fat, metabolizable protein and amino acids, forage harvest management, quality, fermentation and feeding management

- Cow management
    - A clean , comfortable environment
    - adequate water access
    - resting time
    - minimize the time away from pen

Nutrient balance



Feed balanced Ration



Metabolizable protein:
the protein cows really need

microbial protein

+

bypass CP

+

Endogenous protein

What methionine does?

First pathway

Carnitine is required for transport of NEFAs into the fuel centers (Mitochondria)

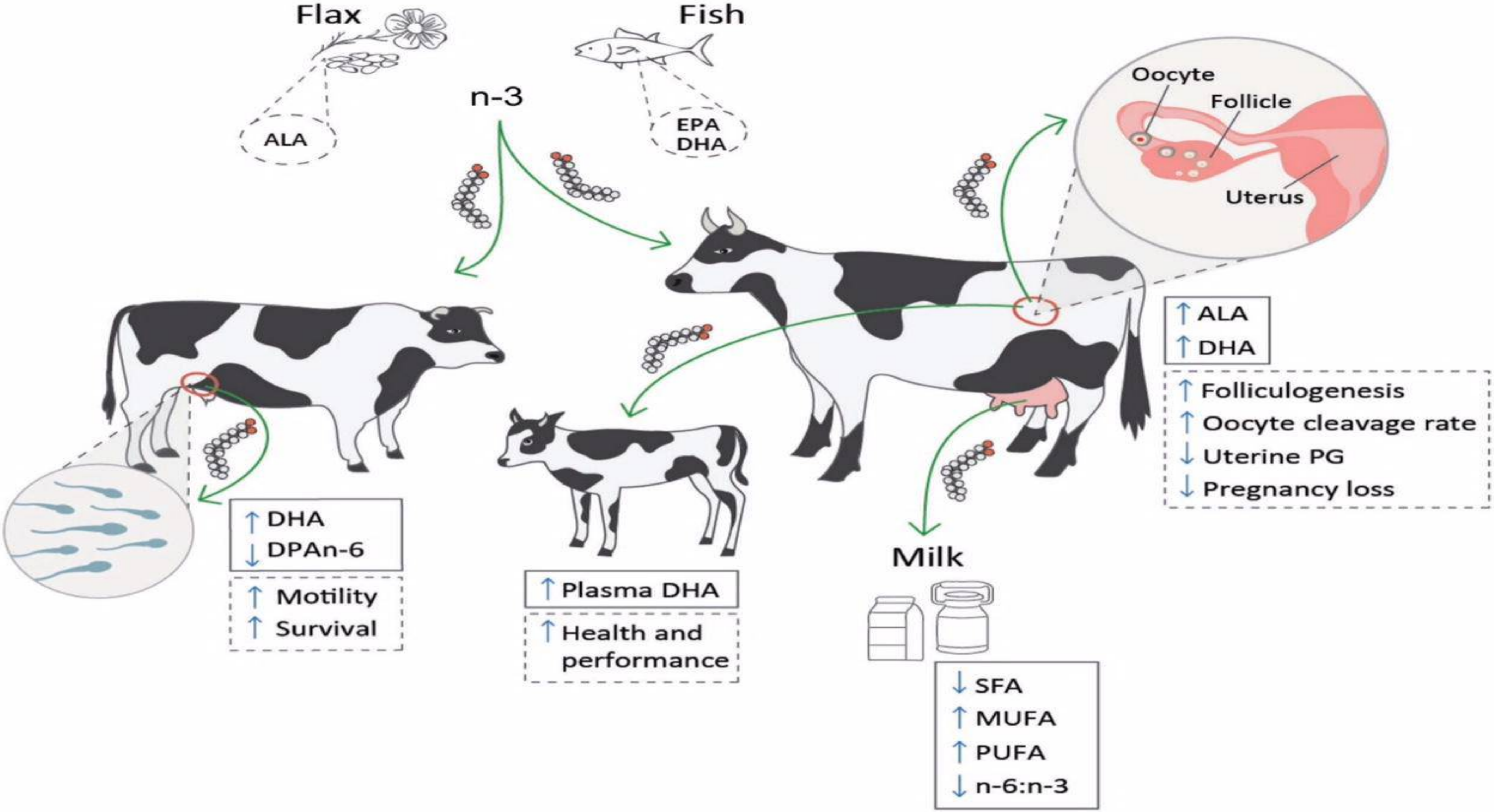
Second pathway

Apolipoprotein Is required for stabilization of VLDL

Third pathway

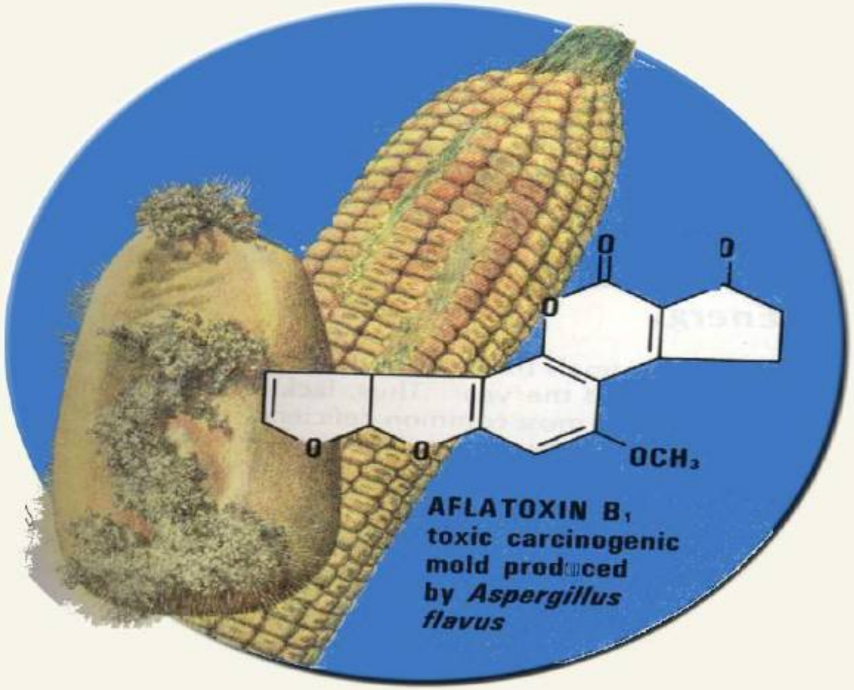
30% of absorbed methionine is used for Choline synthesis . Choline is required for synthesis and secretion of VLDL

Roles Of Dietary Omega -3 Fatty Acid In Dairy Cattle



More dependant on Stored forage

Mycotoxins represent a risk to modern dairy and beef production that can not be avoided.



Sporulation of aspergillus flavus on kernals of corn. This fungus prouduces aflatoxin . Alfatoxin is associated with a high incidence of liver cancer , and may be involved in some types of acute poisoning .

Heat stress

Cow comfort

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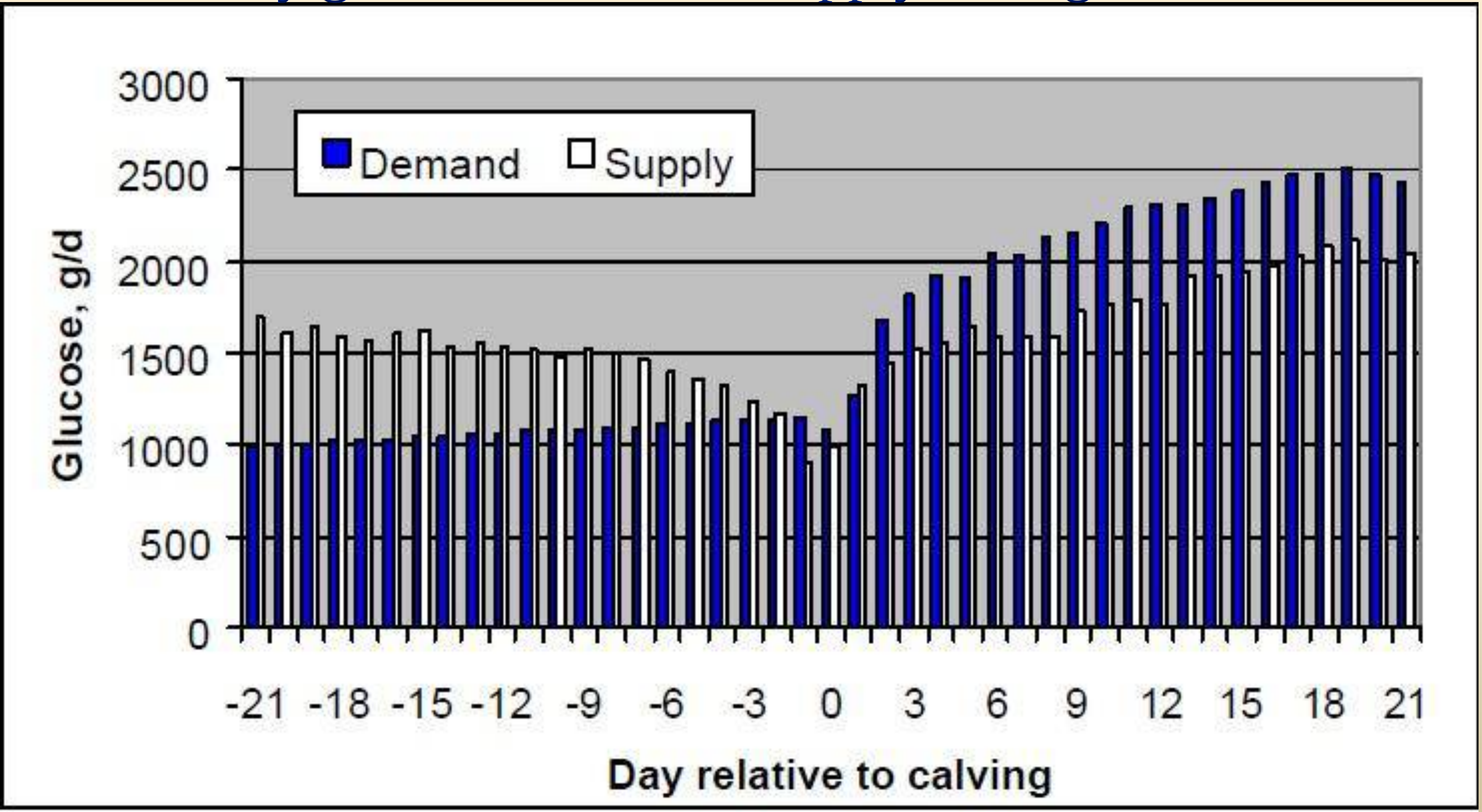
4-Support Fresh Cow Health

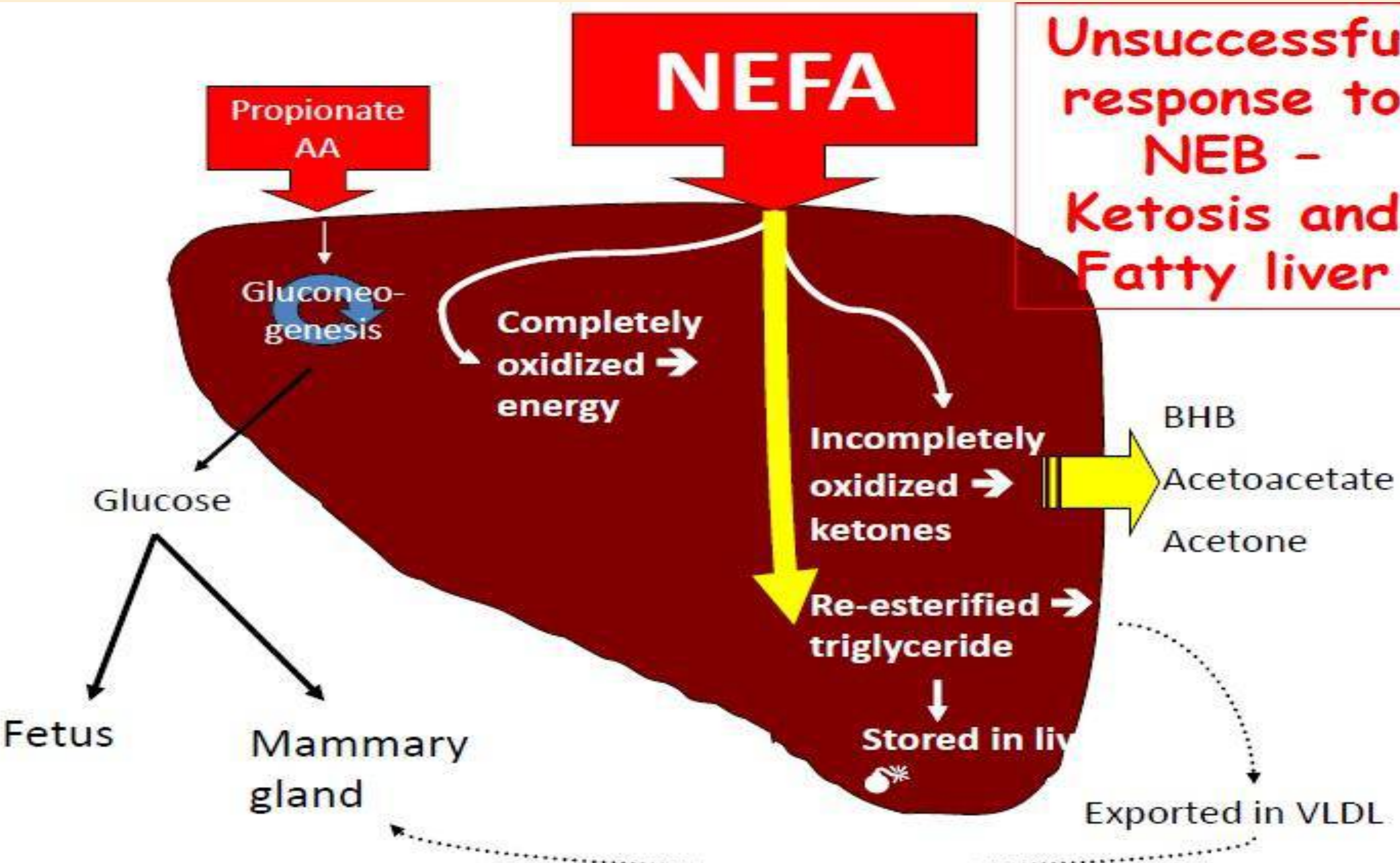
A lot of energy is requires to get to the summit

- Support transition cow health and immune function with pre-fresh diet formulation
- A DCAD formulation approach to support calcium metabolism

Body glucose demand &supply during transition



Unsuccessful response to NEB - Ketosis and Fatty liver



NEFA

Propionate
AA

Gluconeo-
genesis

Glucose

Fetus

Mammary
gland

Completely
oxidized →
energy

Incompletely
oxidized →
ketones

BHB
Acetoacetate
Acetone

Re-esterified →
triglyceride

Stored in liv

Exported in VLDL

Blood Ca level

- Normal blood Ca level (8.80 – 10) mg/dl
- 50 % of old cows develop subclinical hypocalcaemia (5.50 - 8) mg/dl
- 25% Heifers of blood Ca level < 8 mg/dl

Urine pH during anion salt application

Urine pH (5.5 - 6.5)

How do I interpret urine pH

- Suppose you check urine pH of close-up cow.
- you are interested in average
- There is always one odd ball cow

DO NOT adjust the diet to accommodate the one cow

SCENARIO 1

Average PH = 6 ± 0.60

Congratulations !!!!

You have induced metabolic Acidosis

SCENARIO 2

Average PH = 7.40 ± 0.50

Add anion source gradually
Wait 3 days and check pH

SCENARIO 3

Average PH = 4.50 ± 0.50

You have induced

An uncompensated metabolic acidosis = sick cows

Reduce anion source and check urine pH in 3 days

SCENARIO 4

4 cows at pH = 5.0
6 cow at pH = 7.80

- Cows at pH 5.20 today ate well this morning but will not this afternoon due to uncompensated metabolic acidosis

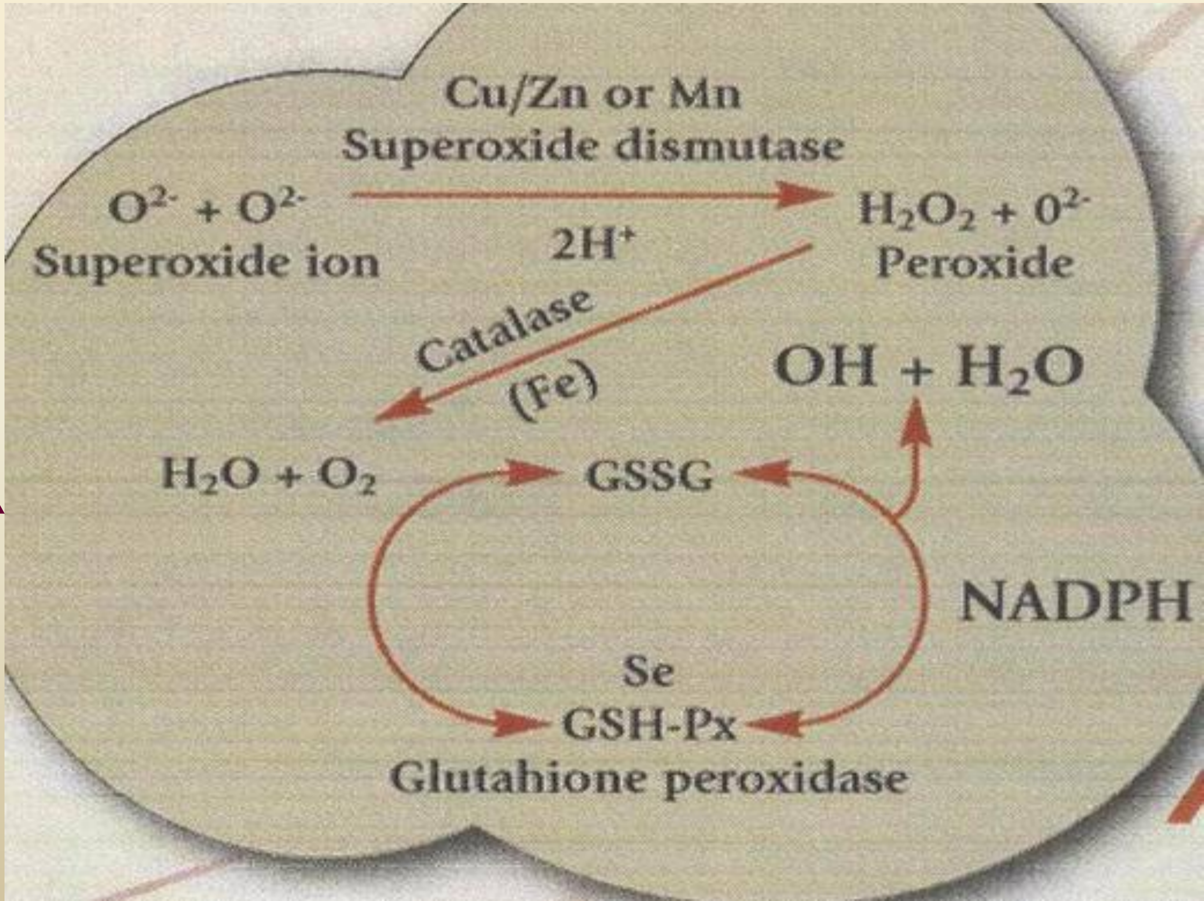
- The cows at pH 7.80 went off feed yesterday from over-acidification but will likely eat today and be over-acidified tomorrow

SCENARIO 4

- Reduce anion salt
- Wait 4 -5 days, check pH and start increasing anion source as needed

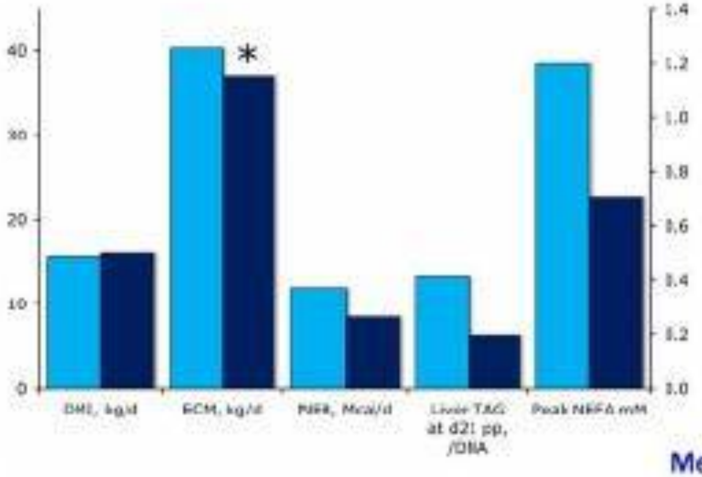
Cu, Zn, Mn, Fe, and Se are cofactors in antioxidant enzymes that neutralize free oxygen radicals inside the cell

Vitamin E provide antioxidant protection in the cell membrane

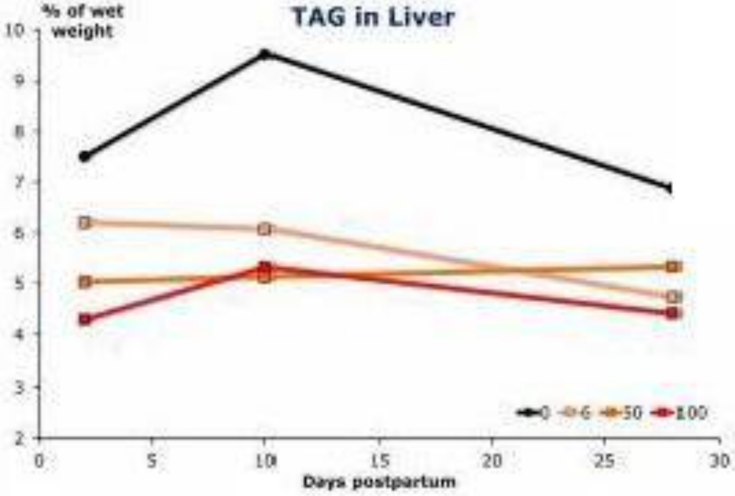


Other additives that affect liver function:

- Niacin
- Carnitine
- Methionine
- Betaine
- Folic Acid
- Vit. B12



Methyl donors in ruminant nutrition



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5- Manage Body Reserves

Maintain appropriate BCS during **the dry and pre-fresh period** is important

Target Body Condition Score

1st lactation heifers → 3.25 - 3.75

2nd lactation Cows or greater → 3.00 - 3.50

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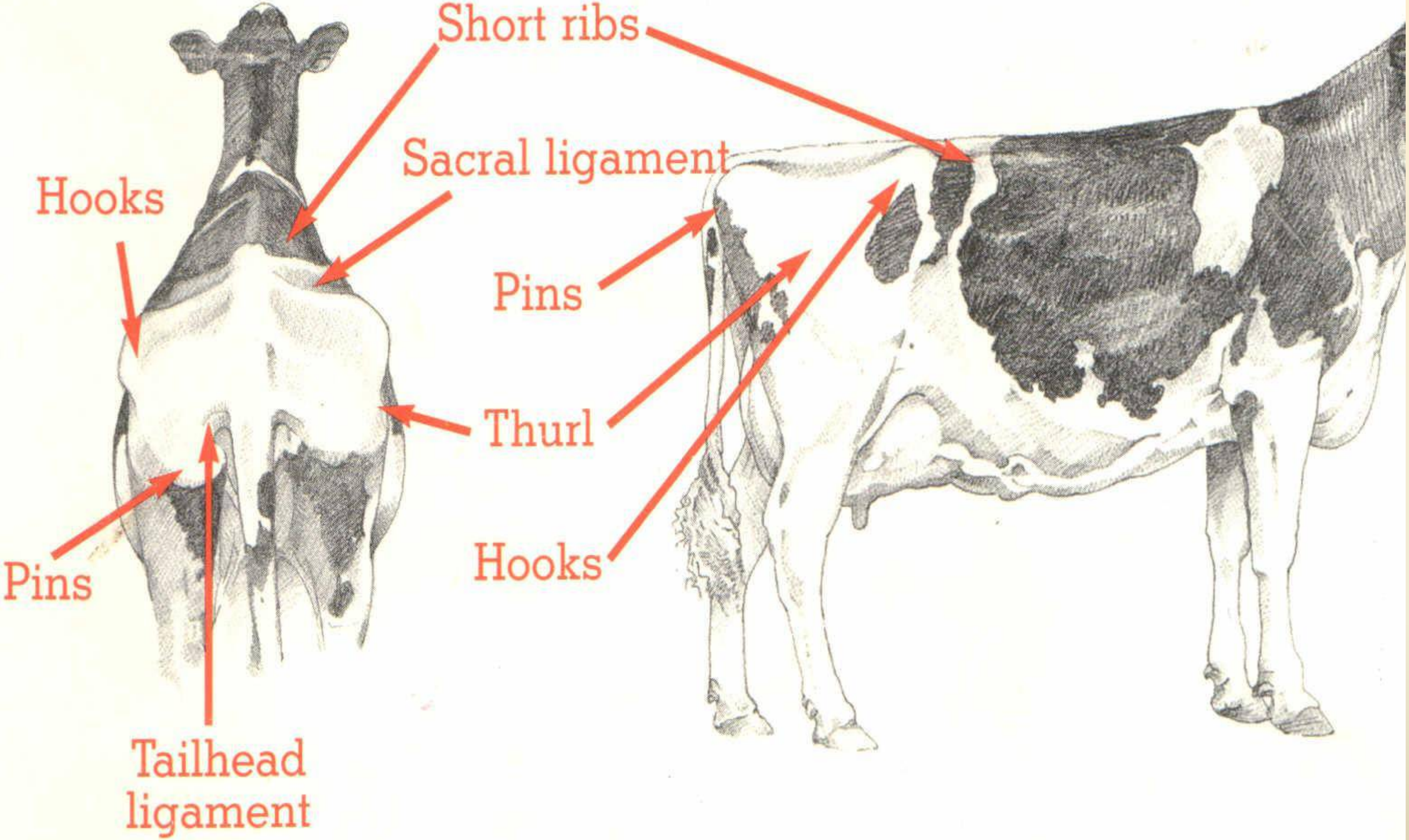
5- Manage Body Reserves

It is better to reduce energy density in the diet for late-lactation Cows to better manage the dry period

- High BCS → reduced feed intake → high risk for fresh cow disease
- Low BCS → No body reserves to support milk production and reproductive efficiency



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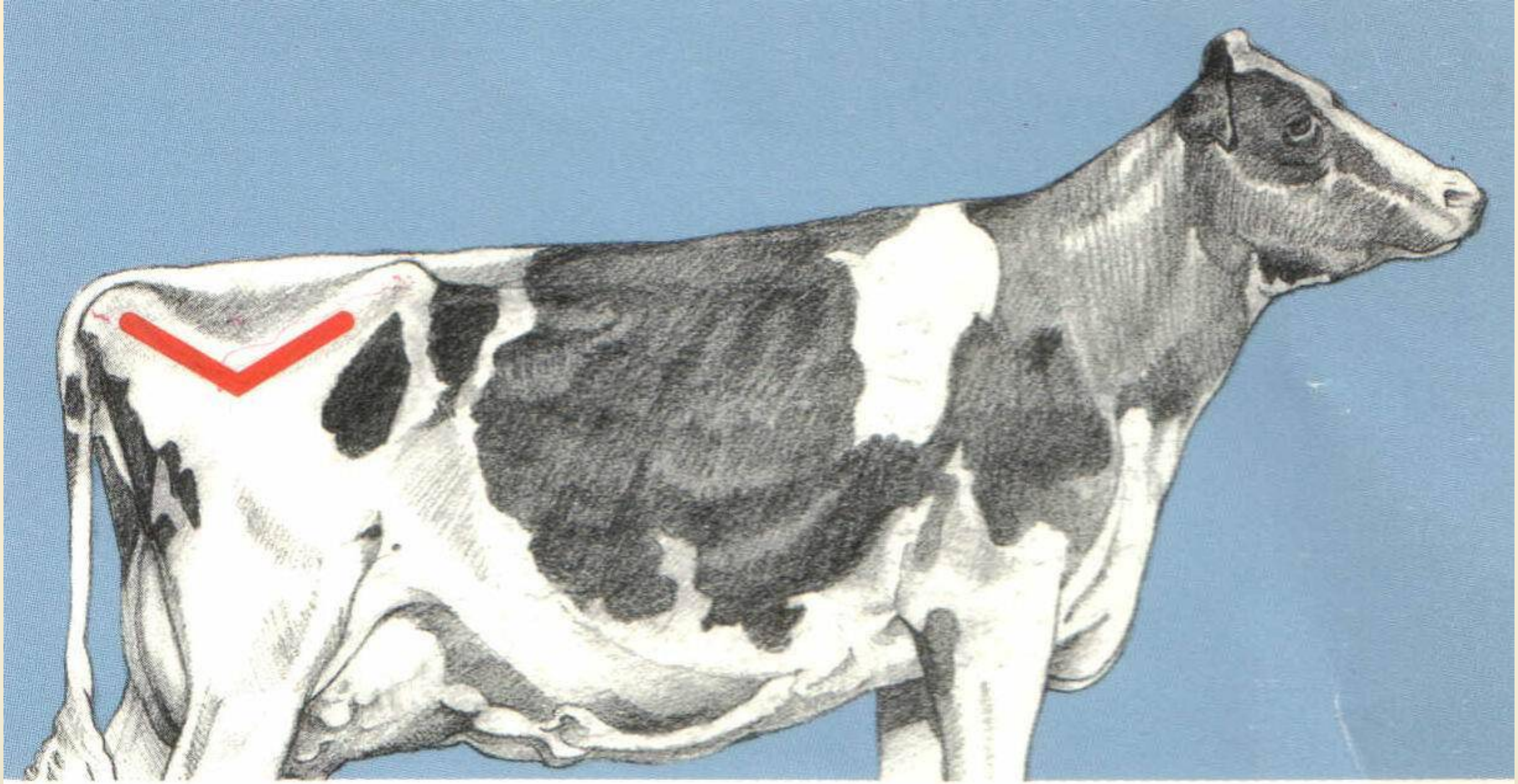
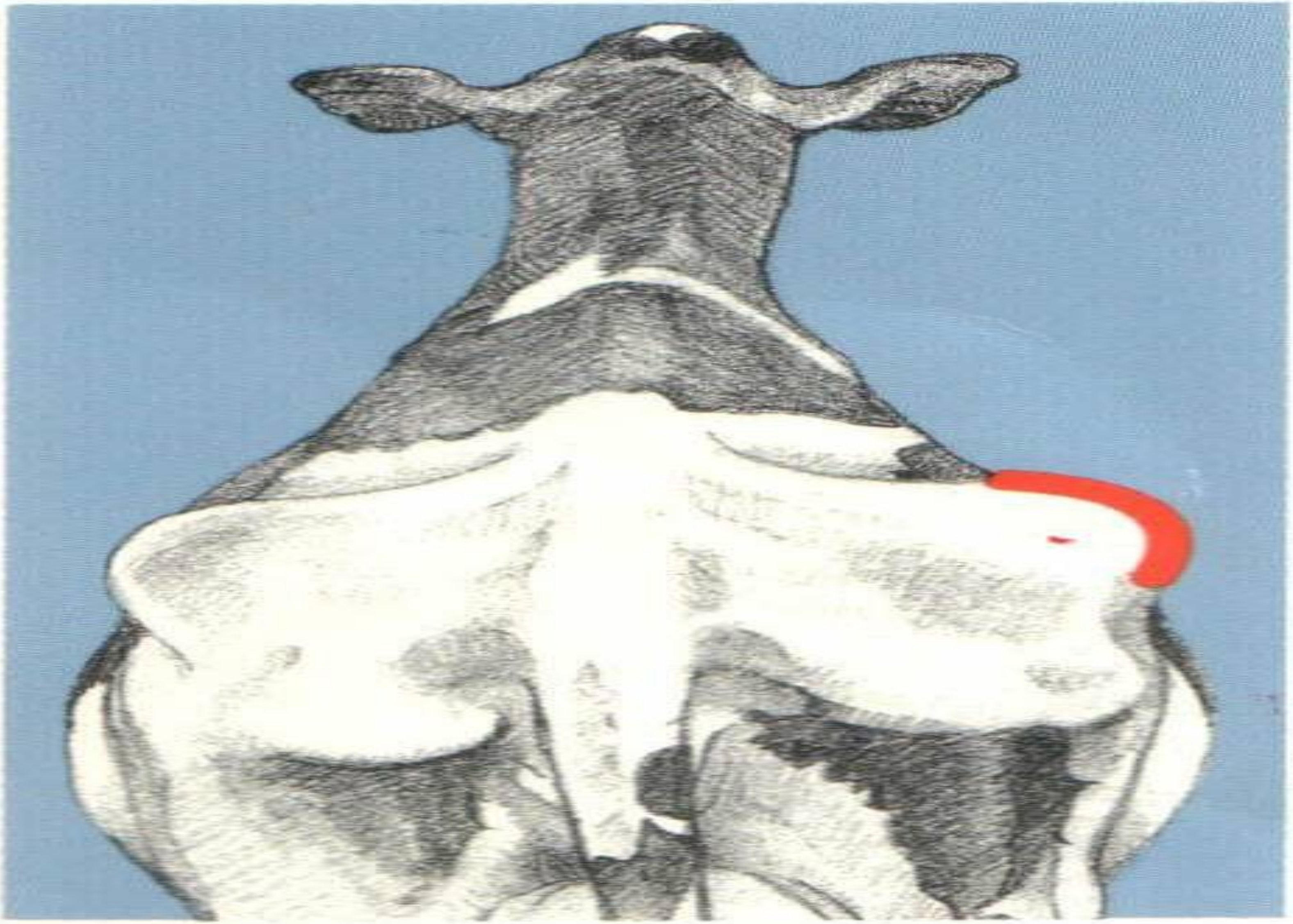
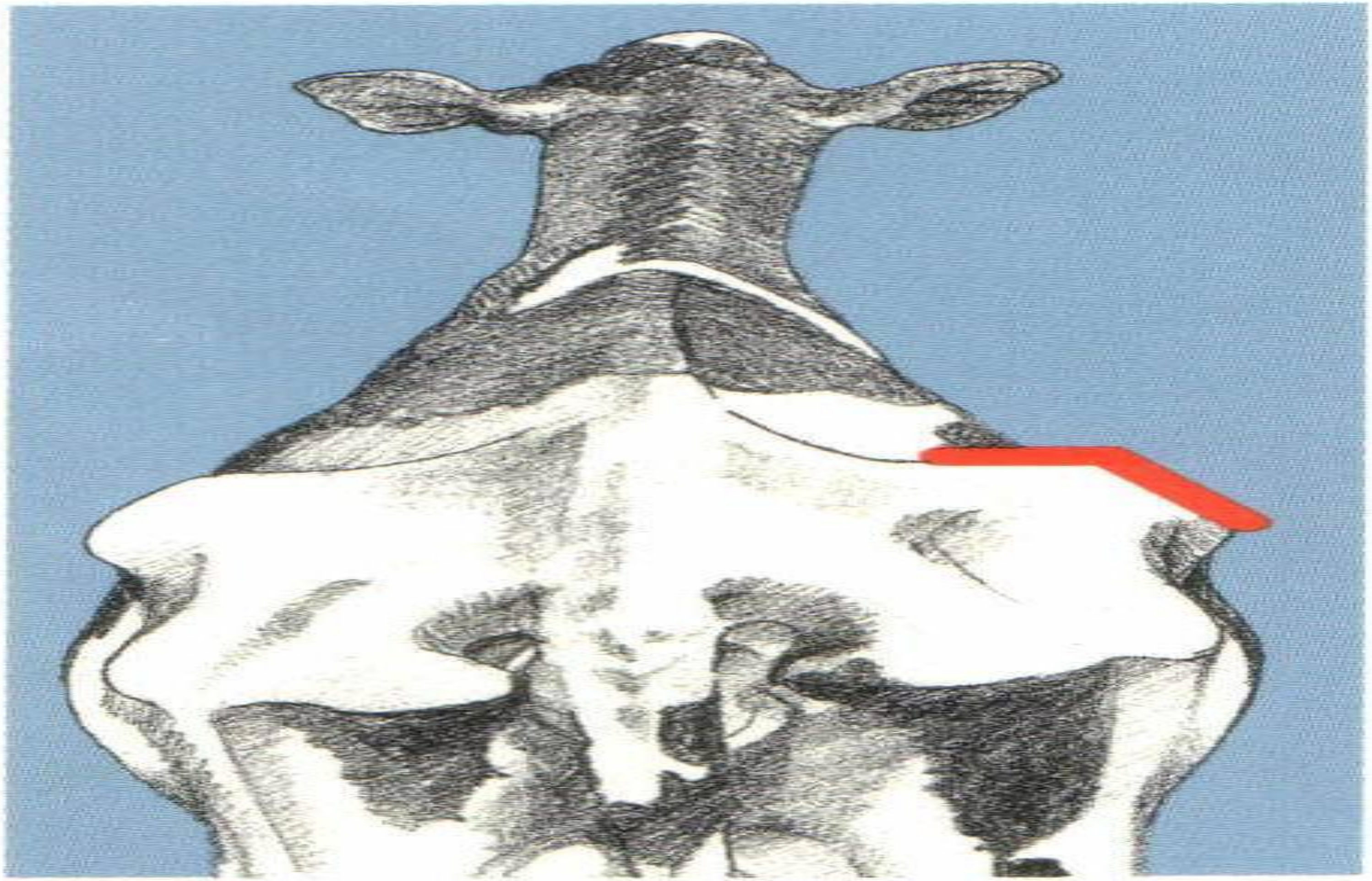


V If the line forms a flattened **V** then **BCS** ≤ **3.0**.

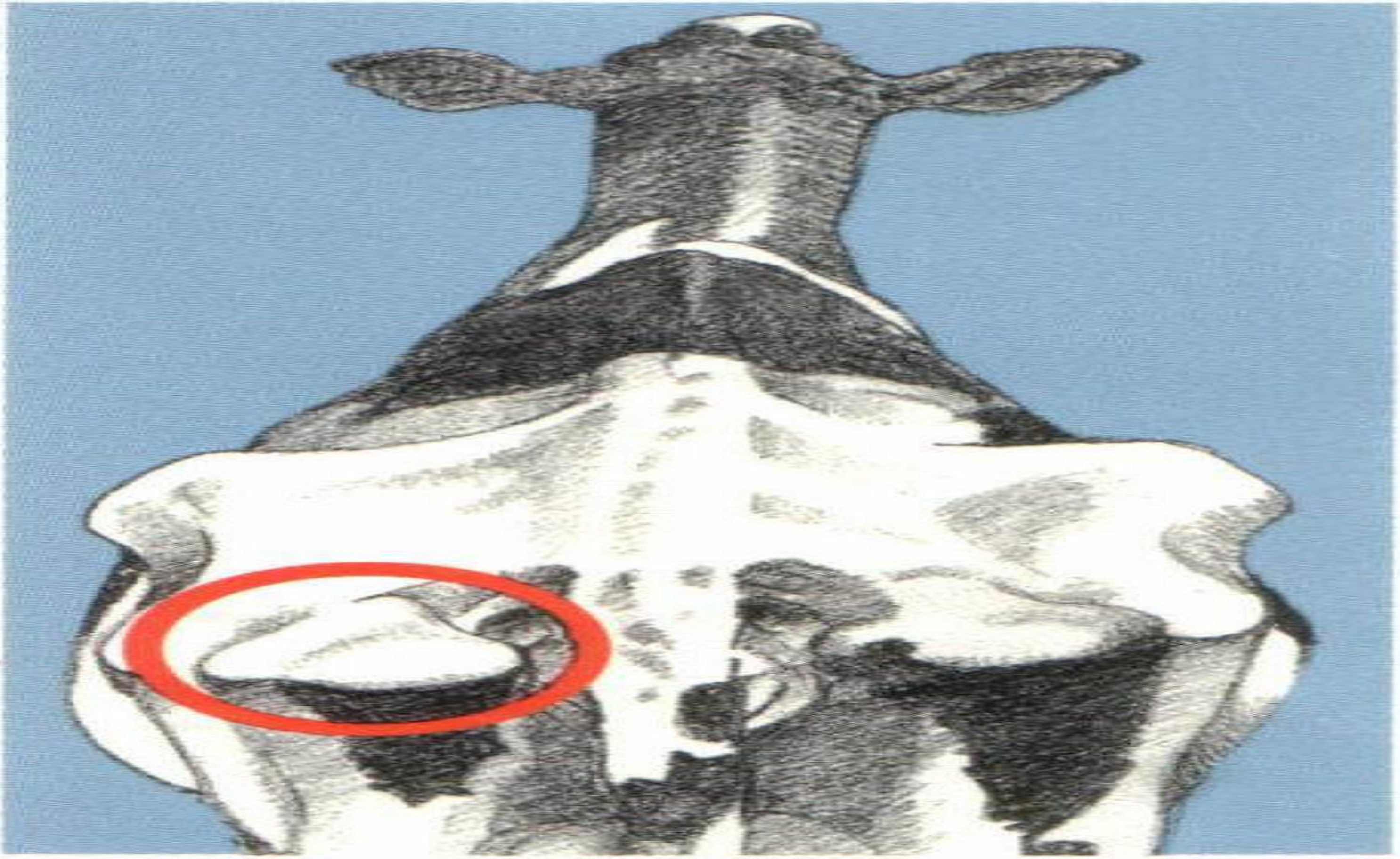


1 If hooks rounded

BCS = 3.0.



2 If hooks angular **BCS < 2.75.** Check pins. If pins padded **BCS = 2.75.**

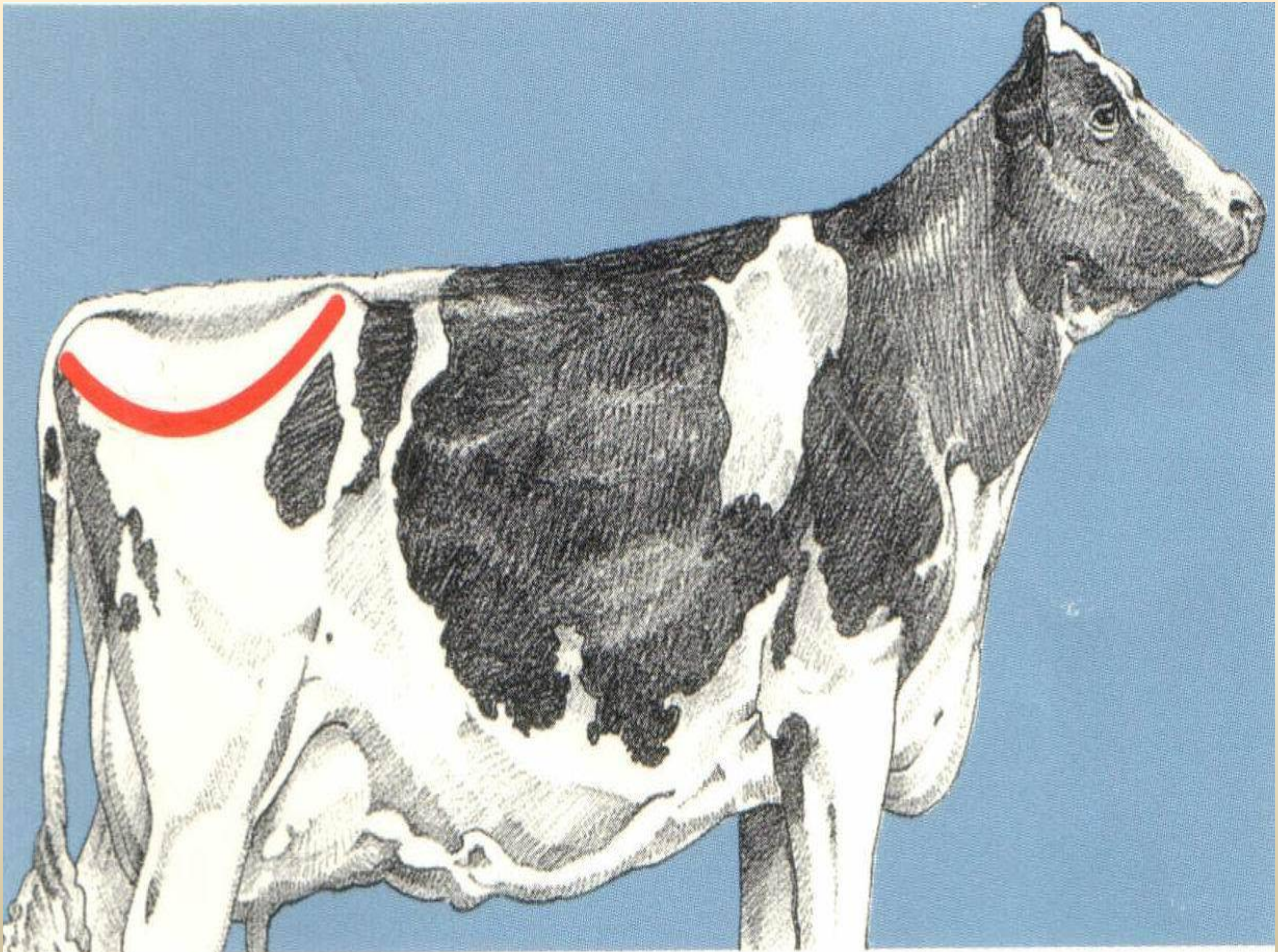


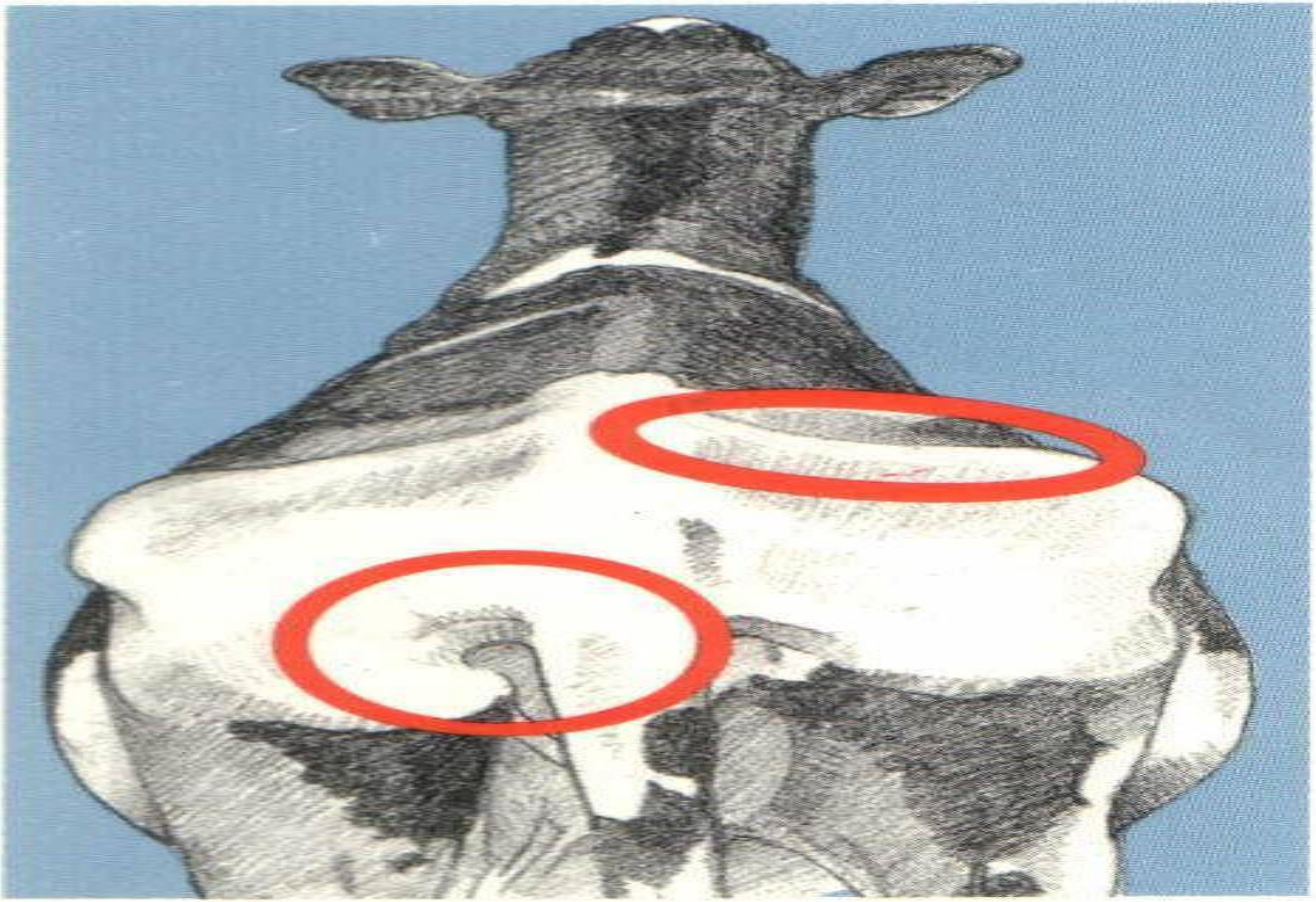
3 If pins angular

BCS < 2.75.

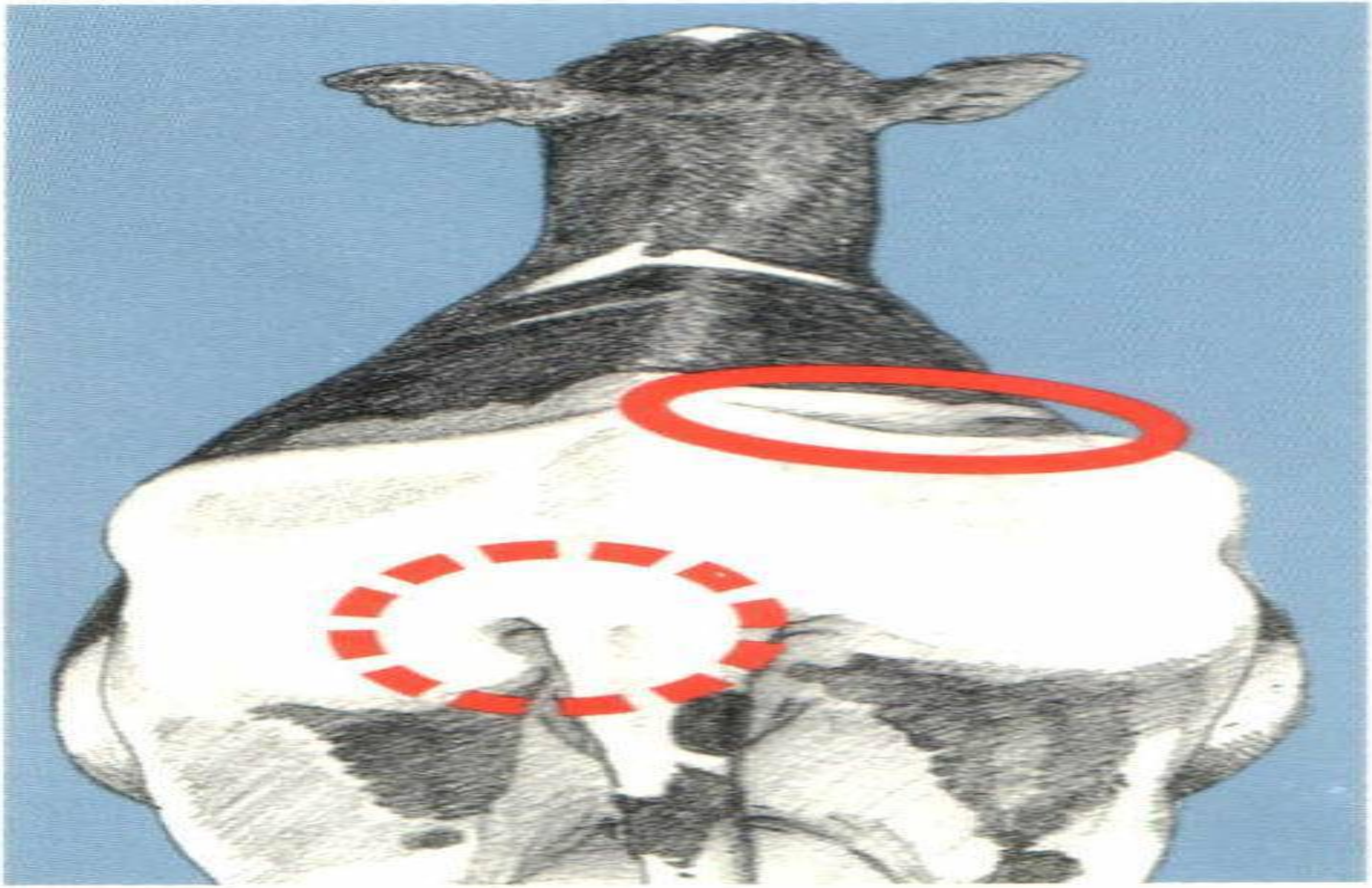
If palpable fat pad on point of pins

BCS = 2.50.



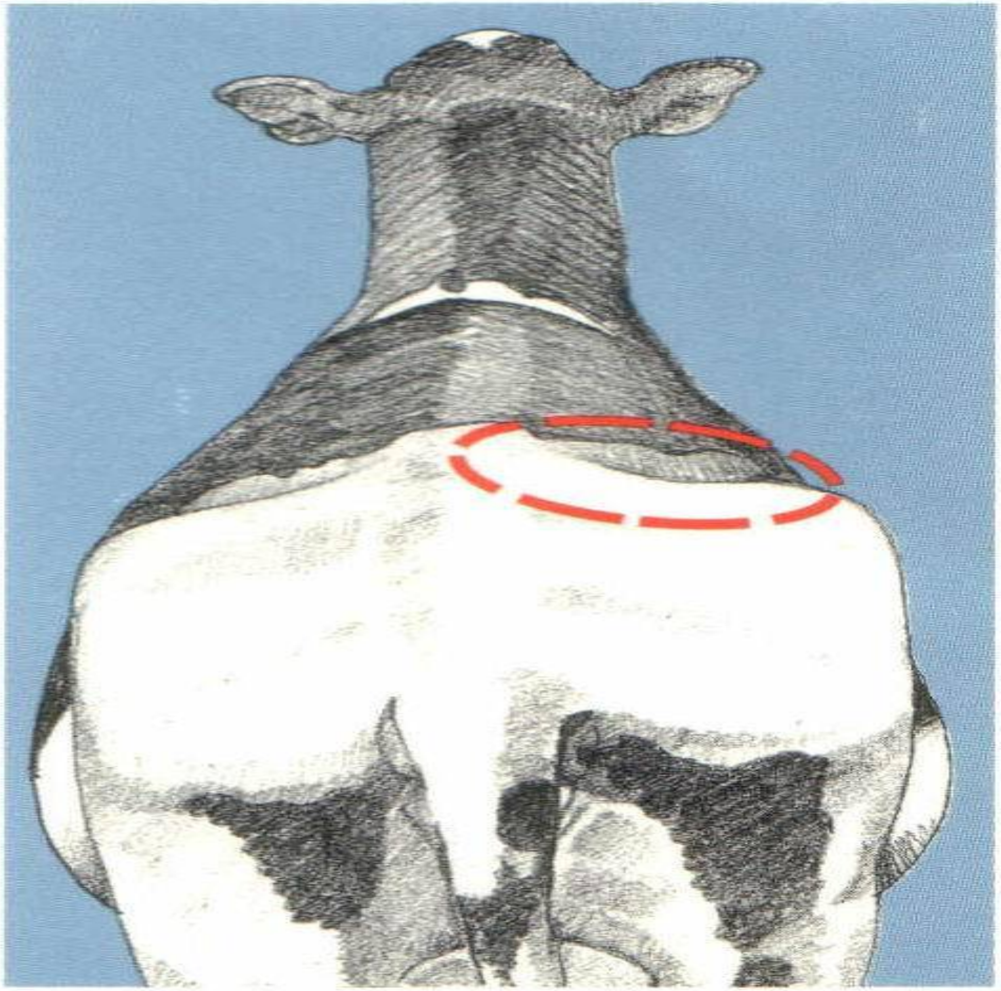


1 If sacral and tailhead ligaments visible **BCS = 3.25**.

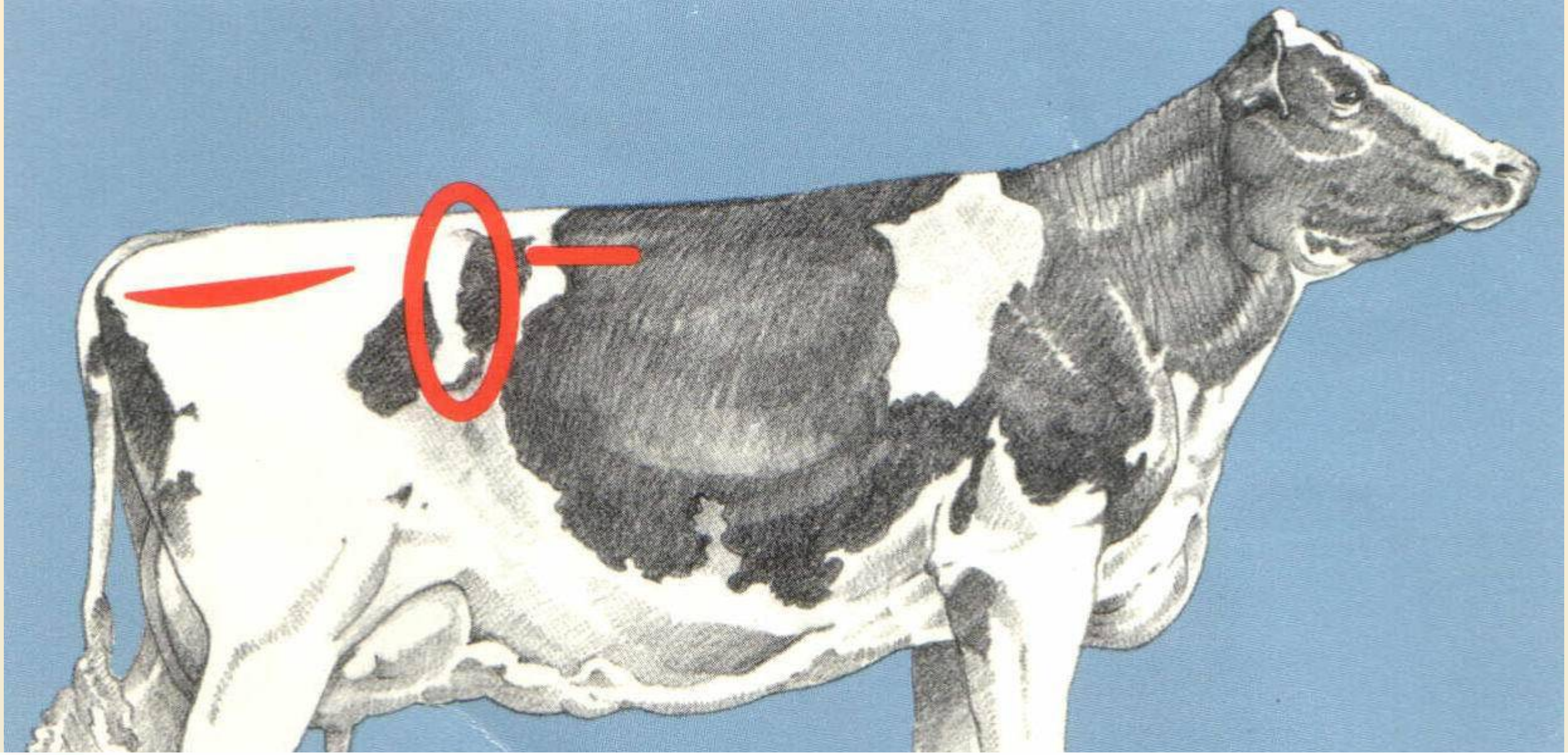


2 If sacral ligament visible and tailhead ligament barely visible

BCS = 3.50.



3 If sacral ligament barely visible and tailhead ligament not visible **BCS = 3.75**. If sacral and tailhead ligament not visible **BCS = 4.0**.



4 If thurl flat **BCS > 4.0**. If tip of short ribs barely visible **BCS = 4.25**. If thurl flat and pins buried **BCS = 4.5**. If hooks barely visible **BCS = 4.75**. If all boney prominences well rounded **BCS = 5.0**.

Using body condition scores

* Dry off	3.0 to 3.5
* Calving	3.0 to 3.5
* Breeding	2.5
* Pregnant check	2.75

Just when is the best time to body score cows?

1- scoring cows during routine events such as:-

➔Calving
➔First AI
➔Dry off

* **post calving exams**
* **pregnancy checks**

2- Monthly.

Dynamics of BCS

* One BCS equals 58 Kg

* Cows are more efficient while milking

* Score 5-8 cows / group

Thanks For Attention