PROGRAZE™

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SEGMENT 5

CATTLE BREEDING PACKAGE

In this segment you will learn:

- How to fat score cattle.
- How fat scoring is used, in conjunction with pasture benchmarks, to manage the nutritional requirements of the cow herd through the annual breeding cycle.
- Of the management of cows, bulls and weaners through the breeding cycle.

CATTLE BREEDING PACKAGE

Key factors in the cow breeding package are:

- Skills in pasture and livestock assessment.
- Establishing pasture and livestock targets.
- Developing sound cow/heifer management practices.

FACTORS TO BE CONSIDERED

Managing the breeding herd involves decisions on several key factors in determining the best annual breeding calender:

- Calving/weaning rate targets.
- Bull management.
- Joining time and length.
- Age to join heifers and heifer management.
- Weaning age.

Availability and reliability of pasture will influence some of these decisions.

WHAT ARE THE TARGETS?

The aim of a beef enterprise must be to get each cow to produce one calf per year at the optimum or most desired time (not one calf every 15 to 18 months). Given a gestation period of 280 days and a return to first oestrus (on heat) of 55 days, this leaves a period of 30 days for the cow to rejoin and so produce the required one calf each year.

280 days	55 days	30 days
Pregnancy	Normal time to start cycling	Two heat chances

Other targets are:

- A condensed calving over 6–12 weeks.
- Weaning rate of 85% or better (to cows joined)
- Joining heifers at minimum liveweights:
  - » 280 to 320 kg British breeds and crosses depending on mature cow size
  - » 300 to 340 kg European and Bos Indicus breeds and crosses
- Joining heifers to calve at 24, 30 or 36 months of age, depending on expected growth rates.

FAT SCORING CATTLE

Fat scoring cattle ideally uses both visual and manual assessments.

Visual assessment

Visual assessment is less accurate but can give a useful indication of overall fatness. A number of sites can be referred to when visually assessing fatness (Figure 5.1).

What to look for as cattle get fatter:

- Ribs become less visible.
- Fat deposits are visible beside the tailhead.
- Muscle seams of hindquarters become less evident.
- Brisket, flank, cod and twist all fill out giving less sharp – more rounded and then a squared appearance.

From the rear the top line gets rounder as fatness increases As cattle get fatter, knobs appear on both sides of the tail head and both the cod and twist fill with fat. Leaner animals have a more prominent tail head, the twist is more angular and more wrinkled and the cod is less noticeable with little fill. Like the twist area, the flank also appears much sharper in lean cattle but appears more rounded and 'let down' as fat is deposited there.

Individual muscle groups can be more readily seen in lean animals. In particular, muscle seams can be seen in the hind quarter from the side and rear when animals are in fat score 1 and 2.

From the front and side views, the brisket becomes fuller and more rounded as fat is laid down there. A deep, full briskets indicates excess fat.

Manual assessment

Manually assessing fatness often allows for a more accurate assessment of overall fatness. Sites are assessed where fat can be readily differentiated from muscle (see Figure 5.2).

These areas include the ends of the short loin ribs (A), or over the long ribs (B and D) and around the tail head (C). Some older animals may be very fat and ribs will not be able to be felt. If, by placing a hand flat on the hide, you cannot feel the ribs, this indicates that fat is likely to exceed 30 mm. In these cases assessments are best done on sites A, B, and C. Generally make assessments around the tail head area and cross check on the ribs.

Figure 5.1. Reference points for visual assessment.

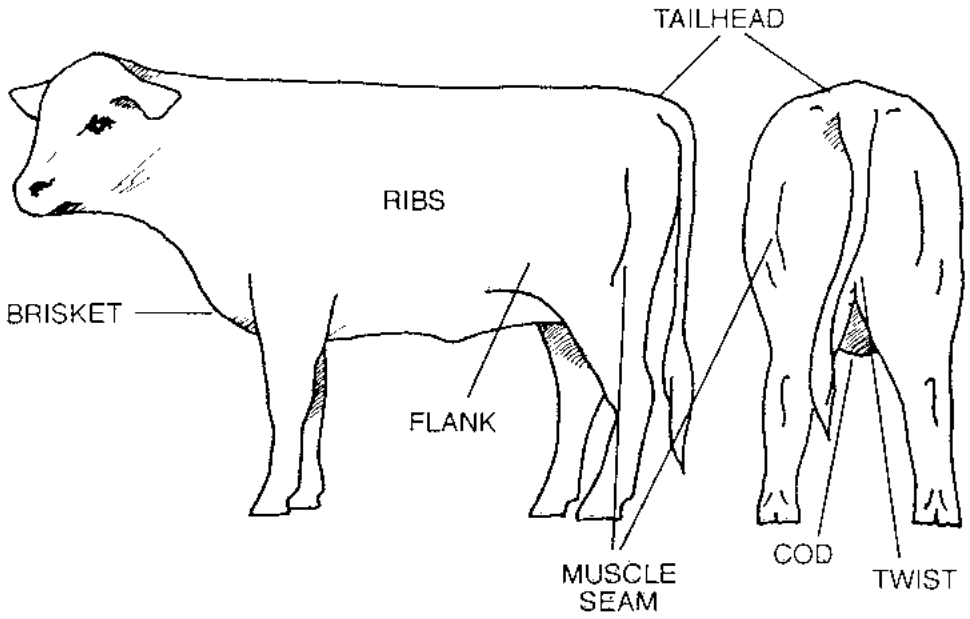
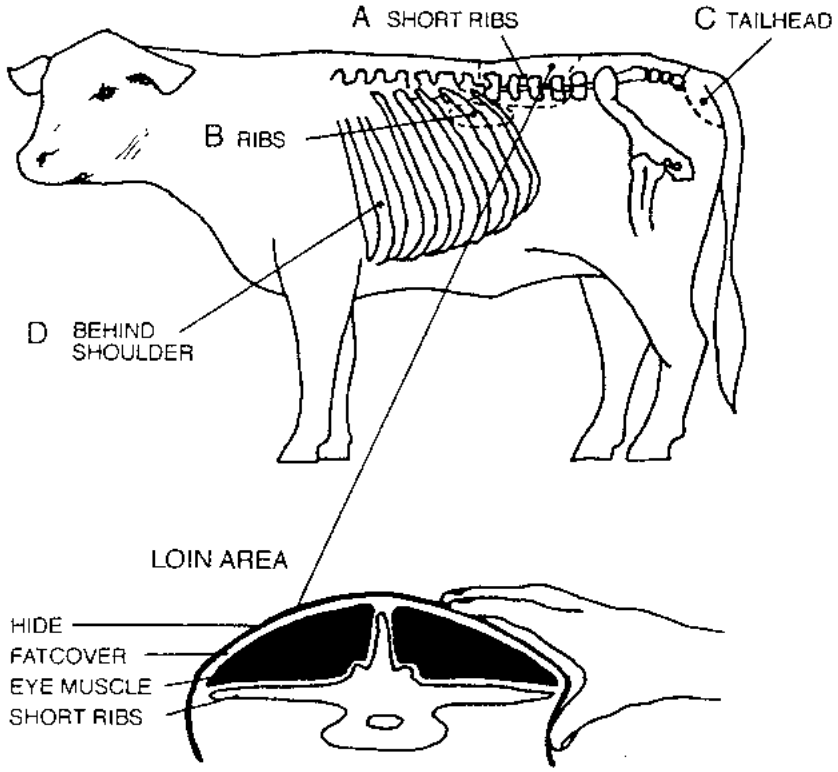


Figure 5.2. Location and position for fat scoring cattle.



Understanding Fat Scores

Fat scoring is used to assess fat thickness.

A description of fat scores is given below. (see Figure 5.2).

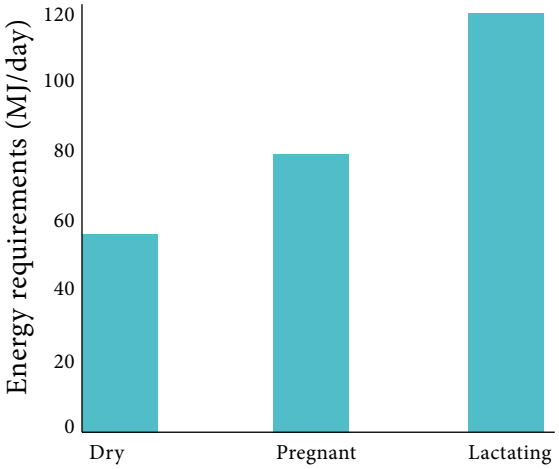
Description	Score
Animals maybe emaciated. Short ribs feel 'sharp'. There is no fat around the tail (C). Hip bones, tailhead and ribs are prominent.	1 (0–2 mm* P8; 0–1 mm 12th rib)
No fat beside tail head (C). Short (A) and long ribs (B) are easily identified. Short ribs feel rounded rather than sharp. Hip bone and ribs (B) still feel hard. Ribs are no longer visually obvious.	2 (3–6 mm P8; 2–3 mm 12th rib)
Short ribs are more rounded but still easily felt. The ribs (B) are easily felt with firm pressure. Muscle seems fill, appear smooth. Easily felt fat cover either side of the tail head (C).	3 (7–12 mm P8; 4–7 mm 12th rib)
Short ribs cannot be felt. Some fat cover over the hip and back bones. Small mounds of fat that are soft to touch are around tail head. Ribs are difficult to distinguish.	4 (13–22 mm P8; 8–12 mm 12th rib)
Short ribs cannot be felt. Tail head and hip bones are almost buried in fat. Ribs (B) are 'wavy' from fat folds. Brisket and cod appear full. Squaring off in the flank area.	5 (23–32 mm P8; 13–18 mm 12th rib)
Short ribs cannot be seen. Tail head and hips are completely buried by large 'rounds' of fat. Ribs 'waved' from fat folds. Heavy brisket and cod/udder. Squared off flank and blocky appearance. Mobility reduced to a walk.	6 (32+ mm P8; 18+ mm 12th rib)

*Millimeters of fat

NUTRITION

Feed requirements of a breeding cow are highest immediately after calving through to joining. Figure 5.3 indicates the relative change in energy requirements of a dry to lactating cow. These energy requirements must be obtained from pasture and/or supplements or through the use of the cow's fat resources.

Figure 5.3. Energy requirements of a breeding cow.



Research has shown that fat score at calving, cow age (with both first calvers and older cows susceptible to lower fertility) and nutrition during early lactation affect fertility at joining. The higher the fat score at calving the greater chance the cow will be in oestrus 60 days from calving (Table 5.1).

Table 5.1. Fat score of cows at calving and percentage of cows returning to oestrus (on heat) after 50, 70 or 90 days.

Fat score at calving	Days after calving % on heat		
	50 day	70 days	90 days
1–2	34	55	66
3–4	45	79	91
4–5	42	96	100

One third of cows in fat score 1–2 have not cycled by 90 days after calving. They will not calve again within the target 12 months. They will calve later and later each year until they fail to get pregnant at all. This effect is even greater with young females.

Following calving, cows should be on high quality pasture. This ensures early rejoining. When feed supplies are limited, supplementary feeding may be required to stop reproductive rates falling.

Bull management

To achieve a high reproduction rate, bulls must have a good libido, be able to serve cows and produce quality semen. Various injuries, fevers and high temperatures may influence libido and the bulls ability to serve.

Aim for fat score 3 of the bulls at joining. Fat bulls may become lazy and susceptible to high temperatures,

reducing their work rate. The rate of bull breakdown is related to excess fatness, restrict pasture to fat animals well before joining. Conversely, consider supplementary feeding bulls, commencing 3 months prior to joining, if bulls are in poor condition.

To avoid disease transfer, and fighting injuries, join young bulls to heifers and older bulls to cows. Check these three areas to improve bull joining performance:

- General health and condition; includes sound feet and legs, abnormal teeth formation (which will influence feeding).
- Sheath free of infections/irritations; testes firm and free from any lumps.
- A scrotal circumference of at least 35 cm and 31 cm for mature and young bulls respectively. Sperm production (and fertility of daughters) is directly related to teste size.

The joining period

Ideally, joining should coincide with the seasonal feed flush to maximize conception rates, although market targets can influence this aim. Joining prior to the feed flush can lead to increased costs associated with:

- Supplementary feeding.
- Lower stocking/fertility rates.

The joining period determines the length of calving. If calving is drawn out, cows may calve each year but not once every 12 months. This reduces herd productivity.

A longer calving period:

- Increases the chance of feed shortages
- Increases the range of weaning weights and likely selling costs.
- Reduces the time for heifers to reach joining weight. A tighter calving may give more calves access to the best feed from weaning, meaning more weight at 15–18 months.

Weaner and heifer management

Weaners require special attention to ensure they are well grown prior to joining but also avoiding obesity in heifers as it can reduce lifetime fertility and milk production.

Heifers must be grown out to meet minimum joining weights. These weights are set to ensure that 85% of heifers are cycling. The actual weights will vary depending on the mature weight of the cow herd and also the expected weight gain between joining and calving but guidelines are 280 to 320 kg for British breeds, and 300 to 340 kg for Euro/Bos Indicus heifers).

First calvers are the hardest group to get back in calf and need careful management. Heifers may be advantaged by joining 3 weeks before the main herd as it makes supervision easier gives them longer to recover for joining. Join heifers to sound young bulls for 6–9 weeks.

Calving heifers at 2 years of age has economic benefits but should be considered only when they:

- Reach minimum joining weights at 12–14 months of age.
- Can reach fat score 3 and weigh over 450 kg prior to calving.
- Can be supervised at calving.
- Can be given high quality feed after calving to make sure they rejoin.

Heifers calving at 30 months is an alternative to 2 year old calving. This practice allows heifers to calve down out of season, i.e. autumn for a spring calving herd, and vice versa. Heifers are then rejoined to calve early in the cow calving group.

Calving at 3 years (usually 3–6 weeks before the cow herd) is still common in areas with lower pasture quality. As heifers have an extra year to grow and mature, they are better prepared for returning to oestrus after their first calf, and in subsequent years.

Heifer nutrition

After joining the next target is minimum precalving liveweight which should be 450–500 kg for heifers calving at 30 months.

Over-feeding of heifers in late pregnancy can create calving difficulties. Nutrition must allow steady growth but not letting them become obese. Aim for fat score 3.

Avoid feed flushes for heifers if dystocia can be a problem. Where the clover content of pastures is high and is the dominant feed pre-calving, consider moving the heifers to a pasture less likely to improve fat score. Increasing stocking rate to reduce pasture availability and subsequent animal intake is the other alternative.

Feeding may be restricted over the last 6 weeks of pregnancy to maintain fat score.

Weaning age

Weaning age for calves depends on several factors:

- Feed availability and cow fat score. Cows can lactate for longer without losing weight in good years but may require early weaning in drier years.
- Type of cows. After 6 or 7 months, milk production in British breeds (more so than in cows with B. Indicus or European content) declines, with little gain for calves from leaving them on cows after this time.
- Type of production. Calves sold straight off cows (such as vealers and store weaners) may be left up to 10 months depending on whether feed is available and cows are not losing weight.
- Weight and age of cows. Cow fat score is the key factor to joining success. Ask: 'Can cows recover to the required weight by joining?'

Older, poorer cows will have greater difficulty in returning to oestrus than those in good condition.

Steers destined for the 2 to 4 tooth markets can be weaned, when feed is available, at 5–6 months. Once cows are back in calf, feed priority should be given to weaners.

Early weaning of late calving cows allows time for recovery and an earlier return to oestrus the following season. As well, first calvers falling to fat score 1 or 2 should have their calves weaned regardless of calf age.

Fat score and the weight gain associated with improving fat score are the major factors in improving conception rates.

FAT SCORE TARGETS

The use of fat scoring, in conjunction with the pasture benchmarks in Segment 2, enables realistic targets to be set and achieved as part of breeding herd management.

During the year pasture quality (digestibility) and quantity (kg DM/ha) will vary greatly between seasons. Cow fat score also varies as a result of both this and the lactation stage. Changes in cow fat score are normal and allow cattle to be managed through seasonal feed troughs, dry spells and droughts.

Cow fat score targets

Fat score targets for breeding cows can be set for weaning, calving and joining. These fat scores are the same for spring or autumn calving cows.

Feed supply will dictate how much the cow 'lives off her back'.

The relationship between cow fat score at weaning and cow fat score at the next joining is usually within half a fat score. This is why early weaning, based on cow fat score, ensure better fertility next joining (Figure 5.4).

As an example, a spring calving herd in northern New South Wales has a feed supply curve that reflects the summer dominant rainfall pattern. The cows lose weight after calving but then recover as pasture growth quality respond to spring/summer rainfall. After calving the cow will 'milk-off-her-back' if feed quantity is limiting. In a dry spring/summer, supplementary feeding or early weaning is necessary as cow fat score approaches 2.

Between joining and weaning, cows should put on weight. Early weaning can improve cow fat score dramatically when the autumn pasture is limiting and cows are losing weight. This practice particularly applies to fat score 1 and 2 cows.

Target fat scores and related management

Calving

- Cow fat score target range: 2.5–3.5
- First calvers require priority management.

Joining

- Cow fat score target range: 2.0–3.0
- Join heifers for 6 to 9 weeks
- Join cows for 6 to 12 weeks
- Supplementary feed if pasture quantity is inadequate, i.e. 'green drought', with hay or silage.

Prior to weaning

- Cow fat score target range: 2.5–3.5
- Wean early if cows fall below fat score 2
- Weaner education, health and nutrition are required to achieve weight targets, especially for early weaned calves.

Post weaning

- Cow fat score target range: 2.5–3.5
- In 'tight' seasons draft cows and heifers to above/below fat score 2.5 to allocate specific pasture and/or supplements.

When managing the breeding herd to fat score targets it is important this is done in conjunction with the pasture benchmarks contained in Segment 2 of this manual. The pasture benchmarks provide guidance to the type of pasture required to maintain or change cow fat scores.

Figure 5.4 shows cow fat score targets and the variation that may occur over the year. Breeding cows need to maintain fat score 2 or more in order to optimize production. A 1 unit increase in fat score can be achieved in 40–80 days on good quality pasture, except during peak lactation.

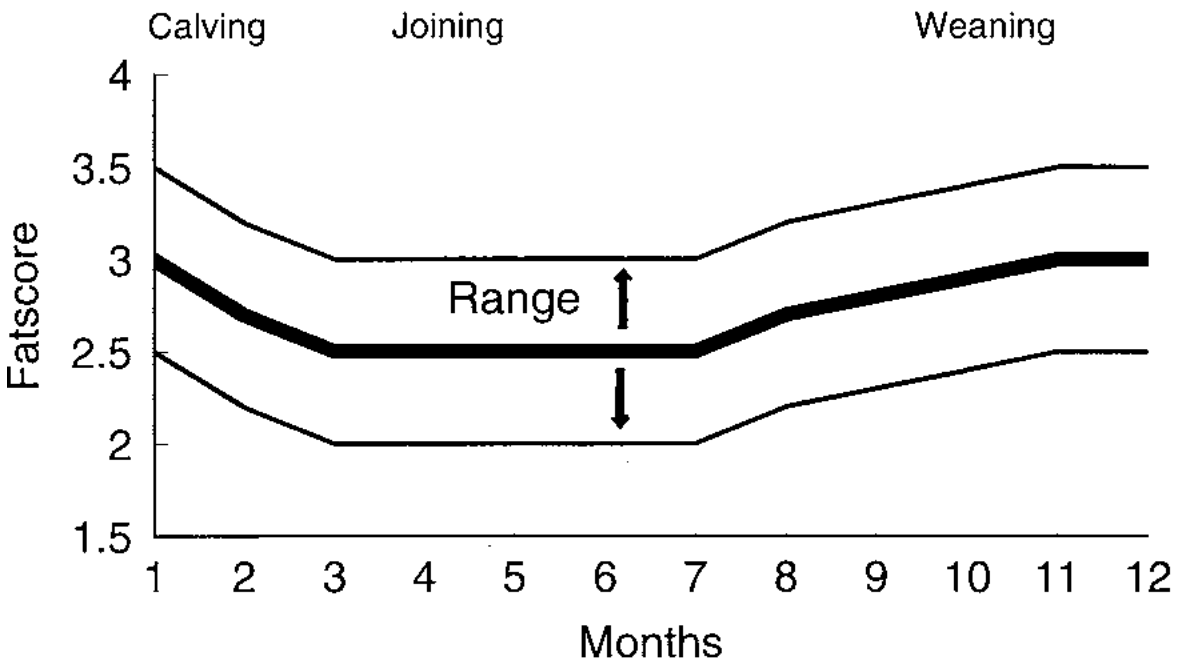
During the year (and across years) the fat score of individual cows in the herd will vary enormously. This range is normal and reflects the wide range of fat score that cows can tolerate. However, at either end of the fat score range production losses occur from poor reproductive rates and low calf weaning weights.

To break a cycle of low fat scores, and subsequent low fertility, in the breeding herd, wean calves early and cow fat scores will improve.

For best results the herd should be managed so that breeding cows remain within the range of targets shown in Figure 5.4. Calving time will vary between summer and winter rainfall areas.

Note that due to lower pasture availability over winter, autumn calvers need to be to the higher end of the fat score range compared to spring calvers. This often means weaning earlier to allow cows to build fat reserves over summer.

Figure 5.4. Cattle fat score targets.



Conclusion

The most critical period for a breeding cow (and for dollar return) is from calving to the end of joining. Cows must have sufficient herbage mass or fat score (or both) to be able to rejoin successfully.

Pasture benchmarks for herbage mass show when strategic feeding is required to ensure target condition scores are achieved. Drafting cows on fat score at weaning allows low fat score cows to have 'best' feed to improve fat score pre-calving.

Supplementary feeding to maintain the herd calving pattern should be considered in poor seasons.

SUMMARY

- Cattle fatness can be estimated using a combination of:
  - » visual assessment to determine the general levels of fatness
  - » manual palpation to fine tune the visual assessment.
- Breeding cows have their highest feed requirements (quantity and quality) after calving to joining.
- Fat score at calving, age of cow and nutrition in early lactation affect fertility.
- Aim for bulls to be in fat score 3 at joining, no more.
- A joining period of no more than 4 cycles is recommended.
- Early weaning, 4-7 months of age, is a practical way to manipulate the fat score of cows.
- Heifers to be joined as yearlings (12 to 15 months) need to reach critical mating weights (British breeds and their crosses – 280 to 320kg/European and Bos Indicus breeds and their crosses – 300 -340 kg).
- Joined heifers must not get to fat score 4 or more (over fat and lazy at calving).
- Weaning age/time depends on feed quantity/quality, fat score and age of cows.
- After weaning cows must be managed to increase their liveweight before calving. The benefits are:
  - » improved fertility at their next joining, and
  - » higher milk production, resulting in better calf growth, in early lactation.
- Fat Score Targets allows fertility and calf growth rate to be managed.

Further reading and information

- www.dpi.nsw.gov.au