# The supplementary feeding of weaner cattle

Geoff Tudor
Department of Agriculture, Western Australia, PO Box 1231, Bunbury WA 6230
Ph: (08) 9780 6275 • Fax: (08) 9780 6136 • Email: gtudor@agric.wa.gov.au

## Background

### The Climate

The Mediterranean environment of southern Western Australia has a predominantly winter rainfall although as illustrated in Figure 1 the quantity and spread of rain varies significantly between the Northern Agriculture Region (Mingenew) and Esperance (Esperance Downs Research Station). This rainfall pattern results in high quality and quantity annual pasture in late winter through to late spring or early summer and along the southern coastal region where there is better distribution of rain throughout the year leading to the growth of very useful perennial pastures. In this environment the annual pastures senesce over the dry summer and autumn period with a resultant decline in nutritive value and hence a decrease in the availability of feed. The industry practice is to wean calves in December through January therefore weaned animals can expect a period of reduced quantity and quality of feed unless perennial pastures or tagasaste are available, grazing animals are supplemented or animals are placed directly into feedlots.

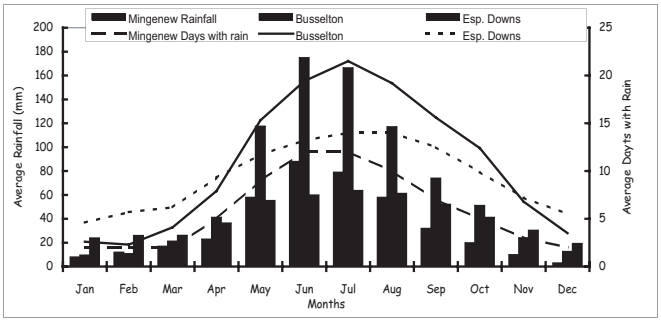


**Figure 1. Average rainfall and number of days of rain in three regions of southern WA**

### The Production System

Cattle in the SW are normally produced for the domestic market (210 – 270 kg HSCW; 4 – 15 mm BF), the restaurant or live export trade, or high quality beef for Japan or Korea. Production systems include;

- Milk fed vealers – slaughtered at weaning at 8 – 10 months old.
- Cattle that will be grain finished either in feedlots with complete rations fed in bunks or in small paddocks on self-feeders with grain and hay fed separately. Starting live weights 250 – 350 kg. Start these animals shortly after weaning and these animals will be expect animals to grow well up to slaughter.
- Pasture finished in spring or finished in feedlots later in the year. There are several options;

(a) Do nothing. Calves may gain weight until mid to late February then they can expect to lose weight particularly after the opening rains, they will not gain weight until the pasture growth is well established (Figure 2).

(b) Supplement with hay, silage or grain during this period so that the animal may maintain weight and condition or possibly gain weight until there is sufficient nutritious pasture after the opening rains to encourage growth and then it is expected they will be slaughtered in spring.

(c) Feed silage or good quality hay plus 1 – 3 kg of lupins per day to weaners not quite ready for slaughter as a Milk-fed vealer. This ration will produce good live weight gains and will allow animals to be slaughtered in 6 – 8 weeks after weaning.

- Cattle for the live export market, off pasture at specified target weights, may require supplements to achieve target weights.
- Cattle finished in feedlots producing high quality marbled beef for the Japanese or Korean market, will be backgrounded to between 350 – 450 kg live weight before starting long-fed finishing.

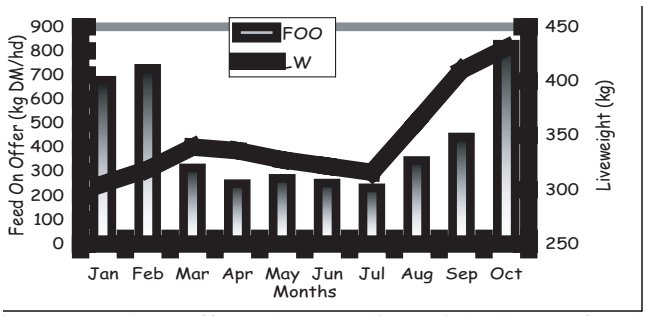


**Figure 2. Feed-on-Offer and average live weight change of cattle grazing annual pasture in the southwest of Western Australia with no supplements.**

The calves illustrated in Figure 2 were about 300 kg liveweight at weaning. They gained weight until early March and lost about 10% liveweight before starting to gain weight after the pasture establishment after the opening rains.

The challenge with beef production in the Mediterranean environment is calves are born during autumn when pasture quantity and quality may be at it lowest and then weaned towards the end of spring or in early

summer onto poor quality mature pasture (Figure 3). This production system requires the use of supplements for the cows after calving until good pasture growth after the break-in-season rains when the cow will be able to get all its nutrients from the pasture. The earlier the calves are born, the more hay or silage has to be fed to provide nutrients for the cow to produce milk and to maintain condition as cows will be re-mated in June. At weaning the calf will need to be supplemented or it will lose weight if grazing the annual pasture system. Cattle browsing tagasaste in the Northern Agricultural Region or those grazing perennial pastures in the south will be able to maintain weight or perhaps even gain weight over this period. Weaning at a set time of the year makes it difficult for a year round supply of cattle for the domestic market, particularly in the latter half of the year.

**Meat Standards Australia**

Meat Standards Australia (MSA) is a very successful grading system based on the eating quality of the various cuts of beef. This grading system guarantees tenderness and for carcasses to grade MSA they must meet certain standards and grades. There are a number of on-farm requirements to meet MSA specifications one of which includes information on the age of the animals at slaughter (goes back to how the animals grew out, ie gained weight from birth through to slaughter). Of interest to us in this talk is "how the animals grow post weaning", ie through to slaughter or entry into feedlot, as calf growth while suckling is normally very good in southern WA on the spring pastures.

Data from experimental studies from the Beef Quality CRC, primarily in NSW and Queensland, suggests that to ensure carcases qualify for MSA grading calves should average 0.6 kg/hd/day from birth through to entry into a feedlot. Hearnshaw (1977) reported that calves weaned at lighter weights (< 180 kg at 9 months of age) did not preform as well and were lighter at slaughter when finished in the feedlot than their contemporaries that were heavier at weaning (> 200 kg). Herd and Oddy (1997) showed that age when growth restrictions occurred influenced the degree of catch up growth. Restrictions early in life resulted in animals not catching up to their contemporaries that had not suffered any restriction.

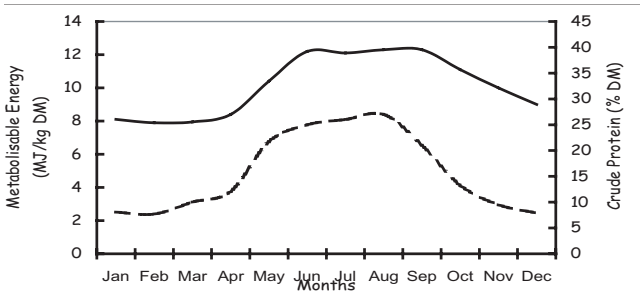


**Figure 3. Seasonal variation in energy and protein levels in annual pasture in the southwest of WA.**

The question is what effect will any growth restrictions in the heavier weaners in WA have on future growth and MSA grading? Calves in southern WA are generally weaned around 8 - 10 months of age and certainly are heavier than those reported in the eastern states. The effect of weight and age at weaning on the growth and development will be tested in the Regional Combination project where calves will be weaned at different weights and different ages. The heavier weaning weight means these animals are a higher proportion of their mature weight and should not have the same problems with growth restrictions as the lighter weaners reported by Hearnshaw (1997).

**Supplementary feeding in the SW of WA**

In an experiment designed to investigate the economic benefit of feeding supplements, 9 – 10 month old weaner Angus or Limousin x Wokalup steers grazed annual rye and clover pastures at 2 beast/ha at the Vasse Research Station. They were randomly allocated to treatment on initial liveweight, within breed, and were fed supplements of hay, silage or cereal barley grain when the animals started to lose weight in April. The average liveweight ($\pm$ s.d.) of the cattle at the start and at slaughter were 303 kg $\pm$ 11.9 kg and 445 $\pm$ 18.7 kg, respectively. The nutritive value of the pasture and Feed On Offer (FOO) is presented in (Table 1) and the nutritive value of the supplements in (Table 2).

**Table 1. Feed on Offer (FOO), Dry Matter %, metabolisable energy and crude protein of pasture at three periods through the year with and without hay, silage or cereal barley supplements.**

| | February | July | September |
|---|---|---|---|
| FOO (kg DM/ha) | 2700 | 870 | 2400 |
| Range (t) | 2.2 - .3.7 | 0.7 – 1.4 | 1.9 – 3.9 |
| Dry Matter % | 95 | 14 | 18 |
| ME (MJ /kg DM) | 7.0 | 9.9 | 12.3 |
| Range | 6.4 – 7.6 | 7.8 – 11.2 | 11.2 – 13.3 |
| Crude protein (% DM) | 7.8 | 26.2 | 27.1 |
| Range | 5.8 – 10.3 | 19.6 – 31.4 | 25.1 – 29.1 |

**Table 2. DM, energy and crude protein of supplements fed to steers grazing annual pasture with and without hay, silage or cereal barley supplements.**

| Supplement | Dry Matter % | Metabolisable Energy MJ ME/kg DM | Crude Protein % |
|---|---|---|---|
| Hay – low quality | 90.0 | 9.5 | 7.4 |
| Hay – High quality | 86.6 | 10.4 | 12.7 |
| Pasture silage | 30.0 | 9.7 | 12.5 |
| Cereal barley | 87.9 | 11.5 | 10.5 |

The supplements were fed for about 100 days between April and July with the animals in the deferred treatment fed high quality hay for seven weeks while they were off the experimental plots. The supplements were fed three times per week and the animals were weighed fortnightly. Cattle were slaughtered when the average for each group (4) reached 450 kg.

The live weight change of the cattle with no supplements or supplemented with either hay, silage or cereal barley grain are presented in Table 3.

**Table 3. Supplement intake, average daily weight change during period when supplements were fed and post supplement feeding and days to slaughter from weaning steers grazing annual pastures with and without hay, silage or cereal barley supplements.**

| Treatment | Supplement (kg DM/hd.d) | Suppl. Feed (kg/hd.d) | Post Suppl. (kg/hd.d) | Days from weaning |
|---|---|---|---|---|
| No supplement | 0 | - 0.79 | + 1.80 | 277 |
| Deferred | 4.8 | - 0.57 | + 1.84 | 254 |
| Hay LQ *ad lib.* | 6.2 | + 0.48 | + 1.08 | 255 |
| Hay HQ Rest. | 5.1 | + 0.22 | + 1.13 | 242 |
| Hay HQ *ad lib* | 6.6 | + 0.62 | + 1.16 | 248 |
| Silage Low | 1.6 | - 0.36 | + 1.61 | 239 |
| Silage Med | 3.1 | + 0.06 | + 1.37 | 235 |
| Silage High | 5.9 | + 0.43 | + 1.10 | 224 |
| Grain Low | 1.4 | - 0.47 | + 1.63 | 249 |
| Grain Medium | 2.7 | - 0.04 | + 1.43 | 231 |
| Grain High | 8.5 | + 1.24 | + 1.85 | 235 |

The data shows that cattle that were not supplemented (Control and Deferred treatments) and those fed Low or Medium levels of either silage or cereal barley lost or only maintained weight over the autumn period.

The response to feeding supplements can be seen in Figure 5 where the relationship between average daily gain and metabolisable intake is illustrated. The data in Figure 4 shows that the increase in average daily gain is strongly related ($R^2$ 0.93) to energy intake, irrespective of source of energy. This relationship does illustrate that cattle fed more energy in the supplement grow more rapidly, probably at the expense of pasture, but does not demonstrate if the response is economically beneficial. The data also demonstrates how much energy needs to be fed to achieve a certain rate of gain.

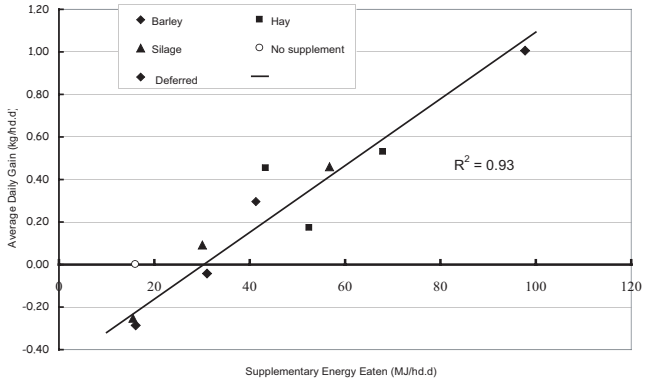


**Figure 4. The relationship between ME intake and average daily gain in steers grazing annual pasture and supplemented with hay, silage or cereal grain.**

Conclusion

In this paper I have looked at the possible differences between beef production in the Mediterranean environment of southern WA and the temperate to subtropical production in NSW and southern Queensland. The guidelines to achieve MSA grading are quite clear with the lighter weight weaners but in southern WA the heavier weaners may be able to suffer some set back with no loss of productivity because of their later stage of maturity at weaning.

- In the Mediterranean environment with the dry summer and autumn weaner calves will lose weight on annual pastures but may maintain or gain weight on tagasaste or perennial pastures.
- During supplementary feeding average daily gain is strongly related to energy intakes from supplements
- Daily gain pre-weaning is generally not a problem in southern WA although calves produced in areas with shorter growing seasons may be different.
- The Regional Combinations project will test the effect of weaning age and live weight and growth paths of progeny on meeting MSA specifications.

**References**

Hearnshaw, H. (1997). Effect of pre-weaning nutrition on post-weaning growth, carcass and meat quality traits. *Proceedings of the Growth and Development Workshop* pp 59 – 67. (Eds. Hennessy, McLennan & Oddy) Beef CRC, University of New England, Armidale, NSW.

Herd, R.M. & Oddy, V.H. (1997). Concluding remarks. *Proceedings of the Growth and Development Workshop* pp 129 – 132. (Eds. Hennessy, McLennan & Oddy) Beef CRC, University of New England, Armidale, NSW.