Weaner Cattle Nutrition and Growth

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Introduction

The management of nutrition and growth of cattle from the time of weaning is important in all beef cattle production enterprises. This applies whether the business is breeding and finishing for slaughter; targeting the live export trade; growing out steers and heifers for feedlot entry or breeding stud bulls for sale.

Management for good growth rates in weaners will increase the proportion of steers and speyed heifers reaching target markets when you want them too. It will ensure that as many replacement heifers as possible reach a suitable weight for age at mating. It will ensure that bulls for sale are looking better than those of your competition.

A better understanding of nutrition and growth in young cattle can assist in improving overall enterprise productivity and profitability.

Basics of nutrition in growing cattle

Intake

The performance of growing cattle is largely determined by voluntary feed intake. To put this simply, the more stuff that is eaten the better the performance will be. The quality of feed ingested is also an important factor in growth performance. However, even very high quality feeds give poor growth performance if there is not enough of that feed provided. Other factors such as the genetic potential of an animal will also have a significant impact on growth, but these issues are outside the scope of this paper.

The feed base for the northern Australian cattle industry is predominantly native pasture. The native pastures of the rangelands represent a relatively cheap source for feed for grazing ruminants. **Getting the most out of the native pasture feed base is the most cost-effective way to improve the performance of growing cattle**. Producers in northern Australia need to optimize the intake of the native pasture resource in a sustainable fashion.

Some of the key factors that influence intake of pasture include:

- Amount of pasture available, particularly the amount of green leaf.
- Palatability.
- Digestibility.
- Grazing time.
- Presence of harmful plant substances (anti-nutritional factors).
- Rate of passage through the rumen and gut.
- Balance of nutrients supplied to the tissues.
- Physiological status and age.

How can we practically influence these factors to maximize intake?

Grazing management decisions are an important area where we can influence the amount of pasture available and subsequently individual animal performance. Consideration of the **area of pasture available** to weaners is important. Do the weaner/grower paddocks provide enough feed for the expected number of weaners? It sounds basic but in the busy mustering season, do we just keep putting the weaners out in the same area in the hope that they will get a feed?

The grazing history of the paddocks into which weaners are put, over both the short and long term, should be considered. Do the weaners go into the same paddocks that the sale steers have just come out of every year? Is there

some opportunity to spell a proportion of the weaner/grower paddocks every growing season to provide a good body of leaf for the freshly weaned cattle to select? Over the longer term, strategic spelling and sensible stocking pressure allow the more **palatable** and preferred species to remain a reasonable proportion of the pasture. The more palatable species tend to have more leaf per plant and this leaf is generally of higher **digestibility** and higher protein content. High digestibility and protein content equates to high quality and increased animal performance.

It has long been recognized that the type of country in any paddock will have a major influence on growth performance. The better land systems and soil types will grow more of the palatable species that cattle select. The higher nutrient status of these better soils is reflected in higher quality of the pastures that grow on them. We cannot expect weaners to grow out well on country that requires lick to be fed out to keep breeders alive.

There are only so many hours in the day and to maximize performance, a high proportion of this **time should be taken up grazing** and ruminating (chewing cud), not walking! The number and distribution of waters and fences is important in ensuring that weaners do not have to walk miles for a feed.

The presence of so called **'anti-nutritional factors'** in pasture and top feed will influence weaner performance. An example of this is the tannins naturally present in mulga that bind protein and make it less available to the grazing animal.

Feeding **supplements** such as urea and sulfur with dry winter feed is the main way that we can increase the rate of passage of feed through the rumen and gut. Supplements containing urea and sulfur whilst not increasing the digestibility or quality of the dry feed can increase the intake of this feed by 15-20% resulting in increased animal performance. Remember, more the more stuff that is eaten the better the performance will be. On phosphorus (P) deficient country, feeding P in the growing season assists in balancing the nutrients needed for growth that ultimately reach the tissues. Balancing nutrient supply results in increased animal performance.

Matching the nutrient requirements of animals to achieve high performance **with the supply of nutrients** from pasture is one of the greatest challenges for graziers anywhere. The gap between what native pasture supplies (quantity and quality), especially during the dry winter period, and the requirements of young animals for high growth rates is a big one! This gap can be filled by full-feeding and reduced by mineral supplementation. The benefits must be weighed up against the costs. Another strategy is to reduce the demand at the time when the nutrient supply is poor. If a high proportion of the weaners are over 150kg at weaning, then their nutrient demand in terms of quality will be less. Timing up the mating/calving period (controlled mating) is one approach that has traditionally been used to achieve this where animal control and paddock security is good. Some examples of the amount of pasture that weaner cattle will eat are given in Table 1.

Table 1. The rough guide to intakes (some examples)

Feed Quality	Intake (% of liveweight)	Intake (kg) for a 200kg animal
Dry winter feed	1.2-1.5	2.4-3.0
Growing season feed	2.0-2.3	4.0-4.6
Feedlot ration	3.0	6

Energy

Energy can be thought of as the ability of a substance to do work. The metric system units of energy are joules (calories are the old Imperial system units). When talking about energy in cattle feed or energy requirements for growth or maintenance in cattle, megajoules (MJ-millions of joules) are used. There is a number of ways to measure energy and the one usually used in Australia is metabolisable energy (ME). This is the energy in a feed after an allowance is made for the digestibility of the feed and for losses of energy in urine and as methane from digestion. For grazing animals, most energy comes from carbohydrates in plants. Young growing cattle have a high requirement for energy above their maintenance needs and this is used to grow muscle and deposit fat. The faster an animal grows the more energy it needs. As an animal gets older, for every kilogram of bodyweight that it gains, it lays

proportionally more and more fat rather than muscle. Meeting the growing animals demand for energy is the primary consideration in achieving a target level of performance.

Protein

Protein provides the building blocks of muscle and is vital for many body functions. Protein is usually referred to as crude protein (CP), which includes both true protein and non-protein nitrogen sources. The amount of CP in a feed is usually expressed as g/kg of feed or as a percentage. Rumen bacteria break down much of the protein in feed to grow and reproduce, then they are in turn broken down by the abomasums (true stomach). The resulting amino acids are absorbed in the intestine of cattle to be re-built into protein in the body. In the grazing ruminant, ~80% of protein absorbed by the gut comes from rumen bacteria. The relationship between the rumen bacteria and the animal allows cattle to turn non-protein sources of nitrogen such as urea into protein. The young growing animals requirement for protein is high and this demand decreases with age. Requirements for protein are usually secondary to that for energy, however they are closely linked.

Phosphorus

For much of northern Australia, soils and plants are low in phosphorus (P). The requirement for P is high when young cattle are growing rapidly. However, unless adequate energy and protein is available from pasture or feed, supplementation with P will not improve growth rate or prevent weight loss. Think of P as a growth promotant; feeding it only works when there is plenty of ME and CP for growth.

Target Markets

Calculating the growth rates required to meet the specifications of the domestic and live export markets highlights the importance of weaner growth and nutrition. Domestic feeder steers need to be between 300 and 370kg, have no permanent teeth, and mainly Bos taurus genetics. If steers are weaned at an average of 150kg liveweight at 6 months of age, then to meet the middle range of these specifications, weaners need to put on around 160kg in 9 months. That's 600g/d, every day from weaning! Egypt slaughter specifications will require 270kg to be put on in 21 months (430g/d); SE Asian feeders need to put on 120kg in 12 months (330g/d) and mickies 170kg in 18 months (300g/d).

When considering target markets, the first question that needs to be asked is; "are the targets realistic ones?" Knowing the growth rates that are needed to meet the targets and working out current growth rates of weaners is the first step. This will highlight how large the gap that needs to be filled is. Another way of looking at this is to calculate what quality feed is needed to provide the target market growth rate. From the tables in the published feeding standards our average 200kg steer will need about 45 MJ of ME, 325g protein and 8g of P per day to grow at 500g/day. Intake of pasture in the growing season is about 2.3% of liveweight or 4.6 kg/day of pasture for the 200kg steer. By calculation, the pasture must have at least 9-10 MJ ME/kgDM and 8-10% protein to allow this growth rate to be achieved. Native pastures usually only supply this level of quality in the growing season. How to bridge the gap at other times of the year and not go broke is the tough question for which there are no simple answers as each situation will inevitably differ. Providing weaners with growing season spelled paddocks or feeding weaners urea based licks in the dry winter period may be enough to bridge the gap and may be cost effective. If you need to be feeding energy to meet the target (eg grain or molasses) then in this environment, the cost and logistics are likely to outweigh any benefit of increased growth rates. Some rules of thumb to achieve moderate cost-effective growth rates that have been around for a while are given in Table 2.

Table 2. The Rough guide to supplements for weaners (some examples)

Weaner weight	Type of supplement needed	Examples
<100kg	Energy and protein	Calf pellets
<150kg	True protein	Copra meal, cottonseed meal
150kg+	Non-protein nitrogen	Urea, dry season mix

Conclusion

Achieving profitable growth performance from weaners in extensive grazing systems requires optimal use of the native pasture feed base. Grazing management and strategic use of supplements to maximize intake and balance nutrient supply are the key tools available to producers to reach target markets.