TECH NOTE

WEANER MANAGEMENT

REPRO active

WEANER MANAGEMENT

Weaning is potentially one of the most stressful and therefore one of the most important procedures in the production cycle of beef cattle.

If poorly executed, weight loss, morbidity and mortality can occur. Done effectively, weight gain can be achieved during the weaning process itself (Australian Livestock Production Services unpublished data, March 2017).

Considering that it is logical to wean calves earlier (or more accurately, at lower bodyweight) under drought/conditions of feed shortage, it is therefore logical to wean calves earlier regardless of seasonal conditions to reduce total feed requirements and to allocate more feed resources to growing stock than to cows.

It is more efficient to feed a calf directly, than to feed a cow to feed a heavy calf with milk, and the whole point of weaning early is to either, run more cows and achieve optimal reproductive performance from them, or to allow opportunistic trading.

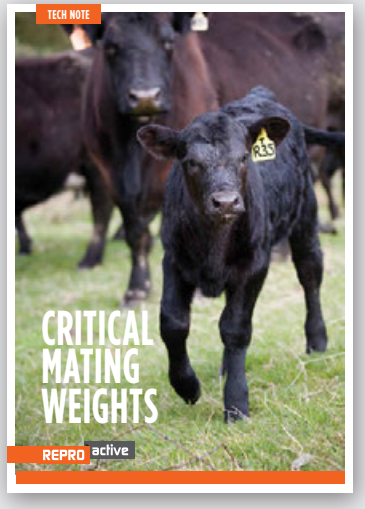
This technical note will focus on the tools to improve results from routinely weaning calves down to 130 kg, and down to 100 kg under drought conditions. This will have flow on benefits to the cow herd in terms of management of body condition score and achieving critical mating weight in heifers.

A short joining period, especially in heifers, facilitates early weaning of calves. Refer to the ReproActive modules on body Condition Scoring, Critical Mating Weight and Joining Periods for further information.

TIP CRITICAL MATING WEIGHT

Critical mating weight is defined as – the weight at the start of the joining period in which 85% or more heifers will fall pregnant in a 42-day joining period.

Refer to Critical Mating Weights Tech Note for more information.



THE ECONOMICS OF EARLIER WEANING - DOES IT STACK UP?

The energetic efficiency with which dairy cows convert forage energy into milk is approximately 60% (Moe, 1981) and this figure is likely lower in beef cows. The energetic efficiency with which milk is used for liveweight gain in pre-ruminant calves is approximately 90% because it is directly digested in the abomasum (the "true stomach": Moran, 2012).

This is considerably higher than the energy use efficiency of pasture for live weight gain in ruminant calves of approximately 60% (Moran, 2012), which approximates that of milk production by cows on forage. Despite the high efficiency of use of milk energy for calf growth, the multiplicative effect of the efficiency of forage energy use by the cow results in an efficiency of approximately 60% x 90% = 54% for the conversion of the forage energy consumed by the cow into calf liveweight gain.

However, with the developing predominance of the rumen in the ruminant calf, the efficiency of use of energy from milk decreases substantially to be as low as 63% (Johnson, et al., 1972). This then reduces the efficiency of energy utilisation from forage eaten by a cow to feed milk to a ruminant calf to 60% x 63% = 38%.

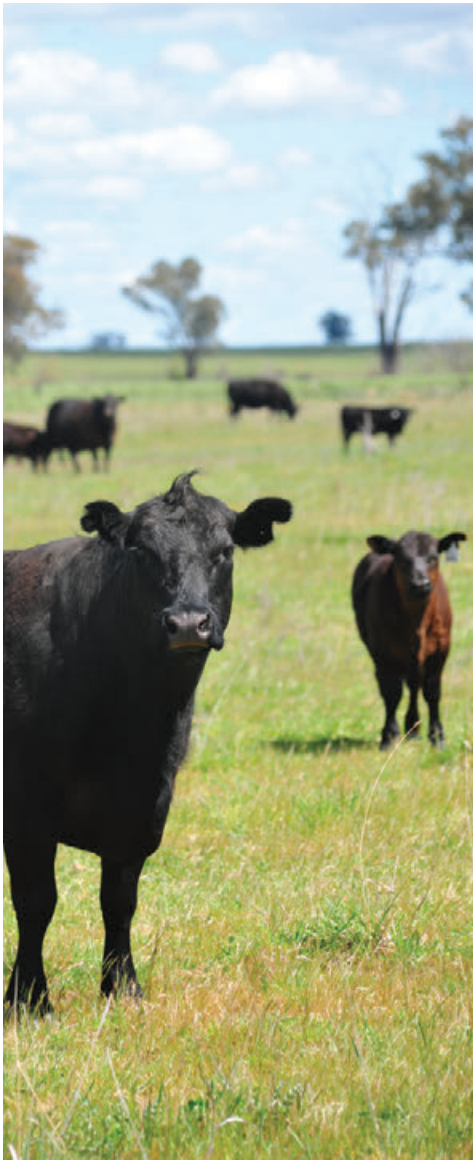
The explanation for the decrease in digestive efficiency of milk in the developing ruminant lies in the loss of the oesophageal reflex which diverts milk away from the rumen and fermentation by microbes, directly into the abomasum with clot formation and simple digestion.

Most of the anatomical and functional transformation from pre-ruminant to ruminant with calves on nutrient dense forage has occurred by two months of age and progressive loss of the oesophageal reflex accompanies this (Ensminger, 1990). In addition, it is likely that flooding of the abomasum with fermented forage interferes with clot formation even in calves with a persistent strong oesophageal reflex.

To summarise, it is energetically more efficient to feed high quality forage to a young ruminant than to a cow to feed the young ruminant, and this effect is established by the time the calf is two to three months old.

TIP ENERGETIC EFFICIENCY

Energetic efficiency is defined as the efficiency with which cattle convert forage energy into milk or meat.



THE ECONOMICS OF EARLIER WEANING - DOES IT STACK UP?

Key point: An example for understanding energetic efficiency*

THE PRODUCTION SYSTEM

A cow and calf unit are grazing a paddock that is providing a moderate to high energy density pasture of 10 megajoules of metabolisable energy per kilogram of dry matter (10 MJ ME/kg DM).

THE ANIMAL UNITS

The cow, weighing 550kg, has a maintenance energy requirement of approximately 60MJ ME/day. If the pasture is providing 10MJ ME/kg DM, she will therefore require 6kg of pasture dry matter daily.

The calf, weighing 150 kg, assuming it is achieving a moderate growth rate, requires approximately 36 MJ ME/day.

TO WEAN OR NOT TO WEAN?

If this 36 MJ ME were to be entirely provided by the cow in the form of milk (equating to approximately 7 L milk/day), the cow requires an additional 95 MJ ME/day.

36 MJ ME x 1/0.38 = 95 MJ ME (allowing for the efficiency with which the cow converts forage into milk and the reduced efficiency with which the ruminant calf utilises milk as an energy source).

TIP FOOD FOR THOUGHT

Weaning earlier in your enterprise could lead to:

- Increased capacity to run more breeding cows
- Better allocation of feed resources

THE ECONOMICS OF EARLIER WEANING - DOES IT STACK UP?

THEREFORE the total energy requirement for the cow/calf unit (unweaned) =

60 + 95 = 155 MJ ME/day

HOWEVER the total energy requirement for the cow and weaned calf =

60 + 36 = 96 MJ ME/day

WHAT DOES THIS MEAN?

The additional pasture requirement for the unweaned pair is **59 MJ ME/day (155 MJ ME – 96 MJ ME).**

This equates to an extra consumption requirement of **5.9 kg pasture DM/day (59 MJ ME per day/10 MJ ME per kg DM)**.

If this is multiplied out over 100 cows and calves, the additional requirement for the unweaned pair is **590 kg pasture DM/day**, and over a month this amounts to **17.7 tonne** of pasture dry matter.

Note: *The above example is a hypothetical example with several assumptions. There would be considerable variation from these figures dependent on cattle age and breed/size and pasture dynamics.

In addition to the energetic efficiency of earlier weaning, there are managerial factors that can enhance the positive effects on productivity and profitability. These are:

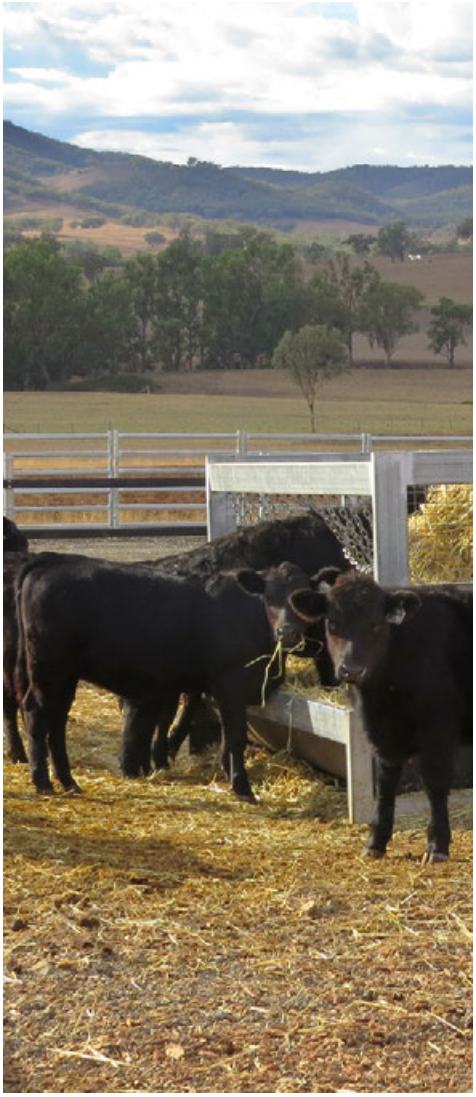
- the reallocation of feed resources to growing animals
- more accurate sustained management of the condition score of breeders, and
- the avoidance of the wasteful deposition of fat in breeders.

These effects are enhanced by an increase in energy partitioning in the cow away from milk and into body tissue deposition with advancing lactation (Xue et al., 2011). **Thus, earlier weaning converts more of the available feed energy into saleable beef by increasing the growth rate of young stock, increasing the sustainable number of breeders, allowing more opportunistic trading, or a combination of all these.**

TIP FOOD FOR THOUGHT

Weaning earlier in your enterprise could lead to:

- Better management of cow condition
- Increased production system efficiency



CONDITION SCORING

Cattle condition scores should be maintained above minimum guidelines to ensure they meet welfare, health, growth and reproductive targets. Know their limits before compromising their biological function.

Condition score 2*

Condition score 3

Condition score 4

*Due to welfare conditions, a condition score of 1 is not acceptable.

REALLOCATION OF RESOURCES

Increased production and profitability in response to earlier weaning (at approximately 3 months compared with 6 to 7 months) have been reported for a range of production systems in southern Australia (Tathum et al., 2004) and throughout the world, including Brazil (Vaz et al., 2014; Vaz et al., 2010), Cuba (Simeone and Beretta, 2016), Mexico (Ibarra Flores et al., 2011) and the U.S. (Kruse et al., 2007). Some studies have not found positive effects (Rasby et al., 2016; Warner et al., 2015) but these interventions were not accompanied by a reallocation of resources through increased stocking rate or increased nutrient density of the diet offered to the young growing stock.

In summary, earlier weaning must be matched with greater feed availability by growing animals to be profitable or with savings in feed costs if cows no longer require supplementation to achieve target body condition.

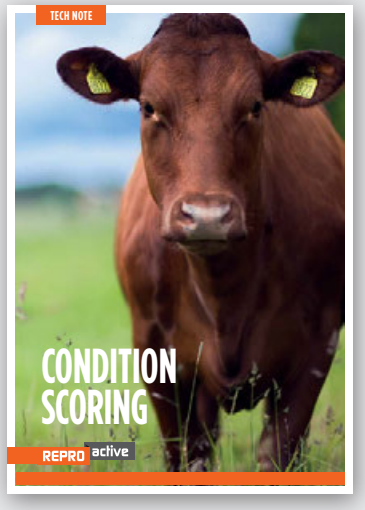
TIP CONDITION SCORE

One condition score equals between 50-80kg liveweight depending on the frame size of the cattle[1].

TIP CONDITION SCORES BELOW 2.5

Consider early weaning, supplementary feeding or herd segregation to prevent your herd's condition score falling below 2.5.

Refer to Condition Scoring Tech Note for more information.

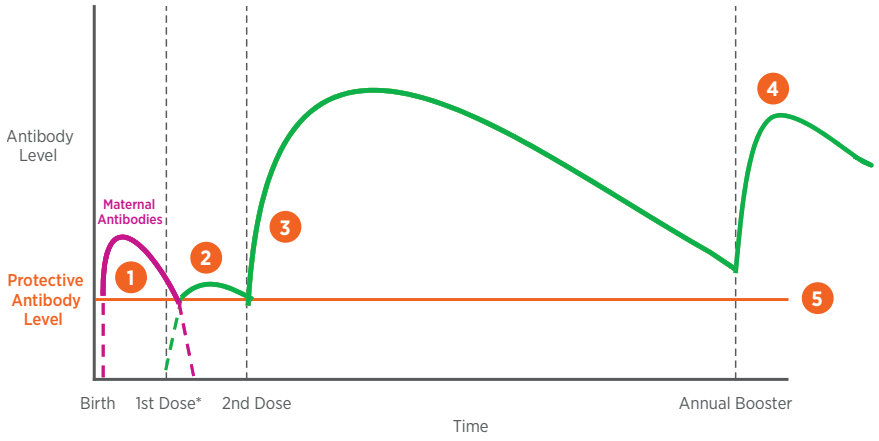


1. Feed.FIBRE.future. Are my beef cattle at the right condition score? 2007. Dairy Australia.

PREPARING FOR WEANING

Weaning should be planned and prepared for several weeks before it is implemented. Preparation for weaning includes the purchase of vaccines (including the initial priming shot in some cases), the provision of high quality pastures or nutrient dense feedstuffs, management of dust or mud in yards and working areas, and the allocation of time and staff for daily handling during the weaning process.

Understanding the Principles of Vaccination



1. Maternal antibodies† in the colostrum can interfere with the vaccine, so it's important not to give some vaccines too early in life, until the maternal antibody level has dropped.
2. The first dose of vaccine primes the immune system, but only provides a small amount of short-term protection. In some animals, there may be no protection at all from this dose.
3. It's not until the animal is given the second dose of vaccine that the immune system is capable of providing protection against the disease. In most cases, this protection lasts 12 months.
4. An annual booster dose is required to ensure the immunity of the animal continues to remain high for another 12 months. Without booster doses the animal is at risk of disease.
5. This is the level of immunity required by the animal to provide protection against infection or disease.

*The first dose of vaccine may not confer protective immunity.

†Maternal antibodies are the proteins present in the colostrum, or "first milk" that provide immediate, but temporary protection for the newborn from infection. The amount of maternal antibodies an animal receives will vary and is influenced by the vaccination status of the dam.

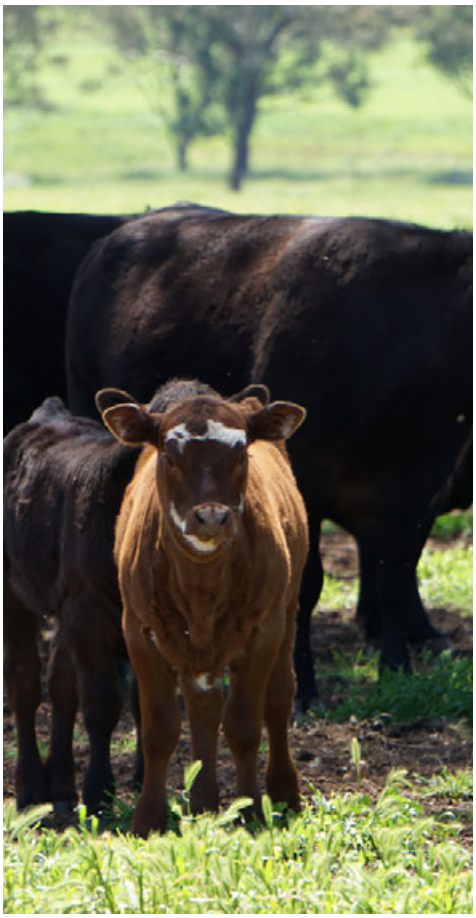
This is a schematic representation to demonstrate the principles of vaccination.

Actual levels of antibody following vaccination will vary from vaccine to vaccine and animal to animal.

TIP THE IMMUNE SYSTEM – WHAT IS IT?

The immune system is a network of cells, tissues, and organs that work together to defend the body from harmful germs.

Vaccines are like a training course for the immune system.



GETTING CASTRATION RIGHT

One of the most important elements of preparation for weaning is castration. To minimise the production cost and negative animal welfare aspects of castration it should be done as early as possible after the birth of the bull (Huerta Leidenz and Rios, 1993). Castration should be performed prior to weaning to eliminate it as a stressor.

The cost and logistics of mustering frequently make this impossible under the very extensive conditions of northern Australia but there is no reason it cannot be routinely achieved in southern Australia.

Calves castrated prior to weaning should have received at least one injection of a clostridial vaccine (5-in-1 or 7-in-1) and can therefore be given a booster at weaning to minimise the risk of losses due to clostridial diseases. The clostridial disease that poses the greatest risk with intensive yard weaning or weaning onto high quality forage is Pulpy Kidney (enterotoxaemia).

Enterotoxaemia can occur under any feeding conditions where a high concentration of readily fermentable carbohydrate is delivered to the intestines and can therefore occur on either grain supplements or lush forage.

TIP WHAT ARE CLOSTRIDIAL DISEASES & HOW DO THEY MANIFEST?

- Common clostridial diseases include Pulpy Kidney (Enterotoxaemia), Tetanus, Black Leg, Black Disease & Malignant Oedema
- Causes sudden death in animals
- Treatment is usually futile
- Clostridial organisms will only grow in the absence of oxygen (an anaerobic environment)
- Produce toxins under certain conditions which can kill the animal
- The bacteria produce resistant spores when exposed to air which is how they survive in the environment.

TIP PAIN RELIEF

Animal Welfare Standards stipulate calves must be castrated or dehorned prior to 6 months of age, unless pain relief is provided. Best practice is to perform castration and dehorning as young as possible and to consider pain relief regardless of age. For further information visit:

www.animalwelfarestandards.net.au/cattle/

MANAGING BOVINE RESPIRATORY DISEASE (BRD)

Bovine respiratory disease (BRD) is a multifactorial disease of intensification (Cusack and Mahony, 2016; Cusack et al., 2003) and has been reported at weaning.

Being a multifactorial disease, the use of vaccines can reduce the incidence of BRD but not eliminate it (Barnes et al. 2014). In addition, if there is an option of marketing young cattle to feedlots, prior vaccination against BRD agents can secure greater market access, and in some cases, a premium.

In Australia there are vaccines against the most severe and acute of the potential BRD bacterial pathogens, *Mannheimia haemolytica*. A single dose vaccine against *Mannheimia haemolytic*a can be given just prior to or at the start of weaning. Alternatively, a two shot vaccine against *Mannheimia haemolytica* can be given with an initial priming dose given 3-4 weeks prior to weaning, with the booster administered at the start of weaning.

There are also vaccines effective against the potential viral BRD pathogens, bovine herpesvirus 1 (BHV-1, which causes infectious bovine rhinotracheitis), and bovine viral diarrhoea virus (BVDV or pestivirus). Both of these viruses cause immunosuppression and damage to the respiratory tract increasing the opportunity for secondary respiratory infections to occur due to bacteria such as *M. haemolytica*.

The inclusion of an effective IBR vaccine should further reduce the risk of BRD in weaners. The use of a vaccine against BVDV in weaners should be part of a larger programme to manage BVDV in the entire herd, based on serological sampling (BVDV Management Programme; www.swansvet.com/page19.php or BVDV TAG guidelines - https://www.zoetis.com.au/product-class/easset_upload_file23103_219925_e.pdf).

TIP WHAT FACTORS AFFECT MY RISK?

There are several factors that affect the risk of cattle contracting BRD. BRD is a combination of stress and an infectious agent (Barnes et al 2014).

Stressors:

- transport
- lack of condition
- weather extremes
- co-mingling
- dehydration
- handling
- dust
- feed and water changes

Infectious agents:

Viruses

- BHV-1 (Infectious bovine rhinotracheitis virus)*
- BVDV (pestivirus)*
- BRSV
- PI3

Bacteria/Mycoplasmas

- *Mannheimia haemolytica**
- *Pasteurella multocida*
- *Histophilus somni*
- *Mycoplasma bovis*

TIP WHAT IS IMMUNOSUPPRESSION?

Cattle recently infected with BHV-1 and BVDV (pestivirus) may suffer damage to their immune system and respiratory defence mechanisms which reduces their ability to fight off subsequent infections such as with *Mannheimia haemolytica*. This damage is transient and they will recover from it with time but it has been documented to make secondary infections more severe.

* registered vaccines are available to aid in prevention of these pathogens

WEIGHING YOUR WEANERS

It is essential that weaners are weighed at the commencement and completion of weaning to:

- Ensure weaning weight targets are met,
- To match feed nutrient density (and particularly protein density) to the lowest weight calves in the weaning group
- To measure the success of the weaning process in terms of growth rate.

Effective weaning therefore requires accurate scales and some form of individual animal identification. The use of NLIS tags along with an NLIS transponder reader, and a data logger interface aids in performance recording and monitoring, but weighing and manually recording ear tag numbers and weights can also be done.

The time of calving is generally matched to the period when feed is most available. Therefore, weaning is typically occurring after the main growth period for pastures. Calves are highly susceptible to worms as they are yet to develop immunity and by weaning time, they can be carrying significant worm burdens (Taylor 2016). Whilst the data from controlled studies on the production value of a weaning drench is equivocal, Smeal (1995) concluded that a weaning drench is warranted. Appropriate early weaning in southern Australia will occur in December/January with late winter/spring calving, or in August/September with autumn calving. Ensure an effective drench is used as weaners are moved onto summer pastures.

Some drenches provide efficacy at the time of treatment ('knockdown'), however if sustained action is required e.g. if calves remain on contaminated pastures, an injectable macrocyclic lactone (ML) treatment with persistent activity may be given. The aim at weaning should always be to wean calves onto appropriately spelled pastures of low parasite risk.

Pour-on treatments should be reserved for situations where facilities are poor, fly control or biting lice control is needed, or for WHS reasons.

TIP WHAT WORMS ARE IN MY AREA?

Australia wide, over 50,000 dung tests have shown that the vast majority of internal parasite burdens are of mixtures of worm types, with the most predominant genera being *Cooperia*, *Ostertagia* and *Haemonchus*. Identify the mixture of worm types in your local areas by heading to **www.wormtrax.com.au**

Worm TRAX™
Check your count

WORM EGG COUNT MONITORING – KNOW YOUR WORM BURDEN

Worm egg count (WEC) monitoring is of value in determining whether drenching of weaners is necessary and whether the drenches being used are effective.

All drenches should be checked regularly by doing a 'before and after' worm egg count and larval culture to determine worm genera. This allows the efficacy of a treatment to be calculated. This involves 10-15 fresh dung samples being picked up from pasture or collected directly from each calf - one set of samples at treatment time and another set 14 days later.

If the 'before' treatment is zero, then the need for drenching is very low. If the 'after' treatment count is high (when compared to the before count), then this may indicate resistance is present on your farm. A WEC a week before the planned treatment date will help you decide if drenching is needed or not.

TICK AND LICE CONTROL

Weaning time may also be an ideal time for strategic treatment of external parasites. Depending on the timing of weaning, treatments for cattle tick, lice and buffalo fly may also be applied. Read product labels carefully to determine which parasites particular treatments cover against and those that are not covered.

TIP INJECTABLE VS POUR-ON DRENCHING

The commonly used macrocyclic lactone (ML) drenches are available as injectable and pour-on formulations. Injectable formulations result in higher blood levels of active ingredient and more reliable dosing.

Pour-On products, while convenient to apply, ultimately result in lower peak blood levels because of barriers to absorption into the animal's bloodstream.

The only situation where Pour-On products will give a better result than injectable products are when biting lice and buffalo fly are being targeted or where handling facilities are poor.

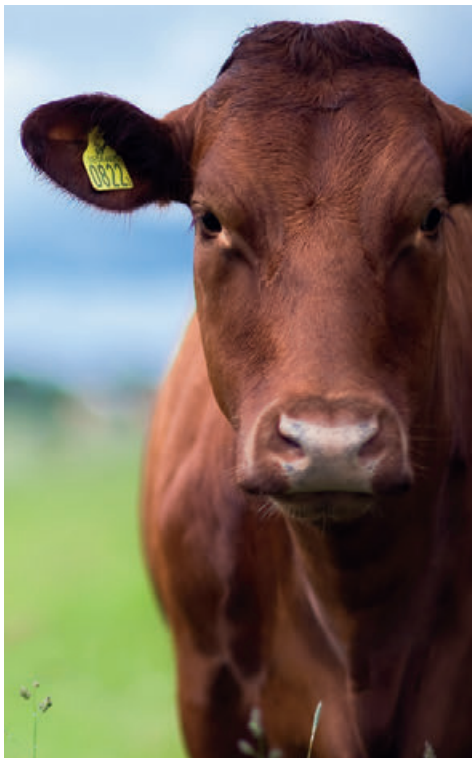
TIP IDENTIFY WORM BURDENS EARLY

WEC monitoring is a vital tool in the early detection of worm burdens before visual signs of a parasitic challenge become apparent. Utilise WEC monitoring regularly, especially in young animals, to allow informed decisions around treatment timing to be made. In times of high challenge, treatment may be necessary prior to weaning. WECs on grazing beef cattle can be undertaken from 4 months of age.

WEANING SYSTEMS – WHAT ARE THE OPTIONS?

PADDOCK WEANING

With traditional paddock weaning, calves are abruptly separated from their mothers and placed in a paddock with their total nutritional requirements provided by pasture.



YARD WEANING

With yard weaning, again calves are abruptly separated from their mothers but are held in confinement for a variable period, during which their nutritional requirements are provided as conserved forages, grains and pulses, protein meals, or a combination of all these. It is customary to handle the calves on most days of their confinement to train them to respond appropriately to humans, horses, and/or dogs and to familiarise them with the handling facilities.

The duration of yard weaning is usually 5 to 10 days, depending on the initial temperament of the cattle, available conserved feeds, and the quality and quantity of allocated pasture for turn-out. Yard weaning requires at least 2.5 m^2 /hd yard space, at least 3 cm/hd water trough space, and continual access to forages and concentrates.

The addition of an ionophore such as lasalocid to the concentrates assists with the management of coccidiosis. The target at the completion of yard weaning is to have weaners of a temperament that allows them to be easily handled with a minimum of stress for both the cattle and the handlers, and for them to be gaining weight with well-developed rumens and robust immune systems.

Ensure yards are well prepared & safe prior to commencing weaning.

WEANING SYSTEMS – WHAT ARE THE OPTIONS?

Supplementary Feeding – a hay rack can assist to maintain feed quality, minimise wastage and manage dust loads.

Supplementary Feeding – a bunk / trough can be used to provide grain mixes or pellets.

WATER IS VITAL IN ANY WEANING SYSTEM

A clean water supply is important. Ensure clean quality water is always available.

WEAN IN BATCHES

Where larger numbers of calves are being weaned or where different groups of calves from different paddocks or properties are being weaned centrally in one set of yards, batch weaning may be necessary.

Always avoid constantly adding new calves to a larger group or mixing calves with very different backgrounds as this may precipitate outbreaks of respiratory disease (Taylor 1998). Take each batch separately through the yard weaning process and then turn them out into a paddock.

Group sizes for yard weaning need to be kept to manageable levels – avoid group sizes of >100 head. This may require some investment in infrastructure to allow for sufficient pens, or alternatively, weaning should be staggered over a period of time so available facilities can cope. When dividing calves from larger groups into smaller groups for weaning, sort them into weight ranges as larger weaners will bully smaller weaners and potentially reduce access to feed.

If group sizes <100 head are not possible, it is important to ensure that calves are only weaned with animals from their paddock groups. Mixing or drafting of different groups of calves should only occur after yard weaning has been completed as the extra space reduces the ability of respiratory pathogens to spread.

NUTRITIONAL MANAGEMENT AT WEANING

The development of the rumen is not a once in a lifetime event. The papillae, the absorptive surface of the rumen lining, increase in size (Liebich et al., 1987) and metabolic activity (Schweigel et al., 2006) in response to the production of fermentation end products (volatile fatty acids) from the rumen microbes (Gabel and Aschenbach, 2006). This response occurs throughout the ruminant's life depending on the feed ingested and therefore the delivery of nutrients to the rumen microbes.

Nevertheless, the maintenance of high growth rates by weaners is dependent on having a large population of rumen microbes producing large amounts of volatile fatty acids (Schwartzkopf-Genswein et al., 2003) and microbial protein, and a healthy rumen with a large absorptive surface to absorb those volatile fatty acids. To achieve this, high intake of a nutrient dense diet is paramount. The source of fermentable carbohydrate to drive volatile fatty acid yield is of secondary importance to the requirement for a high intake of a carbohydrate rich feed. The feed does not necessarily have to be high in starch, and an excess of starch can predispose the weaners to ruminal or lactic acidosis when their voluntary feed intake increases after the first couple of days.

Pulses, particularly lupins, are a safe energy source for feeding weaners due to their much lower starch content compared to cereal grains (Hedley et al., 2001). Where it is cost-competitive, molasses is useful with weaning because the high sugar concentration stimulates the rumen microbes to produce a volatile fatty acid mix which is high in butyrate (Martel, et al., 2011), and butyrate is a potent stimulant of rumen papillae development as it is heavily utilised as an energy source by the rumen lining (Daniels and Yohe, 2014; Weigand et al., 1975). It is important to note that propionate, which is produced in higher concentrations in the rumen from a diet high in starch, is also a strong stimulant of papillae development (Daniels and Yohe, 2014).

In summary, a weaning diet which promotes rumen development will be high in fermentable carbohydrates thereby increasing production of volatile fatty acids and microbial protein, and increasing the surface area available for absorption of nutrients.

TIP VOLATILE FATTY ACIDS

Volatile fatty acids are the major energy yielding compounds used by ruminants. They are:

- Propionic acid
- Acetic acid
- Butyric acid

TIP FERMENTABLE CARBOHYDRATES

These are starch, sugars and components of plant structure

TIP WHAT IS ACIDOSIS?

Ruminal acidosis occurs when cattle accustomed to a forage based diet are suddenly fed large amounts of fermentable carbohydrate such as grain. Rumen microbes that produce lactic acid multiply rapidly resulting in an abrupt drop in rumen pH to 5 or lower. This begins a cycle of impacts leading to signs ranging from poor performance, diarrhoea and lameness through to death of affected cattle. Correct ration formulation and careful feeding management avoids ruminal acidosis.

NUTRITIONAL MANAGEMENT AT WEANING

Braman et al. (1973) found with feedlot cattle inducted at a mean body weight of 253 kg, and fed a high energy concentrate diet, increasing dietary crude protein from 11% to 18% using soya meal improved growth rate and feed efficiency, with the effect most marked during the first 28 days, but maintained to close out at 140 days. The same effect was not found where urea was used as the nitrogen source to increase crude protein. There are two important conclusions from this study. Firstly, true protein increases performance more than non-protein nitrogen with low body weight cattle on high energy diets, and, factorial calculations of protein requirements appear to generate dietary protein targets that are lower than those that improve performance in the field (CSIRO, 2007; CSIRO, 1990). These observations might be explained to some extent by the positive effects of metabolisable protein as an alternative energy source, and the increased requirements for protein in cattle subjected to the stress of weaning and the transient interruption to normal feeding behaviour that this induces. **Regardless of the explanation, the practical application of this finding is that early weaned calves benefit from high dietary protein concentration, and we should aim for 16 to 18% crude protein with the bulk of the protein provided as true protein.**

TIP UNDERSTANDING PROTEIN SOURCES

Crude Protein is an expression of the total content of nitrogen compounds of the analysed product, calculated by multiplying the corresponding nitrogen content by a conversion factor.

Non-protein nitrogen (or NPN) is a term used in animal nutrition to refer collectively to compounds such as urea, biuret, and ammonia, which are not proteins but can be converted into proteins by microbes in the ruminant stomach.

True protein is obtained from feeds naturally high in protein such as soya bean meal, cottonseed meal, canola meal or lupins.

NUTRITIONAL MANAGEMENT AT WEANING

The combined requirements of high energy density from fermentable carbohydrate, and high protein density, make the following feeds suitable for yard weaning:

- **High quality legume hay combined with oats or milled cereal grain**
- **High quality silage (provided the total intake includes approximately 20% cereal grain plus 10% protein meal, or, 30% pulse).**

Note that there is a limit to the quantity of silage that should be fed, with studies finding an association between high silage diets and the incidence of BRD in calves newly placed in feedlots (Martin et al., 1982). This is due to the relatively low concentration of fermentable carbohydrate in well-made silage (with the exception of high quality maize silage) and the relatively low concentration of true protein. In the process of ensiling, fermentable carbohydrate is converted to organic acids and true protein is converted to non-protein nitrogen compounds. There is also a limit to the proportion of the diet that can be fed as starchy cereal grain due to its propensity to cause ruminal or lactic acidosis. Liquid feeds, such as molasses, corn steep liquor, and condensed distillers syrup, can be added to feed mixes or fed separately through licker drums to provide highly palatable sugars which increase energy intake and assist with the stimulation of rumen papillae development.

Liquid feed drum - for molasses, corn steep liquor and condensed distillers syrup.

TIP GETTING YOUR RATION RIGHT

It is important to meet both the protein and energy requirement for weaners to ensure productivity. Obtain a feed test of your feed components to allow accurate formulation of your weaning ration. Engage the assistance of a qualified nutritionist where necessary.

NUTRITIONAL MANAGEMENT AT WEANING

In southern Australia, the requirements of spring weaned calves from an autumn calving are readily met with high quality improved temperate pastures – either after yard weaning or for paddock weaning. There is a greater challenge with summer/autumn weaned calves from a spring calving. Actively growing lucerne meets the requirements of weaners. However, where lucerne growth slows due to dry seasonal conditions, its energy density falls and weaner performance will benefit from feeding a fermentable carbohydrate such as cereal grain (100 to 200 g/hd/d). If lucerne is not available additional feed inputs are required to maintain growth. Where abundant dry feed is available, growth rates of 0.6 to 0.7 kg/hd/d have been consistently recorded with light trade cattle provided with high crude protein liquid supplements in licker drums (10% urea-molasses mixes or corn steep liquor). Note that these growth rates have not been consistently achieved with lower protein liquid supplements (i.e. 3% urea-molasses mixes) presumably due to a lack of nitrogen relative to energy to drive consumption and fermentation of dry feed to the same extent as the higher crude protein mixes.

Alternatively, a trickle of energy and nitrogen to the rumen to fuel microbial fermentation of dry feed can be achieved with cereal grain/protein meal/urea mixes, or pulses, with limited intake through a lick feeder – targeting approximately 200g/hd/d intake. Summer forages, such as the C4 species, forage sorghum and millet, also benefit from the feeding of nitrogen and energy sources as they are low in protein and energy (they are also consistently low in sodium so salt should also be provided). Needless to say, if dry matter availability is low enough to limit intake, weaners should be supplemented with a mix equivalent to that described for yard weaning.

NUTRITIONAL CHECKLIST

- ✔ Feed the bugs (rumen microbes) with a nutrient dense diet to increase production of microbial protein and VFAs as well as increasing the ruminal absorptive surface
  - Eg. Lupins, molasses
- ✔ Ensure adequate levels of dietary crude protein, in early weaned calves. This equates to 16-18% crude protein in the form of true protein
- ✔ The combined requirements of high energy density from fermentable carbohydrate, and high protein density, make the following feeds suitable for yard weaning:
  - High quality legume hay combined with oats or milled cereal grain
  - High quality silage (provided the total intake includes approximately 20% cereal grain plus 10% protein meal, or, 30% pulse).
- ✔ Be careful of oversupplying certain feedstuffs
  - High silage diets may increase the incidence of BRD
  - Diets consisting of a high proportion of starch cereal grains (eg. wheat, barley) may lead to lactic acidosis or increased Pulpy Kidney risk
- ✔ Ensure adequate feed supply post weaning
  - Assess pasture to ensure it meets requirements, if not:
  - Provide suitable supplementary feed

DAILY SCHEDULE – PLANNING FOR PERFORMANCE

DAILY SCHEDULE CHECKLIST

Day: Approximately 4 weeks before weaning or earlier at calf-marking:

- Administered all primary vaccinations
  - Clostridial diseases (5-in-1 or 7-in-1)
  - Bovine respiratory disease (BRD); i.e.MH and/or IBR and/or Pestigard
  - Pinkeye vaccination may also be considered
- Ensure all calves to be weaned have been castrated

Day: Approximately 7 days before weaning:

- Ensure required feeds and supplements, vaccines and drench, are on hand
- Place bins, hay/silage feeders in the yard weaning facility
- Slash or scrape the weaning yard(s) if any undesirable weeds are present or manure build-up has occurred from prior use
- If possible, with summer/autumn weaning, reduce dust by watering yards in the week leading up to weaning

Day 1: Weaning Day:

- Administer all booster vaccinations
  - Clostridial booster
  - BRD Booster (if necessary) or single BRD vaccination (if not done earlier)
- Drench all weaners with an effective drench
- Weigh all animals
- Sort calves into weaning pens based on paddock origin and weight

Days 2 to 6 or 2 to 9:

- Calves should be handled daily using low stress handling techniques
  - The calves should be taught to respond quietly and calmly to the handler
  - The calves should be walked through the yards and crush daily and then returned to their weaning yards

Final Day:

- Move all weaners onto high quality pastures
  - Targeting at least moderate energy density and high protein density (10 MJ ME/kg DM + ideally ≥ 16% CP) such as lucerne or summer/autumn forage plus supplements, or spring pasture for autumn calves

POTENTIAL TRAPS

1. **Inadequate preparation –** planning and the allocation of sufficient time and labour will make weaning a stress free process for calves and producers.
2. **Dust –** weaning in summer/autumn frequently presents a dust challenge in the yards and this increases the incidence of BRD (MacVean et al., 1986), which weaners are particularly susceptible to. If dust is likely to be a recurring challenge with weaning in a given system, where possible, sprinklers should be installed to eliminate the problem.
3. **Flies –** Flies can result in the spread of pinkeye. Once yard weaning has been completed, scrape the yards clean to remove built up manure and hay as this may create an ideal breeding ground for nuisance flies following rain.
4. **Mixing of paddock groups –** weaning in batches in smaller groups, and only mixing paddock groups in turnout paddocks reduces stress on cattle at weaning and subsequent risk of BRD.
5. **Clostridial diseases –** particularly pulpy kidney (enterotoxaemia), can cause losses where weaners are placed on nutrient dense feeds, either grains or lush pastures. Ensure all calves are vaccinated correctly (2 shots – primary and booster) with 5-in-1 or 7-in-1 to prevent this avoidable loss.

VACCINATION TECHNIQUE

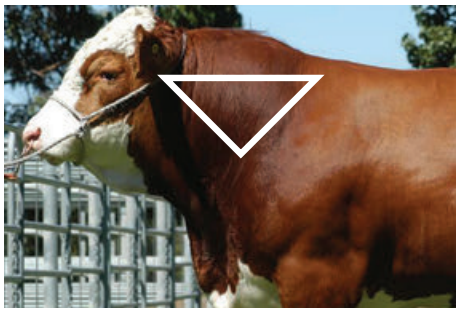


Figure 1:
Injections should be given in the area outlined by the triangle.

Figure 2:
Tent the skin and vaccinate under the skin, and not into the muscle. Be careful to avoid accidental self-injection. Vaccinators are also available that have shrouded needle guards and self-tent the skin so that only one hand is needed for injection.

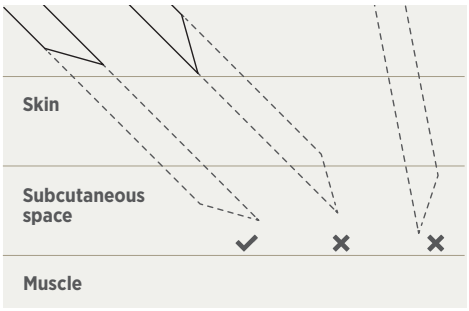


Figure 3:
Place the needle at about a 45° angle to the skin and inject into the subcutaneous space.

VACCINATION TIP

- Avoid vaccinating cattle when wet or in dusty yards
- Vaccinate high on the neck, near the base of the ear if possible to avoid carcass damage
- Avoid vaccinating through soiled skin. If required, clean skin with a paper towel
- Replace needles regularly so they remain clean and sharp

SUMMARY

WEANER MANAGEMENT

1. Weaning is one of the most stressful and important procedures in a beef cattle production system
2. If weaning is poorly executed the consequences can be dire, however, if completed successfully it will impact positively on enterprise performance and profitability
3. Weaning calves earlier and at a lower body weight will have flow on benefits for the cow herd and carrying capacity
4. After 2-3 months of age it is energetically much more efficient to feed high quality forage to a weaned calf whilst maintaining and managing its mother separately than by prolonging lactation and feeding a cow-calf unit
5. Planning is required in regards to animal health inputs, suitable feedstuffs, adequate facilities and the provision of labour to ensure a successful weaning
6. To effectively manage the risk of disease is it important to minimise stress on the animal, provide adequate nutrition and improve immune defences through the correct use of vaccines relevant to the disease in focus. Make sure castration is performed prior to weaning
7. Measurement is an important indicator of success. Animals should be identified individually and weighed regularly to track performance against weight targets and to measure productivity before, during and after the weaning process. Parasite burdens should also be monitored frequently to allow informed decisions to be made regarding parasite control
8. Yard weaning is the preferred method of weaning to allow careful monitoring and sensitisation of the animal to handling. In large enterprises, wean in batches to minimise stress and disease risk
9. Feed the bugs. Young animals have high requirements for dietary energy and protein to ensure development and growth.
   - ✔ Energy - diet should provide at least 10MJ ME/kg DM
   - ✔ Protein –crude protein levels should be at 16-18%, with the majority fed as true protein
10. Utilise WEC monitoring regularly, especially in young animals, to allow informed decisions.
11. Planning to perform. Devise a daily schedule and stick to it.

THANK YOU

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