

Sheep Reproduction Strategies

A stylized illustration of a sheep farm. In the foreground, a large white sheep stands on a green field. Behind it, a dark green silhouette of a sheep is visible. The background features a red mountain range, a sun with rays, and several smaller white sheep scattered across the landscape. The entire scene is framed by a green border.

**Producer experiences from
North & Central West Qld**



From the North & Central West Leading Sheep Coordinator

For producers by producers: This e-book is a follow-up to a workshop held at Longreach, in September 2010. The focus of the workshop was to help meet an expressed need by producers in North and Central West Queensland, namely “*How can we improve our lambing and weaning percentages?*”.

Our Leading Sheep committee strongly supported the idea of hearing how some of their fellow producers manage their sheep breeding enterprises to maximise weaning percentages. And so the search was on for producers, each with a slightly different story to tell, to share their management practices.

At the workshop, we asked Department of Employment, Economic Development and Innovation (DEEDI) principal beef scientist Désirée Jackson, from Longreach, to share her extensive knowledge on the nutritional requirements of ruminant animals. We thank her for a wonderful presentation. Désirée can be contacted at the Longreach DEEDI office on (07) 4650 1200 for further information.

We are mindful that the information presented in this e-book is a reflection of the personal experiences and practices of the presenters: Peter and Elizabeth Clark from “*Leander*” north west of Longreach; Duncan Ferguson manager of “*Barcaldine Downs*” north west of Barcaldine; and Buckles and Ann Peacey from “*Laidlaw*” west of Longreach.

Throughout this e-book, links (words that are blue and underlined) have been included. Clicking on the links, while holding down the ‘Ctrl’ button on your keyboard, will take you to an external site which gives further information on the relevant topic.

My sincere thanks to the presenters for the time and effort they put into their presentations, and to Andrea Hewitt for putting it all together as a PowerPoint presentation on the day.

Good health and happy lambings.

Virginia Wacker

April 2011



“Leander” Sheep Breeding Program

Peter & Elizabeth Clark

“Leander” is located 25km north west of Longreach, with an average rainfall of 430ml. The property area is 12,000ha, consisting of Mitchell grass downs, gidgea woodland, sand plains and alluvial frontage country. It is watered by dams (some equipped, some open) and waterholes (semi-permanent and permanent).

The main enterprise is merino breeding and wool growing.

Background:

After the 1982/83 drought we reduced our stocking rates by a third. When the 1987/88 drought occurred, we re-assessed stocking rates again, to try and drought proof the property by lowering grazing pressures and attempting to even out variability in production results.

The large increase in kangaroo numbers, a desire to even out nutritional requirements over the whole year, and our aim to determine an optimal stocking rate to gain a predictable outcome, were at the forefront of this decision.

To do this we had to lower kangaroo numbers by culling with a damage mitigation permit. We also had to determine the optimal stocking rate per paddock. This was done by changing stock numbers until we achieved the best wool cuts, lambing and weaning percentages and bodyweights per head, so that every paddock was returning a predictable outcome regardless of country type.



By using production results (and nothing to do with visual assessment or historical stocking rates), we achieved this. The individual changes to stocking rates in some paddocks were astounding.

As a consequence, we have largely evened out the highs and lows in production returns in terms of wool produced, lambing percentages and bodyweights - except in well below average seasons.

There have been some other interesting results over this period which we have observed and noted. Species of flora that had nearly disappeared are re-emerging and wool cuts, bodyweights, lambing percentages and weaning rates have all increased. Chemical use has gone down markedly and although we have reduced the numbers of sheep shorn, the bales of wool produced have increased.

Pre-Joining Strategies:

Pre joining strategies are linked to all aspects of our yearly management program. We shear in September/October, which fits in with our joining program.

- All sheep are shorn, lambs included.
- All sheep are treated with a pour on [lice treatment](#).



- Sheep are weighed to determine the heaviest animal, to calculate the correct amount of chemical to be applied. This is most important, as it is very difficult to accurately judge weights visually.
- All surplus sheep (cast-for-age, culls and dry ewes) are removed. Cast-for-age between 5 and 6 years old or 4 to 5 years of age if we have enough numbers. A ewe's milk and wool production declines from 3 ½ years on.
- Culls are taken out prior to shearing, and sold off shears.
- Dry ewes (identified as a result of wetting and drying, maidens included) are sold off shears.
- Wean at shearing. This has been carried out for the last 30 years, with the odd exception due to drought.
- When ewes have lambs on them at joining, you cannot expect an average lambing. In our experience lambings come back at least 10%.

Weaning:

Care of weaners is going to affect their breeding and wool cutting ability for life. We try to make sure the [grazing pressure](#) is in relation to available nutrition. Weaners need room, so don't jam them up. They must have the best opportunity as any setback is going to have consequences later.

Joining Strategies:

- [Join](#) at end of October for an April/May lambing. This has been influenced by the knowledge that an older mature ewe when shorn, which may only be in light store condition with below average [pasture conditions](#), will pick up sufficiently to start cycling, even if change in body condition is not visible. This is known as the "*shearing effect*" - less weight to carry, and feeding increases through need to keep warm.
- All ewes must be on a rising plane of nutrition to cycle and while the shearing effect is enough for older ewes, it won't be for maidens.
- Select rams for maidens – preferably use rams that have been used before and are in top order. Put younger rams in on the second cycle.
- Maidens have to be given the best opportunity. They will not cycle effectively even when in good condition if they are not on a rising plane of nutrition.
 - * **lower stocking rate than older sheep** and * **give them room.**
- We join initially at about 1 to 1.5% for the first 17 days (one cycle) and then put in the remaining 1%. Rams are left in for 3 cycles. The first cycle rams have a "teaser" effect on non-cycling ewes, and this has an effect on conception rates.
- Practical hands on experience has taught me that a ewe in drought condition may only stay on heat for **one hour**, whereas in good conditions it could be 24 hours or more.

Crutching:

All breeders are crutched in March before lambing. We cradle crutch as this is less stressful on the ewe. Dry sheep can be crutched later, depending on availability of crutchers etc. We juggle this around our capability to muster as we are a husband and wife show. We try to get the rams shorn at this time also, as we shear them twice a year.



Predator Control:

All year awareness. We endeavor to have a concentrated baiting program 1 week prior to, and during lambing.

Lambing:

Continue with normal management and observations i.e. continue to check for predators, fly, general health etc. We do not seem to have [mis-mothering](#) problems driving through ewes and lambs. We wait until the ewe has gathered her lamb and moved off (turn vehicle off so they can hear each other). Our sheep are pretty quiet and are not easily disturbed. This may be due to the fact that we do not use dogs.

Lamb Marking:

Lamb marking is carried out in June/July, dependent on conditions.

We do not mark any more than a mob of 600 lambs to enable us to get them out in reasonable time and to enable them to mother up (in holding paddocks).

We use a knife to remove tails but prefer to use rings on the testicles. We do not apply any chemicals – reasons being:

- Allergy to chemicals.
- Have been told by vets that there is not anything known to speed up healing and that it is more important to keep instruments clean and change disinfectant when it becomes dirty.

We also cull any lambs with black or brown spots/marks, stags, hermaphrodites and any with structural deformities.

- [Wet and dry](#) at lamb marking. I do it myself. The dries are identified by tags and drafted off and run separately which eases the grazing pressure for the wet ewes. We have noticed a trend towards increased mothering ability in the general flock as well as the maidens, which we have directly linked to wetting and drying.

It is quite easy to work out if a ewe has had a lamb and lost it, and roughly when (at birth or later), and also if they did not get in lamb at all.

I keep a notebook and work out the percentage lost and those that did not get in lamb etc. It is very important to be able to determine why lambings are down, and what initial conception rates have been.

You can work out predator attack times, and check the time during lambing when this may have happened. You cannot correct a problem if you don't know when it occurred, and why.

Wetting and drying is very important because in our experience, a maiden that does not get in lamb has a very high chance of either not getting in lamb next season, or getting in lamb and missing the following year and repeating this trend.

Also, weaning percentages and mothering ability are gradually improved because the ewe that has lambed and lost her lamb (for whatever reason), is sold.



We like all ewes to have one lamb and bring it to weaning, rather than some having twins, and some none. Wetting and drying may promote twinning but in practice most twins bred in this country are culled because they are generally inferior to the single lamb.

Classing and General Husbandry:

August/September.

- We use an outside Classer to bring a different perspective, which we believe is important.

We cull at around 25% but when you add the dries taken out at lamb marking, it usually comes to around 40%. To do this you have to maintain high lambing and weaning percentages.

Over the period from 1978 to 2007 we averaged 85% lambing. We did not join in 1982 and 2001, and those years are not included in the average. This average has been worked out on ewes mustered at lamb marking, and any lambs culled (black, stags etc) are not included.

It is worth noting that the maiden percentage over this period has never been any more than 10% lower than the older ewes, in fact closer to 5%.

- If there is a suspected [worm](#) build up we take samples and do a worm test ourselves using our own microscope. This does take time, but it allows us to identify if the eggs have hatched or not, straight away. Once the worm burden is identified, it is up to us to control the problem.

If needed, the sheep are drenched - once again emphasis is on correct dosage rates based on a weight basis, as recommended by the manufacturer's instructions.

A well-known vet once said to me "*The only difference between worms and kangaroos is that worms eat the grass on the inside of the sheep and the kangaroos eat the grass on the outside*".

- Any sheep that have been struck by fly are automatically culled.

Ram Care:

During classing, the rams are checked for general health, cast-for-age, number of replacements determined and a decision is made whether to feed or not, prior to joining.

Rams are run on their own and not disturbed, apart from regular checking for general health. It is not good practice to run killers with rams as unnecessary handling has a detrimental effect on the rams (sperm quality and risk of damaged testicles).

At joining time the rams are transported by vehicle to the ewes and are let out on watering points. We are careful that they have a non-slip surface to jump out of the vehicle to avoid any testicle damage.

Lessons Learned:

- When we joined close to 2,200 ewes in October 2009, 1,500 of these were [maidens](#), as we had sold an age group due to the ongoing drought. Conditions were still not good at joining. The ewes were in store condition and stationary or declining, which we realised was not ideal with such a high percentage of maidens. We spread them out as much as possible as we were only half stocked.
- We should have fed our [rams](#).
- This was the first year we were unable to bait before lambing, and coupled with very few neighbors baiting in the past few years, this resulted in an increase in losses from predators.



- When wetting and drying in 2009 we identified approximately 10% to 20% losses in the first cycle of lambing, consistent with predators. Where attacks were more constant, losses were up to 20%. Where not so constant, losses were down to 10%. Interestingly, there was only about a 5% or more increase in ewes that did not conceive in comparison to normal years.
- We marked 65% overall in 2009, but in hindsight if we had fed our rams and controlled predators we could reasonably assume a marking of 75% to 80% may have been possible. We know from wetting and drying that it was more losses from predators, than poor conception rates in the ewes.
- [Worm testing kits](#) - only count eggs, not immature worms. We do our own testing as we have had the problem of a test count being zero, but follow-up testing some hours later revealing a high presence of immature worm infestation.
- It is very difficult to accurately judge the weight of a sheep by visual methods only. It is important to apply chemical and drenches to cover the heaviest animal in the mob. Also, check expiry dates on chemicals. Be especially careful if using Organophosphate based treatments as these can easily cause death if used incorrectly.
- Stocking rates should match the energy available in pastures. Don't rely on conventional stocking rates for an area as this will change from paddock to paddock. In addition to seasonal conditions, kangaroos and feral goats have a big impact on quality and quantity of pasture and ultimately ewe productivity and wool quality.

Conclusion:

- We adjust stock numbers at shearing to match our feed reserves and change sheep between paddocks. This is so we can alternate from downs to desert country, or desert to river/pulled country. We do this because we know there is a copper deficiency in the desert country and prolonged time in that country can cause a problem. We adjust stocking rates for the forthcoming year using production results and visual appraisal of stock as assessed in the shearing and mustering period.
- [Nutrition](#) is obviously the biggest contributing factor to production. I believe it is the key, and how you manage that determines how successful your lambing and weaning percentages will be. Nutrition drives conception rates, lamb survival to weaning, body weights, genetic potential, and combined with good husbandry practices, can deliver a successful end result.



You will notice there is not much, if any, mention of quite popular methods of technology used in our industry. To me, you have to get the basics right first before you can expect new methods to create a dramatic change.

This is what we do at "*Leander*", and how it works in our situation. Hopefully we can all learn something from each other.

Peter Clark

September 2010



“Barcaldine Downs” Sheep Breeding Program

Duncan Ferguson

Overview:

“Barcaldine Downs” is 54,000ha of Mitchell grass downs country. It is well shaded with vine trees and boree. There is scattered gidgee scrub where buffel grass is starting to dominate.

There are five artesian bores with 300kms of bore drain.

“Barcaldine Downs” has two shearing sheds and there are holding paddocks strategically placed for mobile crutching and lamb marking operations.

All major paddocks are connected by laneways for easy movement of stock. The laneways are 200m wide and can be used as holding paddocks if required.

Program:

Mid November

Shearing of sires - occurs twice a year in mid November and May. They are drenched, back lined and horn tipped.

The sires are also classed on age, wool quality, conformation and are palpated for fertility and soundness.

At this stage, we make a judgement call in relation to supplementation (if we are not already feeding). If we need to feed, then feed a minimum of 250g per head per day - lupins 2 to 3 times per week.

Lupins sourced from Narromine cost \$430 per tonne landed. We feed rams for six weeks prior to joining unless they need longer. This equates to 10.75c per head per day or \$4.52 per ram for the six weeks. I believe it is better to feed a little too early than a lot too late.

Lupins and whole cottonseed are placed onto the ground at any point where there is water. Loose lick is put into tyres - 6% urea for rams and 8% for wet ewes.

Mid February

The annual general shearing commences mid February for all ewes, weaners and teasers. The weaners are sexed and weaned and everything is back lined and drenched.

End of March

Joining occurs at the end of March when ewes are on a rising plane of nutrition. They have been shorn, and the weaners taken off and drenched.

The oldest ewes are 5 ½ years old. The rams go out on the sixteenth day after the teasers have been joined, and are joined at 2.5%. Ewes cycle every 17 days.

Prior to the rams going out - Click™ is used on their heads to cover against blowfly infestations of injuries sustained from fighting when joined.



Due to our large paddocks with large areas of water, we join in holding squares approximately 200 metres wide. Sheep are mustered into these holding areas and kept there overnight.

Joining takes place after the longest day of the year over a period of 68 days. This is equivalent to four cycles for the ewes.

[Teasers](#) are a very important part of our breeding program. Using teasers helps ensure there will be a large number of ewes cycling at one time.

This helps prevent stress and injuries to the sires caused from rams fighting over small numbers of cycling ewes at the initial join period.

We inject teasers with 2 x 4ml injections of testosterone. The first 4ml is injected one week prior to joining and the second 4ml injection is given on the day of joining.

Sires are joined on the sixteenth day following introduction of the teasers. This important management practice is done to work in with the 17 day ovulation cycle of the ewe. Ewes are mustered into the holding squares, teasers removed, and sires put in.

Using teasers also gives you a more even line of lambs early in the lambing season. Even lines of sheep mean easier classing and more presentable lines for selling purposes. This equates to more dollars in the pocket.

When rams are taken out, the sheep are again mustered and put into holding squares overnight, so rams can cover any remaining ewes that may still be cycling.

End of July

Crutching and [scanning of ewes](#) occurs at this time, and is done together to save labour and workload. Dry ewes are identified then put in a separate paddock from the wet ewes. Ewes get two chances, and then they are sold if still empty.

The ewes are crutched at least five weeks prior to lambing. Any later than this the ewes can abort and get pregnancy toxemia due to unnecessary stress.

Supplementation:

The decision to [supplement](#) ewes prior to lambing is made at crutching. Condition score 2 or higher is required for lambing ewes.

If ewes do need feeding, then lupins or whole cottonseed are used. A minimum of 250g per head per day is fed, preferably 2 to 3 times per week.

Cost of supplementing ewes at 10.75c per head per day through to shearing (180 days) equates to \$19.35 per head. Supplementing means if drought persists after shearing and there is a need to sell, the sheep are in saleable condition. We can then lighten off our numbers after getting a return from our wool and our lambs.

For lactating ewes, we regularly [check the udder](#) to ensure milk production is adequate. If the lamb is losing condition it is generally too late as the mothers milk has already started to dry up.



62 wheat tonne capacity Mitzi silos



Pre-Lambing/Lambing Strategies:

Predators

We bait every 8 to 10 weeks using 1080. Aerial baiting occurs twice a year with the council plane for inaccessible areas such as the Alice River.

Ground baits are used out of vehicles at all identified 'hotspots' e.g. thoroughfares, creeks and timberlines. The council dogger is used if needed.

At times of lambing, shooters and staff do not go near the lambing paddocks unless instructed otherwise. This is to minimise the risk of mis-mothering.



Lamb Marking (November):

A treatment of 6 in 1 Glanvac is administered, mainly for [tetanus](#) and [pulpy kidney](#), and a booster is given at shearing time the following year. Lamb marking strategies are dependent on the condition of the lambs and ewes, and the ewes' milk supply. The strategies are decided at the time of marking. I prefer to use rings and apply Click™ but if a knife is used for any reason, Defiance is used.

Post - Marking:

All lambs are put back into holding paddocks to mother-up overnight. On average 1,500 lambs are marked per day. Average paddock sizes on "Barcaldine Downs" of 6,000 to 7,000 acres makes it very hard for lambs to mother up successfully, hence the use of holding squares.

Weaning (March):

Weaning occurs at shearing time when lambs are 5-months-old. Weaners are put into smaller, well-watered paddocks that are not overgrown and are close by for constant supervision. They are checked every couple of days to make sure they are not holding in corners etc. It is important to check they are going in to water and grazing the paddock adequately.

Lessons Learned:

- Very important to identify your dry ewes and separate them.
- Very important to regularly assess the ewes' milk supply. Once lambs become 'woody' looking, it's too late to rectify the problem. Better off weaning early and supplementing the lamb when you notice the quality of the ewe's udder is starting to dry up.
- Use every tool available to you and keep your mind open to new ways of doing things.
- Better to feed a little too soon than a lot too late. Didn't feed in 2002/03 and paid the price. It took 6 years to fully recover losses. We went down to 15% lambing in those years in some paddocks, compared with over 100% in some paddocks over the last 5 years. ([Rainfall records](#) for 2001, 2002 and 2003 were 467.5mm; 319.25mm & 325.75mm respectively. Of note, "Barcaldine Downs" only received 17.5mm from April to December in 2002 and only 8.5mm from June to October in 2003. This did not bode well for a successful September/October lambing in those years).



- Preventative [drench](#) at shearing every year - too many sheep (35,000 ewes) to muster and process if discovered we have a problem after shearing.

To date this strategy has worked well for us. The ewes and lambs are bigger and healthier and this equates to better returns.

- In bigger rainfall years, we slash tracks in and out from waters and put cattle into paddocks with sheep.

Better to put cattle in first to cut tracks and take the top off the overgrown grasses. We then remove the cattle and follow up with sheep behind them.

The rule is - cattle are **always** put into the paddock before sheep, never sheep before cattle. Cattle forage from the top, sheep browse from lower on the plant.

If the feed is too dense, sheep will not utilise the paddock effectively and will be susceptible to worm infestations as they overstock the shorter more accessible country.

- Predator control - horse meat seems to be the most effective at attracting [wild dogs](#). If we don't bleed the carcass we seem to get better results.



Conclusion:

I certainly do not say this is the only way, but this program works extremely well and efficiently for us at "*Barcaldine Downs*".

Duncan Ferguson

September 2010



“Laidlaw” Sheep Breeding Program

Buckles and Ann Peacey

Background:

“Laidlaw” is located 92km south/south west of Longreach. It has an average [rainfall](#) of 424mm.

The property is 15,069 hectares of mostly Mitchell grass downs with small areas of Gidgea woodland and with Boree and Whitewood dispersed throughout the property.

The property is watered by dams (some equipped and some open) depending on the season. There are some semi-permanent waterholes in Tocal Creek that last from a few weeks to a few months.

There are 3 sets of sheep yards - all paddocks join a set of yards.

The main enterprise on “Laidlaw” is Merino breeding and wool growing (medium to fine wool merinos) alongside a small Braford cattle herd when seasons permit.

Prior to 2002 we ran 1 sheep to 4 acres plus 250 breeders. Since 2002 the stocking rate has been reduced by $\frac{1}{3}$ or more.

By 2004, we had 3,000 ewes on dry lick plus cottonseed (not all year around).

Each year we aim to sell surplus and cast-for-age stock after shearing. This adjusts the stocking rate for the following year.



Pre-Joining Strategies:

- Rams are shorn October/November and are run in a small, good paddock. The rams are classed in full wool, are shorn once, and fed cottonseed if the season requires. Any wool-blind sheep are culled without exception. Usually treat ram's heads with Vetrazin immediately prior to joining.
- Maiden ewes are classed in October. Any sheep with 8 to 9 months [wool](#) growth that are wool blind are culled, along with any that do not meet our standards with regard to wool type, wool colour and conformation traits. The maidens are classed yearly with 25% to 30% taken out.
- Ewes are crutched in November. The past 8 years have been very dry and we have not had to drench or treat for fly in that time.



- We cross-wean all lambs at crutching (i.e. take weaners from one paddock and put them into another paddock with an unrelated mob of ewes). By doing this we have managed to avoid any of the problems associated with large mobs of weaners running together, i.e. animals perishing or under-utilising the paddocks.

Joining Strategies:

- We join after the first decent storms (falls of 50mm or better approximately 2 weeks after rain is received). December is our month of preference, although we have joined as late as March with good results. In 2009 we joined in November.
- Normal [joining percentage](#) is 1.5% to 2% and maidens are joined separately. After shearing, maidens are put back with mixed age ewes prior to lambing.
- There is no supplementation at joining, as we only join after decent rain. Feed is usually good with ewes on a rising plane of [nutrition](#). We have found this greatly improves their tendency to ovulate.
- If we [join](#) in December, rams are not removed until we shear in March. Although this may be regarded as a long joining period, in reality we have found the majority of ewes conceive within the first 2 cycles following introduction of the rams. I believe this is because we only join after receiving 50mm of rain or more, which induces the ewes to cycle. This practice, in turn, reduces the need to re-muster stock to remove the rams.

Lambing Strategies:

- More intensive predator controls.
- The decision to supplement or not: If the season is borderline, usually trial feed cottonseed at watering points to see if the ewes want the supplement. As we only join following 50mm of rain or more, the ewes are usually able to carry through. We continue to trial feed throughout the lambing period. If the cottonseed remains largely untouched for a couple of weeks, it is a good indication they do not need it. Conversely, if they have cleaned it up we start to feed regularly (every second or third day).
- The maidens are run with the older ewes during lambing.



Lamb Marking Strategies:

- Mark in small lots while in good order on their mothers (approximate mob sizes of 400 to 500). Where possible, lambs are let out into holding paddocks to mother up.
- Woody lambs are taken off, supplemented and processed at a later date when they are stronger.
- In poor seasons, a gas lamb detailer is used. [Tail length](#) is important (i.e. past tip of the vulva).
- The less chemicals used the better. Not interested in jetting sheep although will vaccinate for tetanus in better season. Vetrazin is applied to lambs only, at marking.



- No wetting and drying over the last 8 years (well below average rainfall years) except in the ram breeding groups.
- Our long-term average lambing is 74% which includes maidens. The older ewes rear approximately 80% and maidens range from 50% to 65%.
- Lambing percentages have averaged 74% (with maidens included) over past 13 years. Approx 25% to 27% of the ewes are maidens.

Other: Ram Breeding Groups

At “Laidlaw”, we have been breeding a selection of our own rams for the past 28 years. High fertility, reduced micron while maintaining fleece weights are mandatory qualities.

- We prefer plainer bodied sheep. Ewes have to rear a lamb every year or they are culled and only the best ram lambs are selected back into our breeding program. Approximately 20% of the top ram lambs are kept and joined each year.
- Breeding stock are not given any special treatment, and we purchase top sires every couple of years to introduce fresh bloodlines into our flock, with a preference for polls.

Lessons Learned:

- We have had good results from leaving weaners on mothers and feeding them together in the drought years.
- Sell cast-for-age ewes at 5 ½ years. This maintains a fertile line of ewes and allows us to get good money for those cast-for-age.
- Cull any wool-blind animals (without exception).
- Importance of maintaining a stocking rate to suit seasonal conditions.
- Always use lice control off shears.
- Rearing twins/triplets difficult in our semi-arid country unless conditions are perfect; prefer to have one good quality lamb.
- Prefer to wait until a break in the season before joining (50mm fall or better). We would rather get a smaller percentage of better quality lambs.
- Tail length is important.
- Due to the dry seasons haven't [vaccinated](#) or drenched for years. In good seasons will use 7 in 1 Glanvac at marking.
- Our country has been more suited to sheep due to run of dry seasons in recent years.

Year	% Lambs Weaned	Rainfall (inches)	Rainfall (mm)
1998	85	24	600
1999	75	31.6	790
2000	82	24.6	614
2001	77	19.6	490
2002	55	6.84	171
2003	40	12.2	305
2004	84	18.48 (12inches in one week)	462
2005	70	10.08	252
2006	85	12.52	313
2007	55	12.32	308
2008	86	13.4	335
2009	78	13.56	339
2010	Approx 90% (92% lambing)	29	725mm

33 year rainfall average - 424mm or 16.96 inches.



- Safer to lamb ewes on open waters rather than troughs. We lost 30 lambs at one trough in the middle of the day (courtesy of a chopper checking power lines).
- Important to keep an open mind to [new technologies](#) and information - it can only help us all in the long run.
- Use Vetrazin on lambs only. Have managed to control fly with crutching, and in 2010 brought shearing forward by 1 month.
- We prefer to run sheep on open waters. There are also troughs in every paddock however we shut these off unless the dams become boggy.
- When seasons are borderline allow ewes to indicate need to supplement or not by trial feeding throughout lambing.

Summing Up:

- Predator control all year round - lucky we have seen no evidence of wild dogs yet.
- Fortunately we have neighbours who control [lice](#) and predators.
- Just need to add reliable/regular precipitation!

Buckles Peacey

September 2010



Fundamental Nutritional Considerations for Grazing Sheep in Western Queensland

Désirée Jackson

Agri-Science Queensland, DEEDI

What makes a sheep unique?

Like cattle, sheep are ruminants. This means there are two major modes of digestion taking place in a sheep: microbial digestion and chemical digestion.

Ruminants have four “stomachs”. These consist of the: reticulum, the rumen, the omasum and the abomasum. The reticulum acts as a sieve, ensuring the particle size of feed consumed is small enough to enter the rumen. If not, the feed is regurgitated as bolus back into the mouth and re-chewed by the animal, then re-swallowed.

Once in the rumen, the feed is digested by microbes. The most common microbes are bacteria of which there are literally billions in the rumen. Fungi also become more important as the feed gets drier and sheep are having to graze more indigestible feed. Protozoa are parasitic, in that they do not break down feed for the animal but rather rob nutrients from the animal. Feed additives such as rumen modifiers are put into licks to reduce protozoa numbers in the rumen.

Rumen microbes have the unique ability to break down plant components that have a low digestibility, like cellulose. Monogastric animals, such as horses, do not have the ability to break down cellulose that ruminants do. In order for microbes to break down these plant components, they require nutrients as well, such as sufficient energy, protein and minerals. Once these nutrients become in short supply in the diet, the microbes’ capacity to do their job will be limited, and the sheep’s productivity will be reduced. This means both the rumen microbes and sheep must receive adequate nutrients in order for the sheep to be highly productive.

The microbes break down plant material, resulting in the production of volatile fatty acids, which are the main supply of energy to the animal. The microbes also continuously multiply, provided there is enough fibre in the rumen and the rumen is healthy. These microbes then become a major source of protein to the animal. Microbial crude protein can provide up to 70% of a ruminant’s protein requirement.

Plant nutrient levels

The nutrients that ruminants require most of are energy and protein. Ruminant energy and protein requirements are referred to as metabolizable energy (ME) and crude protein (CP).

Plants contain energy, protein, lipid, water and minerals. The levels of each of these nutrients vary with plant age, plant part and seasonal conditions. On a cellular level, nutrients are found at higher levels in the cell content fraction and at much lower levels in the cell wall fraction. As the plant ages, the relative proportion of cell wall increases. The cell wall is comprised of components such as lignin, cellulose and hemicellulose. Cellulose and hemicellulose can be digested to some extent by the microbes, however lignin is indigestible. This means that as a plant ages, its digestibility decreases.

Measuring the digestibility of a plant, or of the diet, is important because digestibility is strongly correlated with ME (metabolizable energy). As the digestibility decreases in the diet, ME also decreases. It is important to monitor ME because once it becomes deficient in the diet, sheep will lose weight rapidly.



Maximising pasture intake

As the digestibility of the diet decreases so does ME. A decrease in digestibility also results in a decrease in feed intake, so the total amount of energy and protein they receive from pasture also decreases. This is critical because even when sheep are fed supplements, the majority of their diet still comes from pasture. Because it costs us nothing to provide pasture to the sheep, the more pasture we can get the sheep to eat, the more CP (crude protein) and ME they will receive from the pasture. This is why the provision of urea-based supplements are so effective - not only do they provide nitrogen, but they also stimulate appetite and can lift feed intake by as much as 30%, provided the sheep consume enough urea and the pasture quality is still reasonable.



Feed intake of pasture will increase when:

- There is plenty of green leaf available to the animal
- Plenty of palatable standing feed
- High leaf:stem ratio in the plants, because leaves are much more digestible than stems
- Plenty of herbage available in the pasture

It is important to manage the grazing pressure to maximize diet quality and feed intake so reliance on supplements, and the associated expenses, is minimised.

Digestibility decreases rapidly in the early growing phases (Phase 1 and 2) of the plant. Once the plant begins to flower and senesce (Phase 3 and 4), the rate of decline of ME will level out, provided there is no spoiling rain or frost.

Supplementing breeding ewes for pasture deficiencies

Generally speaking, when plants are in their early growth phases, there is sufficient energy in the diet for all classes of sheep to gain weight. Once the plants begin to dry out and are in the latter growth phases, those ewes that are lactating or in late pregnancy will become energy-deficient. They will require an energy supplement to prevent weight loss and other potential health issues such as pregnancy toxaemia.

On tropical pastures, dietary crude protein tends to become deficient in the diet before energy. This is why supplements such as urea-based dry licks and blocks are effective early in the dry season. They provide nitrogen, which is completely degraded in the rumen and utilized by the microbes to manufacture microbial crude protein.

Once energy becomes deficient in the diet however, the sheep require an energy and protein supplement. This is because urea-based dry licks and blocks cannot provide sufficient amounts of energy because the intakes are too low. The exception is a high protein meal mix or grain mix that contain a very low level of urea (e.g. 3%) which enables high intakes.



Monitoring pasture quality versus diet quality

The digestibility and crude protein levels can be analysed in both the pasture and the diet. Samples of pasture can be taken and sent away for analysis for digestibility, ME and CP. It is important when collecting pasture that the sample is representative of what the stock are eating. This is difficult because we don't know the proportions of each plant species that stock are eating. Also, their grazing preferences change throughout the day and on a day-to-day basis. In addition, there are so many palatable species that can be growing in a paddock at once, it becomes even more difficult to pluck a sample representative of what the sheep are grazing. However, a pasture analysis will provide some indication of the quality of feed on offer to the sheep.

Diet quality can be measured through 'Faecal Near Infrared Reflectance Spectroscopy' (F.NIRS) analysis. A bulk faecal sample is collected from stock all of the same class, running in the same paddock. This dung sample is then dried and sent away for analysis. The F.NIRS results include:



- predicted dietary digestibility (from which ME can be calculated),
- predicted dietary crude protein
- the percentage of non-grass species (which could include browse, herbage, legumes and bushes) in the diet.

The drawback of F.NIRS analysis is that the calibration equations for the technology were developed based on pen-feeding studies of cattle, so

the reliability of F.NIRS results for sheep cannot be guaranteed.

If the diet quality for sheep is required then one option would be to get a diet quality analysis for cattle running in the same paddock or an adjacent paddock that is of similar land type. The diet quality for the sheep would likely be better because they are more efficient at selecting their feed. This is because sheep prehend (grab hold of) feed with their teeth whereas cattle use their tongues.

However, some producers have had F.NIRS analyses done on their sheep, and have found the information useful.

The benefit of a diet quality analysis is that it makes a prediction of the diet quality on the day the sample is taken. It provides an indication of the nutrients going down the animal's neck – not what is available in the paddock.

Often, weighing sheep is used as a means of determining animal performance. However, this only provides a historical performance and gives no indication of how that the sheep are performing on the day of weighing, so it is difficult to develop an appropriate nutritional management program based on this information.

Further information on collecting and preparing pasture and faecal samples for pasture analysis and F.NIRS analysis, respectively, can be obtained from a DEEDI beef or sheep extension officer.



Critical moments in nutritional management of breeding ewes

Last month of pregnancy

A ewe's ME requirement increases markedly in the last month of pregnancy. This sudden increase in ME requirement is further exacerbated by the reduction in rumen capacity due to the expansion of the growing uterus in the last month. This decreases the ewe's feed intake markedly. If the ewe is due to lamb in the dry season, then diet quality is likely to be low. It is no wonder then, that the incidence of pregnancy toxaemia (also known as preg tox) is much higher at this time of year. In addition, her CP requirement also more than doubles at the same time.

Producers who choose to lamb during winter (e.g. September) must be prepared to feed these ewes an energy and protein supplement every year, a month prior to lambing, to meet their requirements and to prevent the incidence of preg tox. Urea-based dry licks and blocks do not afford high enough intakes for the ewes to receive an adequate amount of energy. These licks are aimed at animals that have a protein deficiency. Once sheep become energy-deficient they require an energy supplement that is fortified with protein. Some examples of these feeds are: lupins, whole cottonseed and corn.

To determine when to provide these energy-based supplements, it is important to monitor diet quality. Making management decisions based on changes in animal body condition is a recipe for disaster. Once weight loss becomes visually obvious, the animals are usually losing weight very rapidly and it often becomes an expensive exercise to stabilise this weight loss.



Lactation

The ME requirement of a lactating ewe almost doubles again once she lambs and her protein requirement more than doubles. It is critical then, that dietary energy and protein meet her requirements or both she and her lamb will become survival risks.

Protein and energy requirements decline once the ewe is in her third month of lactation.

Effect of handling sheep in the yards on productivity

Does mustering sheep and putting them through the yards knock them around? If they have no access to roughage, it can have significant consequences. Once sheep are 12 to 24 hours' off roughage, the microbe numbers in the rumen begin to decline rapidly. This means the efficiency of the rumen decreases.

If the sheep are off pasture for more than 24 hours, there is a significant decrease in rumen function and sheep are at risk of "dead bellies". It can take up to three weeks for the rumen function to return to normal. If sheep are going to be held in yards for more than half a day, they should have access to hay or some form of roughage to ensure the integrity of rumen function. Whilst this may seem like an extravagance, the consequences of not providing sheep with adequate roughage will result in decreased productivity. Provision of roughage is a good investment with clear benefits.



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