Sheep nutritional requirements when grazing stubble

Crop stubble can provide a valuable source of nutrition to sheep in summer and autumn and help reduce the stubble load. The feed quality varies significantly - and supplements are often required. Animal health is a priority. Paddocks should always have sufficient ground cover to prevent soil loss from erosion.

Advantages of grazing stubble

Crop stubble provides a valuable nutrition source to livestock in summer and autumn.

Grazing stubble also has the benefit of reducing high stubble loads.

Grazing value of stubble

An adult dry sheep of 50 kilograms has a minimum daily requirement of:

- Seven megajoules (MJ) of metabolisable energy
- and six per cent crude protein.

Energy

The most important thing to consider when grazing stubble is the energy content of the diet. Most energy comes from carbohydrates in the diet.

Protein

Protein is the second most important criterion. Protein must still be included in the sheep's diet. Microbes in the rumen can break up protein to form new types of protein.

Digestibility

Digestibility is also very important. Digestibility determines the feed intake and energy value of the feed. Grain has higher digestibility than straw (see Table 1).

The maximum dry matter a sheep (or cow) can take in is two to three per cent of their body weight per day.

Sheep feed should have a minimum of 60 - 65 per cent digestibility. This means for every kilogram of feed consumed, 600 to 650 grams is used by the animal.

Animals will eat the most digestible parts first, i.e. grain and green shoots, and leave the least digestible parts last, i.e. straw and trash.

Roughage

A sheep's diet must also include at least 10 to 30 per cent roughage.

Roughage is particularly important for lambs in the first eight weeks of life, as it stimulates the proper development of the rumen and intestine.

Roughage also helps sheep produce saliva. This helps to lubricate food and provides a buffer to the acid produced when digesting food.

Value of feed in stubble

The value of feed in stubble comes from the amount of residual grain plus green plant biomass. This includes shot grain and summer weeds. However, modern grain farming practices have resulted in less grain being left behind and better summer weed control.

Farmers should be careful with the type of stubble being grazed and what state it is in.

Variation in stubble value

The feed value of stubble varies considerably between crop types and plant parts (Table 1). This feed value should always be compared back to the sheep's minimum daily feed requirements (e.g. a 50 kg adult dry sheep requires seven MJ metabolisable energy per day and six per cent crude protein).

Table 1: The average feed value of crop components.

Feed value	Wheat and barley stubble			Oat		Lentil	
	Grain	Green	Straw	Grain	Loose trash	Grain	Straw
DMD	82-87	59-73	38-40		40-41	92	36
ME	12.7-13.2	8.5-11.0	5.0-5.3	9.0-11.0	5.3	13.1	4.6
CP	9.5-13.5	15.9-18.7	1.2-2.8	6.0-12.0	2.0-4.0	27.5	6.7

DMD = dry matter digestibility, as percentage of dry matter; ME = metabolisable energy, as megajoules per kg dry matter; CP = crude protein as a percentage of dry matter. SOURCE: Grain & Graze website.

The value in stubble for feed varies between seasons.

While rainfall decreases digestibility, it also encourages the germination of seeds to provide a green feed source. Spring rains can also promote the development of late tillers which remain after harvest.

Dry seasons and heat damage mean residual grain has less energy, but the stubble can be more nutritious. Windy weather during grain filling can leave more residual grain.

Measuring the value of stubble

The feed value of stubble can be measured with a feed test. This is the only way to determine metabolisable energy and protein content. It can be difficult to measure accurately due to variability across paddocks.

Stubble value can also be determined by measuring sheep liveweight and monitoring body condition score. While these can be labour intensive, there are new innovations to increase the efficiency and ease in which sheep can be monitored including walk-over weighing, electronic ear tags and GPS tracking.

Timing of grazing

The best time to start grazing stubble is immediately after harvest. The quality decreases with time.

As a general guide, stock should be removed after six weeks. This, however, depends on a number of factors including the season, paddock size and stocking density.

Stock should be removed once grain and green shoots fall below 40 kg per hectare (or 4 g per square metre).

At least 50 per cent ground cover must be maintained to minimise the risk of wind erosion of the soil; 70 per cent ground cover will minimise the risk of water erosion.

Stock should also be removed immediately if animals are not maintaining weight.

A stock containment area can be useful used to protect soil and pastures resources during adverse seasons.

Further information on livestock nutrition can be found on: www.feedinglivestock.vic.gov.au

Licks and supplements

Stubble that lacks adequate nutrition can be supplemented by pellets or grain.

Calcium

Calcium is especially important for young growing animals and pregnant or lactating ewes.

Grain and stubble are low in calcium.

Many forms of calcium supplementation exist. It is easiest to put out limestone for sheep to consume *ad libitum*.

Calcium deficiency will lead to broken bones in young animals and ewes becoming cast when feeding lambs due to hypocalcaemia. Ewes can also prolapse due to inadequate calcium.

Adding salt to calcium encourages uptake. Limestone with the addition of five per cent salt solves the calcium and salt requirement.

Salt

Salt encourages sheep to drink more water. This results in:

- The sheep eating more and producing more, and
- Prevention of bladder stones and reduced incidence of heliotrope toxicity.

Trace elements: copper and selenium

While trace element deficiencies such as copper and selenium are sometimes a problem, only provide a supplement if symptoms are visible and a deficiency has been diagnosed. Supplementation can cause toxicity if not required and may lead to sheep deaths.

Copper deficiency can cause swayback disease in lambs. However, it is more common to see copper toxicity in sheep rather than copper deficiency. Cattle have a higher requirement for copper than sheep, so a cattle ration can lead to copper toxicity if fed to sheep.

Selenium is important for normal muscle function, growth, wool production and reproduction. Selenium levels can be determined by a blood test or post-mortem liver samples. Some vaccines and drenches contain selenium so always be wary of delivering excessive amounts particularly to young sheep which can result in toxicity and even death.

Vitamins

A lack of green feed can result in vitamin deficiency.

If concerned about vitamins, a Vitamin A, D and E drench (or injection) will last three months. Sheep are not likely to overdose on vitamins.

Vitamin A is required for eyesight. Vitamin D can be obtained from the diet or sunlight exposure and is important for calcium absorption across the gut. Vitamin E is important for muscles.

Urea

A urea supplement may sometimes be used where stubble is low in protein. It provides a source of nitrogen for microbes in the rumen to make protein.

In the long run, it is cheaper and more efficient to supplement with lupins or other grains. These are a more reliable way of increasing dietary protein.

It was previously thought that supplementation with urea could help to break down the structural carbohydrates (lignin) in the stubble by increasing the number of microbes in the rumen. More recent research has shown that urea supplementation has little to no impact on lignin breakdown.

Health issues with grazing stubble

When grazing sheep on stubble, it is important to be aware of the following potential health issues:

Water belly (Urinary Calculi)

Mineral imbalances and the low moisture content of stubbles mean that sheep especially wethers can develop bladder stones. This may result in water belly if the stones get caught in the urethra where they can cause partial or complete blockage and ultimately death if the bladder ruptures. Water belly can be prevented by providing salt in the diet which makes the sheep drink more. It can also be prevented by addressing the mineral imbalances in the diet - particularly with regard to calcium and phosphorus.

Grain poisoning

Sheep are at risk of grain poisoning when gorging food particularly stubble with a high grain content. Sheep should have full stomachs before being first introduced to a stubble paddock, or they can gradually be introduced to the stubble by initially limiting the time they are allowed to graze or by grazing the stubble in cells.

The sheep that most often succumb to grain poisoning are the largest sheep as they tend to eat more of the grain.

Thiamine deficiency/polioencephalomalacia

Stubble tends to be low in thiamine (Vitamin B1). In addition, stubble diets encourage the growth of thiaminase-producing bacteria in the rumen, further depleting available thiamine and leading to thiamine deficiency.

Thiamine is essential for brain functioning. Sheep with thiamine deficiency become dopey and will stargaze. They may look blind.

Some sheep will respond to thiamine injections, but others do not recover.

Nitrate or nitrite poisoning

Some stubble types have high levels of nitrate, which can lead to nitrate and nitrite poisoning.

High nitrate can irritate the stomach wall and intestine, leading to stomach cramping, scours and diarrhoea.

Nitrite poisoning is worse and can be caused by high levels of nitrate entering the bloodstream. Nitrite poisoning results in a compound forming with haemoglobin and preventing oxygen being carried in the blood.

Most animals are found dead. Others may be seen having difficulty breathing, gasping for air, and staggering prior to collapsing, convulsing and ultimately dying.

A coffee brown discolouration in the mouth due to the change in colour of the blood is a sign of nitrite poisoning. However, this is only evident for a short period of time as the blood will return to its normal colour

Lupinosis

Lupinosis is caused by the toxin from a fungus living on lupin stubble.

The toxin causes massive liver damage when ingested by a sheep. The animal gradually becomes more unwell as the liver failure progresses. The eyes and mouth become yellow (jaundice).

Worms

Worms in sheep make them susceptible to many other health problems. Lambs and pregnant ewes are most susceptible to worms.

The only way to accurately measure the worm status of your sheep is to conduct a worm egg count. Sheep should be contained to obtain the best fresh faecal samples. These tests can be undertaken through a veterinary clinic or stock agent. The cost is low relative to the cost in lost production and the cost of drenches.

Drenching programs should always be approached strategically.

ACCESSIBILITY

If you would like to receive this publication in an accessible format, please telephone Department of Jobs, Precincts and Regions, Agriculture Services Horsham on 5362 2111.

This document is also available in (insert HTML and/or PDF and/or Word) format at https://agriculture.vic.gov.au

AGRICULTURE VICTORIA

AGRICULTURE VICTORIA