

# Sheep Notes



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Welcome to the autumn edition of SheepNotes. We hope you find some articles of interest and relevance to your farming enterprise. After a challenging spring for many, we have included articles on animal health issues and feed testing. We are pleased to promote the BestWoolBestLamb conference is definitely back on this year and celebrating 25 years. Early bird packages promise to be very worthwhile.

Please consider subscribing to the digital version of this newsletter by going to <https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter> and let one of us know if you no longer need to receive the hard copy version.

*Jane Court and Jeff Cave, Agriculture Victoria*

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## Pneumonia in sheep

*Dr Joan Lloyd, Joan Lloyd Consulting*

*Dr Joan Lloyd recently presented in the series of BestWoolBestLamb and BetterBeef roadshows in regional Victoria. She has also presented at a BestWoolBestLamb conference on arthritis.*

### Pneumonia

Sheep and other ruminants are anatomically predisposed to pneumonia through the rumen pressing on the diaphragm, resulting in shallow breathing. Pneumonia and pleurisy in sheep are referred to as Ovine Respiratory Complex or ORC for short. Pathogens commonly involved in ORC include the bacteria *Mycoplasma ovipneumoniae*, *Mannheimia haemolytica* and *Pasteurella multocida*, and two viruses, Parainfluenza-3 virus and Respiratory syncytial virus. In Australia, ORC is often called Summer Pneumonia. Marking, weaning, hot dry weather, raised dust, summer storms, the first shearing and grain feeding can be stressful for lambs, contributing to outbreaks of the disease.

*Continued on page 2*



## How common is it?

An abattoir survey of ORC pathogens funded by Animal Health Australia and Meat & Livestock Australia was completed in March 2022. Twenty-four abattoir visits were conducted between October 2020 and December 2021, with 1,095 samples collected from diseased ovine lungs. The samples represented 253 abattoir lots, including 182 lots of lambs and 71 lots of adult sheep. Across all the abattoir visits, 64.4 per cent of sampled abattoir lots tested positive for *Mycoplasma ovipneumoniae*.

*Mycoplasma ovipneumoniae* was first isolated from two large sheep flocks in southern Queensland in the 1960s that had shown poor growth rates and reduced exercise tolerance for some years. Mycoplasmas are a type of bacteria. Infection with *Mycoplasma ovipneumoniae* predisposes sheep to secondary lung infection with other bacteria such as *Mannheimia haemolytica* and *Pasteurella multocida* that normally live in the nose and throat without causing any harm.

Once in the lungs these bacteria grow and secrete toxins that cause inflammation and lung tissue destruction. All breeds of sheep are susceptible to infection with *Mycoplasma ovipneumoniae*. Infection persists in a flock in chronic carrier ewes and rams, with infection passing from ewes to lambs soon after birth. Ewes shed the bacteria from their nose and throat, as well as in their milk.

## Symptoms

Infected ewes and rams may show no outward signs of infection, or may be coughing, wheezing, have runny eyes, breathe heavily after exertion or simply be found

dead. Lambs may begin showing signs of infection (wheezing, coughing, runny nose, runny eyes, difficulty suckling) from one to two months of age. Some lambs may develop swelling of the carpal (knee) joints. Obvious signs of clinical pneumonia may not be evident for some months until the damage to lungs is much further advanced and the demands on the lungs for oxygen or heat exchange is increased by high summer temperatures or exertion.

## Pleurisy

The pleura is a thin membrane that covers the outside of the lungs and the inside of the chest cavity. When animals have pneumonia, the pleura can become inflamed. Approximately 20 per cent (one in five) sheep that have pneumonia from *Mycoplasma ovipneumoniae* infection will develop pleurisy. Pleurisy is a problem in sheep processing plants because it makes it difficult to eviscerate the carcase. Dr Lloyd's previous research has shown that trimming for pleurisy results in an average one kg per carcase loss to producers. In addition to lost carcase weight will be the financial penalty to some producers from the trimmed carcase no longer being within specification. Losses are highly leveraged to the processor as high value cuts and the on-floor costs incurred by the abattoir in handling affected carcasses. Insert Pic of pleurisy on lungs

## Diagnosis and treatment

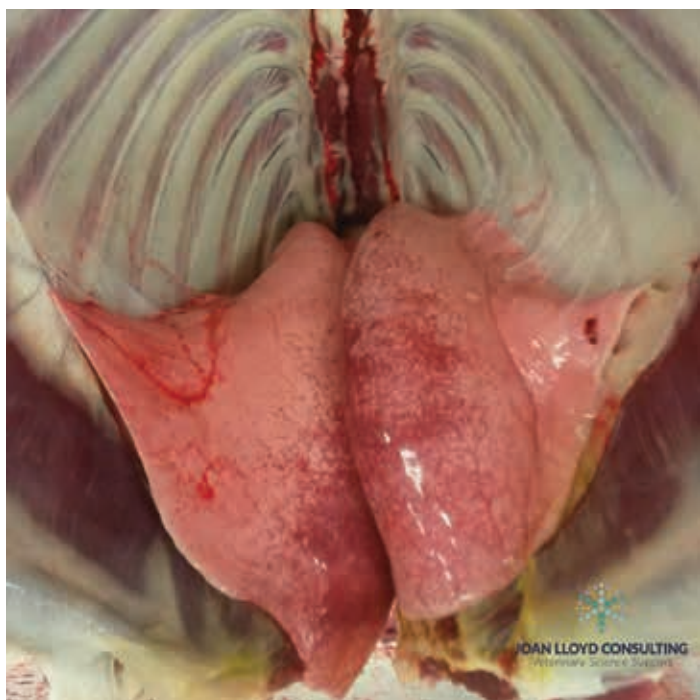
In the 1970s researchers in Victoria suggested that nasal swabs could be a useful way to monitor sheep for respiratory pathogens. Today, PCR tests and new sample collection technology makes nasal swab monitoring even more useful.

*Mycoplasma ovipneumoniae* is often introduced onto a farm with newly purchased animals. Testing for *Mycoplasma ovipneumoniae* and/or asking questions about the infection status of newly purchased animals can help to stop spread onto the farm.

The PCR test developed for the abattoir survey and the innovative Genotube Livestock Swab for collecting PCR samples from livestock is a good way to screen newly purchased animals. Collecting nasal swabs from sheep is straightforward and farmers can collect samples themselves. PCR testing costs less than \$200, which is a good investment compared to the cost of controlling summer pneumonia in infected flocks. Samples can be tested individually or in pools of up to five samples.

When detected early, infection with *Mycoplasma ovipneumoniae* can be treated. Chronic infections are more difficult to treat. Treatment requires the strategic use of antibiotics, culling animals that don't respond to treatment and trying to keep infected and uninfected animals separate.

◀ *Pleurisy in lambs*





# Global eradication of peste des petits ruminants – a globally important disease of sheep and goats

*Alison Lee, Agriculture Victoria, Warrnambool*

The detection of both Foot-and-mouth disease (FMD) and Lumpy skin disease (LSD) in Indonesia last year served as a reminder of the ever-present risk of an emergency animal disease (EAD) incursion within Australia. Clearly, EADs impact our export markets, affect animal health, welfare and productivity, and the cost of responding to an incursion is usually substantial.

Wouldn't it be tremendous if we could globally eradicate EADs so they no longer posed a risk to Australia, like we did with smallpox in humans? Well, the good news is this has been done previously in the livestock industries. In June 2011, the cattle disease, rinderpest was officially recognised as eradicated from the globe. Rinderpest was a highly contagious disease of cattle and buffalo, with death rates often as high as 100 per cent. Eradication was achieved through hard work, dedication and perseverance in many countries, and Australia is a beneficiary of this accomplishment.

You may be aware that a closely related disease to rinderpest occurs in sheep and goats. This disease is called peste des petits ruminants (PPR), sometimes also referred to as sheep and goat plague. Unlike rinderpest, it hasn't yet been eradicated. Since first being reported in western Africa about 70 years ago, PPR has spread widely around the globe. PPR hasn't been reported in Australia to date, but it has spread exponentially in recent years, and is now present in over 70 countries throughout Asia, Africa, the Middle East. It reached Europe as recently as 2016. This disease has a considerable impact on rural economies and the livelihoods of farmers where present.

Although the risk of an incursion of PPR in Australia is considered lower than some of the more commonly referred to EADs, such as FMD, it would be naïve to consider ourselves 'safe' from an incursion. An outbreak of PPR in Australia would result in



▲ Vaccinating goats as part of the PPR global eradication program (Copyright FAO/Luis Tato)

significant animal welfare issues and enormous economic losses within the Australian sheep and goat industries, processing sectors and the general community. Goats tend to be more severely affected than sheep, with signs ranging from high fever, conjunctivitis, respiratory disease, severe diarrhoea, abortions, and death. Clinical signs in sheep have been reported to be similar but generally less severe than goats. As the Australian sheep and goat population is naïve to PPR, clinical signs in both species may be equally severe.

PPR virus doesn't survive long outside its host, therefore spread is usually via the movement of infected sheep or goats. Australia's strict biosecurity requirements reduce the likelihood that PPR would enter via live animals. The illegal importation of semen and embryos is likely to pose the highest risk for an incursion.

The good news for the sheep and goat industries is following the successful eradication of rinderpest, efforts are now being directed towards the global eradication of PPR. Developed in 2015, the Food and Agriculture Organization of the United Nations (FAO) and the World

Organisation for Animal Health (WOAH) oversee the PPR Global Eradication Program. The program relies heavily on disease surveillance and the large-scale vaccination of sheep and goats. Despite the widespread global distribution of PPR, the program is committed to eradicating PPR globally by 2030. Recent events, such as the COVID-19 pandemic, have hindered progress due to logistical issues and increased costs associated with the transportation and delivery of PPR vaccine. However, the program continues with the aim that PPR may be another disease of only historical significance within the next decade.

You can learn more about the eradication of PPR at [woah.org/app/uploads/2021/03/ppr-global-strategy-avecannexes-2015-03-28.pdf](https://woah.org/app/uploads/2021/03/ppr-global-strategy-avecannexes-2015-03-28.pdf)

*If you suspect PPR (or any other EAD) in your flock, please call your local Agriculture Victoria veterinarian or the Emergency Animal Disease Watch Hotline (1800 675 888) immediately. We would much rather exclude many EADs in suspected cases than miss the one important confirmed positive case!*

# How good is that feed – interpreting a feed test

*(adapted from Chapter 3 in the Sheep Drought Feeding Book on the FeedingLivestock website)*

Feeds vary considerably in their nutritional value depending on growing conditions, stage of harvesting and storage conditions. It's difficult to judge the quality of a feed visually, so it's important to have feeds analysed to get an objective measure of the quality so you can estimate its value and how much you will need.

The main feed components that can be tested are energy, protein, fibre and dry matter.

## Energy

As energy is the main requirement of livestock, knowing the metabolisable energy (ME) values of different feeds is important for two reasons:

- Calculation of the amount of feed required to meet production targets is only possible when the energy value of the various feeds that make up a ration is known
- Deciding to buy feed should be based on the cost per unit of energy rather than the cost per tonne.

A feed analysis report will report on metabolisable energy (ME), expressed as megajoules per kilogram dry matter (MJ/kgDM), sometimes also written as MJ ME/kgDM.

ME is the amount of energy in the feed that is available to sheep for use. It involves measurement of energy excreted in faeces, urine and exhaled as methane. This requires specialised equipment and, in Australia, is not available as a direct measure. Instead, it is calculated based on the digestibility of a feed. Table 1 shows how the energy value can affect the actual cost and the implications for not knowing.

**Energy** – the amount you need to feed will be dependent on how much energy is in the feed. However, if the energy content is too low (and the NDF too high) then the animal may not be able to eat enough. See Useful Tables for sheep (or beef) on the FeedingLivestock website for animal requirements for energy and protein. [feedinglivestock.vic.gov.au/sheep-resources/useful-tables-sheep/](https://feedinglivestock.vic.gov.au/sheep-resources/useful-tables-sheep/)

## Protein

Protein is measured as crude protein as a percentage of dry matter. Protein contains nitrogen, and this is used to estimate the protein content of feeds. A portion of the nitrogen in feed is non-protein nitrogen (nitrates, ammonia and urea); crude protein is a measure of both this and the true protein (amino acids).

Crude protein values give a good indication of whether or not a particular feed will satisfy the protein needs of an animal. Some supplements, such as grain legumes,

are high in protein and will be useful if they are cost effective and practical. Supplements that are likely to be low in protein include cereal hays, straws, low-quality pasture hays and some cereal grains. Protein can range from six to 19 per cent in hay. Silage can show similar variation, and in the case of cereal grains, protein can vary from five to 16 per cent. Lupins are very high in protein and are often added to a cereal grain to increase the protein level of the diet.

Forms of non-protein nitrogen such as urea can be used to increase the rate of digestion of high-fibre feeds such as hay and straw. However, caution is needed as products such as urea can be toxic if consumed in large quantities. In general terms, at least two-thirds of an animal's crude protein intake should be provided as true (natural) protein. That is, not more than one-third of the crude protein should be represented by non-protein nitrogen (NPN). These additives should not be included in levels above two per cent of the diet.

**Protein** – selection of feeds that will meet animal requirements will be dependent on the percentage of crude protein in the diet. For example, if feeding as a sole ration, the protein requirement needs to be at least seven per cent protein for maintenance or above 12 per cent for lactation or growth. See Useful Tables for sheep (or beef) on the FeedingLivestock website for animal requirements for energy and protein. [feedinglivestock.vic.gov.au/sheep-resources/useful-tables-sheep/](https://feedinglivestock.vic.gov.au/sheep-resources/useful-tables-sheep/)

## Fibre

Neutral detergent fibre (NDF), as reported via a feed analysis, is a measure of all the fibre (the digestible and indigestible parts) and indicates how bulky the feed is. It is reported as a percentage of dry matter.

A high NDF will mean lower intake. Conversely, lower NDF values lead to higher intakes and tend to have higher energy values. Too little fibre can result in acidosis, as the feed is digested too quickly and the rumen isn't able to function properly. Low-fibre, high-starch diets (grains) cause the rumen to become acidic. The fibre levels of most high-starch grains are generally low. Oats and lupins are both generally higher in fibre and lower in starch. This is why these grains are generally much safer to feed than the cereal grains. Oats are the safest and highest-fibre cereal grain with 29 per cent NDF, compared with barley at 14 per cent NDF and wheat at around 11 per cent NDF.

Cereal grains can be feed in large amounts for long periods very safely, but slow introduction is the key.

*Continued on page 5*

**NDF** – beef cattle need about 30 per cent in the diet as optimal but the level is not well known for sheep and is rarely limiting on pasture. The NDF can be used to estimate how much an animal can eat. The maximum percentage of a sheep's liveweight that they can eat is 120/NDF. Therefore a feed with an NDF of 50 per cent means an animal could eat 2.4 per cent of their liveweight (for a 60 kg animal that is 1.44 kg they can eat per day).

## Dry matter

All measurements of energy and protein are made on a dry matter basis so feeds of different moisture contents can be compared. Dry matter is the amount of feed left after all the water in the sample has been removed by oven drying. It is expressed as a percentage of the original sample.

Silage has a high moisture content and is around 45 per cent dry matter. This means one tonne of silage has only 450 kg of dry matter and 550 kg of water. Grain has a much lower moisture content, at about 90 per cent dry matter. This means one tonne of grain has 900 kg of dry matter and only 100 kg of water.

Knowing the dry matter percentage enables you to work out how much feed to provide to meet the energy requirements of the stock.

Example: If silage has an energy level of 11 MJ ME/ kg DM, how much silage do you need to feed 10 MJ ME of energy?

Silage required:

$$\begin{aligned} 10 \text{ MJ ME} \div 11 \text{ MJ ME/kgDM} &= 0.9 \text{ kgDM} \\ 0.9 \text{ kgDM} \div 0.45 \text{ (silage 45\% dry matter)} \\ &= 2 \text{ kg as fed} \end{aligned}$$

## Other components of a feed analysis

**Moisture** – measured as a percentage of the original sample, it is the amount of water in the feed. It is what is taken out to give the dry matter reading.

**Digestibility** – is provided on a feed analysis report as DDM (Digestible Dry Matter) or DMD (Dry Matter Digestibility), depending on the company doing the analysis, and is reported as a percentage of dry matter. It is the percentage of the dry matter actually digested by the animal. High-quality feeds will have a figure over 65 per cent. Feeds below 55 per cent are of poor quality and even if sheep are given free access, they will be unlikely to be able to maintain their live weight if it is supplying all of the diet.

**Digestibility of organic matter** – DOMD is a calculated figure and is expressed as a percentage of dry matter. It is a measure of the digestibility of the organic component of the feed and takes into account the inorganic component (referred to as ash) such as sand, dirt and clay that may be present in the sample.

**Acid Detergent Fibre** – ADF is reported as a percentage of dry matter. It estimates the proportion of feed that is indigestible to stock (mainly cellulose and lignin). Feeds with a low ADF are high in energy, and those with a high ADF are low in energy.

**Ash** – is reported as a percentage of dry matter and is the inorganic portion that is not utilised by the stock. It is any sand, dirt and clay present in the sample.

**Fat** – expressed as a percentage of dry matter, is a measure of the lipid content of the feed. If the diet of sheep is too high in fat (i.e. greater than five per cent), intake will be reduced.

**Water soluble carbohydrate** – WSC is reported as a percentage of dry matter and is a measure of the total naturally occurring sugars in the feed. The sugars are a highly digestible source of energy for the rumen bacteria and therefore the sheep.

*Note: Not all companies test and report on the same components. Metabolisable energy, protein, neutral detergent fibre and dry matter are key components to have tested.*

When sourcing feeds, ask for the feed analysis before you buy. If a test is not available, it may be possible to get a sample and send the test off yourself before deciding whether to buy. If you buy feed without a test, it is still worth taking a sample and getting a test done so that you can fine tune your rations and assess whether all requirements are being met.

There are a number of companies in Victoria that do feed tests and can provide follow-up advice if needed. Three are listed below and their websites will provide details about how to sample, costs involved, how to access sampling kits and payment methods.

**FEEDTEST**<sup>®</sup>, PO Box 728, Werribee Vic 3030  
Ph: 1300 655 474, Email: [feed.test@agrifood.com.au](mailto:feed.test@agrifood.com.au)

**Livestock Logic**, 60 Portland Rd, Hamilton Vic 3300,  
Ph: (03) 5572 1419, Email: [feed@livestocklogic.com.au](mailto:feed@livestocklogic.com.au)

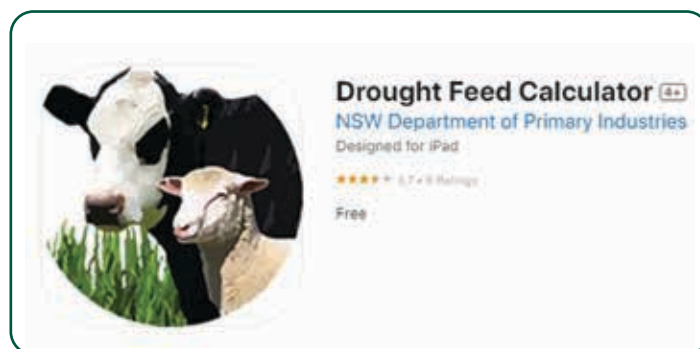
**Feed Central**, 38 New Dookie Road Shepparton VIC 3630,  
Ph. (03) 5823 0000,  
Email: [info@feedcentral.com.au](mailto:info@feedcentral.com.au)

## Tools to help

To save doing the maths by hand there are some simple tools to help you make feed comparisons and look at simple cash flow and amounts over time.

For example, the NSW Drought Feed Calculator is an app that allows you to enter three feeds with their Dry Matter, energy and protein contents and the price per tonne. Enter the livestock you want to feed, liveweight, period of feeding and number of animals and it will give you quick outputs of the amount and cost for each feed (including a mix). As an example, I put in four feeds to compare the cost to feed a mob of 3000 dry ewes (60 kg liveweight) for 60 days. Table 1 shows the feeds I used and the calculated cost and amount required to feed (as a full ration).

Table 1 shows that in this example, Feed 2, as a high quality oat sample, is the cheapest feed at 2.62 c/MJ which translates to a total cost of \$36,109 for a full ration over 60 days. This is \$19,000 cheaper than the oats with a poorer feed quality. This means that without a test, you could be vastly over or underfeeding (by 30 per cent). Whilst the lupins (Feed 3) had a very high protein content, as a sole feed the cost to feed the energy required makes it expensive at \$12,000 more in total cost than Feed 2, but could be useful to boost protein levels of low protein feeds. The hay sample (4) is the most expensive (despite the lowest cost per tome) because of the low energy value and note that the protein level is insufficient. Hays vary enormously and in this season's



report the range for grass hay was 4.4 to 11.6 ME and <0.5 to 20.4 per cent CP, just illustrating the substantial savings and losses to be made.

## Animal requirements

For comprehensive tables on what different livestock require, visit the FeedingLivestock website ([feedinglivestock.vic.gov.au](http://feedinglivestock.vic.gov.au)) and look at Useful Tables (for both beef and sheep) or use the tables in the sheep or beef Drought feeding books from your library or on the website. Some of the calculators like the NSW Drought Feed Calculator or the Drought and Supplementary Feed Calculator (which you can access on your computer if you prefer) will have these tables built in.

Watch a video – *Feed testing – making sense of the numbers and how you can use them* – available on the FeedingLivestock website.

Table 1. Example of four supplement comparisons to feed 3000 dry ewes (60 kg liveweight) for 60 days

The feed tests results in this table have been sources from actual ranges of samples tested at the FEEDTEST laboratory in the 20/21 season

	Feed 1 Oats	Feed 2 Oats	Feed 3 Lupins	Feed 4 Pasture hay
Cost \$/Tonne	\$330	\$330	\$450	\$300
Energy (ME)	10	14	14	8
Protein (CP)	8%	12%	30%	7%
Dry Matter	90%	90%	92%	88
Amount required to feed per head per day	0.93 kg	0.61 kg	0.59 kg	1.24 kg
Total amount required to feed	167t	109t	107t	224t
Total Cost	\$55,110	\$36,109	\$48,170	\$67,071
Costs per MJ	3.67	2.62	3.49	4.26
Comment	Protein inadequate for growing or lactating animals		High protein, but expensive energy	Protein level is below maintenance



# Poultry Litter – keep livestock away

Hayden Morrow, Agriculture Victoria, Bendigo

Variant Creutzfeldt-Jacob Disease (vCJD) is a fatal human degenerative brain disease. Overseas humans consuming meat affected with 'Mad cow disease' (classical BSE) has been linked to vCJD cases.

BSE and Scrapie which affects sheep, are known as transmissible spongiform encephalopathies (TSE's). Due to TSE's potential impact on human health markets are very sensitive to their occurrence. Brazil recently reported a case of atypical BSE which is a rare condition that can arise sporadically in older cattle. It has a lower transmission risk than classical BSE. Despite this Brazil has still needed to temporarily suspend exporting beef to China.

Ruminants consuming restricted animal material (RAM) is known to be a risk of transmitting TSE's. RAM is defined as any material taken from a vertebrate animal other than tallow, gelatin, milk products or treated oils. It includes rendered products, such as blood meal, meat and bone meals, fish meal, poultry meal, eggs, feather meal, and compounded feeds made from these products.

In Victoria an order made under the *Agricultural and Veterinary Chemicals (Control of Use) Act 1992* prohibits a person from offering for food or failing to reasonably

**prevent exposure of ruminants to RAM.** This means if ruminants are exposed to RAM including poultry litter stockpiles that person could be prosecuted. In addition, ruminants that have been exposed to RAM are no longer eligible for LPA accreditation and are given a RAM status on the NLIS database. This will affect the marketability and processing costs of the livestock.

Poultry litter includes feathers, parts of carcasses and sometimes meat and bone meal, thus it is considered RAM. When using poultry litter on farms, livestock must never have access to stockpiles. Inquisitive livestock will consume poultry litter if given access, use fencing to prevent their access. In addition, livestock must not graze until pasture has grown well above the manure or a minimum of 21 days after spreading manure. Sometimes pasture growth can be slow and significantly more than 21 days is required.

**Protect our international trade and never let ruminants have access RAM including stockpiles of poultry litter.**



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## Farm debt mediation – because your farm is your business

In Victoria, banks and other creditors must offer to undertake mediation with farmers before they can initiate debt recovery on farm mortgages.

Farm debt mediation is a structured negotiation process where a neutral and independent mediator assists the farmer and the creditor to reach an agreement about current and future debt arrangements. The service is low cost (\$195, per party), confidential, and independent and can help avoid the costs and other consequences of expensive and potentially unnecessary litigation.

The Victorian Small Business Commission (VSBC) manages all aspects of the Farm Debt Mediation Scheme with aquaculture, forestry, and timber production businesses now also protected.

For more information call the VSBC on 1800 878 964, or [enquiries@vsbc.vic.gov.au](mailto:enquiries@vsbc.vic.gov.au) or visit [vsbc.vic.gov.au](http://vsbc.vic.gov.au) and search 'farmers'.



**Farm debt mediation**

**Because your farm is your business**

If you're a farmer, aquaculturist or forester facing financial difficulty, support is available to help resolve matters relating to farm debts.

Under Victorian law, banks and other creditors must offer to undertake mediation with you before they can start debt recovery on a farm mortgage.

Contact the Victorian Small Business Commission on 1800 878 964, [enquiries@vsbc.vic.gov.au](mailto:enquiries@vsbc.vic.gov.au) or visit [vsbc.vic.gov.au](http://vsbc.vic.gov.au) and search 'farmers'.

Victorian Small Business Commission

**AGRICULTURE VICTORIA**

# Understanding methane from livestock

Jane Court (Agriculture Victoria), Ainslie Macdonald and Richard Eckard (University of Melbourne)

As part of the CN30 Pathways project

## The carbon cycle in the livestock system:

Figure 1 shows the carbon cycle in a livestock grazing system, showing carbon (as C) existing in different phases in the system – as a gas ( $\text{CO}_2$ ) and as a carbohydrate in plants (CHO). Plants capture  $\text{CO}_2$  from the atmosphere via photosynthesis to produce plant material as carbohydrate (CHO), which livestock eat for maintenance and production of food and fibre. The main carbohydrate is cellulose as the largest energy source on earth. This ability to digest cellulose in plants is one of the key attributes of ruminants. They can use a largely indigestible energy source to maintain themselves and produce meat, milk and fibre.

Most of the carbon digested by the animal is respired back into the atmosphere again as  $\text{CO}_2$  and the products produced and consumed by humans are similarly respired back into the atmosphere (as  $\text{CO}_2$ ) over a 12 month period.

If that was all that happened the cycle would be completely in balance, with all the carbon absorbed and returned to the atmosphere in the same form.

BUT, some of the carbon that the animal consumes is turned into methane ( $\text{CH}_4$ ) and belched out as a gas into the atmosphere (Figure 1). Two key characteristics determine the impact of different greenhouse gases on the climate: the length of time they remain in the atmosphere and their ability to absorb energy. Methane has a much shorter atmospheric lifetime than carbon dioxide ( $\text{CO}_2$ ) – around 12 years compared with centuries for  $\text{CO}_2$ . After 12 years methane breaks down into  $\text{CO}_2$  and water. However, the other key issue is its contribution to warming while it is in the atmosphere. Methane absorbs much more energy while in the atmosphere – over a 20-year period, it is 80 times more potent at warming than  $\text{CO}_2$ .

The emitting of methane makes the carbon cycle 'imbalanced' in its contribution to warming.

## Methane sources and cycle

Methane is emitted into the atmosphere by a number of sources (Figure 2). These include natural sources (volcanoes and wetlands); fossil fuel production (e.g., oil, gas and coal extraction); from agriculture (e.g., livestock) and landfill. Fossil fuels are the largest emitters followed by ruminant livestock (e.g., sheep, goats and cattle).

Natural (Naturogenic) methane is not targeted for emissions reduction as these emissions aren't caused by human actions. Methane from agriculture (biogenic) is created from  $\text{CO}_2$  already part of an otherwise balanced carbon cycle. Whereas fossil methane isn't and therefore fossil fuel production contributes additional  $\text{CO}_2$  into the atmosphere once it is broken down, which is taken account of in total greenhouse gas emissions and warming potential.

Methane from all sources has the same significant absorption of heat from the atmosphere while it is there. The heat that methane absorbs during its lifetime is primarily transferred to the ocean, stored in the deep ocean, where it will continue to contribute to climate change for centuries after methane has broken down. Long-term, this heat significantly contributes to increases in global average temperatures.

So, in considering a constant sheep or beef herd over a 12 year period all the methane belched out in year one, has by year 12, been reverted back to  $\text{CO}_2$ . Theoretically then, they are not putting any 'new' methane into the atmosphere. However, the methane has contributed to global warming while in the atmosphere and continues to beyond its lifetime and therefore can't be ignored. In other words, with stable livestock numbers the amount methane in the atmosphere might be constant (i.e., no new direct warming) but heating potential has been cumulative into the ocean over this time – the damage is done and continues to do so.

The Global Methane Pledge is a non-binding agreement signed by 150 countries including Australia, which aims

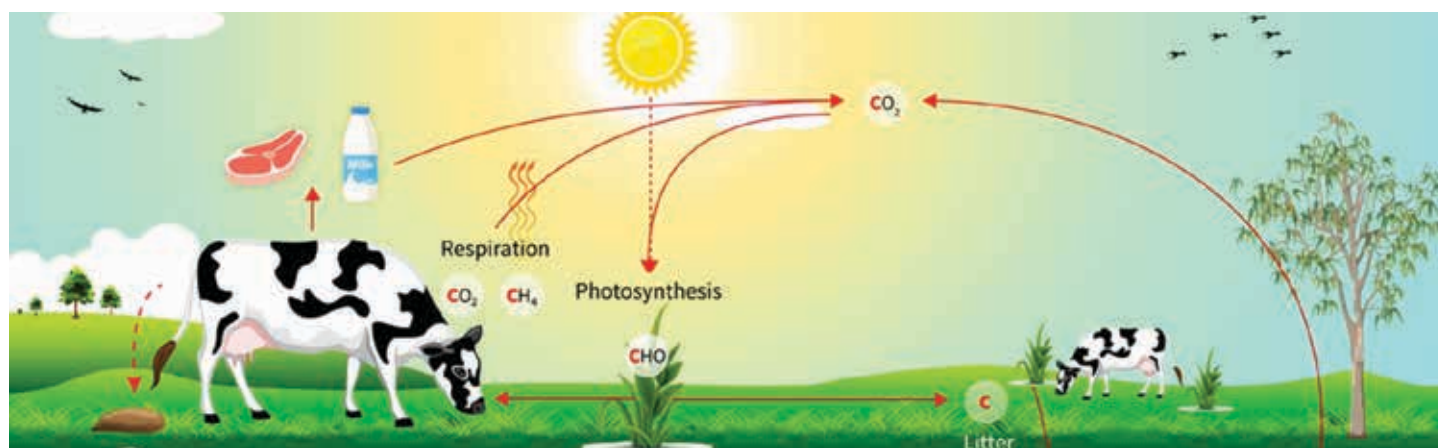


Figure 1. The carbon cycle in a livestock system showing Carbon (C) in different phases – as a gas ( $\text{CO}_2$ ) and as a carbohydrate in plants (CHO)

Continued on page 9



**“Every emission of methane makes the planet warmer, regardless of whether it arises from fossil fuel or biological sources.”** – Professor Mark Howden, Vice Chair of the IPCC.

to reduce methane to keep net global increases in temperature below two degrees Celsius. However, unlike CO<sub>2</sub> emissions, radiative forcing shows that methane does not need to be zero to keep the rise in global temperatures below two degrees Celsius, it just has to be reduced. Radiative forcing measures the impact of all greenhouse gas emissions by the amount of radiative energy they capture in the earth’s atmosphere, to determine the impact of greenhouse gas emissions on global warming.

This method was used to develop the Methane Pledge’s target of 30 per cent less methane by 2030 and the New Zealand target of 47 per cent less methane by 2050. This acknowledges that methane is different to carbon dioxide, and due to its short life and potency, methane can be reduced and have the same impact as sources of carbon dioxide reaching carbon neutrality (i.e., net zero). The Methane Pledge also identifies the energy sector, not agriculture, as the sector with the greatest potential for emissions reductions by 2030.

At an industry level the Australian red meat industry has set a target to be carbon neutral by 2030, not a requisite for every farmer. As a target to aim for, they are stimulating research and development (both public and private) to help the livestock industries reduce methane emissions. The most promising technologies are dietary supplements, most appropriate for intensive feeding but early life programming, vaccines, and genetics are being explored for grazing systems. **Livestock producers won’t be able to significantly reduce or eliminate methane without new technology.**

However, supply chains are driving the demand for lower emission meat, milk and fibre and this is generally for lower emission intensive products i.e. lower emissions per unit product rather than total emissions. Management practices that achieve this are doable and generally

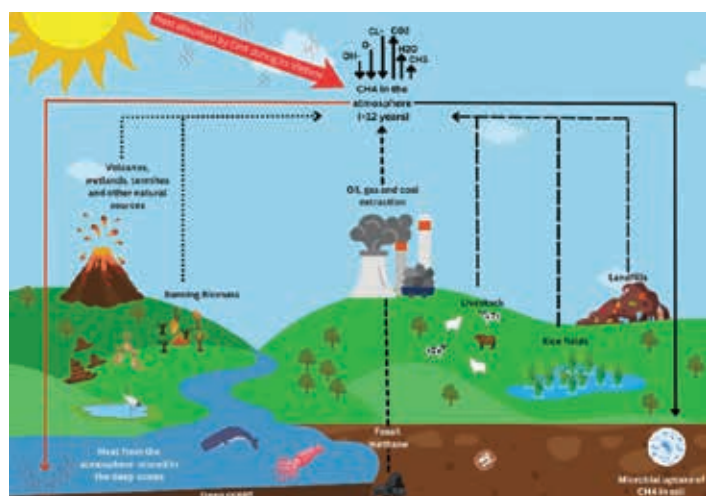


Figure 2. The life cycle of methane (CH<sub>4</sub>) from different sources as natural sources (volcanoes; wetlands etc); fossil fuel (oil; gas and coal extraction); from agriculture (livestock and rice fields) and landfill. CH<sub>4</sub> breaks down after approx. 12 years to CO<sub>2</sub> and H<sub>2</sub>O but whilst in the atmosphere it absorbs significant amounts of heat which is primarily absorbed by and stored in the deep ocean.

no-regrets options that increase productivity such as reproductive efficiency and focussing on productive animals and pastures.

## Key messages

- A key value of our grazing livestock is that they can digest widely available and largely indigestible carbohydrate in pastures to produce food and fibre.
- The carbon cycle in livestock would generally be a balanced system but for the production of methane as part of the digestive process.
- Whilst methane breaks down after about 12 years compared to decades for CO<sub>2</sub>, its warming potential is far greater, and longer lasting. The heat that methane absorbs in its lifetime is primarily transferred and stored in the deep ocean, where it continues to contribute to global warming for centuries, after the methane has broken down.
- The largest emitters of methane are fossil fuel production followed by livestock. Unlike livestock, fossil fuels emit ‘new’ C into the atmosphere and therefore emit both methane and CO<sub>2</sub> into the atmosphere.
- The Global Methane Pledge recognises the difference in warming of CO<sub>2</sub> and methane, by setting a target to reduce methane by 30 per cent and not zero, by 2030.
- The red meat industry target for carbon neutral by 2030 is an industry target and not a target all farmers need to achieve.
- Setting these targets has led to increased investment in technologies to help livestock farmers reduce emissions. If scientists can’t find a way to have ‘methane free’ sheep (or cows or goats), then we won’t be able to get methane to zero.
- Supply chains are leading the drive for lower emission products but are focussed on lower emission intensity, which farmers can often do something about, and which is also positive for farm productivity and profitability.

## References

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# What are the major health issues in sheep this season?

*Dr Jeff Cave, Agriculture Victoria, Wodonga*

A key to understanding current health issues in sheep as well as predicting those which are around the corner, is to consider the environmental conditions recently being experienced.

In a nutshell, we have just experienced three wetter than average years with record breaking rains last spring.

For internal parasites this has meant favourable conditions for the survival of the environmental stages of the parasite's life cycle. Consequently, summer drenching hasn't achieved the desired reduction in parasite burdens. Furthermore, parasite clean paddocks to put sheep onto after drenching are harder to find and are often relatively heavily contaminated with parasite larvae.

The end result of this are sheep with relatively high internal parasite burdens, despite regular drenching. As we move towards winter this is likely to remain a problem particularly in the sheep most susceptible to internal parasitism i.e., ewes at the point of lambing and weaners. Regular monitoring through faecal egg counts coupled with an appropriate drench program is going to be of particular importance this season. **Wormboss** contains good practical tips if you are considering using long-acting drenches.

The wet conditions have also led to an increased incidence and severity of foot conditions, both of footrot for those flocks which have it, and foot abscess. The prolific population of flies compounded the problem with a high incidence of fly struck feet being seen. The



recent dryer conditions may have alleviated the acute stage of the disease process but the aftermath of what we saw in spring remains.

Firstly, a notable reduction in condition score may be seen in sheep which have struggled with foot conditions. Secondly, poor scanning results may be seen, which may have resulted from rams being lame during joining. In some cases, ewes may have aborted during early pregnancy due to the stress of lameness.

Naturally, the severity of any sheep health issues will vary from property to property as will their most appropriate management, which are best solved in consultation with your local veterinarian.

**Acknowledgement:** Thanking Dr Tristan Jubb of Bendigo Sheep Vets for sharing his observations and thoughts which helped form the basis of this article.

## Do your dams still hold the same amount of water?

*Greg Bekker, Agriculture Victoria, Benalla*

With last year's wet winter, wet spring and then floods your dams may not have collected just water.

With the large volumes of water flowing across your paddocks, from local rainfall, flooded rivers and creeks a huge amount of soil and sediment has been shifted across the landscape. If this is now in your dam, you have lost water storage capacity.

When you look at your dams all you see is the water. The dam may be full or have dropped half a meter around the bank. How much water do you still have left?

What has happened under the water? Doing some measurements may help you make decisions about your dams and water situations. Allocating funds and getting contractors to do work is costly and takes time. Not having the amount of water, you thought you had during the next dry spell may be more so.

Agriculture Victoria have developed a few practical tools to help you measure and calculate the amount of water in your dams. DAMDEEP measures the depth of the dam so you can do a few measurements to get an

average and the online summer water calculator does the calculations for you.

### YouTube video on measuring the depth of your dam

This video takes you through the process of making a DAMDEEP measuring tool. You can then use the measuring tool to get an accurate measurement of the depth.

The video then shows how to use the summer water calculator to determine how much water you have in your dam.

<https://youtu.be/Kp21tB5hPj8>

Contact Greg Bekker on 0417 340 236 or [Greg.Bekker@agriculture.vic.gov.au](mailto:Greg.Bekker@agriculture.vic.gov.au)



# Providers of worm testing (WEC) sourced from the WormBoss website

[wormboss.com.au/professional-service-providers/victoria/](http://wormboss.com.au/professional-service-providers/victoria/)

W = worm egg count L = larval cultures (not tested through QA program)

Organisation/Laboratory	Contact details	Category
Ballarat Sheep Veterinary Services 241 Aubrey's Road MAGPIE VIC 3352	Monica Dickson Phone: 0437 941 774 Email: <a href="mailto:dicksonmonica@gmail.com">dicksonmonica@gmail.com</a> Web: <a href="http://www.bsvs.com.au">www.bsvs.com.au</a>	W
Black Range Feeds PO Box 636 STAWELL VIC 3380	Tanya Meares Phone: 0402 221 523 Email: <a href="mailto:blackrangefeeds@gmail.com">blackrangefeeds@gmail.com</a>	W
Dynamic Ag Consultancy 260 Mt Baimbridge Road Hamilton VIC 3300	Glenys Downes Mob: 0419 152 945 Email: <a href="mailto:s.cotton@dynamicag.com.au">s.cotton@dynamicag.com.au</a> Web: <a href="http://www.dynamicag.com.au">www.dynamicag.com.au</a>	W, L
Dynamic Ag Pty Ltd 260 Mt Baimbridge Road HAMILTON VIC 3300	Steve Cotton Phone: 0447 352 321 Email: <a href="mailto:s.cotton@dynamicag.com.au">s.cotton@dynamicag.com.au</a> Web: <a href="http://www.dynamicag.com.au">www.dynamicag.com.au</a>	W, L
Grampians Animal Health/ Livestock Logic 60 Portland Road HAMILTON VIC 3300	Bonnie Beall Phone: 03 5572 1419 Email: <a href="mailto:wec@apiam.com.au">wec@apiam.com.au</a> Web: <a href="http://www.livestocklogic.com.au">www.livestocklogic.com.au</a>	W, L
Livestock LogicWorm Logic Laboratory 60 Portland Road Hamilton VIC 3300	Bonnie Beall Ph: 0428 244 547 Email: <a href="mailto:b.beall@livestocklogic.com.au">b.beall@livestocklogic.com.au</a> Web: <a href="http://livestocklogic.com.au">livestocklogic.com.au</a>	W, L
Para-Tech Veterinary Services 76 Huckers Road Wickliffe VIC 3379	Dr David Hucker Ph: 03 5350 3252 Email: <a href="mailto:dahucker@bigpond.com">dahucker@bigpond.com</a>	W, L
Para-Tech Vet Services 76 Huckers Road WICKLIFFE VIC 3379	Julie Veale Phone: 0418 172 113 Email: <a href="mailto:dahucker@bigpond.com">dahucker@bigpond.com</a>	W
Regional Laboratory Services 136 Samaria Rd BENALLA VIC 3672	Jack Paynter Phone: 03 5762 7502 Email: <a href="mailto:info@regionallabservices.com.au">info@regionallabservices.com.au</a> Web: <a href="http://regionallabservices.com.au">regionallabservices.com.au</a>	W
University of Melbourne Parasitology, University of Melbourne 250 Princes Highway WERRIBEE VIC 3030	Dr Charles Gauci Phone: 0434 917 647 Email: <a href="mailto:charlesg@unimelb.edu.au">charlesg@unimelb.edu.au</a> Web: <a href="http://fvas.unimelb.edu.au/research/groups/parasitology">fvas.unimelb.edu.au/research/groups/parasitology</a>	W, L



## Guidelines for collecting samples for worm egg counts:

*This is an excerpt taken from an article written by David Rendell for a previous SheepNotes*

1. Submit samples only if, when first picked up, they are warm when squeezed; all those that are not should be discarded
2. Collect at least 20 and preferably 30 samples per mob, regardless of mob size
3. Where samples are mixed before submission, collect similar volumes of each sample
4. Ensure that lamb and ewe samples are placed in separate labelled containers because, even if they are running together, they are likely to have quite different WEC results
5. Immediately on collection, either refrigerate samples or place them in an air-tight container
6. Before leaving the paddock, label the sample legibly
7. Submit the samples to a laboratory that participates in regular interlaboratory quality assurance.

Refer to the WormBoss website — this tool provides critical levels for your region, where to get WECs done and other valuable worm control information.

◀ Faecal sample for submitting for a wec



# Ovine Brucellosis

*Berywn Squire, Agriculture Victoria, Swan Hill*

Ovine brucellosis (OB) is a bacterial disease of sheep found throughout Australia and causes infertility in rams and a subsequent poor lambing rate. Infection can be spread from ram to ram directly or via the ewe by exposing clean rams to infected semen from a recent previous mating. Purchased ewes shouldn't be joined with OB-free rams unless it is known that no rams of positive or unknown status have been with the ewes in the previous three weeks.

Infected rams usually produce semen of lower quality, making them either sub-fertile or sterile, depending on the site and severity of the lesions. The effect on flock fertility will also depend on the percentage of infected rams and flock breeding management. Lesions can be palpated in the testes and epididymides of about 40 per cent of infected rams and affected testes can be swollen, or shrunken, and hard and irregular in shape. Most scrotal lesions, but not all, are due to OB. Other causes of scrotal lesions can be abscesses, cysts, infected wounds, swelling due to an injury, or hernia, or other bacterial diseases (eg. *Actinobacillus seminis*, *Histophilus ovis*).

The effects of OB are often insidious and unrecognised, especially in areas where marked fluctuations in fertility occur due to variation in ewe nutrition, predation by foxes, or other circumstances. Blood testing and scrotal palpation by a veterinarian are used to diagnose exposure to OB infection. Culling the positive reactors and the small percentage of infected rams that develop scrotal lesions without a positive blood test reaction is the usual basis for eradicating OB from infected flocks. Repeated flock testing is then necessary to eradicate OB because rams can take between 10 and 60 days, and sometimes longer after exposure to infection, to show a positive blood test.

The key for commercial producers is to source rams from studs that are OB accredited. Victoria has a voluntary accreditation scheme for ram breeders. OB-free accreditation requires two successive negative blood tests of all rams initially followed by routine scrotal inspection and blood testing every two years. Other states have similar schemes and so purchasing rams from accredited ram breeders will greatly reduce the risk of OB in your flock.

## The Mallee experience

During the 1990s OB was widespread in the Mallee, infecting about 57 per cent of ram flocks. Normal methods used for the control of OB were of less value in the Mallee due to the higher cost of testing individual flocks and the greater difficulty and cost of constructing and maintaining sheep-proof boundary fences. The proclamation of the Mallee as a Control Area for ovine brucellosis (OB) in 1997 was the result of an industry-driven initiative to increase the productivity and profitability of sheep enterprises by systematically



▲ Ram inspection

eradicating OB from farms in the area and preventing its reintroduction.

There are specified conditions under which the Control Area operates. In the main this includes the submission of rams over six months old for testing on request, provision of assistance and information, culling of infected rams for slaughter and the retesting of infected flocks to confirm eradication. But most important is the prohibition of the entry of rams into the Control Area unless they are accompanied by a completed OB vendor declaration. It is the obligation of the purchaser to procure this. Ovine Brucellosis Vendor Declarations provide legal and practical protection against purchasing infected rams, and their use is legally required in the Control Area.

## Are ewe prolapses affecting your business?

The article on prolapses by Dr Cathy Bunter in our autumn 2022 edition of SheepNotes was one of our most popular online articles. We are keen to understand the scale and likely triggers of this issue for Victorian farms and whether more investigations are warranted. If you are concerned about

prolapses on your property, please complete this brief survey using the QR code above or the following link [forms.office.com/r/LKnAWx2tAP](https://forms.office.com/r/LKnAWx2tAP)

Ewe prolapse survey



# Celebrating 25 years of BestWool/BestLamb

The Glenthompson-Dunkeld BestWool/BestLamb (BWBL) group is celebrating its 25th year in 2023, along with Bairnsdale BWBL group. The BWBL network now comprises 45 groups across the state.

**Russell Mitchell** was the first producer representative for the Glenthompson-Dunkeld BWBL group and 25 years later, is still a keen and active group member. We asked Russell to reflect on his 25 years with the group.

## How did the group get started? What do you remember from that time?

We were part of a Paired Paddock Program (Triple P) run by the Grassland Society of Southern Australia (GSSA), and Jason Trompf had just finished his degree and was running the group for us. We were keen to continue as a group after Triple P, this was in 1998 when BestWool was about to start. We held a meeting in Glenthompson, and heaps of farmers turned up and decided to form a BWBL group, so we were one of the initial groups to be involved.

I was one of the youngest at the meeting and someone from the VFF, pointed at me and said 'you can be the group contact', and so I was. We employed Jason as our coordinator and off we went. Not only was I one of the youngest, but I felt quite inexperienced about a lot of farming practises, and I was like a sponge taking in everything without any preconceived ideas. I found it interesting to see the conflict some had with new ideas against what they had done for years and believed in. What was pleasing was every practical thing we did was on-farm and backed up with our own data and evidence. This was a challenge for some, but it was great to see these farms move forward with new plans and enthusiasm.

## Why is BWBL important to you? Why have you stuck with it for 25 years?

Over 25 years, we have had fires, drought, wet years and falling commodity prices, and the whole time the group has been there to lean on at time when we all needed support. We perhaps didn't realise it at the time, but we were able to tap into everyone and share our worries. For instance, when we had a drought around 17 years ago, some of us built stock containment yards and we were able to share and help each other through that process as none of us had any real experience with these.

We have been lucky to be involved with pilot projects and one of the best was the Lifetime Wool Project. They were



looking for farms to test and plan this new course and we gladly put up our hands to be involved, and it was brilliant. At the time it pulled together all the things we had learnt and wrapped it up into one course, which really made

◀ Russell Mitchell

some major gains for the businesses in the group. Of course, this is now called Lifetime Ewe but we still refer to it as Lifetime Wool for some reason.

Being part of the BWBL group has also given us exposure to a range of new ideas and people who we would otherwise never meet or hear about. Just having Jason Trompf as our leader and a phone call away was so lucky for us and then to be around people like Charlie De Fegely and John Keiller just to name a few, has had a lasting impact in our area.

## What has changed over 25 years?

There have been major changes to sheep production systems over the last 25 years in our district. Our group has been able to support and help this transition and show members how it could be done and share the good and bad of the changes.

It is also interesting and pleasing to see the succession changes of the farms in our group. Over time farms have changed hands and children have moved home to take over the management of the business. I personally have moved from one of the youngest in the group to one of the eldest members.

The yearly conference is always a great way to connect and catch up with other like-minded farmers and hear about the latest programs and research in agriculture. It also leaves a lasting impact on me, and I find that when I come home from the conference I'm inspired and enthusiastic about the year ahead, especially as it's the middle of winter - it gives me a kick along as we enter spring and the busy months ahead.

## Developing new Ovine Johne's Disease tests

*John Jardine, Agriculture Victoria*

Ovine Johne's Disease (OJD) can have a high cost to a sheep farm. The current tests have low sensitivity in non-clinical stages of the disease. To try to improve this situation, Agribio and CSIRO are developing tests to better diagnose OJD in sheep. We are looking for farms that don't vaccinate with Gudair and have suspect positive sheep. We are seeking these farms to replenish the serum bank to perform quality control on current tests, and to get samples to try to develop new tests.

If you think you have sheep with clinical OJD and you do not vaccinate with Gudair and would like to assist us please contact me at [john.jardine@agriculture.vic.gov.au](mailto:john.jardine@agriculture.vic.gov.au) or call 0436 014 197.



# Digital Tips

## Taking good photos and videos with your phone

Source: *Photography 101, ExtensionAus* ([Extensionaus.com.au](http://Extensionaus.com.au))



### How to create a great photo with your phone

- Horizontal photos work best for social media and web
- Vertical photos are great for publications
- Clear photos: tap the middle of the screen so a yellow box appears, your phone will adjust the focus and lighting
- Stay in focus: hold down the screen until the AE/AF Lock appears, a guaranteed way to stay in focus
- Natural light is best: face the light, don't use flash
- Rule of thirds: divide the photo into thirds, position the subject matter in one of the thirds
- Subject matter: be creative, think differently, look for interesting shots that tell a story, don't use zoom



- High resolution photos: use these tips to ensure a high-quality photo and send your image as a large file

### Links to video guides for social media

- Social media specs guide: [sproutsocial.com/insights/social-media-video-specs-guide/](https://sproutsocial.com/insights/social-media-video-specs-guide/)
- How to create engaging short videos for social media: [blog.bufferapp.com/social-media-videos](https://blog.bufferapp.com/social-media-videos)
- Wistia video blog: [wistia.com/learn/production](https://wistia.com/learn/production)
- Shootsta video blog: [shootsta.com/blog](https://shootsta.com/blog)

### Tips for taking a good video on your phone

Mark Freeman, *Production, Department of Jobs, Skills, Industry and Regions*

- Go to your device's settings/camera settings/Record Video, then choose either 1080p HD at 30fps or 720HD at 30fps - former is best, latter will work OK as well
- Shoot in landscape mode, not portrait (i.e. hold device on its side so that the image is wider than it is tall)
- Shoot with your face towards any available lighting (window, room light etc) - not with your back to the light
- Try to have the phone approximately level with your head height
- Keep the device no further away than 3/4 arm's length
- Try to prop the phone on a table/shelf etc so that the image is steady - if hand-held, try to keep as steady as possible
- Try to have the top of your head nearly touching the top of the video frame
- Look at the lens of the iPhone/Android camera when speaking, not the screen, so that you directly address the audience in the resultant video
- Minimise any external sounds (music, other people talking etc), and
- For editing purposes, leave at least one second of silence at the beginning and at the end of your piece (i.e. hit the record button, wait at least one second before speaking, then after speaking wait at least one second before hitting stop).



## Seasonal reminders and resources

Below is a reference to past articles that may be useful over the coming months, particularly given the wet season. These are available either as previous SheepNotes articles on the Agriculture Victoria website ([agriculture.vic.gov.au](http://agriculture.vic.gov.au)) and search for 'Sheep Notes') or on the FeedingLivestock website

Topic	Content	Where is it
Soil temperature for sowing decisions	Critical soil temperatures for pasture sowing	SheepNotes <i>Autumn 2022</i>
Wormboss Drench decision guide		WormBoss website
Nutrition and health of ewes after the break	Guides on ewe requirements - pasture, health and condition	SheepNotes <i>Autumn 2015</i>
Condition Scoring	This site outlines the when and how to Condition Score sheep (including link to a 'how to' video). Many other resources for ewe management here.	Lifetimewool website <a href="http://www.lifetimewool.com.au/conditionscore.html">www.lifetimewool.com.au/conditionscore.html</a>
Why I should scan for multiples	This article outlines the benefits and procedures for pregnancy scanning ewes for multiples	SheepNotes <i>Autumn 2020</i>
Targets for maternals	Outlines results from research to develop guidelines for condition scores for crossbred ewes	SheepNotes <i>Autumn 2020</i>
Calcium disorders of ewes and lambs	Colin Trengove outlines hypocalcaemia, risks and potential treatment	SheepNotes <i>Spring 2016</i>
Prolapsing ewe	Possible causes and prevention of prolapses in ewes	SheepNotes <i>Autumn 2022</i>
Tail length – getting it right	Guidelines (and why) of getting tail length in	SheepNotes <i>Autumn 2016</i>
Soil temperature for sowing decisions	Critical soil temperatures for pasture sowing	SheepNotes <i>Autumn 2022</i>
The lowdown on lime	Jim Shovelton from Meridian Agriculture works through some of the myths on lime and considerations for applying	SheepNotes <i>Autumn 2015</i>

## BestWool/BestLamb Conference 20 June

We are excited to announce the BestWool/BestLamb Conference is returning to Bendigo and will be celebrating 25 years of the BestWool/BestLamb network. The conference will begin with dinner on Monday 19 June and a full day of speakers and activities on Tuesday 20 June. As always, the conference promises to cover the latest developments, insights and updates for the sheep industry.

The event will be held at the Bendigo Showgrounds and the conference dinner at the All Seasons, Bendigo. Keep an eye out for the opening of registrations. The conference welcomes all sheep producers, regardless of whether you are part of the BestWool/BestLamb network.

For further information please contact Shona Sekene on [shona.sekene@agriculture.vic.gov.au](mailto:shona.sekene@agriculture.vic.gov.au) or 0459 902 064 or visit [agriculture.vic.gov.au/support-and-resources/event-listing](http://agriculture.vic.gov.au/support-and-resources/event-listing).

Attention sheep industry  
**SAVE THE DATE**  
**BestWool/BestLamb 2023**  
 Celebrating 25 years of BWBL  
 Industry dinner and conference  
 19 - 20 June  
 BENDIGO  
 More details to come  
 AGRICULTURE VICTORIA

# Agriculture Victoria animal health and sheep industry contacts

Although our offices are currently closed, the office numbers provided below are diverted to staff who can assist you. Alternatively, you can contact Agriculture Victoria on 136 186.

Location	Office Contact	Meat and Wool Services		Animal health
		Livestock Industry Development Officers	Land Management Officers*	
<b>South-West region</b>				
Ararat	136 186	✓	✓	
Ballarat	5336 6856	✓	✓	✓
Colac	5233 5504			✓
Geelong	5226 4878		✓	✓
Hamilton	5573 0900	✓		✓
Horsham	0343 443 111			✓
Queenscliff	5258 0229			
Warrnambool	5561 9946	✓		✓
<b>South-East region</b>				
Attwood	9217 4200			✓
Bairnsdale	136186	✓	✓	✓
Cranbourne	136 186		✓	✓
Ellinbank	5624 2222	✓	✓	✓
Leongatha	5662 9900		✓	✓
Maffra	5147 0800	✓		✓
Swifts Creek	5159 5134	✓	✓	
<b>Northern region</b>				
Alexandra	5772 0200		✓	
Benalla	5761 1611	✓	✓	✓
Bendigo	5430 4444	✓	✓	✓
Echuca	5482 1922			✓
Rutherglen	02 6030 4500	✓		
Seymour	5735 4300			✓
Swan Hill	5036 4800		✓	✓
Tatura	5833 5222		✓	✓
Wangaratta	5723 8600			✓
Wodonga	02 6043 7900		✓	✓

\*Farm planning, soil health advice, soil conservation advice, dryland farm water planning

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