

Sheep Notes



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Welcome to the spring edition of SheepNotes 2023. It is with mixed feelings that we compile this, reflecting on the current sheep market and climate projections for the season. At the time of writing, the spring is looking variable across the state, with very useful October rains received in some parts but an early finish looking likely for others. For many, it has been a very good winter and early spring, leading to good stock condition and lambing results.

Thank you to those who have given us feedback on this newsletter. We are moving towards digital SheepNotes into the future, so please subscribe to the newsletter so we can keep in touch: <https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter>. Past editions and articles can be found on our website.

Jane Court and Jeff Cave, Agriculture Victoria

Contact: jane.court@agriculture.vic.gov.au phone: 0436 606 742
Jeff.cave@agriculture.vic.gov.au

Worm resistance in Victoria

Dr Steve Cotton – Dynamic Ag Hamilton

- **Drench resistance of most of the single active drenches in Victoria is quite high on properties tested.**
- **Knowing and managing your property’s resistance to chemical groups will give you better protection and control to worm infestations, particularly in challenging years (like last year).**

Part of a solid worm control program is to understand what level of resistant worms you have on your property and to what extent these worms have resistance to the various chemical groups on the market. While rotating drenches is important, we must be rotating actives rather than brand names because quite often, the different brand name products contain an active from the same chemical group (for example Abamectin versus Moxidectin) or worse still, the same active (e.g., Triguard versus Trifecta).

The level of drench resistance from year to year can change markedly on the same farm. You can see in Table 1 how the efficacy of the same active

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changes over time. This is dependent on what level of selection pressure is applied to the worms (drench frequency, time of year) and through your pasture and grazing management (level of worm larvae and pick up on pastures).

Table 1. Drench efficiency results from a case study farm over 3 years (NT = Not tested)

DRENCH TYPE	TEST RESULTS		
	2021	2018	2014
CONTROL worm egg count as eggs per gram (epg)	1292epg	1095epg	890epg
BZ/Lev	90%	96%	66%
Ivomec (Ivo)	67%	86%	57%
Abamectin (Aba)	100%	99%	98%
Cydectin (Cyd)	100%	99%	100%
Aba/BZ/Lev	100%	100%	100%
NapFIX	NT	NT	NT
Zolvix	100%	NT	NT
Tridectin	NT	NT	NT
Startect	100%	NT	NT

BZ – benzimidazole; Lev – Levamisole

A drench resistance test should be conducted every 3 years. Knowing what chemical actives are working against the worms on your farm allows you to make informed management decisions. At times, it can demonstrate that your worm program is on track but it can also demonstrate a need to reduce your reliance on chemical control and look at alternative options. You can easily conduct your own ‘mini’ drench trial from time to time by re-testing a mob 10–14 days after drenching. Compare the post drenching worm egg count to the initial count pre drenching. Ideally the drench will have greater than 95% efficacy but preferably greater than 98%.

For example, you collect samples from a mob and they test at 1900epg. You drench these sheep, and re-test 10–14 days later and your count comes back at 60epg.

A simple calculation will determine the effectiveness of that drench:

$$60/1900 = 0.0316$$

$$1 - 0.0316 = 0.9684$$

$$0.9684 \times 100$$

$$= 96.8\%$$

In the above example, the drench has been effective. For that drench to be 98% effective, the post drenching worm egg count would need to be around 30epg. You should also keep in mind that the different laboratories have different methods for preparation of samples and 1 egg counted under the microscope could represent anywhere from 20epg to 40epg depending on the dilutions used in the sample preparation.

Traditionally, drench resistance has usually developed around 10 years after a new active has been released onto the market. Table 2 shows the level of drench



▲ Collecting individual faecal samples

resistance from multiple properties across Victoria over the past 8 years. Approximately 90% of the properties in this data set are from western Victoria, so care should be given to interpretation of these results.

Table 2. Results of drench resistance trials conducted across western Victorian properties over 8 years.

Drench group	No. of trials conducted	No. of resistant properties	Percentage of farms with resistance
BZ/LEV	133	66	49.6
IVO	111	79	71.2
ABA	136	35	25.7
MOX	104	13	12.5
ABA/BZ/LEV	124	6	4.8
MONEPANTEL	64	2	3.1
NAP/BZ/LEV	62	10	16.1
DERQUANTEL/ABA	59	0	0.0
NAP/ABA/BZ	27	0	0.0
TRIDECTIN	27	0	0.0

MOX – Moxidectin; NAP – Naphthalophos

Conducting a drench resistant test is easy. For a comprehensive test, you will require between 100–120 lambs. Weaning is an ideal time to select lambs for a drench resistance test because usually they have a high worm egg count and they still have little to no immunity to worms. You require a worm egg count of 300epg or higher to get an effective result. Ideally select a mob that did not receive a drench at marking time.

Once your count is high enough, you will drench groups

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of lambs (usually 12–15) with different drench actives and identify the different groups with ear tags or coloured spray marker on their head. Make sure you use a clearly visible means of identification that won't wash off with a rainfall event in the short term. You then run each of the drench groups plus a control group (animals not drenched) together in a paddock for 10–14 days until each animal is sampled and counted.

This period ensures the only worm eggs that are in the sheep's faeces are ones that have survived the drench and not new pick up from the pasture. The easiest way to collect samples is to draft the lambs into their drench groups and get individual samples from ten in each group.

Your laboratory will also conduct larval cultures which will identify what worm species were still present at 10–14 days (the resistant ones!)

Contact a Paraboss accredited laboratory near you to discuss the specific requirements of drench resistance testing. Keep in mind that some laboratories are just that, laboratories. If you need help understanding or interpreting your results or you would like a drench management report and plan, speak to your consultant or animal health care provider.

Note: In the last (autumn edition) of SheepNotes we included a list of accredited laboratories from the WormBoss/ParaBoss website. Alternatively go direct to: wormboss.com.au/professional-service-providers/victoria/

Further details regarding conducting a worm egg resistance test: wormboss.com.au/testing-drench-effectiveness-with-a-drenchtest-or-wecrt/

Keep diseases out

Jeff Cave, Senior Veterinary Officer, Northern Region

Consider the time and money that you have spent keeping your flock healthy and add up the investment that you have made. Now think about the steps that you might take to prevent the introduction of disease.

Truly closed flocks are uncommon. When you moved livestock what actions did you take to reduce the risk of introducing an infectious disease into your flock?

Purchasing sheep that have the least disease risk must be a primary aim of farmers when buying sheep. Diseases such as footrot can seriously disrupt the enterprise.

The risk of the introduction of disease can be minimised by getting a good history of the livestock to be introduced. Did the vendor breed them? Is the vendor's herd closed? Has the vendor provided a declaration relating to the disease status of the properties on which the livestock have been kept? Are the livestock derived from a tested or accredited herd? What is their drenching and vaccination history?

Introduced sheep should routinely be isolated from other sheep until they are determined to be free from diseases or pests. Drenching sheep on arrival with an effective chemical and moving them to an isolation area will limit the risk of introducing drench resistant worms. During the quarantine period the newly introduced livestock should be examined for disease and external parasites.

Footrot can remain undetected in the feet of sheep for long periods, especially during dry conditions. Ideally, introduced sheep should be kept isolated until they have passed through a suitable footrot expression period, such as a wet spring or autumn.

Similarly, the first signs of sheep lice may not become apparent for 6 months or more from the time of arrival on your premises, and Ovine Johne's disease (OJD) may take years before the first signs of ill thrift and deaths are seen.

Aside from arriving on the back of a truck, the other way in which sheep may arrive on a property is by straying. Are your fences in sufficient order to prevent the introduction of stray livestock from neighbouring properties?

The entry of people, vehicles and agricultural equipment also carries a risk of disease and weed seed introduction. A strategically placed notice, such as on the entry gate of the farm will help to ensure that all visitors check in at the house or office before having contact with stock.

Disinfecting footwear and wearing clean outer clothing should become routine practice for personnel arriving for work on the farm. These measures are particularly critical if workers have been on other farming enterprises and have had contact with other stock.

For visitors to the farm whose primary purpose is a social visit to the family home, disinfection procedures should not be necessary. If visitors need to have contact with stock, biosecurity measures can be imposed.

Vehicles and machinery coming onto the farm should be cleaned prior to arrival. Vehicles not required for specific operations on the farm should be left at the residence and travel undertaken in the farm vehicles.

Prevention is cheaper and easier than cure. A way of ensuring an effective and consistent approach is to document and follow a farm biosecurity plan which promotes good hygiene practices and controls the movement of livestock, people, and equipment onto your property.

Understand the signs of disease. At first suspicion of sickness or a disease that concerns you, contact your local vet or notify Agriculture Victoria on the Emergency Animal Disease Watch Hotline number 1800 675 888.

Soil carbon explained

Heather Field, Agriculture Victoria Climate Change Service Development Officer

Are you keen to understand more about soil carbon?

Agriculture Victoria has developed a soil carbon eLearning module that will provide a great introduction for those seeking a better understanding of soil carbon, its role and function in agriculture.

Over recent decades farmers have been actively working towards conserving and increasing soil carbon and reducing soil carbon losses by improved farm management practices. Soil carbon is critical for soil health, improving productivity, profitability and resilience. While soil carbon is easy to lose, and can be challenging to increase, it's important to remember that maintaining your soil carbon levels whilst producing food and fibre is a great outcome.

The introduction to soil carbon eLearn delves into:

- soil health benefits of soil carbon
- difference between soil carbon and soil organic matter
- influence of soil type, climate and land management on soil carbon stocks
- impacts of agriculture practices on soil carbon
- where to go for further information and resources.

If you would like to learn about the importance of soil carbon, this is a great resource.

Access the Introduction to soil carbon eLearn: agriculture.vic.gov.au/climate-and-weather/understanding-carbon-and-emissions/introduction-to-soil-carbon-what-you-need-to-know



Ten key considerations for soil carbon changes

Accurate longer-term measurement and monitoring is essential to determine changes to soil carbon levels. Factors such as soil carbon testing methods and accuracy, the age of trials (particularly if less than 5 years old), plus rainfall and seasonal variability are

all factors which must be carefully considered before conclusions are made.

Increasing carbon input rates or decreasing carbon loss rates can improve soil carbon levels and have other benefits including improved soil nutrient uptake, (where nutrients are available), water holding capacity and overall productivity.

While soil organic carbon (SOC) can function as a source of nutrients for farm production, it is also important to consider the reverse of this process, as increasing soil carbon levels will require nutrients to be locked away and bound up with the sequestered carbon.

Soil carbon occurs in a number of different fractions, each having different properties, vulnerabilities and rates of decomposition. The Particulate Organic Carbon or labile fraction can be easily lost and decomposed in the soil and subsequently released back into the atmosphere as carbon dioxide.

The capacity for soils to sequester carbon is finite and there are specific maximum achievable equilibrium levels of soil organic matter for most farming systems due to climatic and primary productivity limits to plant dry matter production and decomposition rates.

For carbon accounting purposes, genuine carbon sequestration must result in an additional net transfer of carbon from the atmosphere to land, not just movement of a carbon source from one site to another.

Changes in land management which lead to increased carbon in soil must be continued indefinitely if farmers wish to maintain the increased stock of SOC. For many farmers, committing to long term land use may be undesirable if it reduces their ability to adjust land management to meet changing market or profitability drivers over the longer term.

Some management practices may only be reducing losses of soil carbon and not actually sequestering additional atmospheric carbon into the soil. Many soils are still responding to initial cultivation of the native soil and experiencing soil carbon decline.

Increasing soil carbon may potentially lead to perverse impacts as a consequence of the links between soil carbon, nitrous oxide and methane cycles. For example, changing from annual crops to permanent pastures may increase soil carbon, but may also lead to an overall increase in total net emissions via increased ruminant livestock production. Soil carbon needs to be considered in a wider systems context.

Climate change and changing patterns of seasonal variability will affect the ability of soils to maintain or sequester carbon. For some regions this may make the task of maintaining or improving soil carbon levels even more challenging over coming decades.

Bucks for brains

Dr Anna Cavallaro, District Veterinary Officer, EchUCA

There are many notable disease surveillance programs available to producers, and one worth mentioning is the National Transmissible Spongiform Encephalopathies (TSEs) surveillance program (NTSESP). It's quite a long name, but the disease we're talking about in sheep has the common name of Scrapie, with perhaps a more familiar partner name for the disease in cattle being Mad cow disease.

Australia is free from TSEs, which gives us access to many valuable export markets. An element of proving we are free from TSEs is to complete active ongoing surveillance. As part of the NTSESP the 'bucks for brains' initiative provides financial incentives for producers who submit an eligible brain, through their private veterinarian or district animal health staff, for national surveillance. This can be quite appealing for a return on an unwell animal with no commercial value.

In addition, there is also the opportunity to have diseases investigated with fully subsidised laboratory testing. Across Victoria the program has supported

producers in reaching a diagnosis of a variety of common diseases of sheep such as Phalaris toxicity, *polioencephalomalacia* (polio), hypocalcaemia and pregnancy toxaemia.

So how do you participate?

An eligible animal is a sheep that is between the age of 18 months and preferably no older than 5 years old, which is displaying signs consistent with Scrapie. Many of the clinical signs of Scrapie overlap with a variety of common sheep diseases, and can include any change in temperament, mild behavioural and neurological signs, rubbing or scratching, muscle tremors, paralysis and difficulty rising. Up to 2 sheep per property can be enrolled in the program.

If you have sheep that meet these criteria, please get in contact with your private veterinarian or district animal health staff to see if you are eligible for an incentive payment. Call 136 186.

Biosecurity 101 – want to learn more about farm biosecurity?

Complete our free online learning modules to find out how you can help protect Australia's farms from biosecurity threats such as foot-and-mouth disease and lumpy skin disease.

These modules are designed to teach you the risks and impacts these diseases can have on our agriculture sector and what you can do to reduce those risks.

There are four modules that each take about 15 minutes to complete:

- Foot-and-mouth disease Awareness
- Lumpy Skin Disease Awareness
- Come Clean, Stay Clean, Go Clean – when visiting farms
- Livestock Standstill for foot-and-mouth disease

Scan the QR code to enrol.

Are you a small-scale farmer, hobby farmer or new to farming?

There are plenty of small steps you can take for a big impact on keeping your animals free from disease.

Agriculture Victoria has a range of information for small landholders that can help you keep your animals safe.

To find out more, visit the website agriculture.vic.gov.au/backyardbiosecurity. You can subscribe to our Backyard Biosecurity newsletter on this page. Each edition will focus on a different topic, with practical tips about how to implement good biosecurity practices. Topics include managing the health and welfare of your animals, weeds, pest animals, biosecurity and much more.



Ration builder – making it easier

Nick Linden, Agriculture Victoria

If you are supplementary feeding stock on pasture, feeding in containment or finishing in a feedlot, the relatively high grain to stock prices makes it critical to use the most cost-effective ration.

Agriculture Victoria have a new spreadsheet 'Ration Builder' to help producers do just that.

While there are plenty of tools for building a ration out of 2 ingredients, Ration Builder has some important differences – the most notable being its ability to let producers use multiple ingredients to achieve the desired energy and protein levels.

As a starting point, producers need to know what ingredients they can access (even better if you have feed test results for quality), their cost and a target for the energy and protein of the ration. The tool can calculate dry matter and fibre levels, which may be of interest depending on your system. Ration Builder won't tell you the percentages of each ingredient you need to get to a certain level of energy or protein in the ration, rather it lets you alter the percentages of each ingredient until you reach the desired ration specifications.

It is up to users to set the energy (as megajoules of metabolisable energy – MJ ME) and protein (crude protein – CP) levels of their ration. For example, it could be 11.5 MJ ME/kg DM and 15% CP for a finishing diet, or lower energy and protein levels such as 9.7 MJ ME/kg DM and 9.5% CP if maintaining dry stock. But it's up to the user to vary the percentage of ingredients in the ration until the target has been met (ensuring that the ration components do not exceed 100%).

What you need to do

1. Enter ingredients into the light green squares (enter specific FeedTest values if you have them or use default values).
2. Enter cost of each ingredient into the darker green squares.

3. Alter the percentage of each ingredient in the ration (yellow squares) until you can achieve the desired energy, protein and fibre levels (orange squares) – making sure that the total percentage of ingredients in the ration equals 100%.

4. Enter in the number of animals being fed and their daily energy requirement at the bottom (mauve squares) – daily energy requirements for different stock classes can be found under the beef or sheep resources at feedinglivestock.vic.gov.au/

As you alter the percentage of each ingredient in the ration, the spreadsheet will calculate not only the energy and protein of the ration, but also the cost of the ration on a \$/tonne and on a c/MJ basis (blue squares).

What you get

1. The energy, protein and fibre levels of the ration.
2. Full costings of the ration.
3. How much of each ingredient (fresh weight) to achieve a required amount of feed.
4. The maximum possible daily intake of stock consuming this ration (based on animal liveweight and fibre in the ration). Use this to check the amount required does not exceed the maximum daily intakes.
5. How much feed is required given the number and class of stock being fed.
6. A mixing sheet that gives the running scale weight as ingredients added to the feed wagon.

While Ration Builder can be used to design and cost a ration to achieve set energy and protein levels, it can also be used to calculate feed volumes and 'mixing sheets'. The mixing sheets are useful for producers using mixing wagons with scales and gives a running scale weight as ingredients are added. To that end, it is important when including ingredients in the ration, they are selected in the order they would be mixed in the feed

RATION BUILDER													1 055 Tonnes of ration per feed/day					
Ingredient	DM	ME	CP	NDF	% in ration	DM of ration	ME in ration	CP in ration	NDF in ration	Actual kg in final ration	Actual % in final ration	AM	PM	1 feed	\$/tn fresh	\$/tn DM	Cost fresh	Cost DM
Triticale	89.3	13.1	10.2	12.6	40.0	35.7	5.2	4.1	5.0	44.8	33.4	106	246	352	340.00	380.74	113.40	126.99
Canola hay	85.0	9.5	15.0	53.1	10.0	8.5	1.0	1.5	5.3	11.8	8.8	28	65	92	200.00	235.29	17.52	20.61
Lupins	91.6	12.3	31.4	35.5	12.5	11.5	1.5	3.9	4.4	13.6	10.2	32	75	107	410.00	447.60	41.66	45.48
Cereal Hay	94.4	8.1	7.5	60.4	5.0	4.7	0.4	0.4	3.0	5.3	3.9	12	29	42	200.00	211.86	7.89	8.36
Silage	50.0	9.0	18.0	50.2	20.0	10.0	2	4	10.0	40.0	29.8	94	220	314	280.00	560.00	83.40	166.79
Salt	100.0	0.0	0.0		1.0	1.0	0	0	0	1.0	0.7	2	5	8	200.00	200.00	1.49	1.49
Limestone	100.0	0.0	0.0		1.5	1.5	0	0	0	1.5	1.1	4	8	12	230.00	230.00	2.57	2.57
Sodium Bicarb	100.0	0.0	0.0		1.5	1.5	0	0	0	1.5	1.1	4	8	12	740.00	740.00	8.27	8.27
Bentonite	100.0	0.0	0.0		1.5	1.5	0	0	0	1.5	1.1	4	8	12	468.00	468.00	5.23	5.23

Screenshot of the Ration Builder data entry page

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wagon (i.e., some people would add roughages first, with grain added last – depending on desired chop length of fibre, mixer wagon capacity and volumes being mixed).

To accommodate those feeding cattle on a twice daily basis the spreadsheet can allocate feed mixes to a morning (AM) and an afternoon (PM) mix – to those only feeding on a daily or less frequent basis this can simply be ignored.

It doesn't matter if you are finishing lambs in a feedlot or feeding ewes in containment or the paddock – it's critical that energy and protein requirements of the stock are being met. Being able to cost rations

consisting of different ingredients lets you make use of different inputs and enables comparisons on both the cost and feed quality of different ration formulations. The Ration Builder is a simple spreadsheet that can be used to design rations that will meet the energy and protein requirements of your stock.

Access Ration Builder at feedinglivestock.vic.gov.au in either sheep or beef resources and then in the tools and calculators tab.

For more help with the Ration Builder feel free to contact Nick Linden on 0438 369 486.

Goat identification in Victoria

Goats can become infected by and spread serious emergency animal diseases including foot-and-mouth disease (FMD) and anthrax. For this reason, goats need to be traceable to assist in the prompt containment of disease outbreaks and food safety incidents.

Persons owning or managing a property upon which sheep or goats are or will be kept must obtain a Property Identification Code (PIC) from Agriculture Victoria. This includes residential properties and hobby farms where goats are kept as pets or for lifestyle reasons.

Some goat breeds are difficult to identify using a tag because they have only rudimentary ears, or because their ears are prone to infection regardless of the tag used. For this reason, owners of dairy and miniature breeds in Victoria are not required to identify their goats with an electronic NLIS tag.

Even though the electronic identification of miniature and dairy goats in Victoria is voluntary, consignors must supply a correctly completed movement document which could be a National Vendor

Declaration (NVD) form or Victorian Consignment Declaration (VCD) when they dispatch their goats to another property. VCD forms can be downloaded free of charge from Agriculture Victoria's website at Agriculture.vic.gov.au [Victorian Sheep and Goat Consignment Declaration.docx](#) (put 'sheep and goat consignment' in the search at Agriculture.vic.gov.au)

Importantly, the person receiving both electronically tagged and 'tag-exempt' goats must record the movement on the NLIS database within 48 hours of their arrival. For untagged goats, this is done under the mob-basis system. Visit nlis.com.au to open a database account and for further information about movement recording.

Producers in the future will, if they wish, be able to identify their goats with NLIS accredited leg band tags marketed by Datamars. Use of leg band tags on earless goats will, however, not be mandatory in Victoria.

Goat owners interested in using leg band tags should be aware this device has only been trialled in Australia on predominantly adult dairy goats, and needs to be adjusted to prevent injury as goats grow. No information is currently available regarding the suitability of this device for use on kids or non-dairy breeds, so user discretion is advised.

For producers wishing to use leg band tags, they must first obtain an Authority to Purchase permit. Leg band tags can then be purchased directly from Datamars. These tags cannot be purchased from Agriculture Victoria on-line and are not subsidised.

In summary, all properties on which goats are kept must have a PIC, and movements between properties must be recorded within 48 hours on the NLIS database, including where the goats are 'tag exempt'.

Goat owners who would like to apply for permission to purchase leg band tags, or would like further information on the NLIS (Sheep & Goats), should visit agriculture.vic.gov.au/nlis or call Agriculture Victoria's NLIS Helpline during business hours on 1800 678 779.



Hypocalcaemia in sheep

This article has been compiled from a webinar and discussion with David Masters and Victorian advisers (through the Bestwool/Bestlamb co-ordinators) in 2019.



Hypocalcaemia is a metabolic disease in sheep that is primarily due to a lack of available calcium. This is not usually a simple deficiency. Risk may be increased on pastures or forages with high potassium and/or low

sodium and magnesium. Low vitamin D also increases the risk. Because of the interactions between minerals in the forage and digestion, absorption and the metabolic state within the animal it is difficult to manage.

Sheep are most susceptible in late pregnancy, but hypocalcaemia may also occur during lactation or in young rapidly growing animals. The incidence is greatly increased when at-risk sheep are stressed through handling or changes in weather. There are numerous differences between sheep and cattle in susceptibility to deficiencies; peak timing of requirements; differences in the reproduction cycle and a greater variation in reproductive rates. Therefore while the sheep industry often looks to the dairy industry for solutions, recommendations on managing and preventing the disease should be considered separately.

There is reportedly increasing incidence of the disease in the sheep industry, although this can be difficult to measure given the ability to diagnose hypocalcaemia and often associated diseases (e.g. hypomagnesaemia; pregnancy toxaemia). While MLA report the incidence of the disease as of relatively low importance with incidence of 0.2–0.4% nationally or a value of \$11M, Ivan Caple (1988) estimated that between 100,000 and 300,000 pregnant ewes die from hypocalcaemia in Victoria alone. The Victorian sheep industry has substantially shifted since then from primarily a merino wool-based industry to a more diverse crossbreed lamb industry focussing on reproduction and increased growth rates, which would logically put more pressure on the mineral requirements, absorption and recovery.

Current recommendations for prevention of hypocalcaemia

- 1. For sheep being fed cereal grain supplements (ewes and growing stock) in summer and autumn add 0.5% salt and 2% limestone (of the rations) to the diet. Mixing in the diet is preferable but an alternative is to provide limestone and salt ad lib as a loose lick.**

Cereal grains are low in calcium (Ca) and sodium (Na). The purpose of this supplementation is to ensure bone reserves are not depleted prior to pregnancy and young growing sheep have adequate calcium for bone development. Salt provides sodium, but also is used to increase intake of the limestone.

- 2. For all pregnant ewes, from mid-pregnancy, keep stress events and time off feed to a minimum (i.e. yarding for shearing; crutching etc). Avoid yarding ewes during the last 4 weeks of pregnancy.**

Stress can cause a redistribution of calcium and magnesium (Mg) in the body. It is likely stress can induce hypocalcaemia even in ewes that are otherwise managed to have an adequate calcium status. The higher the risk status of the ewes, the higher attention required.

- 3. For sheep grazing vegetative cereal crops, provide a mixture of caumag:limestone:salt (2:2:1) at an allowance of 30 g/head/day.**

Young cereals are often low in magnesium, sodium and calcium but high in potassium (K). The risk of mineral imbalance is high.

- 4. Continue to provide calcium supplements to ewes grazing lush pastures post droughts (or after high rates of grain feeding).**

Past research has also indicated that high incidence of hypocalcaemia has occurred in ewes grazing lush green pastures post drought (and after high cereal grain diets). Continuing to offer calcium supplementation after grain feeding has ceased, is the current recommendation rather than removing the supplement to 'induce' bone mobilization, as sometimes practised in the dairy industry. Ensuring supplements are consumed at the amount required (and by the animals that require it) in a paddock situation via a lick, can be unreliable due to significant variation in individual animal consumption within and between mobs. In a Charles Sturt University study, where ewes in paddocks were given access to a low DCAD (dietary cation-anion difference) supplement (supplied in troughs) only 2 out of 5 mobs consumed amounts considered to be effective.

High DCAD reduces bone mineralisation and hence the use of anionic salts that aim to aid mobilisation of bone stores, is gaining interest and some promotion in these situations, but are yet to be researched as to if, when and how they play a role in prevention in sheep. Part of the reasoning for using anionic salts rather than continuing to provide access to calcium supplements is due to the changing blood pH status to more alkaline on green pastures reducing effectiveness of Ca absorption. Promoting Ca mobilisation in sheep would require some confidence that bone supplies have been repleted while sheep have been on grain and are adequate.

There are also reports that indicate the incidence of hypocalcaemia is an increasing issue on green pastures (not associated with drought) and possibly related to an increased focus on reproduction and growth rates.

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5. Identify and manage separately high-risk ewes grazing pastures pre-lambing and consider options for prevention as outlined in Table 3 – given no current guarantees. High risk ewes are older ewes (>3 years old) carrying more than one foetus.

Ewes carrying twins or triplets have a higher calcium requirement and older ewes tend to have lower bone calcium turnover. Cyclical seasonal deficiencies of Ca and P, together with losses associated with pregnancy and lactation, could lead to progressive depletion of bone Ca reserves in ewes. Replenishment of partly depleted skeleton takes longer in older animals which have lower rates of accretion of Ca into bone than young. Mg and Ca have a synergistic interaction, (and

high K reduces Mg absorption) and while the incidence of hypomagnesaemia is considered to be an issue in Victoria, the Charles Sturt study reported in a one-year study, 6 out of 15 farms across southern Australia had low (but not critical) plasma Mg concentrations (but mean plasma and urine concentrations on all farms did not indicate a risk).

Other indicators?

While grasses are lower in calcium and often higher in potassium than legumes, pasture composition may provide some clues to identifying high risk pastures. However, this is not consistently supported. Pastures

Table 3. Options for prevention of hypocalcaemia for high-risk ewes on green pasture

Option	How they work	Comments
Mineral supplements during pregnancy (Ca; Mg and Na) – on pasture Causmag:limestone:salt	Increases Ca and Mg in plasma and urine, decreases urine pH	Some indicative evidence from Wagga of pen trials indicated improved health and immune response from twin lambing ewes and lambs but was not replicated in farm trials. Consumption of adequate mineral supplements was an issue on pastures. Requires broader flock scale experiments to confirm.
Anionic salts – provided as lick for ewes that have come from high grain diets	Improves mobilisation of Ca from bone in dairy cattle. Dairy cattle are also provided with high fibre.	Some observational suggestions that this may have a place in high-risk flocks in some circumstances but need work to show the how and when, particularly given the dairy and sheep differences. Requires confidence that Ca bone levels are adequate and consumption of supplements effective.
Vitamin D treatment	Some evidence of improved Ca and Mg status in sheep with low vitamin D. Vitamin D levels are more likely to be low in southern Australia (below 35° Latitude)	Requires flock research to confirm.

Table 4 Comparison between pregnancy toxemia and hypocalcaemia

	Pregnancy toxemia	Hypocalcaemia
Causes	<ul style="list-style-type: none"> • Low levels of glucose in the blood • Increasing metabolic demand of pregnancy • Nutrition not meeting demand • Pregnant ewes feeding predominantly on green pick are at increased risk • Can be associated with yarding or transport • Can occur following severe weather. 	<ul style="list-style-type: none"> • Low levels of calcium in the blood • Can be secondary to eating plants containing oxalates • Nutrition not meeting demand • Pregnant ewes feeding predominantly on green pick are at increased risk • Can be associated with yarding or transport • Can occur following severe weather.
Signs	<ul style="list-style-type: none"> • Ewes separated from the mob • Drowsy or comatose • Stop eating • Nervous signs – tremors, blindness • Go down and lie on their side for 3–4 days • Death 3–4 days later. 	<ul style="list-style-type: none"> • Rapid onset • Often a number affected • Stiff, uncoordinated gait • Muscle trembling • Down ewe sitting on her brisket unable to get up • Death within 24 hours.
Post-mortem changes	<ul style="list-style-type: none"> • Twin lambs often found • Yellow liver. 	<ul style="list-style-type: none"> • No significant findings.
Treatment	<ul style="list-style-type: none"> • Glucose drench or injection • Response poor to variable 	<ul style="list-style-type: none"> • Calcium borogluconate injection • Response good if treated early.
Prevention	<ul style="list-style-type: none"> • Good nutrition and careful management • Provide good quality hay and grain to stock that are about to lamb • Avoid sudden periods of starvation such as yarding. 	<ul style="list-style-type: none"> • Good nutrition and careful management • Provide good quality hay and grain to stock that are about to lamb • Avoid sudden periods of starvation such as yarding • Add limestone to grain rations or supplement with a loose lick containing a source of calcium.

Source: Department of Primary Industries and Regional Development, Government of Western Australia
agric.wa.gov.au/livestock-biosecurity/pregnancy-toxaemia-and-hypocalcaemia-ewes

associated with hypocalcaemia post the 1982 drought were dominated by sub clover and capeweed. Simple testing of pastures for mineral status has also been proposed as a potential indicator of high risk and hence provide some triggers for enacting more preventative options. However, this also has not been consistently supported. Larsen (1983) reported annual monitoring and comparison of minerals in pastures between years was considered more useful than looking at individual years and Caple also suggested where pasture levels indicated adequate levels, there may be some issue with the dietary availability for the animal. The Charles Sturt University study did not find mineral levels of Ca or Mg in

pastures were consistent with urinary pH and Ca and Mg concentrations in pregnant ewes. There do not therefore appear to be any simple and reliable pasture indicators of potential risk.

Hypocalcaemia and Pregnancy Toxaemia

Hypocalcaemia can be confused with pregnancy toxaemia in late pregnant ewes. Both are related to nutrition, symptoms and treatments can also be similar (treatment is often aimed to treat both). Table 4 outlines some of the key differences in the 2 diseases. One of the key differences however is that treatment of pregnancy toxaemia does not often lead to recovery.

The value of trees – more than carbon storage

Rachelle Meyer, Melbourne University

Integrating trees into farming systems offers environmental, productivity, and amenity benefits. The 'Trees on Farms: maximising co-benefits' project aims to assist farmers with decisions on tree plantings to meet multiple objectives. It is co-funded by the Department of Energy, Environment and Climate Action (DEECA) and Meat and Livestock Australia (MLA) and is part of MLA's CN30 research program.

Planting more trees can also reduce net farm carbon emissions. With the right conditions and management, trees sequester carbon sequestration at faster rates than in soil. Tree growth and carbon sequestration varies with climate. Mixed species environmental plantings in drier areas have slower growth rates – less than 4t CO₂e/ha/year, whereas fast growing species timber species in higher rainfall areas can sequester more than 30t CO₂e/ha/year. Carbon sequestration generally peaks after about 10 years after planting and then slows, reaching negligible amounts about 20 years after planting.

While the contribution to reducing farm emissions wanes, shelter benefits increase over time as the trees increase heights and shelter effects extend over

larger areas. Shelter benefits depends on the height and porosity of the shelterbelt. Porosity of 25 to 50% is recommended as it reduces the windspeed substantially over a larger area. The lower the porosity the more the windspeed is reduced close to the shelterbelt but the less it is reduced at intermediate distances, as dense belts create wind vortexes across the paddock. These benefits continue for the life of the shelterbelt, which may be up to 100 years.

Shelterbelts reduce wind speeds, which reduces the chill experienced by sheep. A study in the ACT found that a chill index accounted for most of the differences in lamb mortality in the first 3 days of life, particularly for multiples. Chill index varies with temperature, rain and wind speeds (Figure 1).

Therefore, trees on farms lower sheep mortality. A study in southwest Victoria found that lamb mortality in a bush paddock was 16% while it was 25% in a neighbouring unsheltered paddock. Another experiment reported mortality of 19% for singles and 27% for multiple births in unsheltered paddocks, compared with 6% for singles and 13% for multiple births. A demonstration

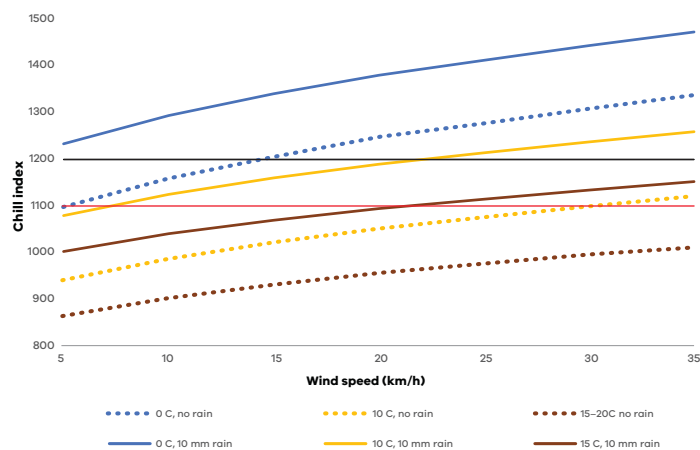


Figure 1: The chill index for sheep in southern Australia. A chill index of 1100 is a high risk of chill (horizontal red line) and 1200 is a severe risk (black line).



Photo by Hugh Stewart, Yan Yan Gurt

site in southwest Victoria found a 10% increase in lamb survival in twin-bearing ewes in the paddock with more shelter. Other evidence brought together by the project indicates farmers have recorded increases in lambing rate of up to 11% and a 4.8% increase in marking rates with sheltered lambs.

Graziers in Victoria, Tasmania and NSW interviewed as part of the project all reported increases in lambing with shelter. Lambing paddocks are selected based on shelter. Trees also provides privacy and protection and improves ewe-lamb bonding.

Tree shelter can also reduce mortality in shorn sheep, but evidence is mostly anecdotal. Historic extreme chill events report mortalities of 12.2% and 11% in unsheltered shorn sheep but no losses in shorn sheep that were effectively sheltered. Others reported zero to very low mortality rates for sheltered shorn sheep.

Improvements in lamb survival will depend on the exposure of the property to cold winds and the extent to which trees reduce wind speeds. The project modelled 2 farms in Victoria, one near Hamilton and one near Bairnsdale. Lambs per ewe increased by 6.4% with a 30% lower wind speed at Hamilton while, at Bairnsdale which has lower wind speeds in winter, the increase was only 0.8% with a 15% lower wind speed. Thus, the topography and degree of exposure to wind is important for estimating the likely productivity benefit associated with shelterbelts.

NSW: 'Shelter drastically improves the survival when lambing in bad weather. Fenced off tree lines are useful, but when lambing nice for the sheep to be in there with the trees.'

Tasmania: 'Chill factor is a big deal here. With smaller sheltered lambing paddocks get 10% increase in survival from lambing to marking; it is especially important for twins and triplets.'

Victoria: 'Shelter is the most important thing for any lambing ewe. A ewe in great condition with lots of food won't save lambs from a bad weather event if there is no shelter. ... For twins, ...shelter and then small mobs are most important.'

Factors influencing the return on investment in trees include costs for verifying carbon outcomes (if the grazer chooses to assess or trade carbon), revenue from trees (e.g., timber) and the productivity of the pasture the trees replaced.

In our analysis, including timber revenue meant a 10% return could be achieved without assuming lamb or productivity increases. This depends on the access to timber markets. When costs of verification were low (10% of the carbon value) and the productivity of the pasture being replaced was low (< 9 DSE/ha) the odds of getting a 10% return on investment were good, ranging from 62% to over 90% depending on the extent of the wind speed reduction and the frequency of chilling.

Further Reading

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BestwoolBestlamb 2023 conference presentations

Presentations at the BestwoolBestlamb conference this year covered a range of topics and excellent speakers. Topics included oral lice; Barbers Pole; optimising sub clover; reducing dag; wool bioharvesting; managing triplets and farm emissions. Keynote speakers were Alex Ball; Chris Howie and Michelle Henry.

These presentations will soon be available to listen to at agriculture.vic.gov.au/support-and-resources/networks/bestwoolbestlamb/bestwoolbestlamb-conference-videos



Do I need to give selenium or vitamin B12/cobalt to my sheep?

By Lisa Warn (Lisa Warn Ag Consulting)

Whether to supplement sheep with the trace elements selenium or vitamin B12/cobalt is a frequently asked question by producers. Many are using vaccines and drenches that contain these additives without knowing if they are necessary for their sheep or if these short-acting products would be adequate if they did have a deficiency.

Managing the risk of a trace element deficiency in stock is not always straightforward. Even if a region has some soil types that are naturally low in selenium or cobalt, the occurrence of deficiencies in stock can be very sporadic, seasonal, and can be influenced by different pasture species/crops on the farm, fertiliser history or class of stock.

Role of selenium and vitamin B12/cobalt

Selenium is an essential element for animals, but not plants. Selenium is required by sheep for growth and has a role in immune function.

Cobalt is required by rumen microbes to synthesise vitamin B12. Without an adequate supply of cobalt from the soil or feed a vitamin B12 deficiency can occur. Vitamin B12 is important for energy metabolism, protein synthesis and production of red blood cells.

Symptoms of Selenium and Vitamin B12 deficiency are summarised in the boxes.

Marginal selenium and cobalt areas in Victoria

Areas in Victoria at risk of trace element deficiencies in stock or pastures were documented and mapped by the Department of Agriculture in the book "Trace elements in Victoria" by Hosking *et al.* (1986). Based on available experimental data at the time, the maps show areas where records of livestock blood tests indicated low levels for a trace element or where responses to trace elements had been obtained (Figures 2 and 3).

Risk factors

In the marginal selenium and cobalt areas, rapidly growing lambs and weaner sheep are most at risk. The conditions that can predispose sheep to selenium or Vitamin B12 deficiency are summarised in the boxes.

Diagnosis

Early diagnosis of a disease and treatment are essential to minimise production and stock losses. A veterinarian can help diagnose a selenium or vitamin B12 deficiency by collecting blood samples or post-mortem liver samples for laboratory analysis.

Blood samples can also be taken from weaned lambs (or adult sheep), who are not showing clinical signs of disease, to determine their trace element nutritional

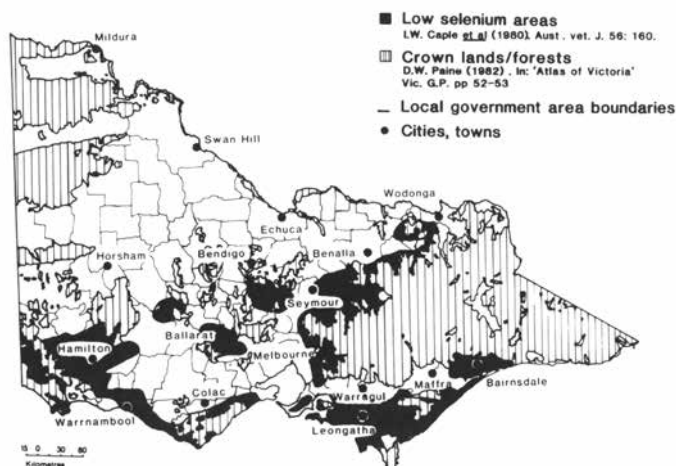


Figure 2. Map of Victorian showing marginal selenium areas based on original data by Caple *et al.* (1980). Within the black shaded areas sheep may have blood glutathione peroxidase activities less than 50 units, cattle less than 40 units (from Hosking *et al.* 1986).

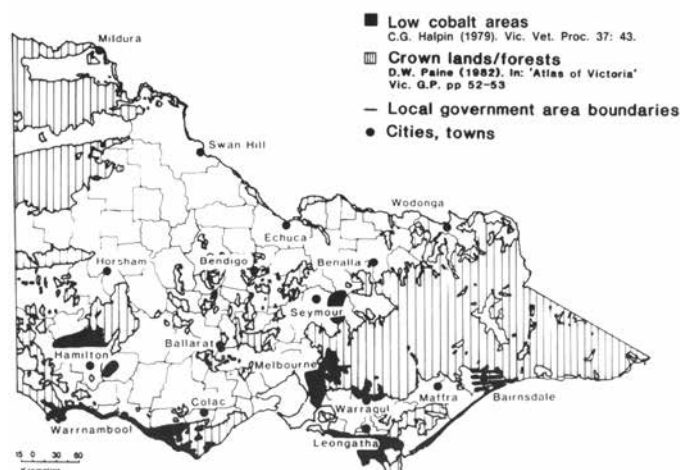


Figure 3. Areas where cobalt deficiency has been detected in livestock in Victoria based on original data by Halpin (1979). (from Hosking *et al.* 1986).

status and see if they might be at risk. **Plant leaf analysis or soil tests are not appropriate methods to determine the nutritional status of stock.**

Recently, the Bairnsdale Bestwool/Bestlamb group undertook a survey of group members flocks to ascertain the selenium and vitamin B12 status. The area is known to be marginal for both (Figures 2 and 3). On each farm, blood samples were taken from lambs (born in late winter/spring 2020) at marking and weaning, before any trace elements were given in vaccines. This work was part of a Meat and Livestock Australia (MLA) Producer Demonstration Site (PDS) project. The results highlighted that 5 out of 10 group members flocks had blood selenium levels considered to be marginal (20–50 GSHPx units) and 1 flock was deficient (less than 20 units). Only one of the 10 flocks had blood vitamin B12 levels that were marginal (200–400 pmol/l). Spring pasture conditions were above average during 2020 to 2021 when the PDS was run.

Continued on page 13

Selenium deficiency

Symptoms

- Ill-thrift – reduced weight gain and wool growth in lambs.
- White muscle disease – can affect lambs and calves:
 - Stiff-legged gait or unable to stand.
 - Arched back.
 - Sudden death – caused by lesions in heart muscle.

Risk factors

- Stock class – Young growing stock are most susceptible
- Soil type – sandy or granite soils
- Seasonal variation – lowest levels of selenium in pastures occur in spring and summer.
- Variation between years – white muscle disease in lambs and calves in spring is most prevalent in years when there is good autumn rainfall and abundant clover growth in spring
- Heavy or long-term applications of fertilisers containing sulphur (eg. superphosphate or gypsum) decrease the concentration of selenium in pastures and may also decrease the uptake of selenium by livestock.
- Pasture type – Clover dominant pastures – clovers have lower Se concentrations than grasses.

If blood tests indicate weaner sheep have marginal / deficient levels of a trace element a response trial can be conducted. A definitive diagnosis of a trace element deficiency can only be made from measured improvements in health and production of animals following supplementation compared with a 'Control' group with no supplementation.

However, carefully controlled response trials cannot always be conducted on farms and predictions of likely benefits from supplementation may have to be based on information relating production responses to the results of blood tests.

Preventative treatment options

Selenium (Se) is available by injection either alone or in combination with vaccines or drenches, as is vitamin B12 (but as cobalt (Co) in drenches). Se and Co are also available in rumen pellets which can be given to lambs at weaning and can last for 3 years.

In low Se areas, lambs can be treated with a Se injection at marking and weaning. Short-acting forms of Se found in vaccines can give 6–8 weeks protection. The need for any follow up treatment, or the need for a longer-acting Se injection (18 months protection) at marking or a selenium rumen pellet at weaning, will depend on the extent of the deficiency/risk period and the age that the lambs are kept.

Vitamin B12/Cobalt deficiency

Symptoms

- Reduced appetite and growth rates
- Diarrhoea
- Weeping 'rheumy' eyes
- Anaemia
- Scaly ears (Affected sheep show signs of photosensitization associated with liver damage).

Risk factors

- Stock class – Young growing stock are most susceptible. Lambs are more susceptible than calves.
- Soil type – coastal calcareous sands, sandy or well drained soils.
- Seasonal variation – cobalt in pastures and plasma vitamin B12 in livestock is lowest in spring.
- Variation between years – seasons favouring lush pasture growth favour development of cobalt deficiency. This is due to animals ingesting less soil when grazing lightly stocked, rapidly growing pastures. Soil provides a more concentrated source of cobalt to the ruminant than pastures.
- Pasture type – Grassy pastures – grasses have lower Co concentrations than clovers.



In Victoria, no responses to selenium treatment have been observed in adult sheep. However, if pregnant ewes are deficient, they can be treated with a short-acting selenium injection 4 weeks before lambing so that lambs are protected from white muscle disease in the first few weeks after birth.

In low cobalt areas, lambs can be treated with a vitamin B12 injection at marking and weaning. Short-acting forms of vitamin B12 in vaccines or separate injections can give up to 6–12 weeks protection, depending on the extent of the deficiency. There are no long-acting B12 injections available in Australia. The need for any follow up treatment or the need for a cobalt rumen pellet at

Continued on page 14

weaning will depend on the extent of the deficiency/risk period. If ewes are deficient, they can be treated with a vitamin B12 injection before lambing to ensure adequate vitamin B12 reserves in the foetal liver and colostrum.

The addition of Se to a 6 in 1 vaccine increases the cost by around 5 c/dose while the addition of vitamin B12 increases the cost by around 40 c/dose (nearly double the cost of the vaccine). A separate vitamin B12 injection costs around 8c/dose (lamb dose) so is a cheaper option if it is needed but requires the extra labour/time for a separate injection. A long-acting Se injection can cost 30c/dose (lamb) to 60c/dose (adult). In severely deficient areas where use of rumen pellets may be an option at weaning, the cost is around 90c for a selenium pellet (with a grinder), \$1 for a cobalt pellet (and grinder) or \$1.50 for a Se and Co pellet.

Seek advice

If you are uncertain about whether your stock may be at risk of certain trace element deficiencies it is important to seek expert advice from your veterinarian or animal health advisor. They can diagnose if selenium or vitamin B12, or both, is an issue or not and if so then work out which product/s will supply the required trace elements to cover your main risk period, most efficiently and at lowest cost.

For more information about the MLA PDS 'Managing trace elements in sheep' go to the MLA website: mla.com.au/extension-training-and-tools/search-pds/pds-data/managing-trace-element-deficiencies-in-sheep/

Thank you to Dr Dianne Phillips and team at Agriculture Victoria, for collecting the blood samples for the MLA PDS project.

The importance of understanding 'fit to load'

Angus Misan, Veterinary Officer, Bendigo

The daily transport and movement of livestock is an integral part of our sheep industry. While the transporter is responsible for the animals during the journey, the consignor is responsible for the assembling and preparation of livestock, including the assessment of whether animals are fit to load.

In summary, an animal is **not** fit to load if it:

- is not able to walk normally or bear weight on all 4 legs. This may be due to a recent or old fracture, an injury, a deformity, or an infection.
- is not strong enough to make the journey
- is suffering from severe distress or injury
- is in a condition that could cause it increased pain or distress during transport
- is blind in both eyes
- is in late pregnancy.

If you identify an animal that is unfit to load you have a few options. You could treat the animal and transport it when it has recovered and is fit to load. Naturally this is not an option in cases that are not readily treatable. Alternatively, you could humanely destroy the animal. Finally, you could consult a veterinarian and only transport under veterinary advice. Generally, if in doubt, leave it out.

Not only does loading an unfit animal compromise welfare, but it also has the potential to reduce interest from buyers assessing the mob as sub-standard based on a few individual sheep, and it reflects poorly on the sheep industry as a whole.

Abattoirs and saleyards also have a duty of care to the livestock they receive, and if they note any issues, the livestock that were unfit to load may be humanely

destroyed and followed up, which could include reporting to Agriculture Victoria for investigation. Remember you, the person in charge of the animal and its assessment prior to loading, are responsible for its welfare. Producers have a vital role in maintaining welfare standards and the public image of the sheep industry, and community values and expectations will not accept anything less.

A guideline titled 'Is the animal fit to load?' has been produced by Meat and Livestock Australia (MLA). This guideline can be viewed electronically on MLA's website or ordered freely from MLA. The MLA fit to load guide is a national guide to help producers, agents, buyers, and transporters decide if an animal is fit to be loaded for transport by road or rail to any destination within Australia.



Is the animal fit to load? 
MEAT & LIVESTOCK AUSTRALIA

A national guide to the pre-transport selection and management of livestock Revised edition 2019

Endorsed by:



Is the animal fit to load? Guide >

The national guide includes more detailed information to help producers, agents, buyers and transporters decide if an animal is fit to be loaded for transport by road or rail.

Get shearing done to prevent animal welfare issues

Dr Sarah Chaplin, Agriculture Victoria Program Manager Livestock Welfare Compliance

Agriculture Victoria is keen to remind people responsible for the care and management of sheep of their responsibility to manage wool length, so it doesn't become excessive. Sheep with more than 1 year's wool growth are highly susceptible to heat stress and disease and those with over-long fleeces are also more likely to become cast – lying on their side and unable to rise.

A person who allows sheep in their care to grow excessively long fleeces may be exposed to cruelty provisions of the Prevention of Cruelty to Animals Regulations 2019. Under the regulations, a person must not allow the fleece of a sheep to grow to a length greater than twice the average annual growth for the breed of sheep or more than 250mm (whichever is shorter).

Most sheep producers undertake shearing annually and won't have issues complying with this requirement.

People that keep sheep as pets also need to ensure they plan ahead and arrange for their sheep to be shorn annually. All people who own or manage sheep must take appropriate actions to prevent their sheep's wool becoming over-long. Sheep with excessive fleece length are at increased risk of heat stress, becoming cast and serious animal health issues such as flystrike.

This regulation applies to anyone responsible for sheep, including sheep kept for commercial or hobby reasons. Anybody who owns or is in charge of sheep can be fined for having sheep with excessive wool growth.

It's also important anyone responsible for sheep consider the time of year they undertake shearing, particularly during the colder months when adverse

weather conditions can have serious impacts on the welfare of sheep. Freshly shorn sheep should be placed into paddocks that contain proper and sufficient shelter to protect them from adverse weather conditions.

For further information regarding sheep health and welfare visit the Agriculture Victoria website, call 136 186 or consult with Animal Health and Welfare staff at your local Agriculture Victoria office.

Anyone wishing to make a specific complaint regarding livestock welfare should contact Agriculture Victoria on 136 186 or aw.complaint@agriculture.vic.gov.au.

For more detail on what is required when making a complaint, please visit the [REPORT ANIMAL CRUELTY](#) webpage at our website.



Farm Business Resilience

The Farm Business Resilience Program is supporting farmers to develop the knowledge and skills they need to improve their farm business and be better equipped to manage the impacts of drought and a changing climate. The program supports farmers to improve skills and management practices in:

- Business planning and risk management
- Farm finances and profitable decision making
- Managing people on farm, farm safety and wellbeing
- Climate adaptation and natural resource improvement including soil, water, crops and pastures

The program includes short courses, workshops, webinars, field days and farms walks to suit the varying needs of farmers and community groups. Follow our events page to see when activities relevant to you are on: agriculture.vic.gov.au/support-and-resources/event-listing. You can also subscribe to their newsletter at the web address below to keep up to date with news and activities.

The web site includes a Farm Fitness Checklist that you can download and fill in plus templates for Farm Business Plans: agriculture.vic.gov.au/farm-management/managing-for-and-during-drought/farm-business-resilience-program

The Farm Business Resilience Program is jointly funded through the Australian Government's Future Drought Fund and the Victorian Government's Future Agriculture Skills Capacity Fund.

FeedingLivestock

Feedinglivestock.vic.gov.au/

The FeedingLivestock website is where we store and share all our resources on livestock (sheep and beef cattle) nutrition. On this site you can find:

- The Sheep and Beef Cattle Drought Feeding books (by chapter or entire)
- Useful tables – protein and energy requirements of different classes of sheep and cattle; weights of hay bales; common nutrient values of a range of supplements and more
- Pasture resources – identification resources; guides to pasture growth rates; estimating feed on offer
- Water resources
- A range of feed and water budget tools and calculators from the very simple to more complex ones (like the Ration Builder in Nick's article)
- A range of articles and webinars and up to date news articles.



Watch out for new videos on the FeedingLivestock website

A series of short 'How to' videos that work through key considerations for feeding livestock will soon be available on the FeedingLivestock website. The calculations are 'back of the envelope', easy to follow and can be readily adapted to a range of feeding scenarios for cattle or sheep.

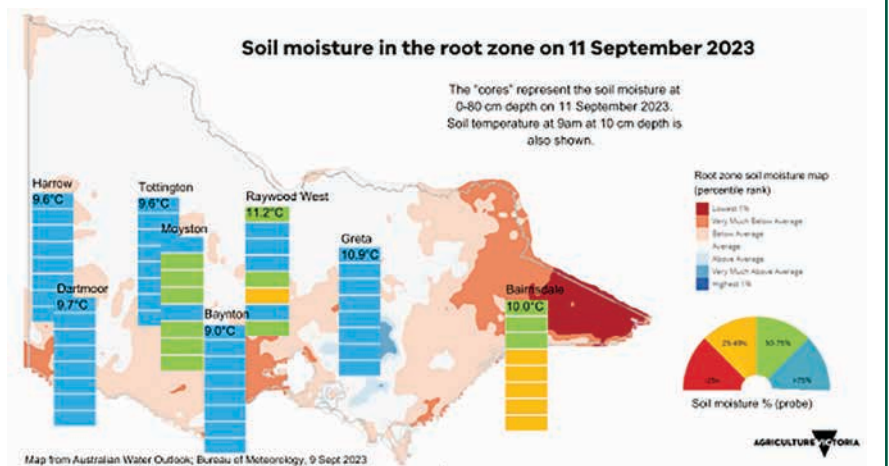
In the 4 videos, Livestock Development Officer Nick Linden (image below) demonstrates how to calculate 'what to feed', 'costing out your feeds', 'how much to feed', and 'estimating animal performance'.

1. 'What to feed' looks at the key considerations in choosing supplements for stock by calculating their requirements and the energy density of feed against its cost.
2. 'Costing out your feed' shows you how to make sure what you're feeding to your animals is the most cost-effective option.
3. 'How much to feed' looks at getting the balance right in developing a feed budget by avoiding the pitfalls of too much or too little feed.
4. 'Estimating animal performance' covers the calculations to use in determining what level of performance you can expect from your cattle in comparing a couple of different feed stuffs.

The videos have been produced as part of Agriculture Victoria's technical support program for agriculture recovery.

Soil moisture updates

You can access soil moisture and temperature for many Victorian pastures (and crops) at extensionaus.com.au/soilmoisturemonitoring/. The website displays soil temperature, current soil moisture profile for many soil moisture probes installed across the state. To keep up to date with seasonal commentary (like the snapshot displayed) subscribe to our newsletter at the Agriculture Victoria website – agriculture.vic.gov.au/support-and-resources/newsletters/soil-moisture-monitoring-of-pastures.



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ISSN 1326-4559
ISSN 1836-4756 (Online)

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