

WormTest for livestock and guide to egg counts

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NSW Department of Primary Industries veterinary laboratories at Camden, Orange and Wollongbar offer a number of tests that help farmers to control worms in sheep, cattle and other farmed animals. WormTest, which is used to monitor worm egg counts, is the most frequently used test. It is an invaluable tool to help achieve sustainable worm control.

WormTest – monitoring for worms

This test is used to monitor worms and liver and stomach fluke in a mob of cattle, sheep, goats or alpaca. Worm egg and fluke egg counts are taken from dung samples submitted to the laboratory in a WormTest collection kit. Within 24 hours of the samples arriving at the laboratory, egg count results are faxed or mailed to farmers, and to their advisers if requested.

The type of roundworms present can also be identified. For most roundworms, this requires culturing worm eggs and examining the larvae which hatch, so a further 10 days is required for the 'worm type' result. The type of fluke eggs present – liver or stomach fluke – is determined during the egg counting stage.

WormTest kits are available from Rural Lands Protection Boards, rural suppliers and NSW DPI. Each kit includes instructions and an information sheet, prepaid postage to the laboratory, a mailing container, a glove and 10 sample containers. Private laboratories and consultants may also provide a similar service.

Sampling

Samples can be collected from the rectum of animals in a race, or in the paddock. To collect dung samples in the paddock, muster a large number of the mob to a clean corner of a paddock for 10 minutes and then let them drift away quietly. Young animals, such as weaners, are an important group to sample because they tend to be quite vulnerable to worms. However, it may be necessary to sample more than one mob.

Fresh, clean dung samples can then be collected from the ground, avoiding soil. Ten samples from separate sheep are required and sufficient dung to fill each sample container in the WormTest kit should be collected. For cattle, take 2–3 small 'grabs' from each dung pat rather than one large sample.

Within 24 hours of collection fill out the kit's information sheet and post it with the samples to the laboratory. Keep samples cool but do not refrigerate, as this may affect further development of eggs.

WormTest – value for money

WormTest is good value for money.

- It could save you the expense of unnecessary drenching or using the wrong drench.
- It can help you to forestall a disaster due to heavy worm infection.
- WormTest can be used as a simple and quick way to check drench effectiveness. Collect samples 10–14 days after using a particular drench – longer for long-acting drenches.
- WormTest is a useful tool to monitor your worm control program.

Liver fluke testing

Different techniques are used for egg counts for fluke and roundworm.



The test for fluke is very reliable for sheep where significant numbers of fluke eggs are shed in faeces. Bulk faecal pools are sufficient, with two pools each representing five animals.

In cattle, the fluke test is less reliable due to the less regular shedding and low numbers of fluke eggs. Five bulk pools, each pool representing samples from two cattle, are usually recommended.

The relationship between fluke egg counts and numbers of adult flukes is poor. Even low egg numbers indicate that the animals have been exposed to infection, and the need for control and treatment programs. Eggs are not produced for 12 to 16 weeks after infection. By this time immature flukes may have already caused significant damage.

Blood tests (ELISA) detect antibodies produced in response to fluke infections from as early as two weeks after infection. These tests are available at NSW Department of Primary Industries laboratories. These tests are considered as herd or flock tests and sufficient numbers of blood samples are required – ideally 12–15 per flock/herd.

WormTest – gold or basic?

WormTest gold

WormTest Gold is the traditional WormTest.

- You get 10 individual egg counts – results include the average egg count and the range.
- This provides you and your adviser with information about the variability of numbers of worm eggs present in the dung of the mob. For example, a high count may mean that one animal was missed at the last drench, not that the whole mob is wormy.
- If 'worm type' is requested (that is, larval culture and differentiation), dung is pooled from the 10 animals and determine the type of worms present in the mob.

WormTest basic

- The laboratory combines dung from five animals and thus provides two counts per 10 dung samples.
- The laboratory determines the average of the two counts. Thus you lose the detail of the individual counts, but can monitor for a lower cost.
- If type is requested, dung is pooled as above.

Which WormTest should you choose?

The choice is best made by you with help from your adviser. Your adviser may have visited your farm and is best placed to know local conditions. By discussing your management objectives with your

local adviser you will receive the best advice on how worms should be managed on your property.

Basic is useful when routinely monitoring less susceptible stock, such as dry ewes and mature wethers.

Gold. Consider Gold for susceptible stock, such as pregnant or lactating ewes, and weaners; or to confirm the effectiveness of your drenches; or at other critical times where detailed information is required.

NSW DPI strongly recommends that you consult a veterinarian, or other suitably qualified adviser, for advice on monitoring and interpretation of the results.

Interpreting roundworm egg count results

It is very difficult to give hard and fast rules on interpreting egg counts, as there are so many variables to consider.

Age of animals

Adult dry animals in good condition tolerate worms much better than young or poor animals. In the case of extensively grazed cattle, adults often require little or no drenching – except where liver fluke is a problem. Cattle up to two years of age are likely to need drenching, but egg counts may not be a reliable indicator of actual worm burdens in animals older than 9–10 months. An adult occasionally may be wormy but yet have low egg counts. In such case, local expert advice, and possibly a 'diagnostic drench' given to a small group of animals may be in order.

Physiological status

Late pregnant or lactating sheep have a temporary relaxation of immunity, so in these cases you may consider drenching at lower egg counts than otherwise.

Egg counts in sheep – summary

<200 (epg)	drench probably not required (exception: summer drenching in DrenchPlan areas)
200-500 epg	seek advice
>500 epg	drench probably required

For more information, see Table 1 – Guide to worm egg counts in sheep, or Table 2 – Guide to egg counts in cattle.
epg = eggs per gram

Host species

Well grown cattle and sheep over two years of age develop some immunity to worms. The immunity in cattle tends to be stronger than in sheep. Goats do not appear to develop a great deal of immunity,

even when they reach adulthood. Host immunity will have a bearing on how you interpret egg counts.

Alpaca are generally resistant, due in part to their dunging habit of using 'latrines', but they can be infected with both cattle and sheep worm parasites. Alpaca in fluke-endemic areas should be monitored

carefully, as the small size of their livers makes them particularly susceptible to the effects of liver fluke.

Nutritional status

Well nourished animals develop stronger immunity to worms faster and so withstand a worm challenge

Table 1. Guide to worm egg counts in sheep

Worm egg count epg	Interpretation/comments (see box page 4: 'NB Tables 1 and 2 are guides only')
0-100*	A good result. There would be few situations where you would contemplate drenching at this level. Consider another WormTest 4–6 weeks after significant rain, or before a 'management event' such as a summer drench, pre-lambing, prior to yarding, or when there are signs consistent with parasitism. Be aware, however, that sheep in some cases can get heavy worm burdens quickly before egg counts rise. An example might be a thin-necked intestinal worm (<i>Nematodirus</i>) problem in young sheep following rain after a dry spell.
100-200*	This range of egg counts is still low, but can be a trigger to drench in certain situations such as the first or second summer drench in the DrenchPlan area of central and southern NSW. Traditionally summer drenches have been done in DrenchPlan areas if mean counts exceeded 100 epg or thereabouts. Farmers, especially regular WormTesters, may tolerate higher egg counts – especially in adult dry stock – in the interest of preserving drenches for a little longer. Consider another WormTest 4–8 weeks after significant rain, or before a 'management event' (see above).
200-500*	Productivity losses and scouring may be occurring, especially if the counts are dominated by scour worms rather than barber's pole worm. (Barber's pole worm actually tends to constipate.) Depending on prevailing weather conditions and other factors, you may consider drenching, or repeating a WormTest in about four weeks. A count of 500 epg has been a commonly used if somewhat conservative benchmark in WormKill areas (northern NSW) where barber's pole worm often predominates. At this point, drenching may be necessary, especially if conditions favour increasing numbers of larvae on pasture, or there are signs consistent with parasitism, including anaemia, 'bottle-jaw', scouring or ill-thrift.
500-1000*	In the DrenchPlan areas of central and southern NSW – where worm burdens are often mostly black scour and brown stomach worms – this range of counts is entering the 'high' range. Production losses are becoming significant. This count is also of significance in WormKill areas. Scour worm burdens could be quite significant, and the stage may be set for a rapid escalation in numbers of barber's pole worm if conditions are warm and moist. In any case, treatment with an effective drench will be required in many if not most cases.
1000-2000*	These counts are into the high range, especially if worms are mostly scour worms. Production losses could be quite significant and clinical signs – especially related to scour worms – may be quite obvious. Anaemia and exercise intolerance from barber's pole worm may not yet be clearly evident. However, barber's pole numbers could rapidly increase in a short time under favourable conditions
2000+*	Production losses are likely to be severe. Deaths may be occurring or imminent. Treating with a highly effective drench and moving to a low risk paddock is clearly a priority.
<i>Nematodirus</i> eggs	Eggs of the thin-necked bowel worm are bigger and distinctly different from strongyle roundworm eggs. Numbers are often low (<100 epg), but can be a cause of significant ill health in young lambs, occasionally with few or no eggs in the faeces. Counts >200 epg should be investigated promptly
Liver fluke egg counts	Any egg count can be significant, more so in sheep than cattle. Counts in sheep >50 epg and cattle >25 epg are considered high.
Stomach fluke egg counts	In most cases, these are of little consequence. Significant disease can be caused by stomach fluke, but only under certain conditions and in certain areas, such as cattle on the North Coast of NSW. In these cases, the damage is done by migrating immature stomach fluke, and egg counts may be low or zero. Sheep are less commonly infected as they are not frequently grazed in coastal wetland areas.

* strongyle eggs per gram of faeces – epg

better than poorer animals. Sometimes moving animals onto a better paddock is as good as a drench.

Forecasting

A decision to drench or not, based on a certain egg count, may be influenced by how wormy pastures are likely to get in the coming weeks and months. Another factor may be whether a move to cleaner, better pasture is being considered.

Management factors

If animals are to be mustered for some other reason, you may decide to drench based on egg count as well as convenience. This can be an important factor in western NSW where stock are long distances from handling facilities.

The worm mix

In areas where barber's pole worm is commonly a problem, egg counts in general are likely to be higher than in other sheep raising areas. For the three major sheep worms, barber's pole worm has the highest egg output, followed by the scour worms, black scour worm, and then small brown stomach worm.

Egg counts in brown stomach worm in sheep and goats are regarded as a less reliable indicator of actual worm burdens than for other worm species.

Table 2. Guide to worm egg counts in cattle
Cattle 6–18 months of age – burdens that may cause ill-thrift*

Common name of worm	Scientific name	eggs per gram
Barber's pole worm	<i>Haemonchus</i>	200
Black scour worm	<i>Trichostrongylus</i>	50
Brown stomach worm	<i>Ostertagia</i>	150
Nodule worm	<i>Oesophagostomum</i>	100
Intestinal worm	<i>Cooperia</i>	500
Liver fluke	<i>Fasciola</i>	5
Stomach fluke	<i>Paramphistomum</i>	†

† Clinical disease is usually caused by large numbers of migrating immature stomach fluke, and egg counts may be low or zero. Source: Guidelines from Regional Veterinary Laboratory, Wollongbar.

Cattle over 18 months old: In older cattle, egg per gram output of all species will be lower. When there are clinical signs, strongyle worm egg counts less than 100 and any fluke egg count may be

significant. Adult cattle usually have protective immunity and do not require routine drenching.

*NB Tables 1 and 2 are guides only

Many factors need to be considered in any worm control program:

Seek expert advice relevant to your situation.

Aim to reduce reliance on drenching as a means to control worms.

Make better use of non-chemical control options, including nutrition, grazing management, and breeding more resistant stock.

Objectives

A rule of thumb for worm control is – *the more effective the worm control, the greater the selection for drench resistance.*

If a farmer places more emphasis on suppressing worms, maximising production and keeping faecal worm egg counts very low, especially in dry seasons, the price paid is likely to be more rapid development of drench resistance.

Other producers may place a higher priority on slowing development of drench resistance, and so may be less inclined to drench when egg counts are low.

Get good advice

The bottom line is that it is advisable to get expert advice to help interpret egg counts.

A Complete laboratory service

NSW DPI's veterinary laboratories provide a complete diagnostic service, which includes parasitology. In addition to WormTest, total worm counts can be done following post-mortem examination of animals at the laboratory or in the field.

Drench resistance tests – Faecal Egg Count Reduction – and special tests for closantel resistance are available.

Blood tests for liver fluke infections are helpful if fluke infections are suspected but can not be confirmed by faecal egg counts. Other causes of ill thrift and scouring, indeed any animal health problem, can be investigated.

Further information

For further information contact your local veterinarian, Rural Lands Protection Board or NSW DPI.

For a comprehensive range of Primefacts on internal parasites in sheep, see the NSW

Department of Primary Industries web site at:
www.dpi.nsw.gov.au/reader/sheep-internal.

Titles at that site include:

- Combinations of sheep drenches, resistance and 'refugia'
- DrenchPlan – the basics
- DrenchPlan 2005
- Identifying liver fluke snails
- Laboratory tests for worms – prices and availability
- Liver fluke disease in sheep and cattle
- Quarantine drenching – don't import resistant sheep worms
- Registered drenches for sheep worms
- Sheep measles – another profit killer
- Sheep worm control and drench resistance
- Sheep worm control: Summer vs Winter drenching in southern NSW
- Stomach fluke (paramphistomes) in ruminants
- Turning The Worm Newsletter
- WestWorm and FarWestWorm
- Worm control regions
- WormBoss
- WormFax NSW
- WormMail – an electronic internal parasite information mailing list

Many of these publications are also available as hard copy through NSW DPI offices and Rural Lands Protection Boards.

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Check for updates of this Primefact at:
www.dpi.nsw.gov.au/primefacts

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