

Livestock Health Monitoring Report – April 2021

The Livestock Health Monitoring program collects confidential/anonymous information on livestock diseases and conditions observed by rural service providers and abattoir data from the National Sheep Health Monitoring Project in Tasmania and produces a monthly report that is circulated as widely as possible amongst Tasmanian livestock producers and service providers. It is based on a successful pilot project conducted in 2018-19.

See www.animalhealthaustralia.com.au/tas-health for previous reports.

The program is designed to keep Tasmanian livestock producers and rural service providers up to date on what livestock diseases and conditions are currently occurring in Tasmania. This should mean earlier diagnosis, more effective treatment and better prevention of future outbreaks.

Information from these reports may be used to help convince our overseas trading partners that we don't have certain livestock diseases that they are concerned about, thus keeping our valuable export markets open and stopping risky imports coming in.

This program should also help detect an outbreak of emergency animal disease earlier, allowing effective action to stamp it out or reduce its impact.

The program has a sheep industry emphasis, but all common livestock species are covered. The National Sheep Industry Biosecurity Strategy lies at the core of the program (see www.animalhealthaustralia.com.au/nsibs)

Funding is provided by Animal Health Australia (with support from Sheep Producers Australia and WoolProducers Australia) and by DPI/PWE. Private veterinarians coordinate the project.

You are welcome to distribute this report to anyone you like. The next Livestock Health Monitoring report will be out in mid-June.

If you need more information on this project please contact Bruce Jackson on 0407 872 520 or rja69392@bigpond.net.au.

For farm biosecurity plans, animal health declarations and information on biosecurity practices see: www.farmbiosecurity.com.au/

Livestock Data Link (LDL) allows you to access information on carcase data, diseases and conditions detected in your livestock at slaughter. See: <https://www.integritysystems.com.au/globalassets/isc/pdf-files/ldl-pdf-files/about-livestock-data-link.pdf> for more details.

Remember:

- Report any suspicion of an Emergency Animal Disease to the Hotline on 1800 675 888
- Never feed animal protein such as meat meal to any ruminant including sheep.
- Use NVDs and NLIS tags properly so that animals can be 'contact traced' quickly if there is an outbreak of an Emergency Animal Disease.
- If you have pigs, don't feed them swill.
- Never feed raw untreated offal to dogs.
- If you have a sheep or cow showing neurological (nervous) signs you may be able to claim a subsidy for a post mortem investigation (https://animalhealthaustralia.com.au/wp-content/uploads/2015/11/Bucks-for-Brains_Jun16_WEB.pdf)

Seasonal Disease alerts

Pink eye: Still quite a lot about in sheep. Reduce exposure of young sheep to flies, dust and long grass.

Belly strike: Fly activity now low but carryover cases of belly strike being seen in areas where sheep have walked through long grass wet by rain or dew. Look for dark wool on lower flank.

Liver fluke: One in every 6 adult sheep processed in Tasmania had fluke with nearly 70% affected in one line. Consider testing/treatment of both cattle and sheep this autumn and winter.

Drench resistant Cooperia worms in cattle: If young cattle don't respond to a Mectin family drench, consider doing a WORMTEST 11 days after treatment to ensure it has been effective.

Vibrio abortions in cattle: Many cows are in mid-pregnancy now, so if you find an aborted foetus get it tested for Vibrio and other causes of abortion.

Twin lamb disease: Have ewes scanned 70 days after rams went in, identify ewes with multiples and feed them to maintain a condition score of 3.3 (especially in the last 7 weeks of pregnancy) to prevent twin lamb disease (pregnancy toxemia) in the lead-up to lambing.

Biosecurity story of the month

A bull breeder had leased some bulls to a dairy farmer. Later, another client needed bulls urgently and these bulls were available, but there were some disease risks because they had been in a herd of unknown disease status.

The main diseases of concern were Mycoplasma, Pestivirus and Vibrio. Vibrio is being diagnosed more frequently in Tasmania (two this last month), Pestivirus is quite common (causes reduced fertility, runty calves and spreads very easily) and Mycoplasma is not as common but very destructive when introduced into a herd (lameness, abortion, mastitis, calf deaths).

The bulls had been vaccinated against Vibrio and Pestivirus some time ago so a booster shot was given. The bulls were blood tested for Mycoplasma and all tested negative. A clean truck was used to transport the bulls and they were kept in 'hotel quarantine' for over 2 weeks under observation for any signs of disease before mixing with other cattle on the purchaser's farm.

A Cattle Health Declaration was not used in this case, but the same principles were used.



Diseases and conditions seen in April

SHEEP				
Disease/condition	Number of reports/cases	Region	Details	Prevention, treatment, and other biosecurity advice or measures
Air under skin	One sheep in a medium sized flock	Southern Tasmania	Ewe dropped out back of mob when driven. Air under skin of head.	Some Clostridial tissue infections form a gas but the sheep would normally be down and very sick. This one sounded like a puncture wound into an airway with exhaled air escaping under the skin. Prevention: muzzle dogs that bite sheep.

Arthritis - degenerative	Two aged sheep in one small flock.	Northern	Aged sheep lame with swollen and unstable stifle joints	Anti-inflammatory treatments. Euthanasia if not responsive.
Arthritis - infectious	One sheep in one flock	Northern Tasmania	Seen as lameness and swollen joint/s. In abattoir, whole leg will usually be removed, often dropping carcass into a lower price grade on the grid.	Can attempt antibiotic treatment in early cases before joint surfaces are badly damaged. Prevention: Removing tails at the third joint (level with tip of vulva in ewe lambs) at marking prevents many cases. Early antibiotic treatment of lame lambs may work. If Erysipelas is diagnosed in the flock (submit affected joints to laboratory) then use Erysipelas vaccine. See fact sheet on: https://sheepconnecttas.com.au/disease-factsheets/
Cough	2 weaner lambs in large mob.	Northern Tasmania	Sheep cough when yarded.	Can be due to lungworm, bacterial, viral or mycoplasma infection. Use drench effective against lungworm. If no response and lambs appear sick, consider antibiotic treatment.
Cysticercosis ("bladder worm")	Detected at abattoir in 1.8% of lambs and 9.3% of mutton carcasses.	Southern and Northern Tasmania	Seen as small clear bags of fluid attached to liver or elsewhere in abdominal cavity of sheep at abattoir. Causes liver to be trimmed or condemned. Spread by a dog tapeworm.	Prevented by stopping dogs from eating sheep offal and/or by treating all dogs including pets with a wormer containing praziquantel every 30 days. Visiting dogs (contractors, shooters) must be treated at least 2 days before arrival on property. Keep stray dogs off the property. These measures also prevent sheep measles and hydatids. See fact sheet on: https://sheepconnecttas.com.au/disease-factsheets/
Dags	10% of weaners on one large property	Northern Tasmania	Due to scouring.	May be due to worms, coccidia, gut infection (eg Salmonella, Yersinia), nutritional factors. Have a WORTEST egg count done and ask the laboratory to culture for Yersinia and Salmonella if egg counts are low. Check paddock for plants such as capeweed. Crutch and ensure fly prevention program is effective.
Dermo (lumpy wool)	One small and one large property	Southern Tasmania	Wool in hard blocks along topline.	Can treat with long-acting tetracycline during dry period, wait for 6 weeks and shear. Wool still valuable. Prevent by not yarding sheep when wet to skin.
Dog attack	One sheep in one small flock	Southern Tasmania	Bite wounds around head and neck and flanks, back legs	Treat: antibiotic cover, stitching (ensuring wound drainage), pain relief/anti-inflammatories
Fly strike	Moderate number of cases in crutched and un-crutched including body and belly strike	Wide-spread in Northern and Southern Tasmania	Mostly breech strike but body strike too. Some belly strike in sheep on paddocks with long wet grass.	Green blowfly usually only active if temperature is over 19 degrees, so new strikes should be rare now, but residual strikes could be present. Belly strike reported due to long wet grass from dew or rain – watch for dark patches of wool on lower flank. See FLYBOSS on http://www.flyboss.com.au/sheep-goats/ for details on treating, preventing and breeding aspects.

Foot abscess	Rams in one medium sized flock	Southern Tasmania	Swelling of one toe, hot, painful and discharge pus in acute stage, Most in healing phase now but some active cases seen. May affect all 4 feet in some cases, but usually one foot.	Keep mob average BCS to 3 - 3.3, autumn or pre-lamb shear, reduce interdigital skin injury, walk through 5-10% formalin footbath weekly. Pare away hoof to allow drainage of pus. Treat with long-acting broad-spectrum antibiotics, keep feet dry eg on slatted floor of shearing shed, epsom salts on drainage point and bandage. Ensure fit to load if transported.
Footrot (virulent)	A number of flocks.	Southern, Northern and North-West Tasmania	Spread is starting on some properties on some irrigated and non-irrigated pastures.	Eradication window is over for this year. Control by footbathing, culling chronic cases, use of vaccine. Prepare for eradication next summer by keeping number of infected sheep low. Ensure culls are fit to load if transported. Prevention: Ask for a Sheep Health Declaration when buying sheep and ensure section B1 confirms flock is free of virulent footrot but still footbath and check feet on arrival . Maintain good boundary fence. See Ute Guide for Tasmania: https://www.wool.com/globalassets/wool/sheep/welfare/other-husbandry/footrot--a-guide-to-identification-and-control-in-the-field---tas-2019.pdf
Foot stamping in footbath	20% of 100 lambs	NW Tasmania	Purchased lambs footbathed in 10% zinc footbath stamped feet.	Ewe lambs introduced into flock, were in "hotel quarantine" feet inspected for footrot and found to be free. Stamping possibly due to irritation of injuries to skin above hoof, maybe thistle damage etc.
Goitre	A number of lambs in one flock	Southern Tasmania	Swelling (from just detectable to orange size) of upper front of neck	May be caused by iodine deficient soil or grazing some plants such as brassicas. Treat lamb with iodine. Give ewes 300 mg potassium iodide per ewe dissolved in water as a drench in last month of pregnancy to prevent.
Ill-thrift in weaned lambs	One medium flock	Northern Tasmania	Poor growth rates.	Possible causes may be worms, fluke, dietary deficiency (energy, protein, micronutrients), chronic infections such as pleurisy etc. Conduct WORMTEST and FLUKETEST, review Food On Offer, liver or blood test for micronutrient (copper,/selenium/B12) deficiency.
Lameness	A number of sheep in a number of mobs	Northern Tasmania	Reluctant to bear full weight on at least one foot.	Could be footrot, scald, foot abscess, scabby mouth of feet, injuries, toe abscess, laminitis, standing on concrete surfaces too long. Identify cause and treat accordingly.
Lice (body lice)	Many flocks	Northern and Southern Tasmania	Sheep body lice cause fleece damage. Check for 2mm long insects with broad reddish head moving slowly away from light by parting wool 10 times down each side of 10 sheep.	See LICEBOSS: http://www.liceboss.com.au/sheep-goats/ for a full practical guide to managing and preventing sheep body lice. Use Sheep Health Declaration when buying sheep. Maintain good boundary fences. "Hotel quarantine" and consider treatment of introduced sheep.
Liver fluke	Detected at abattoir in 2.2% of lambs and	Northern and Southern Tasmania	Abattoir detection, farm post mortem or Fluke eggs	Most fluke are adult stage in bile ducts in liver at this time of year but pickup of immatures will continue till July. Triclabendazole best treatment from November to July as it kills immature fluke as

	15.8% of mutton carcasses.		found in FLUKETEST on manure samples sent to laboratory. Bottle jaw, anaemia, weight loss and deaths from heavy infestation.	well as mature fluke. Consider treatment with a different flukicide family in late winter to kill adult fluke. See fact sheet on https://sheepconnecttas.com.au/disease-factsheets/
Micronutrient deficiency	Suspected in one large flock	Northern Tasmania	Lowered growth rates, and fertility. Can cause white bands in black wool and/or bone fractures (copper deficiency), white muscle disease (selenium deficiency), anaemia (B12 deficiency).	Collect 5 blood or liver samples (July is best time) for testing. Various options for treatment. Beware over-use of copper in sheep. Selenium can also be toxic, especially if several forms of supplement used at once eg in drench as well as vaccine.
Neck fracture	One ewe in one small flock	Northern Tasmania	Ran into gate when about to leave yards.	Cover gates with hessian or ply so that sheep can see the barrier.
Ovine Johnes' disease (OJD)	One sheep in one small flock	Southern Tasmania	Adult sheep over 2 yrs old waste away over several months and die despite drenching.	Quickest diagnosis is by post mortem. Prevent by vaccinating lambs at marking with Gudair vaccine. If confirmed present in the flock, cull any sheep over 18 months of age that waste away and don't respond to drenching. See factsheet on: http://www.ojd.com.au/wp-content/uploads/2013/02/OJD_factsheet.pdf
Photosensitisation	Two sheep from 2 different flocks.	Northern Tasmania	These were severely affected from nose to tail. Ears were badly damaged in one.	Can be due to eating certain plants such as St John's Wort or Brassicas fed off too early. Also due to liver damage (eg from blue-green algae or severe infection). Remove from paddock, provide good access to deep shade, good water and feed. Antihistamines, multivitamin and antibiotic injections can help prevent secondary complications. 'Pink zinc' on bare areas if small number/valuable animals.
Pink eye	Wide-spread	Southern and Northern Tasmania	Discharge down cheeks, white areas on surface of eye. Usually spread by flies, long grass and close contact (eg yarding, trucking)	If low prevalence and on good feed and water leave alone to self-heal as mustering can increase spread within mob. Treat with antibiotic injections if have to be yarded. Eye ointments/sprays less effective.
Pregnancy Toxaemia (twin lamb disease)	One flock	Northern Tasmania	Caused by insufficient energy in diet in last 6 weeks of pregnancy. Usually in twin-bearing ewes or ewe	If heavily pregnant ewes go down in last 6 weeks, inject 1/5 milk fever pack under skin and massage in well (to differentiate from milk fever). If ewe does not get up within an hour, twin lamb disease is most likely cause. Oral treatments rarely work unless you catch them while still able to walk but dropping out of back of mob and 'star-gazing'.

			bearing a large single lamb.	
Ryegrass staggers	One flock in S, wide-spread in North and North-West	N, NW and Southern Tasmania	Usually young sheep - tremors, abnormal gait, may become downers, may convulse when disturbed. Often seek water and drown in dams. Can have high mortality.	See https://dpiwwe.tas.gov.au/biosecurity-tasmania/animal-biosecurity/animal-health/sheep/perennial-ryegrass-staggers for details on diagnosis treatment and prevention. Feed with additives to absorb the ryegrass toxin in the rumen may be worth a try.
Sarcosporidia ("Sarco")	Detected at abattoir in 19.6% of mutton carcasses and 0.4% of lambs.	Southern and Northern Tasmania	Small 'rice grain' whitish raised lesions on outside of food pipe (oesophagus), diaphragm and in skeletal muscles. Carcase trimmed or condemned.	Spread by cats. Takes a long time to grow so not usually seen in lambs. Deny cats access to sheep meat - burn or bury carcasses promptly, persistently control feral cats over large area. See fact sheet on: https://sheepconnecttas.com.au/disease-factsheets/
Sheep measles	Detected at abattoir in 7.4% of lambs and 11.2% of mutton carcasses.	Northern and Southern Tasmania	Small whitish mass about half the size of a 5 cent piece protruding from the muscle of the heart, diaphragm or skeletal muscle. Carcase is trimmed or condemned if too many to trim.	This is the intermediate stage of a dog tapeworm. Prevented by stopping dogs from eating raw sheep meat. Freeze sheep carcase meat for 2 weeks before feeding to dogs, burn/bury sheep carcasses promptly and/or treat all dogs including pets with a wormer containing praziquantel every 30 days. Visiting dogs (contractors, shooters) must be treated 2 days before arrival on property. Keep stray dogs off the property. See fact sheet on https://sheepconnecttas.com.au/disease-factsheets/
Sudden deaths on irrigated lucerne or clover	Wide-spread	Northern and Southern Tasmania	Lambs found dead and blown up.	May be caused by 'lucerne red gut', Pulpy Kidney (PK) or frothy bloat. Give third PK vaccination or use 8-in-one, don't place hungry lambs on irrigated legumes, offer good quality hay ad lib. Some mineral loose licks may help prevent problems.
Teat deformities ("bottle teat")	Several ewes from one large flock	Northern Tasmania	Teats too large for lamb to get into mouth resulting in lamb loss soon after birth.	Check ewes at marking or weaning and cull.
Transport death	One sheep from one medium flock	Northern Tasmania	Fond dead on unloading.	Many possible causes. Ensure correct loading density per pen to ensure sheep don't smother during transport.
Udder ulcers	One ewe in one small mob	Southern Tasmania	Udder hard and enlarged. Chronic. Ulcers and discharge.	Could be chronic mastitis or cancer. Antibiotics may work. Biopsy to diagnose cancer. Mastectomy feasible for pet ewe.

Vaccination lesions	Detected at abattoir in 2.6% of sheep and 0.7% of lamb carcasses	Southern and Northern Tasmania	Caused by vaccinating into the muscle, armpit, top of neck etc. Trimming can involve removing the whole hind leg or front leg.	Extra care must be taken with Gudair vaccine as large lumps often result. Vaccinate under the skin high on the side of the neck. Never vaccinate into the muscle especially of the hind leg, or under skin of armpit. For details see: https://www.zoetis.com.au/livestock-solutions/pdfs/zoetis_gudair-product-information-2018.pdf
Wool loss	One sheep in a small flock	Southern Tasmania	Wool hanging out of fleece.	Could be due to body lice, shedding genetics (eg Dorper, Wiltshire horn) or a wool break due to stress. Any stress can weaken the wool fibre as it grows. Individual sheep may lose fleece after acute infection eg mastitis, whole mobs can have 'tender wool' after nutritional restriction or disease outbreak (eg heavy worm infestation) events.
Worms	Egg counts in S Tas now averaging about 250 epg. Other flocks in North suffered losses.	Southern and Northern Tasmania	Worms can be diagnosed by scouring, anaemia, poor weight gain which respond to drenching, or by WORMTEST with or without larval identification, or total worm count at post mortem.	Nematodirus and Brown stomach worm common in summer/autumn. These two species of worm may not produce a lot of eggs so still drench if scouring or weight gain is not what it should be. Black scour worms will be increasing from now on and do a lot of damage See WORMBOSS at: http://www.wormboss.com.au/sheep-goats/programs/sheep.php

CATTLE

Bloat	One steer	Northern Tasmania	Left flank bulging out a lot.	Treat: oral vegetable oil or pleuronic can break down froth to gas and allow burping out of the gas if due to eating lucerne/clover too fast. Chronic bloat can also be due to internal damage ("vagabloat") – a vet may be able to help.
Brown stomach worm	One large herd	Northern Tasmania	Worm egg counts with larval identification showed that brown stomach worm is an emerging problem.	Brown stomach worm egg counts are often low even though significant worm burdens are present. A blood test that detects a stomach wall enzyme (pepsinogen) can assist diagnosis. Worm larvae picked up over winter/spring can lay dormant in stomach wall and emerge next autumn. A long-acting ML anthelmintic to cover the winter/early spring period may be required.
Cooperia – resistant to mectin family drenches	One large herd.	Northern Tasmania	Scour, sub-optimal growth rates. Weaner cattle with high worm egg counts in manure samples 11 days after ML family treatment.	High % Cooperia detected using larval ID in lab . Resistance to the Ivermectin family of drenches has been seen in Tasmania, but oral BZ drenches usually still work. Try to create "clean" paddocks for weaner cattle. Monitor with WORTEST every month.
Eyelid cancer (pre-cancerous lesion)	One cow	Northern Tasmania	Small crusty erect growth on eyelid.	Small lesions can usually be removed easily by a vet, if not removed may become fully cancerous and if allowed to then become more advanced may require removal of eye.

Growth on penis	One bull	Northern Tasmania	Lump seen on penis	Usually caused by wart virus if on young bull. Can reduce size surgically or with rubber ring. Usually self-heal over time. Can get vaccine made up from removed wart.
Mastitis	One case each in two beef herds	Northern and Southern Tasmania	Udder or milk abnormal.	Antibiotics via teat canal or by injection. See https://www.dairyaustralia.com.au/en/animal-management-and-milk-quality/mastitis-and-milk-quality#.YFq2Z68zY2w
Pink Eye	15% of one mob	Northern Tasmania	White area on eye, discharge down cheek. Dust, flies long grass, dusty hay, close contact eg yard, transport) spread it.	Start treatment early. Separate affected animals, use antibiotic injection into eyelids, eye patches or vet can stitch eyelids. Sprays less effective. There is a vaccine available that covers most of the strains of pink eye bacteria that occur in Tasmania.
Ryegrass staggers	Wide-spread	North, NW and Southern Tasmania	Usually more severe in young cattle - tremors, abnormal gait, may become downers, may convulse when disturbed. Often seek water and can drown in dams.	See https://dpiwwe.tas.gov.au/biosecurity-tasmania/animal-biosecurity/animal-health/sheep/perennial-ryegrass-staggers for details on diagnosis treatment and prevention. Feed with additives to absorb the ryegrass toxin in the rumen may be worth a try.
Vibrio (Campylobacter)	Two herds	Northern Tasmania	Bacterial infection spread by bulls. Causes return to service and abortions.	Vaccinate bulls, complete course 4 weeks prior to joining. Cull empty females at preg testing and any female that aborts or not rearing a calf. If exposure to unvaccinated bulls is likely vaccinate females as well. See https://www.mla.com.au/research-and-development/animal-health-welfare-and-biosecurity/diseases/reproductive/vibriosis/
Warts	One vealer in one small herd	Northern Tasmania	Cauliflower-like growth anywhere on body but often around head.	Normally only seen in young cattle. Will normally self-cure if left alone. A vaccine can be made up if warts persist or are very extensive.
Wire around foot	One cow in one small herd	Southern Tasmania	Wire twisted around foot.	Cut wire and remove, treat wound. Usually deeply embedded and need Vet to use anaesthetics to remove surgically.
GOATS				
Arthritis	One goat in one small herd	Southern Tasmania	Lame, aged and in poor condition	May respond to anti-inflammatories. Euthanasia justified.
Acidosis	One goat in one small herd	Southern Tasmania	Mild illness after eating waste fruit and vegetables	Any feed containing a lot of carbohydrate (including grains, fruit and vegetables) can cause the rumen contents to become acidic, and the goat becomes ill and in severe cases can die. Treatment: drench with alkaline solutions. Prevent: Introduce carbohydrate rich feeds gradually so that rumen can adjust.
Downer	One goat on one property	Northern Tasmania	Unable to rise.	If thin, could be Johne's Disease, CAE virus, worms, cancer, internal tumour, loss of teeth or old age. After giving birth can be milk fever, uterine

				infection etc. Euthanasia often most humane option for very old, thin animals.
Overgrown hooves	One goat in one small herd	Southern Tasmania	Hooves long and toes may curl up ("slipper feet") or wall of hoof can roll under (differentiate from footrot)	Pare hooves back into shape. Hooves neglected for a long time may grow a lot of excess sole and require careful paring back to avoid bleeding.
PIGS				
Sub-fertility	One sow in one small herd	Southern Tasmania	Small litter size	Very old sow.
POULTRY				
Bumblefoot	One duck in one small flock	Southern Tasmania	Chronic bacterial (usually a Staph) infection in foot causing swelling.	Surgical drainage of abscess. Antibiotics can help in some cases. Prevent by reducing opportunities for foot injury.
Mites	One small flock of chickens	Southern Tasmania	May be seen along feather shafts or on legs ("scaley leg") but can live in coop and feed off birds at night. Can suck blood and cause anaemia.	Treat all birds with appropriate insecticides. Check, clean, remove loose material and treat coop as well. Prevent by regular routine treatment of birds and coop, "hotel quarantine" introduced birds and treat during quarantine. Prevent wild birds from accessing food, water or coops.
Respiratory infection	One chicken in one small flock	Southern Tasmania	May be due to Mycoplasma, Pullorum, Infectious Bronchitis virus (IB), Infectious Laryngotracheitis (ILT) virus (and secondary infections), Pasteurella, Avian influenza or Newcastle Disease.	Antibiotics in water often used initially and further testing for viruses, resistant bacteria if little response. If a high percentage of birds die or show neurological signs avian influenza or Newcastle disease could be the problem and a vet should be called or ring the Emergency Animal Disease hotline on 1800 675 888.
Neck trauma	One chicken in one small flock	Southern Tasmania	Neck twisted, poor balance. Recovered fully.	Good nursing.
Tumour on leg	One chicken in one small flock	Southern Tasmania	Large lump on leg.	Surgery may be successful but may have to euthanase if too large or too many vital structures involved.
Worms	One small flock	Southern Tasmania	Diarrhoea, thin, depressed birds.	Treat with wormer (usually in drinking water). Prevent with regular (eg every 3 months) treatment, 'hotel quarantine' and treat introduced birds. Exclude wild birds from poultry runs.