
Code of Good Practice Regarding the Responsible Use of Antimicrobials on Sheep Farms



These Guidelines have been developed by Irish Farmers and Veterinary Practitioners to guide good practice in the responsible prescribing and use of antibiotics in farm animals, in response to the global societal challenge of antimicrobial resistance



The Farmer's Role

Strategies to reduce the use of antibiotics and the development and spread of antimicrobial resistance

For disease to occur, several conditions must be met. These include host (sheep) factors, environmental factors (stresses) and factors dependant on the characteristics of the infectious organisms. Manipulation of husbandry and management practices on a farm can go a long way toward tipping the balance against disease. Implementing these well recognised strategies will keep your flock healthier and reduce the need for antibiotics in the long run. The key to reducing the overall use of antibiotics on sheep farms is to reduce the incidence and spread of infection and disease on the farm. The practical strategies outlined in this document highlight some of the important ways that sheep farmers can make a big difference in the fight against AMR.



Guideline 1: Prevention of disease is always better than cure.



Guideline 2: Herd Health Plans are an essential tool for Farmers.



Guideline 3: Reduce and Eliminate Disease entry to your farm through Biosecurity

- ▶ Have a planned and rigorous cleaning and disinfection routine



Guideline 4: Prevent diseases where relevant with vaccination.



Guideline 5: Keep animals stress-free through

- ▶ Good Husbandry Practices
- ▶ Good Housing and adequate space
- ▶ Plentiful access to clean drinking water



Guideline 6: Prevent and control Parasites to enhance performance, reduce stress and prevent disease.



Guideline 7: Where treatment of disease is necessary with Antibiotics, observe the six 'rights' of prescription and use

- ▶ Right Veterinary Diagnosis
- ▶ Right Animal(s)
- ▶ Right Antibiotic
- ▶ Right Dose
- ▶ Right Duration
- ▶ Right Storage and Disposal



Practical strategies to reduce Antibiotic usage on Sheep Farms

How can Sheep Farmers prevent AMR?

- More Focus on Preventative Strategies
- Enhanced flock Biosecurity
- Improved Husbandry
- Increased Strategic Use of Vaccination
- Only use antibiotics on foot of veterinary advice
- Always use antibiotics as prescribed

Flock Health Planning

The aim of a Flock Health Plan (FHP) is to ensure the best possible health and welfare of the sheep on the farm, which in turn leads to optimum animal performance and productivity. The FHP should be devised as a collaborative effort between the sheep farmer and their veterinary practitioner. The plan is developed based on a unique personalised knowledge of the farm in combination with an on-farm risk assessment which includes inspection of facilities, routine examinations, review of selected flock performance records, and decisions and actions related to specific flock management issues.

The stages involved in a standard FHP include:

- ▶ Investigation and establishment of the flock health status.
- ▶ Plan to prevent disease introduction to the farm.
- ▶ Plan to prevent the spread of disease.
- ▶ Regularly monitor the control strategies/ review the FHP

Health Management of Newborn Lambs

Newborn and young lambs are probably the most immunologically naive animals on the farm. This means that their immune systems have not yet developed to the stage where they can recognise the common bacteria and viruses in the environment and effectively fight them off. It is essential that they are given every form of protection to prevent the development of disease in this group of animals.

When immunologically naive animals are stressed or exposed to high levels of pathogens in their environment, they will succumb to disease. The most common infectious diseases encountered by newborn lambs on farms are diarrhoea (scour) and watery mouth disease. The term watery mouth is used to describe a collection of clinical signs in newborn lambs which includes lethargy, failure to suck, profuse salivation, bloating and retained meconium. The condition is caused by colonisation of the small intestine by *E. coli* with rapid multiplication and release of toxins. What these diseases all have in common is that they are caused by a combination of trademark factors, i.e. a naive immune system, poor (or no) transfer of antibodies from colostrum, a build-up of the infectious agent in the environment, such as dirty pens, and poor operator hygiene when intervening in the lambing process or handling / treating newborn lambs, and other stressful factors such as moving or mixing lambs between groups. Other conditions encountered are navel and joint infections (see later).

Managing levels of disease in lambs' means addressing these contributory factors correctly. Reducing levels



of disease in your lamb cohort will significantly contribute to reducing the need to use antibiotics used during the lamb rearing period and will positively contribute to the fight against AMR. The following are essential guidelines for keeping lambs disease free:

- ▶ Colostrum is vital to lamb health. It provides the lamb with valuable antibodies but is also an excellent source of food and fluid for the lamb. Newborn lambs need a minimum of 50ml/kg within the first six hours of life, and 200ml/kg within the first 24 hours of life. Feeding for as long as possible is advised as colostrum is also known to provide a local protective covering on the gut lining to prevent virus and bacteria from getting through. If the lamb is unable to suck you should feed the lamb using a stomach tube, preferably with colostrum taken from freshly lambed ewes. Ideally colostrum should be from the dam, but a store of frozen ewe colostrum is also very useful.
- ▶ Correct nutrition of pregnant ewes is important to ensure correct lamb birth weights and good quality colostrum. Both colostrum quantity and quality is very dependent on feeding adequate quality protein to pregnant ewes in late gestation.
- ▶ Cow colostrum is a reasonable substitute for ewe colostrum. Ideally the cow should be vaccinated with a clostridial + Pasturella vaccine pre-calving. The volumes of cow colostrum fed to the newborn lamb should be increased by 30% on the above recommended rates as cow colostrum is less concentrated than ewe colostrum.
- ▶ Colostrum substitutes are a poor replacement for ewe or cow colostrum and every effort should be made to get some ewes colostrum into every lamb.
- ▶ Overheating colostrum is ill advised as this denatures the protein structures of the antibodies and renders them useless from an immunological point of view.
- ▶ The main source of bacteria for a lamb is the environment where



they are born and reared, plus the hygiene of the farmer at lambing e.g. clean gloves, overalls, lambing ropes, stomach tubes etc. Practicing good hygiene protocols including power hosing, disinfecting and liming of lambing pens combined with plentiful use of straw, and sterilising equipment used in the lambing process and for feeding newborn lambs between use) all contribute to dramatically reducing the risk of infection. Similarly disinfecting the navel immediately after birth will reduce the risk of the lamb picking up disease.

- ▶ Coccidiosis tends to become a problem from about week three post lambing. If possible, late born lambs should not be grazed on pastures that earlier born lambs previously grazed. This is particularly important if there is a long spread of lambing.

Joint Ill

Joint-ill occurs in lambs up to one month of age. Usually the route of infection is through the mouth or navel. There is a sudden onset of lameness in young lambs. Morbidity rates usually vary from 2-15% between flocks. Affected lambs are often lame in several limb joints including fetlocks, knees, hocks, and stifles. Affected joints are hot and painful. The lambs are dull, feverish, and unthrifty. Some may have swollen, infected navels, while others may have symptoms of pneumonia or

meningitis. In flocks the focus must be on prevention of joint ill including the following:

- ▶ Lambing areas should be cleaned and well bedded with straw. If lambing indoors, the ewe and her lamb(s) should be moved to a clean, previously disinfected, well bedded straw pen.
- ▶ Ideally, pens should be thoroughly cleaned, disinfected, and limed after each used.
- ▶ Shortly after birth, treat the lamb's navel with a tincture of iodine.
- ▶ Avoid tail docking, castrating, or tagging lambs until they are dry and at least 24 hours old.

Lameness

The three most common causes of infectious lameness in sheep are interdigital scald, bacterial foot rot and contagious ovine digital dermatitis (CODD). Managing levels of lameness in the flock will reduce the overall antibiotic consumption.

Preventing/reducing lameness in the flock can be achieved by following the guidelines below.

- ▶ Employ good biosecurity protocols by, dosing and foot bathing and then quarantining any newly purchased animals onto the farm.
- ▶ Never purchase lame sheep.
- ▶ Footbaths are very useful in the prevention of lameness caused by foot rot or scald. Ensure that



foot-bathing solutions are made and maintained at the recommended concentrations (10%) of either copper or zinc sulphate.

- ▶ Ensure that sheep stand for 10 minutes in the foot-bathing solution and are held on a hard, clean surface for at least 30 minutes post foot-bathing.
- ▶ Regular foot bathing combined with rotational grazing reduces the build-up of footrot-causing bacteria on pastures.
- ▶ Ensure roads and other handling facilities are well maintained to avoid physical injury.
- ▶ Stop trimming of over-grown claws as it leads to an increased incidence of lameness in the flock .
- ▶ Once examined non infected sheep should be turned out into a field which has not contained sheep for at least the previous 2 weeks.
- ▶ Avoid overstocking sheds.
- ▶ Isolate lame sheep from healthy sheep. Cull ewes that are chronically infected or repeat offenders.
- ▶ In flocks with persistent foot rot problems discuss with your veterinary practitioner the use of the foot rot vaccine.

In summary, management of lameness in sheep flocks can be considered as a FIVE POINT PLAN, and should contain the following key points:

1. **Quarantine incoming animals**
2. **Prevent the spread of infection**

3. **Treat clinical cases promptly**
4. **Cull chronically affected animals or repeat offenders**
5. **Vaccination (see below)**

Pneumonia in store lambs

Outbreaks of pasturella pneumonia, generally caused by Mannheimia haemolytica, are common particularly in store lambs in the autumn. Such outbreaks are often associated with weaning, purchase of store lambs, transport or immediately after housing. Often the first sign of the disease is finding several dead lambs or nearly dead lambs. In severe outbreaks the mortality rates can be high so treatment must be discussed with your veterinary practitioner. Again, the focus must be on prevention rather than on treatment including:

- ▶ Ideally, purchase lambs that are vaccinated (primary and booster) against pasturella pneumonia (part of a combined pasturella and clostridial vaccine) or vaccinate lambs on arrival.
- ▶ Ensure that lambs have completed their vaccination programme at least 2-3 weeks prior to the risk period such as housing.
- ▶ When housed, ensure adequate floor space (0.7-0.8 square metre /lamb depending on live weight), trough space, adequate ventilation, and clean water supply.

Abortion in Ewes

Most sheep flocks experience some abortions each year, but some can experience an abortion storm with up to 25% of the flock aborting. Abortion in sheep flocks can be devastating and very stressful for farmers and animals alike. As well as being detrimental to production rates in sheep flocks, abortion in ewes can contribute to a high usage of antibiotics in the flock in the form of direct treatment of the infectious agent (abortifacient), secondary infections which may develop in the ewe, and the treatment of weak and sick lambs which are born prematurely. The two most common causes of abortion are chlamydial (enzootic) and toxoplasma abortion. It is important to diagnose the cause of abortion and if it is enzootic abortion your veterinary practitioner will prescribe antibiotics to control it in a flock.

Enzootic abortion of ewes (EAE) is caused by a bacterium, *Chlamydia abortus* that spreads to the womb and afterbirth of an unprotected sheep and kills the developing lambs. Aborted lambs, afterbirth and discharges from aborted ewes are heavily contaminated and can infect other pregnant sheep. Non-pregnant female sheep, including newborn lambs, can pick up the infection from an aborting ewe and the organism will remain latent until the animal is 90 days pregnant and then become active, causing the animal to abort. The disease can be brought into a clean flock through bringing in infected sheep that picked up the infection at lambing time. Where an outbreak occurs, it can be controlled by treating the flock with an antibiotic prescribed by your veterinary practitioner.

Toxoplasmosis is caused by sheep becoming infected from ingesting oocysts shed by cats on pasture or in contaminated feed, bedding, or water. Infection of sheep early in pregnancy may result in unnoticed abortions or barrenness whereas infection in later pregnancy may cause stillbirth, mummified foetus, or birth of a weak lamb. Following infection, sheep develop immunity which will protect them against the disease in subsequent pregnancies.

The following are suggested guidelines which should be adhered to when considering an abortion control plan on your farm:

- ▶ Ideally prevent the introduction of one or more of these infections onto your farm by keeping a closed flock. If this is not possible, then employ strict biosecurity protocols when introducing new animals.
- ▶ If purchasing breeding females, ensure that they are purchased from flocks known to be free of EAE or are vaccinated against these diseases before arrival on your farm.
- ▶ Pay attention to vermin control and minimise the access of feral cats to the feed source.
- ▶ If breeding ewe lambs, consider vaccinating for toxoplasmosis given that the ewe lambs are unlikely to have achieved natural immunity to toxoplasmosis

prior to becoming pregnant.

- ▶ Isolate aborted ewes immediately as they can spread disease through vaginal discharges for some time after aborting. Chlamydia (enzootic) may be present in discharges for up to two weeks after abortion and survive in bedding for up to six weeks. Mark or identify the ewes for future blood sampling or culling.
- ▶ Collect aborted lambs together with all afterbirth material and submit through your local vet to the regional veterinary laboratory for diagnosis. Several fresh samples may need to be sent for a definitive diagnosis. The lambing area should be disinfected and freshly bedded.
- ▶ Employ veterinary intervention to investigate the cause of the abortion and use diagnostic laboratory facilities to obtain an accurate diagnosis.
- ▶ Pregnant women are a major risk group for both zoonotic diseases and should avoid all contact with ewes or clothing/equipment contaminated with lambing fluids etc. at lambing time.

Parasite control

Optimum parasite control will not only improve the growth rate and reproductive efficiency of sheep, but it will maximise the flock's ability to fend off other infections and remain healthy. Anthelmintic resistance is now a widespread problem in sheep flock and the flock owner should establish the resistance status of their flock and sparingly use anthelmintic products when there is a demonstrated need for them on their farm. A healthy flock means less veterinary intervention for treating sick animals, less use of antiparasitic drugs and antibiotics, and ultimately less spread of AMR.

Vaccination

Vaccination is a powerful tool in preventing the occurrence of infection at farm level and in reducing the need to use antibiotics. The use of vaccines is accredited with minimising production losses associated with many diseases.

Some important principles about vaccination should be considered before deciding on a vaccination strategy for any farm:

- ▶ A vaccination programme should be tailored to each farm and devised in conjunction with the flock veterinary practitioner. Vaccines are available for a variety of ovine diseases. Not all of them are required or will be useful on every farm.
- ▶ Often, vaccines will require an initial primary administration followed by a booster administration and then followed by repeat annual administrations, or "boosters" to ensure that the level of antibodies in the blood and colostrum will be adequate to fight off the infection should it be encountered.

This information is available on the datasheet, or summary of product characteristics.

- ▶ Correct storage of vaccines is essential. In general, most vaccines will need to be stored in a fridge. Always read datasheet regarding storage instructions, and ensure your fridge is working correctly. They are inactivated by heat and sunlight (e.g. the car dashboard) and are inactivated by freezing. Vaccine failure has regularly been attributed to poor storage conditions.
- ▶ The use-by date on vaccines must be adhered to strictly as vaccines are ineffective after this date. Once opened it is essential that they are used within the timeframe indicated.

Using vaccines to their maximum effect as part of a flock health plan will improve the productivity of the flock, will minimise the burden of disease and reduce the requirement for antibiotic usage.

Biosecurity and biocontainment

Biosecurity is the term used to describe the implementation of a set of management practices designed to keep disease out of a farm. Where disease does occur, biocontainment is the term used to describe management practices to keep it from spreading between animals on the farm.

A good biosecurity and biocontainment protocol should include the following:

- ▶ Ensure that disinfection facilities are provided to all farm visitors.
- ▶ Keep a closed flock if possible.
- ▶ Buy from accredited disease-free or closed flocks as

much as possible.

- ▶ Always isolate purchased animals or animals that have participated in shows for at least 28 days to monitor for signs of disease.
- ▶ Sharing of equipment between farms should be avoided unless it can be thoroughly disinfected.
- ▶ A farm's biosecurity plan should be reviewed annually as farming practices may have changed.

Air Quality and Ventilation

Good air quality is an important factor to maintain health and well-being in housed animals. Air quality is determined by the quantity of gases, dust particles, and air-borne bacteria and virus within the housing facilities. Good air quality will be achieved by combining appropriate ventilation with good hygiene practices in sheds, both of which should be investigated as part of your herd health plan. Poor air flow, a build-up of waste gases, draughts, and increased levels of disease-causing organisms will overwhelm an animal's immune system and result in disease.

Cleaning and disinfection

Cleaning and disinfection are the most important of all disease control measures. Removing or killing the infective agents as quickly as possible once they emerge on the farm is key to preventing the spread of disease, and by extension, the need for drug therapy. It is important to ensure that the correct disinfectant is used, i.e. one that is licensed to treat the diseases of concern, and that the use of the disinfectant is in line with the manufacturer's instructions.

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