

# Flock health plans for the modern sheep farmer



Sheep Parasite Management



**FARM HEALTH  
FIRST**

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PHARMA



# Contents

<b>Introduction</b>	<b>4</b>
<b>Parasites In Focus</b>	
Coccidiosis	6
Gastrointestinal worms	8
Liver Fluke	10
<b>Problem Solving</b>	
The Lamb	12
The Ewe	16



# INTRODUCTION



Grazed grass and its relative cost versus other feeds like concentrates or silage represents a significant competitive advantage for farmers in the UK versus other parts of the world. However, in countries with mild, moist climates like ours, livestock parasites can thrive in these grasslands.

Internal parasites are a significant problem in modern sheep farming systems. While sheep farmers have always been conscious of the damage that fluke and worms can cause to their animals' health and performance, more and more new challenges are arising around parasite management.

### Intensification

Farms are becoming more intensive – there is a constant drive to carry more animals on a given area of land and to stretch grazing seasons into the shoulders of the year. As animal numbers lift, however, so too do parasite burdens and their activity becomes more unpredictable as farming systems evolve. Changing climatic patterns are also making it more difficult to predict and manage parasites.

### Anthelmintic resistance

Anthelmintic resistance, while well-chronicled, is now a very real threat to the long-term sustainability of every single sheep farming system. The SCOPS group is leading the way in terms of practical advice. The issue was one of the principle reasons for the establishment of the [www.farmhealthfirst.com](http://www.farmhealthfirst.com) resource.

### Coccidiosis

Some sheep farmers have been dealing with coccidiosis for years on their farms, while others will experience problems abruptly, with no apparent cause or source. Relative to worms and fluke, information and guidance around coccidiosis management is less commonly touted. The most sinister aspect, however, of coccidiosis is that it is largely an asymptomatic condition – for every lamb that displays the classic coccidiosis symptoms, 24 others will have their growth rates reduced, but show no symptoms<sup>1</sup>.

# PARASITES IN FOCUS

## Coccidiosis

### NOT JUST A BLACK, BLOODY SCOUR

Coccidiosis is a disease caused by tiny single-celled organisms that disrupt gut function, causing diarrhoea and ill thrift. These are known as coccidia and belong to the protozoa family. Microscopic coccidia oocysts (eggs) live in large numbers in the animal's environment and are extremely resilient. In the right conditions (heat and moisture) they become infective (switch on). They are consumed via the mouth and eventually arrive in the intestine. Here they penetrate cells in the intestinal lining. These play a vital role in the absorption of food and water from the intestine into the animal's blood stream. Inside these cells the coccidia multiply rapidly, eventually causing the cell to burst. Damaged cellular material contributes to the bloody scour symptom commonly associated with coccidiosis and thousands of new oocysts pass out into the environment via faeces. Time from ingestion of oocysts to potential symptoms (the pre-patent period) in cattle and sheep will be 18-24 days.

Older animals develop an immunity to coccidiosis and can harbour small burdens without issue. Younger animals are more vulnerable, and their immunity takes time to build. The problem is that on commercial farms it can be difficult to keep coccidia levels low (maximise hygiene) and young animals commonly experience significant burdens of the parasite. If the burden is high enough, then we can have clinical coccidiosis.



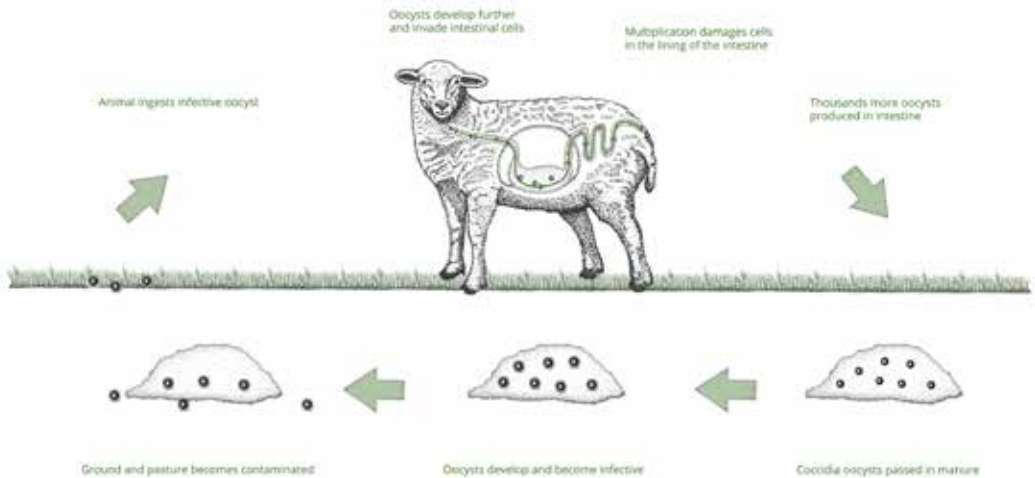
*Intestine of animal with severe coccidiosis*

Research shows that lambs do attain a small level of immunity to coccidiosis via their ewe's colostrum, however, this is short lived. After around three weeks, coccidia oocysts that lambs ingest from their environment will be able to proliferate in their digestive tract.

First symptoms are then encountered, in general, from five to seven weeks of age (18-24 day pre-patent period). From a whole-flock point of view, cases of clinical coccidiosis are generally confined to a small percentage of animals. From a review of the recent research, only 4% of infected animals will display clinical symptoms on average<sup>1</sup>. The other symptomless animals' immune systems will prevent the parasite from overwhelming them. But this comes at a cost. The immune system is powered by dietary energy and any immune response uses energy that the animal may have used for things like maintenance or growth. Although just 4% of infected animals display coccidiosis symptoms, across full animal groups a 'silent' 19% reduction in growth rates has been demonstrated<sup>1</sup>.

Stress has a significant role to play in the onset of clinical coccidiosis symptoms as it can act to weaken an animal's immune system. It is not uncommon for older, store lambs to exhibit coccidiosis symptoms in the weeks after arriving on a new holding as the stress of sale/transport significantly weakens their immune defences.

### Coccidiosis Lifecycle:



Although just **4%** of infected animals display coccidiosis symptoms, across full animal groups a 'silent' **19%** reduction in growth rates has been demonstrated<sup>1</sup>.

# Gastrointestinal Worms

## A COMMON KILLER

Gastrointestinal worms (GI) are a significant threat to UK sheep flocks, from both welfare and commercial points of view. Indeed, a gastrointestinal worm (GI) infection can reduce growth rates in lambs by between 30% and 40%, with losses common in times of heavy burden. There are approximately 15 different species of GI worm that can affect UK sheep. However, four of these are considered to be of commercial importance to vets, farmers and advisers.

### 1 ***Nematodirus battus* – ‘Thin Necked Intestinal Worm’ – no intro needed**

*Nematodirus* is unique in a number of ways. It affects the animal's intestine and unlike other GI worms, the clinical damage is caused by the larval stages. The *Nematodirus* life cycle is also extremely long, with eggs remaining on pasture overwinter and a mass hatch occurring when a cool period of weather is followed by a sudden increase in temperature, bringing daily averages above 10°C for a number of days. With a heavy burden the intestine will become compromised, preventing the absorption of nutrients, including water. Dark scour is a common symptom. Infected lambs become rapidly dehydrated and another tell-tale sign of an infection is when lambs are seen to be gathered around water troughs. Lambs are most at risk from *Nematodirus* from six weeks-of-age and generally develop their own immunity to the parasite at ten weeks. Multiples will be at a higher/earlier risk of *Nematodirus* infection given their grazing habits.

### 2 ***Teladorsagia circumcincta* – ‘Small Brown Stomach Worm’ - the hibernator**

*Teladorsagia* (more commonly known as *Ostertagia*) manifests itself in two forms, known as Type I (occurring during the summer) and Type II Ostertagiosis (during the winter months). With Type II Ostertagiosis, the parasite's development in the animal becomes temporarily arrested, resuming during the winter months. An infection with *Teladorsagia* will yield the classic GI worm symptoms of scour and lost thrive.

### 3 ***Haemonchus contortus* – ‘Barbers Pole Worm’ - the blood sucker**

*Haemonchus* is a sinister parasite in that its symptoms don't become obvious until a relatively advanced stage of infection. Scour is not a symptom of *Haemonchus*. The parasite feeds on blood and an adult can consume 0.05ml of blood daily. A heavy infestation could see up to 5,000 worms per animal. Anaemia is the principle symptom of *Haemonchus* and first clinical signs can involve rapid weakening of animals that appear in good body condition. Indeed, infected animals may collapse if driven. If a burden is high enough, sudden death is possible. *Haemonchus* risk is not confined to lambs and can affect adults too.





#### 4 ***Trichostrongylus* spp. – ‘Black Scour Worm’ - don’t underestimate**

Symptoms of *Trichostrongylus* are generally seen later in the year and the principle sign is soft, dark faeces. The parasite often affects store lambs. Weight loss and death, where a burden is high enough, can follow. Of the four worm species mentioned here, *Trichostrongylus* would be considered the least pathogenic. However, this is assuming a farm has equal burdens of all four parasites. A high enough burden of any of the GI worms cited above can be lethal.

#### **Adult Sheep**

While sheep generally become immune to gastrointestinal worms (GI) after one full grazing season - apart from *Haemonchus contortus*, which can affect older sheep - this immunity can dip at certain times. In the weeks around lambing, thinner ewes and/or ewes carrying multiple lambs can become more susceptible to worm infection. This is known as the periparturient relaxation of immunity, or ‘Spring Rise’ and as well as affecting the ewe itself, it can also lead to the contamination of pastures with infective worm larvae which can cause problems in more naïve, younger sheep as they graze them later in the season. Proper nutrition pre-lambing, strategic grazing/housing and strategic anthelmintic treatment can help to reduce the effects of the Spring Rise. Other ‘stressors’ that could potentially see worms clinically affecting adult sheep include breeding time for rams, transport or poor supply/quality of feed.

*A gastrointestinal worm infection can reduce growth rates in lambs by between 30% and 40%, with losses common in times of heavy burden.*

# Liver Fluke

## NOT JUST A PROBLEM FOR WET LAND

The full fluke life cycle takes 18-20 weeks. When an animal ingests an infective fluke larva from pasture, it works its way through the digestive system and eventually arrives in the small intestine. Here it develops into an early-immature liver fluke, before burrowing through the lining of the gut and continuing towards the liver.

The liver plays a vital role for our animal. It is responsible for the removal of harmful toxins from the system, the production of glucose – the body's fuel source – and the synthesis of important proteins and antibodies which are key components of the immune system.

Young fluke (early immature/immature) tunnelling through our animal's liver disrupt these mechanisms. Once a fluke reaches the bile duct it matures and begins to lay eggs. Here it feeds on blood from the lining of the ducts. While a large infestation of mature fluke can lead to anaemia in the animal and have a negative effect on fat digestion, the main losses associated with liver fluke come about during the immature stage of the parasite's life cycle (first 6-8 weeks) when it is boring tunnels through our animal's liver.

Liver fluke is an interesting parasite as an intermediate host is required during its development. A mud snail, or water snail, fills this role. These peppercorn-sized snails are most active where there is heat and moisture and will hibernate in cool, dry weather.

A single mature fluke in an infected animal has the capacity to lay up to 20,000 eggs per day. When it hits pasture via dung, a fluke egg will hatch into a young larva with the right levels of moisture and heat. This larva has some level of mobility and goes in search of the intermediate host (mud/water snail) which it needs to complete its life cycle.



*Mud snail*

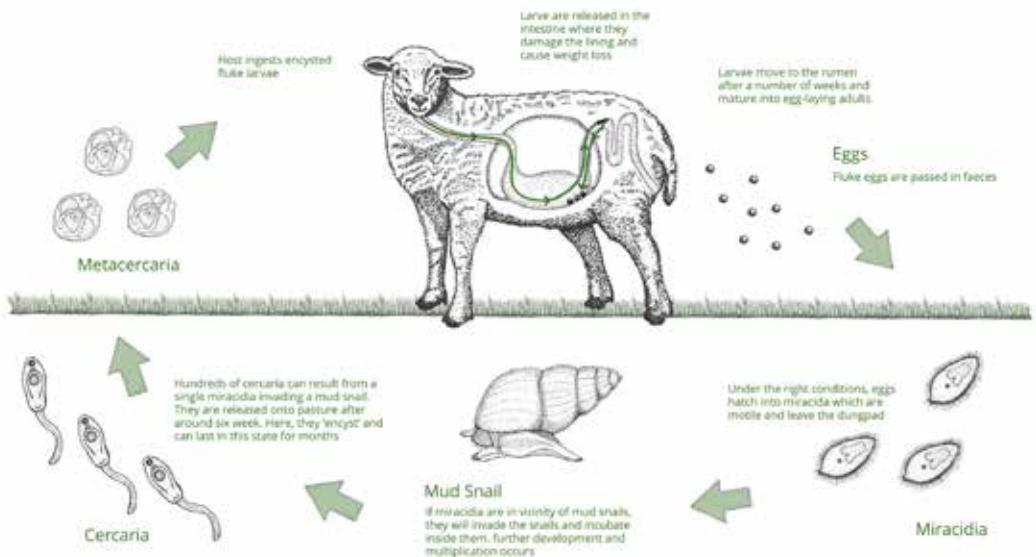


Inside the snail, the larva multiplies and after 4-6 weeks upwards of 600 infective larvae will be released onto pasture. These larvae are what leads to a liver fluke infection.

There is a misconception that all dry farms are 'immune' from liver fluke infection given the need for moisture. However, a single wet area can act as a harbour for fluke larvae. Boggy conditions common on heavy farms are ideal, but other favourable scenarios could include depressions in fields, muddy gaps or leaking water troughs.

Fluke risk will be highest in a year where infected animals were grazing pastures during a wet summer (May to July). ELISA analysis can be used to test for the presence of fluke antibodies. Faecal egg counts will only detect the presence of mature fluke (egg layers) in an animal.

### Liver Fluke lifecycle:



- ✓ A single wet area can act as a harbour for fluke larvae.
- ✓ Younger fluke are more damaging than mature fluke in our animal's liver.
- ✓ A single mature fluke in an infected animal has the capacity to lay up to 20,000 eggs per day.

# Problem Solving

## THE LAMB

### COCCIDIOSIS

**When:** Farm-specific. Generally first symptoms between 5-7 weeks, but can vary. Also a condition common with store lambs.

**The solution:**

#### DYCOXAN

**Timing:** One week in advance of symptoms (based on farm history), across whole group. For store lambs, dose one to two weeks post-arrival.

**Indicated for:** Coccidiosis prevention

**Admin route:** Oral

**Active ingredient:** Diclazuril

**Pack sizes:** 1L, 2.5L, 5L

**Meat withdrawal:** Zero days

**Dose rate:** 4ml/10kg

**Doses per pack:** 17.5kg lamb: 1L = 142

**Comment:** In certain cases a second treatment may be required three weeks later. Monitor animal performance and symptoms from three weeks post treatment. Moving animals to clean pasture post-dosing and keeping stressors to a minimum can help to reduce the need for subsequent treatment.



### GASTROINTESTINAL WORMS

**When:** *Nematodirus* is generally the first species of worm that affects young lambs. Numbers of *Nematodirus* eggs will be highest on pastures that carried lambs the year before. A sudden lift in temperatures causes a mass hatch of the eggs deposited by these lambs. Risk will be highest when three days of consecutive average temperatures above 10°C follow a cold period. This varies across years and regions (further north will generally be later).

Lambs typically become immune to *Nematodirus* from 10-12 weeks of age and thereafter the biggest immediate threats will be from *Teladorsagia* and – depending on the farm – *Haemonchus*. *Trichostrongylus* generally enters into the fold as a risk later in the year though evidence of it appearing earlier in the season is beginning to emerge.

## The solutions:

### **ALBEX 2.5% SC**

**Timing:** When *Nematodirus* risk is highest, pay attention to warnings from agricultural media outlets. Generally five to seven weeks of age.

**Indicated for:** Treatment of mature & developing immature forms of gastro-intestinal roundworms, lungworms, tapeworms and adult liver fluke

**Admin route:** Oral

**Active ingredient:** Albendazole with added selenium and cobalt

**Meat withdrawal:** 5 days

**Pack sizes:** 1L, 2.5L, 10L

**Dose rate:** 2ml/10kg

**Doses per pack:** 17.5kg lamb: 1L = 285



**OR** .....

### **ZEROFEN 2.5%**

**Timing:** When *Nematodirus* risk is highest, pay attention to warnings from agricultural media outlets. Generally five to seven weeks of age.

**Indicated for:** Controls mature & developing immature forms of roundworm & lungworms

**Admin route:** Oral

**Active ingredient:** Fenbendazole

**Meat withdrawal:** 21 days

**Pack sizes:** 1L, 2.5L, 10L

**Dose rate:** 2ml/10kg

**Doses per pack:** 17.5kg lamb: 1L = 285



**THEN**

### **CHANAVERM 7.5%**

**Timing:** Use Chanaverm as a mid-or late-season dose for worms.

**Indicated for:** The treatment and control of gastro-intestinal and pulmonary roundworm infections

**Admin route:** Oral

**Active ingredient:** Levamisole Hydrochloride

**Meat withdrawal:** 20 days

**Pack sizes:** 2.5L, 5L

**Dose rate:** 1ml/10kg

**Doses per pack:** 25kg lamb: 2.5L = 1000



**OR** .....



## ANIMEC ORAL

**Timing:** Use Animec Oral as a mid-or late-season dose for worms.

**Indicated for:** Treatment and control of 'gastro-intestinal' roundworms, lungworms and nasal bots

**Admin route:** Oral

**Active ingredient:** Ivermectin

**Meat withdrawal:** 10 days

**Pack sizes:** 2.5L, 5L

**Dose rate:** 2.5ml/10kg

**Doses per pack:** 25kg lamb: 1L = 160



OR .....

## MOXODEX

**Timing:** Use Moxodex as a mid-or late-season dose for worms.

**Indicated for:** Treatment and prevention of 'gastro-intestinal' roundworms and lungworms

**Admin route:** Oral

**Active ingredient:** Moxidectin

**Meat withdrawal:** 14 days

**Pack sizes:** 1L, 2.5L, 5L

**Dose rate:** 2ml/10kg

**Doses per pack:** 25kg lamb: 2.5L = 500



**Comments:** While anthelmintic resistance among worm populations to benzimidazoles/white wormers has been documented, it is extremely rare in the *Nematodirus* species. Hence, benzimidazoles, like Albex 2.5% SC or Zerofen 2.5%, are recommended as a first dose for lambs when targeting *Nematodirus*.

After *Nematodirus* season, switch to clear or yellow wormers. Minimum dosing interval after a white wormer will be three to four weeks, but use performance (weight gain), faecal egg counts and monitor visual symptoms before making the decision to dose again. Moxodex and Animec Oral belong to the same family (clear wormers/Macrocytic Lactones), but in terms of resistance to these products research states that there are differences between the two in terms of the rate it develops. Resistance to moxidectin is slower to come about than resistance to ivermectin and trial work has been published in which moxidectin was effective against ivermectin resistance worms<sup>2</sup>.

Moxodex also boasts persistent activity against *Teladorsagia* and *Haemonchus* – when targeting these particular worms (mid-season), we can operate an eight-week minimum interval between doses.

## LIVER FLUKE

**When:** Liver fluke can cause liver damage and mortality in sheep in the late-summer/ autumn-time and onwards, following a warm, wet summer. It's important to note that the flukicide products for targeting the fluke damaging lambs' livers will have relatively long meat withdrawal periods. Other fluke management strategies such as pasture rotation or drainage may be necessary when lambs are in the midst of drafting for slaughter. These products may be more suitable for breeding or store lambs.

### The solutions:

#### TRIBEX 5%

**Timing:** Use Tribex 5% where there is a moderate to high fluke risk (after a wet, warm summer), generally between August and November. Ideally treat and move sheep to clean, dry pasture or aftergrass. If returning to the same pasture, treat twice, three weeks apart.

**Indicated for:** Liver fluke (all stages)

**Admin route:** Oral

**Active ingredient:** Triclabendazole

**Meat withdrawal:** 56 Days

**Pack sizes:** 2.2L, 5L

**Dose rate:** 2ml/10kg

**Doses per pack:** 37.5kg lamb: 2.2L = 293



#### THEN

#### ALBEX 2.5% SC

**Timing:** Albex 2.5% SC is effective in treated adult liver flukes and so can be used as a 'clean out' dose early in the season (January/February). At this point generally only adult fluke will be present in the animal and so a strategic dose with an adulticide here will prevent pasture contamination during the following warmer months and reduce overall fluke risk.

**Indicated for:** Treatment of mature & developing immature forms of gastro-intestinal roundworms, lungworms, tapeworms and adult liver fluke.

**Admin route:** Oral

**Active ingredient:** Albendazole with added selenium and cobalt

**Meat withdrawal:** 5 days

**Pack sizes:** 1L, 2.5L 10L

**Dose rate:** 2ml/10kg

**Doses per pack:** 37.5kg lamb: 2.5L = 333



**Comments:** It's important to note that fluke risk will vary across years and farms. Highest risk will be the autumn after a warm wet summer. Large numbers of immature fluke will be actively damaging livers at this point. Picking the correct flukicide is important. While adulticide products like Albex 2.5% will kill only adult fluke and not the more dangerous immature stages, adults are sources of eggs that lead to future fluke problems and so a strategic dose prior to favourable mud snail weather will see a huge reduction in future problems – i.e. late winter/early springtime. At this point in the year (late winter/early spring) faecal egg tests can be used to check for the presence of fluke and determine necessity to treat.

## THE EWE

### LIVER FLUKE

**When:** Liver fluke can cause liver damage and mortality in sheep in the late-summer/autumn-time, following a warm, wet summer. Unlike worms, sheep do not develop a natural immunity to liver fluke infection. Adult sheep are as prone to infection with fluke as younger sheep.

#### The solution:

#### **TRIBEX 5%**

**Timing:** Use Tribex 5% where there is a moderate to high fluke risk (after a wet, warm summer), generally between August and tugging season. Ideally treat and move sheep to clean, dry pasture or aftergrass. If returning to the same pasture, treat twice, three weeks apart.

**Indicated for:** Liver fluke (all stages)

**Admin route:** Oral

**Active ingredient:** Triclabendazole

**Meat withdrawal:** 56 Days

**Pack sizes:** 2.2L, 5L

**Dose rate:** 2ml/10kg

**Doses per pack:** 80kg ewe: 2.2L = 137



**OR** .....

#### **ALBEX 2.5% SC**

**Timing:** Albex 2.5% SC is effective against adult liver flukes and so can be used as a 'clean out' dose early in the season (January/February). At this point generally only adult fluke will be present in the animal and so a strategic dose with an adulticide here will prevent pasture contamination during the following warmer months and reduce overall fluke risk.

**Indicated for:** Treatment of mature & developing immature forms of gastro-intestinal roundworms, lungworms, tapeworms and adult liver fluke.

**Admin route:** Oral

**Active ingredient:** Albendazole with added selenium and cobalt

**Meat withdrawal:** 5 days

**Pack sizes:** 1L, 2.5L, 10L

**Dose rate:** 2ml/10kg

**Doses per pack:** 80kg ewe: 2.5L = 156



## GASTROINTESTINAL WORMS

**The risk:** Generally treatments for ewes will be targeted at breeding and/or lambing time. However, in both cases we should aim our treatments solely at clinically affected ewes and/or young sheep and/or thin sheep. If there is a history/presence of *Haemonchus contortus* on the farm, adult sheep should also be treated and Moxodex has persistent activity against this parasite.

### PRIOR TO BREEDING ON A LOW RISK FARM ANIMEC ORAL

**Timing:** Use Animec Oral at breeding time.

**Indicated for:** Treatment and control of 'gastro-intestinal' roundworms, lungworms and nasal bots

**Admin Route:** Oral

**Active Ingredient:** Ivermectin

**Meat Withdrawal:** 10 days

**Pack Sizes:** 2.5L, 5L

**Dose Rate:** 2.5ml/10kg

**Doses Per Pack:** 80kg ewe: 2.5L = 125



### PRIOR TO LAMBING TIME, OR BREEDING TIME ON A HAEMONCHUS-RISK FARM MOXODEX

**Timing:** Two weeks pre-lambing or at breeding.

**Indicated for:** Treatment and prevention of 'gastro-intestinal' roundworms and lungworms

**Admin Route:** Oral

**Active Ingredient:** Moxidectin

**Meat Withdrawal:** 14 days

**Pack Sizes:** 1L, 2.5L, 5L

**Dose Rate:** 2ml/10kg

**Doses Per Pack:** 80kg ewe: 5L = 312



**Comment:** On a farm with a *Haemonchus* problem, consider Moxodex when worming ewes as it boasts five weeks of persistent activity against the parasite. To slow down the onset of resistance, when using Moxodex a minimum of 10% of a mob should be left untreated. The guidelines above around dosing at breeding time hold for rams also.

**REFERENCES:** 1. Lenehan, 2019. Literature Review. [www.cocci.news/research](http://www.cocci.news/research). 2. Prichard, R., Ménez, C., Lespine, A., 2012. International Journal for Parasitology: Drugs and Drug Resistance. Vol. 2, Pages 134-153. Legal category of all products: UK: POM-VPS. **Dycosan** Oral Suspension for sheep and cattle contains 2.5mg/ml diclazuril. VM08749/4085. **Albex 2.5% SC** Oral suspension for sheep and cattle contains 25mg/ml albendazole. VM11990/4015. **Zerofen 2.5%** Oral suspension for sheep and cattle contains 25mg/ml fenbendazole. VM11990/4000. **Chanaverm 7.5%** Oral Solution for sheep and cattle contains 7.5% w/v levamisole hydrochloride. VM11990/4002. **Animec Oral** solution for sheep and cattle contains 0.8mg/ml ivermectin. VM08749/4027. **Moxodex** Oral solution for sheep contains 1mg/ml moxidectin. VM08749/4089. **Tribex 5%** Oral suspension for sheep contains 50mg/ml triclabendazole. VM11990/4033.

Use medicines responsibly. Refer to product packaging and leaflets for full indications, side effects, precautions, warnings, contra-indications and meat withdrawal. Advice should be sought from Medicine Prescriber or SQP. Further information can be found on the datasheet, SPC, at [www.chanellepharma.com](http://www.chanellepharma.com) or [www.farmhealthfirst.com](http://www.farmhealthfirst.com). DISTRIBUTED BY: Chanelle Veterinary (Ireland) and Chanelle Pharmaceutical Manufacturing Ltd (UK), Dublin Road, Loughrea. Copyright Chanelle Pharma 2019.









# FARM HEALTH FIRST

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PHARMA

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