

**The goal: healthy sheep**



**Always take a sick animal's temperature**



**Antibiotic**  
Pen-Aqueous



**Intramammary antibiotics**  
Extra-label

## Drug use in sheep

A drug is a product used to treat or prevent an illness. Drugs can play an important role in preserving the health of individual sheep and the flock as a whole. However, they need to be used in a responsible manner, and producers should strive to minimize drug use and not use drugs in place of good management and feeding practices.

There are two classes of drugs: over-the-counter (OTC) and prescription (RX). OTC drugs are available to producers from many sources: veterinarians, feed and farm supply stores, and via mail order companies. Prescription (Rx) drugs can only be purchased and used under the guidance of a licensed veterinarian.

### Extra-Label Drug Use

It goes without saying that all drugs should be used in accordance with the manufacturer's label or product insert. Using a drug in any manner that is not specified on the manufacturer's label must meet the requirements of "extra-label" drug use. Extra label drug use requires veterinary involvement.

In addition to using a drug that is not labeled for a particular species, giving a higher dosage of an "approved" drug or administering it in a different manner (SQ vs. IM) also constitutes extra-label drug use.

Extra-label drug use can be legal when the health of an animal is threatened and there is no other treatment alternative. However unapproved drugs cannot be used "off-label" to improve performance or control reproduction. As compared to cattle, horses, and swine, fewer drugs are FDA-approved for use in sheep.

### Withdrawal period

The withdrawal period is the amount of time it takes for a drug to "clear" the animal's system, so that drug residues do not remain in the tissues or milk. Every federally-approved drug or animal health product has a withdrawal period printed on the product label or package insert.

When used for an approved species, most meat withdrawal periods range from 0 to 60 days. Withdrawal periods may be different for milk and in some cases, the product is not approved for use in dairy females. Withdrawal periods can be an important consideration when choosing which drug to use to treat a sick animal.

Withdrawal periods should be extended when combinations of drugs are used or when drugs are used in an extra-label manner. In these situations or at any time a producer is uncertain as to the withdrawal period of a certain drug, a veterinarian should be consulted. Veterinarians have access to the Food Animal Residue Avoidance Database (FARAD) which provides withdrawal information for drugs that are used in an extra-label manner.

## Antibiotics



**Ophthalmic ointment**



**Long-acting antibiotic LA-200® Extra-label**



**Antibiotic for scours (Rx)**

An antibiotic is a medication used to treat or prevent bacterial infections. When used appropriately, antibiotics are powerful tools for maintaining healthy, productive animals. Not all antibiotics work the same and are effective against the same bacteria or diseases. Sometimes, laboratory cultures are necessary to determine which antibiotic(s) should be used to treat a disease.

Producers should limit antibiotic treatment to those animals that are sick or at-risk of becoming sick. If antibiotics are not used properly, the opportunity for resistant bacteria to evolve increases needlessly and can compromise future antibiotic therapy. Detailed and accurate records of antibiotic treatments and outcomes should be recorded.

The following table lists the antibiotics that are currently FDA-approved for use in sheep and lambs. The approved antibiotics vary in their use.

**Antibiotics FDA-approved for sheep**  
(source: [Animal Drugs @ FDA](#))

Trade name	Drug ingredient		Labeled dosage	Meat Withdrawal
Aureomycin®	Chlortetracycline	OTC	20-50 g/ton (lambs)	0 days
Biosol®	Neomycin sulfate	OTC	10 mg/lb, ≤ 14 days	2 days
Micotil®	Tilmicosin Phosphate	Rx	10 mg/kg SQ single treatment	28 days
Naxcel®	Ceftiofur sodium	Rx	0.5-1.0 mg/lb. IM for 3 days	0 days
Pro-Pen G Agri-Cillin®	Penicillin G Procaine	OTC	1 ml/100 lbs. IM ≤ 4 consecutive days	8 days
Terramycin®	Oxytetracycline	OTC	10-20 g/ton feed 10 mg/lb.	5 days

When deemed necessary, the following antibiotics may be prescribed for use in sheep by veterinarians. When using drugs extra-label, you cannot assume the withdrawal period indicated on the label is adequate for sheep.

[Animal Drugs @ FDA](#)

Trade name	Drug ingredient	Labeled use (other species)
Cefa-Dri® Tomorrow®	Cephapirin Benzathine	For use in dry cows to prevent mastitis
Cefa-Lak®	Cephapirin Sodium	For use in lactating cows to treat



**CD-T toxoid**



**Tetanus anti-toxin**



**Injectable vitamins**

Today®		mastitis
Excenel®	Ceftiofur Hydrochloride	Rx antibiotic for cattle and swine
Nuflor®	Florfenicol	Rx antibiotic for cattle
LA-200®	Oxytetracycline	Long-acting OTC antibiotic for cattle
Long acting penicillin	Penicillin G Benzathine; Penicillin G Procaine	Long-acting penicillin for cattle
Scour-Halt® SpectoGard™ Scour-Chek™	Spectinomycin	OTC antibiotic for treating <i>e.coli</i> scours in baby pigs
Sulmet®	Sulfamethazine	OTC antibiotic for cattle and horses
Tylan® 50	Tylosin	OTC antibiotic for cattle and swine

### Sub-therapeutic use of antibiotics

Sub-therapeutic means below the dosage level to treat disease. Sub-therapeutic levels of antibiotics are sometimes fed to sheep and/or lambs to prevent disease outbreaks. Feeding antibiotics to ewes during late pregnancy can help to control abortions. When a ewe has been assisted in the delivery of her lamb(s), it is recommended that she be given an antibiotic to prevent uterine infections.

Antibiotic use is prohibited under USDA certified organic and natural standards of livestock and meat production. While it is not recommended that treatment be withheld from a sick animal, if an animal is treated with an antibiotic, it cannot be marketed as certified organic or natural. It's milk cannot be used to make in organic products.

### Anthelmintics

An anthelmintic is a medication which kills worms. It is also called a "dewormer." Anthelmintics are available as drenches, boluses, pastes, injectables, pour-ons, and as products that you mix with the feed. All anthelmintics may be purchased over-the-counter.

It is recommended that sheep and lambs always be treated with oral products: drenches and boluses. These formulations are more effective and less likely to promote drug resistance. In the U.S., they are the only products FDA-approved for use in sheep and lambs.

When treating sheep for parasites, make sure you give them the proper dose. Underdosing promotes the development of drug-resistant worms. Anthelmintics should be delivered over the sheep's tongue using a syringe with a long metal nozzle.

It is not recommended that sheep and lambs be dewormed on a regular or scheduled basis or that all animals in a group be treated with an anthelmintic. Selective anthelmintic use should be integrated with other worm control practices.



**Needles**



**Syringes**

Animal Drugs @ FDA

Trade name	Ingredient	Dosage	Meat withdrawal
Cyductin® drench	Moxidectin	1 ml/11 lbs.	7 days
Ivomec® sheep drench	Ivermectin	3 ml/26 lbs.	11 days
Prohibit® drench	Levamisole	1 oz/100 lbs. 2 ml/50 lbs.	3 days
Valbazen® drench	Albendazole	3 ml/100 lbs.	7 days

Under USDA organic standards, animals destined for slaughter cannot be treated with an anthelmintic. While it is not recommended that treatment be withheld from a clinically parasitized animal, if it is treated, it cannot be sold as certified organic, even if proper or extended withdrawal periods are observed.

### Coccidiostats

A coccidiostat is a compound added to animal feed to partially inhibit or delay the development of coccidia, a protozoan parasite that causes scouring and damage to the lining of the small intestines. Coccidiostats are "narrowly" classified as antibiotics by FDA, though they are not used in human medicine.

In the U.S., Bovatec® (lasalocid) is approved as a coccidiostat for sheep maintained in confinement. Twenty to 30 grams of Bovatec® may be mixed in a ton of sheep feed. Ionophores are permitted under USDA natural standards, but not under USDA organic standards. There is no slaughter withdrawal.

Deccox® (decoquinate) is also approved as a coccidiostat for young sheep. It can be mixed in the feed or milk replacer. Rumensin® (monensin) is not approved for use in sheep, but can be prescribed by a veterinarian, if the other coccidiostats are determined to be ineffective. Rumensin is toxic to members of the equine family.

Animal Drugs @ FDA

Trade name	Ingredient	Dosage	Meat withdrawal
Bovatec®	Lasalocid Sodium	20-30 g/ton of feed	0 days
Deccox®	Decoquinate	13.6 g/ton of feed	0 days

Corid® (amprolium) is the only coccidiostat that can be used as both a preventative and treatment for coccidiosis. It can be mixed in the drinking water to prevent outbreaks of coccidiosis or it can be administered to individual animals at a higher dose to treat clinical coccidiosis.

Corid has a unique mode of action. It mimics thiamine (vitamin B12). When the coccidia ingest Corid, they experience thiamine deficiency and starve from malnutrition. Sulfa drugs are also used to treat coccidiosis.

Animal Drugs @ FDA

Ingredient	Dosage for labeled species
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**Anthelmintic (Cydectin®)**



**A coccidiostat can be added to feed, mineral, or water.**



Trade name		
Corid®	Amprolium	4 oz/50 gal. of water
Di-methox (Albon)	Sulfadimethoxine	1.25 to 2.5 g/100 lbs. 4 cc of 12% solution/25 lbs.
Sulmet® liquid, oblet, powder	Sulfamethazine	Various

Both Corid and sulfa drugs require veterinary approval.

## Vaccines (biologics)

A vaccine is a biological preparation which is used to establish or improve immunity to a particular disease. Sheep and lambs are commonly vaccinated for clostridial diseases and other diseases as situations warrant.

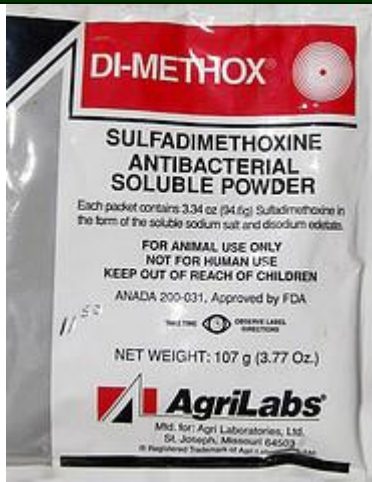
A vaccine stimulates the body's defense system to build immunity to a particular disease, by exposing the animal to either the live organism in a safe form (e.g. sore mouth) or to a killed or inactivated organism or part of an organism (e.g. clostridial diseases).

Vaccinations in an annual program require an initial dose the first year followed by a booster to provide maximum protection. Anti-toxins can be used in disease outbreaks or to provide immediate short-term immunity. In sheep, the tetanus anti-toxin is often give to lambs at the time of docking and/or castration, if the lamb's dam was not vaccinated.

Most vaccines are administered by giving an injection under-the-skin (subcutaneous). A few are administered intramuscularly and occasionally some are given topically (e.g., soremouth vaccine) or intranasally. If there is a choice, subcutaneous injections should be given, as this causes less damage to muscle tissue.

Vaccine	Dosage	Meat Withdrawal
<i>Campylobacter</i>	5 ml SQ shortly before breeding, repeat in 60-90 days. Revaccinate annually (single dose)	21 days
Case-Bac™	2 ml SQ, repeat 2 ml dose in 4 weeks, revaccinate annually (single dose)	21 days
Caseous D-T™	2 ml SQ, repeat 2 ml dose in 4 weeks, revaccinate annually (single dose)	21 days
C & D antitoxin	Suckling lambs, 5 ml SQ, feeder lambs, 10 ml SQ; for treatment double doses	21 days
CD-T	2 ml SQ, repeat in 21-28 days revaccinate annually	21 days
Covexin™-8	5 ml SQ, followed by a 2 ml dose in six weeks, revaccinate annually with 2 ml	21 days
<i>Chlamydia</i>	2 ml SQ 60 days prior to breeding, repeat dose 30 days	60 days

product labels



**Sulfa drug (Rx)**



**Bo-Se (Rx)**

	later, revaccinate annually (single dose)	
Epididymitis	2 ml SQ, repeat dose in 30-60 days Annual booster	21 days
Footvax®	1 ml SQ prior to anticipated outbreak, repeat 6 weeks to 6 months, booster bi-annually	60 days
Ovine Ecolizer™	5 ml orally within 12 hours of birth	21 days
<i>Pasteurella</i>	2 ml SQ, repeat in 2-4 weeks	21 days
Rabies	2 ml IM, annual revaccination	21 days
Soremouth	Apply one drop to scarified area	21 days
Tetanus antitoxin	1,500 units for prevention 3,000-15,000 units for treatment, SQ or IM	21 days
Volar footrot bacterin	3 ml SQ or IM, repeat in 3-4 weeks, booster annually or prior to anticipated outbreaks	21 days

Always followed label directions when giving vaccines. Proper handling of vaccines is important to prevent vaccination failure. Vaccines are sensitive to light and should be refrigerated.

All USDA and third party labeling and certification programs allow the use of vaccines for disease prevention.

## Other treatments and medications

Sometimes other injectables are used to treat health problems in sheep. For a producer to administer many of these injectables, the product(s) must be purchased from and used under the guidance of a licensed veterinarian.

Name		Labeled use	
Banamine®	Rx	Anti-inflammatory. Anti-pain.	Consult veterinarian.
BO-SE®	Rx	Prevent and treat selenium deficiency.	Sheep, 2.5 ml/100 lbs. Lambs, 1 ml/40 lbs.
Calcium gluconate	OTC	Treat milk fever caused by calcium deficiency.	50-100 ml of a 23% solution, IV
Dexamethasone	Rx	Anti-inflammatory. Anti-pain.	Consult veterinarian.
Dextrose, 50%	OTC	Treat glucose deficiency (e.g. ketosis). Nutrient replenisher.	50 cc/100 lbs. IV
Epinephrine	Rx	For treatment of anaphylactoid	1 ml/100 lbs, SQ



**Dextrose and Calcium**



**Oral dosing syringes**



**Drenching**

		shock.	
Iron Dextran	OTC	Prevent and treat iron deficiency in baby pigs	
Lutalyse® PGF-2A	Rx	Causes the regression of the corpus luteum in cattle. Induce parturition in swine.	
Oxytocin	Rx	Uterine contractor. To assist in birthings and milk let down.	1.5-2.5 ml IM or IV
Thiamine HCL Vitamin B1	Rx	To treat thiamine deficiency (polioencephalomalacia)	Consult veterinarian.
Vitamin B Complex	OTC	To treat B vitamin deficiencies and provide supplemental B vitamins	5 cc/100 lbs. IM
Vitamin E-300	OTC	To correct vitamin E deficiencies	Ewes, 4-5 ml IM or SQ Lambs, 2-4 ml IM or SQ
Vitamin E-AD	OTC	To provide a supplemental source of vitamins E, D3, and natural vitamin E	

Oral products are used to treat disease conditions or provide supportive therapy. Unlike many of the injectables listed above, they can usually purchased over-the-counter and used without veterinary consultation. They are commonly used to treat sheep with digestive upsets or to provide supplemental nutrition to sick or stressed animals.

Name	Labeled use
Bimusal (bismuth subsalicylate) Same as Pepto Bismol®	For control of non-infectious diarrhea.
Electrolytes (many brands)	Supplemental supply of electrolytes and fluids. To rehydrate sick animals.;
Kao-Pec Kaolin-Pectin Same as Kaopectate®	For control of non-infectious diarrhea
Mineral oil	Mild laxative.
Power Punch™	Nutritional supplement for stressed animals.
Probios® oral gel	Restore healthy bacteria to digestive system.
Propylene glycol	For prevention and treatment of ketosis in dairy cattle
Sheep Nutri-drench™	Nutritional supplement for stressed sheep/lambs.
Therabloat® (poxalene)	To treat frothy bloat in cattle.
Vitamin E and Selenium oral gel	Supplemental source of vitamin E and selenium

**DESCRIPTION:** Each mL contains 300,000 units Penicillin G Potassium Hydrochloride\*, 2.0% Procaine Hydrochloride, 3.0 mg Potassium Phosphate Dibasic, 0.4% Sodium Formaldehyde Sulfite 80, 0.2% Sorbitan Monolaurate (Span 20), 0.1 mg Polyoxyethylene Methyl Paraben, 0.01% Propyl Paraben, 0.15% Sodium Carboxymethyl Cellulose for Injection.  
 \* Penicillin G Potassium and Procaine Hydrochloride react to form a complex.

**DOSAGE:** Pen-Aqueous should be administered by the intramuscular route. The product is ready for injection after warming the vial to room temperature and shaking to ensure a uniform suspension. The recommended daily dosage of penicillin is 3,000 units per pound of bodyweight (one mL per 100 lbs bodyweight). Continue daily treatment until recovery is apparent and for at least one day after symptoms disappear, usually in two to three days. Treatment should not exceed four consecutive days. No more than 10 mL should be injected at any one site in adult livestock; rotate injection sites for each succeeding treatment.

**RESTRICTED DRUG (CALIFORNIA)**  
 Use Only As Directed.  
 Store at 2-8°C (36-46°F).  
**SHAKE WELL BEFORE USING.**

**Always follow label instructions**



**Tools for vaccinating**

Various products found around the house can often be used to treat sheep and lambs for simple health problems. In some cases, they can replace more expensive commercial products or supplements. Like the oral treatments in the table above, they are used primarily to treat digestive upsets and provide supplemental nutrition to stressed animals.

Trade name	Common use
Aspirin	Pain reliever. Fever reducer. 1 day meat WD.
Antacid	To neutralize acid in the rumen.
Baking soda	To neutralize acid in the rumen.
Honey	Energy supplement.
Kaopectate®	Treat non-infectious diarrhea.
Karo syrup®	Energy supplement.
Molasses	Prevent or treat mild cases of ketosis.
Pedialyte® Gatorade®	For rehydrating a sick animal.
Pepto Bismol®	Treat non-infectious diarrhea.
Vegetable/corn oil	For treatment of bloat.
Yogurt (plain, live culture)	Restore healthy bacteria to digestive system.

Household remedies are used on a trial-and-error basis. Generally, there is no scientific basis for their use and they may not be as effective as the commercial products.

## Administering medications and other treatments

Medications do little good, unless they are administered properly. You can also kill or cause permanent damage to an animal if you do not administer the medication properly. Before any treatments are given, the animal must be properly restrained.

### Injections

Only clean needles and syringes should be used for giving injections. A clean needle should be used to draw solution out of a bottle. The length and gauge of the needle will depend upon the size of the animal and the thickness of the solution. Generally, use the smallest gauge needle that is suitable. a 5/8 inch 18 gauge needle is ideal for vaccinating sheep and lambs. Needles are inexpensive and should be disposed of after use.



**Subcutaneous injection**



**Properly dispose of sharps**



**For treating ketosis**

Type		Where injection should be given	
SQ	Subcutaneous	Under the skin	axilla (armpit) over ribs up on neck behind shoulder
IM	Intramuscular	In the muscle	neck muscle
IV	Intravenously	In the vein	jugular vein
IP	Intraperitoneal	Into the peritoneum	body cavity
	Intramammary	Into the udder	teat canal

The best place to give subcutaneous injections is in the loose skin of the axilla (armpit) or over the ribs. Intramuscular injections should be given in the neck muscle. While the large muscle mass of the thigh may seem like the logical place to give an intramuscular injection, this will cause damage to the meat.

When repeating injections, use the opposite side of the animal for the second injection. Never inject more than 5 ml at one site.

Very few drugs need to be given intravenously; although the same technique is used to collect blood samples. It takes some skill to locate a vein (usually the jugular) and keep the needle in place while the drug is being given. IV drugs should be injected slowly, as animals will react very quickly, with the drug dispersing to all the tissues and going straight to the heart.

An intraperitoneal injection should only be attempted by a skilled person who is familiar with anatomy, as improper technique can cause peritonitis. An intraperitoneal injection is most commonly given to a hypothermic lamb. While the lamb is hanging from its front legs the needle is inserted perpendicular to the skin, approximately 1 inch to the side of and 1 inch caudal to the navel.

Intramammary "injections" (infusions) are given using a long-neck tube instead of a needle. The tube is delicately inserted into the teat sphincter. It goes without saying that the end of the teat should be cleaned before inserting the tube into the teat canal.

**Learn proper injection techniques ==>**

If the animals receiving the injection will be used for meat, make sure you check the withdrawal times. Slaughter withdrawal times for most vaccines are 21 days. Meat withdrawal periods for antibiotics and other injectables vary. Be sure to check the label or consult with a veterinarian. When a drug is used extra label, its withdrawal time may be longer than what is listed on the label for the approved species.

**Sharps**

Sharps should be properly disposed of. Sharps include needles, syringes, scalpel blades, slides, pipettes, and anything else that can puncture. Sharps should be collected on the farm in a rigid, puncture-resistant container with a screw-on or tightly secured lid. Containers should be visibly labeled as biohazardous material. Once full, they should be taken to an approved collection facility for medical or veterinary waste. Expired and unused medicine should be disposed of in the same manner as sharps.



**Probiotics**



**For treating digestive upsets**



**Anti-inflammatories**

### **Drenching**

Drenching is when liquid medicine is poured down the animal's throat. An oral syringe with a long metal nozzle should be used for drenching. Automatic drench guns can be used for large numbers of animals.

To drench, you should place a hand under the animal's head and tilt it slightly to the side. The gun nozzle should be placed in the gap between the molar and incisor teeth and then over the back of the tongue. If the medicine is placed in the mouth, it may by-pass the rumen as it escapes down the esophageal groove. The animal should swallow before the gun is removed. Covering the animal's nostrils will encourage swallowing.

Poor drenching technique can cause aspiration pneumonia (an infection of the lungs caused by breathing in foreign material). To prevent medicine from entering the animal's bronchial tubes or lungs, the animal's head should be held horizontally. It should not be tilted up. Drench guns should not be forced down the animal's throat. Drenches should not be administered faster than the animal can swallow.

### **Giving boluses**

Sheep and lambs can be given boluses (or capsules) by using a balling gun. A balling gun is a plastic or metal tube with a capsule holder on one end and a plunger on the other end (to eject the capsules). Balling guns are available in different sizes. Young animal balling guns are suitable for sheep and lambs.

The balling gun is inserted into the animal's mouth in the same manner as drenching. The plunger should not be depressed until the end of the gun is over the base of the tongue. Otherwise, the pill may be chewed or spit out by the animal.

### **Quality and Safety Assurance**

The American Sheep Industry Association (ASI) began development of an industry-wide quality and safety assurance program in 1991. Quality assurance programs provide assurances to consumers that products have been produced in accordance with certain standards, including the proper use of animal health products.

USDA and third party certification groups that do not allow the use of antibiotics, anthelmintics, coccidiostats, and other animal health products do so without any scientific basis. As with people, sometimes drugs are necessary to maintain the health and well-being of farm animals. It is safe to consume the milk and meat from treated animals, if proper withdrawal times have been observed.



<http://www.sheep101.info/201/drugs.html>