

# Vaccination Protocol for a Goat Herd

## Introduction

Recent surveys conducted by researchers at Alabama A&M University indicated that 80 percent of Alabama and Tennessee goat producers reported that they do not vaccinate their herds. However, vaccination is a precaution that goat producers should adopt to prevent infectious diseases.

## Why Vaccinate?

- For many diseases, it is cheaper to vaccinate than to treat.
- Vaccination decreases the chance of goats contracting various diseases.
- If a vaccinated goat is exposed to a disease and still contracts the disease, the course of illness may be shorter and less severe, with reduced rates of mortality.
- Vaccination reduces economic losses associated with animal illness and death.

## What is a Vaccine?

A vaccine is a substance that causes a goat's immune system to respond by producing specific antibodies (proteins). Currently, goat vaccines are categorized as *modified-live*, *killed*, and *toxoid*.



## Vaccinate goats for disease prevention

- *Modified-live vaccines* use live microorganisms that have been weakened. This type of vaccine causes a prolonged response of the animal's immune system. The vaccine for sore mouth disease is an example of a modified-live vaccine.
- *Killed vaccines* use killed (inactivated) bacteria or viruses. These vaccines, which include the pneumonia vaccine, are generally safer than live vaccines.
- *Toxoid vaccines* are comprised of disease-causing bacteria that produce toxins that invade the bloodstream. Toxoid vaccines, such as those for

enterotoxemia and tetanus, use bacterial toxins that have been rendered harmless to provide immunity against the toxin.

## How Do Vaccines Work?

A vaccine stimulates production of B cells (white blood cells). These B cells produce plasma cells (a type of white blood cell) that in turn produce antibodies (specific proteins), which fight particular invaders. Once produced, these antibodies circulate in the goat's bloodstream. Once the goat's body has produced a particular

antibody, it rapidly produces more antibodies if needed. In addition to the B cells, other white blood cells, such as macrophages and T cells, will help destroy invading diseases. Antibodies and memory T cells immediately react to the organism, attacking the invader before disease can develop.

### **Vaccine-Induced Immunity**

Vaccine-induced immunity provides results days after the goat has been vaccinated. The vaccine triggers a response to infection from the immune system without exposure to the pathogens in their full disease-producing form.

Extra doses or boosters of a vaccine may be needed to produce a full immune response. In some animals, a single vaccination induces a lower response and only after a second vaccination will the animal achieve full immunity.

Some vaccines induce a short period of immunity. Thus, goats may need yearly booster shots to restore or increase immunity to a specific disease.

### **Do Vaccines Work?**

No vaccine is 100 percent efficient. The immune response to a vaccine depends on the type of vaccine used and the ability of the animal to respond to the vaccine administered. Some vaccines can protect up to 98 percent of vaccinated animals. Some produce lower protection rates. A vaccine may induce a weaker immunoprotective response if the animals have weaker immune systems. Thus, the animals do not produce enough antibodies to

fight disease. Even if every goat in a herd was vaccinated against a specific disease, a few goats in the herd may not respond to the vaccine and will be at risk of contracting the disease.

## **Diseases to Vaccinate Against**

### **Enterotoxemia and Tetanus**

Vaccinate pregnant does against clostridial diseases enterotoxemia and tetanus; use a vaccine against *Clostridium perfringens* types C and D and against *C. tetani* during the fourth month of pregnancy. This vaccine is commonly referred to as the 'Clostridial CD/T' vaccine. Herd bucks may also receive annual CD/T booster shots at this time.

Vaccinate kids against enterotoxemia and tetanus at three months of age. A booster should be administered one month later then once annually.

### **Pneumonia**

Vaccinate against pneumonia caused by *Pasteurella multocida* or *Mannheimia haemolytica*. The pneumonia currently available on the market causes temporary limping in goats.

Vaccinate adults with two dosages, two to four weeks apart. Kids vaccinated while less than three months old should be revaccinated at weaning or at four to six months of age.

### **Leptospirosis**

Vaccinate against leptospirosis in regions where the disease is prevalent or in case

of an outbreak under veterinarian guidance. The commercially available vaccine is not labeled for goats and is considered to be an extra-labeled product. Consult a veterinarian to administer this vaccine among your herd.

### **Foot Rot**

Vaccination against foot rot is practiced by some goat producers. A vaccine used for sheep has not been approved for use in goats by the United States Food and Drug Administration (FDA). It has been effective, however, in reducing the severity and incidence of foot rot in sheep. In sheep herds, its recommended use is two to four weeks prior to the rainy season, with a booster between six weeks and six months later. Boosters should be given twice a year, one to two weeks prior to expected outbreaks. The vaccine causes a localized raised lump at the injection site and is not recommended for use in pregnant ewes.

### **Caseous Lymphadenitis (CL)**

Some goat producers use a commercially available vaccine for sheep to vaccinate against caseous lymphadenitis (CL) in goats. However, a combination of Clostridium C&D/T plus CL vaccine produces a strong adverse reaction, and is not recommended by the FDA for use in goats.

### **Rabies**

There are several killed virus rabies vaccines made for sheep that are not labeled for goats. The vaccines seem to be effective for goats; however, they are too expensive to be practical in many situations.

## Chlamydia

A killed vaccine to prevent chlamydia and abortion in sheep is available. This vaccine is not labeled for use in goats; however, it seems to be somewhat effective. The vaccine produces side effects that include muscular soreness and stiffness, and the vaccine can cause abortion if goats are vaccinated during the first 28 to 45 days of pregnancy.

Autogenous vaccines, vaccines made from bacteria isolated from a specific herd, are another source of immunization. However, a reputable certified laboratory must produce the vaccine. Before using an autogenous vaccine, test it in several animals for adverse side effects. Goats are more sensitive than sheep to these types of vaccines.

### NOTE:

For better immune response and to prevent illness, vaccinate only healthy animals that show signs of good health and body condition. Adverse reactions, including anaphylaxis, may occur following vaccination. If anaphylaxis occurs, administer epinephrine immediately.

SIGNS OF A HEALTHY GOAT	SIGNS OF AN UNHEALTHY GOAT
<b>Normal body temperature:</b> 101.5 to 103.5° F	<b>Body temperature:</b> Above 104° F
<b>Heart rate:</b> 70 to 80/minute	<b>Heart rate:</b> At rest lower than 70 to 80/minute and above 80/minute
<b>Respiratory rate at rest:</b> Approximately 12-15 breaths/minute (20 to 35 for kids)	<b>Respiratory rate:</b> Above 12 to 15 breaths/minute (20 to 35 for kids)
<b>Ruminal Movements:</b> 1 to 1.5/minutes	<b>Ruminal Movements:</b> No movement or less often than 1 to 1.5/minute
<b>Attitude:</b> Alert and inquisitive, sociable	<b>Attitude:</b> Lethargic, listless, unsociable, away from the herd
<b>Appetite:</b> Interested in food; eats and drinks normally. Chews cud after feeding	<b>Appetite:</b> Doesn't eat or drink water; no sign of cud chewing
<b>Weight:</b> Weighs the average pattern for the breed	<b>Weight:</b> No weight gain despite good appetite
<b>Reproductive Organs:</b> Normally presents no signs of any discharge, unless female is in heat or postpartum	<b>Eyes:</b> Runny eyes, pale inner eyelids
<b>Eyes:</b> Bright and not runny	<b>Nose:</b> Heavy mucous in nose; runny nose.
<b>Nose:</b> Cool and dry	<b>Coat/Skin:</b> Rough, dull hair coat; hair falling out, presence of lesions
<b>Coat/Skin:</b> Clean, glossy; no lumps, no lesions	<b>Droppings:</b> Diarrhea, watery with presence of mucous or blood
<b>Droppings:</b> Firm in form of pellets	<b>Breathing:</b> Labored, coughing
<b>Urine:</b> Light brown; no blood present	<b>Gait:</b> Limping
<b>Breathing:</b> Regular; unlabored	<b>Body:</b> Swelling on any part of body
<b>Gait:</b> Steady; no limping	
<b>Vocal:</b> Normal sounds	

## Vaccination Guide

- Follow manufacturer's guidelines for vaccine dosage, route of administration, product storage, and expiration date.
- Avoid drug residues in meat and milk by following the recommended drug withdrawal times printed on label for treated animals that will enter the food chain via slaughter or will provide milk for human consumption.
- Disinfect the injection site with alcohol.
- Use sterile needles and use a new needle for each animal.
- Administer vaccines to goats using a 20-gauge, 1-inch needle for adult animals. For smaller does and kids, 1/2-inch needles may be used. Used needles should be kept in a container for disposal.
- Keep vaccination records.
- Be aware of contraindication of the product before applying.
- Consult a veterinarian for disease control and product orientation.

## References

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