

Vaccination of Sheep and Goats: A 4 H Primer...

Robert M. Dyer VMD, PhD
Department of Animal and Food Science
College of Agriculture and Natural Resources
University of Delaware
Newark, Delaware, 19717-1303

Introduction: Goals and expectations of vaccination programs in sheep and goats intended for show purposes

A comprehensive strategy to address disease problems in show sheep and goats might entail vaccination strategy, biosecurity practices and disease surveillance programs. In as much as *proactive* programs of vaccination can maximize protection of the show animal against specific diseases, vaccination remains an integral component of any strategy to maximize disease resistance in the show animal. However, be aware the show violates one of the single most important concepts in disease prevention: mixing groups of animals causes disease problems. The reason is simple: when populations of animals are assembled from a wide variety of sources and herds, many disease causing agents are assembled together as well. Disease resistance as well as disease agents are very different within each herd and therefore the general show population represents a collection of pathogens floating about in a population of animals with no to very high levels of resistance to each disease agent. Realistically speaking, vaccination prior to assembly will never, ever guarantee infectious disease problems will not arise in the show animals either at the show or soon after the return home.

Realistically speaking, the greatest transmitted diseases that could potentially be a problem in small ruminant show animals is respiratory disease and Orf. Orf is usually transmitted by direct contact between animals, contaminated utensils and contaminated animal caretakers. The most common respiratory agents in goats and sheep are Mycoplasma agents, the bacterial agent *Mannhiemia hemolytic* and the viral agent Parainfluenza-3 virus (PI-3) Thus, the goal of any vaccination program in show sheep and goats should be to maximize vaccine induced immunity against these agents. Unfortunately, vaccines against *Mannhiemia* and *Myocplasma* species have little to no proven efficacy. The PI-3 vaccine is very effective but is usually supplied in conjunction with Infectious Bovine Rhinotracheitis (IBR) as the bovine vaccine. There is to date, no good evidence IBR causes any problems in small ruminants. Use of the modified virus preparations is not unusual in small ruminants but be aware its use is off label.

Aside from these agents, some of the clostridia agents, particularly *Clostridium perfringens* could be a problem when dietary problems arise in show animals. Thus ensuring animals have developed sufficient immunity against this clostridia agent is important in small ruminants.

Vaccine induced immunity should begin at a very young age and then be build upon up until weeks prior to the show season. Vaccination of the young very much depends upon the level of immunity passed by the dam's colostrum to the newborn. Generally speaking if the does or ewe has been well vaccinated then the level of colostrum immunity will be high and last up to 5-6 weeks of age. After that time, vaccination of the newborn should become a priority. If the does and ewes have not been vaccinated, then the newborns will likely lack any specific protection. Vaccination can begin within 2 weeks of life in these individuals. A high priority in newborns born to unvaccinated ewes and does is to give the newborns antitoxins against tetanus and Clostridium perfringens type C and D. Regardless, a core vaccine program should be instituted early in all newborns and boosted thereafter during several strategic times prior to the show season. Vaccination at the time of the show season or 1-2 weeks prior to the show season is never a good strategy to maximize immunity. Often times this becomes an unnecessary stress on show animals and results in incomplete immunity. This becomes a real problem in stressed animals (show stress) assembled from a variety of sources (mixing animals). Disease agents circulating in highly stressed animals mixed with groups of animals from many sources becomes a recipe for disease outbreaks.

Concepts and Principles behind an Essential Vaccine Program in Show Sheep and Goats

Minimum Essential program: The minimal basic program should include vaccination against leptospirosis and contagious ecthyma and the clostridium disease problems such as tetanus, enterotoxaemia, blackleg and malignant edema. .A reasonable core program is listed in the following table

Core Vaccines and Vaccination Programs for Small Ruminants.

Bacterial Vaccine Schedules for Sheep and goats		
Group	Vaccine	Comments
1-2 months	Clostridium perfringens Types C and D toxoid and Clostridium tetani toxoid Contagious ecthyma	Clostridium vaccination should be boosted within 2 weeks after first exposure
6 months	Leptospira 5 way must include Leptospira 5 way must include L. pomona, L. canicola, L. icterohaemorrhagica, L. grippityphosa and L. borgpetersenii serovar hardjo. Clostridium tetani, Clostridium perfringens type C and D, Blackleg and Malignant edema Contagious ecthyma	Critical to start immunity early in young stock. Follow initial exposure with a 4 week boost. No boost---no protection! The Clostridia and Contagious ecthyma vaccines are a boost in young stock.
Breeding adults 3-4 weeks prior to breeding season	Leptospira 5 way must include L. pomona, L. canicola, L. icterohaemorrhagica, L. grippityphosa and L. borgpetersenii serovar hardjo.	Boost at this time is essential to generate strong immunity to protect pregnancy. Thereafter an annual boost is required 30-60 days post partum for the rest of adult life.
Breeding adults 1 month prior to lambing or kidding	Clostridium tetani, Clostridium perfringens type C and D, Blackleg and Malignant edema Contagious ecthyma	This ensures colostrum immunity is high for newborns.

Notes and Comments:

Clostridia vaccination is boosted at the end of pregnancy to ensure high levels of colostrum immunity are transferred to newborns. Otherwise, newborns must receive anti-toxins against tetanus and enterotoxaemia type C and D.

Contagious ecthyma (Orf or Sore Mouth) Orf is a viral disease most common in unimmunized adults and youngsters of both sheep and goats. It is a viral disease that also infects humans. Some vaccines are live virus preparations that if accidentally injected into animal caretakers performing vaccination can lead to disease problems in humans.

Leptospira vaccination is a good preventive approach in small ruminants even though leptospira problems are not common in small ruminants. When given they must be boosted prior to breeding season to generate high immunity during pregnancy.