



The Herd Health Handbook for Goat Producers: Vaccination Protocol and Quality Assurance Measures for Goats¹

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Introduction

One of the major concerns in a goat operation is health, maintenance, and well-being of the goat herd. Some of the major impacts of not maintaining a healthy herd include higher operation costs, greater risks of disease outbreak to on-farm and off-farm animals, higher food safety risks, lower reproduction efficiency, and tarnished reputation. A sound approach to goat health is the maintenance of a year round preventive-based goat program. A preventive-based program involves addressing potential disease conditions before they occur. It also involves a systemic approach to good management and nutrition. A year round program is recommended in order to manage and maintain conditions that may affect a herd. A disease condition is easier (and less costly) to prevent than to treat an existing condition.

A general systems strategy includes the following:

Vaccination Protocol for Different Ages of Goats	
Pregnant	Vaccinate last month of pregnancy with clostridium C&D + tetanus. Booster annually, last month of pregnancy, e.g., Bar-Vac CD/T, 2 ml sc.
Kids	Vaccinate at 1 to 2 months of age if does were vaccinated during last month of pregnancy. Booster 3 weeks later. Second booster 3-4 weeks later.
Bucks	Vaccinate at same time when pregnant does are vaccinated.
Yearlings	Booster all the yearlings at the anniversary date of previous vaccinations.

Other Animal Health Concerns:

- Selenium deficiency
- Parasites
- Nutrition
- Vitamin and other mineral deficiencies.

Factors that determine when other vaccinations can be given include the following:

- Geographic dependent
- History of disease agents in area, for example: contagious ecthyma. In the event of this, it is necessary to vaccinate all the animals and then only kids. Other diseases of importance are: paratuberculosis, foot and mouth, rinderpest, anthrax, blackleg, leptospirosis, and rabies (need specific).

Quality Assurance (QA)

Quality assurance is the activity of providing evidence needed to establish quality in work, and that activities that require good quality are being performed effectively. All plans or systematic actions necessary to provide enough confidence for products or services will satisfy the given requirements for quality.

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Quality Assurance Measures Routine QA Measures Include the Following:

- Proper Site Selection
- Proper Facility Design
- Adequate ventilation and Quarantine
- Practice on-farm bio-security
 - Traffic control
 - Sanitation
- Purchase from reputable source
- Use sound de-worm program
- Handle animals carefully to minimize bruising
- Ensure injection site is free of manure and dirt
- Avoid chemical disinfectants
- Use needle size that will do the least damage
- Use site anterior to scapula
- Don't contaminate bottles
- Change needles
- Maintain good farm records
- Follow label instructions and all guidelines to medication use and administration-if *extra-label*, check with a veterinarian

References

Dawson, L. (2001). Caprine herd health program. Pp. 16-23 in Proc. 16th Ann. Goat Field Day, Langston University, OK. <http://www2.luresext.edu/goats/library/field/dawson01.html>. Received August 06, 2009.

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Appendix I. Goat Guideline for Anthelmintic Dosages (Internal Parasite Dewormers) July 2006 *Important --- Please read notes below before using this chart*

Animal Weight		Oral Dosing <i>Note: 1 ml = 1 cc</i>							Subcutaneous injection	
		Valbazen ¹ Albendazole 20 mg/kg 2 ml/25lb	SafeGuard ² Fenbendazole 10mg/kg 1.1 ml/25lb	Ivomec ³ Ivermectin 0.4 mg/kg 6 ml/25lb	Levasole ⁴ Levamisole 12 mg/kg 3 ml/25 lb	Cydectin Pour on Moxidectin ⁵ 0.5 mg/kg 1.1 ml/25 lb	Cydectin Drench Moxidectin ⁶ 0.3 mg/kg 3.4 ml/25 lb	Cydectin *Injectable* Moxidectin ⁷ 0.2 mg/kg 1 ml/110 lb		
20	9.1	1.6	0.9	4.8	2.4	0.9	2.7	0.2		
25	11.4	2	1.1	6	3	1.1	3.4	0.2		
30	13.6	2.4	1.4	7.2	3.6	1.4	4.1	0.3		
35	15.9	2.8	1.6	8.4	4.2	1.6	4.8	0.3		
40	18.2	3.2	1.8	9.6	4.8	1.8	5.4	0.4		
45	20.5	3.6	2.1	10.8	5.4	2.1	6.1	0.4		
50	22.7	4	2.3	12	6	2.3	6.8	0.5		
55	25	4.4	2.5	13.2	6.6	2.5	7.5	0.5		
60	27.3	4.8	2.7	14.4	7.2	2.7	8.2	0.5		
65	29.5	5.2	3	15.6	7.8	3	8.8	0.6		
70	31.8	5.6	3.2	16.8	8.4	3.2	9.5	0.6		
75	34.1	6	3.4	18	9	3.4	10.2	0.7		
80	36.4	6.4	3.6	19.2	9.6	3.6	10.9	0.7		
85	38.6	6.8	3.9	20.4	10.2	3.9	11.6	0.8		
90	40.9	7.2	4.1	21.6	10.8	4.1	12.2	0.8		
95	43.2	7.6	4.3	22.8	11.4	4.3	12.9	0.9		
100	45.5	8	4.6	24	12	4.6	13.6	0.9		
105	47.7	8.4	4.8	25.2	12.6	4.8	14.3	1		
110	50	8.8	5	26.4	13.2	5	15	1		
115	52.3	9.2	5.2	27.6	13.8	5.2	15.6	1		
120	54.5	9.6	5.5	28.8	14.4	5.5	16.3	1.1		
125	56.8	10	5.7	30	15	5.7	17	1.1		
130	59.1	10.4	5.9	31.2	15.6	5.9	17.7	1.2		
140	63.6	11.2	6.4	33.6	16.8	6.4	19	1.3		

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		Valbazen ¹ Albendazole 20 mg/kg 2 ml/25lb	SafeGuard ² Fenbendazole 10mg/kg 1.1 ml/25lb	Ivomec ³ Ivermectin 0.4 mg/kg 6 ml/25lb	Levasole ⁴ Levamisole 12 mg/kg 3 ml/25 lb	Cydectin ⁵ Pour on Moxidectin 0.5 mg/kg 1.1 ml/25 lb	Cydectin Drench Moxidectin ⁶ 0.3 mg/kg 3.4 ml/25 lb	
lbs	kg							
150	68.2	12	6.8	36	18	6.8	20.4	1.4

¹Valbazen Suspension (11.36% or 113.6 mg/ml): Do NOT use in pregnant does in the first trimester of pregnancy. Meat withdrawal time is 9 days and 7 days for milk (FARAD).

²Safe-Guard/Panacur Suspension (10% or 100 mg/ml): **APPROVED** in goats at 5 mg/kg with meat withdrawal time of 6 days and no withdrawal period for milk. Although the label dose in goats is 5 mg/kg, it is generally recognized that 10 mg/kg dosage is required for good efficacy. At 10 mg/kg dosage, meat withdrawal is 16 days for milk (FARAD).

³Ivomec Sheep Drench (0.08% or 0.8 mg/ml): Protect from light. Coughing may occur during and following drenching. Meat withdrawal time is 14 days (FARAD).

⁴Levasole Soluble Drench Powder (Sheep): Oral solution ONLY. To prepare use 1 packet (13 gm/11.7 gm active ingredient) dissolved in 262 ml (8.9 oz.) water (44.7 mg/ml) for 52 gram packet dissolved in 1046 ml water (35.4 oz.). NOTE: This is a different dilution from the label directions for administration. Meat withdrawal time is 4 days (FARAD).

⁵Cydectin Pour on for cattle (0.5% or 5 mg/ml): Meat withdrawal time is 23 days. Not for use in lactating dairy goats.

⁶Cydectin Drench for sheep (.1% or 1 mg/ml): Meat withdrawal time is 14 days. Not for use in lactating dairy goats.

⁷Cydectin Injectable for cattle (1% or 10mg/ml): GIVE SQ. Meat withdrawal time is 30 days. Not for use in lactating dairy goats.

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		lbs	kg	Valbazone ¹ Albendazole 20 mg/kg 2 ml/25lb	SafeGuard ² Fenbendazole 10mg/kg 1.1 ml/25lb	Ivomec ³ Ivermectin 0.4 mg/kg 6 ml/25lb	Levasole ⁴ Levamisole 12 mg/kg 3 ml/25 lb	Cydectin Pour on Moxidectin ⁵ 0.5 mg/kg 1.1 ml/25 lb	Cydectin Drench Moxidectin ⁶ 0.3 mg/kg 3.4 ml/25 lb	Cydectin *Injectable* ⁷ Moxidectin 0.2 mg/kg 1 ml/110 lb
<p><i>Note:</i> Producers should consult their veterinarian for advice on their specific management situation for determining dosages for their herd. With the exception of Fenbendazole administered at the 5 mg/kg dose, these drugs are not APPROVED by the Food and Drug Administration (FDA) for use in goats, and when used in goats are considered <i>extra-label</i>/ (fenbendazole at dose rate of 10 mg/kg is considered <i>extra-label</i>). The FDA regards <i>extra-label</i> use of drugs as an exclusive privilege of veterinary professional and is only permitted when a bona fide veterinarian-client-patient relationship exists and an appropriate medical diagnosis has been made. The chart is intended to serve as a guideline for improving accuracy when dosing goats with an anthelmintic, but these drugs should be used in goats only when appropriate veterinary advice has been received. Drug resistance in parasites of goats is extremely common. The effectiveness of an anthelmintic should always be tested before used by performing a FECRT (Fecal Count Reduction Test) or larva development (DrenchRite) assay if available.</p> <p>**The current recommendation is to use Cydectin cattle injectable formulation and NOT the pour-on formulation (orally) or the sheep oral drench. When administered by subcutaneous injection, moxidectin provides improved drug levels as compared to when administered orally.</p> <p>Reference: Kapan, R. M. (University of Georgia), Scharko, P. (University of Kentucky) and Dawson, L. (Oklahoma State University)</p> <p>Collaborating institution/organization: Alcorn State University, American Boer Goat Association, American Kiko Goat Association, American Meat Goat Association, Florida A&M University, Fort Valley State University, Kentucky State University, Langston University, Prairie View A&M University, Southern University, Tennessee Goat Producers Association, Tennessee State University, Tuskegee University, United States Boer Goat Association, University of Arkansas Pine Bluff, and Virginia State university</p> <p>Web Reference: http://www2.luresext.edu/goat/training/ga.html</p>										

Appendix II. Medications Commonly used in Goats and Approximate Withdrawal Times

I. Antibiotics	Brand Name	Approval	Dosage	Route	Frequency	Withdrawal Time	
						Meat	Milk
Ceftiofur	Naxcel®	APPROVED	0.5-1 mg/lb	IM	Once a day	0 days	0 days
Neomycin	Biosol® and other products	APPROVED	5 mg/lb	PO	Twice a day	3 days	NA
Amoxicillin	Amoxi-inject®	extra-label	5 mg/lb	SQ	Once a day	26 days	120 hours
Ampicillin	Polyflex®	extra-label	5mg/lb	SQ	Once a day	10 days	72 hours
Benzathine Pen G	Pen BP-48®	extra-label	20,000IU/lb	SQ	Every 48 hours	30 days	N/A
Erythromycin	Erythro-200®	extra-label	1 mg/lb	SQ	Once a day	5 days	96 hours
Florfenicol	Nuflo®	extra-label	9 mg/lb	IM	Every 48 hours	28 days	120 hours
Oxytetracycline	LA-200®	extra-label	9 mg/lb	SQ	Every 48 hours	29 days	144 hours
Procaine Pen G	Crysticillin®	extra-label	10,000-20,000 IU/lb	SQ	Once a day	16-21 days	120 hours
Sulfadimethoxine	Albon®	extra-label	25 mg/lb Day 1, 12.5 mg/lb Days 2-5	PO	Once a day	12 days	5 days
Extra-label USE IS PROHIBITED IN LACTATING DAIRY COWS. DO NOT USE IN LACTATING DAIRY DOES.							
Tylosin	Tylan200®	extra-label	10 mg/lb	IM	Once a day	30 days	96 hours
Chloramphenicol	Chloramphenicol	Extra-label USE IS PROHIBITED					
Enrofloxacin	Baytril® 100	Extra-label USE IS PROHIBITED					
Furacin, nitrofurantoin	Furox®	Extra-label USE IS PROHIBITED					
Gentamicin	Gentocin®	DO NOT USE					
Tilmicosin	Micotil®	DO NOT USE-TOXIC TO GOATS					
II. Anti-inflammatory Drugs:	Brand Name	Approval	Dosage	Route	Frequency	Withdrawal Time	
Aspirin	Aspirin	extra-label	100 mg/kg	PO	Once a day	1 day	24 hours
Flunixin meglumine	Banamine	extra-label	1.1 - 2.2 mg/kg	IV or IM	Once a day	10 days	72 hours
Phenylbutazone	Bute	extra-label	10-20-mg/kg	PO	Once a day	60 days	DNU
		DO NOT USE IN LACTATING ANIMALS					

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Dipyron	Dipyron	Extra-label/USE IS PROHIBITED			
III. Prevention of Coccidiosis:	Brand Name	Approval	Dosage	Withdrawal Time	
				Meat	Milk
Decoquate	Deccox®	APPROVED	13-91 gm/ton of feed	0 days	24 hours suggested minimum, DNU
Monensin	Rumensin®	APPROVED	15-20 gms/ton of feed	0 days	96 hours suggested minimum, DNU
Amprolium	Corid®	extra-label	25-50 mg/kg BW in feed or water	2 days	48 hours
Lasalocid	Bovatec®	extra-label	20-30 gms/ton of feed	0 days	24 hours
IV. Anthelmintics:	Brand Name	Approval	Dosage	Route	
1. Avermectins:					
Doramectin	Dectomax®	extra-label	0.3 mg/kg	SQ	56 days
Eprinomectin	Eprinex®	extra-label	0.5 mg/kg	PO	N/A
Ivermectin	Ivomec® Drench	extra-label	0.3 mg/kg	PO	14 days
Ivermectin	Ivomec® 1%	extra-label	0.3 mg/kg	SQ	56 days
Moxidectin	Quest®	extra-label	0.5 mg/kg	PO	23 days
	Cydectin®				
	Cydectin® drench	extra-label	0.3 mg/kg	PO	14 days
	Cydectin® Injectable	extra-label	0.2 mg/kg	SQ	30 days
2. Benzimidazoles:					
Albendazole	Valbazen®	extra-label	10 mg/kg	PO	7 days
					120 hours

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Fenbendazole	Panacur®/ Safe-guard®	APPROVED at 5 mg/kg, <i>extra-label</i> as recom- mended	10 mg/kg	PO	14 days	120 hours
Oxfendazole	Synanthic	<i>extra-label</i>	10 mg/kg	PO	14 days	120 hours
3. Cholinergic Agonists:						
Moranted Tartrate	Rumatel®	APPROVED	10 mg/kg	PO	30 days	0 days
Levanisole	Levasole®	<i>extra-label</i>	8 mg/kg	PO	10 days	4 days
V. Anesthetics and Tranquilizers	Brand Name	Approval	Dosage	Route	Withdrawal Time	
Ketamine	Ketaset®	<i>extra-label</i>	5-10 mg/kg	IV or IM	Meat	Milk
Lidocaine	Lidocaine	<i>extra-label</i>	Variable for local anesthesia use, 1% in goats		3 days	48 hours
Thiamylal Na	Biotal	<i>extra-label</i>	10-20 mg/kg	IV	1 day	24 hours
Xylazine	Rompun®	<i>extra-label</i>	0.05-0.1 mg/kg	IV or IM	5 days	72 hours
Yohimbine	Yobin	<i>extra-label</i>	0.25 mg/kg	IV	7 days	72 hours
VI. Hormones:	Brand Name	Approval	Dosage	Route	Withdrawal Time	
Cloprostenol	Estrumate®	<i>extra-label</i>	125 microgram	IM	Meat	Milk
Dexamethasone	Azium®	<i>extra-label</i>	20-25 mg	IM	0 days	0 days
Dinoprost	Lutalyse®	<i>extra-label</i>	5-10 mg	IM	14 days	4 days
Oxytocin	Oxytocin	<i>extra-label</i>	10-20 IU	IM	1 day	24 hours
VI. Electrolytes	Brand Name	Approval	Dosage	Route	Withdrawal Time	
Calcium	Calcium borogluconate	<i>extra-label</i>	50 to 100 ml 10 to 23% calcium ion	IV	Meat	Milk
					0 days	0 days

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Calcium	Calcium gluconate	<i>extra-label</i>	50 to 100 ml 10 to 23% calcium ion solution	IV	0 days	0 days
<p>Note: In the table above, PO = oral administration; SQ = subcutaneous injection; IM = intramuscular injection; IV = intravenous injection.</p> <p>DNU = insufficient data available to make WDI estimation, this drug is not APPROVED for lactating goats.</p> <p>Use of drugs listed as "<i>extra-label</i>" is legal only if prescribed by your veterinarian in the context of a valid client-patient relationship.</p> <p>The listed dosages and withdrawal times, as well as drug status and legality of use, is subject to change.</p> <p>Consult your veterinarian before any treatment.</p> <p>Reference: www.uky.edu.edu/Ag/AnimalSciences/goats/presentations/A5%20Goatmeds%5B1%5D.pdf</p> <p>Dawson, L. 2001.</p>						