

ALABAMA A&M AND AUBURN UNIVERSITIES

ANR-1296

ALABAMA

MEAT GOAT & SHEEP PRODUCERS



SMALL RUMINANT POCKET GUIDE



Extension

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Preface

Sheep and goat production has the potential to become an economically viable option for small, full-time farmers and the growing number of part-time farmers throughout the United States, particularly in the Southeast. This pocket guide is intended as an aid to basic management practices in today's sheep and goat business. To develop a guide to meet the needs of every producer's operation would be an impossible undertaking; however, the recommendations and guidelines suggested in this guide should address most producers' questions and concerns about operating a profitable sheep and goat enterprise.

The authors do not assume any responsibility, make any guarantees, or offer any warranties regarding the results obtained from the use of any of the management practices or suggestions made in this guide.

The following authors contributed to this guide:

Robert Ebert, *Extension Animal Scientist Youth/4-H*, Auburn University

Diego M. Gimenez, *Extension Specialist*, Associate Professor, Animal Science Management and Reproduction, Auburn University

Chris Kerth, *Associate Professor*, Meat Science, Auburn University

Nada K. Nadarajah, *Research Fellow*, Breeding and Genetics, Auburn University

Darrell L. Rankins, *Extension Specialist*, Associate Professor, Ruminant Nutrition, Auburn University

Susan Schoenian, *Regional Agent Extension Specialist*, University of Maryland Cooperative Extension

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- Glenda Freeman, *Extension Communications Editor*
- D. Ross Heck, *Part-time Extension Art Designer*

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Calendar of Management Activities and Practices for Sheep and Goat Production

This calendar contains a monthly listing of the common management activities and practices needed for sheep and goat production in Alabama. Some are recommended at a certain time of the year and others are recommended when lambs and kids are a certain age or at a certain stage in their reproductive cycles.

Each bimonthly list is divided into three sections: general, management activity, and health. Management practices in the general category are seasonal and apply to most sheep and goat producers in the state. Lambing and kidding are based on a breeding season from August through December for sheep and July through December for goats. Few ewes and does cycle in March and April; February, May, June, and July are considered transitional months. Tropical breeds of

goats may cycle year-round. These dates are not necessarily the best dates for all producers. They are chosen because they are reasonably close to what many producers use. Establish lambing and kidding dates based on your feed resources and availability of labor. A ewe's or doe's energy and protein requirements increase greatly at lambing and kidding.

Use of any animal health product that is inconsistent (species, route, or dosage) with its label constitutes extra-label drug use and requires a veterinary prescription and valid veterinarian-patient-client relationship. Exaggerated withdrawals should be used whenever administering a drug extra-label. It is important to note that many anthelmintics and other drugs are not approved for use in sheep and goats and require veterinary consultation.

General	Management Activity	Health
<ul style="list-style-type: none"> • Monitor forage and hay availability. Be alert to the changing nutritional needs of the flock and herd during gestation, lambing, and lactation. Continue supplemental feeding until grass is plentiful. • Avoid overcrowding and overstocking. • Avoid feeding on the ground. • Offer a free-choice mineral mixture. A good calcium: phosphorus ratio is between 1:1 and 1.5:1. • Observe for symptoms of internal parasite infestation such as rough hair coat, weakness, bottle jaw, weight loss, diarrhea, and anemia. • Provide clean, fresh water to the ewe and doe immediately after birth. • Provide a place for orphaned lambs and kids. • Evaluate your inventory of animals that will be available for sale to target specific holidays. 	<ul style="list-style-type: none"> • Check ewes and does frequently during lambing and kidding season. Expect the first lambs 140 to 155 days or first kids 146 to 155 days after turning the ram or buck with the breeding. Within an hour of the water breaking, the first lamb or kid should be delivered, and all of the lambs and kids should be delivered within 3 hours. • Place ewes and does with newborns in a lambing or kidding pen (jug) for at least 2 days after birth. • Try to graft onto other ewes and does those offspring not receiving enough milk. Ewes and does sometimes fail to claim their newborns because of poor physical condition or other circumstances. • Tag lambs and kids at birth. Record birth dates, tag numbers, and ID. • Castrate and tail dock your lambs at an early age (2 weeks or younger). Male kids can be castrated and disbudded at the same age. • Provide creep feed to your lambs. 	<ul style="list-style-type: none"> • Protect newborn lambs and kids from severe weather. Provide a place out of the cold and wind. • Be ready to provide birthing assistance, if necessary. • Assemble a survival kit. • Be sure that newborns nurse and get colostrum (first milk) during the first 2 to 4 hours after birth. • Apply iodine to newborn's naval as soon as possible after birth. • Vaccinate lambs and kids, whose dams had not been vaccinated before giving birth, with CD-T (or type D) at approximately 6 weeks of age and again 2 to 4 weeks later. If you are unsure of vaccination status, vaccinate for type D at 3 weeks followed by a booster. • Administer the tetanus antitoxin to lambs and kids at the time of docking, castration, or disbudding if the vaccination status of ewes and does is unknown. • Be aware that lambs and kids and lactating ewes and does are the most susceptible animals in the herd. Sheep and goats heavily infested with internal parasites will have pale mucous membranes due to blood loss or anemia. • Remember that extra-label drug use requires a prescription and valid veterinarian-patient-client relationship.

General	Management Activity	Health
<ul style="list-style-type: none"> • Continue monitoring forage and hay availability. Be alert to the changing body condition score of the flock and herd. Continue supplemental feeding until grass is plentiful. Check feet and legs to avoid lameness. • Watch for symptoms of parasite infestation such as rough hair coat, weakness, bottle jaw, weight loss, diarrhea, and anemia. • Consider feeding a lactating female based on whether she is nursing a single or twins, her age, and the time of year she gave birth. • Offer a free choice mineral mixture. A good calcium: phosphorus ratio is between 1:1 and 1.5:1. • Continue observing for symptoms of internal parasite infestation such as rough hair coat, weakness, bottle jaw, weight loss, diarrhea, and anemia. • Evaluate your inventory of animals that will be available for sale to target specific holidays. 	<ul style="list-style-type: none"> • Continue checking ewes and does frequently during lambing and kidding season. • Try to graft onto other ewes and does those offspring not receiving enough milk. Ewes and does sometimes fail to claim their newborns because of poor physical condition or other circumstances. • Begin evaluating the number of lambs and kids born per female exposed (lambing and kidding rate). Is there a natural concentration of births in any particular month or months? • Shear your sheep and trim their feet in April. Sheep must be dry at shearing. Keep the sheared wool clean; do not keep it in plastic feed sacks. • Plan to start weaning at 10 to 12 weeks of age. Remove the dam from the offspring, Milk production in the ewe and doe is very small by that time. • Find out the dates for the Wool Pool delivery location in Mississippi and Tennessee. 	<ul style="list-style-type: none"> • Protect newborn lambs and kids from severe weather. Provide a place out of the cold and wind. • Be ready to provide birthing assistance, if necessary. • Assemble a survival kit. • Be sure that newborns nurse and get colostrum (first milk) during the first 2 to 4 hours after birth. • Apply iodine to newborn's naval as soon after birth as possible. • Vaccinate lambs and kids, whose dams were not vaccinated before giving birth, with CD-T (or type D), at approximately 6 weeks of age and again 2 to 4 weeks later. If you are unsure of vaccination status, vaccinate for type D at 3 weeks followed by a booster. • Administer the tetanus antitoxin to lambs and kids at the time of docking, castration, or disbudding if the vaccination status of ewes and does is unknown. • Be aware that lambs and kids and lactating ewes and does are the most susceptible animals in the herd. Sheep and goats heavily infested with internal parasites will have pale mucous membranes due to blood loss or anemia. • Remember that extra-label drug use requires a prescription and valid veterinarian-patient-client relationship. • Observe for signs of external parasites and treat accordingly. External parasites such as lice, flies, mosquitoes, and ticks can also affect goats. These pests are prevalent during spring, summer, and fall.

General	Management Activity	Health
<ul style="list-style-type: none"> • Remember that between weaning and breeding the ewe and doe are in a dry period with nutrient requirements at their lowest. A maintenance diet is sufficient as long as weight lost during lactation is recovered before breeding. • Supplement, if necessary, replacement ewes, lambs, and doelings for them to weigh at least 60 to 75 percent of their estimated mature weight by breeding time. 	<ul style="list-style-type: none"> • Choose replacement young ewe lambs and doelings in early May and June. Choose with emphasis on multiple births and early-born lambs and kids. • Cull and sell nonproductive ewes and does that failed to give birth or failed to wean a lamb or a kid. Cull ewes and does that do not lamb or kid by 2 years of age. Also cull and sell those with bad mouths, bad feet and legs, or bad teats or udders. • Turn out bucks with does. Recommended buck to doe ratio is 1 buck per 20 to 25 does. Be sure young bucks avoid excessive weight loss. In some instances, limit the number of females to a lower ratio. 	<ul style="list-style-type: none"> • Remember that extra-label drug use requires a prescription and valid veterinarian-patient-client relationship. • Observe for symptoms of parasite infestation such as rough hair coat, weakness, bottle jaw, weight loss, diarrhea, and anemia. • Observe for signs of external parasites and treat accordingly. External parasites such as lice, flies, mosquitoes, and ticks can also affect goats. These pests are prevalent in spring, summer, and fall. • Evaluate rams and bucks for breeding soundness 30 to 60 days before beginning of the breeding season. Do a physical examination, reproductive tract examination, and semen evaluation.

General	Management Activity	Health
<ul style="list-style-type: none"> • Breeding season begins for some producers. • Well-fed animals are more resistant to diseases and parasites. Supplementing a ewe or a doe so she is gaining weight just before breeding is known as flushing. This practice may increase lambing and kidding percentage. Start about 2 to 3 weeks before rams and bucks are turned in. 	<ul style="list-style-type: none"> • Cull and sell nonproductive ewes and does that failed to give birth or failed to wean a lamb or a kid. Cull ewes and does that do not lamb or kid by 2 years of age. Also cull and sell those with bad mouths, bad feet and legs, or bad teats or udders. • Turn out bucks with does by early July. Does bred in July are due to kid by the end of November. Recommended buck to doe ratio is 1 buck per 20 to 25 does. Young bucks should avoid excessive weight loss, and, in some instances, limit the number of females to a lower ratio. • Turn out rams with ewes in early August when most ewes start coming in heat. Ewes bred in August are due to lamb in January. Recommended buck to doe ratio is 1 buck per 20 to 25 does. • Use a marking harness or rub colored grease on the ram's chest to detect breeding activity. If possible, change colors every 18 days. Record breeding dates to plan your lambing activity. Ewes bred in August are due in January. • Be aware that the presence and odor of the ram or buck, when introduced in the herd, will stimulate the ewe or doe to go into heat. 	<ul style="list-style-type: none"> • Remember that extra-label drug use requires a prescription and a valid veterinarian-patient-client relationship. • Observe for signs of external parasites and treat accordingly. External parasites such as lice, flies, mosquitoes, and ticks can also affect goats. These pests are prevalent during spring, summer, and fall. • Check parasite load of ewes and does, and collect fecal samples on those showing signs of parasitism. • Evaluate rams and bucks for breeding soundness 30 to 60 days before the beginning of the breeding season. Do a physical examination, reproductive tract examination, and semen evaluation.

General	Management Activity	Health
<ul style="list-style-type: none"> • Observe for any female returning to heat as the breeding season continues. This could be an indication the ram or buck is not settling them. • Always feed properly. Well-fed animals are more resistant to diseases and parasites. • Record breeding dates. 	<ul style="list-style-type: none"> • Cull and sell nonproductive ewes and does that failed to give birth or failed to wean a lamb or a kid. Cull ewes and does that do not lamb or kid by 2 years of age. Also cull those with bad mouths, bad feet and legs, or bad teats or udders. • Ewes and does bred in October will lamb and kid in late February and March. • Remove rams or bucks in October if you want a shorter breeding season. 	<ul style="list-style-type: none"> • Remember that extra-label drug use requires a prescription and a valid veterinarian-patient-client relationship. • Observe for symptoms of parasite infestation such as rough hair coat, weakness, bottle jaw, weight loss, diarrhea, and anemia. • Observe for signs of external parasites and treat accordingly. External parasites such as lice, flies, mosquitoes, and ticks can also affect goats. These pests are prevalent during spring, summer, and fall. • Evaluate rams and bucks for breeding soundness 30 to 60 days before the beginning of the breeding season. Include a physical examination, reproductive tract examination, and semen evaluation.

General	Management Activity	Health
<ul style="list-style-type: none"> • Monitor forage and hay availability. Be alert to the changing nutritional needs of the flock and herd during gestation. • Provide supplemental feeding in the third trimester, if needed. Nutrition is critical in late gestation (last 50 days) because 70 percent of fetal growth occurs during this time. Protein and energy requirements increase. • Provide clean, fresh water to ewes and does immediately after birth. • Provide a place for orphaned lambs and kids. 	<ul style="list-style-type: none"> • Clean the barn in November in preparation for lambing and kidding. • Provide a shelter for pregnant females in case of bad weather. • Check your breeding records in December and sort those early-bred females a week or two before their due dates. Does that conceived during July will give birth in December. Ewes that conceived during August will give birth in January. • Check ewes and does frequently during lambing and kidding season. Expect the first lambs or kids 148 days after turning the ram or buck with the breeding. Within an hour of the water breaking, the first lamb or kid should be delivered, and all of the lambs and kids should be delivered within 3 hours. <ul style="list-style-type: none"> • Place ewes and does with newborns in a lambing or kidding pen (jug) for at least 2 days after giving birth. • Tag lambs and kids at birth. Record birth dates, tag numbers, and ID. • Remember that breeding season should end by December. • Cull any ewe or doe that did not breed by the end of the breeding season. 	<ul style="list-style-type: none"> • Vaccinate ewes and does for enterotoxemia type C and D and tetanus (CD-T) approximately 30 days before parturition so the lambs and kids will receive passive immunity through the colostrum (first milk). • Remember that extra-label drug use requires a prescription and a valid veterinarian-patient-client relationship. • Observe for signs of lice and treat if necessary.

Normal Physiological Values and Reproductive Parameters of Sheep and Goats

	Sheep	Goat
Rectal temperature	102.8 degrees F (102.5 to 103.2)	101.7 degrees F (101.7 to 104.5)
Heart rate	75 beats/minute (60 to 120)	Beats/minute (70 to 80)
Respiration rate	20 breaths/minute	12 to 15 breaths/minute
Reproductive characteristics of females		
Nature of cycles	Polyestrous (seasonal anestrus)	Polyestrous (seasonal anestrus)
Age at puberty	8 months (6 to 9)	8 to 10 months
Breeding weight	60 to 75% of adult weight	60 to 75% of adult weight
Estrous cycle		
Length	17 days (14 to 20)	21 days (18 to 22)
Estrus	24 to 36 hours	24 to 48 hours
Signs	Relatively inconspicuous	Bleats frequently, wags tail
Ovulation	24 to 27 hours from onset of standing heat	24 to 36 hours from onset of standing heat
Type	Spontaneous	Spontaneous
Time from onset (hours)	24 to 27 hours	24 to 36 hours
Rate number per cycle	1 to 3	2 to 3
Gestation length	140 to 155 days	146 to 155 days
Breeding season	August–January	August–January
Seasonal anestrus	February–July	February–July
Buck effect on estrous	Positive	Positive
Optimum time to service	18 to 24 hours after onset of heat	Toward the end of estrus

	Sheep	Goat
Reproductive characteristics of males		
Age of puberty	4 to 6 months	4 to 8 months
Breeding weight	40 to 60 percent of adult weight	40 to 60 percent of adult weight
Breeding age	8 to 10 months	8 to 10 months
Breeding season	All year	All year
Breeding ratio	1 ram: 20 to 30 ewes	1 buck : 20 to 25 does
Semen		
Volume(ml)	0.8 to 1.2	0.1 to 1.5
Concentration(billion/ml)	1.5 to 4	2 to 6

Estimating the Age of a Sheep or Goat

The approximate age of sheep or goats can be determined by the teeth, as illustrated below. At birth, lambs and kids have eight milk teeth, or temporary incisors, arranged in four pairs in the lower jaw. The central pair of temporary incisor teeth is shed and replaced by the permanent teeth at approximately 1 year of age. At 2 years, the second pair of milk teeth is replaced by a pair of permanent incisors. At 3 and 4 years, the third and fourth pairs of permanent teeth appear, respectively. At 4 years of age, the sheep or goat has a "full mouth." The amount of wear on the permanent teeth is an indication of the approximate age of animals older than 5 years. When a ewe or doe loses some of her incisor teeth, she is called a "broken mouth."



Space Requirements for Sheep and Goats

Breeding ewes and does	Bred ewes and does	Lactating ewes and does
Lot space		
All dirt	20 square feet	25 square feet
Housing		
Open sheds	8 square feet	12 square feet
Confined sheds (solid floors)	12 to 16 square feet	16 to 20 square feet
Confined sheds (slotted floors)	8 square feet	10 to 12 square feet
Confined sheds (lamb creep space)		2 square feet
Feeders for concentrates		
Hand-feeding (fenceline feeders)	16 linear inches	16 linear inches
Self-feeders (concentrates including pellets)	Not recommended	6 linear inches
Self-feeders (complete rations not pellets)	Not recommended	12 to 14 linear inches
Feeders for roughages		
Hand-fed	16 linear inches	16 linear inches
Self-fed	8 to 12 linear inches	8 to 12 linear inches
Watering equipment		
Open tank	1 foot per 15 head	1 foot per 15 head

Automatic bowl	1 bowl per 40 head	1 bowl per 40 head
Feeder lambs and kids		
Lot space	Space/head	
All dirt	15 to 20 square feet	
Dirt and paving	16 square feet	
All paving	16 square feet	
Housing		
Open sheds	6 square feet	
Confined sheds (solid floors)	8 to 10 square feet	
Confined sheds (slotted floors)	4 to 6 square feet	
Confined sheds (lamb creep space)	2 square feet	
Feeders for concentrates		
Hand-feeding (fenceline feeders)	10 to 12 linear inches	
Self-feeders (concentrates including pellets)	1 to 2 linear inches	
Self-feeders (complete rations not pellets)	4 linear inches	
Feeders for roughages		
Hand-fed (fence line feeders)	10 to 12 linear inches	
Self-fed	4 linear inches	
Watering equipment		
Open tank	1 foot per 25 heads	
Automatic bowl	1 bowl per 50 heads	

Adapted from *Sheep Pocket Guide AS-989*, North Dakota Extension Service, Fargo, North Dakota

Equipment for Lambing and Kidding

- Two clean buckets
- Mild soap (for cleaning the genital area of ewe or doe)
- Disinfectant and commercial obstetrical lubricant
- Vinyl gloves and KY Gel, Septi-Lube, or mineral oil
- Fingernail clippers and emery board, if needed to make sure your fingernails are short
- Lamb puller, obstetrical leg snare, or obstetrical chain
- Paper towels, old towels, and rags
- Bottles, nipples, and stomach tube in case lamb needs help getting colostrum
- Thermometer (normal temperature for sheep is 102.8 degrees F and for goats is 101.7 degrees F)
- Suturing material or dental floss to tie off umbilical cord
- Scissors for cutting umbilical cord
- Iodine (7 percent) solution for saturating and disinfecting umbilical cord

Minimum Recommended Scrotal Circumference by Age in Rams and Bucks

Age	Minimum Circumference
5 to 6 months	29 centimeters
6 to 8 months	30 centimeters
8 to 10 months	31 centimeters
10 to 12 months	32 centimeters
12 to 18 months	33 centimeters
18+ months	34 centimeters

Normal Semen Quality in Mature Rams and Bucks

Semen	Ram	Buck
Volume (ml)	1 (0.8 to 1.2)	0.8 (0.5 to 1.0)
Sperm concentration (billion/ml)	2.5 (1 to 6)	2.4 (2 to 5)
Motile sperm (%)	75 (60 to 80)	80 (70 to 90)
Morphological normal sperm (%)	90 (80 to 95)	90 (75 to 95)

Ratio of Ewes per Ram or Does per Buck

Age of rams or bucks	Ratio of ewes per ram or does per buck
Ram lambs and buck kids (approximately 8 to 10 months of age)	15 to 30 ewes or does per 1 ram lamb or buck kid
Yearlings (approximately 12 to 16 months of age)	25 to 50 ewes or does per 1 yearling ram or yearling buck
Mature rams and bucks	100 ewes or does per 2 to 3 rams or bucks

Gestation Table

Aug Jan	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	Sep
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Sep Feb	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	-	-	-	Oct
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	-	-	-	
Oct Mar	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	Nov
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Nov Apr	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	-	Dec
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	-	
Dec May	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	Jan
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Jan Jun	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	-	Feb
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	-	
Feb Jul	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	Mar
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Mar Aug	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	Apr
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Apr Sep	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	-	May
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	-	
May Oct	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	Jun
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Jun Nov	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	-	Jul
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	-	
Jul Dec	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	Aug
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

*Find breeding date in upper line; look below to find lambing or kidding date. Based on a 148-day gestation period.

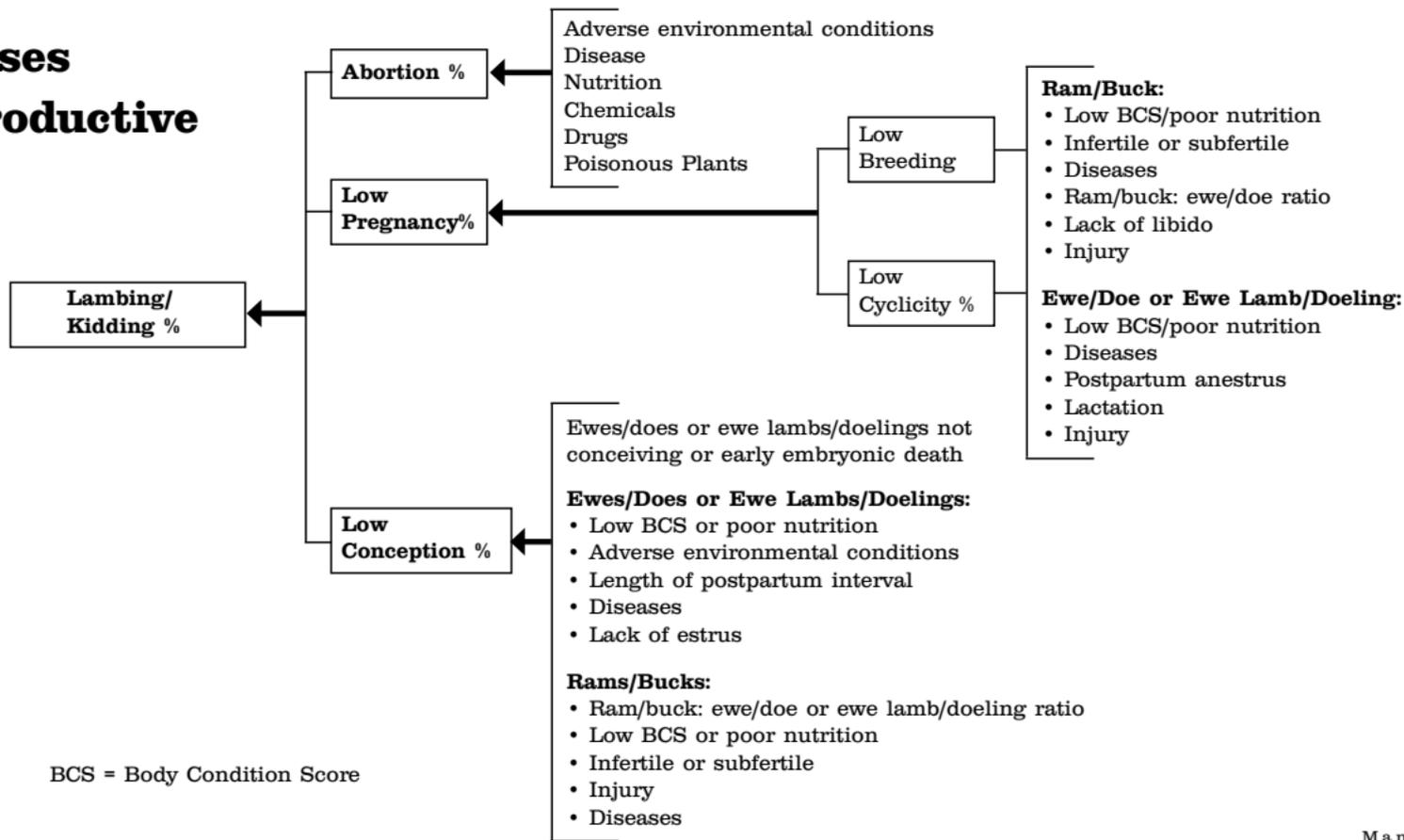
Source: *Sheep Pocket Guide* AS-989, North Dakota Extension Service, Fargo, North Dakota.

Stages of Lambing and Kidding, Related Events, and Duration

Stage	Events	Ewe lamb or doeling duration	Ewe or doe duration
Preparatory (dilation of cervix)	Lamb or kid rotates to upright position. Uterine contractions begin. Female is very restless.	6 to 12 hours	4 to 8 hours
Delivery (expulsion of fetus)	Lamb or kid enters birth canal. Water sac appears. Water sac ruptures. Front feet and head protrude first. Lamb or kid is delivered.	1 to 4 hours	Less than 1 hour
Cleaning (expulsion of placenta)	Ewe or doe straining decreases. Button attachment between uterus and placenta relaxes and separates. Placenta is expelled.	1 to 8 hours	1 to 8 hours

Source: Adapted from G.H. and D.B. Hudson. 1988. *Assisting The Beef Cow At Calving Time*. University of Nebraska—Lincoln. Agricultural Publication G81-539A.

Possible Causes of Poor Reproductive Performance



BCS = Body Condition Score

Rearing Orphan and Rejected Newborn Lambs and Kids

Sheep and goat producers will often have extra or orphaned lambs or kids at lambing or kidding time. These lambs and kids may be the result of abandonment, rejection, insufficient milk, or the death of the ewe or doe. Options to consider are grafting the lamb or kid to another ewe or doe or artificial rearing with a milk replacer.

Within 2 or 3 hours after birth, follow these guidelines:

- Be patient.
- Ensure that a newborn lamb or kid receives colostrum.
- Be sure a newborn lamb or kid receives 3 ounces of colostrum per pound of body weight during the first 18 hours of life. Give this in four equal doses—at birth, at 6 hours, at 12 hours, and at 18 hours.
- Use colostrum from a cow if milk from a ewe or doe is not available. Do not dilute with water or warm too quickly if colostrum is frozen. The best method for thawing is to let frozen colostrum reach room temperature.
- Do not use high heat. High heat destroys the antibodies, which is the reason for feeding colostrum to newborn lambs or kids. Avoid thawing colostrum in microwave ovens.
- Do not use special "home brew" recipes for colostrum. They are not effective because they do not contain antibodies.
- Just before grafting, rub fetal fluids and membranes from the ewe or doe on the lamb or kid to be grafted.
- Graft extra lambs or kids to another ewe or doe as soon as possible after birth; colostrum intake in the first 24 hours is important. A number of grafting methods are available.
- Place a piece of cloth over a ewe's or doe's own lamb or kid for 2 to 3 days. Then remove it, turn it inside out, and place it on the lamb or kid to be grafted.
- In all cases, place the ewe's or doe's head in a stanchion so she can eat and drink but not turn to smell and fight the lambs or kids.
- Put the newborn lambs or kids on milk replacer or put them on goats, if available, when attempts to graft lambs fail.

Biosecurity

- Prevent and control transmission of infectious diseases and pathogens.
- Remember that biosecurity is related to food safety.
- Reduce occurrence and treatment of infectious diseases.
- Control diseases with possible human health implications.
- Control infectious agents of concern to human health.

Implementation of Biosecurity

- Isolate all purchased animals for 2 weeks or, preferably, 30 days.
- Isolate all animals returning from shows the same amount of time as you would isolate purchased animals.
- Be aware that contact with other animals or livestock equipment can expose your animals to disease.
- Make sure livestock trailers are cleaned, sanitized, and sterilized.
- Avoid sharing grooming, feeding, and watering equipment.
- Discourage fair visitors from petting or feeding the animals.
- Practice good personal hygiene.
- Be cautious with visitors to your farm.

Forages

Alabama sheep and goat production generally relies heavily on a good forage program. In addition to grasses, both sheep and goats will utilize browse species to meet their nutritional needs. Goats do extremely well in situations where they have both pastures and woodlands available for their grazing needs. Table 1 shows the prevalent forages in Alabama and the attributes associated with them:

Table 1. Common Forages in Alabama

Forage	Carrying Capacity	Animal Performance	Production/Acre	Pasture Management
Bahiagrass	Medium	Low	Low	Low
Bermudagrass	Medium	Low	Low	Low
Dallisgrass	Low	Medium	Low	Medium
Millets	High	Medium	High	High
Winter annuals	High	High	High	Medium
Tall fescue	Medium	Medium/High	Medium	Medium

Energy is generally the first limiting nutrient under most practical conditions for sheep and goat nutrition in Alabama. In this pocket guide, energy will be discussed as TDN (total digestible nutrients). In general, warm-season, perennial grass hays such as bermudagrass and bahiagrass contain about 50 to 54 percent TDN, whereas most of the cereal grains such as corn contain 80 to 90 percent TDN. Most forages in the green, vegetative state are about 62 to 70 percent TDN while stemmy, poor quality hay is less than 50 percent TDN. A 150-pound ewe requires a diet containing 55 percent TDN for maintenance, 59 percent for late gestation, and 65 percent for the first 6 weeks of lactation. A dry, nonpregnant ewe could use low-quality forage, but the pregnant or lactating ewe needs a diet of lush vegetative forage. See table 2 for the energy and protein requirements for various classes of goats.

Table 2. Daily nutrient requirements for goats

Class of goat	Weight, lbs	Daily intake, lb	TDN, lb	CP, lb
Early pregnant doe	50	1.25	0.64	.091
	70	1.75	0.83	.117
	90	2.25	1.00	.141
	110	2.75	1.17	.164
	130	3.25	1.32	.186
Late pregnant doe	50	1.25	0.80	.159
	70	1.75	1.09	.205
	90	2.25	1.40	.248
	110	2.75	1.72	.288
	130	3.25	2.03	.327
Lactating doe	50	1.75	1.19	.219
	70	2.45	1.67	.306
	90	3.15	2.14	.394
	110	3.85	2.62	.481
	130	4.55	3.10	.569

Growing kid, 0.2 lb/day	30	0.9	0.59	.119
	40	1.2	0.70	.134
	50	1.5	0.79	.148
Growing kid, 0.3 lb/day	30	0.9	0.66	.147
	40	1.2	0.77	.162
	50	1.5	0.86	.176
Growing kid, 0.4 lb/day	30	0.9	0.74	.176
	40	1.2	0.85	.191
	50	1.5	0.94	.205

When feeding hay to a goat herd or sheep flock, evaluate its quality to determine whether a supplement of energy or protein is required. For mature females that are not in late pregnancy or nursing offspring, the hay will probably be adequate to meet nutritional needs. Ewes or nannies in late pregnancy will likely require supplemental energy, and lactating females will probably need both energy and protein.

Feeding hay to sheep and goats results in a tremendous amount of waste. The most wasteful situation is one that involves feeding free-choice round bales without any kind

of hay rack or panel enclosing the bale. Goats will climb on a bale and both sheep and goats will continually pull hay onto the ground where they will soil and thus waste it. If neither availability nor labor is a problem, use small, square bales to ration daily amounts spread over several feeders so all animals can have access to the hay. The better the quality of the hay, the less that will be wasted.

An extremely effective way to supplement sheep and goats grazing in the Southeast is to limit graze pastures containing cool-season, annual forages that are extremely high in energy and protein content. Ideally, ryegrass, rye, wheat, oats, or some combination of these forages should be planted on a prepared seedbed in September and then used after January as a high-quality supplement to the hay. When used as a supplement, about 2 hours of grazing time per day works well. The advantage of this type of system to one in which dry feed is put out as a supplement is that the dominant

animals do not control the submissive animals as they would when eating from a feed trough. The main disadvantage is that the growth of the forage is weather dependent.

A variety of choices is available for energy supplementation. The most common choice is cereal grains, with corn being the most common of these. Several other feedstuffs are available for use as an energy supplement for ruminants consuming a forage-based diet. Oats, grain sorghum, soybean hulls, corn gluten feed, and wheat middlings all make excellent energy supplements for sheep and goats. Another source of energy supplementation is fat. In general, sheep and goat diets should not exceed 8 percent total fat. In Alabama, whole cottonseed is readily available as an excellent source of supplemental fat. Supplement sheep and goats with no more than 20 percent of their daily intake as whole cottonseed, assuming that the remainder of the diet contains no fat.

Protein content varies widely among the available feedstuffs for sheep and goats. Warm-season, perennial grass hay samples can range from less than 6 percent protein to more than 12 percent protein, whereas legumes in the vegetative state may contain as much as 28 percent protein. Similar

to energy requirements, protein requirements vary with the animal's stage of production. For maintenance, a 150-pound ewe requires 8 to 9 percent protein and a 110-pound doe requires 7 to 8 percent protein. During lactation, both the doe and ewe require in excess of 13.5 percent protein depending on the number of offspring suckling. Whenever grass hay is fed, protein inadequacy is a concern, especially for growing or lactating animals.

Typical protein supplements include the oilseed meals (cottonseed meal, soybean meal), commercially blended supplements containing both natural protein and nonprotein nitrogen (range cubes or pellets or molasses-based products), and various by-products (whole cottonseed, corn gluten feed). Feed protein to meet but not greatly exceed requirements because it is an expensive nutrient to provide.

Soybean meal and cottonseed meal are excellent sources of natural protein for sheep and goats. Both contain between 40 and 45 percent crude protein. Soybean meal is slightly more palatable than cottonseed meal, but both are readily consumed by sheep and goats. In the southeastern United States, cottonseed meal is generally cheaper than soybean meal.

Numerous commercially produced feed supplements are available. It is very difficult to determine the energy content of these feeds because labeling laws do not require that TDN content be part of the label. Crude protein as well as fiber and fat contents must be indicated on labels. As you make selections for feeding goats, it is generally better to utilize feeds that contain natural protein versus nonprotein nitrogen or urea. Discuss the feed in question with a representative of the producing company to get some indication of how much energy the feed contains.

Attempting to supplement any sizable group of sheep or goats with a daily allotment of feed is a major endeavor.

Invariably, the submissive animals will be underfed and the dominant individuals will be overfed. Always provide as much feeder space as practically possible. Another potential strategy to overcome problems with submissive animals receiving inadequate quantities is to feed twice as much feed every other day. For example, if you are supplementing with 1 pound of feed per day then feeding 2 pounds every other day would give longer access to the feed and possibly allow the submissive animals to consume more. As already mentioned, the most effective way is to allow the nutrition to come from grazing high-quality forages.

Table 3. Nutrient Composition of Various Feedstuffs for Sheep and Goats

Feedstuff	TDN, %	CP, %	Calcium, %	Phosphorus, %
Bahiagrass, fresh	55	12.5	.45	.31
Bahiagrass, hay	51	9.4	.45	.22
Bermudagrass, fresh	59	12.8	.50	.26
Bermudagrass, hay	54	12.2	.42	.21
Citrus pulp	81	6.7	1.88	.13
Clovers, fresh	70	22	1.37	.30
Clovers, hay	63	20	1.35	.27
Corn grain	88	10	.02	.33
Corn silage	70	8.2	.26	.21
Corn gluten feed	83	22	.35	.84
Cottonseed hulls	45	4.2	.14	.08
Cottonseed meal	80	44	.20	1.17
Cottonseed	90	24	.15	.73
Fescue, fresh	64	11.5	.51	.46
Fescue, hay	54	10.5	.30	.27
Oats	78	13.2	.09	.38
Oat hay	60	10.0	.32	.26
Peanut hay	55	13.5	1.12	.14
Peanut hulls	22	9.0	.27	.07
Ryegrass, fresh	70	17	.66	.40
Ryegrass, hay	58	14	.56	.35
Soybean hulls	85	11.5	.53	.19
Soybean meal	85	48	.26	.62

Table 4. Weights for Common Feedstuffs

Feed	Pounds/ cu. ft.	Pounds/quart
Corn	45	1.7
Corn gluten feed	33	1.3
Cottonseed meal	38	1.5
Oats	26	1.0
Soybean hulls, loose	28	1.1
Soybean hulls, pelleted	40	1.6
Whole cottonseed	25	1.0

A salt block or loose salt is just that, a block or loose mixture of NaCl, usually 98 percent with added trace minerals. The adequacy of certain minerals in the block or loose salt mixture is generally not specified. Most adult sheep and goats will consume about 10 to 30 grams per day or about .66 to 2 pounds per month of the mineral mix. Loose salt is a better choice than blocks because consumption is more uniform and blocks can cause an occasional broken tooth. A 1:1 mixture of dicalcium phosphate and trace mineral salt, made available at all times, provides an effective mineral program for most sheep and goats in Alabama.

Table 5. Mineral Requirements of Sheep and Goats

Mineral	Sheep	Goats
Sodium, %	.09 to .18	.09 to .20
Calcium, %	.20 to .82	.20 to .90
Phosphorus, %	.16 to .38	.14 to .40
Magnesium, %	.12 to .18	.12 to .18
Potassium, %	.50 to .80	.50 to .80
Sulfur, %	.14 to .26	.16 to .32
Iodine, ppm	.10 to .80	.60
Iron, ppm	30 to 50	more than 30
Copper, ppm	7 to 11	10
Molybdenum, ppm	.10 to .50	.10
Cobalt, ppm	.10 to .20	.10
Manganese, ppm	20 to 40	20 to 60
Zinc, ppm	20 to 33	45 to 50
Selenium, ppm	.10 to .20	.10 to .30

Flushing Ewes and Does

Flushing is the practice of supplementing breeding-age females with additional energy just before the breeding season. The female's age and body condition at the time of flushing will greatly affect the response to flushing. Very young and very old females as well as those in poor body condition show the biggest response to flushing. A good response would be defined as a 10 to 20 percent increase in lambing or kidding rate. Flushing can be accomplished by providing lush pasture or by supplementing with 1/3 to 1 pound of high-energy feed, such as corn, per day. It is best to begin about 2 weeks before breeding and continue for an additional 2 to 3 weeks into the breeding season.

Feeding Lambs or Kids

Raising orphans on bottles containing milk replacers is quite expensive and labor intensive. Attempts should be made to graft the orphan onto a foster dam. Ideally, orphans need to consume small quantities of milk numerous times per day; however, this is generally not possible for many sheep and goat producers. The orphans are usually fed two to three times per day.

The newborn needs to receive 10 to 20 percent of its body weight in colostrum, preferably within 3 to 12 hours of birth. After the initial colostrum is fed, the orphan should be trained to a bottle with the next feeding about 5 hours later. Bottle feeding should consist of feeding 10 to 20 percent of the weight in the form of good-quality milk replacer divided into four equal daily feedings.

The most effective way to get young goats off to a good nutritional start is to begin with creep feeding. Lambs and kids will only nibble at the creep feed until they are 3 to 4 weeks old. Nevertheless, the creep feed should be offered at an earlier age to get them used to the situation. The creep feeder should be placed in a dry, well-lit area to which the kids or lambs will naturally go. Make sure it is close enough to the dams to maintain visual contact. A creep feed should contain 12 to 14 percent crude protein and be extremely palatable. When the lambs and kids are weaned, they will need to continue to be fed a high-quality diet to ensure an adequate growth rate. Tables 6 and 7 show example diets for creep feeding and growing young animals.

Table 6. Two Sample Creep Feeds for Goat Kids

Ingredient	Sample 1	Sample 2
Cracked corn	50%	50%
Soybean hulls	30%	—
Oats	—	30%
Soybean meal	15%	15%
Molasses	5%	5%

Table 7. Two Sample Diets for Growing Young Kids

Ingredient	Sample 1	Sample 2
Ground hay	25%	—
Cottonseed hulls	—	25%
Cracked corn	44%	41%
Soybean hulls	15%	15%
Soybean meal	10%	13%
Molasses	5%	5%
Trace mineral salt	0.5%	0.5%
Dicalcium phosphate	0.5%	0.5%

Feed Additives

Very few feed additives for sheep or goats have been approved in the United States. Only two antibiotics, chlortetracycline and oxytetracycline, have been approved. They have not been approved as feed additives for goats. Two ionophores, lasalocid and monensin, are approved as feed additives for both sheep and goats. They are approved as coccidiostats for confinement feeding but neither are approved for use in animals whose milk will be used for human consumption. Decoquinatate is another compound approved as a coccidiostat for use in sheep and goat diets.

Body Condition Scores

A useful system to help assess overall nutritional status of a group of sheep or goats is to assign a body condition score to the animals. Body condition scores range from 1 to 5 with 1 being extremely thin and 5 being extremely fat. Scores are assessed by palpating along the backbone. Because most healthy sheep and goats receive a score of 2, 3, or 4, half-scores are often used. Ideally, the majority of the animals should have a score of 2.5 to 3.5 at breeding and parturition, the two most important nutritional demands of the year.

If a group is scored 45 days before parturition and the average condition score is less than 2.5, the energy intake should be increased so the animals will reach desired body condition by parturition. Handling and condition scoring every animal in a group result in better management. If a few individuals are very thin, they may need to be separated and fed separately. Figures 1 through 5 give basic descriptions of how to assign body condition scores to sheep and goats.

Figure 1. Body Condition Score 1 for Sheep and Goats

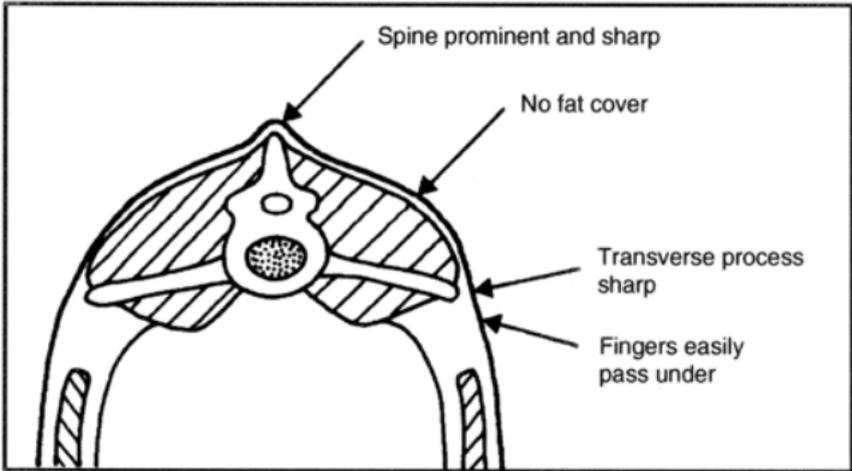
	Score	Spinous process	Rib cage	Loin eye muscle
 <p>Spine prominent and sharp</p> <p>No fat cover</p> <p>Transverse process sharp</p> <p>Fingers easily pass under</p>	1	Very visible, prominent, and sharp. Easy to feel.	Easy to feel and see and easy to press between and under.	Loin eye muscle concave or shallow with no fat cover.

Figure 2. Body Condition Score 2 for Sheep and Goats

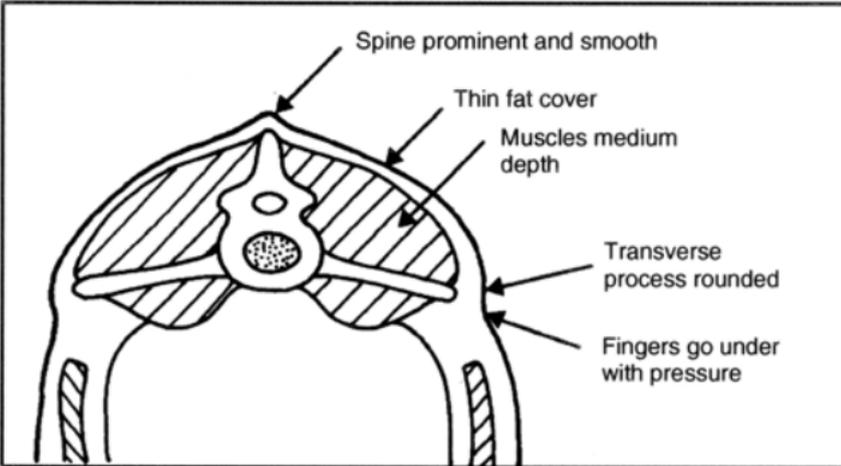
 <p>Spine prominent and smooth</p> <p>Thin fat cover</p> <p>Muscles medium depth</p> <p>Transverse process rounded</p> <p>Fingers go under with pressure</p>	<p>Score</p> <p>2</p>	<p>Spinous process</p> <p>Still easy to feel but somewhat smooth.</p>	<p>Rib cage</p> <p>Smooth, somewhat rounded, can feel under the ribs with little pressure.</p>	<p>Loin eye muscle</p> <p>Little fat cover, medium depth.</p>
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Figure 3. Body Condition Score 3 for Sheep and Goats

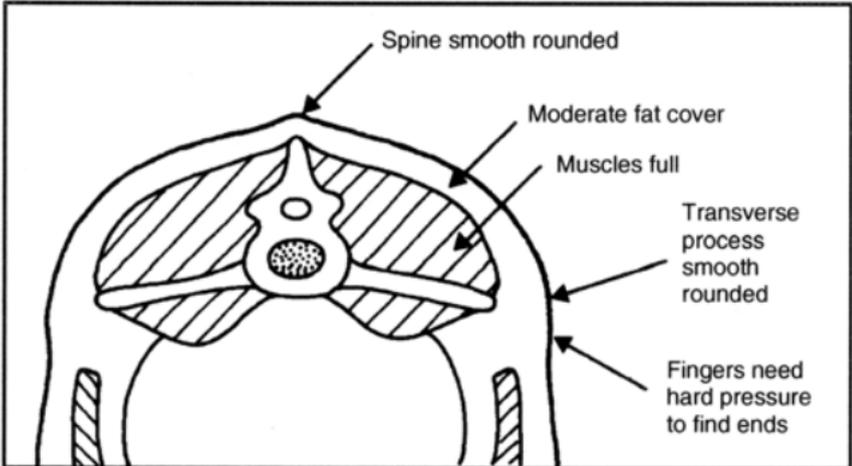
	3	Score	Spinous process Smooth and rounded.	Rib cage Ends of ribs are smooth and well covered, firm pressure necessary to feel over the ends.	Loin eye muscle Is full and rounded with some fat cover.
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Figure 4. Body Condition Score 4 for Sheep and Goats

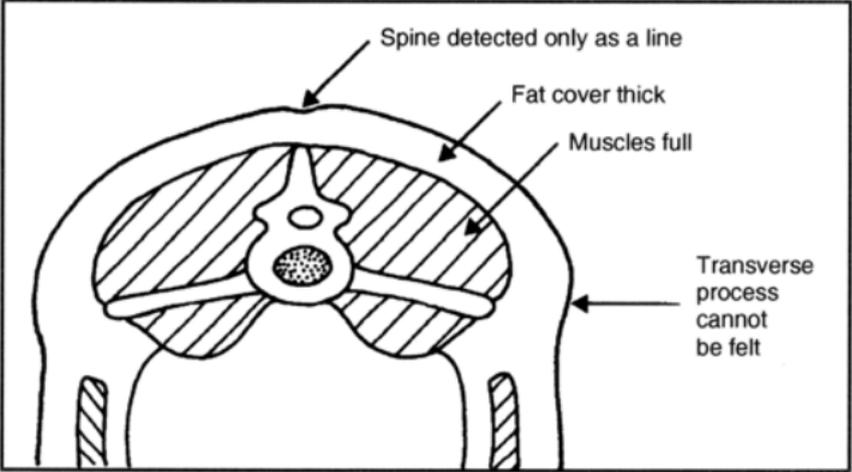
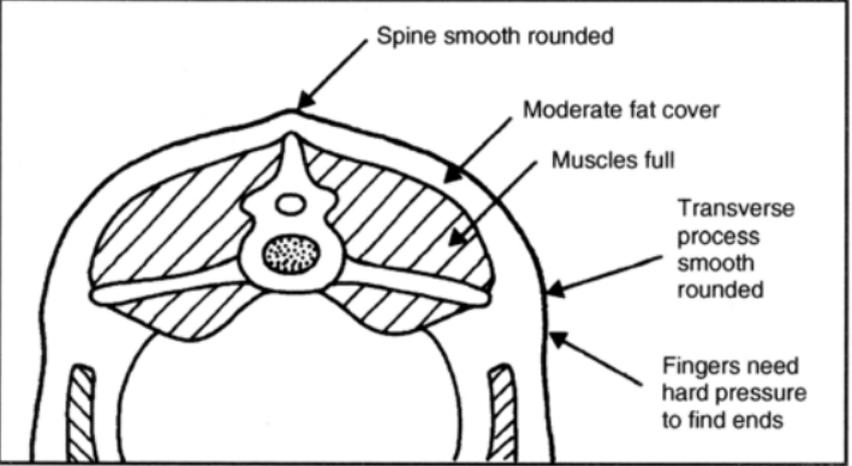
	<p>Score</p> <p>4</p>	<p>Spinous process</p> <p>Detectable only with firm pressure.</p>	<p>Rib cage</p> <p>Individual ribs can be felt with firm pressure, even feel.</p>	<p>Loin eye muscle</p> <p>Full and rounded with moderate amount of fat cover.</p>
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Figure 5. Body Condition Score 5 for Sheep and Goats

 <p>Spine smooth rounded</p> <p>Moderate fat cover</p> <p>Muscles full</p> <p>Transverse process smooth rounded</p> <p>Fingers need hard pressure to find ends</p>	5	Spinous process Cannot be felt nor detected even with firm pressure. There is a dimple over the spine.	Rib cage Cannot be felt even with firm pressure.	Loin eye muscle Full and rounded with a thick cover of fat. It cannot be felt.
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Figures 1-5 reprinted with permission of the Oregon State University Extension Service from EC 1433, Body Condition Scoring of Sheep (Oregon State University, Corvallis).

Selection of Genetics for Meat Production in Goats and Sheep

Introduction

Selection of optimum genetics for meat production in goats and sheep can contribute to production, efficiency, and profit. Most producers select animals for breeding to produce their next crop of kids or lambs based on the phenotype or visual appearance. The phenotype is a reflection of the genetics plus the environment in which an animal is raised. Because the environment has a major effect on phenotype, the assumption that better looking animals are also genetically the best may or may not be true. Producers should select superior genotype to produce the next set of offspring. The question is what is best and how can we pick the best genetics?

Producers can identify the best genetics by ranking the individuals based on their estimated breeding values. The true breeding value or genetic merit of a particular trait cannot be measured directly; it must be estimated through evaluation of performance information based on the heritability of that trait,

after accounting for environmental differences. Heritability is an estimate of the proportion of genes that control a particular trait that parents would pass to the offspring. Records of all available pedigree information on animals—the gene flow—are used to predict the estimated breeding values of individual animals. Therefore, the record of performance on individual animals is the best tool to make selection and culling decisions to improve your genetics. The heritability estimate of a trait affects the transmitting ability of genes in predicting estimated breeding value of animals for that trait. The genetic progress that you would expect in your herd or flock also depends on how many traits you are considering in your selection program. If you select for just one trait, such as average daily gain, you would make faster progress than if you select for a combination of two or more traits. Typically, serious producers put emphasis on a few traits, such as growth, conformation, or reproduction, to produce

well-rounded animals for better market value. The limited performance testing and absence of genetic evaluation programs make selections based on estimated breeding values unfeasible.

For small producers, a simple and quick alternative is to rank individual animals for a particular trait based on their performance data within a contemporary or management group and minimize environmental effects (Appendix A). For example, kids or lambs raised as a group in the same year or season, with the same sex, and in a similar environment can be considered a contemporary or management group. The primary purpose of recording animal performance is to determine which animals are phenotypically and genetically superior in a population. Individual performance records themselves have a limited value, but when all animals in a herd or flock or across many herds or flocks are recorded along with their pedigree information, the comparison of records becomes a valuable tool for evaluating an individual animal's merit for production and genetic superiority.

Tools for Genetic Improvement

The tools in tables one through seven can help producers achieve success in genetic improvement and profitability in goat and sheep meat production.

Table 1. Tools for Selecting Best Genetics

- * Unique identification of all animals in the herd
- * A performance and pedigree record keeping system
- * Collection of data on breeding, reproduction, growth, carcass quality, etc.
- * Equitable comparison of animals (Appendix A)
- * Adjustment factors for environmental differences to adjust individual performance
- * Utilizing the complete pedigree (parents, grandparents, great-grandparents, siblings, etc.) or gene flow information for computing genetic merit
- * Participation in regional or national genetic evaluation programs

Table 2. Procedures Performed by Successful Producers

- * Evaluate each doe's or ewe's production and identify top-producing does and ewes.
- * Assess the performance of those bucks and rams used as sires in your herd or flock.
- * Evaluate kids and lambs for growth and weight on the basis of their weights.
- * Know the differences in feed efficiency in a group of kids or lambs.
- * Check carcass quality to determine if you are producing desirable meat kids or lambs.
- * Participate in any within- or across-herd genetic evaluation programs.
- * Keep track of herd health—parasite control, vaccination, etc.
- * Evaluate the income and profit from your enterprise.

Table 3. Common Meat Production Traits in Goats and Sheep

Growth¹	Reproduction²	Carcass¹	Health²
Birth wt. Weaning wt. 60-, 90-day wt. Market wt. Av. Daily Gain (Pre-weaning / Post-weaning) Feed efficiency Conformation	Conception rate Number born per doe/ewe Number weaned per doe/ewe Percent of kidding/ lambing % kids/lambs weaned Fertility problems	Muscling Dressing % Loin eye area Fat thick- ness % bone conforma- tion	Mortality rate Resistance to parasites Resistance to disease

¹Growth and carcass traits generally have (medium to high: 20 to 60 percent) heritabilities.

²Reproductive and health traits are extremely important to production but have very low heritability estimates (less than 10 percent).

Breeds of Goats and Sheep for Meat Production

Many breeds of goats and sheep are available for meat production. Some common breeds and their production characteristics are shown in table 4. Although the supply of goat meat comes from the less-muscled dairy goat breeds (Alpine, La Mancha, Oberhasli, Saanen, and Toggenburg), only the Nubian, a dual purpose breed, is included in this list.

Table 4. Common Breeds of Goats and Sheep for Meat Production

Breeds	Average Mature Weight in Pounds		Growth Rate	Prolificacy	Milking Ability
	Male	Female			
Goats:					
Boer	240 to 300	220 to 225	H	M	M
Kiko	150 to 170	110 to 130	H	M	M
Nubian	170 to 200	130 to 160	M-H	M-H	H+
Pygmy	90 to 100	80 to 90	L-M	M-H	M
Spanish	90 to 200	80 to 130	M-H	M	M
Tennessee- Wooden-Leg	100 to 200	90 to 140	M-H	M-H	M

Continued on page 41.

Table 4. Common Breeds *continued*

Breeds	Average Mature Weight in Pounds		Growth Rate	Prolificacy	Milking Ability
	Male	Female			
Sheep:					
Border					
Leicester	175 to 250	140 to 180	M-H	M-H	M-H
Cheviot	160 to 200	120 to 150	M	M	M
Columbia	225 to 350	150 to 225	H	M	M
Corriedale	175 to 275	130 to 180	M	M	M
Dorper	200 to 250	150 to 200	M-H	M	M
Dorset	200 to 250	140 to 180	M-H	M-H	H
Finnsheep	175 to 225	120 to 160	L-M	H++	H
Hampshire	250 to 325	175 to 225	H	M-H	H
Lincoln	250 to 350	200 to 250	M	M	L-M
Katahdin(hair sheep)	180 to 250	120 to 160	M	M	M
Merino	150 to 225	110 to 150	L-M	L-M	M
Oxford	200 to 300	150 to 200	M-H	M	M
Polypay	200 to 250	140 to 180	M	H	H
Rambouillet	250 to 300	150 to 200	M-H	L-M	M
Romney	200 to 275	150 to 200	M	M	L-M
Suffolk	250 to 350	180 to 250	H+	H	H
Southdown	175 to 225	130 to 180	M	M	M

L = Low M = Medium H = High

Source: Adopted from various sources of literature including *Breeds of Livestock*, Oklahoma State University; *Sheep Pocket Guide*, North Dakota State University Extension Service; and others.

Note: The weight ranges for some meat goat breeds (Spanish and Tennessee-Wooden-Leg) vary depending on the environment in which they are raised.

Record Keeping Systems

Record keeping can be simple or complex depending on the needs and goals of the producer. A good record keeping system provides an accurate and simple way to permanently organize and keep herd records. Records can be kept in some type of designed forms (see sample forms 1 through 4 that can be used for meat goats or adapted to sheep flocks) either in books, individual sheets, or in electronic spreadsheets. Records kept manually in books or forms and sheets often require that a user browse through the entire records to find a particular animal's entry. Records kept in a good database management system specifically designed for keeping goat or sheep records provides an efficient way to organize information that is easy to access. A database program also allows producers to make many pre-set queries to summarize each component of their operations.

Table 5. Common Types of Herd Management and Performance Records

- ⊙ Pedigree data
- ⊙ Breeding data
- ⊙ Production data
- ⊙ Carcass data
- ⊙ Herd health information data
- ⊙ Financial data

Table 6. Benefits of Having a Good Herd Management Record Keeping System

- * Aids in the selection of parents and replacement animals.
- * Identifies top-producing does and ewes and outstanding bucks and rams.
- * Helps cull low producers in the herd.
- * Documents progress.
- * Makes changes in management style based on the business analyses.
- * Eliminates guesswork; records speak for themselves.
- * Helps in marketing your animals for a premium price.

Selection and Culling of Animals

Important considerations in a selection program for meat production in goats and sheep are rapid growth rate; multiple births and kidding or lambing three times in two years; good conformation (large body size, muscling, sound feet, and legs); and environmental adaptability (resistance or resilience to parasites and diseases). Systematic selection for the above traits will greatly improve the production efficiency (pounds of kid or lamb per doe or ewe bred) and the likelihood of making a profit. Culling is a more complicated process and is usually done for more than one reason.

Selection of Bucks and Rams for Breeding

Buck and ram selection is the most critical decision a breeder has to make. It is important to recognize that the buck or ram will contribute one-half of the genetics to the kids and lambs raised in one year but may quickly influence more than 80 percent of the genetic makeup of your herd or flock if you keep your own replacement does or ewes and breed to young bucks or rams raised in the same herd or flock. Inbreeding can be a problem if outside genetics are not brought into the herd or flock. Generally, sire selection is directed to improve growth, feed efficiency, and meat or carcass quality traits by selecting top sires for these traits. (Example: Average daily gain, growth: 60-d /90-d /120-d wt, conformation, dressing %, yield etc). Avoid selecting any bucks or rams with poor libido, genetic malformation, abnormal testicles, or poor temperament and bucks or rams from a closed herd because this will increase the inbreeding level.

Selection of Replacement

Does and Ewes

Many producers raise their own replacement does or ewes. Producers tend to select does or ewes to improve reproductive efficiency and mothering ability of breeding animals in their herds or flocks. A dam's milk production, size of kids at weaning, litter size or prolificacy, and extended pedigree are key factors producers should look for if they don't have breeding value estimates from genetic evaluation on young replacement stocks.

Crossbreeding and Heterosis

Purebred breeders generally stay with their breed of choice and continuously try to improve their genetics through selection. However, commercial meat goat and sheep producers mostly rely on purebred breeders for purchasing their breeding stock and try crossbreeding different breeds or breed types (F1 crosses, 2- or 3-way rotational crosses) to produce the best market meat kids and lambs. Through a planned system of crossbreeding, a breeder can combine superior genetics for certain traits with another set of traits of top genetics from another breed or breeds to produce the best from both parents. Progenies usually exceed their parents' performance for those traits. Here, the genes from both parents complement each other in a phenomenon known as hybrid vigor or heterosis. Traits that are known to have medium to high heritability estimates (growth and carcass traits) may not show much heterosis or hybrid vigor, but traits with low heritability estimates (reproductive or disease resistant traits) exhibit a relatively high amount of heterosis in their progeny.

Useful Tips for Producers

The additional tips in table 7 will guide producers in planning and formulating a genetic improvement program appropriate for their operation and based on their individual objectives.

Table 7. Useful Tips for Producers

- Use colored ear tags with numbers to identify animals; follow a pattern so you can easily spot animals by year of birth, breed type, etc.
- Update herd inventory bimonthly and try to computerize and summarize using a simple spreadsheet program.
- Beside actual breeding date also record date and heat cycle (estrus) manifestation in all does or ewes.
- Avoid the use of extremely large bucks or rams on young or small does and ewes.
- Diagnose pregnancy 45 to 90 days after the end of the breeding period and cull open does and ewes.
- Aim for 70 to 95 percent reproductive efficiency (percentage kid or lamb crop weaned for the total number of does and ewes of breeding age in the herd or flock each year).
- In case of low percentage of kid or lamb crop weaned, check for buck or ram fertility, diseases, poor body condition of does or ewes, vitamin and phosphorus deficiencies, and physical defects.

- Aim for a short kidding or lambing season of 60 days or less and a kidding or lambing interval of 8 months or less.
- Consider the use of artificial insemination using selected semen from proven bucks.
- Try to use semen or natural service using 3 to 4 bucks or rams.
- Schedule estrus synchronization and artificial insemination programs during the rainy season (July to August).
- Use a proven animal as a clean-up buck or ram, but don't use his relatives or inferior sires.
- Weigh the kids or lambs at birth, at weaning, 2 months post weaning or at 6 months, and at 8 to 10 months.
- Kids and lambs that are heavier at birth are expected to be heavier at weaning provided all management factors are positive.
- Kids and lambs with heavy birth weights from does or ewes kidding or lambing for the first time may result in difficult birthing, known as dystocia.
- Weaning weight is one of the most important weight and size traits affecting productivity. It is primarily determined by two factors: the kid's or lamb's genetic potential to grow or its own growth impetus and the maternal environment.
- At least 50 percent of the variation in weaning weight is due to the milk production of the dam and the kid's ability to obtain its share of that milk.
- Weaning weight is about 40 to 50 percent repeatable suggesting a doe that weans heavier kids one year will do so again the next year.
- Post-weaning weights: This trait is usually taken 30 to 60 days post weaning and is a further measure of the kid's or lamb's potential to grow or its own growth impetus.

SAMPLE RECORD FORMS

(Choice depends on producer's needs and options)

Sample Form 1. Pedigree Record

Pedigree Record		
Animal ID:	Animal Tag. No:	Birth Date: mm/dd/yy
Animal Name:	Breed:	Sex:
Buck ID:	Buck Reg. No:	Registry:
Buck Name:	Buck Breed:	
Doe ID:	Doe Reg. No:	Registry:
Doe Name:	Doe Breed:	

Comments: Buck and doe could be also named as sire and dam, respectively.

Animal ID = Kid ID, Doe ID, or Buck ID is a Unique ID within a herd. By using an electronic spreadsheet such as MS Excel, you could adapt this table in a single row with all the other information in columns.

Sample Form 4. Individual Doe & Kid Performance Record (This is another option.)

Individual Doe & Kid Performance Record															
Doe ID:					Doe Birth Date:					Doe Weaning Weight:					
Sire:				Sire Breed:				Dam:				Dam Breed:			
Source of Doe:					Reason for Culling:					Culling Date:					
Comments:															
Preweaning							Weaning					Doe Status			Remarks
Kid ID	Birth Date	Sex	Type of Birth	Sire ID	Sire Breed	Birth Weight	Weight Date	Weaning Weight	Creep/ Fostered	Market Weight	Kid Price	Condition Score	Preg. Check Date	Preg. or Open	

Appendix A: Compare animals equitably

Always compare animals equitably—“on a level playing field”—when ranking them for merit. For example, if you took the weaning weights of a crop of 50 kids on a particular day and started ranking them based on their weights, you would not get an accurate assessment because they were not born on the same day. We also know that there is a difference in weights between males and females as well as kids born from single births and those that are twins and triplets. In addition, kids born to first, second, third, or fourth parity does or

older does also differ in weight because milk production of a fourth parity doe is much higher than that of a first parity doe. A single-birth kid from a fourth parity doe may have had an advantage in preweaning growth over a single-birth kid of a contemporary first parity doe in that crop. To compare animals equitably, consider all of these issues and make necessary adjustments to rank them for merit. Here are some ways to handle these issues.

Consider animals at a constant age and sex.

To handle the differences in age, you could consider all kids within the same crop at a constant or standardized age. Example, for weaning weight (approximately 8 weeks of age), adjust all of them to a 60-day weight. Here is how you do it:

Calculate the preweaning Average Daily Gain (Pre-w. ADG) and 60-Day-Weight as:

$$\text{Pre-w. ADG} = (\text{Weaning Weight} - \text{Birth Weight}) / \text{Age at Weighing}$$

Where age is the number of days between birth date and weaning weight date. Then,

$$\text{60-Day Weight} = (\text{Pre-w. ADG} \times 60) + \text{Birth Weight}$$

Now group them by male and female kids and rank them within sex for merit. This works well for a purebred operation, but if you have both purebred and crossbred kids in the herd, evaluate them as separate groups.

Adjustment factors for sex, type of birth, and parity of doe

In general, male kids are heavier than female kids. If you know on average the difference in 60-day weights between the male and female kids by breed or breed crosses (from previous research and knowledge), you could add that difference to each female kid in a particular group and rank them as a whole group adjusted to a male base. That will take care of the sex differences only, but to handle the type of birth and parity of doe is more complicated. Some researchers or breed associations who have access to sufficient data on breeding and kid performance can do statistical analyses to obtain the factors to make the necessary adjustments for sex, type of birth (single, twins, triplets, etc.), and doe's parity from one to four. If that information is available, each individual 60-day weight of kids can be adjusted with appropriate factors to ensure equitable comparisons.

Finally, it's a common practice and more appropriate to compare individual animals relative to the average of all animals within a contemporary group. For example, for weaning weight, relative to the average of all kids weaning weight in a particular kid crop (born around same time and reared together), how did a particular individual kid perform? It is a ratio for a particular trait, thus the 60-day weaning weight ratio is calculated as follows:

$$\text{60-Day Weaning Weight Ratio} = \frac{\text{Individual's 60-day weight}}{\text{Average 60-day weight of all kids in group}} \times 100$$

Here the average ratio is set to a standard value of 100 as such all those individuals with a value above 100 will be considered as if they are above average and the rest are average or below average depending on their individual values. The above ratio allows you to rank individuals in a group to quickly visualize individual merit to make your selection decision.

Health

Anthelmintic Drugs Used to Control Internal Parasites in Livestock

Not all drugs are approved for use in sheep and goats. The mention of unapproved products is for informational purposes only. They have extra-label use requirements and can only be used legally under the advice of a licensed veterinarian.

Trade name	Drug ingredient	Drug family	Approved species	Specificity	Labeled dosage	Withdrawal time
Cydectin 0.5% Pour-on for cattle	Moxidectin	MI	Beef, nonlactating dairy cattle, sheep	Roundworms, lungworms, external parasites	5 ml/110 lb topical	Cattle: 0 days slaughter
Cydectin 1% injectable	Moxidectin	MI	Beef	Roundworms, lungworms, external parasites	1 ml/110 lb	Cattle: 21 days slaughter
Cydectin oral drench for sheep 0.1%	Moxidectin	MI	Sheep Not for lactating dairy sheep	Roundworms, lungworms, external parasites	1 ml/11 lb oral or 1 ml/5 kg	Sheep: 7 days slaughter

Trade name	Drug ingredient	Drug family	Approved species	Specificity	Labeled dosage	Withdrawal time
Dectomax injectable 1%	Doramectin	MI	Beef, swine	Roundworms, lungworms, external parasites	1 ml/110 lb (cattle) 1 ml/110 lb (swine) Sub Q or IM	Cattle: 35 days slaughter Swine: 24 days slaughter
Dectomax pour-on for cattle 0.5%	Doramectin	MI	Cattle	Roundworms, lungworms, external parasites	5 ml/110 lb topical	Cattle: 45 days slaughter
Ivomec Eprinex pour-on	Eprinomectin	MI	Dairy cattle	Roundworms, lungworms, external parasites	5 ml/110 lb topical	Cattle: 0 days slaughter
Ivomec pour-on for cattle	Ivermectin	MI	Beef	Roundworms, lungworms, external parasites	1 ml/22 lb topical	Cattle: 48 days slaughter
Ivomec Plus Injection	Clorsulon Ivermectin	MI	Beef	Roundworms, lungworms, external parasites, adult liver flukes	1 ml/110 lb Sub-Q	Cattle: 49 days slaughter
Ivomec injectable 1%	Ivermectin	MI	Beef, swine	Roundworms, lungworms, external parasites	1 ml/110 lb cattle. 1 ml/75 lb swine Sub-Q	Cattle: 35 days slaughter Swine: 18 days slaughter

Trade name	Drug ingredient	Drug family	Approved species	Specificity	Labeled dosage	Withdrawal time
Ivomec sheep drench 0.08% Primectin Drench	Ivermectin	MI	Sheep	Roundworms, lungworms, external parasites	3 ml/26 lb oral	Sheep: 11 days slaughter
Prohibit Drench Powder	Levamisole Hydrochloride	TETR	Cattle, sheep	Roundworms, intestinal worms, lungworms	Depends on dilution	Cattle: 2 days Sheep: 3 days
Quest 2% oral gel	Moxidectin	MI	Horses	Roundworms, lungworms, external parasites	0.4 mg/2.2 lb	n/a
Rumatel Medicated Premix	Morantel Tartrate	TETR	Cattle, goats	Roundworms	1/10 lb/100 lb	Cattle: 14 days Goats: 30 days
Safeguard Panacur liquid 10%	Fenbendazole	BZD	Nonlactating cattle, goats	Roundworms, lungworms, tapeworms	2.3 ml/100 lb oral	Cattle: 8 days slaughter 0 milk withdrawal Goats: 6 days slaughter
Safeguard Panacur paste	Fenbendazole	BZD	Cattle, horses	Roundworms, lungworms	2.3 mg/lb oral	Cattle: 8 days slaughter
Safeguard Pellets	Fenbendazole	BZD	Cattle, swine	Roundworms, lung- worms, tapeworms	1 lb/100 lb oral	Swine: 14 days slaughter

Trade name	Drug ingredient	Drug family	Approved species	Specificity	Labeled dosage	Withdrawal time
Strongid T paste	Pyrantel Pamoate	TETR	Horses	Roundworms, tapeworms	2.27 mg/lb oral	None
Synanthic drench 9.06%	Oxfendazole	BZD	Beef, Nonlactating dairy	Roundworms, lungworms, tapeworms	2.5 ml/110 lb oral	Cattle: 7 days slaughter
Tramisol/Levasole drench	Levamisole	IMID	Sheep, cattle	Roundworms, intestinal worms, lungworms	1 oz/100 lb 1 ml/50 lb oral	3 days slaughter
Tramisol/Levasole injectable for cattle 13.65%	Levamisole	IMID	Beef	Roundworms, lungworms	2 ml/100 lb Sub-Q	Cattle: 7 days
Tramisol/Levasole boluses/oblets	Levamisole	IMID	Sheep	Roundworms, lungworms	1 bolus/50 lb oral	Sheep: 3 days slaughter
Valbazen drench 11.36%	Albendazole	BZD	Cattle, sheep	Roundworms, lungworms, tapeworms, adult liver fluke	3 ml/ 100 lb oral restricted during pregnancy	7 days slaughter (sheep)
Zimecterin paste 1.87%	Ivermectin	MI	Horses	Roundworms, lungworms, external parasites	1 tube/1,250 lb oral	n/a

Drug (chemical) Families

Benzimidazoles (BZD)—also called “white drenches”

- Chemical name ends in "dazole."
- Wide margin of safety regarding dosage.
- No side effects.
- Effective against tapeworms, though fenbendazole is not officially labeled for tapeworms.
- Widespread resistance reported; cross resistance among members.
- Do not administer Valbazen (albendazole) during the first 30 days of pregnancy and 30 days after removal of rams.

Levamisole products/Imidazothiazoles (IMID) or nicotinic—also called “clear drenches”

- Narrow margin of safety, follow recommended dose carefully.
- Effective against all worm stages, including hypobiotic larvae.
- Resistance reported.
- Cross resistance with tetrahydropyrimidines (TETR).

Macrocylic lactones—also called avermectins (MI)

- Wide safety margin for all ages and stages in life.
- The maximum safety dose is more than ten times the therapeutic dose.
- MI's are safe to use on pregnant and lactating ewes, rams and ewes at breeding, and all breeds and ages of sheep.
- Moxidectin (Cydectin or Quest) is also registered to have a persistent effect against *Haemonchus contortus* and *Ostertagia* sp. This will provide protection from reinfection of these worms for a minimum of 2 weeks after drenching and may be a useful control feature.

A special note about oral dosing:

Oral dosing is usually the recommended route of administration for sheep and goats. Studies have shown oral dosing to be more effective than other routes of administration. Injectable products can be administered orally. Pour-on products should not be used on sheep and goats unless they are administered orally. Tramisol drench or oblets are preferred to Tramisol injectable due to a wider margin of safety.

A special note about goats:

Goats metabolize dewormers differently than sheep or cattle. The drugs clear their systems faster. As a result, they require higher doses of the drugs for effective treatment, typically 1.5 to 2 times the cattle/sheep dose. Producers should consult a veterinarian to determine the proper dosage for their animals and to discuss the use of drugs that are not labeled for sheep or goats.

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Author: Susan Schoenian
Sheep & Goat Specialist
University of Maryland Cooperative Extension

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Drugs Used to Treat and Control External Parasites

When using pesticides, read the labels carefully and follow directions and safety precautions. Never use pesticides inconsistent with the label. Record all pesticide usage. Never apply pesticides closer to slaughter dates than the number of days listed on the label. Avoid treatment to animals that are sick, overheated, or stressed. DO NOT apply insecticides to lambs less than 3 months old, and use light applications on lambs 3 to 6 months old. Avoid contamination of feed, mangers, water, milk, and milking equipment. Store pesticides in the original, labeled containers, safely locked away from children, pets, and livestock.

Trade name	Active ingredient	Product type	Approved species	Labeled use	Labeled dosage	Withdrawal time
Insecticides						
BackSide and BackSide Plus	1% Permethrin & 1% Piperonyl Butoxide	Pour-on Spray Ready-to-use	Beef cattle, horses, sheep , premises	Sheep keds and lice, horn and face flies, horse and house flies, mosquitos, black flies	1/2 oz/100 lb max 5 oz for cattle and 3 oz for sheep. Do not treat more than every 2 weeks.	0 days slaughter 0 days milk discard

Trade name	Active ingredient	Product type	Approved species	Labeled use	Labeled dosage	Withdrawal time
Boss	5% permethrin	Pour-on	Beef cattle, dairy cattle, sheep and goats	Horn flies, face flies lice, and keds	1.5 ml/100 lb 18 ml maximum for sheep	0 days slaughter 0 days milk discard
Catron IV	permethrin	Aerosol	Beef cattle, horses, swine, sheep and goats	Maggots, screwworms, ear ticks, face flies	One can will treat 1 to 10 animals depending on severity of fly-strike.	5 days slaughter swine
Co-Ral	Coumaphos	Spray or dip	Cattle, horses, poultry, sheep , dogs, premises	Maggots, keds, lice		15 days slaughter
CyLence	1% Cyfluthrin	Pour-on Ready-to-use	Beef cattle, dairy cattle	Horn flies, face flies, biting and sucking lice	8 ml for flies 16 ml for lice Effective for 3 weeks	0 days slaughter
Diazinon -+	diazinon	Concentrate spray	Cattle, swine, sheep , premises. Do not use on goats .	Horn flies, face flies ticks, keds, lice	4 oz/25 gal water for low pressure spray; 2 oz/25 gal water for high pressure spray	14 days slaughter

Trade name	Active ingredient	Product type	Approved species	Labeled use	Labeled dosage	Withdrawal time
Ectiban - EC	5.7% permethrin	Concentrate Pour-on Spray	Beef cattle, dairy cattle, horses, sheep and goats , premises	Horn flies, face flies, stable flies, house flies, mange mites, lice, ticks	For horn flies, use spray method. For mange mites, lice, ticks, etc., thoroughly wet the animal.	0 days slaughter
Ectrin	permethrin	Pour-on	Beef cattle, nonlactating dairy cattle, sheep . Do not treat lactat- ing goats .	Lice, keds, ticks	For sheep : 1/4 oz./50 lb (up to 3 oz) pour along back line over neck, shoulders, and rump. Residual activity for 28 days.	2 days
Expar	permethrin	Concentrate Pour-on Spray	Beef cattle, nonlactating dairy, cattle, sheep	Lice, flies, fleas, mites	For sheep : 1/4 oz./50 lb (up to 3 oz) Pour along back line over neck, shoulders, and rump. Residual activity for 28 days.	0 days

Trade name	Active ingredient	Product type	Approved species	Labeled use	Labeled dosage	Withdrawal time
Gardstar 40% EC	40% permethrin	Concentrate	Livestock, horses, premises. Do not use on cats!	Horse, house, stable, black flies, mosquitoes, eye gnats, mange mites, ticks, lice, fleas	1 to 2 oz per animal	0 days slaughter
Permethrin 1.0%	1% permethrin	Pour-on	Beef cattle, nonlactating dairy cattle, sheep	Lice, flies, fleas, mites	For sheep : 1/4 oz./50 lb (up to 3 oz) Pour along back line over neck, shoulders and rump. Residual activity for 28 days.	0 days slaughter 0 days milk discard
Permethrin 1.0% Synergized	Permethrin-synergized	Pour-on	Beef cattle, nonlactating dairy cattle, sheep	Lice, flies, fleas, mites keds	For sheep : 1/4 oz/50 lb (up to 3 oz) Treat after shearing.	0 days slaughter 0 days milk discard

Trade name	Active ingredient	Product type	Approved species	Labeled use	Labeled dosage	Withdrawal time
Permethrin 10%	10% permethrin	Pour-on	Beef cattle, nonlactating dairy cattle, sheep , premises	Lice, flies, keds. Not effective for grub control.	For sheep : 1/4 oz/50 lb (up to 3 oz) Pour along back line over neck, shoulders, and rump.	0 days slaughter 0 days milk discard
Permethrin II	10% permethrin	Pour-on spray, dip	Beef cattle, nonlactating dairy cattle, swine, horses, poultry, dogs, sheep , premises	Flies, fleas, lice, mites, ticks (including deer ticks). Aids in control of cockroaches, mosquitoes, and spiders.	30-day residual effect	5 days swine slaughter
Python Dust	0.075% zeta-cypermethrin	Dust	Cattle, horses, sheep, goats	Horn, face, and stable flies; lice, keds	2 oz per animal	0 days slaughter 0 days milk discard
Synergized DeLice	permethrin synergized	Pour-on or Spray Ready-to-use	Beef cattle, nonlactating dairy cattle, sheep , premises	Face flies, stable flies, house flies, sheep keds, lice	Pour along back 8 cc per 50 lb after shearing.	0 days withdrawal

Trade name	Active ingredient	Product type	Approved species	Labeled use	Labeled dosage	Withdrawal time
Tactic EC	12.5% Amitraz	Concentrate	Beef cattle, dairy cattle, swine. Do not use on horses or dogs!	Ticks, mange mites, lice	Cattle 1 qt/100 gal, swine 1 qt/50 gal Thoroughly soak animals. 2 treatments 7 to 10 days apart	3 days slaughter
Ultra Boss	5% permethrin and 5% piperonyl butoxide	Pour-on	Beef cattle, dairy cattle, sheep	Horn flies, face flies, lice, keds	3 ml per 100 lb	0 days slaughter withdrawal 0 days milk discard

Products That Control External Parasites

Cydectin	Moxidectin	Pour-on	Beef cattle, dairy cattle	Cattle grubs, horn flies, mites, lice	5 ml/110 lb	0 days cattle slaughter 0 days milk
Dectomax	Doramectin	Pour-on Injectable	Cattle, swine	Grubs, sucking lice, mange mites	1 cc/110 lb	45 days slaughter cattle (pour-on) 35 days slaughter cattle (injectable) 24 days slaughter swine (injectable)
Ivomec 1% injection	Ivermectin	Injectable	Cattle, swine	Sucking lice, mange mites (scabies), grubs	1 ml/110 lb	35 days slaughter cattle 18 days slaughter swine not established for milk
Ivomec Sheep Drench 0.8% solution	Ivermectin	Oral	Sheep	Larval stages of nasal bot	3 ml/26 lb	11 days slaughter sheep

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 Author: Susan Schoenian
 Sheep & Goat Specialist
 University of Maryland Cooperative Extension

Vaccines Used in the Sheep and Goat Industry

Not all vaccines are labeled for use in sheep and goats. The mention of nonlabeled products is for informational purposes only.

Manufacturer and trade name	Approved species	Labeled use	Labeled dosage	Withdrawal time
Boehringer Ingelheim Bar-Guard-99	Cattle	An oral vaccination for the prevention of colibacillosis caused by <i>Escherichia Coli</i> in newborn calves.	2 ml orally as soon as possible after birth.	21 days slaughter
Boehringer Ingelheim Bar Vac CD	Cattle, sheep, goats	Three-in-one protection against <i>Clostridium perfringens</i> Types C and D.	2 ml SQ Repeat dose in 4 weeks. Booster annually.	21 days slaughter
Boehringer Ingelheim Bar Vac CD/T	Cattle, sheep, goats	Three-in-one protection against <i>Clostridium perfringens</i> Types C and D and <i>Cl. tetani</i> .	2 ml SQ Repeat dose in 4 weeks. Booster annually.	21 days slaughter
Colorado Serum Campylobacter Fetus Bacterin Ovine Origin	Sheep	For use in vaccinating healthy ewes to aid in the control of Vibriosis caused by <i>Campylobacter fetus</i> subsp. <i>jejuni</i> and <i>intestinalis</i> .	5 ml SQ 30 days before breeding with second dose 60 to 90 days later. Booster dose should be injected annually, shortly before or after breeding.	21 days slaughter

Manufacturer and trade name	Approved species	Labeled use	Labeled dosage	Withdrawal time
Colorado Serum Case-Bac	Sheep	Aids in the prevention of Caseous lymphadenitis associated with <i>Corynebacterium pseudotuberculosis</i>	Entire flock should be vaccinated before exposure. 2 ml SQ. Repeat dose in 4 weeks. Booster annually.	21 days slaughter
Colorado Serum Caseous D-T	Sheep	Will aid in the prevention against <i>Clostridium perfringens</i> Type D, toxemia caused by <i>Clostridium tetani</i> , and Caseous lymphadenitis associated with <i>Corynebacterium pseudotuberculosis</i> .	2 ml SQ. Repeat in 4 weeks	21 days slaughter
Colorado Serum Chlamydia Psittaci Bacterin (Killed Chlamydia)	Sheep	For use in vaccinating healthy ewes to aid in the control of Ovine Enzootic Abortion.	2 ml SQ on the top of the neck about 4 inches from ear, 60 days before breeding. Administer second dose 30 days later. Revaccinate annually.	60 days slaughter
Colorado Serum C-D Antitoxin	Cattle, swine, sheep, goats	Antitoxin for temporary prevention of <i>Clostridium</i> enterotoxemia.	Suckling lambs and goats: 5ml SQ and calves: 25 ml. as soon as possible after birth.	21 days slaughter

Manufacturer and trade name	Approved species	Labeled use	Labeled dosage	Withdrawal time
Colorado Serum CD/T	Cattle, sheep	For the immunization of healthy cattle and sheep against enterotoxemia and tetanus caused by Clostridium perfringens Types C and D and Clostridium Tetani.	2 ml SQ. Repeat in 3 to 4 weeks and once annually.	21 days slaughter
Schering Plough Covexin 8	Cattle, sheep	For the active immunization of healthy sheep against diseases caused by Cl. chauvoei, Cl. septicum, Cl. novyi Type B, Cl. haemolyticum (known elsewhere as Cl. Novyi Type D*), Cl. tetani, and Cl. perfringens Types C and D.	5 ml SQ, followed by 2 ml dose in 6 weeks. Revaccinate annually.	21 days slaughter
Schering Plough Footvax 10 Strain	Sheep	A multistrain killed bacterin for the prevention and treatment of footrot in sheep . Combine with conventional treatment.	1 ml SQ. Repeat no sooner than 6 weeks, no later than 6 months. Revaccinate biannually or just prior to anticipated outbreak.	60 days slaughter
Nasalgen (IBR-PI3 intranasal)	Cattle	Establish protection in the upper respiratory tissues to neutralize red-nose (IBR) and PI3 virus when they're inhaled. Protection begins in only 40 to 72 hours.	1/2 ml per lamb up one nostril. 1 ml per nostril on adult sheep .	21 days slaughter
Novartis Ovine Ecolizer	Sheep	For use in the prevention and treatment of colibacillosis caused by E. coli in newborn lambs.	5 ml per lamb within 12 hours after birth.	21 days slaughter

Manufacturer and trade name	Approved species	Labeled use	Labeled dosage	Withdrawal time
Colorado Serum Ovine Ecthyma	Sheep, goats	For vaccination of healthy sheep and goats against soremouth.	Scarify a wool-free area of skin. Apply rehydrated vaccine with brush.	21 days slaughter 24 hours dipping or spraying
Ovine Ecthyma (Texas origin)	Sheep, goats	For vaccination of healthy sheep and goats against soremouth.	Scarify a wool-free area of skin. Apply rehydrated vaccine with brush.	21 days slaughter 24 hours dipping or spraying
Ram Epididymitis Bacterin Brucella Ovis	Sheep	Protection against ram epididymitis.	2 ml SQ to ram lambs at weaning and mature rams. Repeat 30 to 60 days and annually.	21 days slaughter
Colorado Serum Tetanus Anti-toxin (equine origin)	Cattle, swine, horses, sheep, goats	For quick response of short duration in protection against or treatment of tetanus (lockjaw). Useful after castration or puncture wounds. Immediate protection for 7 to 14 days.	1,500 units SQ or IM (prevention) 3,000 to 15,000 units (treatment)	21 days slaughter
Colorado Serum Tetanus Toxoid	Cattle, horses, swine, sheep	For immunization of animals against tetanus (lockjaw). Will provide long-term immunity.	1 cc/100 lb	21 days slaughter
Ultra Bac 8	Cattle, sheep	For use in the prevention of blackleg, malignant edema, red water disease, black disease, and C & D enterotoxemia	5 ml SQ or IM (cattle) 2 1/2 ml SQ or IM (sheep) Revaccinate 6 weeks later. Revaccinate annually.	21 days slaughter

Manufacturer and trade name	Approved species	Labeled use	Labeled dosage	Withdrawal time
Vision CD with Spur	Cattle, sheep , goats	Immunize cattle, sheep , and goats against enterotoxemia caused by Clostridium perfringens Types C and D.	Administer 2 ml dose SQ and repeat in 21 to 28 days. Annual revaccination is recommended.	21 days slaughter
Vision CD-T with Spur	Cattle, sheep , goats	Immunize cattle, sheep , and goats against enterotoxemia caused by Clostridium perfringens Types C and D and tetanus.	Administer 2 ml dose SQ and repeat in 21 to 28 days. Annual revaccination is recommended.	21 days slaughter
Volar Footrot Bacterin	Cattle, sheep	Bacterin containing 2 strains of Fusobacterium necrophorum. Indicated as an aid in the prevention and treatment of chronic foot rot in sheep and acute foot rot in cattle. Results in 61 to 88% reduction in clinical symptoms of foot rot in sheep .	3 ml SQ. Repeat in 3 to 4 weeks. Safe in pregnant ewes.	21 days slaughter

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 Author: Susan Schoenian
 Sheep & Goat Specialist
 University of Maryland Cooperative Extension

Breeding Animal Evaluation

Terms

Livestock producers need a basic understanding of livestock anatomical terms. Sheep and goat producers should be familiar with terms associated with the production of lambs and kids. See figures 1 and 2.

Structural Correctness

Structure is the foundation of the animal, and correctness of structure is important to build upon. The basis for form to function in any species of livestock is related to angles of bone structure and the ability to move or travel with ease. The animal's ability to convert feed and forage to an edible protein product (meat) can be compromised by structural problems. If an animal is unsound or incapable of performing or functioning at an optimum level because of structural problems, emphasis on selection for performance is for naught. Production longevity is directly influenced by structural soundness. For this reason, selection for sound and functional breeding animals is very important to Alabama livestock producers and especially to breeders of seed-stock or purebred animals.

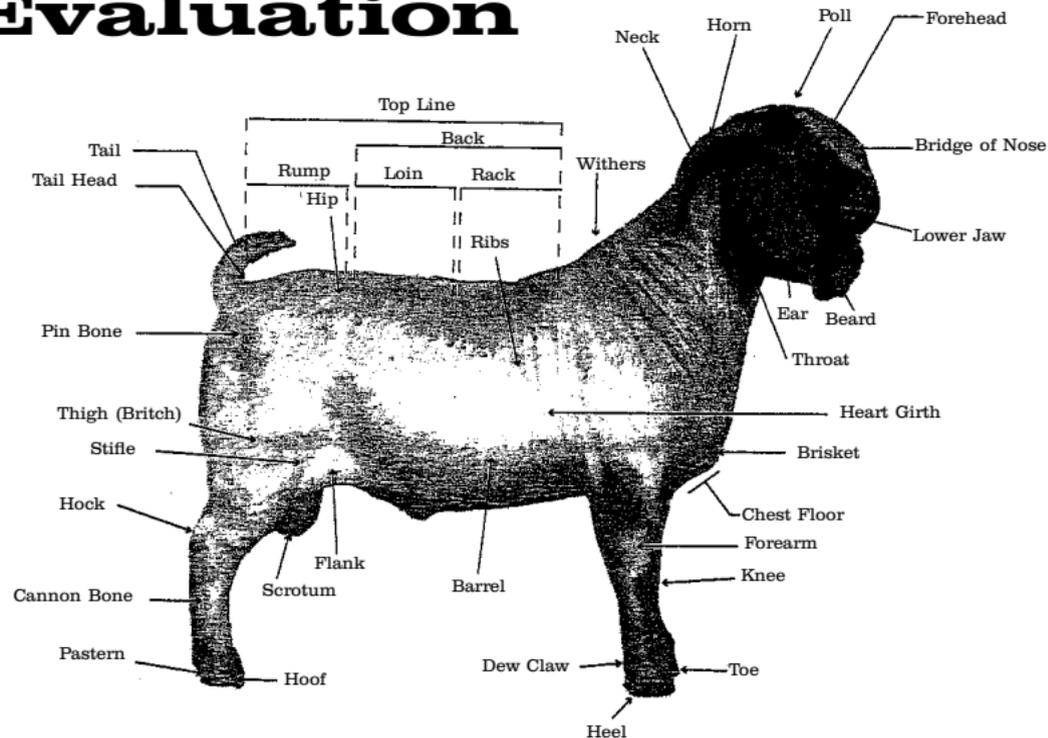
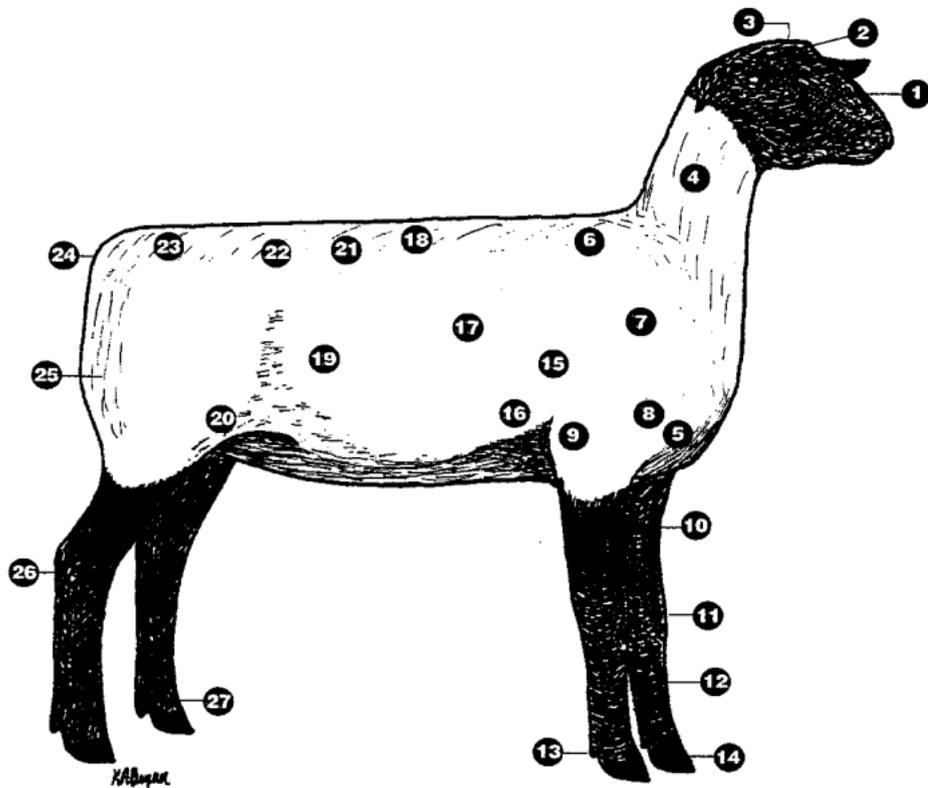


Figure 1: Anatomical Terms for Goats
(Used with permission of the ABGA and Robert Swize)



- | | |
|----------------------|-------------------|
| 1. Face | 15. Forerib |
| 2. Forehead | 16. Lower forerib |
| 3. Poll | 17. Rib |
| 4. Neck | 18. Back or top |
| 5. Breast | 19. Middle |
| 6. Top of shoulder | 20. Rear flank |
| 7. Shoulder | 21. Loin |
| 8. Point of shoulder | 22. Hip |
| 9. Elbow | 23. Rump |
| 10. Forearm | 24. Dock |
| 11. Knee | 25. Leg |
| 12. Cannon | 26. Hock |
| 13. Dewclaw | 27. Pastern |
| 14. Foot | |

Figure 2: Anatomical Terms for Sheep

(Adapted from Pennsylvania 4-H Livestock Judging Manual)

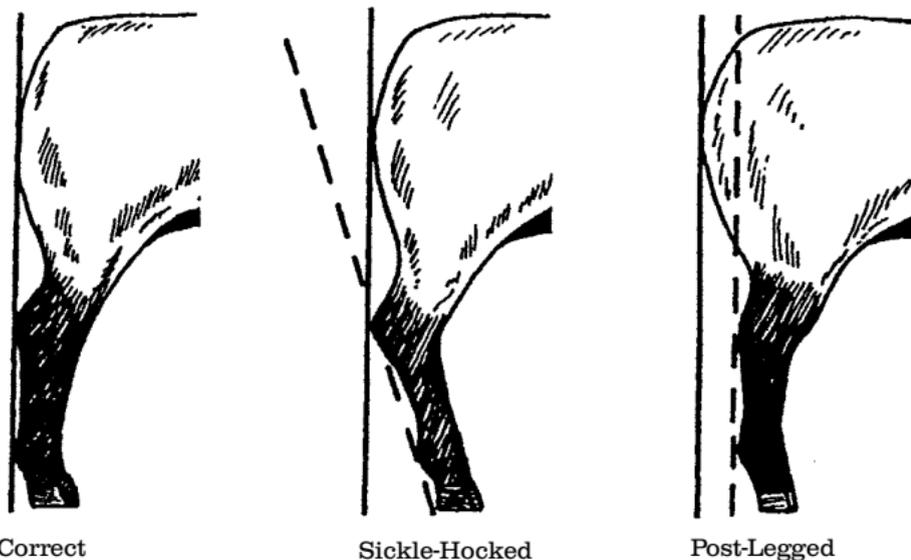
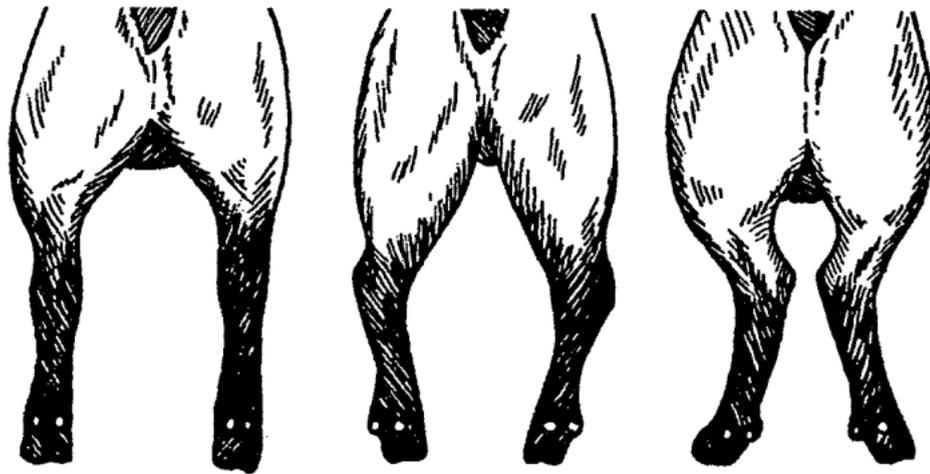


Figure 3: Side view of rear leg and hip structures

(Used with permission of Ohio State University Sheep Learning Lab Kit)

The best way to evaluate structural correctness of an animal is from the side view. Not only can the length, depth, and volume (to a lesser degree) of the animal be evaluated, but both front and rear leg structures can be evaluated at the same time. For longevity of service, bucks and rams must be especially sound in rear leg and hip structure. Movement or ability to travel can be evaluated by observing the length of stride or step, placement of the rear feet in relation to the front feet, and the fluidity of motion. A buck or ram that has proper angulations to his rear legs will be approximately straight down from the pins to the hock and the dewclaw. An animal with sickle-hocked condition has too much angulation to the set or angle of the hocks. This trait is usually associated with weak rear pasterns. Animals that are post-legged have little or no angulation to the curvature of the hind legs and are prone to suffer stifle problems and disorders. This trait is usually associated with steep or straight pasterns. Post-legged animals become unsound much more quickly than animals that are sickle-hocked (Figure 3).



Correct

Bowlegged

Cow-Hocked

Figure 4: Rear view of knee structures

(Used with permission of Ohio State University Sheep Learning Lab Kit)

When viewing an animal from the rear, the animal's legs should come out of the center of the hindquarters and go straight to the ground. The most common unsoundness viewed from the rear is the condition known as cow-hocked, also referred to as narrow or close at the hocks. Larger or longer outside toes magnify this condition. This trait is fairly common and seldom is a hindrance to form as it relates to function. The bowlegged condition (or wide at the hocks) occurs less frequently and is magnified by larger or longer inside toes. This condition is more serious and is frequently associated with animals that are base-narrow or have swollen or puffy hocks (Figure 4).

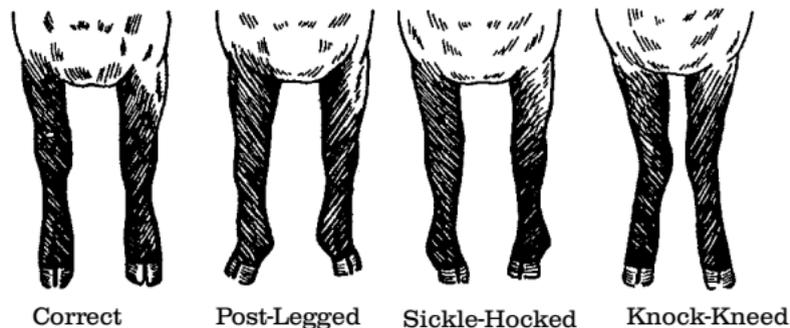


Figure 5: Front view of front leg structures

(Used with permission of Ohio State University Sheep Learning Lab Kit)

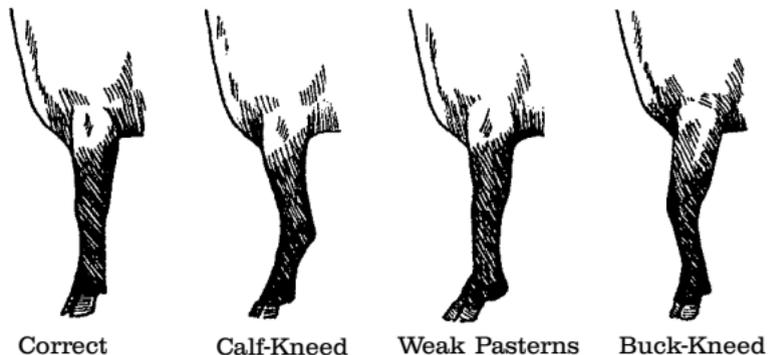
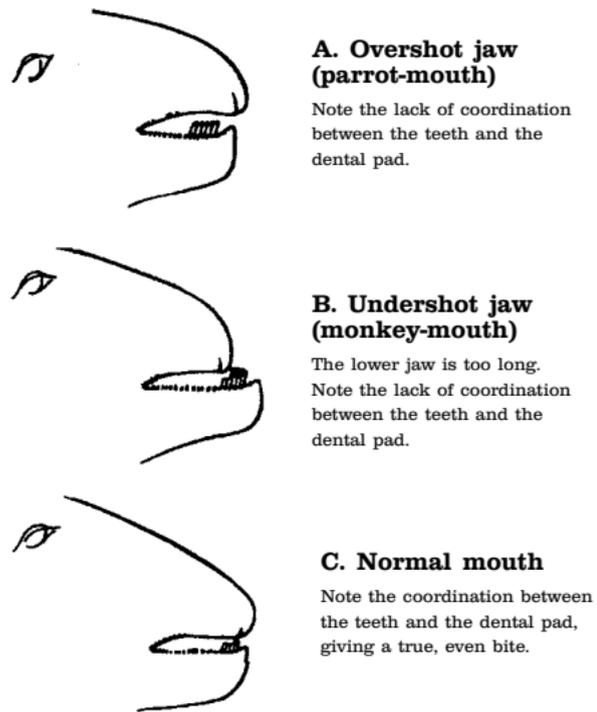


Figure 6: Side view of front leg structures

(Used with permission of Ohio State University Sheep Learning Lab Kit)

The common front leg structural problems include the conditions of being buck-kneed, calf-kneed, pigeon-toed, splay-footed, or knock-kneed. The correct knee structure is straight up and down and in line with the forearm and cannon. Splay-footed is a common defect and is associated with being knock-kneed or turned-out. Pigeon-toed animals are not common, but this trait is a serious defect because it is often associated with other defects such as being wing-shouldered, base-narrow, or bowlegged (Figure 5). Buck-kneed or “over at the knees” is a condition when the knees are pitched forward. This is a serious defect associated with steep shoulders and steep pasterns, and, quite frequently, the post-legged condition. Calf-kneed or “back at the knees” is the least serious defect (Figure 6).



In sheep and goats, other anatomical parts should be considered for soundness or defects. Eyes, ears, mouths, teats, and hooves are important. Animals that are blind or cannot hear should be culled. Some breeds of sheep are affected by wool blindness.

Certain defects of the jaw should be considered. A mouth correct in alignment has incisor teeth that are flush with the pad of the upper jaw. The trait known as parrot-mouth is the condition of an undershot jaw (bottom jaw) or overbite (upper jaw). Monkey-mouth is the condition of an overshoot (bottom jaw) or under-bite (upper jaw). (Figure 7).

Foot structure and hooves should be in proportion to the bone structure of the animal. Cracked or split hooves can be a concern for longevity. Animals with colored hooves tend to be preferable to animals with lighter colored hooves.

Figure 7: Jaw structures

(Used Livestock Judging, Selection and Evaluation, Fifth Ed. Roger E. Hunsley)

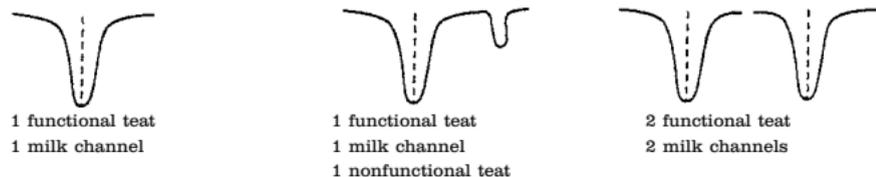


Figure 8: Functional teat structures

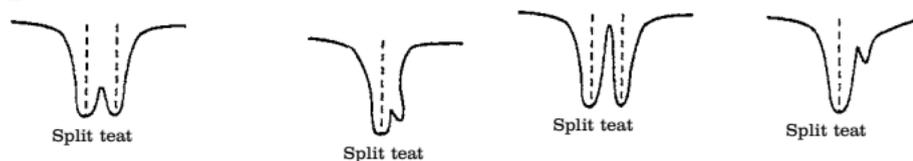


Figure 9: Split teat structures

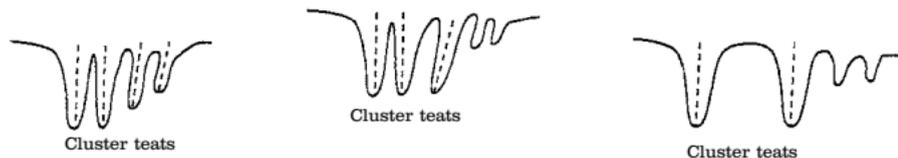


Figure 10: Cluster teat structures



Figure 11: Fishtail teat structures

(Figures 8, 9, 10, and 11 used with permission of the ABGA and Robert Swize.)

Teat structure is of critical importance, more so for does than for ewes. Does and ewes should have no more than two functional teats for each side of the udder (Figure 8). The structure of the udder should allow the offspring to nurse unassisted. Animals with pendulous udders or bulbous or oversized teats should be culled. Split teats, which have two distinctly separate milk channels, are not preferred (Figure 9). Cluster teats (Figure 10) and fishtail teats (Figure 11) should be avoided. For production purposes, keeping daughters of sires or dams with teat or udder defects may not be in the best interest of the breeding program.

Size

Skeletal frame size or weight and bone and muscle development are indicators of size. Size varies significantly among breeds. Frame is commonly referred to as the height of the animal at the hips. Large is not always better. Smaller animals tend to be more efficient. Larger animals tend to have a faster growth rate.

Volume and Capacity

The internal dimension, volume, or capacity of an animal is an important consideration. Volume is three-dimensional—length, depth, and width. An animal that has an expanded spring of rib and that is long sided and deep bodied is preferable.



Muscling

Muscling is apparent throughout the body of an animal. The two primary indicators of muscling of farm meat animals are down the back and through the stifle, leg, and thigh regions. Animals with an abundance of natural muscling are naturally thick topped. This is seen in the bulging of muscle along the top line of the animal, over the rack, through the loin, and out to the dock or tail head. This muscle, the longissimus dorci, yields one of the most tender, highest priced, and most valuable cuts of the lamb or goat carcass. Another indicator of muscling is bulge of the stifle muscle, viewed as the animal walks. The wider the animal walks, the heavier muscled the animal usually is. The thickest part of a market animal should be the width from stifle to stifle. The shoulders should be muscular but not coarse or out of proportion with the rest of the body and other muscle indicators.

Sex Character

Bucks and rams should appear rugged, stout, and masculine. Ruggedness is associated with stoutness of bone, identified by a larger circumference of cannon bone. Width between the eyes and prominence of jaw bone are other indicators of masculinity. Bucks and rams must have two large testicles that are well shaped, equally sized, firm to the touch, and evenly hung in a single scrotum.

Does and ewes should be feminine and more refined in their features. Femininity is typically associated with a longer head and neck coupled with a more refined head and muzzle. The udder should be soft, smooth, well shaped, and balanced. The female external genitalia should be well developed and properly structured. An infantile vulva often indicates a lowered rate of fertility. Doe kids and ewe lambs typically reach puberty at 7 to 9 months. Depending on the goals of the breeding program, efforts should be made to assure they are not exposed to bucks or rams at too early an age. However, in all cases, does and ewes that have not given birth by 24 months of age are subfertile.

Breed Character

Breeders with a purebred or seed-stock program should place special emphasis on enhancing the breed characteristics that make the chosen breed unique.



Carcasses and Cuts of Lamb and Goats

General Information

Lamb. Carcasses of young lambs differ from mutton carcasses primarily by the evidence of ossification, or the replacement of cartilage by bone, of the fore limb growth plate at the knee. In young lambs, this growth plate can be broken by hand with a resulting exposed “break joint.” In mutton carcasses, this growth plate is replaced by bone and cannot be broken by hand resulting in an exposed “spool joint.” This distinction is important because severe quality problems, especially a particularly pungent odor or taste, can result in carcasses needing to be discounted. Because 99 percent of all lamb carcasses are either USDA Prime or Choice, the use of quality grades is minimal. Grades (see equation in the following sections) are used to determine the yield and value of the four major lean cuts. For reference, see USDA-AMS Institutional Meat Purchase Specifications (IMPS) for Fresh Lamb and Mutton Series 200 at <http://www.ams.usda.gov/lsg/imps/imps200.pdf>.

Goat. Goat carcasses and goat meat have numerous unique yield and quality traits. Unlike other animals, goats tend to deposit fat over the body wall (ribs and flank) and inside the body cavity (as kidney fat) instead of over the back. Therefore, equations and estimators commonly used in other species do not work when applied to goats. Additionally, because the size of most market goat carcasses is substantially smaller than other red meat species, fabricating the carcass into merchandisable cuts of appropriate portions is more difficult. The result is that goats may be marketed as whole carcasses or as 2 or more parts. The information in this section is mostly summarized from the USDA-AMS Institutional Meat Specifications (IMPS) for Fresh Goat Series at <http://www.ams.usda.gov/LSG/imps/imps11.pdf>.

Processing Losses

Dressing percentage. The dressing percentage of slaughter lamb and goat carcasses is the loss in weight from removal of the hide, head, and internal organs during harvest. Age, weight, sex, body condition, and amount of gut fill at slaughter influence these losses, which typically range from 46 to 52 percent.

$$\text{Dressing \%} = \frac{\text{Hot carcass weight}}{\text{Live weight}}$$

Cooler shrink. Some weight loss is expected from the evaporation of moisture from the carcass as it hangs in the chilling cooler. This is typically 1 to 5 percent but may be as high as 10 percent because goats usually have very little fat cover to protect against evaporation.

$$\text{Cooler shrink \%} = \frac{\text{Hot carcass weight} - \text{Cold carcass weight}}{\text{Hot carcass weight}}$$



Classification of Lamb Carcasses

Yield of warm carcass weight in closely trimmed primal cuts (leg, loin, rack, and shoulder) can be estimated by the following equation (See also table 1):

Yield Grade =

$$(10 \times \text{fat thickness over the rib eye at the 12 rib}) + 0.4$$

Table 1. Approximate Yield of Four Primal Cuts From Each Yield Grade

Yield Grade	Yield %
1	48 to 50%
2	46 to 48%
3	44 to 46%
4	42 to 44%
5	40 to 42%

Fabrication and Cuts (Figure 1)

- (1) The leg may be removed by using either cuts D or C.
- (2) If cut D is used to remove the leg, remove the sirloin with cut C.
- (3) The loin is removed using cuts C and B. Cut B is made for estimating the yield grade described above.
- (4) The rack is removed from the shoulder by cut A between the fourth and fifth ribs.
- (5) More cuts can be made to remove the breast and flank as needed.

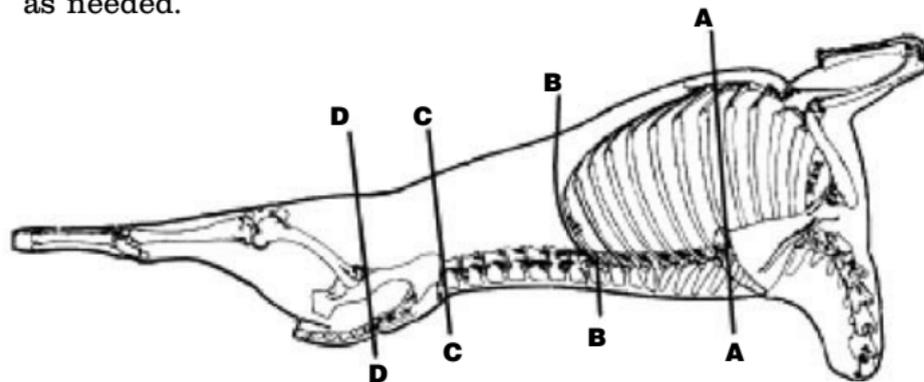


Figure 1. Points of fabrication of lamb carcasses

Table 2. Approximate Yield (in Pounds) of Various Cuts From Lamb Carcasses Differing in Size From 40 to more than 75 pounds.

IMPS No.	Cut	Range A	Range B	Range C	Range D
200	Carcass	41 to 55	55 to 65	65 to 75	75 and up
242	Foresaddle	21 to 25	25 to 35	35 to 40	40 and up
204	Rack	4 to 5	5 to 7	7 to 9	9 and up
206	Shoulders	14 to 19	19 to 23	23 to 27	27 and up
207	Shoulders, square-cut	5 to 6	6 to 8	8 to 10	10 and up
209	Breast	2 and down	2 to 3	3 to 4	4 and up
210	Foreshank	0.5 to 1	1 to 1.5	1.5 to 2	2 and up
229	Hindsaddle, long-cut	25 to 31	31 to 38	38 to 43	43 and up
230	Hindsaddle	20 to 25	25 to 30	30 to 35	35 and up
232e	Flank	0.5 and down	0.5 to 1	1 to 2	2 and up
233	Legs	6 to 9	9 to 13	13 to 17	17 and up
233b	Leg shank-off	4 to 6	6 to 8	8 to 11	11 and up
234	Leg, boneless	5 to 8	8 to 11	11 to 13	13 and up
242	Loins	3 to 4	4 to 6	6 to 8	8 and up
243	Loins, full	2 to 3	3 to 5	5 to 7	7 and up
245	Sirloin	2 and down	2 to 3	3 to 4	4 and up
246	Tenderloin	0.5 and down	0.5 to 1.5	1.5 to 2.5	2.5 and up

For more information and for other cuts not included in this chart, see <http://www.ams.usda.gov/lsg/imps/imps200.pdf>.

Classification of Goat Carcasses

The IMPS Selection Criteria for live goats and carcasses are based on consideration of conformation (muscling). Selection No. 1 goats or carcasses have a high proportion (by weight) of meat to bone. Selection No. 3 goats and carcasses have a low ratio of meat to bone. For ordering data, see the Special Requirements Code (Table 3).

Table 3. Special Requirements Code

Category	Purchaser Specified Options	Code
Selection No.	Selection No. 1	1
	Selection No. 2	2
	Selection No. 3	3
	Selection No. 1 and 2	4
	Any combination	0

Category	Purchaser Specified Options		Code
Class	Buck		1
	Doe		2
	Wether		3
	Doe and wether		4
	Any combination		0
Maturity	Kid goat	14 months or less	1
	Yearling goat	14 to 24 months	2
	Goat	More than 24 months	3
	Kid or yearling	24 months or less	4
	Any combination		0
Breed Type	Dairy		1
	Meat		2
	Breed specified (See purchaser specified descriptions)		3
	Any combination		0

Category	Purchaser Specified Options	Code
Forage Type	Special diet specified (See purchaser specified descriptions)	1
	Not specified/not applicable	0
Organic Certification	As specified	1
	Not specified/not applicable	0
Slaughter Method	Halal	1
	Kosher	2
	Other	3
	Conventional	0

If not specified, code 0 shall be used.

(a) Selection No. 1

Selection No. 1 live goats and/or carcasses have a superior meat type conformation without regard to the presence of fat cover. They shall be thickly muscled throughout the body as indicated by a pronounced (bulging) outside leg (*biceps femoris and semitendinosus*), a full (rounded) back strip (*longissimus dorsi*), and a moderately thick outside shoulder (*triceps brachii group*).

(b) Selection No. 2

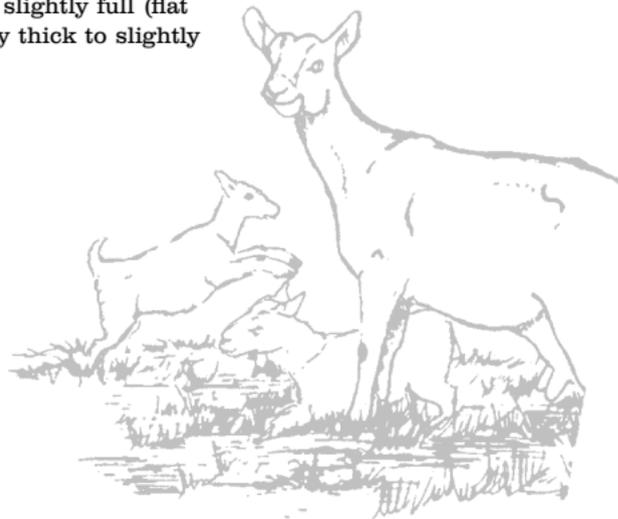
Selection No. 2 live goats and/or carcasses have an average meat type conformation without regard to the presence of fat cover. They shall be moderately muscled throughout the body as indicated by a slightly thick and a slightly pronounced outside leg (*biceps femoris and semitendinosus*), a slightly full (flat or slightly shallow) back strip (*longissimus dorsi*), and a slightly thick to slightly thin outside shoulder (*triceps brachii group*).

(c) Selection No. 3

Selection No. 3 live goats and/or carcasses have an inferior meat type conformation without regard to the presence of fat cover. The legs, back, and shoulders are narrow in relation with its length, and they have a very angular and sunken appearance.

Other Selection Criteria

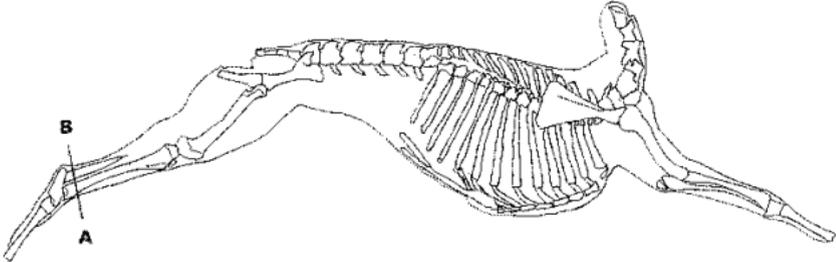
In addition to the selection criteria outlined on the previous page, other specifications may be placed on the biological type, nutrition, age, and management of meat goats.

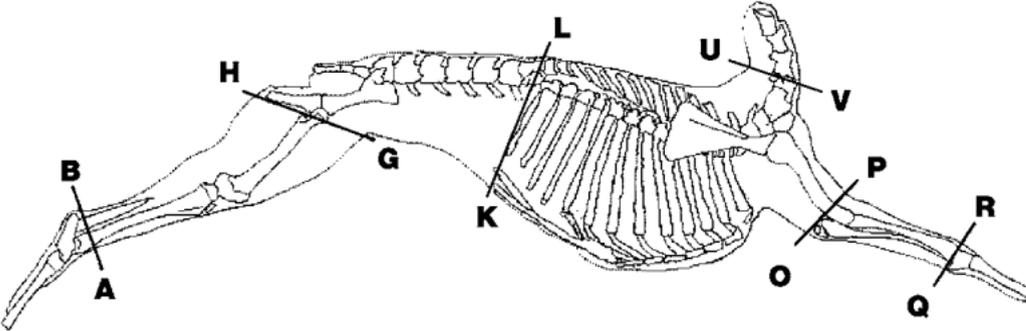


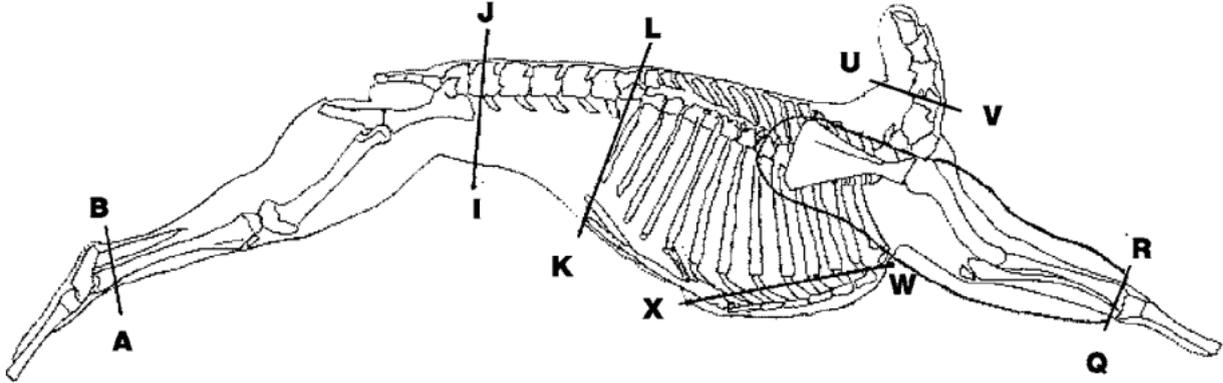
Styles of Goat Carcasses

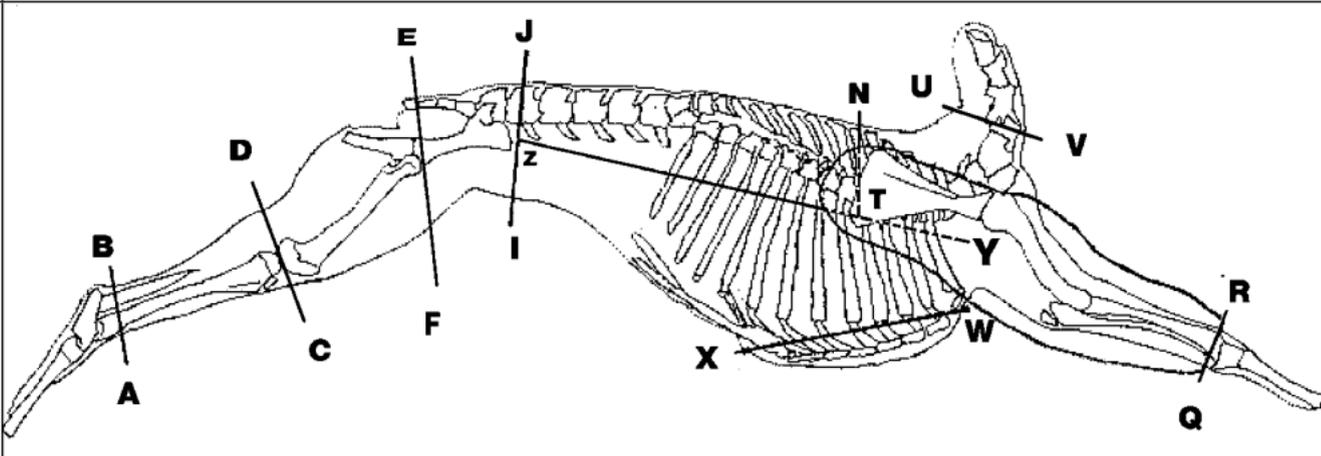
To create portion sizes that can be easily merchandized, five styles of goat carcasses have been created based on the size of the carcass. As the carcass gets larger, it can be cut into more pieces of suitable size. Below are general guidelines for fabricating carcasses of each style along with a description of where each of the cuts is made.

Table 4. Fabrication of Different Styles of Goat Carcasses

Recommended Weight Range for Each Style	Recommended According to Goat Size
<p>Platter Style - 1</p> <p>Weight Range 20 pounds or less</p>	

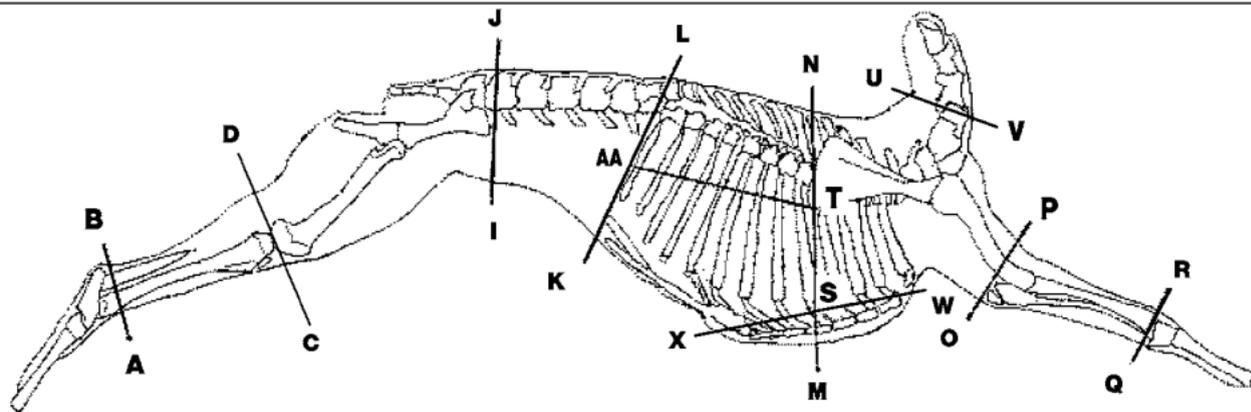
Recommended Weight Range for Each Style	Recommended According to Goat Size
<p>Roasting Style - 2</p> <p>Weight Range 15 to 30 pounds</p>	 <p>A diagram of a goat carcass, viewed from the side, with various anatomical parts labeled with letters A through V. The labels are: A (hoof), B (leg), G (loin), H (back), K (ribs), L (loin), O (leg), P (leg), Q (hoof), R (leg), U (head), and V (neck).</p>

Recommended Weight Range for Each Style	Recommended According to Goat Size
<p data-bbox="144 236 264 291">Barbeque Style - 3</p> <p data-bbox="144 322 336 377">Weight Range 20 to 40 pounds</p>	 <p data-bbox="532 246 1755 629">A diagram of a goat carcass in a side view, showing the skeletal structure and major muscle groups. The carcass is labeled with letters A through V, indicating specific cuts or parts. A is the front leg, B is the hock, I is the loin, J is the rib, K is the chuck, L is the rib, U is the neck, V is the head, W is the chuck, X is the chuck, Q is the rear leg, and R is the hock.</p>

Recommended Weight Range for Each Style	Recommended According to Goat Size
<p>Food Service Style - 4</p> <p>Weight Range 30 pounds and up</p>	 <p>The diagram shows a side view of a goat carcass with 16 cut points labeled A through V. The labels are as follows: A (front hoof), B (front leg), C (front joint), D (front leg), E (front joint), F (front leg), G (front joint), H (front leg), I (front joint), J (front leg), K (front joint), L (front leg), M (front joint), N (front leg), O (front joint), P (front leg), Q (front joint), R (front leg), S (front joint), T (front leg), U (front joint), V (front leg), W (front joint), X (front leg), Y (front joint), Z (front leg).</p>

**Hotel
Style - 5**

Weight Range
40 pounds and up



<http://www.ams.usda.gov/lsg/imps/imps11.pdf>

Table 5. Points of Fabrication Legend for Table 4

Fabrication Points and Styles	Cutting Locations / Descriptions
A - B	A straight cut made at or above the hock joint
C - D	A straight cut made at or above the stifle joint
E - F	A straight cut immediately anterior to the ball of the femur
G - H	A perpendicular cut immediately posterior of the hipbone
I - J, J - Z	A straight cut immediately anterior to the hipbone
K - L, AA - K, AA - L	A straight cut posterior to the last ribs
M - N, N - T, S - T	A straight cut between the fourth and fifth ribs
O - P	A straight cut at or above the elbow joint
Q - R	A straight cut made at or above the knee joint
U - V	A straight cut made through the fourth cervical vertebrae
S - X, S - W, W - X	A straight cut extending from the cartilaginous junction at the first rib to the posterior end of the sternum
Y - Z, T - Z, T - Y	A straight cut on the anterior end immediately ventral to the base of the thoracic vertebrae to a point on the posterior end immediately ventral to the longissimus dorsi
AA - T	A straight cut across the ribs

Platter Style

This style was developed to provide an outlet for small goats, such as the pigmy, where the carcass size may not be appropriate for fabrication. In addition, this style provides for stuffing and display as a center-of-the-table item. After removal of the hind trotter (A-B), (1) the hind legs will be pulled so the hind shank bones are inserted into the thoracic cavity; and (2) the forelegs are pulled so the fore trotters are inserted between the hind legs toward the pelvic cavity (Figure 2).

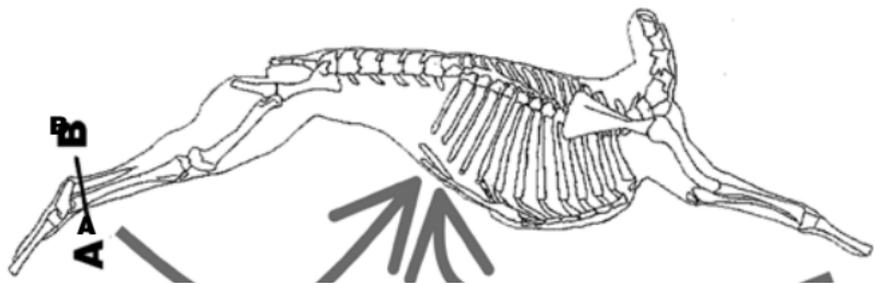


Figure 2. Fabrication of a Platter-Style Carcass

Roasting Style

The roasting style is intended for small- to medium-sized goats with sufficient weight for use in the traditional cabrito market. It provides more usable meat than the platter style. This item is separated into foreshank, neck, foresaddle, double loin (rump-on), and leg (Item Nos. 10, 13, 21, 51, and 71).

Barbeque Style

The barbeque style is intended for fabrication of medium-sized goats. As the name implies, this style is ideal for making the barbeque cuts found during the peak goat eating seasons. It is easily fabricated into cuts for placing on the barbeque pit. This item shall be separated into the neck, outside shoulder, ribs, breast, loin, and legs (Item Nos. 13, 23, 31, 34, 50, and 70).

Food Service Style

The food service style is intended for medium- to large-sized goats to prepare for retail cuts that may be attractive to the food service industry. This item shall be separated into the foreshank, neck, outside shoulder, inside shoulder, breast, ribs (breast-on), back, sirloin, and leg (shank-off) (Item Nos. 11, 13, 23, 24, 34, 35, 40, 60, and 73).



Hotel Style

The hotel style is intended for large-sized goats that are ideal for producing cuts similar to the current hotel/retail cuts of lamb. This item shall be separated into the foreshank, hindshank, neck, square-cut shoulder, rack, ribs (breast-off), breast, loin, and leg (shank-off) (Item Nos. 10, 11, 13, 22, 30, 33, 34, 50, and 72).



Table 6. Typical Weight Range in Pounds of Various Cuts in Each Selection Criteria and Style.
(Yield of Goat Carcasses)

Item	Product Name	Code (Typical Weight Ranges in Pounds)					
		1	2	3	4	5	6
00	Carcass	15 or less	15 to 30	30 to 40	40 or more	Purchaser Specified Weight Range	No Weight Range Specified (Any Combination)
00	Platter Style	* 20 or less	20 or more	N/A	N/A		
00	Roasting Style	* 15 - 30	30 or more	N/A	N/A		
00	Barbeque Style	20 to 30	* 20 to 40	30 or more	N/A		
00	Food Service Style	20 to 30	* 30 to 40	40 or more	N/A		
00	Hotel Style	40 or less	* 40 or more	N/A	N/A		
10	Foreshank	0.5 or less	0.5 or more	N/A	N/A		
11	Hindshank	0.5 or less	0.5 or more	N/A	N/A		
12	Hindshank, Heel On	0.75 or less	0.75 or more	N/A	N/A		
13	Neck	0.25 or less	0.25 or more	N/A	N/A		
21	Foresaddle, Streamlined	4 or less	4 to 6	6 or more			
22	Shoulder, Square-Cut	7 or less	7 to 10	10 or more			

All estimates are made assuming no external fat covering.

Item	Product Name	Code (Typical Weight Ranges in Pounds)					
		1	2	3	4	5	6
23	Outside Shoulder	2.5 or less	2.5 or more	N/A	N/A	Purchaser Specified Weight Range	No Weight Range Specified (Any Combination)
24	Inside Shoulder, Squared	1.5 or less	1.5 or more	N/A	N/A		
30	Rack	1.5 or more	1.5 to 3	3 or more	N/A		
31	Ribs, Full Set	5 or less	5 to 10	10 or more	N/A		
32	Rack, Frenched	1.5 or less	1.5 to 3	3 or more	N/A		
33	Ribs, Breast Bone Off	1.5 or less	1.5 to 3	3 or more	N/A		
34	Breast	0.3 or less	0.3 or more	N/A	N/A		
35	Ribs, Food Service Style, Breast On, Full Set	1.5 or less	1.5 to 3	3 or more	N/A		
40	Back	5 or less	5 to 8	8 or more	N/A		
41	Back Strip, Boneless	2 or less	2 to 4	4 or more	N/A		
50	Loin	2 or less	2 to 4	4 or more	N/A		
51	Loin, Rump On, Double	2 or less	2 to 4	4 or more	N/A		
52	Tenderloin	0.3 or less	0.3 to 0.75	0.75 or more	N/A		
60	Sirloin	0.75 or less	0.75 to 1.5	1.5 or more	N/A		
70	Legs	5 or less	5 to 8	8 or more	N/A		

Item	Product Name	Code (Typical Weight Ranges in Pounds)					
		1	2	3	4	5	6
71	Leg, Roasting Style	2 or less	2 to 4	4 or more	N/A	Purchaser Specified Weight Range	No Weight Range Specified (Any Combination)
72	Leg, Shank Off	4 or less	4 to 6	6 or more	N/A		
73	Leg, Shank Off, Sirloin Off, Partially Boneless	3 or less	3 to 5	5 or more	N/A		
74	Leg, Shank Off, Partially Boneless	3 or less	3 to 5	5 or more	N/A		
80	Leg, Inside	1.5 to 2	2 or more	N/A	N/A		
81	Leg, Bottom	2 to 3	3 or more	N/A	N/A		
82	Leg, Outside	1.5 to 2	2 or more	N/A	N/A		
83	Leg, Tip	0.5 or less	0.5 or more	N/A	N/A		
84	Leg, TBS, 4 Parts	4 or less	4 to 6	6 or more	N/A		
85	Leg, TBS, 3 Parts	4 or less	4 to 6	6 or more	N/A		
86	Leg, TBS, 3 Parts	4 or less	4 to 6	6 or more	N/A		
90, 91, 92, 93, and 94		Use Code 5					

<http://www.ams.usda.gov/lsg/imps/imps11.pdf>

State of Alabama Resources

Alabama Farmers Federation

Director of Meat Goat and Sheep Division

Phone: (800) 392-5705, ext. 4757

Phone: (334) 613-4757

Fax: (334) 284-3957

Department of Agriculture & Industries Commissioner

Phone: (334) 240-7100

Fax: (334) 240-7190

State Veterinarian

Phone: (334) 240-7253 ext. 1

Fax: (334) 240-7198

Diagnostic Laboratory

(Auburn)

Phone: (334) 844-4987

Fax: (334) 826-3592

(Boaz)

Phone: (256) 593-2995

Fax: (256) 593-2996

(Elba)

Phone: (334) 897-6340

Fax: (334) 897-8813

(Hanceville)

Phone: (256) 352-8036

Fax: (256) 352-8038

Premises Identification Coordinator

Phone: (334) 240-7253

Fax: (334) 240-7198

Livestock Market News

Phone: (334) 240-7180

Fax: (334) 223-7501



Livestock Markets

(Sheep and Goat Sales)

Alabama Goat Auction, Boaz

Phone: (256) 878-0739

Sale Day: Saturday

Sale of Sheep and Goats

Alabama Livestock Auction

Phone: (334) 628-2371

Sale Day: Tuesday

Sale of Cattle, Sheep, Goats, and Hogs

Clay County Goat and Poultry Auction

Phone: (256) 839-6824

Sale Days: Second and Fourth Saturdays

Sale of Sheep, Goats, Poultry, Rabbits, and Swine

Central Alabama Goat and Poultry Auction

(Chilton County)

Phone: (205) 280-4628

Sale Days: Second and Fourth Saturdays

Sale of Sheep, Goats, and Poultry

Cullman Stockyard

(Cullman County)

Phone: (256) 734-4531

Sale Day: Thursday morning

Sale of Cattle, Sheep, and Goats

East Alabama Goat and Poultry Auction

Phone: (256) 449-6376

Sale Days: First and Third Saturdays

Sale of Goats

Escambia County Coop., Brewton

Phone: (251) 867-5111

Sale Day: Saturday

Sale of Sheep and Goats

Montgomery Stock Yards

(Montgomery County)

Phone: (334) 288-8060

Sale Day: Monday

Sale of Goats and Sheep

Southern Star Stockyard, Elgin

Phone: (256) 247-5189

Sale Day: Second Friday night

Sale of Sheep and Goats

For information related to other stockyards and livestock auctions in your area, contact the Stockyards and Brands Section of the Alabama Department of Agriculture and Industries at (334) 240-7100.

Meat Goat and Sheep Personnel at Auburn University

Don Ball, *Extension Specialist*,

Forage Crops

Phone: (334) 844-5491

Fax: (334) 844-4586

Robert Ebert, *Extension Animal Scientist Youth/4H*

Phone: (334) 844-1563

Fax: (334) 844-1519

Diego M. Gimenez, *Extension Specialist*, Reproduction

Phone: (334) 844-1520

Fax: (334) 844-1519

Chris Kerth, *Extension Specialist*, Meat Science

Phone: (334) 844-1503

Fax: (334) 844-1519

Nada K. Nadarajah, *Extension Research Fellow*, Breeding and Genetics

Phone: (334) 844-1502

Fax: (334) 844-1519

Darrell L. Rankins, *Extension Specialist*, Ruminant Nutrition

Phone: (334) 844-1546

Fax: (334) 844-1519

Max W. Runge, *Extension Economist*,

Farm Management, Enterprise Budgets

Phone: (334) 844-5603

Fax: (334) 844-5639

Soren P. Rodning, *Extension Veterinarian*

Phone: (334) 844-1521

Fax: (334) 844-1519

For e-mail addresses and other contact information, see the Alabama Cooperative Extension System Web site at <http://www.aces.edu>.

Meat Goat and Sheep Personnel at Alabama A&M University

Julio E. Correa, *Urban Extension Specialist, Production*

Phone: (256) 372-4173

Fax: (256) 372-5840

Jacqueline U. Johnson, *Urban Extension Veterinarian*

Phone: (256) 372-5773

Fax: (256) 372-5840

Maria L. Leite-Browning, *Extension Animal Scientist*

Phone: (256) 372-4954

Fax: (256) 372-5840

Robert Spencer, *Urban Regional Extension Specialist*

Phone: (256) 766-6223

Fax: (256) 718-2049

Tommie Teacher, *Urban Regional Extension Agent*

Phone: (334) 624-8710

Fax: (334) 624-8807

For e-mail addresses and other contact information, see the Alabama Cooperative Extension System Web site at <http://www.aces.edu>.

Meat Goat and Sheep Personnel at Tuskegee University

Nar K. Gurung, *Nutrition, Goats*

Phone: (334) 727-8457

Fax: (334) 727-8552

Sandra Solaiman, *Nutrition, Goats*

Phone: (334) 727-8401

Fax: (334) 727-8552

For e-mail addresses and other contact information, see the Tuskegee University Web site at <http://www.tuskegee.edu>.



Your Experts for Life

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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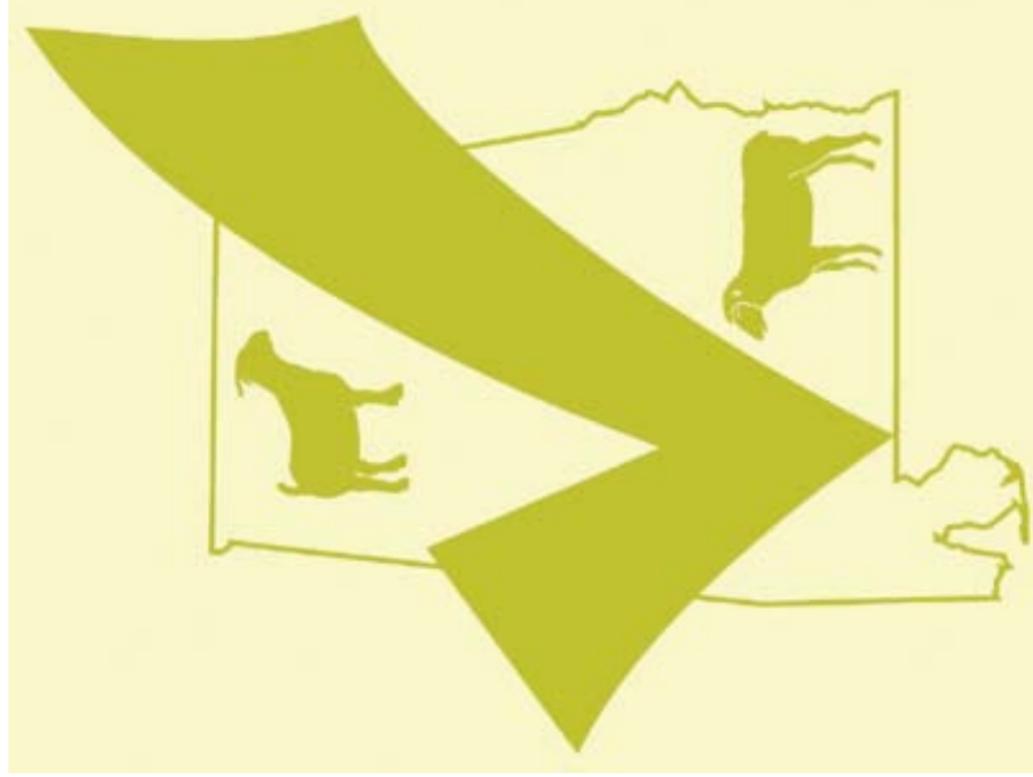
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Alabama Sheep and Goat Checkoff Program



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