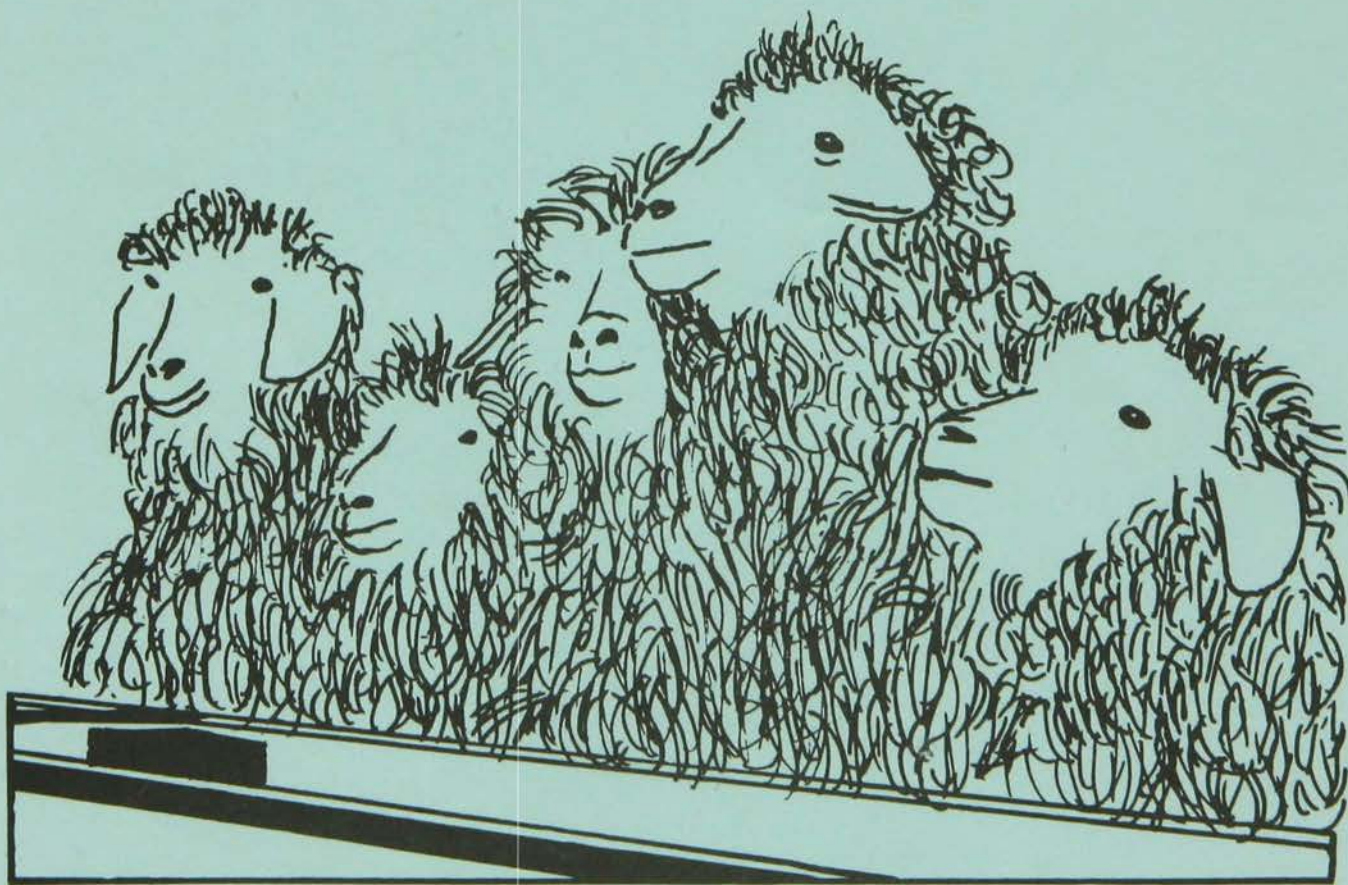


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Angora Goat Seminar

September 26, 1987

Sheep/Goat Research Barn,
St. Paul Campus
University of Minnesota



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Program Format
Goat Seminar
Saturday, September 26, 1987

Chairman: R.M. Jordan

Location: Sheep-Goat Research Barn

<u>Time</u>	<u>Subject</u>	<u>Participant</u>
9:30-10:15	Selecting replacement goats - a dialog and evaluation of 4 yearling does.	R.M. Jordan & Warren Formo
10:15	Coffee	
10:30-11:15	Evaluation and judging of 4-6 yearling does evaluated in the hair.	Participants
11:15-12:00	Shearing, trimming hooves	Warren Formo
	Evaluation of fleeces from sheared yearling does.	Dick Boniface & R.M. Jordan
12:00-12:30	Evaluation and judging of 4-6 yearling does. Out of the hair.	Participants
12:30-1:30	Lunch Sheep-Goat Research Barn	
1:30-2:15	Husbandry practices, goat equipment, management of billy at breeding, castration, drenching, delousing, earmarking etc.	R.M. Jordan & Warren Formo
<u>Questions / Answers</u> <u>Peters Hall</u>		
2:15-2:45	Goats in Texas, Texas Billy Test What We've Seen	R.M. Jordan & Warren Formo
2:45-3:30	Goat research at Minnesota	R.M. Jordan
3:30-4:00	Questions and discussion of goat association	Participants

Some Frequently Asked Questions About Angora Goats

1. Where can I buy goats and how much do they cost?

There are not many breeding goats locally. If you wanted 2-4 head of does, we have a list of breeders who could fill that order and certainly yearling wethers are available. If you want 25-100 head, Texas would be your best source.

The price/head would depend on quality, sex, age and supply and demand.

In Minnesota, Yearling wethers sell for	\$50-100
Yearling does sell for	\$100-150
Aged does (6-8 years)	\$60-100
Doe kids (6-8 months)	\$60-100

In Texas, Yearling does sell for	\$65-90
Aged does sell for	\$50-75
Kids - are often not offered	
Wethers	\$40-60

Normally the quality (hair grade and amount) of Texas goats would be superior to Minnesota goats.

Registered Yearling does - Texas	\$250- 500
Yearling bucks - Texas	\$350-1500

If hair prices increase, goat prices will advance. Supply and demand has a big effect on prices.

2. Where can one sell mohair?

We sell ours to North Central Wool Marketing Corp., 101-27th Ave. SE, Minneapolis, who in turn bag it and ship it to Texas. Virtually all mohair ends up in Texas and eventually England. One could individually ship to Texas, but you have to wait 9-10 months for payment. There is a government incentive payment on mohair of about 60%

3. Where can I sell my "worn out" wethers and does?

That's an unresolved question. They eat them in Texas. Our people don't, though the Bar-B-Q sauce they are "laced" with make them tasty. Eventually, someone will surface and "gather up" 500 head and send them to Texas at a profit. If you only have 2-3 head, you may have to "ship them to heaven".

4. What kind of housing and feed is required?

The same as for sheep. Goats can't stand cold wet weather as well as sheep and are very vulnerable following shearing.

During gestation, we feed 2 parts alfalfa hay and 1 part corn; and during lactation we feed equal parts of alfalfa hay and corn.

Points of Emphasis in Selecting Angora Goat Replacements

R.M. Jordan and Warren Formo

Formo's preference:

Maximize pounds of hair produced. In doing so the fleece will tend to be flat-lock or a mix of flat-lock and ringlet type of lock. The hair will be long stapled, almost invariably coarser (fiber diameter, 42 to 45 microns), higher yielding and equal in luster and soft handling qualities to goats producing finer hair (fiber diameter, 35 to 40 microns).

Coarser fleeced goats tend to be larger in frame, are certainly more prolific, logically produce more milk, and their hair, while coarser, can be as uniform in grade over their bodies as goats with finer fleeces.

Jordan's preference:

Finer grading hair with a micron measurement of 33 to 38. A higher price (\$.50 to \$2.00/lb) may be paid for hair with a micron measurement of 35 to 38 compared to hair with a micron measurement of 45 to 48. Furthermore there may be times when there is simply no bid on the coarser hair. If the finer hair, sells for \$.50/lb more than coarse hair, the return/fleece will be the same when hair production is 20% less/head (16 lb vs 20 lb). Admittedly, the finer haired goats often produce 15 to 20% less.

As goats become older their hair becomes coarser (larger in diameter or higher micron number). If goats start out with a fine fleece one may be able to sell hair from the 3rd shearing as spring clip kid hair or hair from the 5th shearing as yearling hair. Both situations would increase the sale price appreciably.

Mohair is a luxury fiber and even so called fine hair (30-35 micron) is very course as compared to the diameter of wool fibers.

So Formo is banking on more pounds of hair and greater kid production/doe. Jordan is aiming at a higher price/lb which he hopes will offset the lower production. On balance under present circumstances Formo should win the argument.

Obviously, maximum production of fine haired is ideal. Good or poor breed type, Kemp, sway backs, crooked legs, split scrotums, miscolored horns, abnormal mouths, hair blind etc can be seen on both fine and coarse haired goats. Upgrade your flock with well bred Billies.

POINTS TO CONSIDER IN SELECTING BREEDING ANIMALS

Age. Breeding animals 8 years of age or older are decreasing in mohair and kid production abilities. Their fleeces are getting coarse, and they are more apt to have udder problems.

Uniformity of fleece. Give this point maximum selection pressure. More fleece uniformity in Angora goats is currently essential, so discard those lacking uniformity from the breeding flock.

Conformation. Do not keep animals with poor conformation for breeding purposes because of possible weaknesses in constitution and vigor. Look for the same conformation virtues and faults that you would in sheep or cattle.

Size. Since size may affect the constitution and vigor of the animal, small goats usually are not desirable breeding animals. Larger goats normally produce more hair and are more prolific.

Fertility. Give this a great deal of selecting pressure. Discard poor or irregular breeding does. Give preference to does that produce multiple young. Mark "dry" does the first time; sell them the second time.

Short staple length. Shortness is undesirable because of possible rapid decline in production. A 6-inch fiber is not more valuable per pound than 4-inch staple, but fiber length contributes greatly to pounds of hair produced per goat.

Light fleece weight. Avoid light weight because mohair is still sold by the pound. Fleece weight is highly heritable.

Density. Eliminate animals with light, fluffy fleeces from the breeding flock because this affects total fleece weight and mohair quality. But don't select for excessive oil content.

Quality of mohair. Quality refers primarily to fineness. Discard animals with coarse fleeces (52-60 microns). Select goats that have lustrous, even crimped fleeces with good hair growth well up on their chins.

Kemp or colored fibers. Remove animals possessing these defects from the breeding flock. Moderate hair on the face is desirable. Cull hair blind or bald-headed goats.

ANGORA GOAT PLACING AND REASONS SHEET

Class No. _____

Placing Order: 1st _____ 2nd _____ 3rd _____ 4th _____

Reasons: List the number of the goat which matches the description below.

Description	Goat Number
Largest bodied, largest goat	
Smallest bodied, smallest goat	
Longest bodied goat	
Goat with the weakest shoulders and top or back	
Goat with the most correct feet and legs	
Goat with the most desirable breed character	
Goat with the finest fleece	
Goat with the coarsest fleece	
Goat with the most uniformity of fineness of fleece	
Goat with the longest staple fleece	
Goat with the shortest staple fleece	
Goat with the brightest luster to fleece	
Goat with the most dense covering of mohair	
Goat with the most coarse mohair on throat	
Goat which shows the most mohair covering on face	
Goat which has the most pounds of clean mohair	

Reasons scoring: 50 total points possible

PLACING SCORE _____

(Deduct 3 points for each incorrect answer.)

REASON SCORE _____

**OFFICIAL ANGORA JUDGING GUIDE OF THE
TEXAS ANGORA GOAT RAISERS' ASSOCIATION**

Adopted April, 1985

BODY — 50 POINTS

	<u>Points</u>
Size and Weight for Age (Minimum weight: yearling buck, 80 lbs.; yearling doe, 60 lbs.)	11
Constitution and Vigor (Width and depth of chest, fullness of heartgirth and spring of ribs.)	8
Conformation (Width and depth of body, straightness of back, width of loin, strength of back.)	11
Amount of Bone (Indicated by size of bone below knee and hock. Should be clean and in proportion to size of animal. Strength of feet and legs.)	8
Angora Breed Type (Indicated by head, horns, ears, color markings, small freckles not objectionable. Horns should be wide set on a buck and should spiral outward and go back.)	12

PHYSICAL DISQUALIFICATION: All blue or black horn or hoof, deformed mouth, broken down pasterns, deformed feet, crooked legged (including cow hocks), abnormalities of testicles, close set distorted horns, sway back.

FLEECE — 50 POINTS

Length of Fleece (Equivalent to one inch per month or more, uniform over the body, and a high yielding fleece.)	6
Uniformity, Character, and Completeness of Covering (Uniformity includes type of lock and covering. Adequate covering of mohair over entire body, neither too much nor too little on face.)	12
Luster and Softness of Fleece (Luster is a good, bright type of mohair.)	8
Density of Fleece (Indicated by number of fibers per unit of area, visually by amount of skin exposed when fleece is parted.)	8
Fineness of Fleece (Uniformity of fineness of entire fleece.)	16

DISQUALIFYING CHARACTERISTICS OF FLEECE: Excessive kemp, colored hair, sheepy fleece, straight beard-type hair in fore-top or on back.

To Be Re-evaluated in 1990

NAME OR NO. _____

MOHAIR PLACING AND REASONS SHEET

Class No. _____

Placing order 1st _____ 2nd _____ 3rd _____ 4th _____

Reasons: list the number of the fleece which matches the fleece description below

Fleece Description	Number
Finest fleece in class	
Coarsest fleece in class	
Most uniform in fineness	
Longest staple fleece	
Shortest staple fleece	
Most uniform in staple length	
Fleece with the brightest luster	
Fleece with the least luster	
Fleece with the greatest softness	
Heaviest grease fleece weight	
Lightest grease fleece weight	
Most pounds of clean mohair	
Least pounds of clean mohair	
Fleece with most vegetable matter	
Fleece with most stained mohair	
Fleece with the most kemp	

Reasons scoring: 50 total points possible

PLACING SCORE _____

Deduct 3 points for each incorrect answer

REASON SCORE _____

Definitions

Break	Wool that is abnormally weak in one spot in the staple length of the wool.
Breech or britch	Coarse hair-like fibers on the lower hind legs and around the dock of some sheep.
Character	General appearance of the wool or mohair with special reference to the possession of crimp.
Clip	Wool or mohair produced by one flock of sheep or Angora goats.
Clothing wool	Wool that is not suited to combing and is used in the woolen system of manufacturing. Usually, wool of short fiber length.
Color	A bright white to cream is the most desirable color of wool. Other colors are referred to as "off-colors."
Condition	Amount of yolk contained in the fleece.
Crimp	Natural curl or waviness of the fiber.
Defect	Vegetable content of wool and mohair.
Fleece	Wool or mohair produced by one sheep or Angora goat at one shearing.
French combing	Wool or medium fiber length and suitable for combing on the French combs.
Grading	Separating entire fleeces into groups according to fineness and length.
Hank	A standard length of yarn, sometimes called a skein. In worsted yarn, a hank is 560 yards.
Kemp	Opaque, hair-like fiber which is brittle and chalky white. It is a serious defect.
Lock	A group of fibers clinging together within a fleece.
Luster	Shininess of the fiber or its ability to reflect light.
Noils	The short fibers removed from the long ones in the combing process.
Purity	Freedom from off-type fibers, such as hair, kemp and colored fibers.
Quality	A term used in the wool trade to indicate fineness.
Shrinkage	The weight raw wool loses when scoured, expressed as a percentage of the original weight.
Sorting	Breaking up individual fleeces into various grades determined by their fineness and length.
Soundness	Strength of the fiber or freedom from breaks and tenderness.
Spinning count	The number applied to wool indicating the fineness of the yarn which can be spun from it. The numbers are derived from the number of hanks of 500 yards each that are required to weigh 1 pound.
Staple wool	Wool with suitable fiber length to permit it to be combed on the Noble combs. Wools with excellent length within a grade for fineness.
Tags	Heavy, dung-covered locks of wool or mohair.
Tender	Wool that is abnormally weak throughout the entire length of the fiber.
Top	A continuous band of wool fibers that have been made parallel and have had the short fibers, called noils, taken out by combing. Top is an intermediate stage in the manufacture of worsted yarn.
Yield	Percentage of clean fiber left in a lot after scouring.
Yolk	The natural secretions of the skin that cling to the wool or mohair fiber. Yolk is made up of natural oil and perspiration salts.

AGE AND SEASON EFFECTS ON MOHAIR PRODUCTION

James W. Bassett
Animal Science Department
Texas A&M University

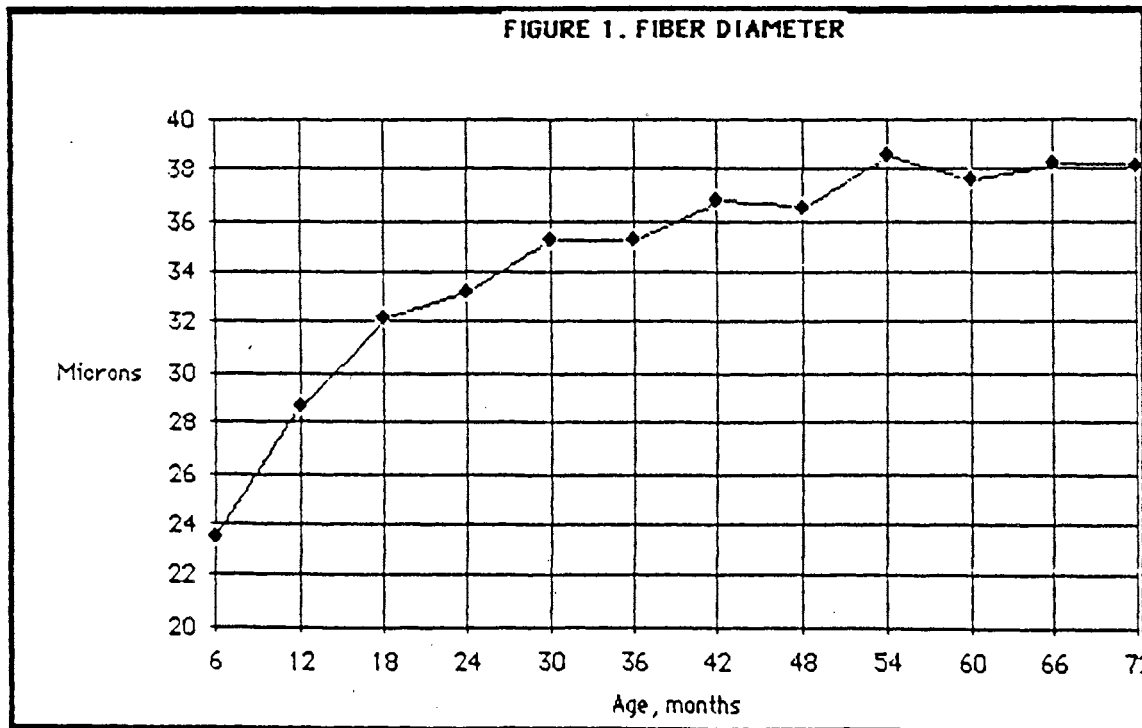
Fiber Diameter

The greatest effect of age of goat on mohair production is on fiber diameter, although fleece weights and lock lengths are also effected. The current marketing terminology used in the U.S. is based on age effects on fiber diameter. Marketing terms of "fall kid, spring kid, yearling, young goat, adult, etc." represent age differences that are used to indicate differences in fiber diameter. Fiber diameter gets coarser with age up to about 4-5 years of age and then tends to level off, although it may continue to be influenced by seasonal factors. Table 1 gives data which were collected from 5 producer flocks over a 3-year period of time (six shearing seasons), during which time fleece and body weights and fiber measurements were obtained from individually identified goats for as long as they were retained within the flocks. Figure 1 shows these data in graphic form.

The effect of season on fiber diameter is not readily apparent until 4 years of age, although there are indications prior to that age. At this age, the spring shearing is finer in fiber diameter than the previous fall, but it is also coarser than the previous spring, indicating that age is still exerting an influence. The seasonal effect is probably due in part to nutritional influences. Mohair shorn in the spring is that which has grown during the preceding fall and winter when range nutrition is generally of low value and the doe is also under nutritional stress from gestation. However, Angora goats which have been maintained under drylot conditions on a uniform plane of nutrition have also shown a finer fiber diameter in the winter as compared to summer.

Table 1. Age and Season Effects on Mohair Production

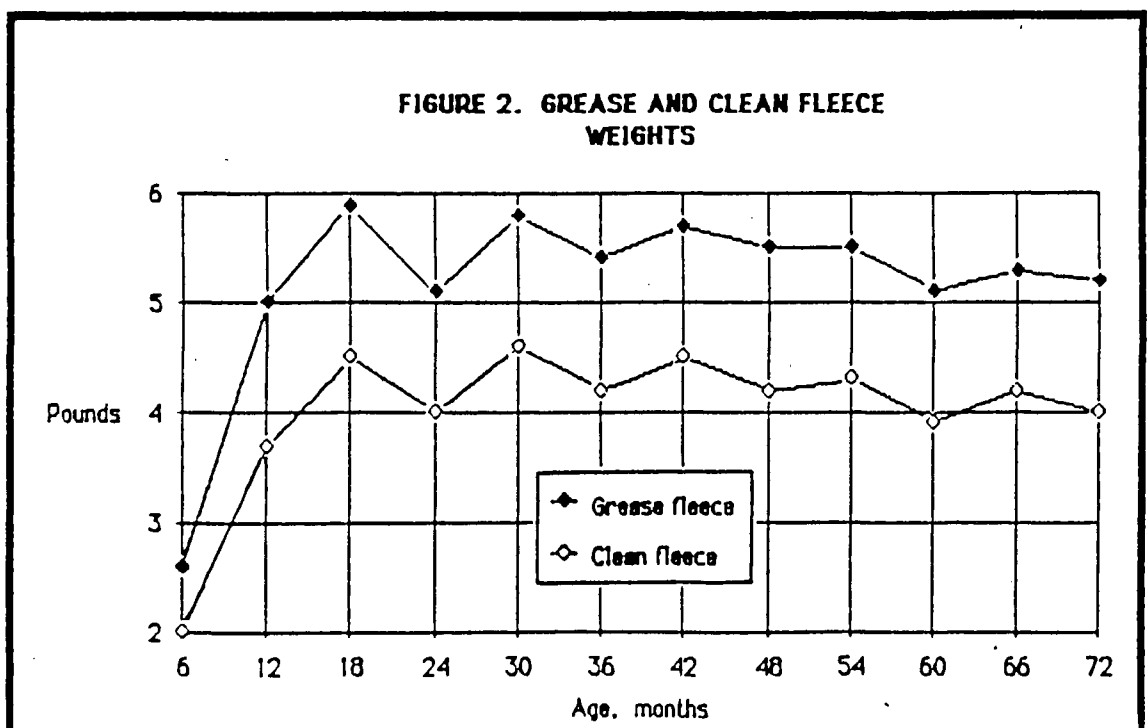
Age	No. of animals	Season	Fiber diameter		Fleece weight		Clean yield, %	Lock length
			Microns	Sp.Ct.	Grease	Clean		
1/2	52	Fall	23.5	40's	2.6	2.0	77.4	5.5
1	49	Spring	28.6	32's	5.0	3.7	73.3	4.8
1 1/2	93	Fall	32.1	28's	5.9	4.5	77.7	5.2
2	89	Spring	33.2	26's	5.1	4.0	77.4	4.0
2 1/2	129	Fall	35.3	24's	5.8	4.6	78.3	4.8
3	116	Spring	35.3	24's	5.4	4.2	77.8	4.0
3 1/2	122	Fall	36.8	24's	5.7	4.5	78.6	4.8
4	110	Spring	36.5	24's	5.5	4.2	77.1	4.1
4 1/2	70	Fall	38.6	22's	5.5	4.3	78.3	4.6
5	58	Spring	37.6	22's	5.1	3.9	77.4	4.1
5 1/2	33	Fall	38.2	22's	5.3	4.2	78.4	4.5
6	21	Spring	38.1	22's	5.2	4.0	76.7	4.0



Extensive studies with wool fibers have shown decreases in fiber diameter in the winter as compared to the summer which are not nutritionally related. In addition, a report from South Africa indicates a similar pattern for mohair with regard to fiber diameter, in that adult hair sold at the "winter" auctions (comparable to Texas spring hair) is finer in fiber diameter than adult mohair sold at the "summer" auctions.

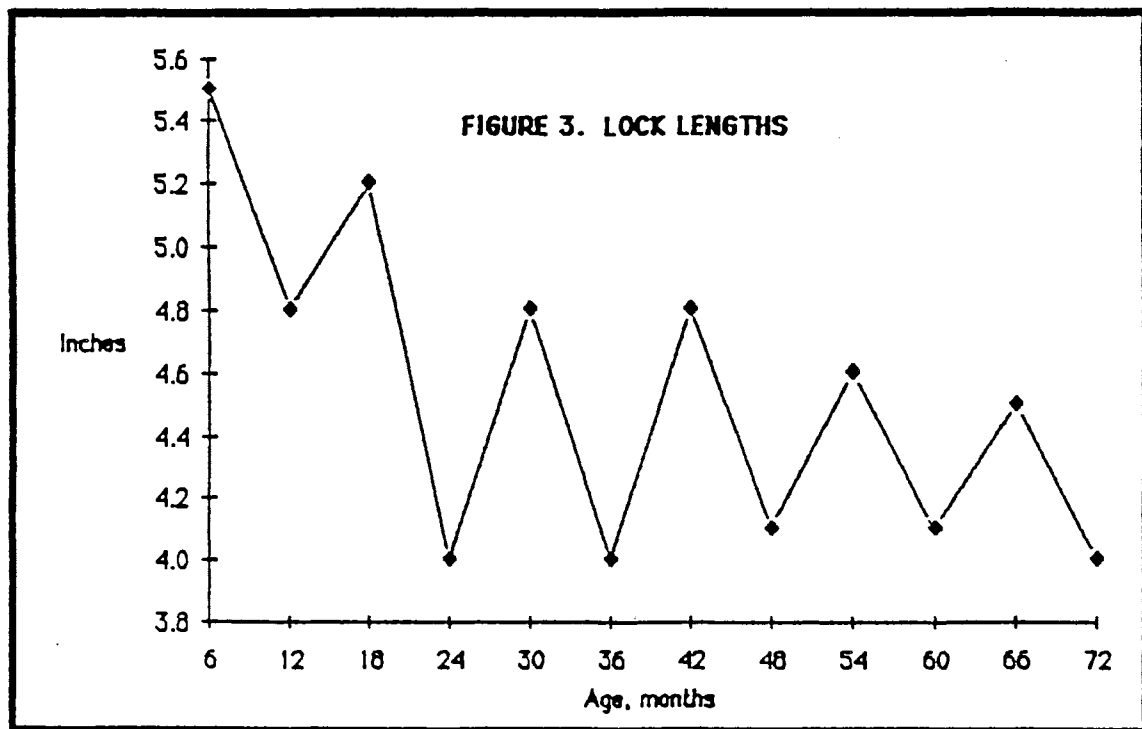
Grease and Clean Fleece Weights and Clean Yield

The lightest fleece weights are at the first shearing (6 months of age), largely because of a small body size, with the heaviest weights in the 2nd, 3rd and 4th years of production (Table 1 and Figure 2). Fleece weights (on a 12-months basis) begin to decrease after the 4th year. A distinct seasonal variation is shown after the first year in that the spring fleece is consistently lighter in grease fleece weight and lower in clean yield with a resulting lower clean fleece weight. There did not appear to be a consistent variation in clean yield which could be associated with age or fiber diameter.



Lock Length

Lock lengths show distinct seasonal influences, but also show a slow but steady decline in length with increasing age when fall and spring lengths are added to give yearly totals. Again, the greatest changes are from 6 months to two years of age. The spring shorn mohair is consistently shorter than fall shorn mohair (Figure 3), but the spring shorn mohair shows little change after 2 years.



Body Area Differences

A study looking at differences in fiber characteristics on different body areas was conducted over four shearings on the same group of animals (Figure 4). Averages for the body areas for several traits are given in Table 2. The neck area was the coarsest in fiber diameter, longest in lock length and

had the highest clean yield (often associated with coarser fiber diameter and longer length). The back area had the finest fiber diameter and with the britch area was the shortest in lock length. The britch area, while being intermediate for fiber diameter, was short and had the highest percent of kemp and medullated fibers.

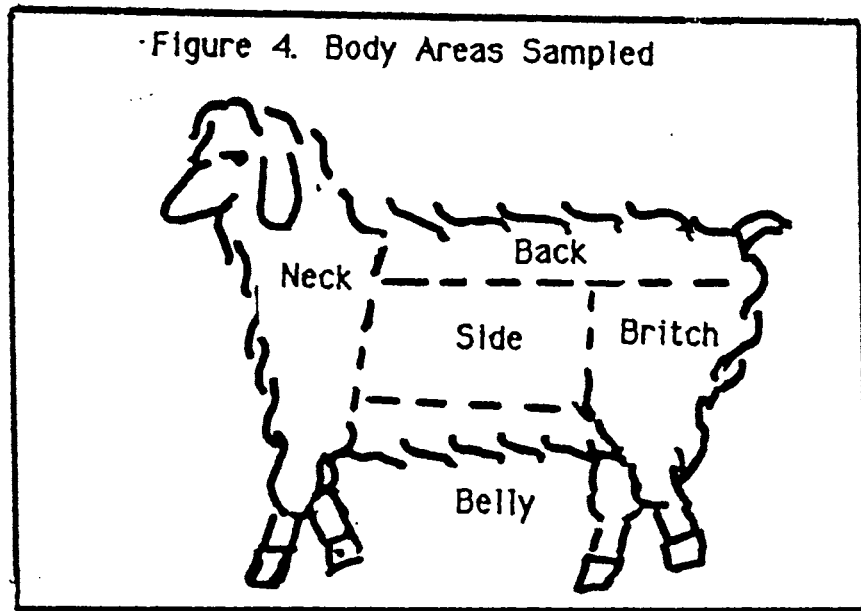


Table 2. Fiber Characteristics by Body Area

<u>Characteristic</u>	<u>Neck</u>	<u>Side</u>	<u>Back</u>	<u>Britch</u>	<u>Belly</u>
Grease fleece, percent	25.1	21.4	18.3	18.2	17.0
Fiber diameter					
Microns	33.1	31.3	30.4	31.6	32.4
Spinning count	26's	28's	30's	28's	28's
Lock length, inches	4.9	4.5	4.2	4.2	4.4
Clean yield, percent	78.2	76.5	74.2	77.0	71.8
Kemp, percent	0.15	0.16	0.16	0.53	0.14
Med fibers, percent	0.29	0.18	0.16	0.54	0.54

GRADES OF MOHAIR EXPECTED

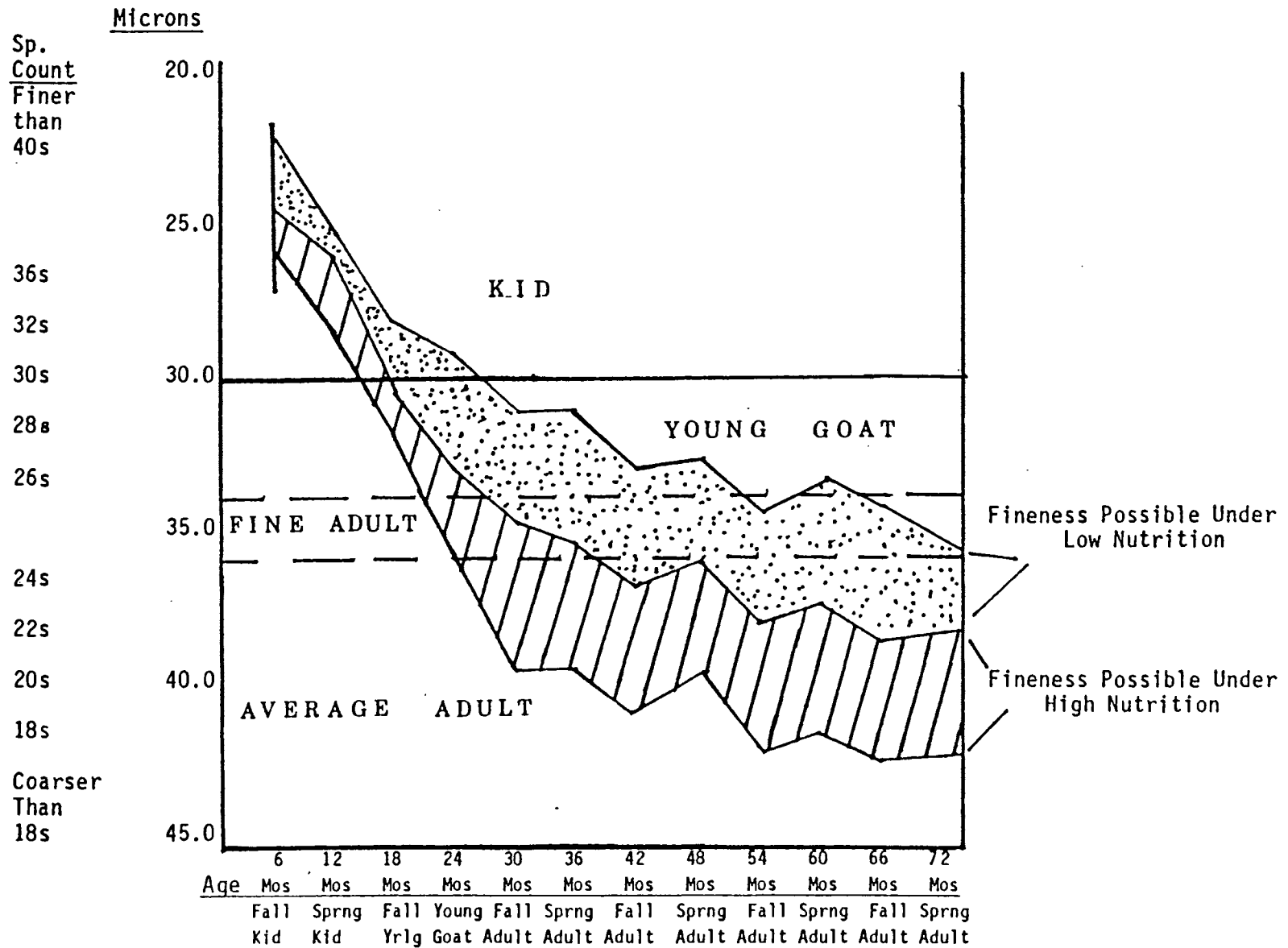
<u>Shearing</u>	<u>Terminology</u>	<u>Age of Goat</u>	<u>Time of Year</u>	<u>Grades Expected</u>
First	Fall Kid	6 Months	Fall	32s - 36s - 40s
Second	Spring Kid	12 Months	Spring	28s - 30s - 32s
Third	Fall Yearling	18 Months	Fall	26s - 28s - 30s
Fourth	Spring Young Goat	24 Months	Spring	26s - 28s - 30s
Fifth and Subsequent				24s - 26s - 28s 22s - 24s - 26s

Grade depends upon season of year, age of goats, breeding, and nutritional conditions.

SPECIFICATIONS FOR THE OFFICIAL GRADES OF MOHAIR*

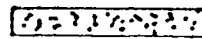
<u>Grease</u>		<u>Top</u>	
<u>Grade</u>	<u>Limits for Avg. Diam. (microns)</u>	<u>Grade</u>	<u>Limits for Avg. Diam. (microns)</u>
Finer than 40s	Under 23.01	Finer than 40s	Under 23.55
40s	23.01-25.00	40s	23.55-25.54
36s	25.01-27.00	36s	25.55-27.54
32s	27.01-29.00	32s	27.55-29.54
30s	29.01-31.00	30s	29.55-31.54
28s	31.01-33.00	28s	31.55-33.54
26s	33.01-35.00	26s	33.55-35.54
24s	35.01-37.00	24s	35.55-37.54
22s	37.01-39.00	22s	37.55-39.54
20s	39.01-41.00	20s	39.55-41.54
18s	41.01-43.00	18s	41.55-43.54
Coarser than 18s	43.01 & over	Coarser than 18s	Over 43.54

*USDA, AMS, Market Bulletin 62, March, 1977



EFFECT OF AGE AND NUTRITION ON FINENESS

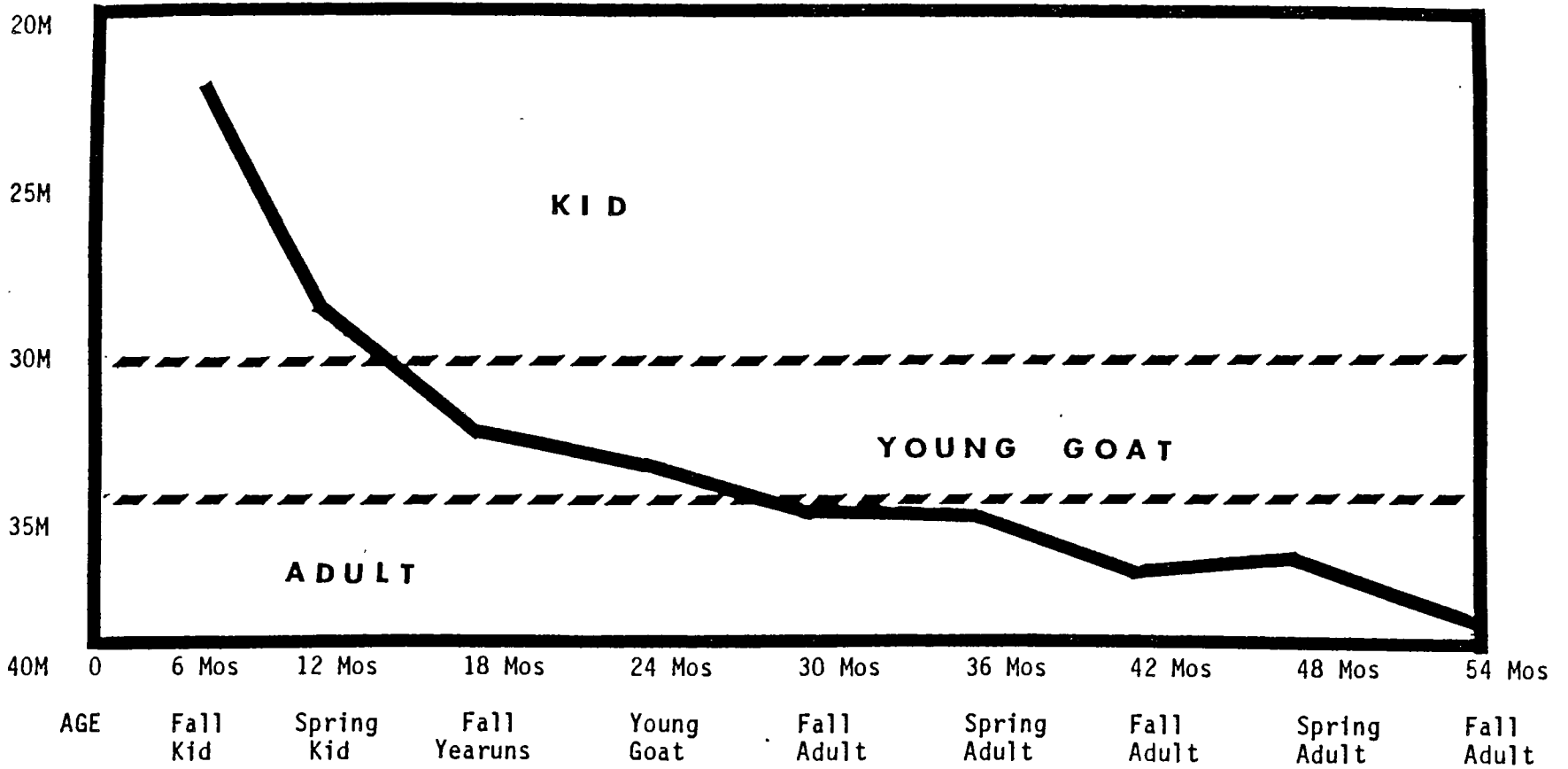
Low Nutrition



High Nutrition



FIBER FINENESS (MICRONS)



-15-

REPRODUCTION - ANGORA GOATS (TEXAS-B-1485, SHELTON AND GROFF)

1. Puberty: 6-8 months
2. Breeding Season: September-February
Both sexes seasonal breeders; don't cycle until exposed to male.
3. Estrus Cycle: 19-21 days
4. Estrus: 20-22 hours (young does and first estrus shorter)
5. Gestation: 149 days
6. 2nd Estrus Cycle: 20% > fertile
7. Effect of Weight on Ovulation of 244 Does: 10.2% didn't ovulate; 69.7% single and 20% twin ovulation

Body wt., lb	% no ovulation	Does with	
		Single ovulation	Twin ovulation
<50	60	40	0
50-60	21	79	0
60-70	7	85	8
70-80	3	76	21
80-90	2	52	46
90-100	0	18	82
>100	0	0	100

8. Fetal Development: frame growth - straight line; weight - curvilinear.
Last 2 weeks fetus gains .1 lb/day; avg. birth wt. = 4.5-7.5 lb.
9. Sources of Reproduction Losses:

Cause	% loss
a) Didn't cycle	10.7
b) Failed to conceive	12.5
c) Ovum not fertilized	19.9
d) Abortion	8.9
e) Embryo loss	12.2
f) Kided but lost kids	22.0
g) Death of kid	31.1

10. Abortion - Angora Goats:

Effect of weight of doe	
Weight	% aborting
<60	56
60-80	11.5
>80	0.0

	% aborting
Previous aborted	26.5
Kidded previous year	12.3
Both groups	16.1

Type and causes:

- a) Abortion storms -- 3.5 month gestation stress, low glucose levels - low energy intake - 20-40%
- b) Repeat aborters
- c) Disease-related

ANGORA KID MORTALITY

- 1. Abandonment - does "plant kids" and fail to return
- 2. Predators
- 3. Chilled
- 4. Low birth weights
- 5. Damaged udders - low milk yield
- 6. Coccidiosis
- 7. Pneumonia
- 8. Accidents

HOW TO FEED ANGORA GOATS FOR HEALTH, KID AND HAIR PRODUCTION

R. M. Jordan
Animal Science Department
University of Minnesota, St. Paul

Angora goats are ruminants like sheep and should, in general, be fed like sheep. Interestingly, they produce hair at the expense of other requirements, including body condition and kid production. It's for this reason that does will abort kids and continue to produce hair, albeit in lower amounts, when fed inadequately.

Based upon about eight years of nutrition research with Angora goats and data published by NRC, "Nutrient Requirements of Goats," a basic nutrition and feeding program suitable for Angora goat production in the Midwest is herein presented.

Goats' nutrient requirements are highly dependent upon: a) the stage of production (maintenance, gestation, lactation); b) the level of activity (goats confined to drylot or those grazing level, high-producing pastures require 25 to 50% less energy daily than goats that must travel and forage over large areas of hilly land); c) average body weight (obviously, a 110-pound goat must consume more energy and protein than an 88-pound goat); d) level of production (does that are fed to gain .2 lb daily, are nursing twins, and are producing 20 lbs of hair yearly require more feed daily than goats that are being maintained at a constant weight, are producing 10 lbs of hair, and have no kids nursing them); and e) age of goats. Kids must gain weight and, in so doing, produce more hair-producing follicles. Adequate feed enables them to mature to weights sufficient for reproduction. Therefore, their diets must be more concentrated in energy, protein, minerals, and vitamins than diets of mature goats. Does from weaning until their second fall as yearlings, should be fed well enough to weigh 60 lbs at breeding time so as to assure a high percent of conception.

How should we feed does in drylot that weigh 85 to 90 lbs, with an expected hair production of 15 lbs annually, and at various stages of production? The following table is based upon a needed modification of NRC data and research data compiled at the University of Minnesota.

TABLE 1. NUTRIENT REQUIREMENTS AND TYPICAL RATIONS FOR ANGORA GOATS

Body wt., lbs	Daily wt. change, lbs	TDN, lb	Protein, lb	Ca, g	P, g	Vit. A, 1000 I.U.	Amt. diet to feed daily, lb	
<u>Maintenance, summer dry period, early gestation</u>								
							<u>Alf. hay</u>	<u>2:1 hay-corn</u>
85-90 (15 lbs hair/yr)	0.0 to .05	1.40	.20	3	2	1.2	2.80	2.30
<u>Late gestation, last 4-6 weeks</u>								
							<u>Alf. hay</u>	<u>2:1 hay-corn</u>
85-90	.10 to .20	1.80	.35	5	3	2.0	3.60	3.00
<u>Lactation</u>								
							<u>2:1 hay-corn</u>	<u>1:1 hay-corn</u>
85-90 (one kid)	0 to -.05	2.20	.40	6	4	4.0	3.70	3.40
85-90 (twin kids)	-.05	2.50	.45	6	4	4.0	4.20	3.80
<u>Kids^a</u>								
							<u>1:2 hay: corn-SBM</u>	<u>1:3 hay: corn-SBM</u>
20-30	.10	.70	.15				1.00	.97
20-30	.20	.90	.20				1.30	1.25

^a Experience at the University of Minnesota has been that weaned kids grain-fed in drylot do not eat this much feed or gain .20 lb daily. The kid grain diet should contain a minimum of 15% protein (20% SBM and 80% corn) plus alfalfa hay. During gestation, and particularly late gestation, feed intakes of 3.5 to 3.8 lb/doe daily (4.0% of their body weight) are difficult to achieve. Goats, when fed excess alfalfa hay, invariably refuse to eat all the leaves. This reduces nutrient intake below what was intended.

Summer Management of Angora Kids
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Angora does and their kids were assigned to one of three nutrition and management treatments employed from mid-May to Mid July:

1. Bromegrass pasture with no grain feeding of either does or kids.
2. Kids were weaned and fed a grain diet containing 16% protein plus alfalfa hay. They were maintained in drylot.
3. Does and their kids were fed in drylot. Doe received 1:1 alfalfa and hay: corn diet in amounts that maintained their weight and provided .95 kg (2.1 lb) TDN/day. The kids were creep fed a 16% protein grain diet plus alfalfa hay.

The results of the 1987 study (table 1), a summary of the same type of treatments during a 3 year period (table 2) and some brief conclusions are here in provided.

Conclusions:

1. Based upon weight changes of grazing lactating does in relation to dry lot does, pasture provided less nutrients than that provided to does fed in drylot. Drylot fed does consumed .95 kg TDN and .166 kg protein daily. This lower nutrient intake by grazing does, and presumably less nutrient intake by the grazing kids, resulted in less kid weight gains (5.8 kg) than comparable kids creep fed in drylot (7.9 kg).
2. Weaned kids creep fed in drylot consumed appreciably more feed than non-weaned creep fed kids. However based upon kid weight gains, the does' milk must have contributed more nutrients than the additional creep feed consumed by the weaned kids. ADG were .064 and .113 kg ($P < .05$) for the weaned and non-weaned drylot fed kids, respectively.
3. Total creep diet/kg gain was 8.86 kg and 3.09 kg for the weaned and non-weaned kids, respectively in 1987.
4. Actual cost per kg of kid gain was calculated as follows: Pasture \$20/acre with a carrying capacity of either 6 lactating does and 8 kids or 15 non-lactating does/acre. Thus the pasture charge was \$3.33/lactating doe and \$1.33/non-lactating doe. The cost of hay and corn fed does in drylot was \$4.07/doe. To these costs were added the kid creep feed costs based upon hay @ \$.088/kg, corn @ \$.088/kg, and creep feed @ \$.110/kg.

For the pastured lactating does and kids the costs were \$3.33 pasture cost X 6 does = \$19.98 divided by total kid gains (46.4 kg) = \$.431/kg.

For the weaned dry lot fed kids the cost were \$1.33 pasture cost X 5 does = \$6.65 plus \$1.82 creep feed cost/kid (\$10.92 total for 6 kids) = \$17.57/27 kg total kid gain = \$.651/kg.

In the case of non-wean kids fed in drylot, costs were \$4.07 doe feed cost x 6 = \$24.42 + \$1.15 creep feed cost/kid X 8 = \$9.20 total for 8 kids = total cost of \$33.62 ÷ 63.2 kg total kid gain = \$.532/kg gain.

5. Weaning kids and feeding in dry lot appears least cost-effective and a system that produces the lightest kids which in turn precludes breeding them to kid as yearlings. While dry lot feeding non-weaned kids cost more per kg kid gains than kids raised on pasture they did gain more, presumably will produce more hair and the possibility of their being sufficiently developed to breed as kids is greater. On balance however the most efficacious systems appears to be pasturing non-weaned kids. However internal parasites must be controlled.

Table 1. Summer Management of Angora Kids (1987)

Item	Treatments		
	Grazed with dams, no creep	Weaned, grain fed	Dry Lot Not weaned, grain fed
Initial age, days	60.9 (42-72)	66.6 (62-70)	59 (34-76)
Day fed	70	70	70
No. does	6	-	6
Initial doe wt, kg	44.0	-	44.0
Wt. change, kg	-3.5 ^a	-	1.0 ^b
Daily intake, kg			
Alf. hay	-	-	.714
Corn	-	-	.741
TDN	-	-	.950
Protein	-	-	.166
Kid initial wt., kg	13.6	13.3	13.3
No. kids	8	6	8
Wt. change, kg	5.8	4.5	7.9
ADG, kg	.083 ^a	.064 ^a	.113 ^b
Daily intake, kg			
Alf. hay	-	.237	.103
Creep grain	-	.330	.246
Feed/kg gain, kg			
Alf. hay	-	3.70	0.91
Creep feed	-	5.16	2.18
Total	-	8.86	3.09
Feed cost/doe	\$3.33	\$1.33	\$4.07
Feed cost/kg kid gain ¹	\$.431	\$.651	\$.532

ab (P<.05)

¹ Feed costs: alfalfa hay \$.088/kg; corn \$.088/kg; creep feed \$.110 kg; pasture \$20/acre and 15 dry goats/acre or 6 lactating and 8 suckling kids per acre. (Total doe and kid feed costs divided by total kid weight gains/treatment.)

Table 2. Summer Management of Angora Kids (1985, 1986 and 1987)

Item	Treatments		
	Grazed with dams, no creep	Dry Lot	
		Weaned creep fed	Not Weaned creep fed
Initial age	57	60	56
Days fed	70	70	70
Number of does	18	--	16
Initial doe wt., kg	44.6	--	43.6
Wt. change, kg	-2.5 ^a	--	.8 ^b
Daily intake			
TDN	--	--	.95
Protein	--	--	.18
Kid data			
No kids	20	16	16
Initial wt., kg	12.7	13.3	12.5
Wt. chg, kg	4.8	4.8	6.5
ADG, kg	.07	.07	.09
Creep intake	--	.47	.29
Creep intake/kg gain	--	6.71	3.22
Feed cost/doe ¹	\$3.33	1.33	4.15
Feed cost/kg gain ¹	\$.628	.619	.794

a,b (P<.05)

¹ Feed costs: Alfalfa hay and corn \$.088/kg. creep feed \$.110/kg. Pasture for lactating does and kids \$3.33/doe and non-lactating does \$1.33/doe.

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