

Judging Wool and Mohair

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Importance of Wool and Mohair in Texas

Texas produces about 20 percent of the total wool clip and more than 97 percent of the total mohair clip of the United States. These two products contribute about 50 million dollars annually to the agricultural income of Texas.

A producer with a good knowledge of wool and mohair encounters fewer problems in production and marketing. Reliable information on the grades and quality of wool and mohair helps ranchers cal-



culate the true value of these products. They also are better able to plan and execute breeding programs through which they can produce the most popular and profitable types of wool and mohair.

WOOL

There are approximately 20 popular breeds of sheep, together with a great many less important breeds and crossbreds, in the United States. The wool produced by these sheep varies from very fine to extremely coarse and from 1 inch to as much as 12 inches in length for a growing period of 12 months.

For yarn to be uniform, the wool from which it is made must be uniform, particularly as to length and fineness. The wide variation in the wool produced, plus the need for uniform fiber, gives a basis for present-day grades of wool. These grades are arbitrary divisions made primarily according to fineness and length. Less important points that may have some influence on the grade include soundness, purity, character, color and condition. A wool grader considers all these points when grading. Clean wool content, fineness, length of staple and strength are the main characteristics considered in arriving at the value of wool.

Grading means the placing of entire fleeces in their grade piles according to fineness and length. When fleeces contain more than one grade of wool, the grader places the fleece in the grade pile represent-

ing the majority of fineness and length. Therefore, each fleece has to be examined in several places.

There are five grades of wool according to fineness: fine, 1/2 blood, 3/8 blood, 1/4 blood, and low 1/4 blood. These are only names of grades and do not indicate the breed of the sheep.



The length of staple is measured from the base to the tip of the unstretched fiber. There are three main grades according to length: clothing, French combing and staple. Clothing wools are the short-stapled wools within a grade that are too short to be combed and are used in the woolen system of manufacturing. French combing wools are of medium length within a grade and may be combed on the French combs. The staple wools are the longest wools within a grade and are suitable for combing on the Noble combs. As a general rule, clothing wools bring the lowest price per clean pound, with French combing slightly higher and staple wool bringing the highest price per clean pound within a certain grade.

Various combinations of grades for fineness and length can now be made, for instance, fine clothing, fine French combing and fine staple.

Fineness in wool also can be designated by the Bradford spinning count or numerical system, such as 58's, 60's, and 64's. The spinning count is determined by the maximum spinning capacity of the wool. Theoretically, when wool is spun to the limit, the number of "hanks" weighing 1 pound equals the spinning count. A worsted hank contains 560 yards of yarn. Next, the hanks of yarn are placed on a scale until 1 pound of wool is represented. The hanks are counted to get the spinning

count. The spinning count system is more accurate and more widely used than our system of grading. Length grades may be combined with these spinning counts; for example, 64's staple, 64's French combing and 64's clothing.

Shrinkage and Yield

"Shrinkage" is a term commonly used with wool and refers to the amount of foreign material found in grease wool, expressed as a percentage of the original grease weight. "Yield" is the amount of clean wool left in a lot after scouring, expressed as a percentage of the original weight. The average yield of fine wool in Texas is 50 percent.

Shrinkage is made up of wool grease, dried perspiration, sand, dirt, corral dust and vegetable matter such as burs, needlegrass, chaff, seeds and twigs. The wool grease and dried perspiration combined are referred to as "yolk."

Yield is extremely variable and is influenced by factors such as the breeding of the sheep, manner of handling, amount of range cover, amount of wind, rate of stocking, soil type, type and amount of feed and other factors. Since yield is affected by so many factors, there is a wide spread in the yield of wools. A variation in yield affects the grease price; wool can have low yield and still be of excellent quality.



Yield usually is estimated by visual examination. For accuracy, it is necessary to scour the wool and of properly taken sample. Pressing the fleece together with the hands and observing the space occupied, together with the weight, gives a rough estimate of the yield. The length of staple and depth of dirt penetration are other guides to wool yield. Examination of the dirt that can be shaken out of the fleece usually gives a good indication of

yield; sand and dirt are associated with low yield, while corral dust and vegetable matter, such as chaff, are usually light and do not contribute greatly to shrinkage.

State and national wool judging contests require that the yield be indicated by calling the percentage of the original weight.



Scoring

The state wool judging contests include the classification of 30 fleeces of wool according to fineness, length and yield. Each fleece should be checked in three different places on the form provided. Strength is of tremendous importance in wool manufacture, but is not considered in placing the grade for length on the 30 fleeces. Scoring is on the basis of 4 points for fineness, 2 points for length and 4 points for yield, or 10 points per fleece.

The state contests require the placing of four classes of wool of four fleeces each. The placings should be made and the numbers inserted. Scoring is based on 50 points for placing and 50 points for reasons. This gives a total of 400 points for the four classes.

A score card (page 4) helps evaluate the various points to consider in judging wool. Estimated weight of clean wool is given the largest number of points. Ranchmen get paid for the number of pounds of clean wool they produce. A high-grease fleece weight does not necessarily mean a high-clean fleece weight. Ranchers should be able to estimate the amount of clean wool in a fleece.

Fleeces are evaluated to determine placing order in a group-of-four class.

Bulkiness

Bulkiness of fleece generally indicates a high yield of clean wool. Squeezing the fleece together with the hands may help you estimate clean wool. If you are able to compress the fleece so that your hands close together, the yield of clean wool will be low.

Length

Length is given the second largest number of points. Longer stapled wools are more valuable and staple length adds weight to a fleece more than any other characteristic. Staple length is determined by measuring the length of the locks from base to tip. The length should be measured at several places over the fleece.

Soundness and Purity

Soundness and purity rank high in number of points. Soundness refers to the strength of the wool fiber. Two types of defects affect the strength of wool. One is termed *tender wool*, which is wool that is weak throughout the length of the fiber. The other is wool showing a *break*. When a lock is stretched and all the fibers break squarely across at the same point, it is termed a “break.” Breaks usually are caused by fevers or sudden changes; for example, difficulty at lambing time, a bad case of screw-worms, udder trouble, a sudden change to concentrated feed, severe storms and freezing temperatures.

Purity refers to kemp and black fibers, both of which cut down greatly on the value of wool. A large amount of kemp increases the loss through breakage and uneven dyeing while black fiber limits the use of the wool to the manufacture of dark-colored fabrics.

Quality

Quality or fineness is next in importance. Fleeces should be uniform in fineness over the entire fleece. Fleeces lacking uniformity require more preparation for manufacture, thus increasing the cost.

Character

Character refers to general appearance and crimp, color, and condition of the fleece. Crimp refers to the natural waviness of the wool fiber. Wool that has good crimp usually has more strength and goes through the manufacturing processes with less breakage.

Color

Color is important to the manufacturer because if wool is to be made into white or light-colored fabrics, it must appear white to creamy white. A large amount of stained wool decreases the value of the fleece.

Color of wool should not be confused with color of the yolk. Fleeces may appear yellow because of the color of the yolk, which varies from almost clear to a dark yellow.

The score card below has been prepared to serve as a guide in wool judging.

A sample judging scantron is shown on page 9. The placing of the class is indicated at the top of the page. Under the number column, insert the fleece number that best represents the fleece description. That is, longest fleece number – number 2, shortest fleece number – number 4, etc. Only one number should be inserted in each blank. In case of tie, the official judge will permit credit for more than one answer for fleeces very similar in quality.



MOHAIR

There are not as many different uses for mohair as for wool, but mohair must meet the same general requirements as wool to be suitable for manufacture.

The quality of mohair varies widely within flocks and within individual fleeces. This brings up the need for grades so that it may be separated accord-

Score Card For Wool Judging

	Points
Estimated Clean Wool Content (yield and shrinkage)	35
High yield per fleece is desirable. Small amount of light-colored yolk as free from adhering sand, dirt and vegetable matter as possible. Cut heavily if tied with any twine other than paper.	
Length	25
Should be combing or staple length for the grade: i.e., fine, 3 in.; ½ blood, 3-½ in.; ¾ blood, 3-¾ in.; ¼ blood, 4 in.; low ¼ blood, 4-¼ in.; braid, 4-½ in. Lengths more than ½ inch greater than this are of no additional value except increasing the yield and grease weight.	
Quality or Fineness	10
Should fall clearly in one of the grades according to fineness; i.e., fine, ½ blood; ¾ blood; ¼ blood; low ¼ blood; braid. Uniformity of fineness is particularly desirable. Cut heavily for hairy britch.	
Soundness (strength)	10
Fiber should be strong throughout and free from breaks.	
Purity	10
Free from hair, kemp, black or brown fibers. Cut heavily for black or brown fibers and coarse, hairy britch.	
Character and Color (crimp)	10
Evenly crimped or wavy from base to tip. Crimp should be distinct. Free from frowsy wool. Soft and springy to the touch. White to cream, bright color most desirable. Should be free from stains and with an even distribution of yolk.	
Total	100

ing to fineness and length. The trade has developed a set of grades that is well recognized, however. The grades are based primarily on fineness and length, with minor attention given to character, luster, condition, strength and purity. These grades have been derived from the American Society for Testing Materials tentative specifications for mohair top.

Spinning counts are derived in the same manner as for wool; that is, the number of hanks of yarn that it takes to weigh 1 pound. Grades of mohair, together with their spinning counts equivalents, are: super kid, d36's and 40's; kid, 30's and 32's; yearling, 26's and 28's; fine adult, 22's and 24's; adult, 18's and 20's. In addition, there is also kempy.

Grading

The designated grades are based on fineness and not on the age of the goat producing the hair. It is possible for an adult goat to produce kid hair and for a kid goat to produce adult hair. As a general rule, however, the mohair becomes coarser as the goat gets older and, consequently, most of the finer hair will be produced by kid goats.

Reference to flat and ringlet type of mohair has been avoided purposely. Many fleeces cannot classify as either of these two types. It is possible to produce high-quality mohair in both the ringlet and flatlock types. One of the objectives in mohair judging is to be able to determine the quality of the



mohair regardless of the type of lock.

Following is a sample classification card for mohair. It is necessary for the contestant to check each sample in one column only.

Scoring

In addition to classifying 20 samples of mohair, the contestant is required to place two classes of four fleeces each and write the numbers. The score card, page 6, can assist the contestant in placing these classes.

Fineness and Uniformity

Fineness is given the largest number of points on the score card. When mohair is sold on a graded basis, the finer mohair sells for the highest price.

It is important to the manufacturer that mohair fleeces be as uniform as possible.

Staple Length

Staple length in mohair is important to produce heavy fleece weights and a fiber with sufficient length for combing. Good Angora goats should produce mohair at the rate of 1 inch per month or a 6-inch staple for each of the 6-month shearings. Mohair with a staple length of 4 inches is long enough for top making.

Character

Character usually refers to waviness and type of lock. Type of lock may be important to the registered breeder but is of little importance to the manufacturer. Character is important to the manufacturer because the fleeces with well-defined locks go through the manufacturing machinery with less breakage of fiber than fleeces lacking character.

Softness

Softness is often referred to as handle. Softer mohair makes softer-handling fabrics. Harshness is undesirable for the manufacture of high quality fabrics.

Luster

Luster is the brightness or shininess of the mohair fiber. Mohair with high luster, but otherwise equal in quality, is preferred over mohair with poor luster.

Condition or Yield

Condition or yield refers to the amount of clean mohair expressed as a percentage of the original grease weight. Mohair should have a shrinkage of approximately 15 percent. In recent years many breeders have bred Angora goats with fleeces containing much more oil than this. Some ranchmen have sprayed goats with oil to increase fleece weights. Fleeces with excessive amounts of oil, whether natural or artificially added, should be discriminated against.

Purity

Purity refers to freedom from kemp or colored fibers, or both.

Kemp fibers are the chalky white hairs similar to the hair on the faces and lower legs that are

found scattered through the fleece. Kemp fibers are usually found on the back and thighs. They are undesirable to the manufacturer because they add to the waste through breakage in manufacture and present a problem in dyeing.

Color

Good quality mohair should have a white color when scoured. Dinginess or dullness in color detracts from the value. A large amount of stained mohair in the fleece will lower the color rating.

Colored fibers are undesirable because they limit the use of the mohair. Mohair containing colored fibers must be used in the manufacturer of dark-colored fabrics.

Score Card for Mohair Judging

	Points
Firmness and Uniformity	40
Should fall into one of the recognized grades: kid 1, kid 2, adult 1, adult 2, adult 3 and adult 4. Should be uniform in fineness throughout.	
Points Length	20
Staple length is very important in mohair. Length should be 6-inch staple for 6-month growth.	
Character	10
Character is denoted by waviness and the degree to which the locks are separated. Avoid straight fluffy hair that has no waviness.	
Condition or Yield	10
Mohair does not have the wide variation in yield that is found in wool—Mohair should have a medium amount of natural oil and be free from adhering dirt and vegetable matter. Cut heavily for oil that has been added to the fleece artificially and for large amounts of vegetable defect.	
Purity	10
Should be free from kemp and colored fibers. Cut heavily for large amounts of either.	
Softness	5
Mohair should have a soft handle, discriminate against mohair with a harsh handle.	
Luster	5
Luster is the shininess of mohair. Good mohair appears bright and shiny.	
Total	100

4-H Wool Contest General Rules and Information

1. Teams may consist of four members, with the scores of the three high members making the team score. The low scoring member of each team will automatically become the alternate. In the event of a team score tie, the score of the alternate will determine the team placing.
2. **Fleece Evaluation of Grading Rail**
Contestants will receive 4 points (full credit) for each correct wool grade selected. If contestants select a wool grade that is one blood grade off, they will receive 2 points. Contestants will receive 2 points for each staple length category correctly answered. If a contestant misses the official, no points will be awarded. The use of any measuring device will be prohibited; this includes markings on hands, clipboards, or anything else. Contestants caught with a measuring device or mishandling fleeces, will be disqualified. The categories for wool grade and length are found in Table 1.
3. Contestants will be required to select an actual percentage yield (Table 2). If a contestant is within 4 points above or 4 points below the official percentage yield, they receive full credit of 4 points. If the constant is within 8 points above or 8 points below the percentage yield,

they receive 2 points. If they are more than 8 points above or below, they receive no points. There will be a box at the top of the scantron that will have a gauge for calling yield. Keep in mind that the average yield changes for the fineness of fleeces.

4. **Placing and Reasons**
Contestants will place the four fleeces within a class and fleece-quality questions will be asked for each class. For questions it is important that contestants use only one number for each description. Officials have the option of giving credit for more than one answer if a particular description matches another fleece. The placing of the class is worth 50 points and the questions are worth 50 points as well.
5. District contests will consist of a minimum of a 20 fleece rail for a total score of 200 points. There will be 2 classes at district contests worth 200 points. The total possible score is 400 points for individuals or a total possible score of 1200 points as a team.
6. Rotations for a 20 fleece rail will consist of two 15-minute rotations. Contestants will have 15 minutes to complete each class.
7. State and national contests will consist of a 30 fleece rail for a total score of 300 points. There will be 4 classes at the state and national levels for a score worth 400 points. The total possible score is 700 points per individual or a total possible score of 2100 points as a team.

8. For the state and national contests, the 30 fleece rail will be split into two 15-fleece rails. For each half of the rail, contestants will receive two 15-minute rotations for a total of one hour on the rail. If contestants start on the rail they will complete both halves

of the rail before starting on classes. The classes will be broken into four 15-minute rotations for a total of one hour on classes.

Table 1. Wool Grades and Length Standards

Blood	Wool Grades		Staple Lengths		
	Spin Count	Average Diameter (Microns)	Staple	French Combing	Clothing
Fine	64s, 70s, 80s	22.04 and finer	>3.00"	3.00"-2.00"	<2.00"
Half	60s and 62s	22.05-24.94	>3.25"	3.25"-2.25"	<2.25"
3/8	56s and 58s	24.95-27.84	>3.50"		<3.50"
1/4	54s and 50s	27.85-30.99	>4.00"		<4.00"
Low 1/4	48s and lower	31.00 and courser	>4.00"		<4.00"

Note there is no French for 3/8 and courser

Table 2. Average and Normal Range of Clean Fleece Yields

Clean Fleece Yield (%)	Wool Grade Categories				
	Fine	Half	3/8	1/4	Low 1/4
Average (%)	50	55	60	65	65
Normal Range (%)	40-60	45-65	50-70	55-75	55-75

National Wool Contest

1. A maximum of two teams may enter from each state with selection of teams to be made by each 4-H/FFA office. Entries must be submitted listing team member's age, birth date, county, state, and coach to the contest coordinator.
2. Contestants must be eligible to compete as senior 4-H members in their respective state contest the year of the contest. Students must not be enrolled in college prior to their local state contest.
3. All team members will be ineligible for future participation in the contest.

4-H MOHAIR CONTEST GENERAL RULES AND INFORMATION

Objective

The Mohair Contest tests a 4-H member's knowledge and ability to determine the grade, rank, and category of mohair. The contest provides an opportunity for youth to compete and develop skills that can be used on an angora ranching operation, within the mohair industry, or agricultural teaching fields.

Team and Contestant Eligibility

Teams consist of three or four members. In teams of four members, all will compete, but the member receiving the lowest score will be declared the alternate. In the event of a team score tie, the score of the alternate will be used to determine the team placing.

Contest Method of Conduct

1. The contest will be divided into two areas: fleece evaluation of grading rail and mohair placing and reason classes.
2. The contest will be conducted using a scantron or evaluation sheet.

Figure 1. Wool judging scantron

Wool
 Form #: 528-5

Team Name

Team #	Last Name	First Name	Placing Classes						Place
			Class Number						
			1	2	3	4	5	6	
1	1234								1234
2	1243								1234
3	1324								1324
4	1342								1342
5	1423								1423
6	1432								1432
7	2134								2134
8	2143								2143
9	2314								2314
10	2341								2341
11	2413								2413
12	2431								2431
13	3124								3124
14	3142								3142
15	3214								3214
16	3241								3241
17	3412								3412
18	3421								3421
19	4123								4123
20	4132								4132
21	4213								4213
22	4231								4231
23	4312								4312
24	4321								4321

Oral Reasons	Questions on Placing Classes										
	Class 1		Class 2		Class 3		Class 4		Class 5		Class 6
1	2	1	2	1	2	1	2	1	2	1	2
Fleece Description											
Longest staple											
Shortest staple											
Most uniform staple length											
Finest in class											
Coarsest in class											
Most uniform fineness (DIA.)											
Heaviest grease WT											
Lightest grease WT											
Most LBS clean wool											
Least LBS clean wool											
Highest yielding											
Lowest yielding											
Most character											
Most vegetable matter											
Most stained wool											
Least fiber strength											

Grading	Spanning Count	Length	Yield	Ones Digit		Tens Digit		#
				Written	Digit	Written	Digit	
	48's and coarser (Low 1/4)	Staple	7 (example)					16
	50's and 54's (1/4)	Friend Combing						17
	56's and 58's (3/8)	Clothing					18	
	60's and 62's (Half)						19	
	64's, 70's, 80's and finer (Fine)						20	
								21
								22
								23
								24
								25
								26
								27
								28
								29
								30

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, color, and condition.

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 — The softness of the fleece due to fiber and grease content.

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 this 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.

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