

*Judging*

# WOOL AND MOHAIR



TEXAS A&M UNIVERSITY

TEXAS AGRICULTURAL EXTENSION SERVICE

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Dedicated to  
4-H Club Members of Texas  
for Their Interest  
and Active Participation  
in the Sheep and Angora Goat  
Industries of Their State.

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# Judging Wool and Mohair

## WOOL

Texas produces about 18.7 percent of the total wool clip and over 97 percent of the total mohair clip of the United States. These two products contribute about \$37,000,000 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 ranchmen calculate 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.

There are approximately 20 popular breeds of sheep, together with a great many less important breeds and crossbreeds, 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 representing the majority of fineness and length. Therefore, each fleece has to be examined in several places.

There are six grades of wool according to fineness: fine,  $\frac{1}{2}$  blood,  $\frac{3}{8}$  blood,  $\frac{1}{4}$  blood, low  $\frac{1}{4}$  blood and braid. These are only names of grades and do not indicate the breeding 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; that is, fine clothing, fine French combing and fine staple.

Following are the grades of wool according to fineness and length in inches. These lengths do not correspond with the ones suggested in the USDA standards, but come closer to meeting the requirements of the wool trade and manufacturer.

GRADES (Fineness)	GRADE (Length)	LENGTH IN INCHES
Fine	Clothing	2 and under
	French combing	2 - 3
	Staple	3 and over
½ blood	Clothing	2½ and under
	French combing	2½ - 3½
	Staple	3½ and over
⅜ blood*	Clothing	Under 3¾
	Staple	Over 3¾
¼ blood	Clothing	Under 4
	Staple	4 and over
Low ¼ blood	Clothing	Under 4¼
	Staple	4¼ and over
Braid	Clothing	Under 4½
	Staple	4½ and over

\*In the coarser grades of wool, the French combing length grade usually is dropped because coarser, short wools are seldom combed with the French combs.

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 then counted and this gives 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.

Following are the tentative grades of wool with their spinning count equivalents according to the manual of American Society for Testing Material:

Fine	— 64's, 70's, 80's
½ blood	— 60's, 62's
⅜ blood	— 58's, 56's
¼ blood	— 50's, 54's
Low ¼ blood	— 46's, 48's
Braid	— 36's, 40's, 44's.

### 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 shrinkage of fine-wool in Texas is 56 percent. For example, if you had a 10-pound fleece of wool, 56 percent, or 5.6 pounds, would be grease and dirt and 44 percent, or 4.4 pounds, would be clean wool. The 4.4 pounds of clean wool would be referred to as the yield and would be defined as the number of pounds of clean wool left in a lot of wool after scouring, and expressed as a percentage of the original grease weight. Shrinkage and yield always add up to 100 percent. Yield is the important factor, but in the United States, it is customary to speak in terms of shrinkage. Yield is the term commonly used by other wool-producing countries.

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." Shrinkage 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 shrinkage is affected by so many factors, there is a wide spread in the shrinkage of wools. A variation in shrinkage affects the grease price; wool can have high shrinkage and still be of excellent quality and have a large amount of clean wool.



*Pressing the fleece together will give a rough estimate of bulkiness and yield.*

Shrinkage usually is estimated by visual examination. For accuracy, it is necessary to scour the wool of a 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 shrinkage. The length of staple and depth of dirt penetration are other guides to wool shrinkage. Examination of the dirt that can be shaken out of the fleece usually gives a good indication of shrinkage; sand and dirt are associated with heavy shrinkage, while corral dust and vegetable matter, such as chaff, are usually light and do not contribute greatly to the shrinkage.

The state wool judging contests require that the shrinkage can be indicated as heavy, medium or light. Heavy shrinkage is more than 60 percent; medium, 55 to 60 percent; and light, less than 55 percent.

## SCORING

The state wool judging contests include the classification of 20 fleeces of wool according to fineness, length and shrinkage. 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 20 fleeces. It is more important to look for fineness, length and shrinkage than spend time hunting for breaks. Scoring is on the basis of 4 points for fineness, 4 points for length and 2 points for shrinkage, or 10 points per fleece. A sample score card follows.

The state contests require the placing of two classes of wool of four fleeces each. The placings

should be made and the reasons checked. Scoring is based on 50 points for placing and 50 points for reasons. This gives a total of 200 points for the two classes.

A score card, page 8, 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. Ranchmen should be able to estimate the amount of clean wool in a fleece.

## Bulkiness

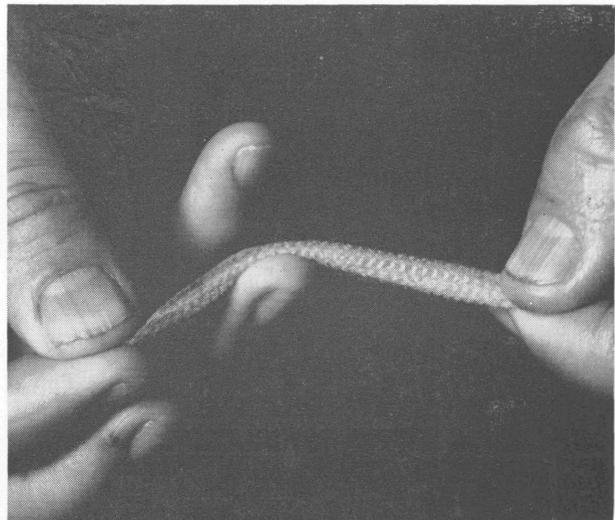
Bulkiness of fleece generally indicates a high yield of clean wool. Squeezing the fleece together with the hands may help you estimate clean wool. If you are able to compress the fleece so that your hands close together, the yield of clean wool will be low.

## 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 unstretched 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



*Testing wool for strength. If wool passes this test, it has sufficient strength.*

## JUDGING CARD FOR WOOL

number Fleece	Fineness						Length			Shrinkage			Score
	Fine	$\frac{1}{2}$ blood	$\frac{3}{8}$ blood	$\frac{1}{4}$ blood	Low $\frac{1}{4}$ blood	Braid	Staple	Fr. comb- ing	Cloth- ing	Heavy	Med.	Light	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Contestant's No. ....

Total score.....



*Estimating the staple length of wool. By knowing how far it is to the joints in the thumb, staple length can be estimated accurately.*

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 rapidly 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. 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

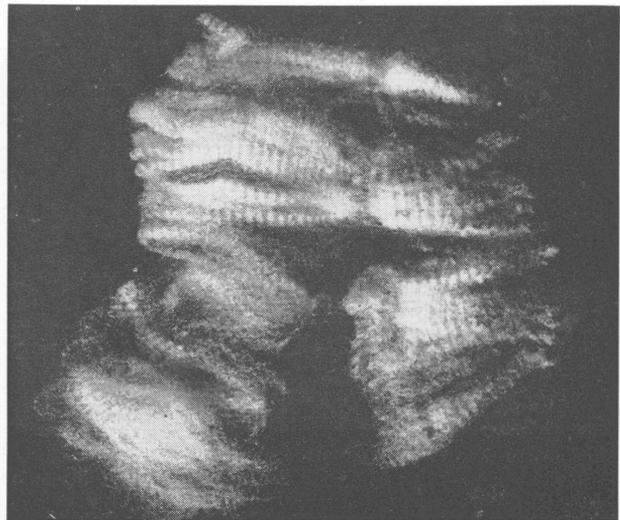
Color is important to the manufacturer because if wool is to be made into white or light-colored fabrics, it must appear white to creamy white. A large amount of stained wool decreases the value of the fleece.

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

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

A sample placing and reason card is shown on page 9. The placing of the class is indicated at the top of the page. Each pair that is first and second, second and third, third and fourth, is to be compared and the reasons checked for its placing. Some of the reasons checked may be the same for each pair, but not necessarily.

Each pair of fleeces should be considered separately and different reasons should be checked. It is not necessary to place a check mark in each of the spaces provided. Indicate by numbers in the space provided any fleeces showing a break.



*Wool showing a break. All the fibers break at the same place in the staple of wool.*

# 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.;  $\frac{1}{2}$  blood,  $3\frac{1}{2}$  in.;  $\frac{3}{8}$  blood,  $3\frac{3}{4}$  in.;  $\frac{1}{4}$  blood, 4 in.; low  $\frac{1}{4}$  blood,  $4\frac{1}{4}$  in.; braid,  $4\frac{1}{2}$  in. Lengths more than  $\frac{1}{2}$  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,  $\frac{1}{2}$  blood;  $\frac{3}{8}$  blood;  $\frac{1}{4}$  blood; low  $\frac{1}{4}$  blood; braid. Uniformity of fineness 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

# WOOL PLACING CARD

(Four Fleeces)

Placing 1st..... 2nd..... 3rd..... 4th.....

Reasons	Top pair	Middle pair	Bottom pair
Higher yield			
Longer staple			
More uniformity of fineness			
Greater strength			
Heavier grease fleece weight			
More uniformity of length			
Brighter color			
More character			
Shows fewer colored fibers			
Contains less vegetable matter			
Cotains less stained wool			
More uniform distribution of yolk			

The following fleeces

Placing score.....

show a break.....

Reason score.....

# 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 according 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 count equivalents, are: kid 1, 36's and 40's; kid 2, 30's and 32's; adult 1, 26's and 28's; adult 2, 22's and 24's; adult 3, 18's and 20's; adult 4, coarser than 18's. In addition, there are the usual off grades, such as burry, kempy, grey, cotted and stained.

## 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 check his reasons. The score card, page 12, 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.

## JUDGING CARD FOR MOHAIR

Fleece number	Kid No. 1 36's-40's	Kid No. 2 30's-32's	Adult No. 1 26's-28's	Adult No. 2 22's-24's	Adult No. 3 18's-20's	Adult No. 4 below 18's	Kempy	Score
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Contestant's No. ....

Total score.....

## SCORE CARD FOR MOHAIR JUDGING

	Points
<b>Length</b> .....	20
Staple length is very important in mohair. Length should be 6-inch staple for 6-month growth.	
<b>Fineness and Uniformity</b> .....	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.	
<b>Character</b> .....	10
Character is denoted by waviness and the degree to which the locks are separated. Avoid straight fluffy hair that has no waviness.	
<b>Softness</b> .....	5
Mohair should have a soft handle, discriminate against mohair with a harsh handle.	
<b>Luster</b> .....	5
Luster is the shininess of mohair. Good mohair appears bright and shiny.	
<b>Condition or Yield</b> .....	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.	
<b>Purity</b> .....	10
Should be free from kemp and colored fibers. Cut heavily for large amounts of either.	

**TOTAL** 100

## MOHAIR PLACING CARD

(Four Fleeces)

Placing 1st..... 2nd..... 3rd..... 4th.....

Reasons	Top pair	Middle pair	Bottom pair
Finer fleece			
More uniformity of fineness			
Higher yield			
Longer staple			
Brighter luster			
Greater softness			
More uniformity of length			
Heavier grease fleece weight			
Shows less kemp			
Contains less vegetable matter			
Contains less stained wool			
Greater strength			

The following fleeces

Placing score.....

show colored fibers.....

Reason score.....

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 manufacture of dark-colored fabrics.

A score card for use in judging classes of mohair fleeces is on page 12.

A sample placing and reason card is shown on page 13. The placing of the class should be indicated at the top of the page. Each pair, that is first and second, second and third, third and fourth, is to be compared and the reasons checked for its placing. It is not necessary to place a check mark in each blank provided. Some of the same blanks may be checked for each pair, but not necessarily. Do not set a pattern and follow it for each pair. If any fleeces show colored fibers, indicate them in the space provided.

## **Instructions for Grading**

### **JUDGING CARD FOR WOOL**

Each fleece is worth 10 points with 4 points for fineness, 4 points for length and 2 points for shrinkage. Credit should be given for any part that is correct. In this way, it is possible to get scores of 10, 8, 6, 4 or 2.

There are arguments against this system mainly because if the grade for fineness is wrong, the grade for length also may be wrong. This grading system has been followed to allow the contestants to make higher scores and provide encouragement and confidence.

Total possible score would be 200 points for this part of the contest.

### **WOOL AND MOHAIR PLACING CARDS**

The official judge should supply the scoring committee with cuts or points difference between first and second, second and third and third and fourth. Total cuts should not exceed 15 points. All possible placings can then be scored in the usual manner on the basis of 50 points for placing.

The official judge also should provide the scoring committee with the reasons on all possible placings.

The scoring committee then can score the reasons checked by the contestant. For each reason checked by the contestant but not by the official judge, deduct 1 point. For each reason not checked by the contestant but checked by the official judge, deduct 1 point.

In cases of a complete error or where there is no justification for the placing, it may be desirable to score it as a bust with a score of -12 for that particular column of reasons. This generally would be in cases where the lowest fleece was placed over the top fleece and in some cases the third-place fleece over the top fleece. In some classes it will not be desirable to use this plan.

Fleeces of wool showing a break should be indicated in the place provided. When fleeces are marked incorrectly as showing a break, deduct 1 point each.

Fleeces of mohair showing colored fibers should be indicated in the place provided. For fleeces incorrectly marked as showing colored fiber, deduct 1 point each.

Reason grades are figured on the basis of 50 points as perfect score. Deduct the total number of points lost from 50 to obtain the reason score.

### **JUDGING CARD FOR MOHAIR**

Each fleece has a score of 10 points. Fineness is the only point considered in grading mohair samples. If the sample is graded correctly, give it a score of 10. If the grade marked is one place on either side of the correct grade, allow 5 points. If it is off more than one grade on either side of the correct grade, give a 0.

Kempy samples should be marked kempy only. If a grade is marked in addition to kempy, 5 points should be deducted.

Giving 5 points for missing the sample by one grade allows the contestant to make a somewhat higher score and provides some encouragement.

## 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 wool 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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