

WOOL EVALUATION

Revised: 12/17/13

PURPOSE

To increase awareness of the marketing value of the wool industry through development of critical thinking evaluation introduced in correlation with the Animal Science Curriculum.

OBJECTIVES

- Increase critical thinking values through decision making during fleece evaluation.
- Increase knowledge of grading values set by the USDA grading system.
- Increase public speaking skills through oral reasons.
- Increase social skills through cooperation and working as a team.
- Help develop employment skills for students who are interested in pursuing a career in the wool industry.

COMMON CORE REFERENCE

7th Grade

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

8th Grade

CCSS.ELA-Literacy.SL.8.1a Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

9-10th Grade

CCSS.ELA-Literacy.SL.9-10.1d Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.

11-12th Grade

CCSS.ELA-Literacy.SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

EVENT FORMAT

- 1 **Commercial Fleeces.** There will be three classes of Commercial Fleeces with four fleeces in each class. These classes will be placed using the "Standard FFA Placing Card".
- 2 **Breed Fleeces.** There will be two classes for Breeding Fleeces with four fleeces in each class. Wool standards for the breed represented by the fleeces will be used to place these classes. The "Standards FFA Placing Card" will be used to indicate the participant's placing.
- 3 **Fleece Evaluation.** Two classes of ten (10) fleece will be evaluated using the "Standard Evaluation Score Card".
- 4 **Oral Reasons.** Two sets of Oral Reasons, one on a Commercial Fleece Class and one on a Breed Fleece Class, will be given by each team member. Participants may use their placing card while giving Oral Reasons which will be limited to two minutes per set. Oral Reasons will be designated by the official judge at the beginning of the career development event.
- 5 **Team Members.** There may be four members to a team with the three highest individual total scores making the total for the team. Each member is to have a clean, clear plastic clipboard.
- 6 **References.** The following New Mexico State University Bulletins can be obtained through your County Extension Agent:
 - Wool Evaluation and Fleece Judging, 400 B-12
 - Selecting Range Sheep, 1958
 - Selecting and Preparation of Show Fleeces, 400 B-11

USDA Bulletin:

- Grading Wool 1805, 1939

New Mexico State University
Animal and Range Science Department
Wool Judging Terminology

A. Wool Definitions:

- 1 Apparel Wools - Any wool manufactured into cloth for use as clothing
- 2 Black Wool - Fleeces that are gray or black. Sells at discount of approximately 1/3 less. (Black Fibers - See Purity)
- 3 Britch or breech - The coarsest wool in a fleece produced on the twist and lower thigh area.
- 4 Bright Wool - Wool that is whitest and most attractive in color. Contrast too dingy or stained.
- 5 Burry Wool - Wool that contains burrs from any plant. Heavy burrs decrease yield while all burrs increase waste.
- 6 Carbonizing - The use of acids to destroy and remove burrs and other vegetable matter from wool.
- 7 Carding - One of the first steps in preparation of scoured wool. In the process the wool fibers are separated from other fibers in the locks.
- 8 Chaff- Refers to light weight vegetable matter such as straw, leaves, etc. Does not include burrs.
- 9 Character - A broad term which in general refers to all those characteristics which make wool attractive. Crimp, color and handle properties are the most important.
- 10 Clean Basis - Quotations of prices that are based on the estimated fiber weight a particular lot of grease wool may contain.
- 11 Clip - The total wool production from a flock or specific group of animals.
- 12 Clothing Wool - Used chiefly in the manufacture of woolens and felts.
- 13 Combing - Manufacturing process in which the short fibers (noils) are separated from the longer fibers which are combed into a continuous strand of parallel fibers called top.
- 14 Combing Wool - Wool that is strong and long enough to be combed.

- 15 Condition - A term referring to the amount of grease and dirt in wool
- 16 Cotted Fleeces - Fleeces in which fibers are matted and felted. Most common in coarse wooled sheep and may be due to ill health or lack of sufficient yolk. Increase noilage or wastiness as fibers are broken as fleece is torn apart.
- 17 Crimp - The natural waviness in fibers
 - a. Distinct Crimp- crimps are sharp and clear
 - b. Bold Crimp - large crimp (fewer per inch). May or may not be distinct
- 18 Crossbred Wool - Term applied to wool from sheep by crossing Rambouillet or Merino with English longwool breeds. Columbia, Corriedale, etc. Are examples. Wool grades from 1/2 to 1/4 blood fineness. Usually has plenty of length, luster and softness, but may lack in uniformity.
- 19 Crutchings - Wool shorn from the britch and inside of the rear legs.
- 20 Defective Wool - Wool that has been damaged by water, fire, insects or disease. Burry wool may be classed as defective.
- 21 Dingy - Wool that is dark and lusterless.
- 22 Domestic - Wool produced in U.S. as contrasted with foreign wool.
- 23 Down Wool - Wool from breeds that originated in the downs of England. Wool is medium in grade, short, wiry, lacks crimp and often contains black fibers.
- 24 Fleece Wools - Wool from Eastern and Central States.
- 25 Frowsy - Wool that is dry and lifeless with out distinct crimp due to weather and/ or poor quality.
- 26 Grading - Separating the unopened fleeces into piles according to fineness and length.
- 27 Grease Wool - Wool in the condition in which it is shorn before washing or scouring.
- 28 Gummy- Grease wool that has excessive amount of yolk which has set and it stiff and sticky.
- 29 Kemp - Chalky white, brittle, weak fiber which is found mixed with normal fibers of a fleece. Kemp will not dye and lacks strength.

- 30 Lanolin - Refined yolk or wool grease.
- 31 Locks - Individual groups of wool fibers as they exist in the fleece. Also known as "Staple"
- 32 Lofty - A term used to describe a fleece that is bulky in comparison to its weight. A lofty fleece is light in condition and is usually springy to the touch and displays good crimp.
- 33 Luster - Wool that shines or reflects light. Desirable.
- 34 Noils - Short fibers removed in the combing process.
- 35 Original Bag Wools- Sold in bags as packed at shearing. Most from western ranges where sheep produce same grade of wool and there is little need for individual grading of fleeces.
- 36 Purity - Refers to presence or absence of black fibers or kemp.
- 37 Quality - General term often used to fineness but often used in boarder meaning to include overall desirability.
- 38 Scouring - Process by which grease and dirt are removed from wool.
- 39 Second Cuts - Short pieces of wool that result from the shearer clipping off the wool left from a previous stroke. Increase noilage or wastiness in combing wools.
- 40 Shrinkage - The percentage loss in weight due to scouring.
- 41 Soundness - Strength of wool fibers.
- 42 Stained Wool - Wool that has been discolored so that it will not wash white in scouring process. May be due to urine, yolk, phenothiazine or other factors.
- 43 Staple - Two meanings:
 - a) Length classification of wool
 - b) Lock of individual fibers
- 44 Tags - Heavy dung locks.
- 45 Tender Wool - Wool that is weak and breaks anywhere along the length of the fiber. Due to poor nutrition or sickness.

- 46 Territory Wool - Wool from the western areas of the U.S.
- 47 Tippy Wool - That is which the tip or weather end of the fibers are encrusted making the wool wasty in processing (increase noilage)
- 48 Top - Partially manufactured wool. Scoured, carded and combed and the fibers lay parallel in a strand.
- 49 Unsound - Wool that is abnormally weak and that will break when subjected to a slight pull. Two distinctions:
 - a) Tender - defined above
 - b) Definite break - a definite weak place that breaks clean across the lock at the same place over the fleece.
- 50 Virgin Wool - Wool that has been used in fabrics for the first time.
- 51 Wasty - Wool that will produce a high amount of noils. (see Tippy Wool)
- 52 Weathered Wool - Wool that has dried out due to action of dust, water, sunlight and insufficient yolk. It is dingy, forwsy, and usually weak-fibered.
- 53 Yield - Opposite of shrinkage. The percentage of clean wool fibers after scouring.
- 54 Yolk - The combined secretion of sebaceous (oil) and sudoriferous (sweat) glands in the skin.

B. Factors to consider in placing classes -

1 Commercial Classes - **To be placed on the basis of greatest return to the producer.**

- a. Pounds of clean wool - determined by the combination of grease fleece weight and percent yield.

A large, bulky, heavy fleece with little dirt penetration will yield more pounds of clean wool than a small, compact, heavy fleece showing a lot of dirt. Avoid a large, fluffy, harsh-handling fleece which is very light weight. Longer staple length is usually indicative of higher yields of clean wool.

- b. Staple Length - Wool is classified by the length according to the type of manufacturing it will undergo, and the longer wools within a grade are worth more on the market. A longer staple fleece will usually return more to the grower than a shorter staple fleece at the same grade and weight. If a fleece is tender it should be acknowledged in the reasons but not moved down in placings. However, if a fleece exhibits a definite break it should be placed last regardless of weight

Following is a chart of length classification used in intercollegiate wool judging contest. There are not official USDA length standards and most manufacturers determine their own length requirements.

Length Classification	Fine 64's & Finer	1/2 Blood 62's , 60's	3/8 Blood 58, 56's	1/4 Blood 54, 56's
Staple Length	Over 3"	Over 3"	Over 3.25"	Over 4.0"
Fr. Comb. Length	1.5-3"	1.5-3"	1.75-3.25"	
Clothing Length	Under 1.5"	Under 1.5"	Under 1.75"	Under 4.0"

- c. Uniformity of Grade - A uniform fleece makes a uniform yarn, and requires little or no sorting, so a fleece which varies wildly in fiber diameter is worth less than one which is predominantly one grade. A coarse britch fleece is an example of what to particularly guard against.
- d. Character - A combination of several properties influencing the appearance and handling qualities of a fleece. Softness, elasticity, luster, color, and crimp are all factors to be considered.

- e. Strength - A strong fleece is desired, as strong wool will make a strong yarn and can also be spun into a finer yarn. Fleeces with weak or unsound fibers will usually be classified into the shorter length classification groups. Lack of strength increases wastiness (noilage) in combing fleeces. Excessive weathering also decreases strength.
- f. Vegetable Matter- Some vegetable matter is found in most fleeces. Excessive vegetable matter content increases wastiness in carding and combing. Some type of vegetable matter cannot be removed by carding and combing and may require carbonizing. Heavy burrs may decrease yield.
- g. Purity - The presence of medullated or kemp fibers is undesirable and the amount of discrimination varies with the percentage present. The presence of black or other colored fibers is more serious matter.

2 Breed Classes-

The primary difference in emphasis between a commercial class and a breeding class are that strength and vegetable matter content are influenced by environment rather than heredity and thus are disregarded in a breeding class and a little more attention is given to character and purity. The following are considered:

- a. Pounds of clean wool - Traits considered to be high in heritability.
- b. Staple length- Traits considered to be high in heritability.
- c. Uniformity of grade - The grade of the fleece should be representative of the breed.
- d. Character - The same factors are considered as in a commercial class but more attention is given to the distinctness of crimp and whether it is typical of the grade of the fleece and the breed. (Color Crimp and condition)
- e. Purity - Medullated, kemp and colored fibers are very undesirable in a class of whiteface breed fleeces. Colored fibers are tolerated in the mutton breeds, but these should be typical of face or leg clippings and not be scattered throughout the fleece.
- f Density - Indicative of more pounds of clean wool. Estimated by lock size and depth of dirt penetration or weathered tip.

C Terminology

1 Yield:

A larger, bulkier fleece.

A heavier fleece that will yield more pounds of clean wool.

A heavier fleece that will scour out more clean wool and therefore have a higher value.

A higher yielding fleece.

A fleece containing more pounds of clean wool.

A lighter conditioned fleece that contains less dirt and vegetable matter.

A cleaner fleece with less dirt and other foreign matter.

A greasy low-yielding fleece.

A dirty low-yielding fleece that will yield fewer pounds of clean wool.

2 Length of Staple:

Has greater length of staple (Fiber).

Longer staple.

A fleece that will yield more staple length wool.

A fleece that is more uniform in length.

Has less variation in staple length.

Lacks uniformity in length.

A fleece that has shorter length of staple.

A trait high in heritability and thus important to the Rambouillet (Columbia) breeder.

3 Grade and Uniformity of Grade:

A fleece with a higher spinning count.

A finer fleece.

A more uniform grading fleece.

More uniform in fiber diameter.

A coarser fleece that has an especially hairy britch.

Lacks uniformity of grade

4 Character:

A more attractive fleece

Displays more desirable character since it is brighter and whiter in color and has a more distinct crimp.

A more even and distinct crimp.
More uniform crimp.
A Whiter fleece with fewer stained areas.
A well-grown fleece of superior handle and character.
Softer more desirable handling properties.
A bolder crimp.
A whiter more lustrous fleece.
Crimp that carries distinctly from base to tip.
Contains less black fiber (or kemp).
A purer fleece containing less black fiber (or kemp).
A kempy fleece.
A dingy, harsh handling fleece.
Lacking uniformity and distinctness of crimp.

5 Strength and Wastiness

A stronger fibered, less wasty fleece.
Contains a definite break.
A fleece with fewer second cuts.
A frowsy weak fibered fleece.
A tippy, wasty fleece.
Less noilage.
A tender fleece that will be excessively wasty.
Would have to be considered a French Combing (clothing) length fleece because of the break.
Contains more vegetable matter and will be a more wasty fleece.
A more wasty fleece and therefore of less value to the manufacturer.
A sound fleece with greater strength of fiber.

D Reasons

Form used in giving reasons is similar to that used for livestock. Truth and completeness of description are the two most important items to consider in giving a good set of reasons. Reasons should be given in a clear and distinct voice in a confident manner.

It is preferable to start discussion of a pair of fleeces with the most important reason or reasons expressed in a general manner. Itemize in later statements, for example: I place one over number 4, because it will yield more pounds of clean wool since it is a heavier, higher yielding fleece that contains less dirt. In addition it is more uniform in grade, etc. Don't start out discussion the pair by mentioning uniformity of grade first, since this is of less importance.

Speak in present tense.

Delivery should not require more than 2 1/2 minutes.

Combine terms that are related as much as possible.

A heavier, higher-yielding, longer staple fleece that will yield more clean wool.

A more attractive higher quality fleece that is whiter and brighter in color and more uniform in grade

Terms for Breeding Classes are the same as for commercial classes, with the exception that the following terms should be used:

Displays more Columbia character in that it is a longer-stapled, bolder crimped fleece.

More typical Rambouillet fleece.

More desirable Corridale fleece.

Displays more breed character as noted by

NOTE:

Rambouilletts should produce fine grading wool.

Columbia and Corridales usually produce 2/8 blood and 1/4 blood (1/2 blood fleeces are acceptable but not typical).

It takes 10 higher percentage points of yield to make up 1 pound of weight.

Commercial Wool Reasons

I place this class of fine commercial fleeces 1-2-3-4.

I started with 1, as it was the heaviest, longest stapled, finest fleece in the class. In addition, it was more uniform in grade and length and would return more dollars and cents to the commercial producer as well as the manufacturer. I grant 2 was higher in its percent yield and more distinct in crimp from tip to base but was lighter weighing and coarser in grade so it is second.

In my middle pair of two similar weight fleeces I prefer 2 over 3. 2 was a higher yielding, brighter whiter, longer stapled fleece that was more uniform in length and grade thus being more advantageous to the manufacturer. Yes, 3 was finer grading and more distinct in its crimp but it was lower in its percent yield and shorter staple so it's third.

Nevertheless, I preferred 3 in the top of my bottom pair because it was heavier, finer grading , more uniform in length and grade and would scour more total pounds of clean wool. Furthermore, 3 displayed a tighter more distinct crimp. Yes 4, was longer staple and higher in its percent yield but it was the smallest lightest more variable in length and grade and would be the least economical to the commercial producer so it is last.

Breeding Fleece Reasons

I placed the class of Rambouillet breed fleeces 1-2-3-4.

In my top pair of similar weight fleeces, I preferred 1 over 2 because 1 was the longest staple, finest grading, brightest whitest fleece that was more uniform in length and grade and higher in its percent yield, traits highly heritable and indicative to the Rambouillet breed. I grant 2 had a tighter, more distinct crimp but it lacked the breed character so it is second.

However, I preferred 2 in the top of my middle pair of lower yielding fleeces as it was a heavier, bulkier, long stapled, finer grading fleece that was more distinct in its crimp from tip to base thus being more beneficial to the Rambouillet producer. I realize 3 was more uniform in grade.

In my bottom pair, I preferred 3 over 4 because 3 was heavier, bulkier fleece that was more uniform in length as well as having a more distinct crimp form tip to base. Yes, 4 was a finer, longer stapled fleece that had the highest percent yield but it was pounds light, lacked uniformity and had no definition of crimp therefore would be the least desirable to the Rambouillet producer so it is last.

Wool Grades

<u>American Grade</u>	<u>Spinning Count</u>	<u>Micron</u>
Fine	>80	<17.70
Fine	80	17.70-19.14
Fine	70	19.15-20.59
Fine	64	20.60-22.04
1/2 Blood	62	22.05-23.49
1/2 Blood	60	23.50-24.94
3/8 Blood	58	24.95-26.39
3/8 Blood	56	26.40-27.84
1/4 Blood	54	27.85-29.29
1/4 Blood	50	39.30-30.99

Wt.	Yield	Clean Wool	Fine	Length	Bulk	B/W	Uniformity		Char.	
							Grade	Length		

Class Name _____

_____ _____ _____ _____

Analysis _____

_____ / _____ **Grant** _____

_____ / _____ **Grant** _____

_____ / _____ **Grant** _____

Bottom _____

Wool Evaluation

Staple Length Chart

Length	Fine	1/2 Bld	3/8 Bld	1/4 Bld
Group	80/70/64	62/60	58/56	54/50
Staple - min	Over 3"	Over 3"	Over 3.25"	Over 4.0"
French MAX	1.5-3"	1.5-3"	1.75-3.25	No French Combing
MIN				
Clothing	Under 1.5"	Under 1.5"	Under 1.75"	Under 4"

All lengths are unstretched.