OKLAHOMA CareerTech

Introduction to Agriscience

Unit 7
The Sheep Industry

Student Edition

CIMC

AG3001

Unit 7
The Sheep Industry

Sheep have many advantages as a livestock species. Not only do they produce both fiber and meat, but they are also adaptable to a variety of production systems. Careful selection of breeding stock and assessment of existing pastureland and buildings can make sheep production a profitable enterprise. In the latter part of the 20th century as synthetic fibers were developed that replaced wool, the sheep industry in the United States began to decline. According to the USDA, the U.S. sheep and lamb population peaked at 56.2 million head in 1942. As of January 2025, the USDA noted that the United States had over five million head of sheep and lambs.

Getty Images

OBJECTIVES

1. Discuss the history of the sheep industry and its role today.
2. Identify major breeds of sheep and their characteristics.
3. Locate the parts of a sheep.
4. Identify consumer products derived from sheep.
5. Recall facts about wool composition and quality.

KEY WORDS

closed-faced
crimp
ewe
fiber diameter
fleece
lamb
lanolin
mutton
open-faced
ovine
pelt
ram
shearing
staple length
wether
worsted
wool
yield

History of the Sheep Industry

Sheep were among the first animals domesticated by humans. Although they are not as important as cattle or swine in today's economic picture, they have been a significant source of fiber and meat for much of human history. Sheep are thought to have been domesticated about 10,000 years ago. There is even some evidence that people were using sheep's wool as long as 20,000 years ago.

Modern domestic sheep are descended from wild sheep of Asia and Europe called Mouflon. Over the centuries, the production of wool became a priority. Sheep breeds were developed that gave finer wool fiber. Archeological evidence in Iran suggests that sheep were being selectively bred for their wool 6,000 years ago. The fine wool sheep breeds of today originated with the Spanish Merino, which was developed more than 1,200 years ago. The first Merino wool sheep were imported to New England in 1793. Within the following 20 years, the demand for Merino sheep swept across the Northeastern United States.

European explorers carried sheep with them on their voyages to the New World. Spanish missionaries introduced sheep to Indian tribes in Mexico. Sheep are still a major part of the Navajo tribe's culture. In fact, the Navajo name for sheep translates as "that by which we live."

Thinkstock Photos

Major Breeds of Sheep

There are as many as 1,000 distinct breeds of sheep in the world today, with about 50 breeds found in North America. However, many of these breeds are quite rare, and some are even at risk of extinction. In the United States, the Suffolk breed is most popular comprising nearly 60 percent of the sheep population. A purebred breed is one that has stayed true to its breed lines with no crossing with other breeds. Many breeds were developed by crossing two or more breeds until a distinct breed began.

Sheep are raised primarily for wool and meat, though some sheep dairies provide milk for cheese-making. Breeds can be classified by the type of wool they produce. The classifications are fine wool, medium wool, long wool, crossbred wool, and hair sheep. There are distinctive characteristics that separate the various breeds. For example, some breeds are considered ***open-faced*** breeds, which indicate they have no wool on their face, while other breeds are considered ***closed-faced*** breeds, which means they do have wool on their face. The general Latin term for all sheep is ***ovine***.

Southdown

Originating from the Downs of Sussex County, England, the Southdown is a medium- to small-sized breed, though the American Southdown is larger than the traditional. The Southdown has been used in the development of other breeds including the Hampshire, Shropshire and Suffolk. Southdowns are a polled, medium-wool breed raised mostly for its meat. They are an early maturing breed, and ewes have good lambing ability and average milk production. They are characterized by light colored wool, with a mousy brown color on the face and legs. Southdowns also have small ears and dark nostrils.

Photo courtesy American Southdown Breeders' Association

American Hampshire Sheep Association photo

Hampshire

The Hampshire is a large, medium-wool breed that originated in Hampshire County, England. Most of the Hampshires in the United States today were imported post-Civil War. The Hampshire has a mild disposition and is best known for the production of club show lambs. The breed is also noted for rapid growth and efficient feed conversion. Hampshires are characterized by a dark, relatively wool-free face and legs with large ears, along with a wool cap and wool on the legs.

Suffolk

Jupiter Images

With the use of Southdown rams and Norfolk Horned ewes, the Suffolk was developed. Originating in England, the Suffolk was brought to the United States in the late 1800s and is now the most common sheep breed in the country. Suffolks have a black head with a Roman nose. The breed can also be distinguished by its black, wool-free legs and large, semi-droopy ears. It is a medium-wool, polled breed that is raised mostly for its meat.

Shropshire

The Shropshire is a multi-purpose breed suitable for meat, wool, and dairy production. They originated in England as a cross between Southdown, Leicester, and Cotswold breeds. Shropshires, or Shrops for short, were introduced into the United States in 1855 and were one of the most common breeds at that time. They are a medium-sized sheep and one of the heaviest wool producers among medium-wool breeds. Shrops are characterized by wool on their legs, jaw and cap with small ears.

Banner Sheep Magazine photo

SAE IDEA:
<u>Entrepreneurship</u>
Raise sheep for breeding, show, or market.

Dorset

Jupiter Images

The Dorset breed is one of the oldest English breeds that actually dates to the Middle Ages. Dorsets are predominantly white with a wool-free face. The nose, eye membranes, and hooves are pigment free. As a medium-sized, medium-wool breed, the Dorset can be either horned or polled, though the polled variety is more common. The ewes are good mothers and good milkers, and can breed out of season giving lambs at any time of the year.

Rambouillet

The Rambouillet originated in France and descends from the Spanish Merino, an old breed that produces some of the world's finest wool. Some distinguishing characteristics include a wool-free face below the eyes and forward-facing, downward-tilting ears. The Rambouillet has good carcass characteristics and is considered a dual-purpose breed. They adapt well to most climates; however, they are susceptible to maggots living in their fleece, which is why they aren't too often found in damp, humid climates.

Jupiter Images

Montadale

Developed near Kansas City, Missouri, the Montadale began as a cross between a Cheviot ram and a Columbia ewe. The breeder, E.H. Mattingly, was looking for a breed that combined the qualities of wool quality, fertility, and meat production. The Montadale is a medium-wool, dual-purpose breed. They are noted for producing high-quality carcasses and excellent wool that is very white in color. Due to the small head size of the breed, there are rarely birthing issues that arise.

Montadale Sheep Breeders' Association

USDA-ARS photo

Dorper

The Dorper breed originated in South Africa when the Dorset Horn and the Blackhead Persian were crossed. It is considered a hair sheep due to the hair fibers it produces rather than wool. There are two Dorper breeds – the Dorper, which is black headed, and the White Dorper, which is white headed. The Dorper is known for its fat tail and ability to withstand warm climates with little rainfall.

Speckled Face

The Speckled Face breed (also known as the Beulah Speckled-Face) originated in Wales. Its wool-free face is white speckled with black. It also has a black muzzle and black around the eyes and ears. Ewes are often crossed with other breeds such as the Suffolk to produce market lambs for meat. Purebred Speckled Face sheep do not meet the market's demand for lean, fast-growing sheep.

Thinkstock Photos

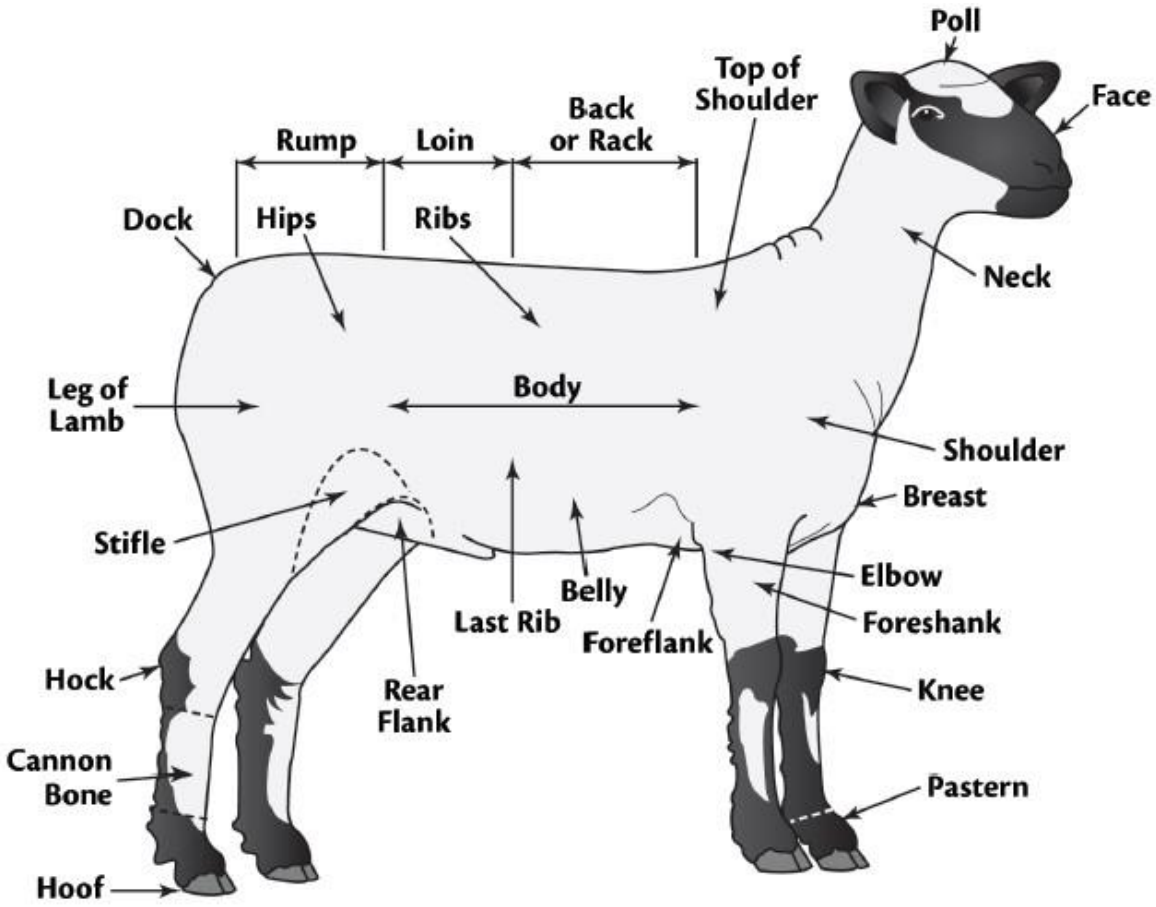
HERITAGE BREEDS

Most sheep raised today belong to breeds that have been selectively bred for a commercial purpose. But hundreds of other sheep breeds exist. Some of these lesser-known breeds, called heritage breeds, were popular at one time but have fallen out of favor in today's production climate. Some heritage breeds are considered "natural breeds" because they developed their unique characteristics without any intervention by humans. An example of one of these hardy and ancient breeds is the Damara Fat-Tailed Sheep. Such breeds can be saved from extinction through the efforts of people who raise them for their own use or as a commercially viable breed; the website **www.damaras.com** shows one such farm. Another endangered breed is the Teeswater Sheep shown here. To learn about preserving heritage breeds and the importance of maintaining the genetic diversity of all livestock, visit the American Livestock Breeds Conservancy at https://livestockconservancy.org/.

Getty Images

Parts of a Sheep

When studying parts of animals, it is important to know the anatomical differences between males and females. A ***ewe*** is a female sheep of any age and is distinguished from a ram by certain body parts. A ***ram*** is a male sheep that has not been castrated. A ram will have a sheath and testicles, while a ewe will have neither of these parts. A ***wether*** is a male sheep that has been castrated, which is typically done when lambs are raised for market.



Consumer Products

The major products from sheep are meat and wool. Milk from sheep is also used to make specialty cheeses. Like other livestock, confined sheep produce manure that is valuable when used as a fertilizer. ***Lanolin***, a grease-like substance that naturally coats the sheep's wool, is a common ingredient in lotions and moisturizers. Slaughtered sheep provide the raw materials for many other by-products, such as glue, soap, fertilizer, and cosmetics.

Meat

The meat from sheep younger than one year old is called ***lamb*** and is the type of sheep meat most often eaten in the United States, as well as most Western countries. Meat from sheep that are older than one year is called ***mutton***. While neither meat is widely popular in the United States, other countries and cultures regard it as a staple. Middle Eastern and Greek cultures consider lamb or mutton a central part of their diets, and Australian families tend to eat lamb on a weekly basis. In the United States, lamb consumption is most frequent in a restaurant setting. On average Americans eat less than one pound per capita each year, which is much less than countries such as Australia and Saudi Arabia. People in those countries consume over 25 pounds per person each year.

Wool

Wool is the fiber taken from the sheep by ***shearing*** (shaving or clipping) from the sheep's skin. The wool taken from one sheep is called a ***fleece***. Wool is a very warm and strong fiber, but it is also elastic, which allows it to be spun into yarn. While wool is the product most often associated with sheep, it is less profitable than meat or even milk. However, wool is still an important product that is used in a variety of ways. Wool sweaters and suits, blankets, and batting for futons or quilts are just a few examples. Selling fleeces to people interested in fiber arts, such as hand spinning, knitting, and weaving, provides a small but popular market.

Thinkstock Photos

Milk

Most sheep's milk is made into cheeses. Feta, Pecorino Romano, and Roquefort are some of the more well-known types of cheeses made from sheep's milk. Some people also drink sheep's milk, which is considered a very nutritious and easily digestible product with a slightly sweeter taste than cow's milk. Sheep dairying is more common in European countries than in the United States. The breed of sheep most often used in dairies is called the East Friesian.

SAE IDEA:
<u>Exploratory</u>
Visit a sheep rancher during a time when they are shearing sheep.

Pelts

When the hide taken from a slaughtered lamb or sheep still has the wool attached, it is called a ***pelt***. If the pelt has less than one inch of new wool on it and is clean and in good condition, it can be used for products such as slippers, mattress pads, and car seat covers.

Wool Composition and Quality

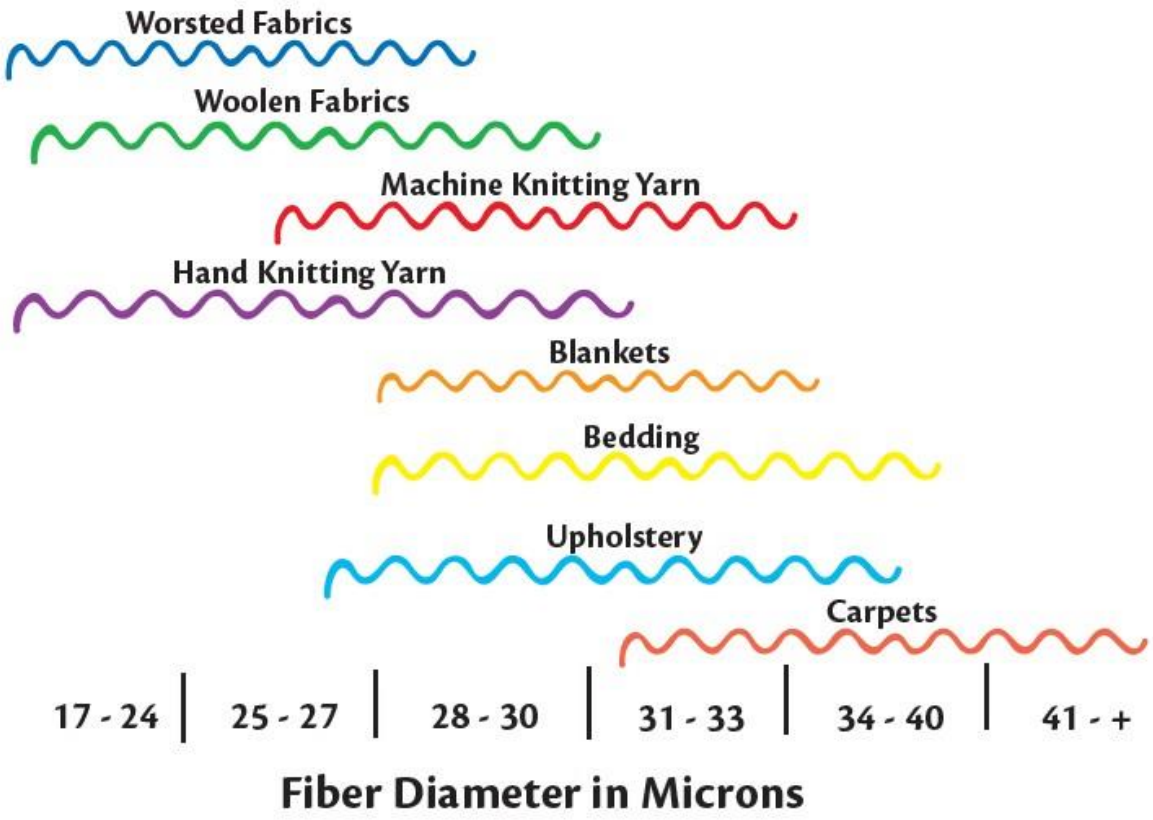
Wool is a versatile fiber that is used in a variety of ways, from woven and knitted fabrics to insulation, carpets, rugs, and felt. It meets the needs of all these uses because it is strong, soft, warm, water-repellent, fire-resistant, and durable. The relative fineness or coarseness of the wool fibers is one of the primary factors that determine the type of product made. Fiber length is also important. Fine fibers that are at least three inches in length can be processed into ***worsted*** fabrics, while shorter fibers are processed into woolen fabrics. Worsted yarns produce a lighter, finer fabric and are used for high-quality garments such as suits. Woolen yarns have more bulk and softness and are used for garments such as sweaters and coats.

Evaluating wool quality is done after the fleece is taken from the sheep, which normally occurs once a year. Several factors are evaluated. The ***fiber diameter*** is an average of the fibers in a fleece. On any sheep, fibers on the shoulder will be the finest, while fibers from the hind leg are the coarsest. A good fleece will not have much variation.

The larger the measurement in microns, the coarser the wool. The average for a fine fleece can be as low as 14 to 15 microns, while the average fiber diameter for a coarse fleece may be 40 to 45 microns. An older system of determining fiber diameter is called “spinning count.” In this system, the higher the spinning count, the finer the fiber diameter.

“NATURAL WOOL”

Naturally colored wool is growing in popularity, particularly among people who like to do their own spinning and weaving. Most commercial buyers prefer white wool so they can dye it any color they want, but there is a market for naturally colored wool that has not been dyed. No one breed of sheep gives naturally colored wool. In fact, colored wool can come from almost any breed of sheep because it can be selectively bred for color, just as white wool has been. These natural colors come in an array of red, gray, brown, blonde, and black. For more information about naturally colored wool, visit the website of the Natural Colored Wool Growers Association at https://ncwga.org/.



Staple length will determine what the wool can be used for. The length of the fibers should be fairly consistent throughout the fleece. The ***yield*** is the weight of the fleece after it has been cleaned of the lanolin and any dirt or plant matter. It is expressed as a percentage. For instance, a clean fleece that weighs half of what it did prior to cleaning has a yield of 50 percent.

The fiber strength is tested by pulling on both ends of a sample tuft of wool from the fleece. If it breaks easily and unevenly, it is considered tender. If all the fibers in the tuft break at the same length, it is called broken wool. Both conditions are undesirable. The ***crimp*** is the waviness of the fibers. Usually, wool with a smaller fiber diameter will have more crimp. The color is important because most commercial buyers want a white fleece with no colored fibers. Any colored fibers, even in a mostly white fleece, means it will be considered a colored fleece.

Jupiter Images

WHY DOES WOOL SHRINK?

Everyone has heard the joke about the well-meaning person who does the laundry and accidentally shrinks a favorite woolen sweater to doll-size. The care of woolen garments isn't difficult but doing it the wrong way can lead to a laundry disaster.

In fact, wool doesn't exactly "shrink." Instead, the moisture, rubbing, and heat from washing and drying causes the wool to *felt*. Felting locks the wool fibers together in a way that prevents them from expanding to their full length. This happens because of the wool fiber's structure. Each wool fiber has microscopic scales on it. When the fiber is on the sheep, all these scales grow in the same direction (toward the tip). But once the wool is removed from the sheep and processed, the individual fibers end up pointing in opposite directions. This means that as each fiber rubs next to its neighbor, the microscopic scales catch and hold on to each other.

The tiny scales create a ratcheting effect on the fiber; instead of being able to stretch back to its normal length, it can only get smaller and smaller. Ultimately, all the fibers are compressed tightly together, and the unfortunate garment is no longer the soft, fluffy, wearable size it once was. The good news is that fabric manufacturers now have methods of treating wool that allow it to be washed normally with no ill effects.

When done intentionally, felting is a way of processing wool. Felting uses the short fibers that cannot be processed into yarn. It produces a fabric called felt or boiled wool.

UNIT SUMMARY

As one of the first domesticated animals, sheep have provided many beneficial products to humans. Fiber, meat, and milk production all have played a role in the U.S. economy with fiber and wool being the most important. There is a variety of breeds raised dependent on a producer's desires. Some breeders prefer breeds that provide more meat where others may focus on wool production. As consumers, we benefit from sheep by the clothes we wear, hygiene products we use, and food we eat. Wool fibers can be used for clothing, blankets, bedding, or carpets depending on a variety of factors such as fiber diameter, staple length, and crimp. Although the uses of sheep have declined over the years, they still provide us with many valuable products.

UNIT REVIEW

1. Why did the need for wool decline in the 20th century?
2. Where are modern domestic sheep decedents from?
3. What is the primary purpose for raising sheep?
4. What is the difference between an open-faced and a closed-faced breed?
5. Outline the distinguishing characteristics of four sheep breeds.
6. Which breed can give birth to lambs any time of the year?
7. What is the difference between a ram and a wether?
8. What sheep product is common in lotions and moisturizers?
9. What is the difference between wool and a pelt?
10. Name five finished products made from sheep.
11. Is wool coarser or finer as the fiber diameter increases?
12. Describe staple length, yield, and crimp in terms of wool.
13. Why does wool shrink?