Need to Know: Sheep body systems, characteristics & functions

Sheep are ruminant mammals that have a range of heights and weights, depending on their breed. Sheep, along with goats, are members of the subfamily Caprinac and the most common species of the genus Ovis. Domestic sheep are raised as livestock for a number of purposes, including wool, meat production and milk.

The word "ewe" refers only to female sheep. A ram is an uncastrated adult male sheep and a wether is a castrated male. A lamb is a baby sheep.

An understanding of basic anatomy and physiology is important in making daily decisions about feed, housing, health and breeding.

All subspecies of sheep share important anatomical characteristics.

- They are four-legged, hoofed animals.
- They have tails that hang down. Tails can be docked, or shortened, for health and sanitary reasons.
- They are ruminants, meaning they can regurgitate and re-chew indigestible foods for digestion in one of the four chambers in their stomach. Sheep are natural grazers.
- Females have udders and teats that provide milk.

Anatomy refers to the form and structure of organisms. In comparison, physiology is the study of the functions of the body and its parts.

Physiology looks at the body systems, organs, tissues and cells.
Know why the skeletal system is important

The skeletal system is one of the systems that make up any animal body. It is the framework on which the body is built and supports the weight of all the other systems. The skeletal system includes bones, muscles, the joints that connect bones, ligaments which allow movement in the joints and cartilage. Therefore, the skeletal system is also fundamental to the movement of the body.

An understanding of the basics of the skeletal system ensures that owners and handlers provide sheep with appropriate nutrition, exercise and living conditions for optimum skeletal health.

The sheep skeletal system supports the animal’s body and weight and is the frame upon which the muscles and internal organs are connected. The skeleton is made up of the vertebral column, ribs and skull, limbs and joints.

The vertebral column is made up of both fixed and movable bones. The ribs are long curved bones that form the ribcage, which protects essential organs. The skull includes all the bones of the head, including the lower jawbone, which forms a movable joint with other parts of the skull.

Limbs include the forelegs as well as hindlegs. Forelegs include the shoulder and foreshank and the lower part of the limb includes the knee, fetlock and pastern. Hindlegs consist of the pelvis, thigh and a lower limb made up of the hock joint and cannon.

Structural soundness refers to the skeletal system and how well its bones support the animal’s body. Structural soundness affects an animal’s well-being, movement and reproductive efficiency.
Know how the digestive system works

Sheep are ruminant animals. **Non-ruminants**, including people, pigs and dogs, digest carbohydrates, protein and fat by enzymatic action. **Ruminants**, including cattle, sheep and deer, use bacteria in the forestomachs to digest fibre by fermentation and use enzymatic digestion in the small intestines. The digestion of this fibre produces carbon dioxide and methane gas. Ruminants also digest carbohydrates, protein and fat this way.

<table>
<thead>
<tr>
<th>Food is broken down in the <strong>mouth</strong> by chewing; saliva is added as a lubricant.</th>
<th><strong>Esophagus</strong> is a simple, muscular tube between the mouth and stomach.</th>
<th>In the <strong>stomach</strong>, including the ruminant forestomachs, enzymatic digestion of proteins is initiated and foodstuffs are reduced to liquid form.</th>
<th>The <strong>liver</strong> is the centre of metabolic activity in the body. Its major role in the digestive process is to provide bile salts to the small intestine, critical for digestion and absorption of fats.</th>
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</thead>
<tbody>
<tr>
<td>The <strong>pancreas</strong> provides a mixture of digestive enzymes to the small intestine, critical for digestion of fats, carbohydrates and protein.</td>
<td>The <strong>small intestine</strong> is where the final stages of chemical enzymatic digestion occur and where almost all nutrients are absorbed.</td>
<td>The <strong>large intestine</strong> differs greatly among species in extent and importance – in all animals, water is absorbed, bacterial fermentation takes place and feces are formed.</td>
<td><strong>Reticulum</strong>&lt;br&gt;<strong>Rumen</strong>&lt;br&gt;<strong>Omasum</strong>&lt;br&gt;<strong>Abomasum</strong></td>
</tr>
<tr>
<td>The <strong>reticulum</strong> lies against the diaphragm and is joined to the rumen by a fold of tissue.</td>
<td>The <strong>rumen</strong> is the largest of the forestomachs.</td>
<td>The reticulum is connected to the spherical <strong>omasum</strong> by a short tunnel.</td>
<td>The <strong>abomasum</strong> is the ruminant’s true or glandular stomach, and is very similar to the mono-gastric stomach of animals such as the dog or cat.</td>
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KNOW WHY THE RESPIRATORY SYSTEM IS IMPORTANT

The respiratory system is the means by which animals obtain and use oxygen and eliminate carbon dioxide.

The respiratory system consists of the lungs and pleura, nostrils, nasal cavities, pharynx, larynx, trachea and bronchi. The cards that follow provide a description of the major body parts and function in the respiratory system.

<table>
<thead>
<tr>
<th><strong>Nostrils</strong> are external openings to air passages.</th>
<th><strong>Nostrils</strong> provide external openings for nasal cavities.</th>
<th><strong>The pharynx</strong> is a passageway for air and food.</th>
<th><strong>The larynx</strong> is the opening from the pharynx and is the organ of sound production in mammals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <strong>trachea</strong> provides the air passageway between the larynx and bronchi. It is a semi-flexible tube.</td>
<td><strong>Bronchi</strong> are major air passages that are important for conducting air into the lungs.</td>
<td><strong>The lungs</strong> are main structures of the respiratory system. They are located in the thorax. When the thorax expands, the lungs expand.</td>
<td><strong>The pleura</strong> are membranes that surround both lungs.</td>
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</tbody>
</table>

KNOW HOW THE MUSCLE SYSTEM WORKS

A sheep’s head has muscles around the ears to permit movement so sound can be picked up. Sheep also have strong jaw muscles so they can tear and grind tough forage and grasses. Smaller muscles around the lip area allow them to graze smaller grains and seeds. Their neck muscles allow them to hold their heads for balance while moving.

The muscles in the shoulders and torso provide support and protection for the spine and ribs. The **petoralis muscles** form the chest section of the sheep. The **obliques** and **latissimus muscles** are along the rear and bottom of the torso and protect and stabilize the abdominal organs.

The muscles of the forelimbs and hindlimbs permit flexibility and allow movement. The hindleg muscles tend to be the largest and strongest of a sheep. Deltoids, biceps and triceps are heavier in meat sheep breeds than in those used for wool production.

**Sheep muscles are suited to activities common to most small ruminants, including grazing and walking or running to escape predators. Sheep also have small cutaneous muscles below the skin that twitch or shake to dislodge insect pests.**

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KNOW ABOUT THE BASIC BODY PARTS IN THE REPRODUCTIVE SYSTEM

Males and females play different reproductive roles, and in most animal species, the role of females is not completed until a viable offspring is produced. Even after birth, females play a significant role in the provision of post-natal care and, in mammals, must lactate to provide nourishment for their young.

Understanding basic anatomy and reproductive physiology of sheep is important for reproductive decisions and management.

Female Reproductive Organs

<table>
<thead>
<tr>
<th>Organs</th>
<th>Description</th>
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<tbody>
<tr>
<td>Ovary</td>
<td>The ovaries contain the ova, or eggs, and secrete female reproductive hormones, progesterone and estrogens.</td>
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<tr>
<td>Oviduct</td>
<td>The oviduct, also called fallopian tubes, transport sperm and ova, or egg, to the site of fertilization, which occurs in the upper one-third of the fallopian tube. The fertilized ovum is then transported to the uterus.</td>
</tr>
<tr>
<td>Uterus</td>
<td>The uterus consists of two separate uterine horns. In animals with multiple births, each horn can contain one or more fetuses. The uterus provides a proper environment for embryo development, supports development of the fetus by supplying nutrients, removing waste, and protecting the fetus. It also transports the fetus out of the maternal body during birth.</td>
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<tr>
<td>Cervix</td>
<td>The cervix is the gateway to the uterus and is a muscular canal consisting of several folds of tissue referred to as &quot;rings.&quot; The cervix participates in sperm transport and, during pregnancy, blocks bacterial invasion.</td>
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<tr>
<td>Vagina</td>
<td>The vagina is the exterior portion of the female reproductive tract and is the site of semen deposition during natural mating.</td>
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<tr>
<td>Vulva</td>
<td>The vulva is a barrier that prevents external contamination of the female reproductive tract.</td>
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</table>
Male Reproductive Organs

The **testes** are paired organs which lie in the scrotum. They produce the male **gametes**, or spermatozoa, and secrete the male sex hormone, **testosterone**. Testosterone is essential for the development of male characteristics, maintaining normal sexual behaviour and sperm production.

The **scrotum** is a muscular sac containing the testes. It supports and protects the testes and also plays a major role in temperature regulation.

The **epididymis** is located in the testes and is a long and convoluted tube in which sperm cells produced by the testicles are stored and mature to be capable of fertilization.

The **vas deferens** is the duct that rises from the tail of the epididymis into the abdomen, where it joins the urethra at the neck of the bladder. It is often referred to as the "spermatic cord."

**Accessory glands** secrete additional fluids which, when combined with the sperm and other secretions from the epididymis, form the semen.

The **penis** is the final part of the male reproductive tract and its function is to deposit semen into the vaginal tract of the female. At the end of the penis is a narrow tube called the **urethral process** that sprays the semen in and around the cervix of the cow. The **preputial sheath** protects the penis, except during mating.

Know about Growth

All living things are constructed of cells, which are capable of performing all functions we associate with life. These functions include growth, intake of food, responses to external stimuli and reproduction. Growth results in increase of size and triggers changes in some body functions, such as the reproductive organs and body parts.