Domestic beef cattle are ruminant mammals that have a range of heights and weights, depending on their breed. Cattle are a member of the subfamily Bovinae and the most common species of the genus Bos. Beef cattle are raised as livestock for meat consumption and other products, compared to dairy cattle that are raised for milk production. In some places, certain species of cattle, including oxen or bullocks, are still used as draft animals, and used to pull carts and plows.

The word "cow" refers only to female adult bovines, but can also be used to generally identify all cattle. A bull is an uncastrated adult male bovine, a steer is a castrated male and a calf is a young female or male bovine. A heifer is a female that has not yet had a calf.

An 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.

An understanding of basic anatomy and physiology is important in making daily decisions about feed, housing, health and breeding.
All subspecies of cattle share important anatomical characteristics.

- They are four-legged, hoofed animals.
- They have long tails.
- They are ruminants, meaning they can regurgitate and re-chew indigestible foods for digestion in one of the four chambers in their stomach.
- Females have udders and teats that provide milk.

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 cattle with appropriate nutrition, exercise and living conditions for optimum skeletal health.

The cow’s skeletal system from the front legs to the head includes the cannon, knee joint, radius, sternum, elbow joint, ulna, humerus, shoulder joint, shoulder blade and eye socket.

From the top of the head and along the top side of the cow, the skeletal system includes the horn cones, cervical vertebrae, dorsal vertebrae, lumbar vertebrae, sacrum and hip bone.

Along the back side of the cow, the cow’s skeletal system includes the femur, knee joint, tibia, hock joint, ribs, pasterns and coronary. These are the major components of the cow’s skeletal system.

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

Cattle 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.

It takes one to three days for food to pass through a cow’s digestive tract, depending upon what it eats. A cow briefly chews food as it eats, breaking it into smaller particles. As the cow chews, digestive enzymes in the saliva are mixed with the food before it passes down the esophagus into the reticulum and rumen.

Since food that is being digested flows freely between the reticulum and rumen, these compartments are collectively referred to as the reticulorumen. The reticulorumen contains more than 50 percent of the total digestive tract capacity.

Most feed is fermented in the reticulorumen, but a small amount may pass unchanged into the omasum and abomasum. Some of the larger food particles are regurgitated, chewed again and re-swallowed. This is called “chewing the cud.” Food is fermented and further broken down in the rumen by microbes.
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 chart below provides a description of the major body parts and function in the respiratory system.

<table>
<thead>
<tr>
<th><strong>Nostrils</strong></th>
<th>Nostrils provide external openings for nasal cavities.</th>
<th>The <strong>pharynx</strong> is a passageway for air and food.</th>
<th>The <strong>larynx</strong> is the opening from the pharynx and is the organ of sound production in mammals.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The 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>The <strong>pleura</strong> are membranes that surround both lungs.</td>
</tr>
</tbody>
</table>

KNOW HOW THE MUSCLE SYSTEM WORKS

The main functions of muscular system are movement and heat production. The muscular system consists of smooth, cardiac and skeletal muscles. Smooth muscles are part of blood vessels, as well as the digestive and reproductive systems. Cardiac muscle forms the heart. These two types of muscles are involuntary. Skeletal muscles are used for both voluntary movement as well as involuntary functions such as breathing.

Beef cattle should be mostly muscle – but they should also have some fat on them. Fat in the right places is a good sign that the animal is well finished, or grown. The brisket and tailhead are two areas that help people judge when beef cattle have reached their ideal weight. The brisket is only fat and skin. The skin should be tight and full, but not overfilled. The tailhead is another place that will fill in as beef cattle reach their finished stage.

Producers raise cattle for their muscle. Ideally, beef cattle should have:

- Smooth shoulders
- Deep, muscular hindquarters
- Long, deep-ribbed body
- Deep, wide chest floor
- Naturally thick, muscular top, with lots of muscle on either side of the spine
- Widest point of the body at the stifle.
**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 beef cattle is important for reproductive decisions and management.**

![Female Reproductive Organs Diagram](image)

<table>
<thead>
<tr>
<th><strong>Female Reproductive Organs</strong></th>
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<tbody>
<tr>
<td>The ovaries contain the <strong>ova</strong>, or eggs, and secrete female reproductive hormones, progesterone and estrogens.</td>
<td>The <strong>oviduct</strong>, 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>The <strong>cervix</strong> acts as a cap that protects the uterus. It is a muscular canal consisting of several folds of tissue referred to as “rings.” The cervix participates in sperm transport and, during pregnancy, blocks bacterial invasion.</td>
<td>The <strong>vagina</strong> is the exterior portion of the female reproductive tract and is the site of semen deposition during natural mating.</td>
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</table>
**Male Reproductive Organs**

<table>
<thead>
<tr>
<th>Male Reproductive Organs</th>
<th>Description</th>
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<tbody>
<tr>
<td>The <strong>testes</strong> are paired organs which lie in the scrotum. They produce the male <strong>gametes</strong>, or spermatozoa, and secrete the male sex hormone, <strong>testosterone</strong>. Testosterone is essential for the development of male characteristics, maintaining normal sexual behaviour and sperm production.</td>
<td>The <strong>scrotum</strong> is a muscular sac containing the testes. It supports and protects the testes and also plays a major role in temperature regulation.</td>
</tr>
<tr>
<td>The <strong>vas deferens</strong> 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.”</td>
<td><strong>Accessory glands</strong> secrete additional fluids which, when combined with the sperm and other secretions from the epididymis, form the semen.</td>
</tr>
<tr>
<td><strong>The penis</strong> 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 <strong>urethral process</strong> that sprays the semen in and around the cervix of the cow. The <strong>preputial sheath</strong> protects the penis, except during mating.</td>
<td></td>
</tr>
</tbody>
</table>

**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.