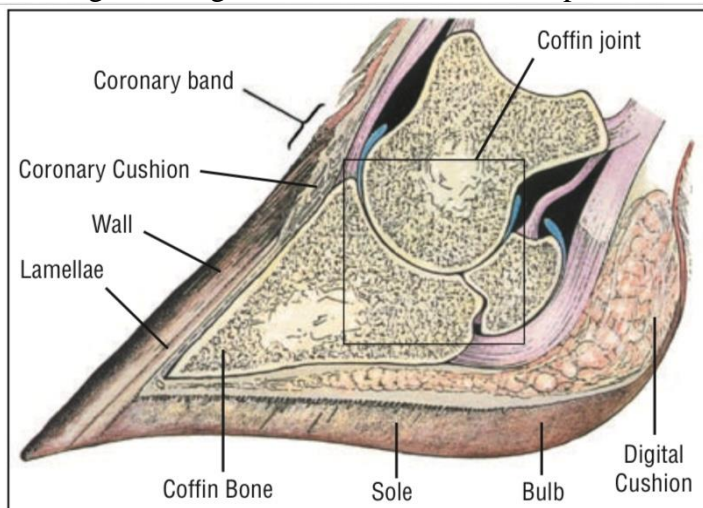


Cattle & goats are cloven-footed animals [the hoof consists of two digits]. In cattle, the lateral claw is slightly larger in the back feet, while the medial claw is the larger claw in the front feet. The space between the two claws is the interdigital clef; with an area of interdigital skin. The hoof is described from the outside moving in, beginning with the hard outer covering of the hoof, known as the hoof wall, or horn. The horn is a hard surface, but functions like skin epidermis. The cells that form the horn are produced by the tissue directly beneath the hoof wall [corium] at the hoof head. The corium is a nutrient-rich tissue that contains many important blood vessels and nerves inside the hoof. The corium continuously produces new cells that are then gradually pushed away from the quick. As the cells are pushed away from the corium, they die and produce the hard, new outer growth. At this point the cells are said to have been keratinized, or cornified. The new growth comes out at the coronary band, the point where the hoof meets the hairy skin on the foot. The soft, new hoof growth that has just come to the surface is the perioplic horn. It is shiny and holds in the moisture of the hoof. As can be seen in the rings that often occur on an animal's hooves, horn is produced at varying rates, because of variation in factors such as nutrition, health, and living conditions. However, as a general rule, bovine hooves grow about 1/5 to 1/4 of an inch per month and horse's hooves grown in general 1/4 to 3/8 of an inch per month.



*Figure 1. Bovine hoof*

Underneath the hoof is a slightly softer region, the sole. The tissue that makes up the sole is produced by the corium of the sole, and is suppler than the horn of the hoof wall. The point where the hoof wall is bound to the sole is the white line. The white line is a somewhat flexible junction between the sole and wall, allowing the hoof to be more flexible as the animal moves. The front region of the sole is called the toe, and the two bulbs at the opposite end of the foot are referred to as the heel bulbs.

The sole should be from 5-7 millimeters thick for the inside of the hoof to be protected properly. Directly above the sole is the corium, which is below the digital cushion. The digital cushion is a pad of

fatty tissue that serves to protect the corium, as well as to aid in blood transport in the leg. It also serves as a shock absorber for the digital phalange bones. The pedal bone is directly above the digital cushion and is the largest bone in the hoof. The pedal bones provide the framework for the general shape of each claw, and they are key components in the movement of the animal. The pedal bone is attached to the corium by sensitive connective tissue called the

laminar tissue, or laminae. The laminae holds the animal suspended in its hoof. The deep flexor tendon is attached to the back portion of the pedal bone, making it very important for locomotion and flexion of the foot. The short pastern bones snugly fit into the top of the pedal

bone, forming a condylar joint [the pedal joint]. Seated directly behind the pedal joint is a small distal sesamoid bone (navicular bone), which serves as a fulcrum for the movement of the joint. The

long pastern bone then fits into the top of the short pastern bone, forming the pastern joint. Above the long pastern bone is the fetlock joint and above that the cannon bone of the lower leg. The pedal bone is the only bone of these three that is completely inside the actual hoof, while the pastern bones serve to connect the hoof to the rest of the leg. The bones in the hoof do not entirely formulate the movement of the foot and the leg. Several tendons allow the animal its range of motion. For example, the deep flexor tendon attaches to the pedal bone and goes up the back of the leg, allowing the animal to flex its foot; the extensor tendons in front allow the animal to pick up its foot and move it forward. Directly below the flexor tendon is the digital cushion, which aids in pumping blood throughout the foot and up the rest of the leg as well as serving as a shock absorber to protect the sensitive tissues from the bones of the hoof.