ANATOMY OF HORN

The keratin in the epidermis, when cornified and thickened, is referred to as horn. Horn is particularly resistant to mechanical and chemical damage. The dermis of horn gives the structures their 3-D structure and shape. Cattle, some sheep, goats and antelope possess horns and these are permanent organs. Breeds without horns are termed polled breeds. Deer possess antlers, which are temporary organs that develop during the rutting season which are then shed after rutting season is over.

Horns have a central, conical bony core or cornual process that grows out from the frontal bone of the skull. After 6 months of age, the bone becomes hollow and the space within it is continuous with the frontal sinuses. The surface of the bone is ridged and porous and is covered with papillated dermis that is continuous with the periosteum and epidermis which keratinises and forms the protective covering of the horn. The substance of the horn is similar to that of the hoof and is a mixture of tubules and intertubular horn. The new horn produced at the base is soft and often transparent and resembles the periople of the hoof, giving the horn a glossy appearance.

In the neonate, the bone portion is very small, with a thin dermal and epidermal covering. Removal of this covering will prevent the horn from growing and thus remove the requirement for disbudding later in life.

If the skin covering the horn bud is not removed, the horn will continue to grow throughout the animal's life from the base, apically. Growth zones are visible with differing thickness of the keratin layer, relating to the nutritional status of the animal at that time.

The dermis of the horn is supplied by the cornual nerve, which is a branch of the maxillary nerve (CN V). This nerve is often blocked to provide local anaesthesia in the disbudding or de-horning process.

The primary function of horns is to convey social hierarchy. The larger the horns, the higher up the social group the animal is. They also have a thermoregulatory roll in cattle and goats. When the ambient temperature increases, the blood flow through the dermis of the horn also increases, thus facilitating heat loss through radiation from the horn surface.