

Getting to Know Your Deer

by

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Deer belong to the Family: *CERVIDAE*

Characteristics of the Family are:

- absence of gall bladder
- dew claws or hooves show (feet are four toed)
- there is a lachrymal depression in front of each eye
- most have 32 teeth (elk are exception)
- males have antlers (reindeer is one exception)

Species of the *CERVIDAE* Family include:

- White-tailed deer
- Mule deer
- Black-tailed deer
- Elk
- Axis deer
- Fallow deer
- Moose

30 subspecies of white-tailed deer exist in North, Central and South America.

They are *UNGULATES* which means they have a hoofed foot.

They are *RUMINANTS* which means they have a four chambered stomach and are “cud” chewers.

They are *CONCENTRATE SELECTORS* (or Forage concentrators) which means they walk from plant to plant and select the best parts.

EXTERNAL ANATOMY

Deer have a narrow elongated muzzle. This allows them to reach into plants or brush and select the most desirable growth and avoid thorns and less desirable portions. The muzzle shape also allows deer to select and pick up tiny, tender forbs not available to other ruminants.

Deer have a long and limber neck. This allows them to reach into brush or trees to eat and elevates eyes for better vision and allows quicker detection of and reaction to predators.

Eyes are large and set on the side of the head and give 310 degree field of vision (prey animal). Eyes function well at low light levels due to presence of *TAPETUM LUCIDUM*. This is a reflective layer of pigmented specialized epithelial cells which reflect light allowing greater light capture in low light. This layer of cells results in “eye shine” present in many nocturnal animals.

Ears are large, cranially concave and rotate comfortably in all directions.

Large chest area allows large volume of air to be inhaled in one breath. Body is compressed laterally to allow more escape options through brush and trees.

Skeleton and muscles built for speed:

- legs and feet slender and light
- hind leg muscles very powerful; push forward strongly in bounds
- no collar bone – shoulder free floating to allow complete front to back movement and still allow for active pivots
- shallow shoulder joint allows rotation – this allows for sudden direction changes to escape predators.

Deer have a short, slick hair coat. There are **PILO ERECTOR** muscles in the skin that fluff hair coat (goose bumps) to increase air space for insulation and used in behavioral posturing (puffing up hair coat).

- Deer deposit fat first in bone marrow, kidney and pelvic areas. Fat is deposited last over the ribs, brisket and tail head and deer lose fat in the reverse order.

GLANDS

External:

- Forehead gland – active during breeding (rut)
- Preorbital gland – territory marking
- Interdigital gland – deposit odor with each step, stomping foot in warning deposits extra amounts
- Metatarsal gland – unknown; possibly circulatory or thermoregulation
- Tarsal gland – identify other deer, dominance position, physical condition, etc. reproductive status – urine deposits its biochemical activity produces the odor
- Vomeronasal gland – vomolfaction – taste and smell – has receptors that are sensitive to non volatile compounds; used in identification and determining reproductive status

Internal:

- Pineal gland - located in the brain and detects changes in day length – influences pituitary gland to produce hormones that influence antler growth / hardening / shedding in males and cycling of females.

DIGESTIVE SYSTEM

Deer have a **RUMINANT DIGESTIVE SYSTEM** - four chambered stomach and chews cud.

Deer's digestive system is specialized to limit exposure to predators. Food passage through the digestive system is more rapid than other ruminants, this is one reason they eat selected plants to allow quicker digestion.

Deer take in selected plants as quickly as possible – chewing slightly while mixing with saliva – the material goes into the rumen and mixes with and is acted on by rumen bacteria and protozoa – the rumen contents are regurgitated and rechewed multiple times – contents eventually move on through the digestive tract where the contents and associated protozoa and bacteria and their by products are used to satisfy nutrient demands – energy and protein.

DENTAL FORMULA: 0/3 (Incisors), 0/1 (Canines), 3/3 (Molars) X 2 = 32 Deciduous premolars are present on yearlings = tricuspid teeth – premolars in mature deer = bicuspid

Major components of digestive system:

- Mouth/Teeth
- Esophagus
- Reticulum – “Honeycomb” first compartment of the stomach
- Rumen – fermentation vat – has papilla on the wall to increase absorptive and mixing surface area
- Omasum – “Butchers Bible” – absorbs fluid – multiple folds dramatically increase surface area and “grinding” function
- Abomasum – true stomach – glands produce acids which digest contents as they arrive – last part of the stomach
- Small Intestine – portion where primary nutrient absorption occurs – villi increase surface area for absorption
- Large Intestine and Cecum – fluid absorption and continued bacterial digestion
- Colon
- Rectum / Anus

Liver – produces bile – no gall bladder – digestive function especially fats and detoxification of substances example: toxic compounds in plants

RESPIRATORY SYSTEM

Nose – excellent sense of smell – very well developed *nasal conchae* – warms and humidifies the air to allow better scenting and oxygen transfer

Pharynx and Larynx – combine to create deer vocalizations – bleats and grunts

Trachea – “windpipe” – divides into Bronchi and ultimately Bronchioles

Lungs – comparatively large and capable of moving large amounts of air in short time, ideal for running full out in relatively short bursts

UROGENITAL SYSTEM

Kidneys – filter blood – save fluids – deer can reprocess water in ways that require relatively small amounts of free water to be consumed.

Ureters – carry urine from the kidney to the bladder

Urinary Bladder – stores urine

Urethra – allows urine to exit bladder and functions in male reproductive tract

MUSCULOSKELETAL SYSTEM

Large hind limb muscles for bounding propulsion

Little fat deposited with in muscles

Thin, light leg bones, strong but light

No collarbone – shallow shoulder joints – deep hip joints

CARDIOVASCULAR SYSTEM

Heart

Aorta – largest artery – leads away from the heart

Pulmonary artery and vein – carries blood to and from lungs

Caudal Vena Cava – largest vein returning blood from circulation back to the heart

Mesenteric arteries and veins – blood supply to the intestines

Carotid artery and Jugular vein – blood supply to head and neck

Brachial artery and vein - blood supply to forelimbs

Femoral artery and vein – blood supply to hind limbs

NERVOUS SYSTEM

Brain

Spinal Cord

Peripheral Nerves

REPRODUCTIVE SYSTEM

FEMALE:

Ovaries – produce ova (eggs) Deer are *seasonally polyestrous* – cycle only during certain times of the year – come into estrus (heat) every 22 – 28 days

Gestation is approximately 7 months

Follicles – structure on ovary that produces ova

Corpus Luteum – structure on ovary that maintains pregnancy

Uterus – 2 horns – cotyledons – areas of attachment on uterus lining for placenta – allows transfer of blood and nutrients etc from mother to embryo

Cervix – fibrous port at opening to body of uterus

Vagina – structure that supports both reproductive and urinary functions and includes the

Cervix (opening to the uterus) and Urethra – exit point for urinary tract

Vulva – external structure of urinary and reproductive tracts

MALE:

Vesicular Glands

Bulbourethral Glands

Prostate Glands

Internal Penis

External Penis – sigmoid (S shaped) flexure

Testicles – enlarge during breeding (rut)- produce testosterone – shrink after rut –testicles located outside body because sperm production is temperature dependent

Vas Deferens

Urethra

White-tailed deer anatomy and physiology is a product of evolution from the very origin of the animal. The anatomy and physiology should be considered a dynamic ecological and evolutionary given. Whitetail deer are extremely adaptable and thrive in many habitats; however those habitats must meet all the critical needs of the deer – food, cover, water, and useable space. On the short term, how completely those needs are met will determine the deer herd's relative wellness; over the very long term and untold generations deer anatomy and physiology will adapt to the habitat.

DISEASE

Distress- *pain or suffering affecting the body, a bodily part, or the mind*

Disease- *a condition of the living animal or plant body or one of its parts that impairs normal functioning*

Distress implies an external and usually temporary cause of great physical or mental strain and stress.

Disease simply implies a state of dis- ease.

Distress creates a state of Dis-ease.

Natural distress - extreme and extended weather phenomena are a common source of natural distress. Sudden changes in temperature and extended temperature extremes, along with excessive and reduced rainfall periods all challenge the evolutionary boundaries of whitetail deer. Life cycle functions of growth, mating, fawning, and lactation are examples of natural distress.

Unnatural distress - confinement, handling and shipment of deer are common examples.

Concentration of deer in penned or range conditions creates behavioral and nutritional distress and increases the probability and clinical expression of disease. Unnatural distress can take on many forms and is usually related to what people do to deer and / or the habitat.

The relative severity, duration and combination of natural and unnatural distress applied to a deer herd will determine the total herd wellness status.

Many, if not most, of the habitat and harvest management strategies employed in white-tailed deer management efforts are designed to directly or indirectly mitigate or reduce natural and / or unnatural distress to the deer herd.

White-tailed deer are creatures that can benefit greatly from disturbances to the habitat. Some disturbances create distress on the short term, but yield great benefits to deer over the long term. Other disturbances may produce mid term or even long term distress for deer, but benefit other species.

Infectious and non- infectious disease

Infectious Disease (organism driven disease)

Microorganisms

- Bacteria – Anthrax – periodic outbreaks in certain parts of the state – sudden death – unclotted blood
Corynebacterium pyogenes – bacterial abscesses – soft tissues and brain especially mature bucks
Foot Rot
Tuberculosis – not seen in Texas to date
- Virus – Bluetongue – viral disease spread by gnats – causes ulceration and soreness of mucous membranes and hooves – sick and poor doers – death possible
Epizootic Hemorrhagic Disease (EHD) – viral disease also spread by gnats – causes deterioration of blood vessels
Hoof and Mouth Disease – not currently in United States – potential devastation for all hoofed animals, wildlife and livestock
- Fungi
- Yeast
- Prions – Chronic Wasting Disease (CWD) – possible problem?? – not known to be in Texas at this time – spongiform encephalomyopathy

Macro organisms

Internal parasites

- Stomach Worms – multiple species – suck blood and cause anemia and create “poor doing” status – generally found in abomasum and intestine
- Blood Worms – Elaeophora schneideri – carotid artery worm of Mule deer – normal host and does not cause harm – affects other deer species by causing muzzle and ear necrosis, malformed antlers, blindness and oral food impactions
- Flukes – Deer Fluke affects liver
- Nose Bots – sheep nasal bots affect deer – mild symptoms include sneezing and nasal Congestion

- Throat Bots – larva of *Cephanomyia* fly – live in pharyngeal area and cause no known harm to the host
- Coccidia

External parasites

- Ticks
- Lice
- Flies
- Keds
- Gnats and Midges

Non – infectious Disease

- Metabolic
- Toxic
- Physical
- Nutritional
- Genetic

Deer are susceptible to most infectious and non - infectious diseases common to wild and domestic ruminants in the habitats they occupy. The relative clinical expression of disease in the deer herd depends on many factors.

Healthy habitats produce healthy deer!

For more detailed information on deer and wildlife disease, check out: www.uga.edu/scwds

Notes: