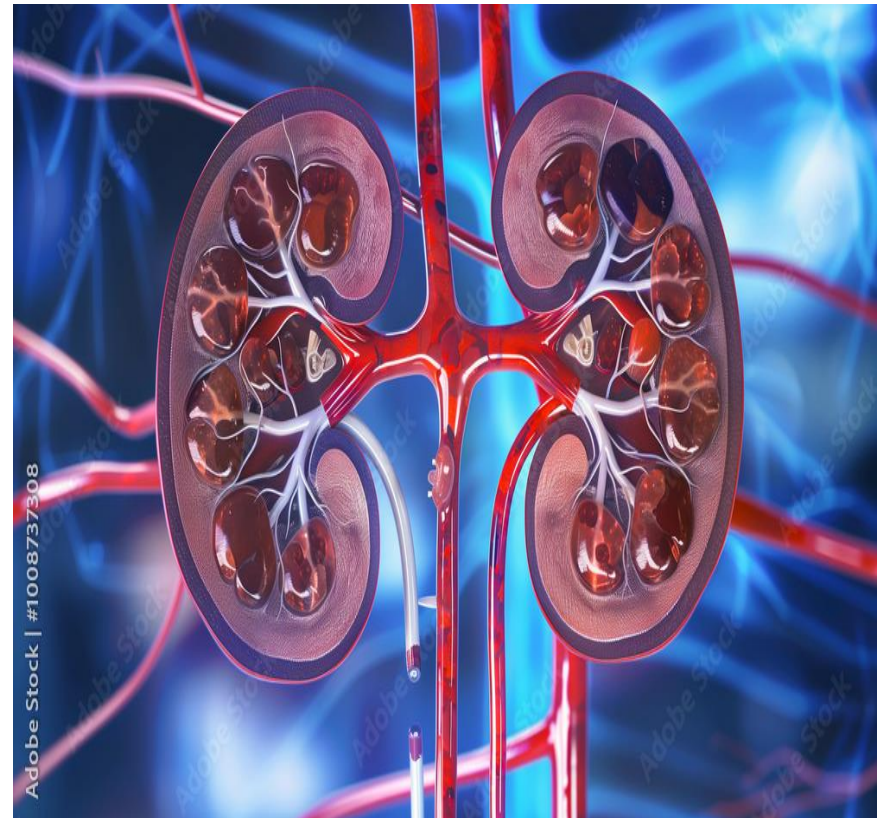


Anatomy of urinary system

Lecturer: Hiba Mohammed
2nd stage

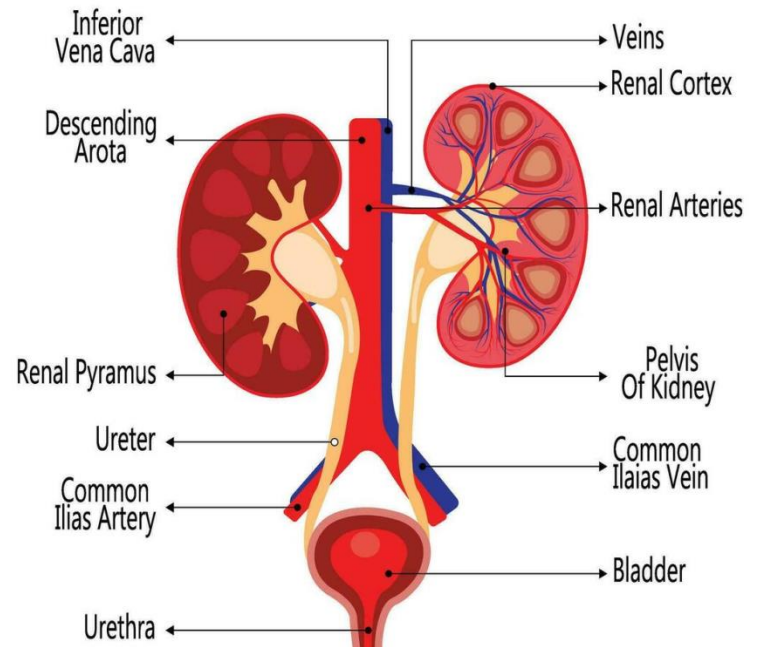


Urinary system

The urinary system in animals consist of the following organs:

- 1- kidneys
- 2- Renal pelvis
- 3- Ureters
- 4- Urinary bladder
- 5- Urethra

Urinary System Diagram



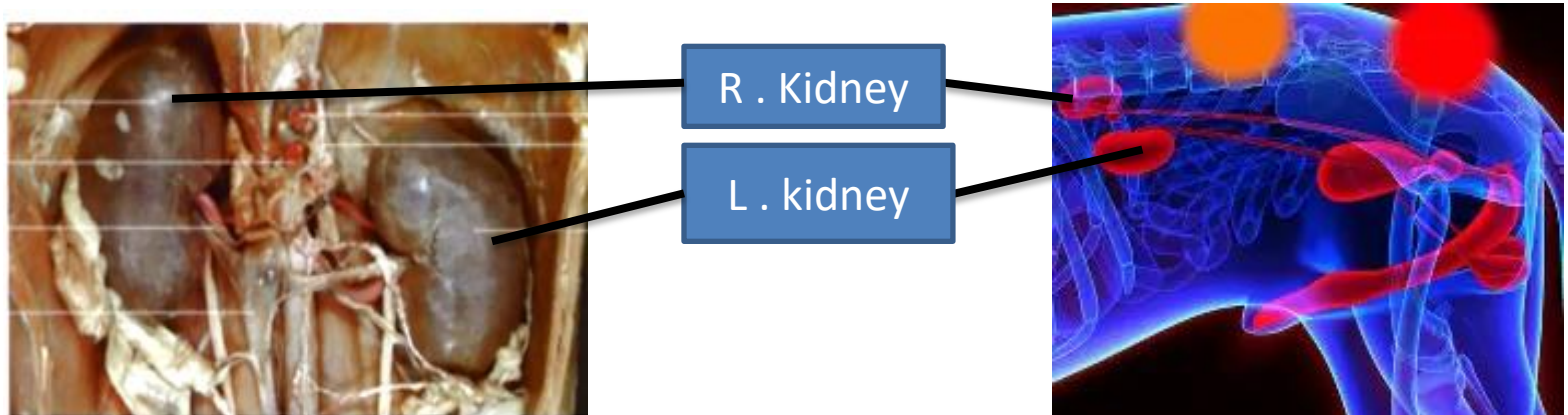
Kidney

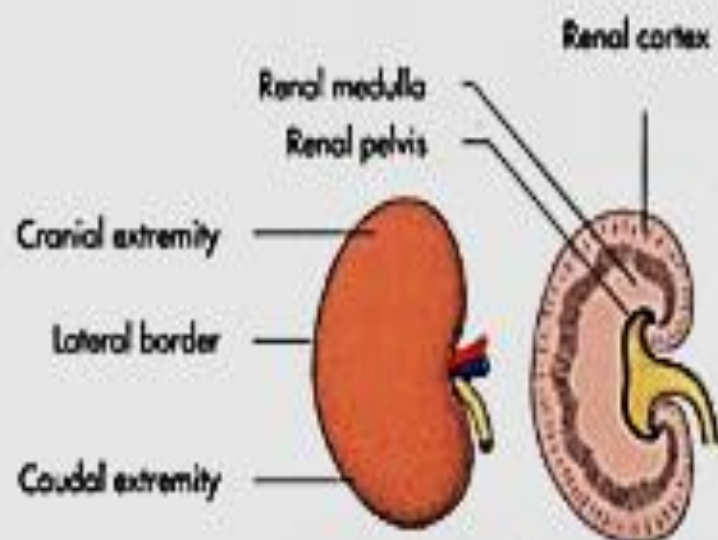
- Shape and appearance:
- Reddish-brown color, with smooth surface
- Bean shaped (dog, cat and sheep)
- in horse ----- Right kidney---- valentine heart shape
----- Left kidney -----bean to pyramid shape
- Bovine kidney: Irregular oval shape and superficially fissured into lobes.

Kidney

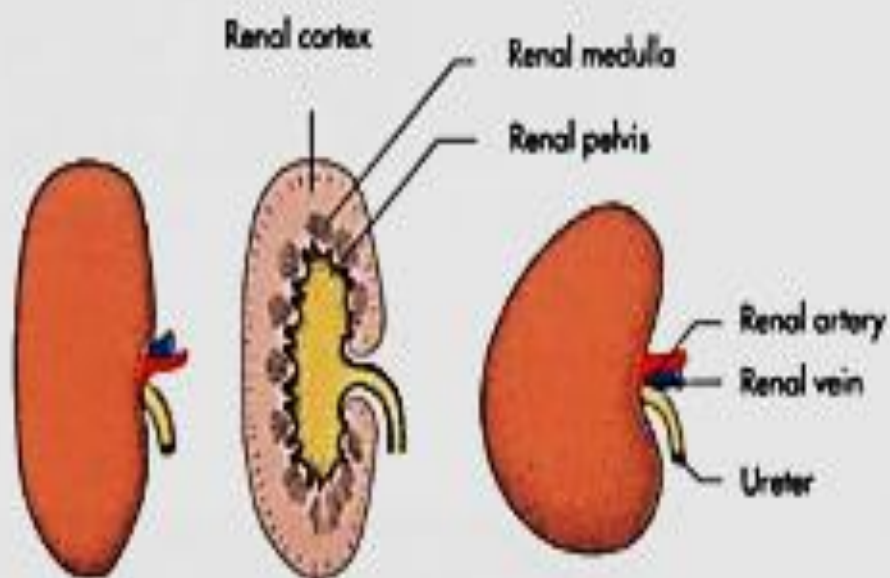
Location: Retroperitoneal embedded in fat tissue

- Pressed against the vertebral column dorsally.
- **Right kidney** more cranial in position, in the renal fossa of liver.
- **Left kidney** more mobile (in ruminants pushed into right half of abdomen by rumen)



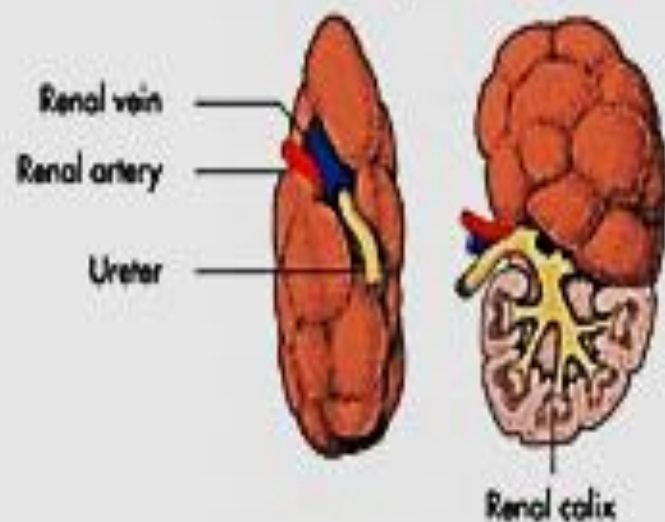


Left kidney of the dog

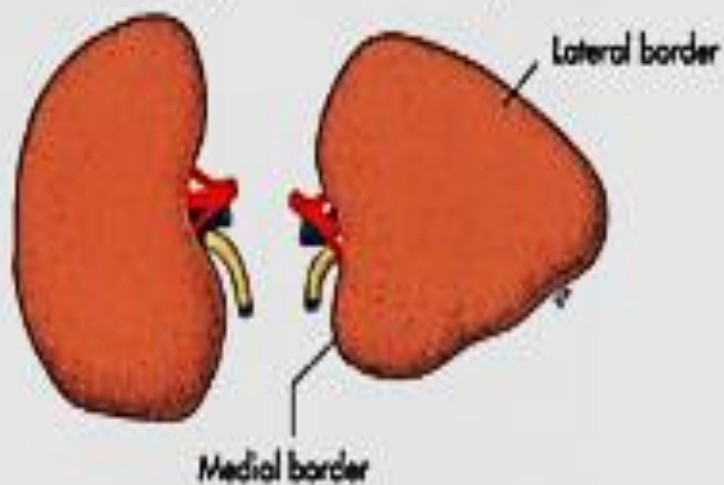


Left kidney of the pig

Left kidney of the small ruminant



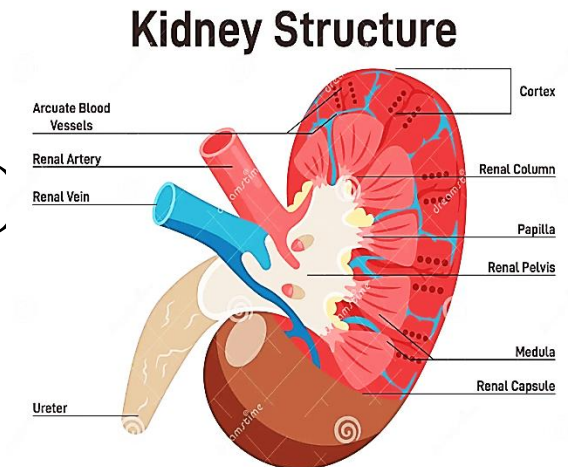
Left and right kidneys of the ox



Left and right kidneys of the horse

Shape and appearance:

- dorsal and ventral surfaces.
- Lateral and medial borders.
- Cranial and caudal extremities.
- Renal Hilus (in medial border for passage of renal pelvis, vessels and nerves).
- Renal sinus (fall filled around the renal pelvis).
- Fibrous capsule
- Cortex(reddish- brown, granular).
- Medulla (dark outer, inner pale zones)



Species differences

- **In bovine:**

- Superficially the lobes are visible.(Multilobular).
- Cortex and medulla divided into pyramid shape

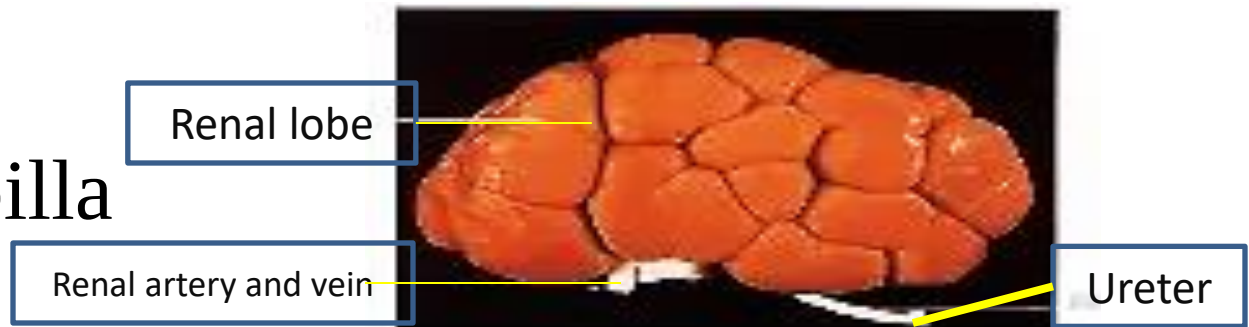
(Un fused)

- Multiple Papilla

- Calyx:

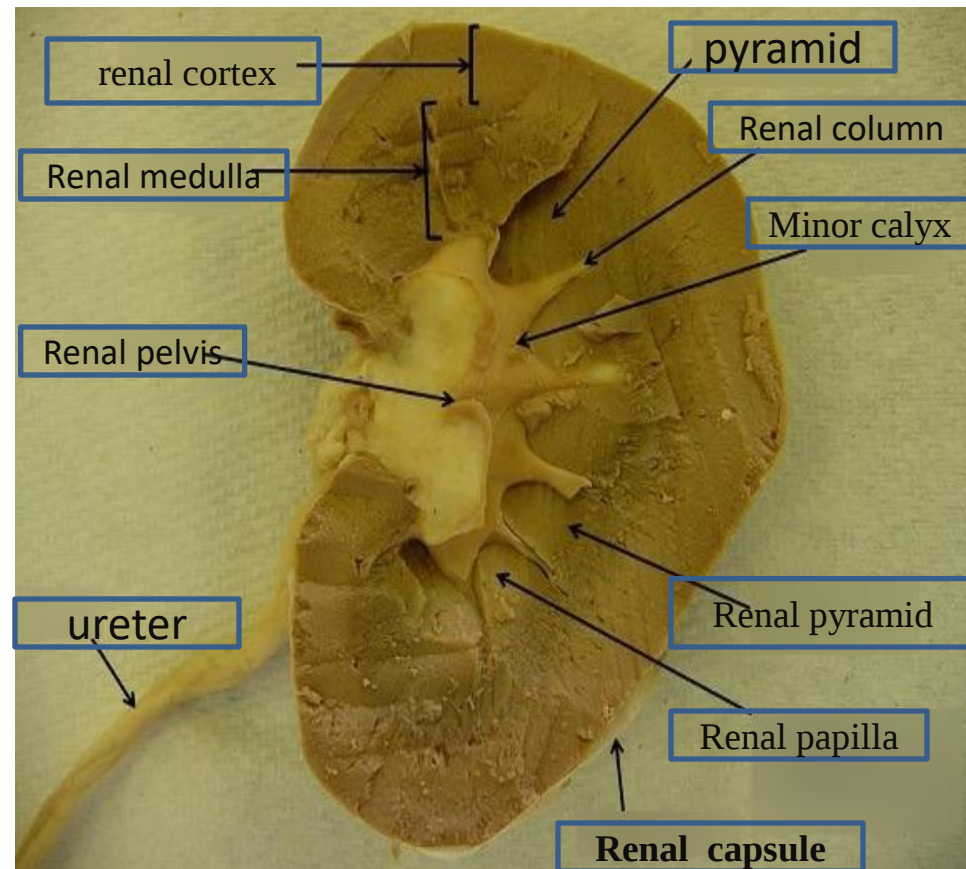
-Minor calyx

- Major calyx



Species differences

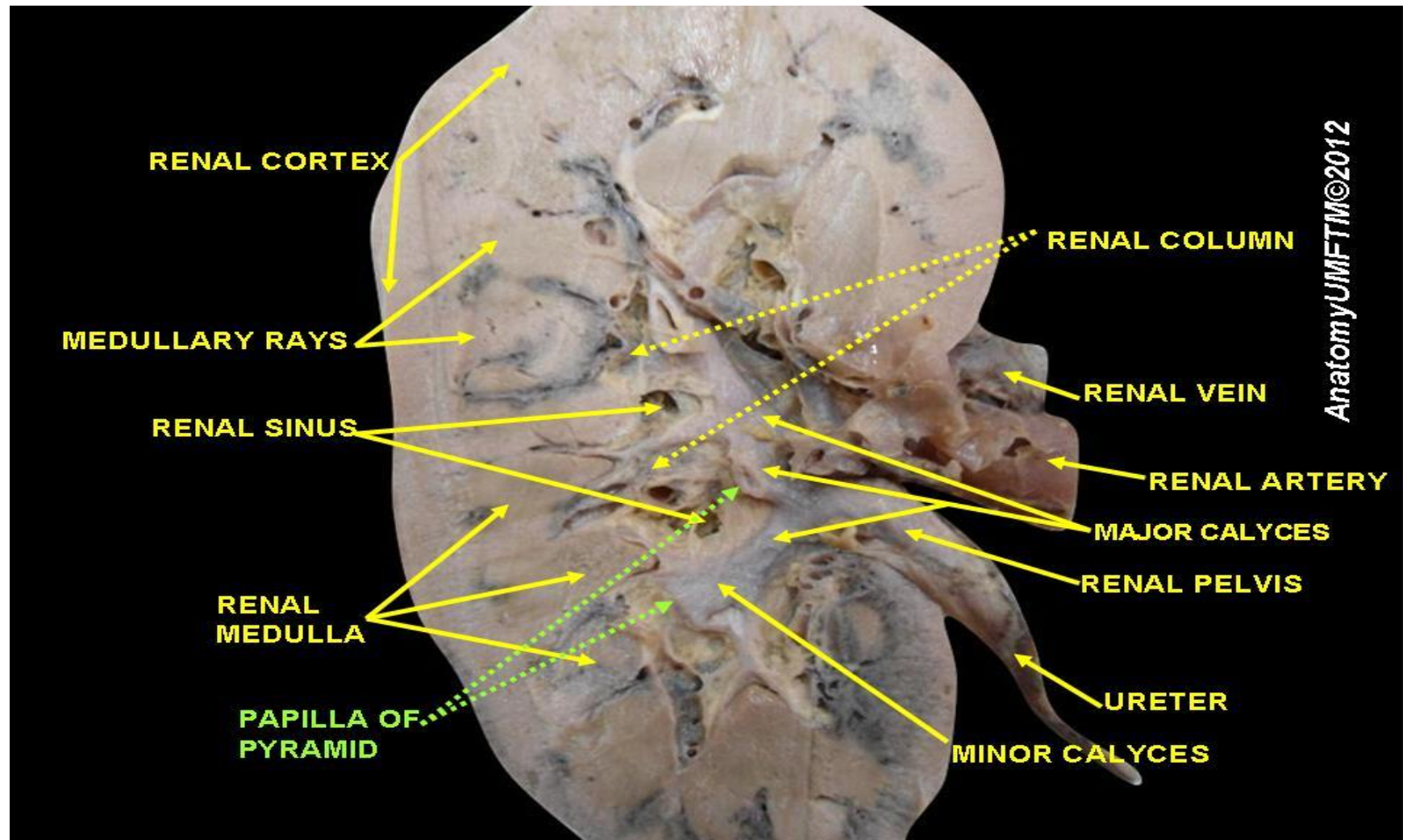
- **In dog, cat, horse, and sheep:**
- Unilobular in shape with smooth surface and papilla.
- Fused medullary lobe.



Renal pelvis

- Proximal expanded part of the ureter.
- All papillary ducts open in renal pelvis.
- **In dog and cat** : moulded around the renal crest to form pelvic recesses.
- **In ox: Absent**
- The papilla fit into minor calyx---- unit into major calyces----- form single ureter.
- **In horse**: central cavity and two terminal recesses.

Bovine kidney



Ureter

- Muscular tube divided into
 - Abdominal part
 - Pelvic part
- Insert to the dorsolateral surface of urinary bladder close to the neck.

Urinary bladder

- Hollow muscular membranous organ
- Divided into:
 - Cranial vertex.
 - Intermediate body.
 - Caudal neck (continuous with urethra).
 - Have two ligament:
 - Paired lateral ligaments.
 - Median ligament.
 - Trigon area : triangular space bound by ureteral opening and urethral crest.

Urethra

Female urethra: carry urine only.

- short and wide in horse.
- Long in dog.
- In the cow and sow urethralis muscle closes the suburethral diverticulum which opens together with the urethra into the vagina.

Male urethra : carries urine, semen and seminal secretion .

1-Pelvic part

- preprostatic portion and prostatic portion)

2-penile part