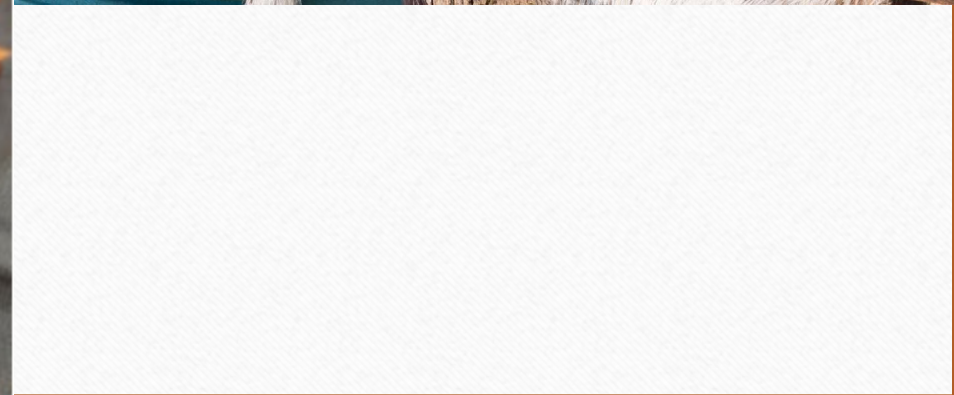
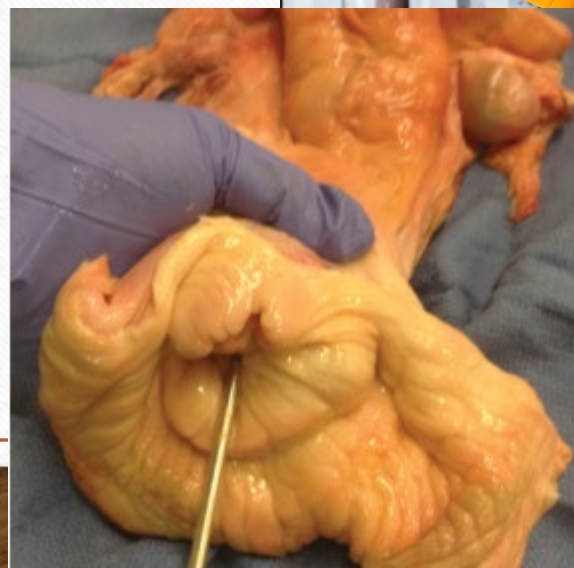


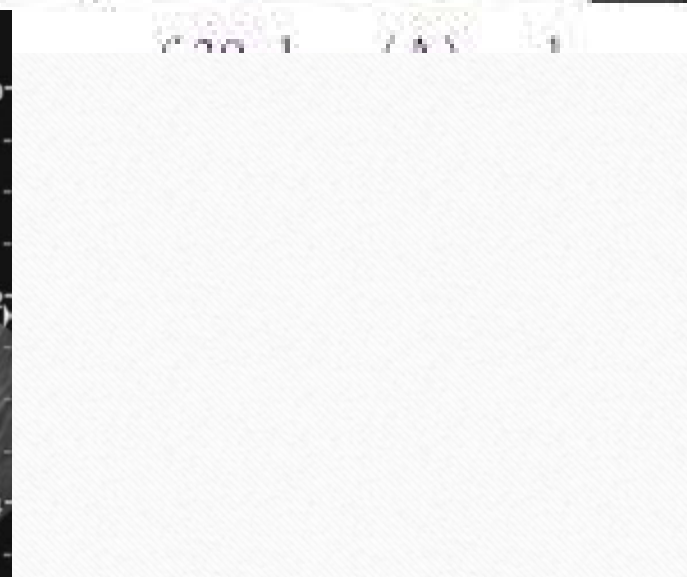


Anatomija ženskih polnih organa

Pripremio: Ass Nikola Cukić

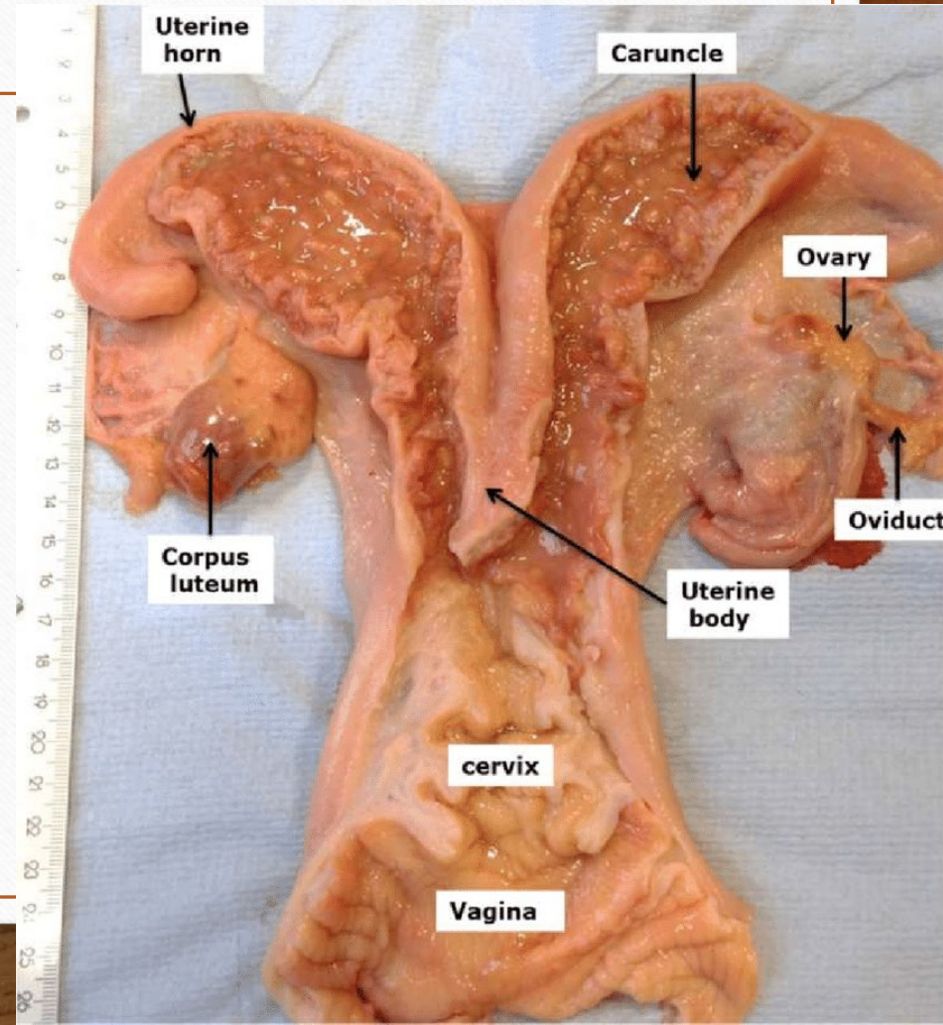






Organa genitalia feminina

- U ženske polne organe spadaju:
 1. Ženske polne žlezde, jajnici (*Ovarium*)
 2. Jajovodi (*Tuba uterina, Oviduct, Salpinx*)
 3. Materica (*Uterus, Hystera, Methra*)
 4. Usmina sa predvorjem usmine(*Vagina*)
 5. Stidnica (*Vulva*)



Organa genitalia feminina

- **Jajnici** – stvaraju ženske **polne ćelije**
- **Jajovodi** – prihvataju ženske polne ćelije, oplodjenje jajne ćelije
- **Materica**- nidacija zigota, rast i razviće ploda
- **Usmina**- porođajni kanal, kopulacija, a predvorje predstavlja mesto ušća mokraćne izvodne cevi
- **Stidnica**- najkaudalni deo ženskog genitalnog trakta i predstavlja ulaz u ženski reproduktivni trakt

Organa genitalia feminina

I Organa genitalia generaciones

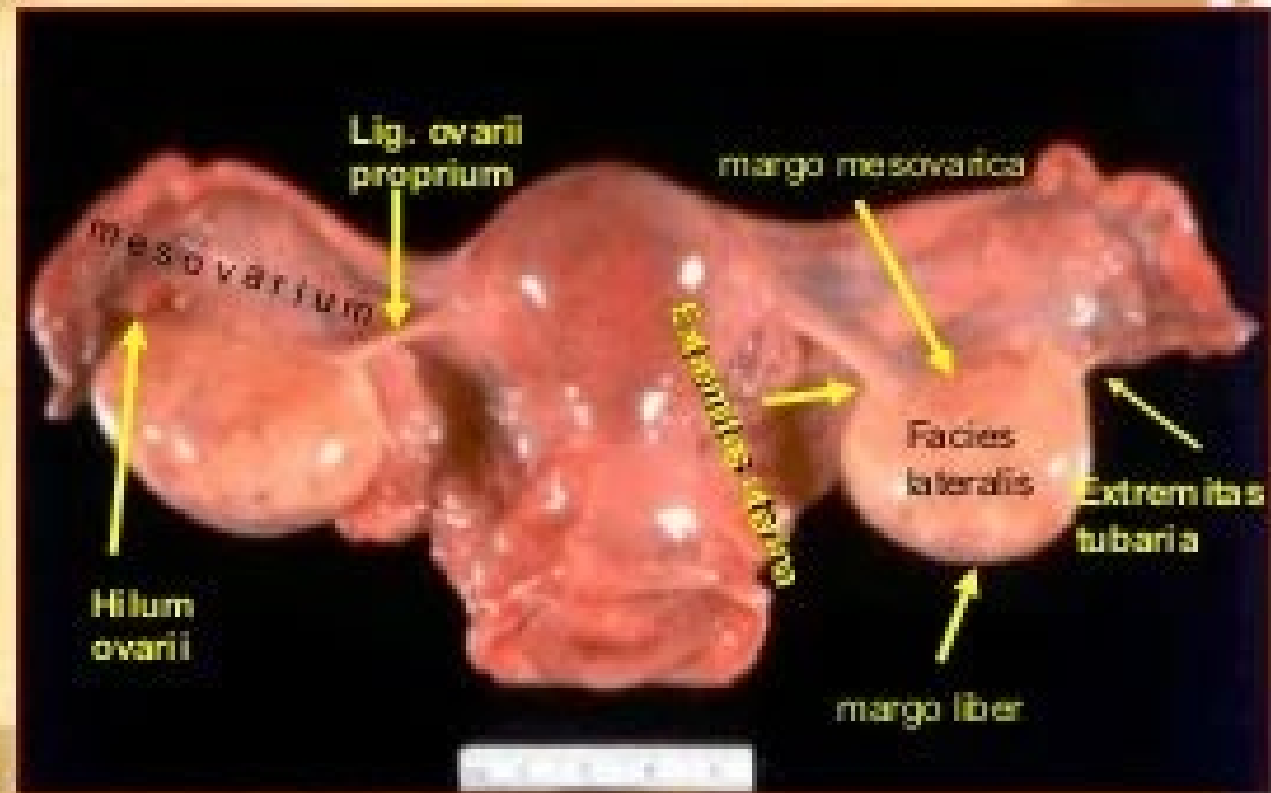
- 1. Ovarium*
- 2. Tuba uterina*
- 3. Uterus*

II Organa genitalia copulaciones

- 1. Vagina et Vestibulum vaginae*
- 2. Vulva*

Jajnik (*Ovarium*)

- Paran organ, okruglog oblika, bočno spljošten
- Leži u slabinskom delu kaudalno od bubrega, levo i desno od medijane ravni
- *Mesovarium*
- Na jajniku razlikujemo sledeće rubove:
 1. *Margo mesoovaricus – hillus ovarii*
 2. *Margo liber*
- Na jajniku razlikujemo sledeće okrajke:
 1. *Extremitas tubaria*-okrenut kranijalno
 2. *Extremitas uterina*- okrenut prema materici sa kojom je povezan pomoću *Lig. ovarii proprium*



Jajnik (*Ovarium*)

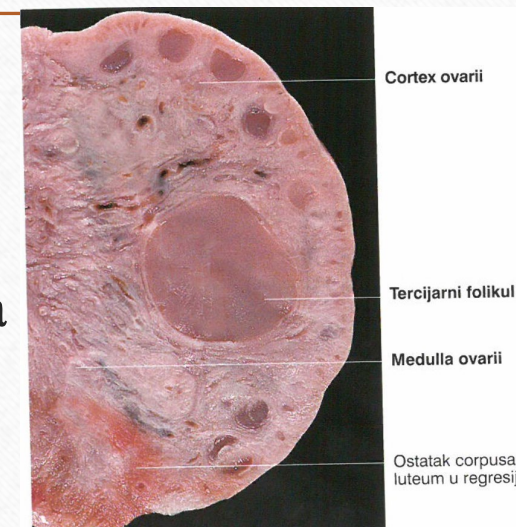
- Na jajniku razlikujemo 2 površine:

1. *Facies lateralis*

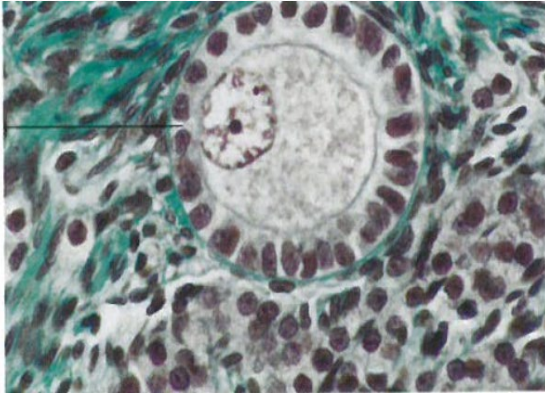
2. *Facies medialis*

Građa jajnika na preseku

- Na preseku jajnika razlikujemo:
 1. Koru- *Cortex, Zona parenchymatosa*- zbijenije građe
 2. Srž- *Medulla, Zona vasculosa*- bogata krvnim sudovima
- Spolja jajnik obavija *Tunica albuginea*



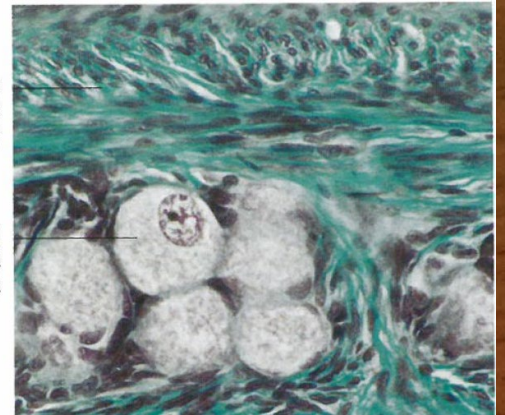
Primarni folikul
s izoprizmatičim
stanicama
folikularnog epitela



Cortex ovarii

Cortex ovarii (zona
parenchymatosa) s
vezivnim tkivom

Primordijalni folikul
sa stanicama
folikularnog epitela



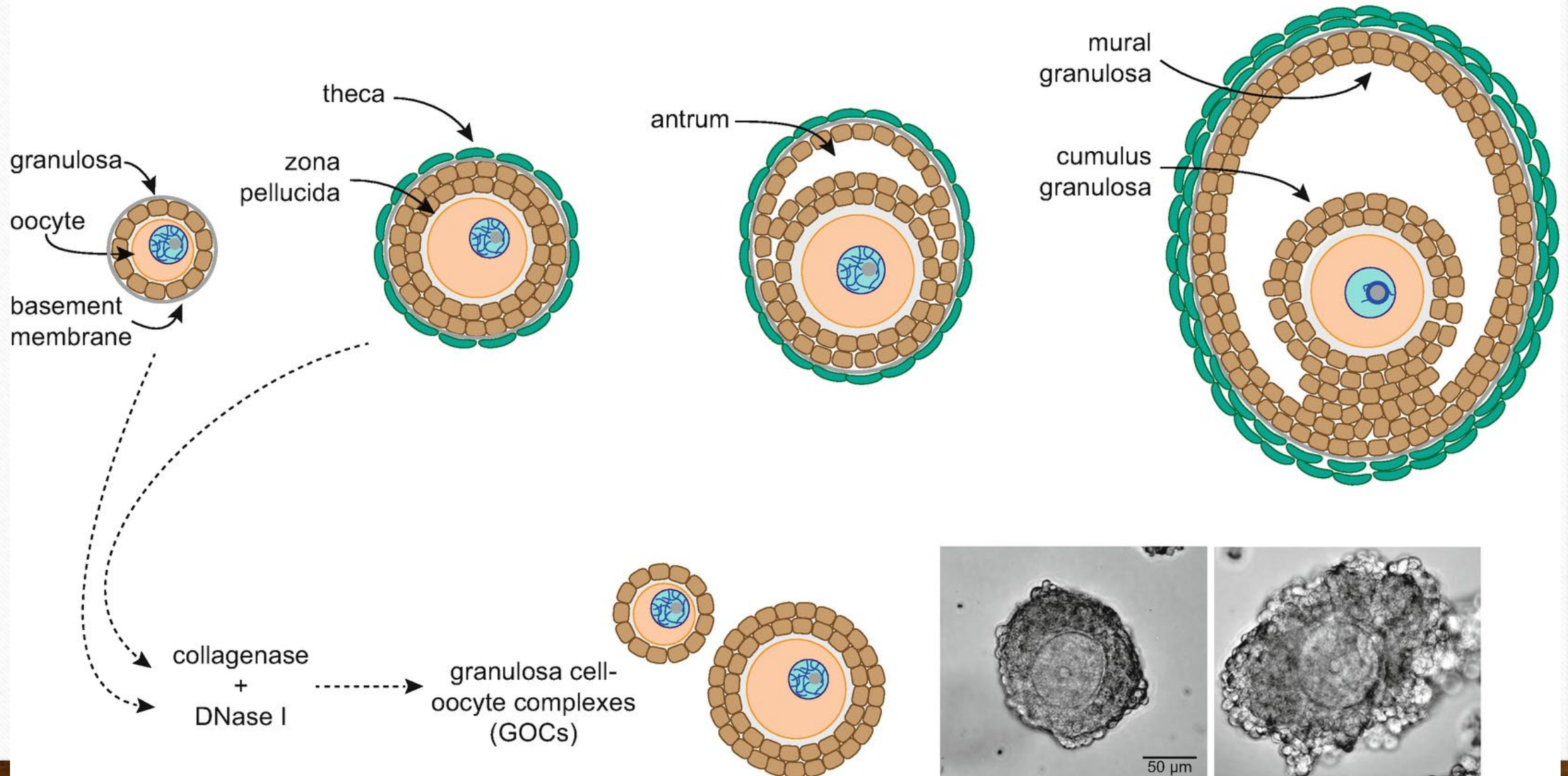
- Osnovu čine vezivnotkivne ćelije strome- **fibrociti**
- U ovom sloju nalazimo **OVOCITE- ženske polne ćelije**
- **Primarni folikuli** – veći broj u odnosu na ovulatorne ćelije, sadže 1 sloj folikularnih ćelija
- Pod uticajem **gonadotropina** povećava se broj folikularnih ćelija i nastaje **Zona pelucida**, kasnije se nagomilava folikularna tečnost (**Liqor folliculi**)- **Cavum folliculi**= **DE GRAFOV FOLICUL (TERCIJARNI)- FOLICULUS OVARICUS VESICULOSUS**

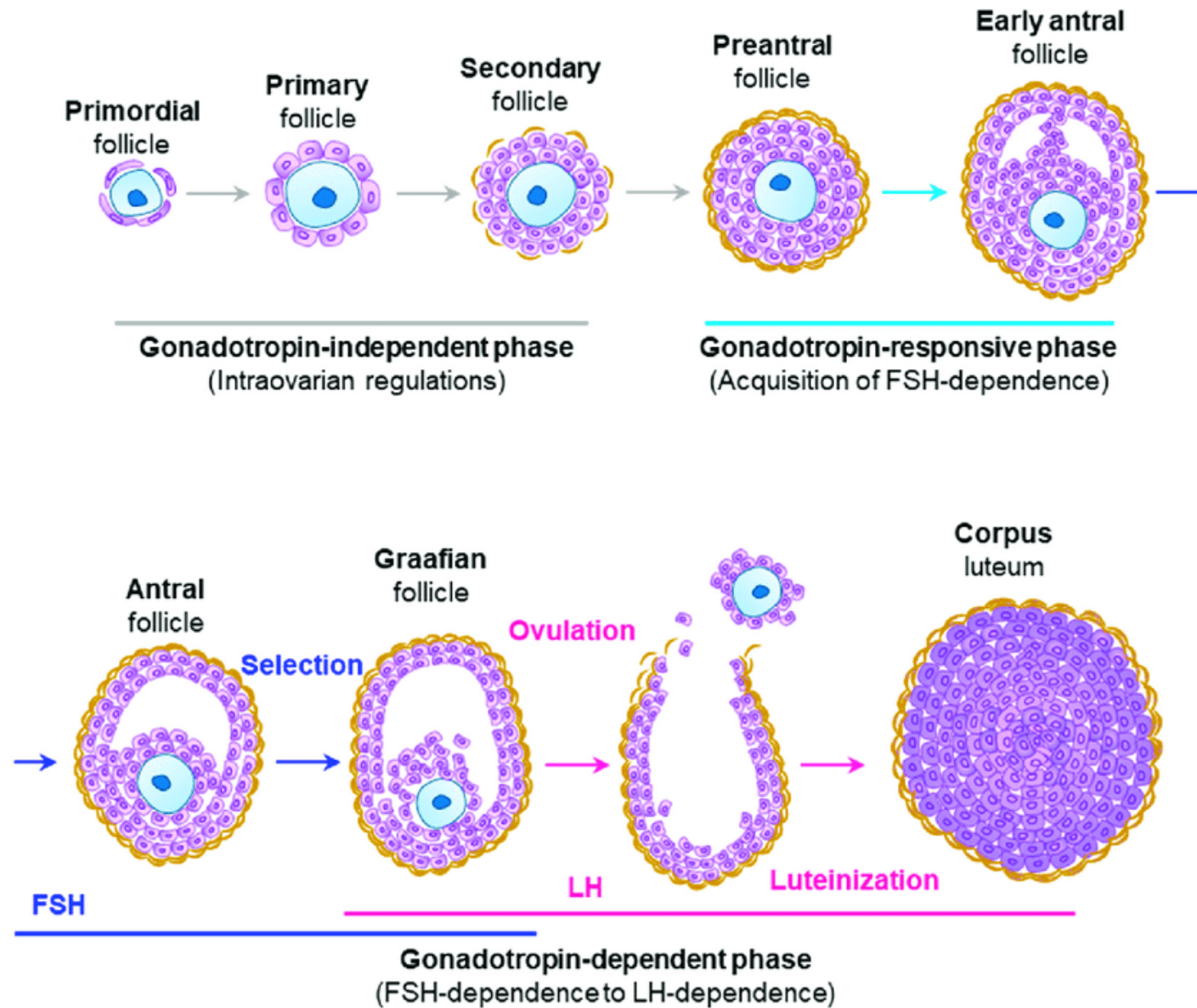
Cortex ovarii

- Folikularne ćelije u vezikuloznom folikulu predstavljaju zrnastu zonu (*Stratum granulosum*)
- *Cumulus oophorus*- zrnasti brežuljak
- Oko jajne ćelije nalazimo sloj kockastih ćelija – *Corona radiata*
- *Theca folliculi*- vezivnotkivni omotač oko sekundarnog folikula
 - *Theca externa*
 - *Theca interna*

Prskanje zrelog Grafovog folikula i izbacivanje jajne ćelije - **OVULACIJA**

PRIMARY → SECONDARY → ANTRAL → PRE-OVULATORY (GRAAFIAN)

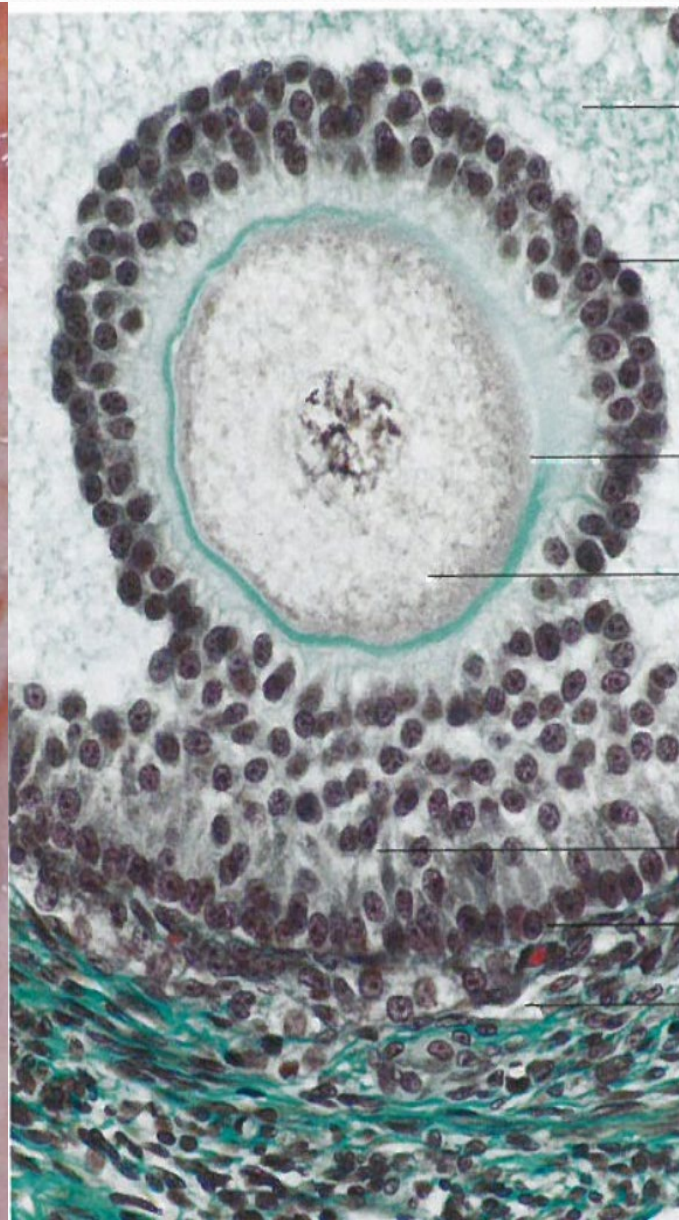
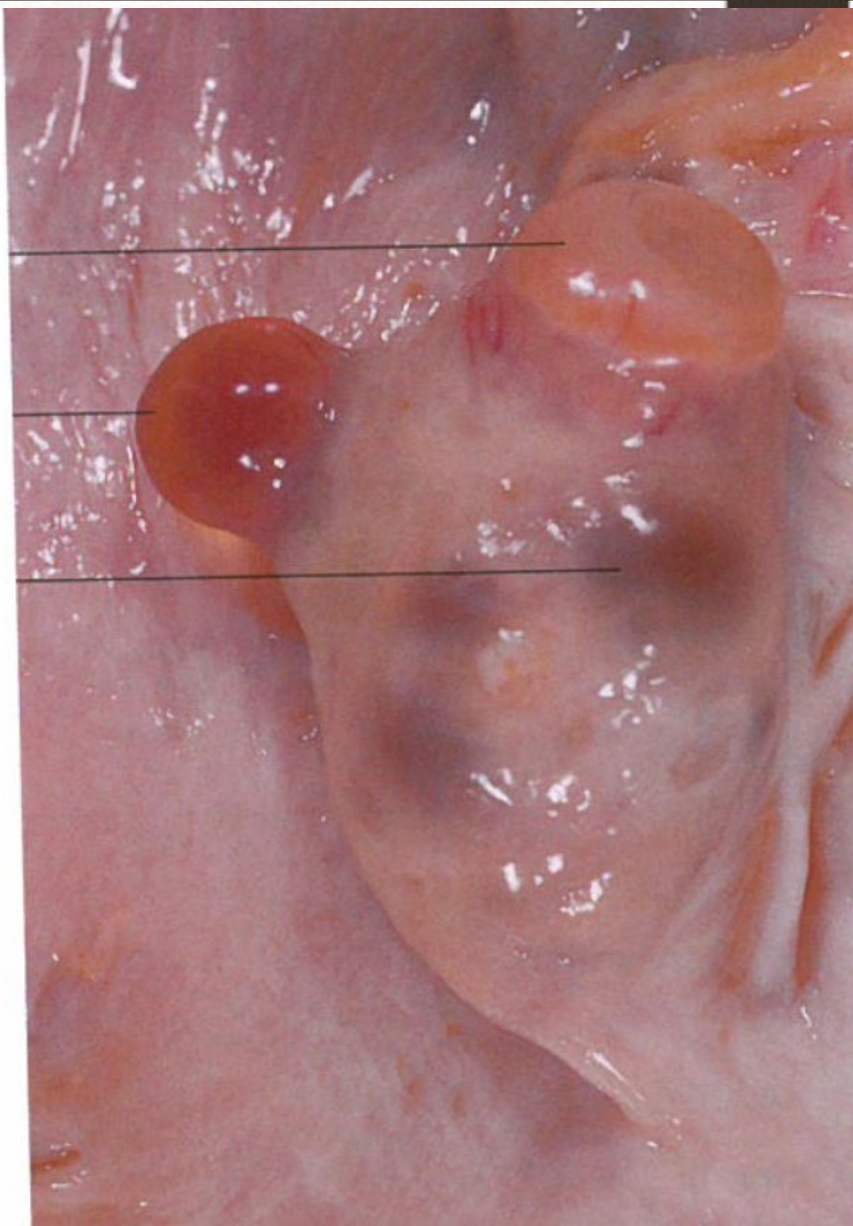




Corpus luteum u
stadiju regresije

Stigma

Tercijarni folikul



Folikularna šupljina i
liquor folliculi

Corona radiata

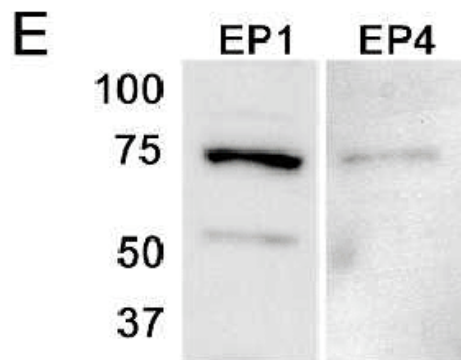
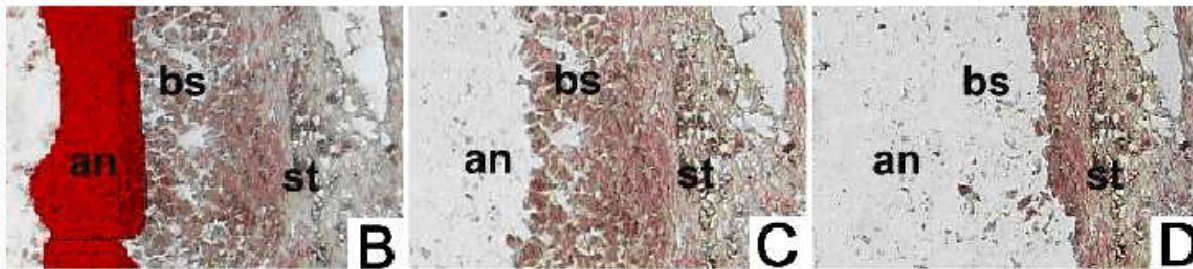
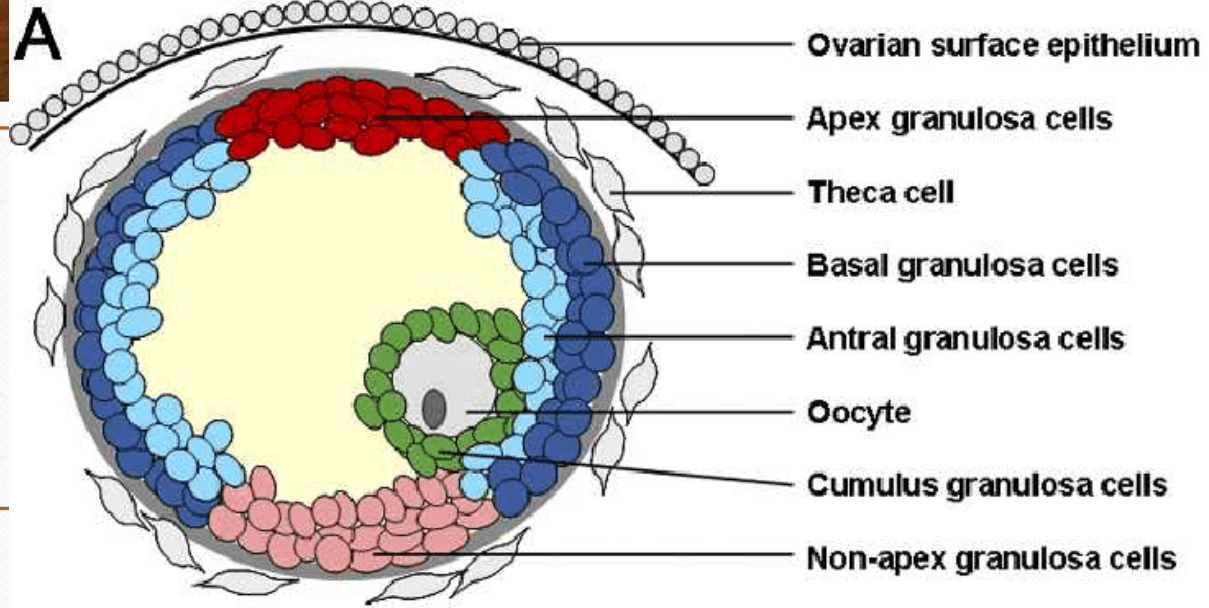
Zona pellucida

Ovocytus s jezgrom

Cumulus oophorus

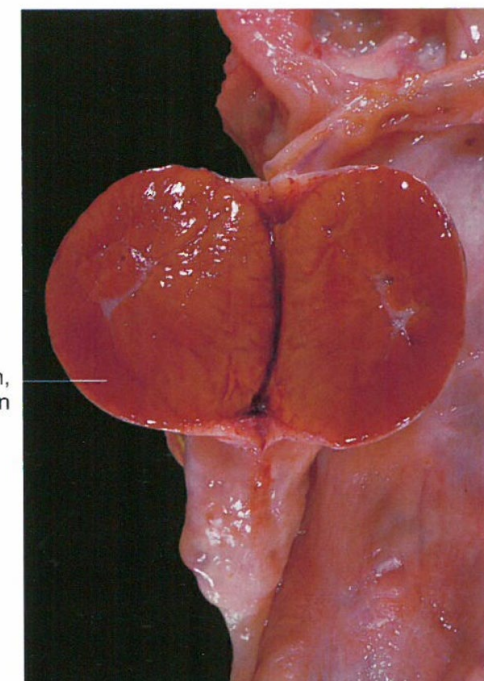
Theca interna

Theca externa

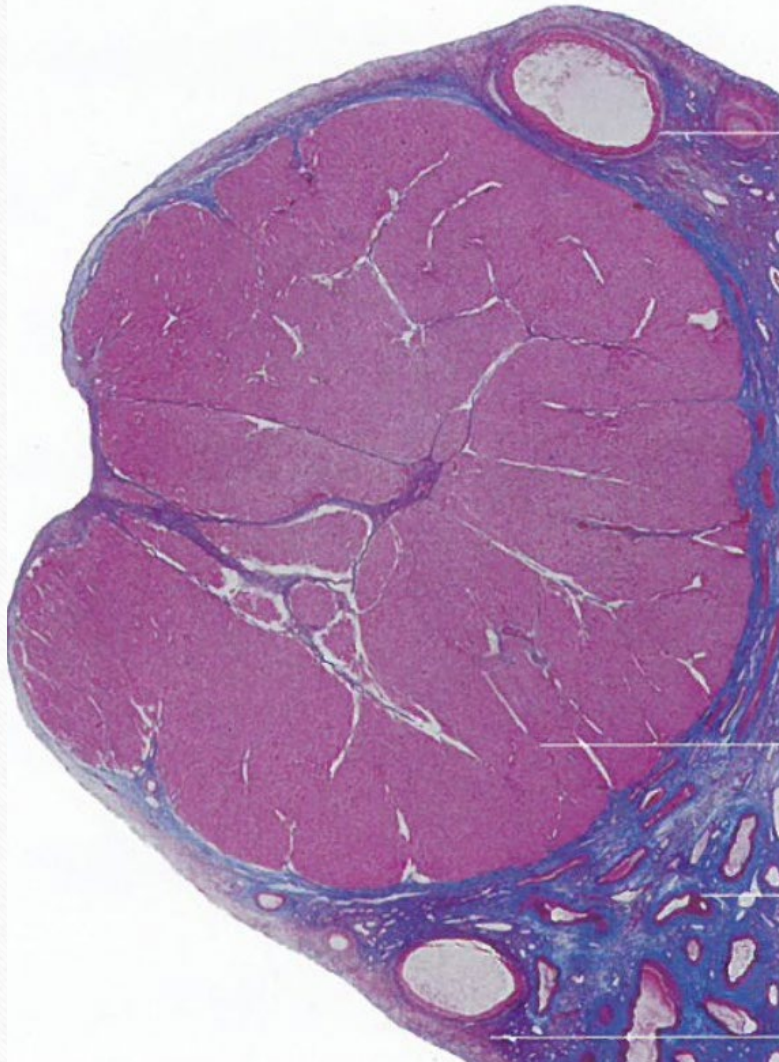


Žuto telo (*Corpus luteum*)

- Na jajniku se nakon ovulacije formira se žuto telo:
- Postoje 4 vrste žutih tela:
 1. *Corpus luteum haemorrhagicum*
 2. *Corpus luteum periodicum*
 3. *Corpus luteum graviditatum*
 4. *Corpus luteum persistens*



Corpus luteum,
prerezan



Folikul

Corpus luteum

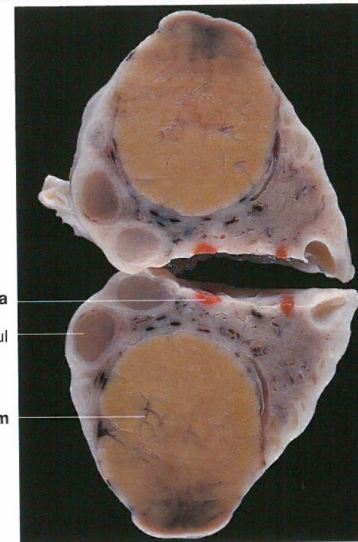
Medulla ovarii

Cortex ovarii

Ožiljak žutog tijela

Tercijarni folikul

Corpus luteum



Graafov folikul

Corpus luteum
u fazi regresije

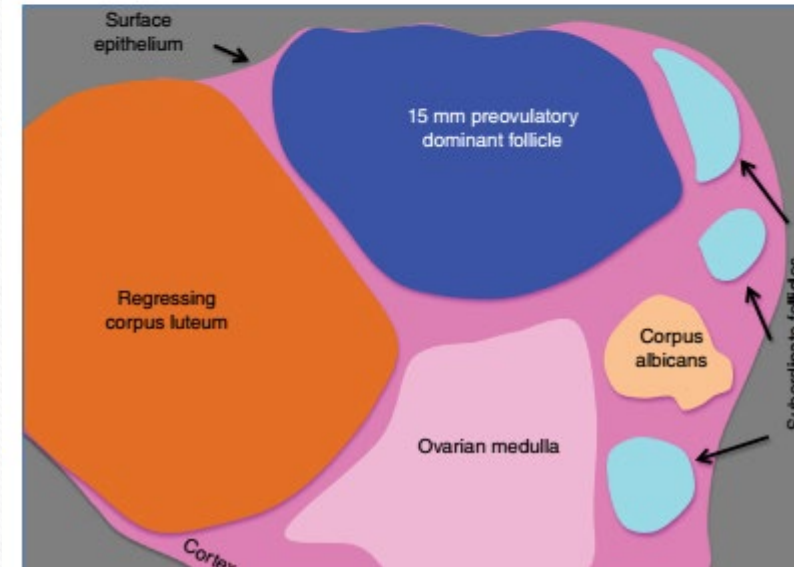
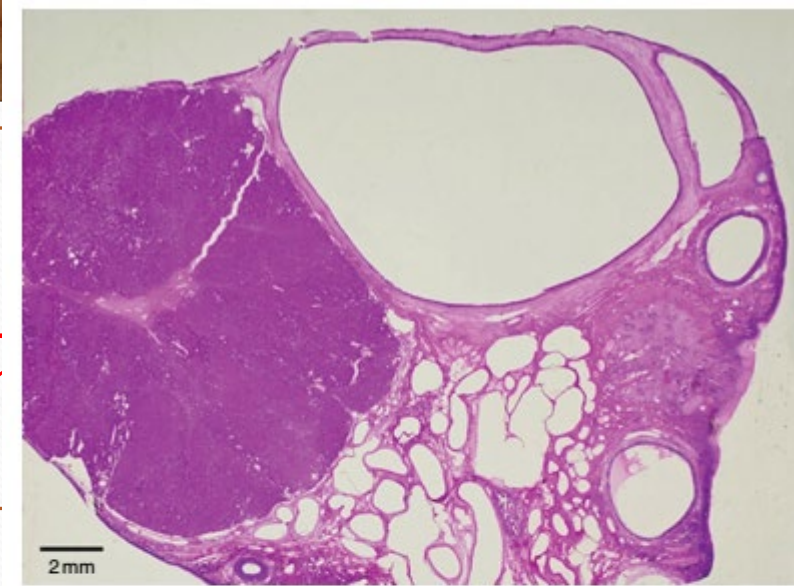
Formacije na jajniku

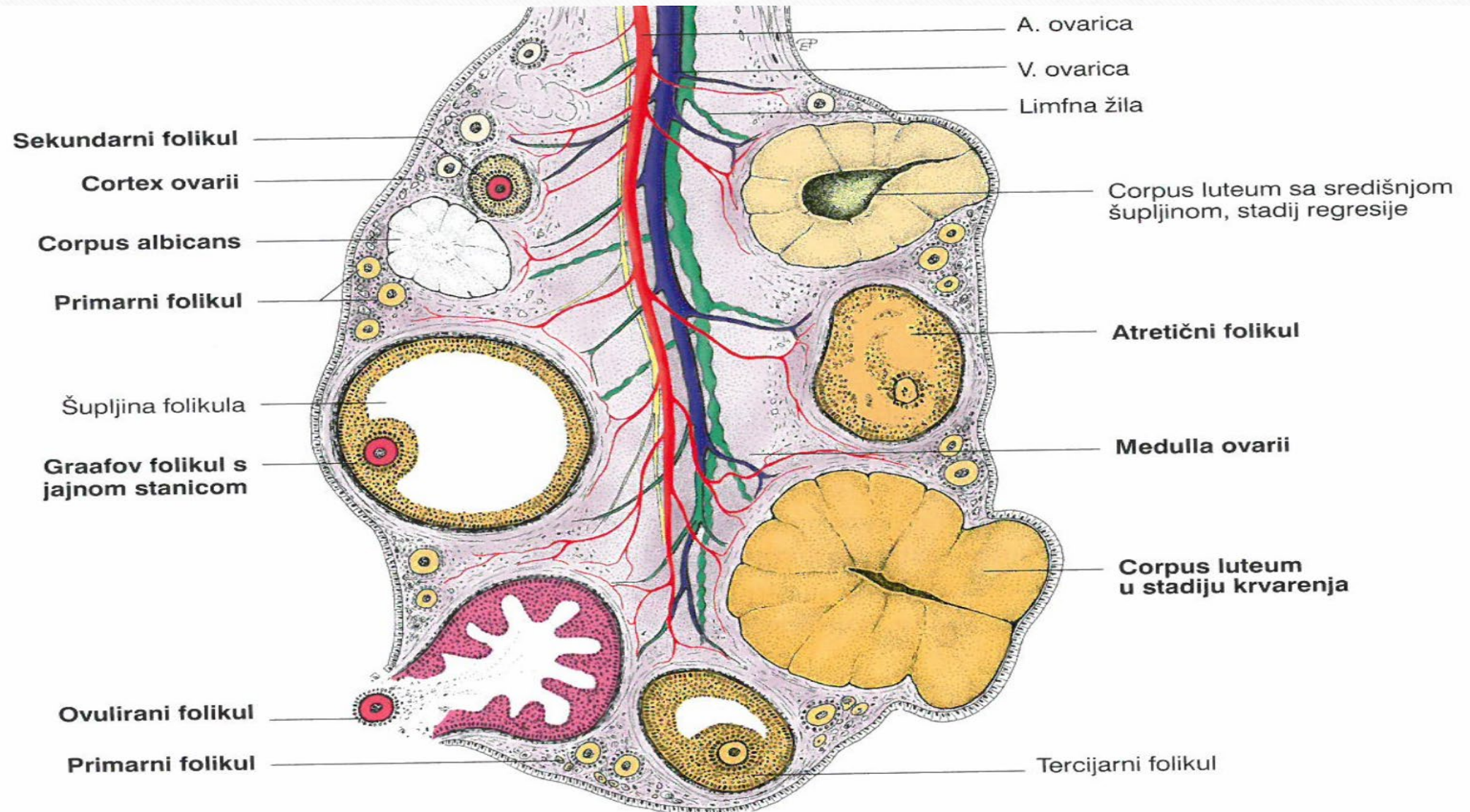
Fiziološke

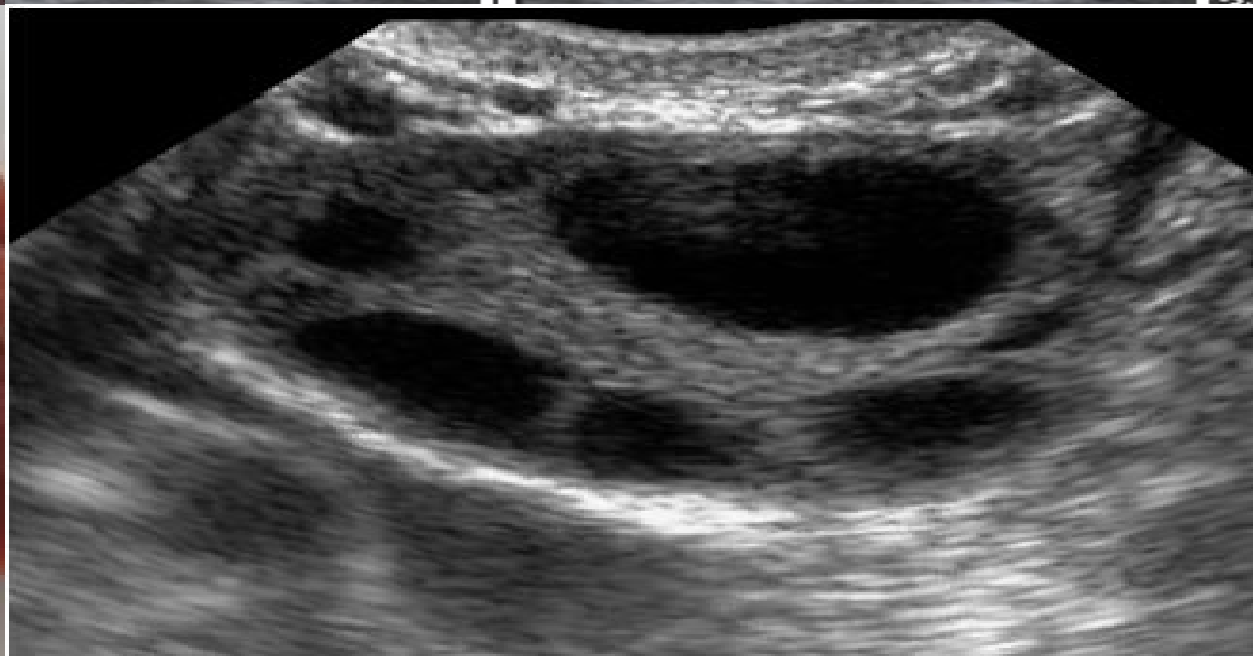
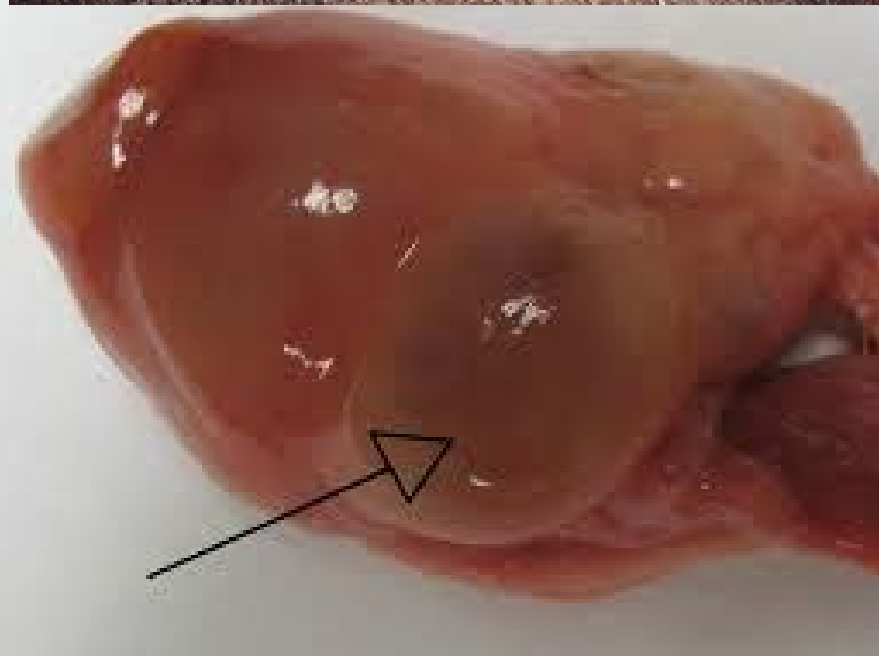
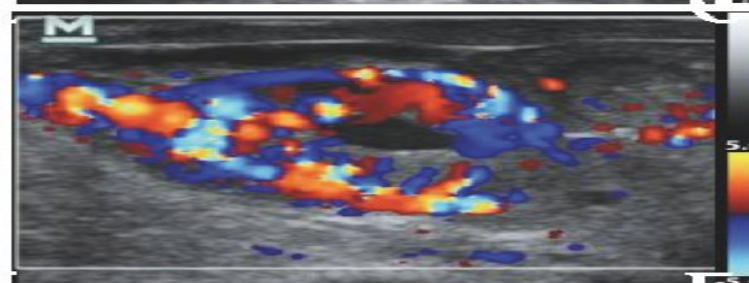
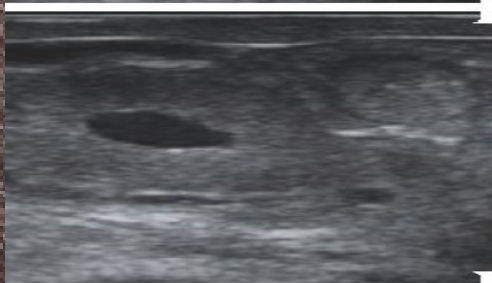
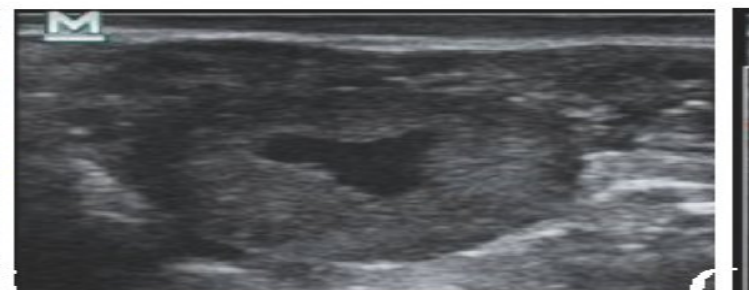
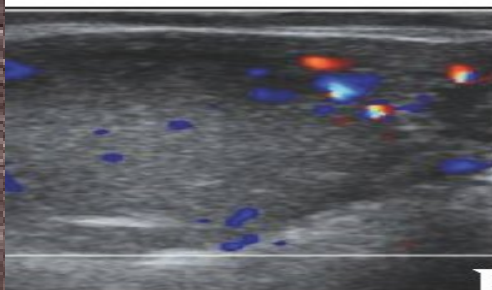
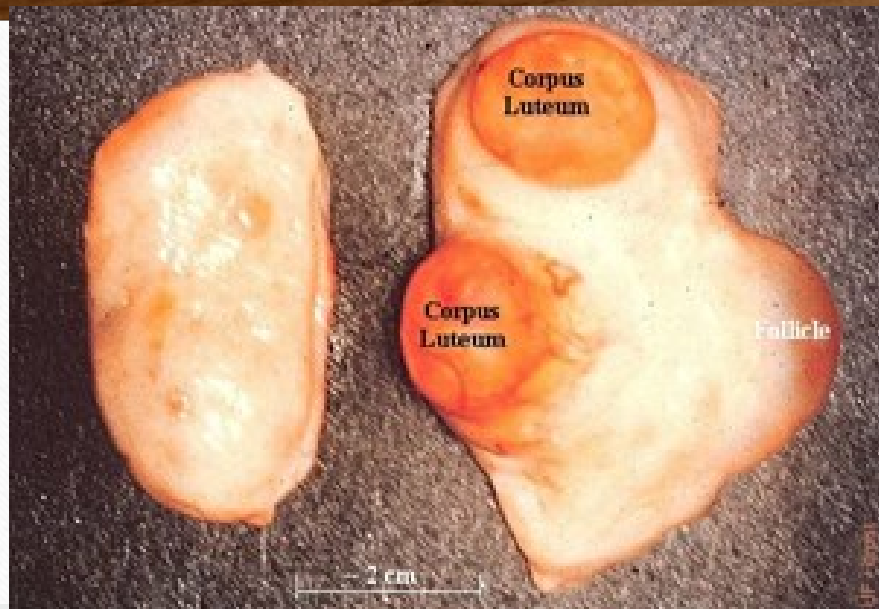
- 1. *Corpus luteum*
- 2. Folikuli

Patološke

- 1. Ciste
- 2. Tumori







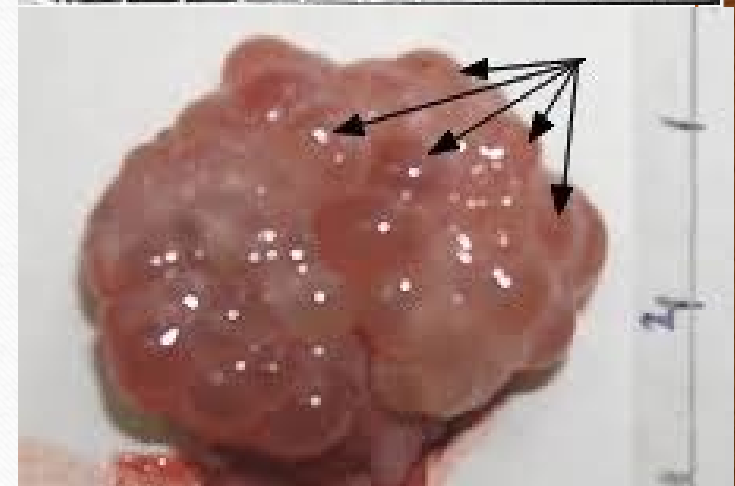
Jajnik krave

- Ovalnog oblika, bočno spljošten
- 14-19 g težine
- Čest nalaz cisti
- Smešteni u trbušnoj duplji na polovini visine ulaska u karličnu duplju
- Kad je materica kontrahovana u visini **pecten ossis pubis**
- Žuto telo je narandžaste boje

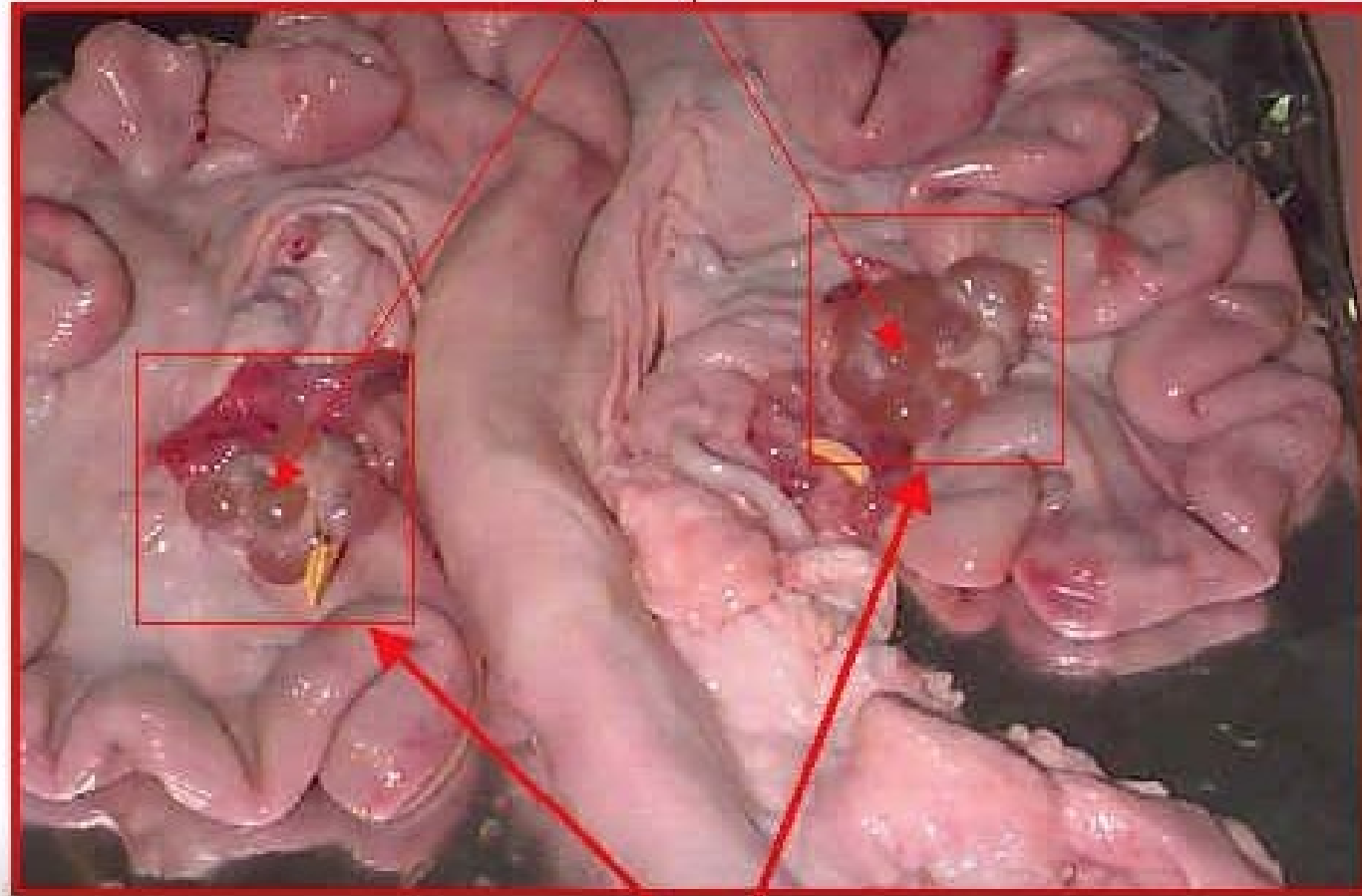


Jajnik krmače

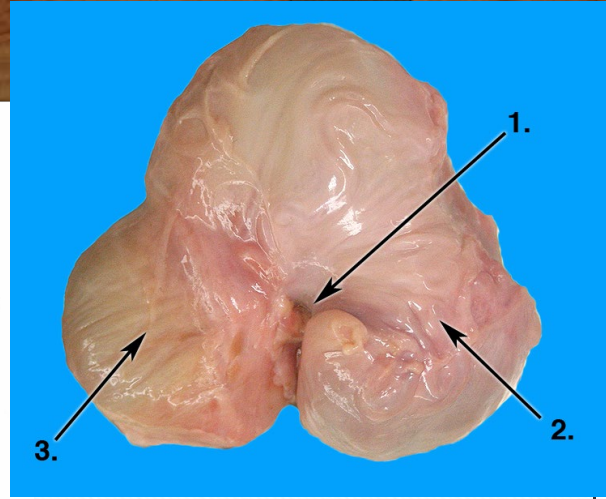
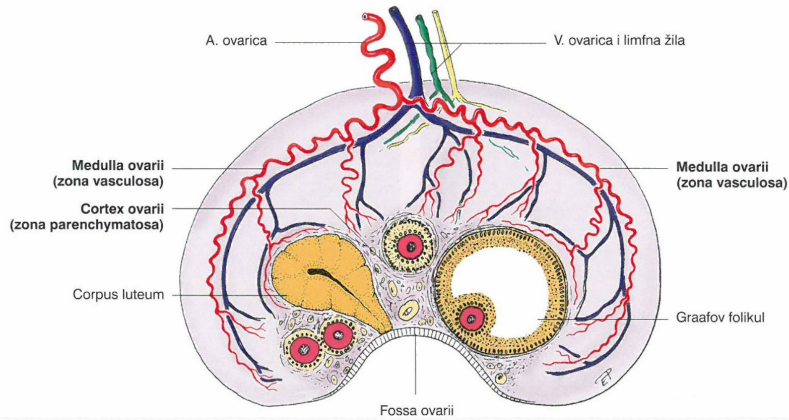
- Ovalnog oblika
- Dugi 5 cm
- Veliki broj folikula i žutih tela na površini
- Ima izgled kupine
- Leži u trbušnoj duplji iza bubrega



Follicles

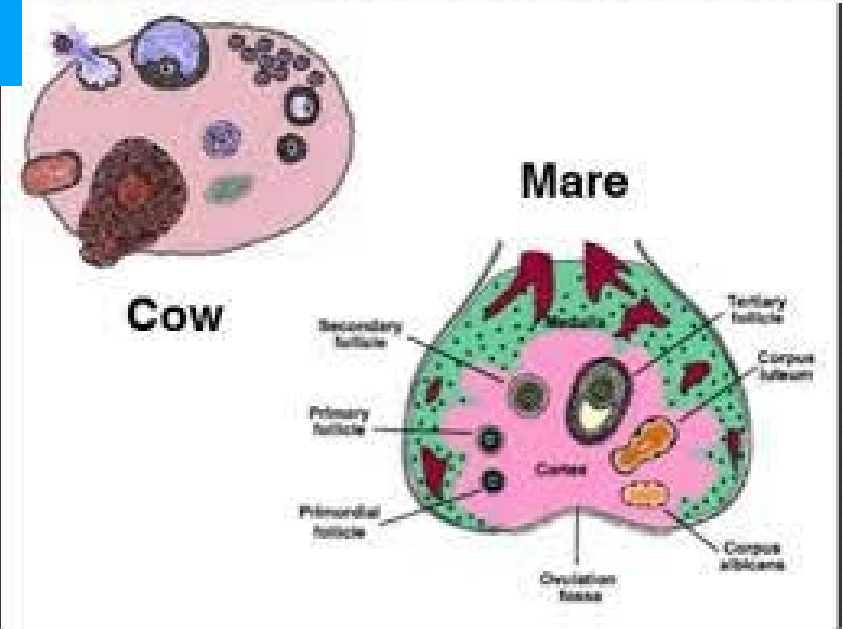


Ovaries

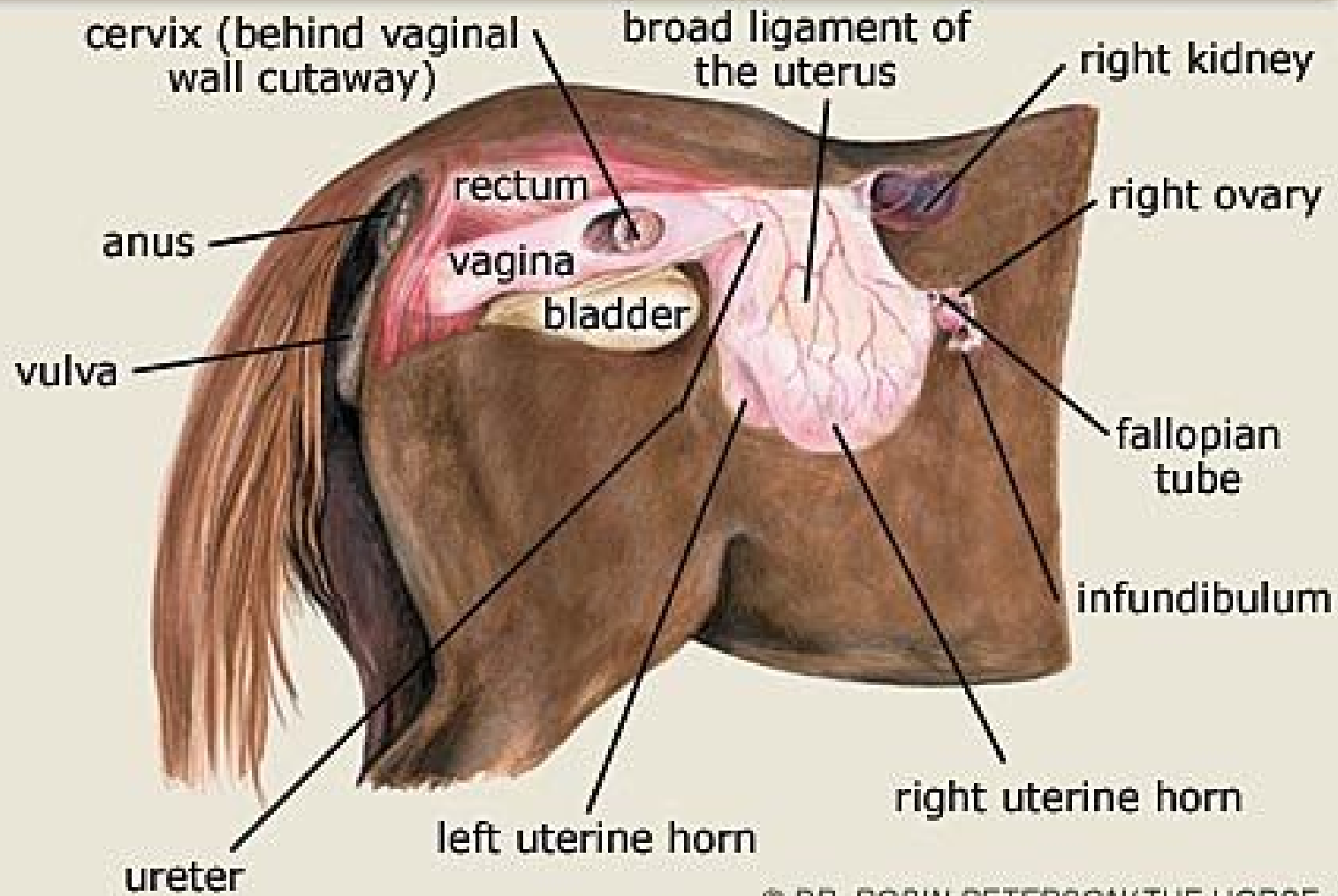


Jajnik kobile

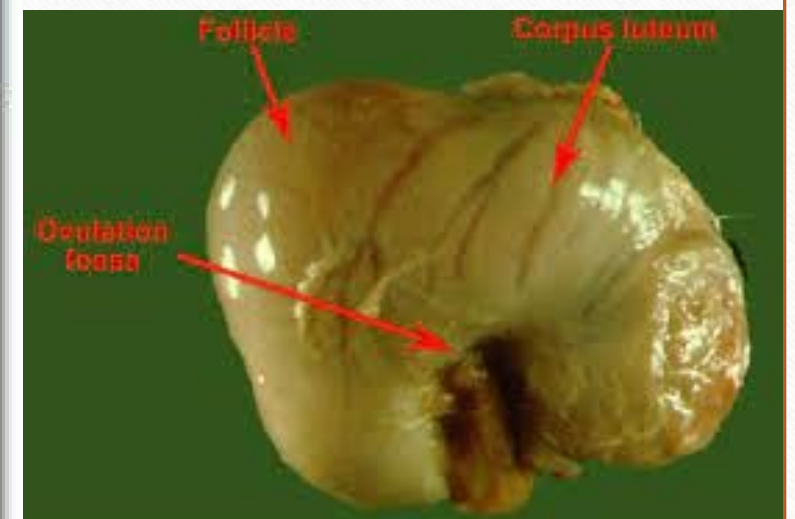
- Pasuljastog oblika
- Težine oko 40 g
- Površina jajnika glatka – *Medulla* – SPOLJA
- **KORA- UNUTRA**
- *Fossa ovulaciones*
- Leže u slabinskom delu, u visini 4-5 lumbalnog pršljena kaudalno od bubrega



THE MARE'S REPRODUCTIVE TRACT

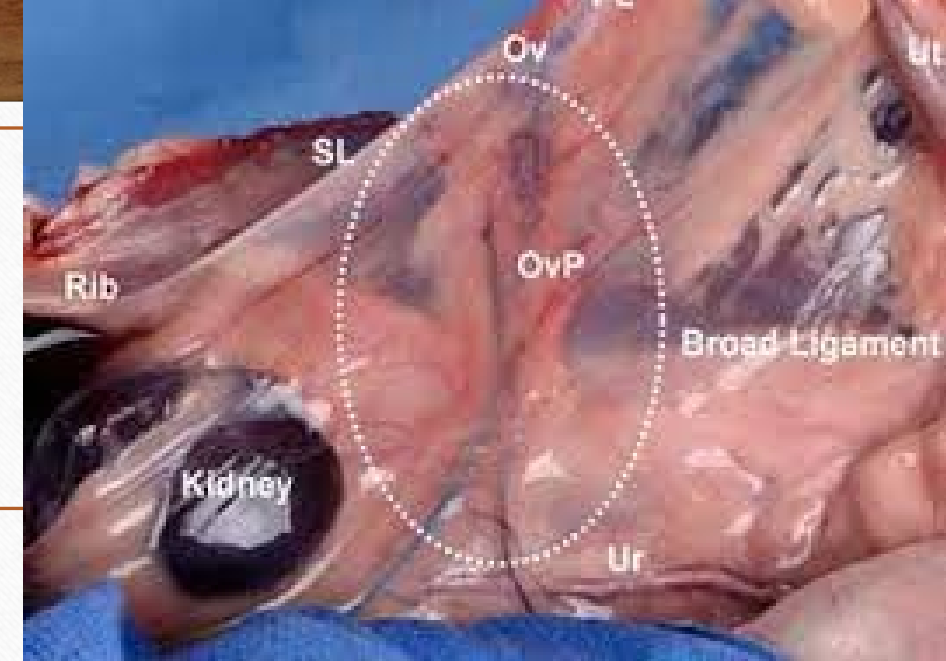


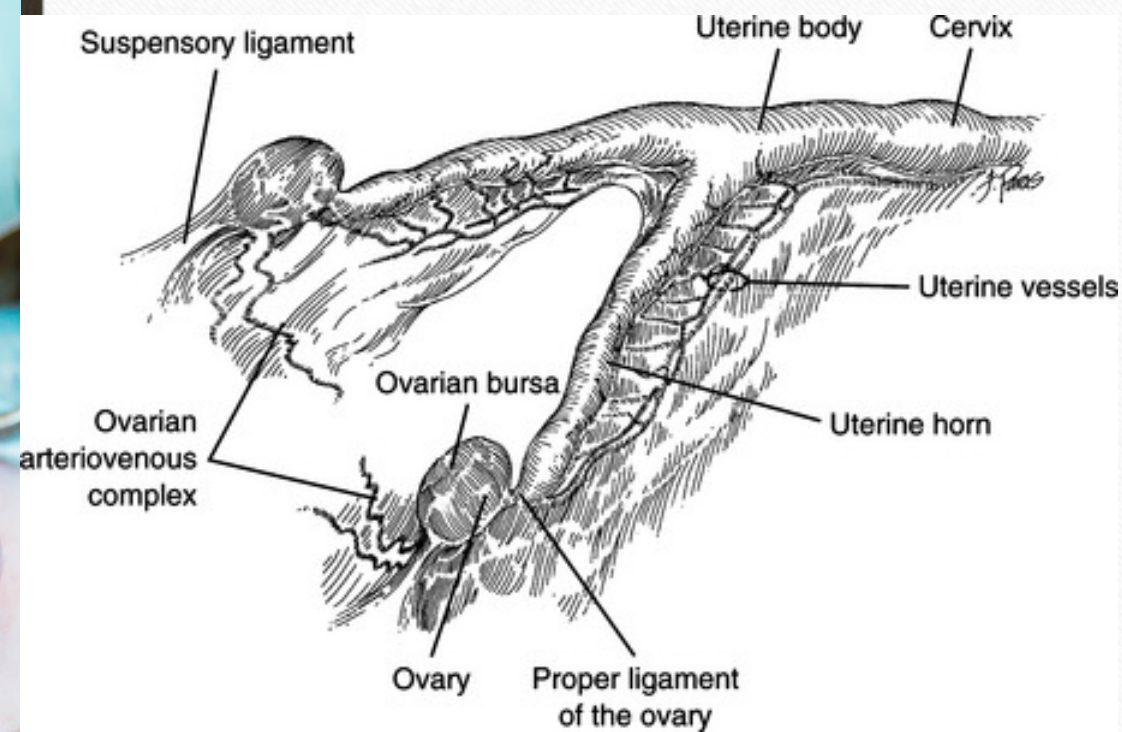
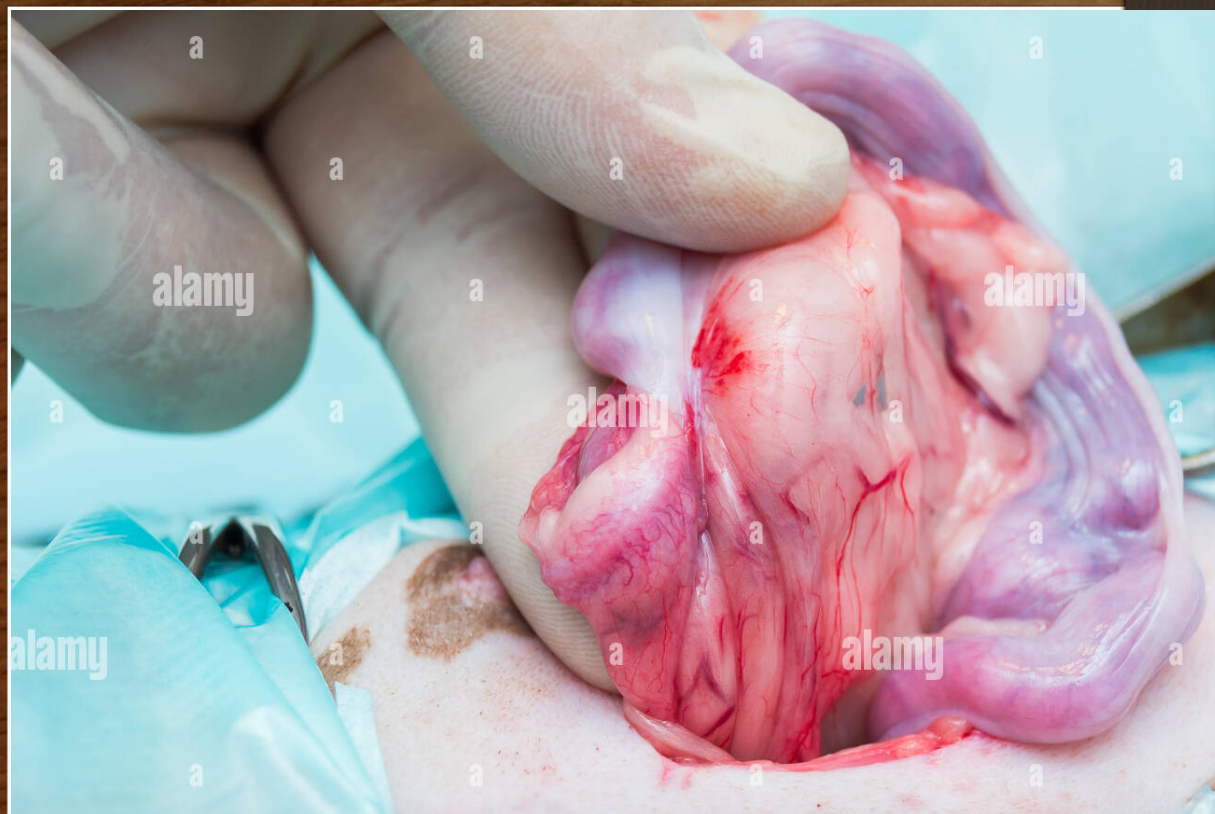
© DR. ROBIN PETERSON/ THE HORSE



Jajnik kuje

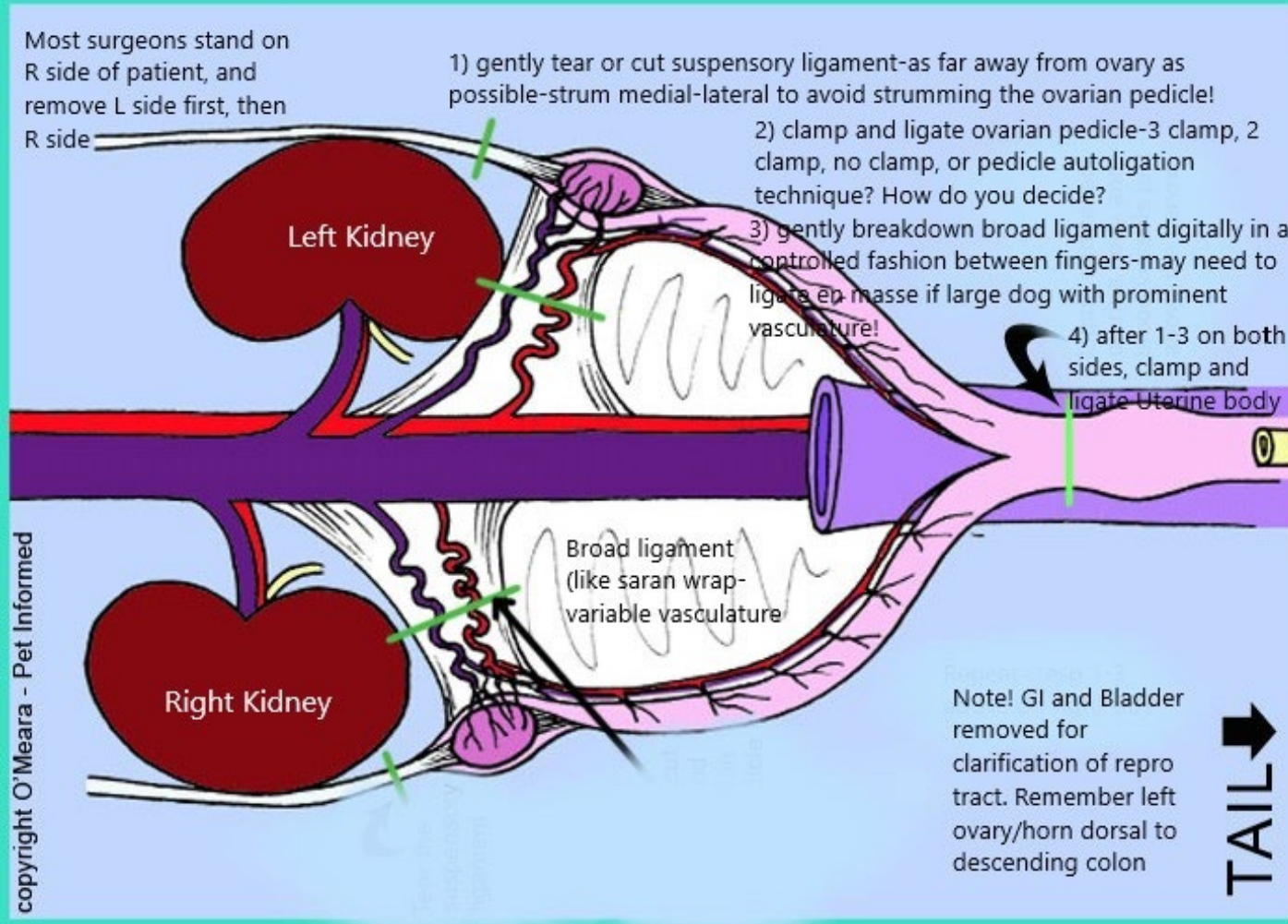
- Duguljastog oblika, bočno spljošteni
- Pripojeni za matericu pomoću *Lig. ovarii proprium* koji sa **mesosalpinx** čini *Bursa ovarii* koja je u kuja potpuno zatvorena
- Jajnik i jajovod su povezani za bubrege zasebno sa svake strane pomoću *Lig. suspensorium ovarii (Lig. renoovaricum)*
- Desni bubrege kuje leži kranijalnije od levog, u predelu II i III lumbalnog pršljena, a levi u predelu III i IV lumbalnog pršljena



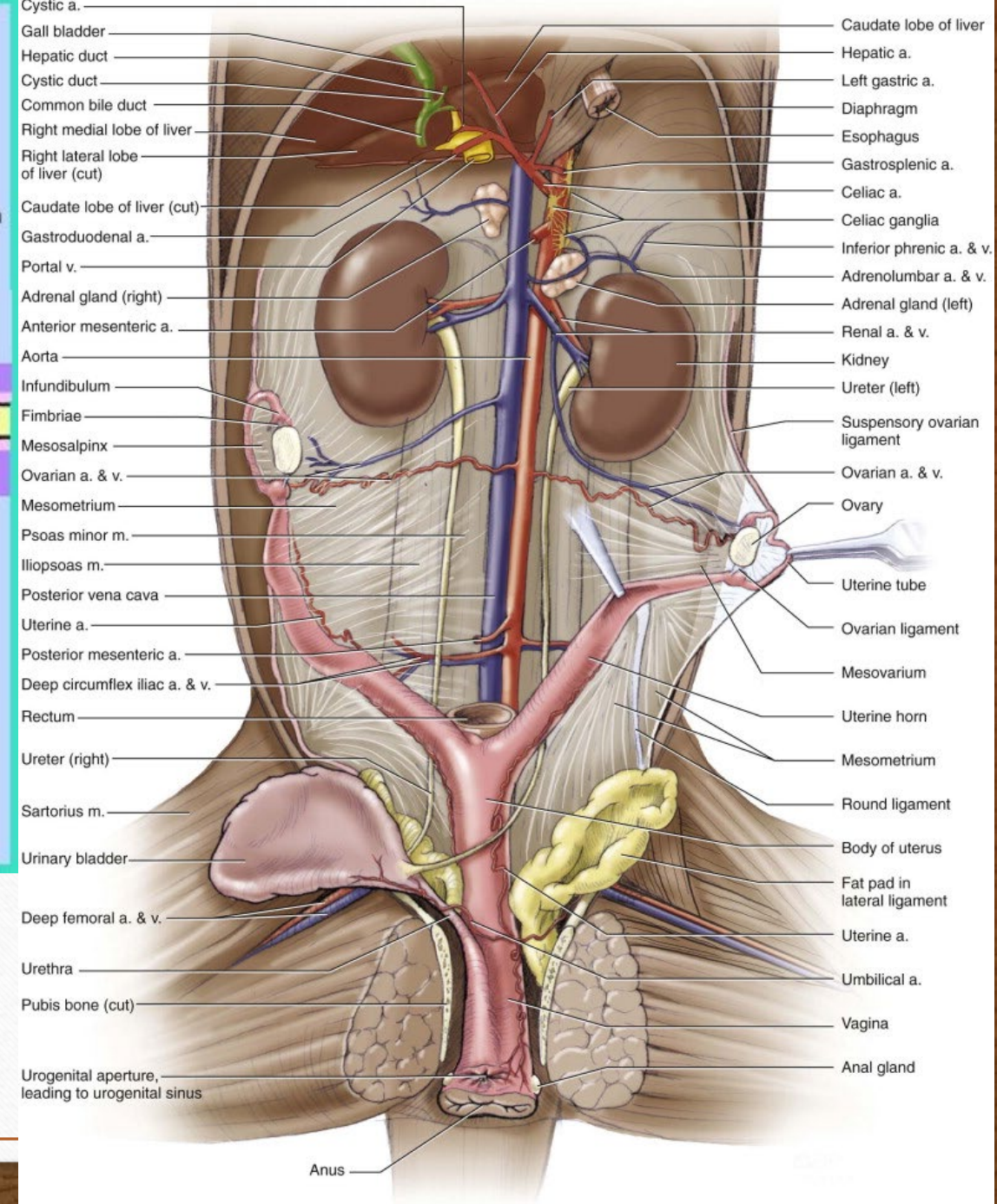


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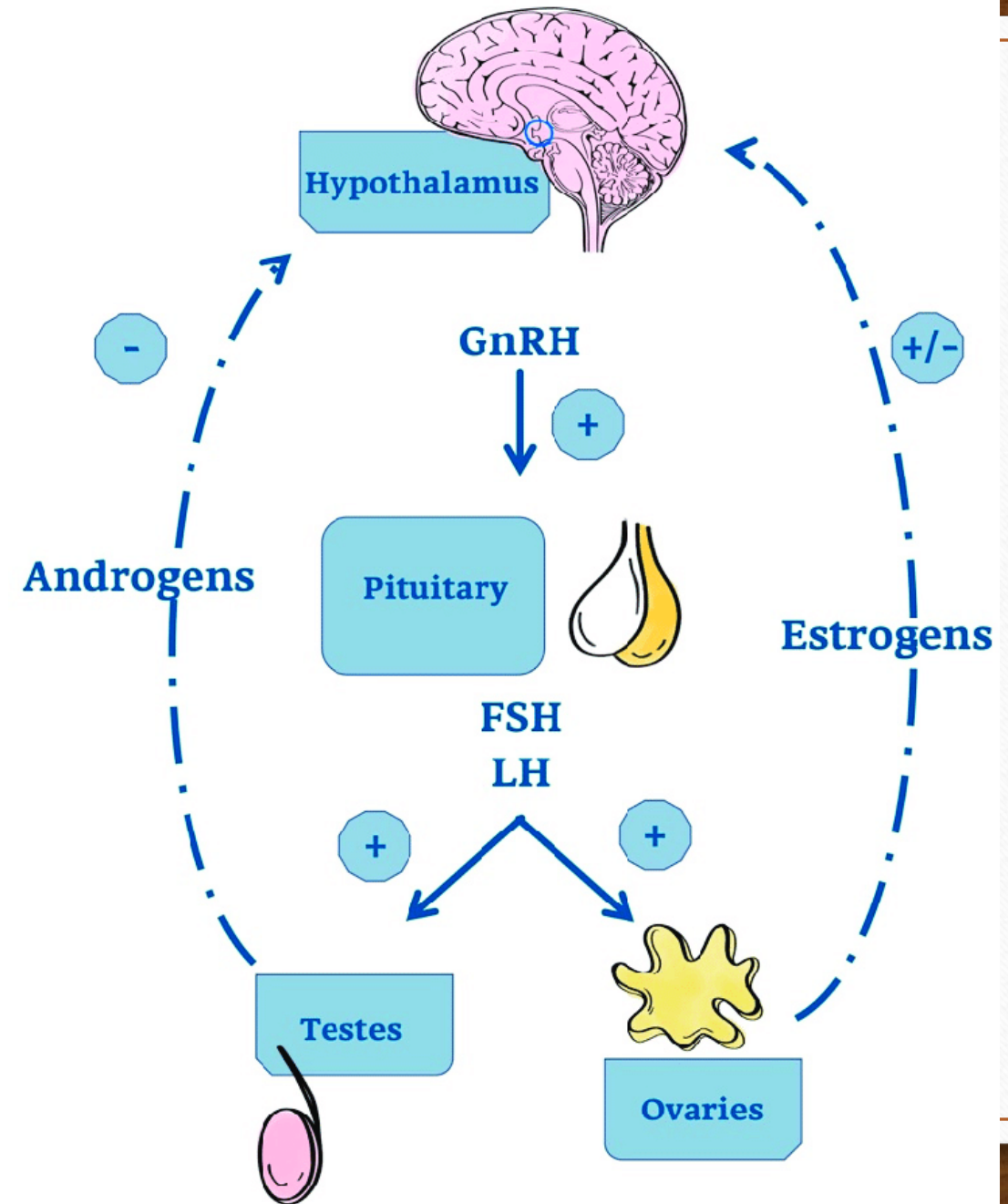
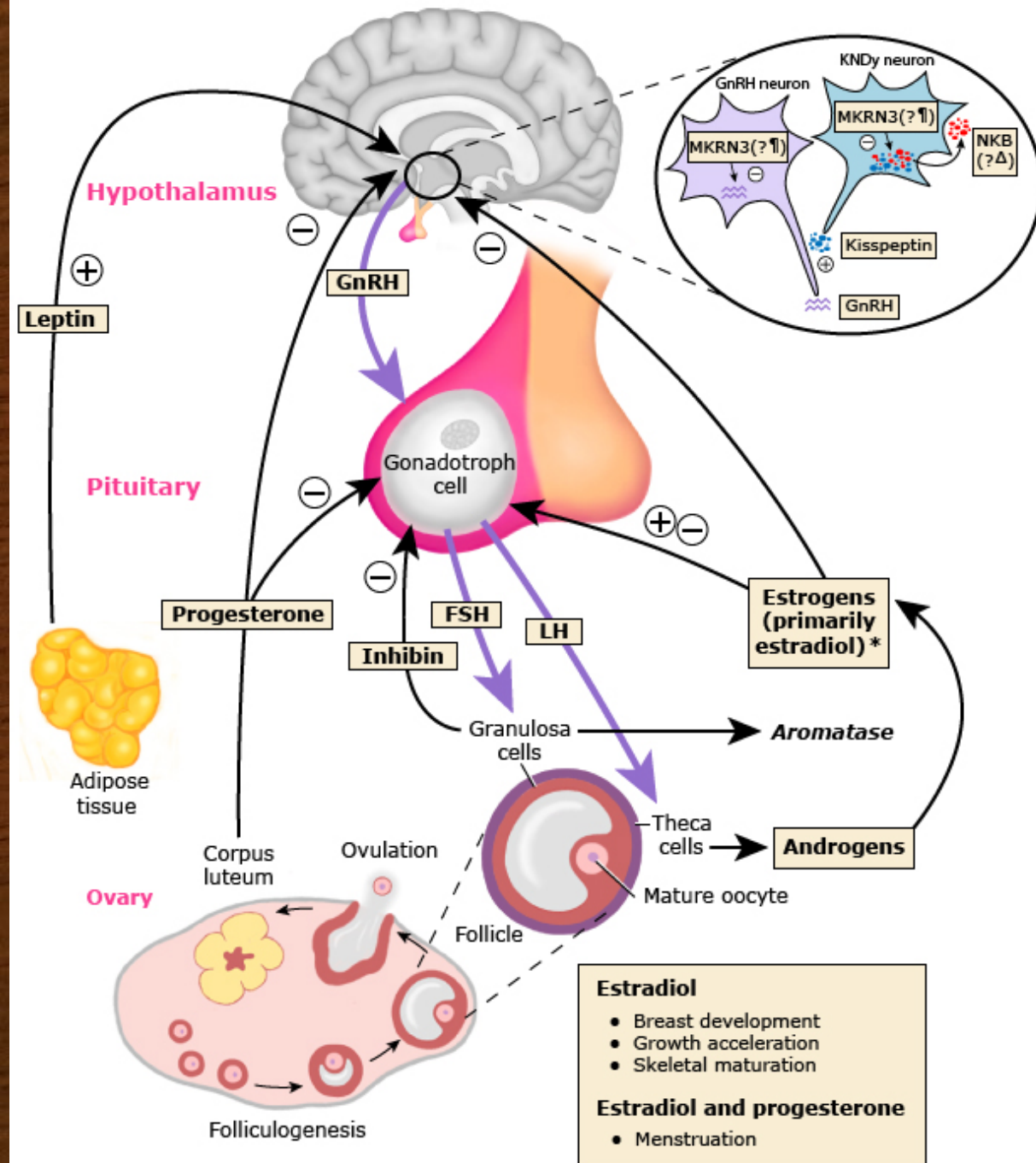
copyright O'Meara - Pet Informed



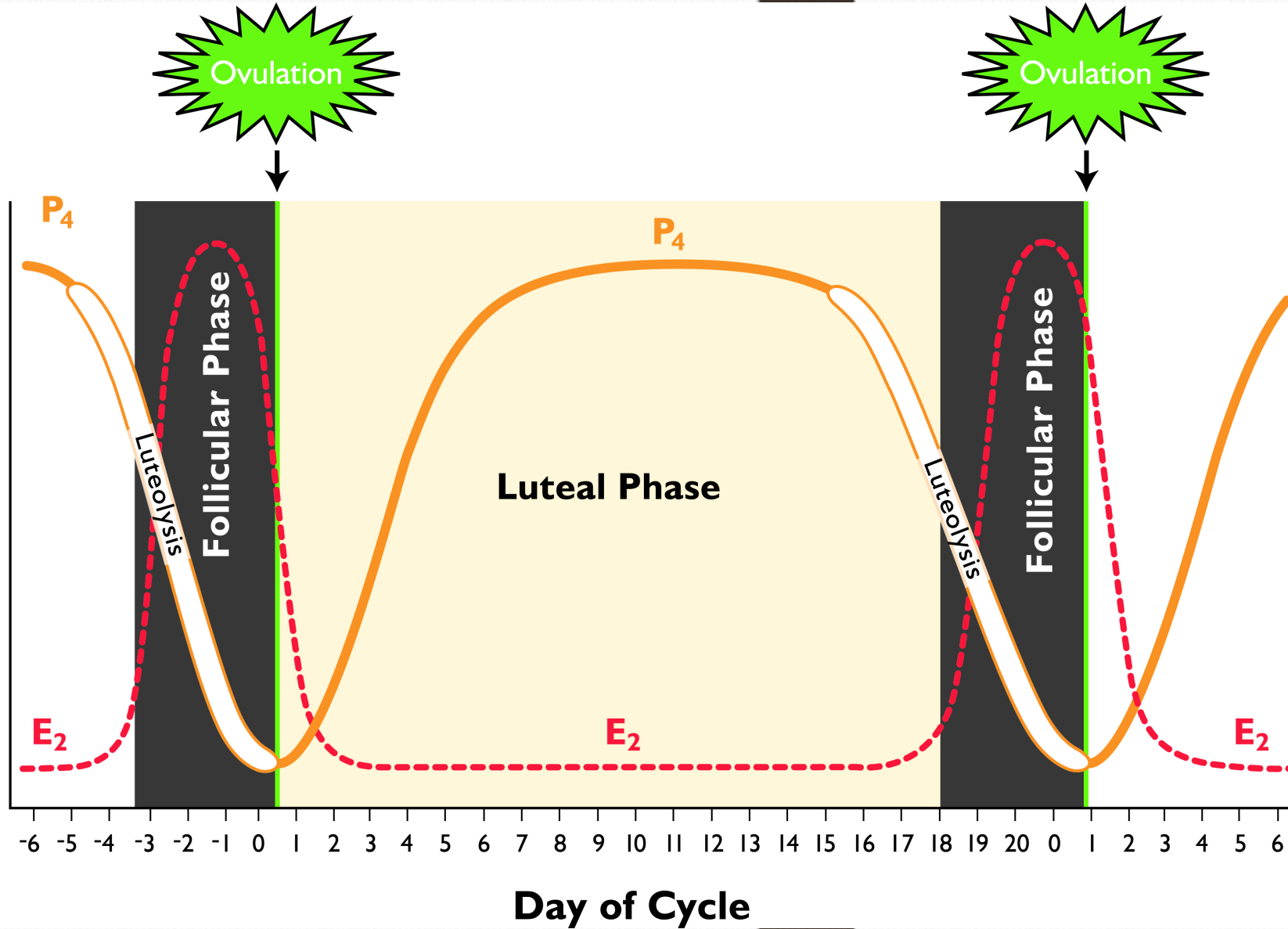
Neurohormonalna regulacija polnog ciklusa

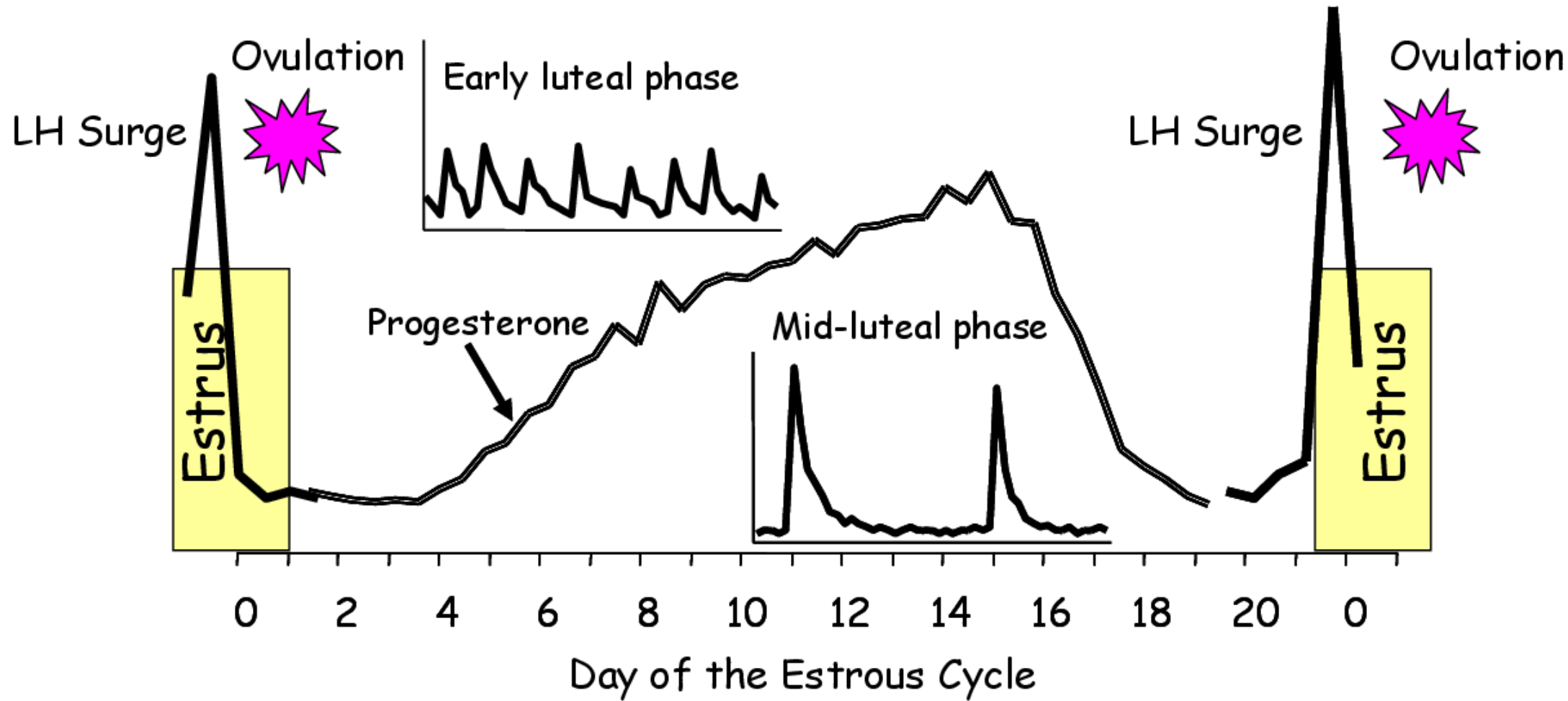
- *Osovina- HIPOTALAMUS-HIPOFIZA-GONADE*
- *Gnrh*
- *FSH*
- *LH*
- *ESTROGEN*
- *PROGESTERON*
- *OKSITOCIN*
- *PROSTAGLANDINI*

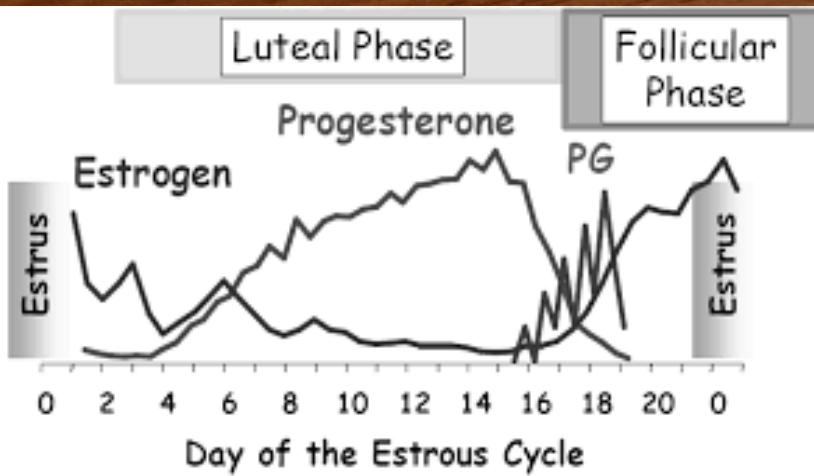
THE HYPOTHALAMIC-PITUITARY-GONADAL AXIS



Relative Hormone Concentrations (blood)





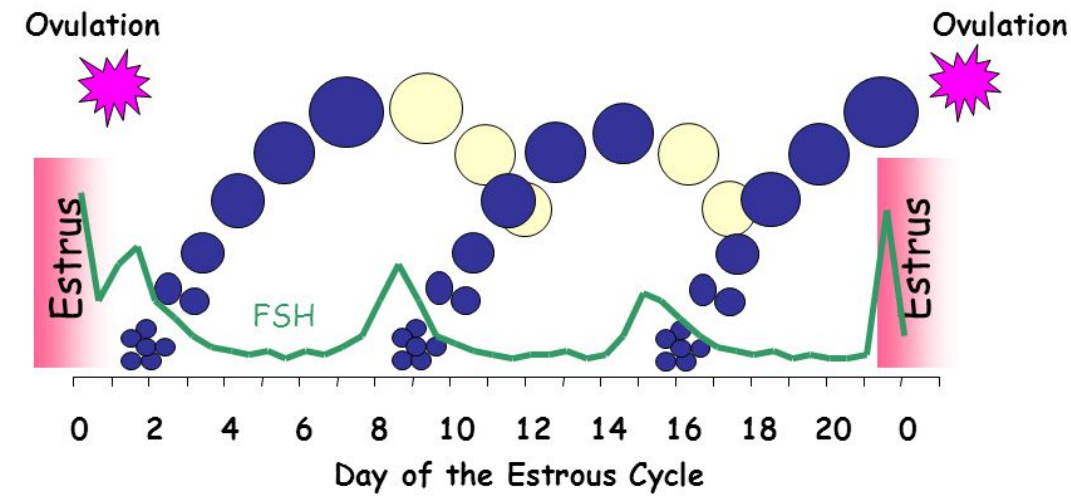


Folikularni talasi

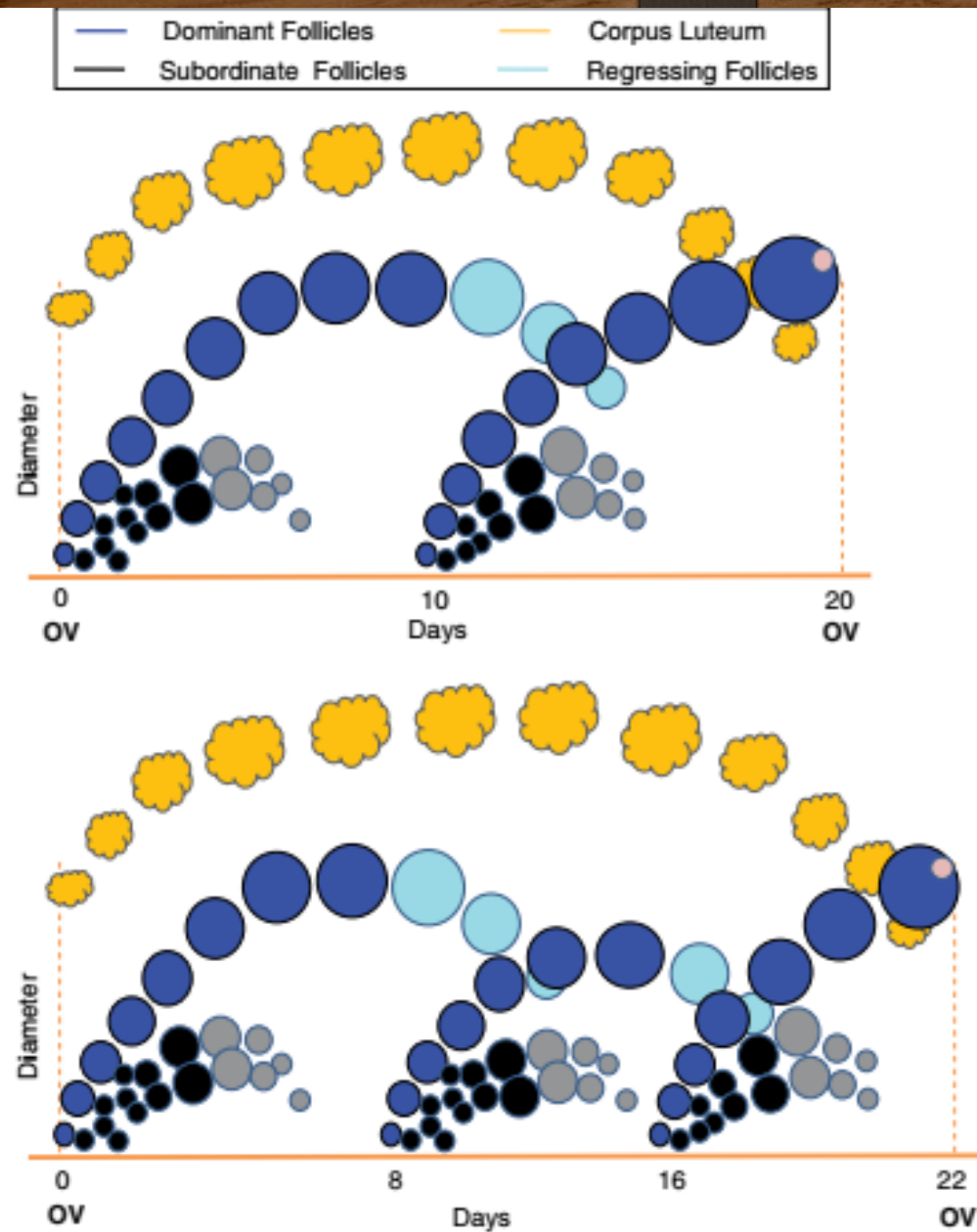
- **Faze razvoja folikula:**
 1. **Regrutacija** – 4 mm
 2. **Selekcija** – oko 9 mm
 3. **Dominacija** - 10-20 mm
- Kod KRAVA 2 do 3 folikularna talasa

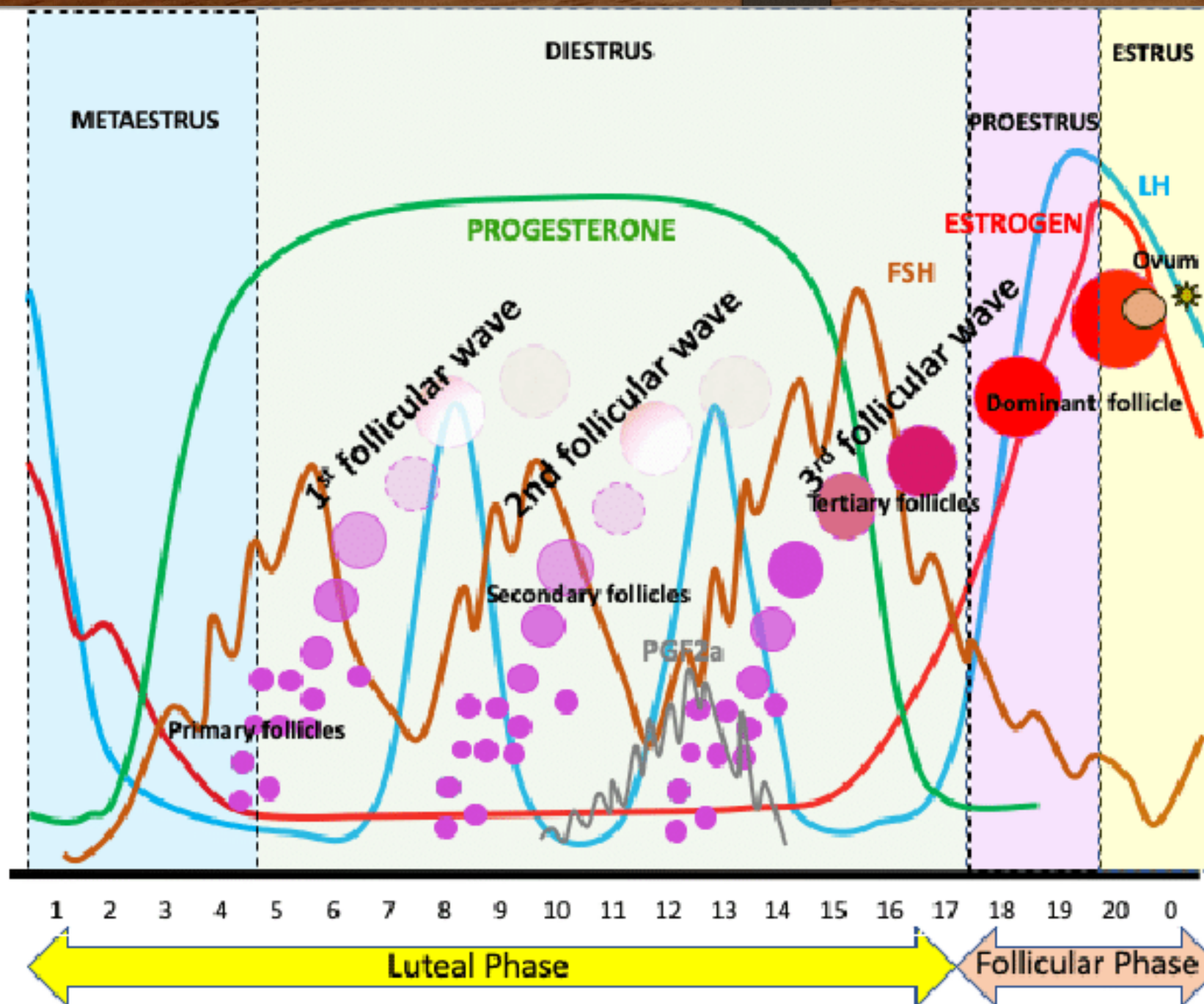
Endocrinology During the Estrous Cycle Follicle Stimulating Hormone (FSH)

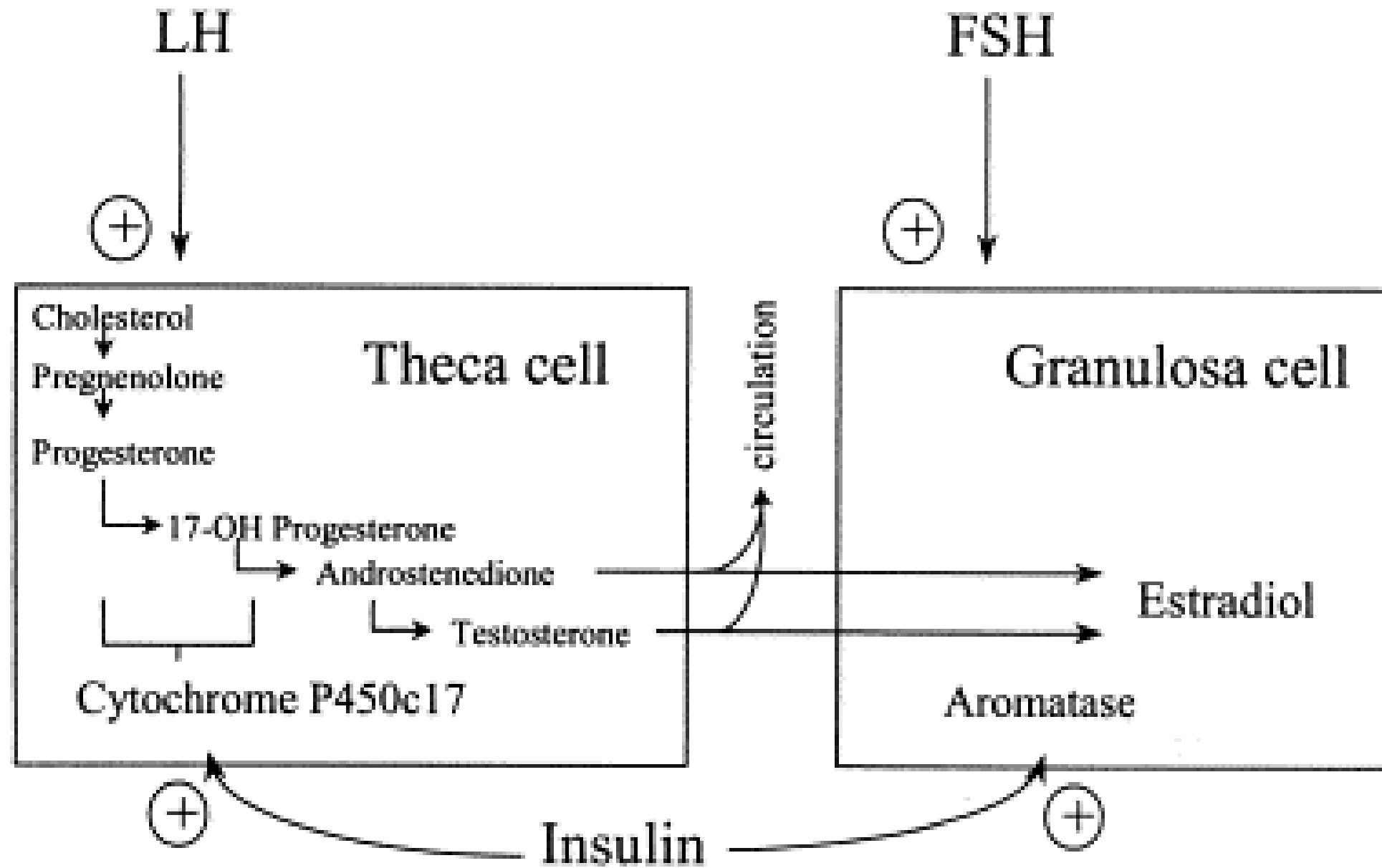
10

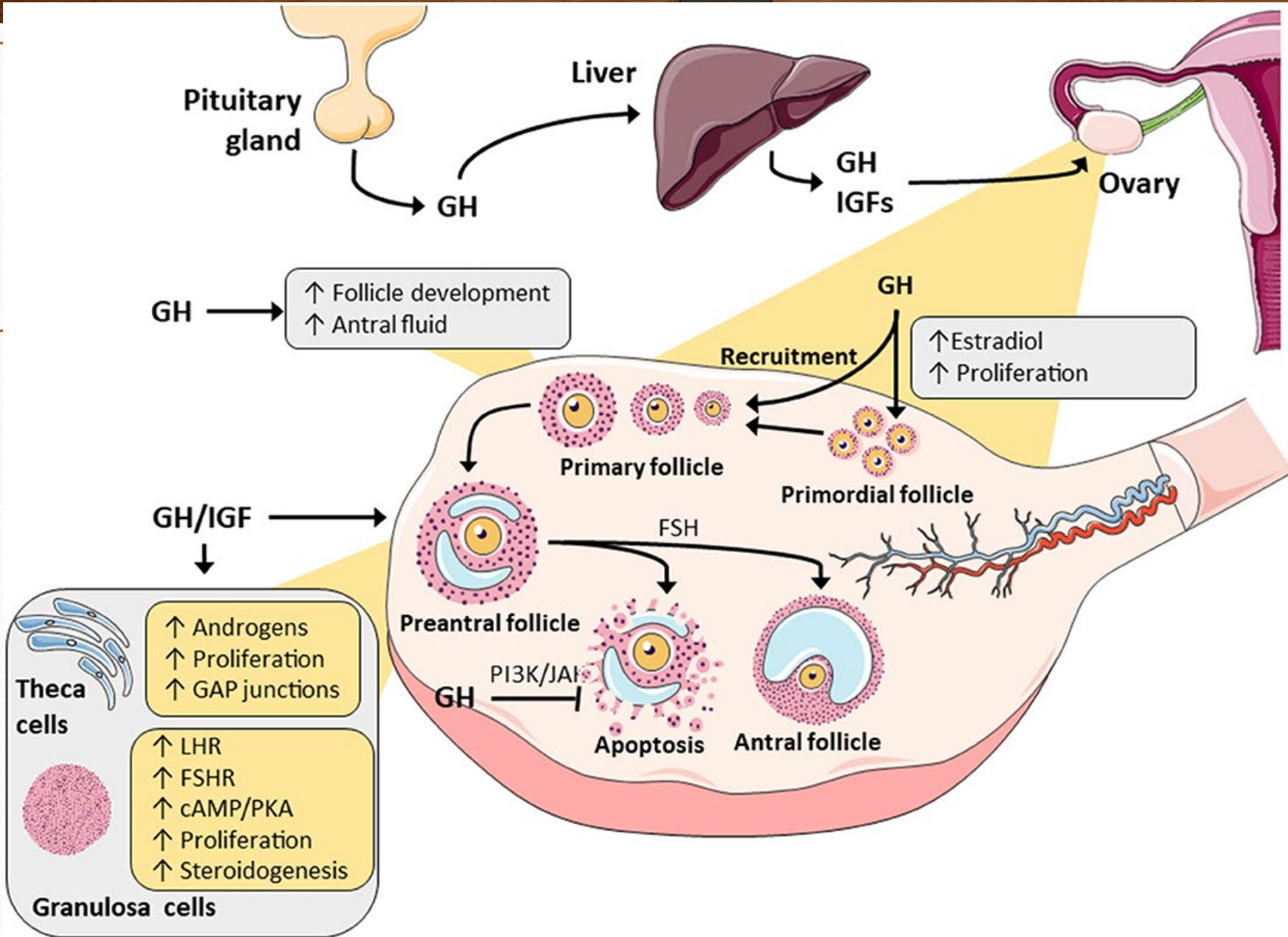


□ Example shown for cattle having 3 follicular waves during a 21-day estrous cycle









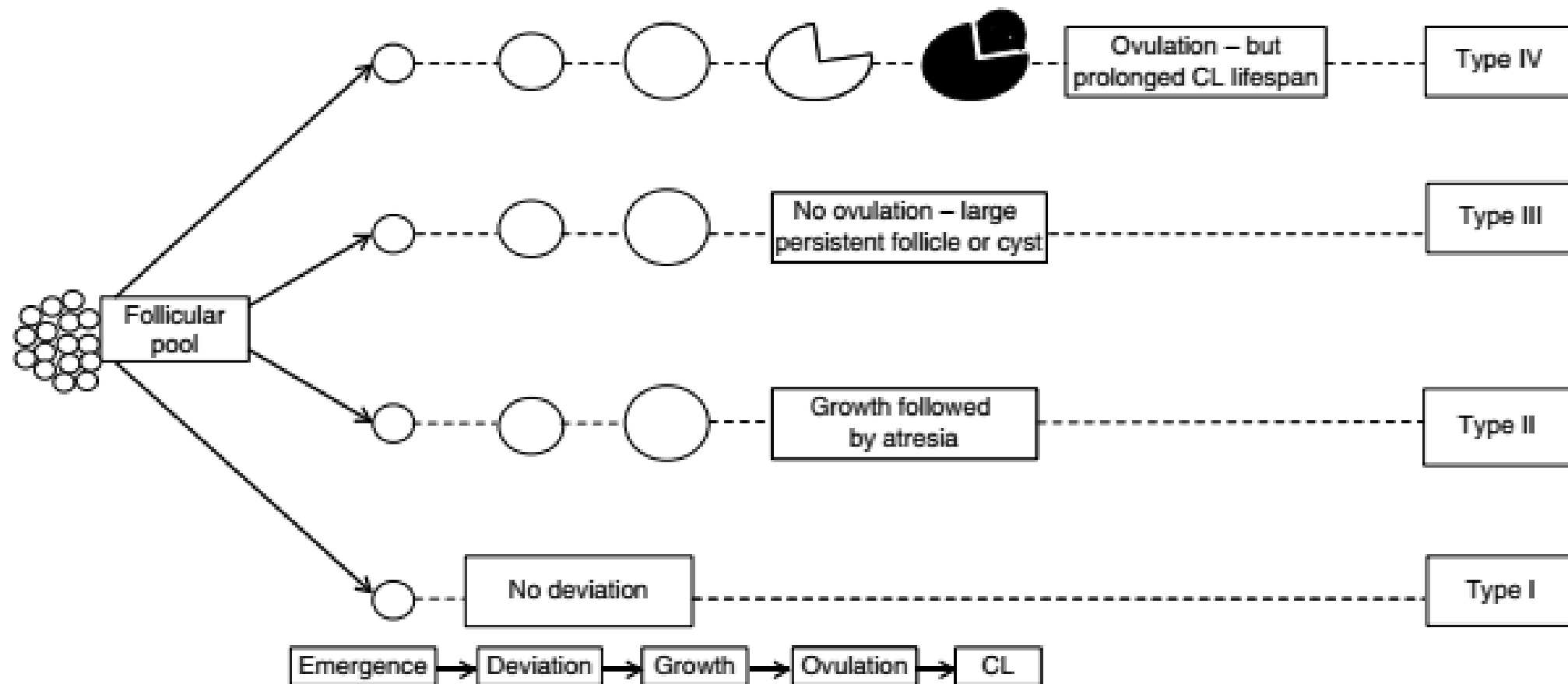
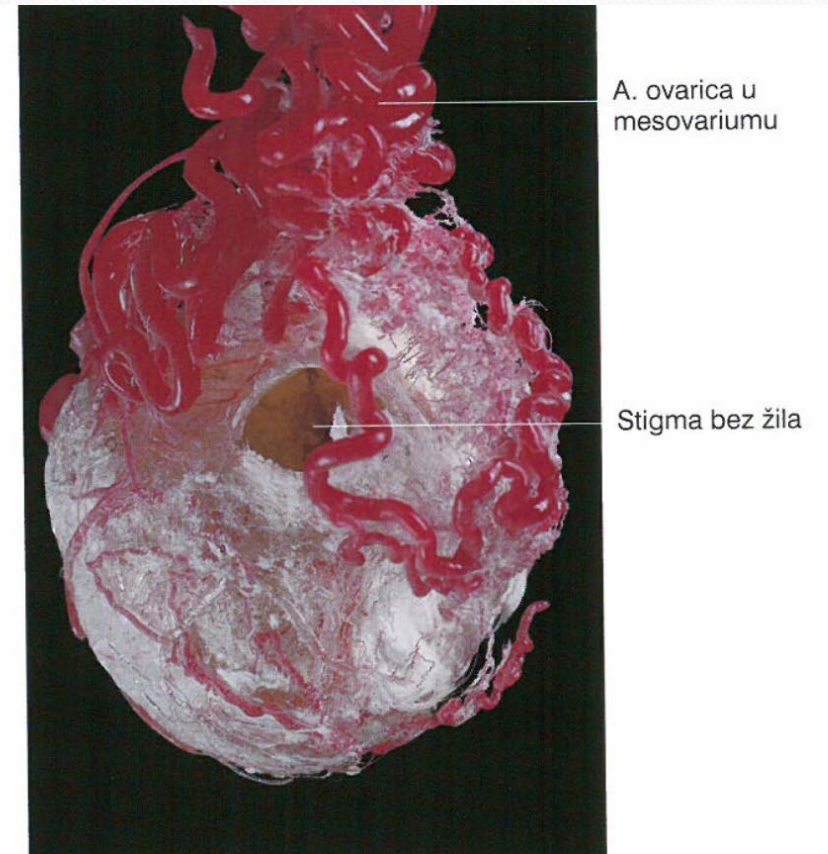
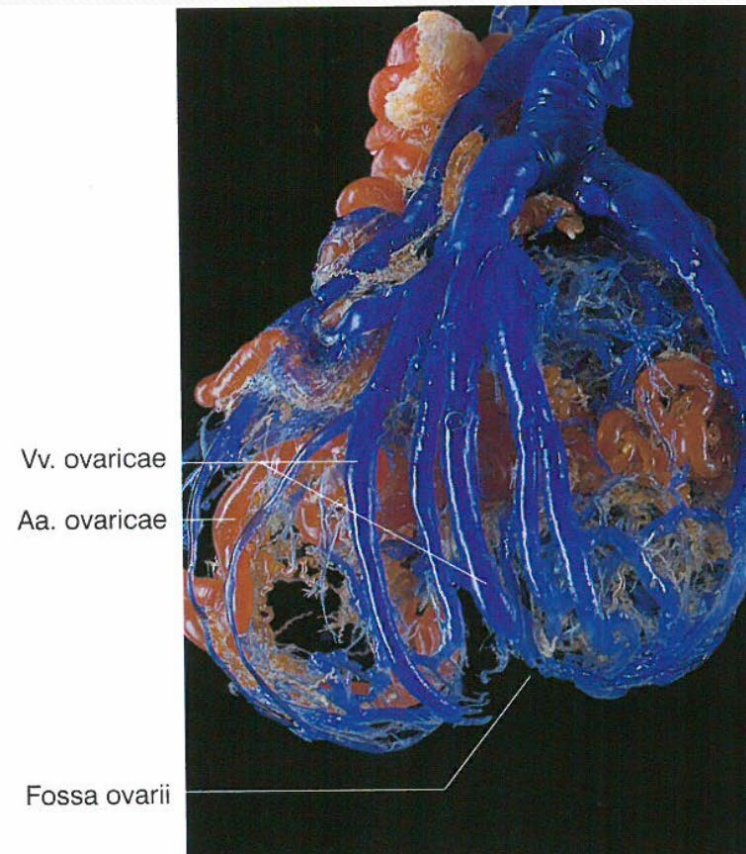
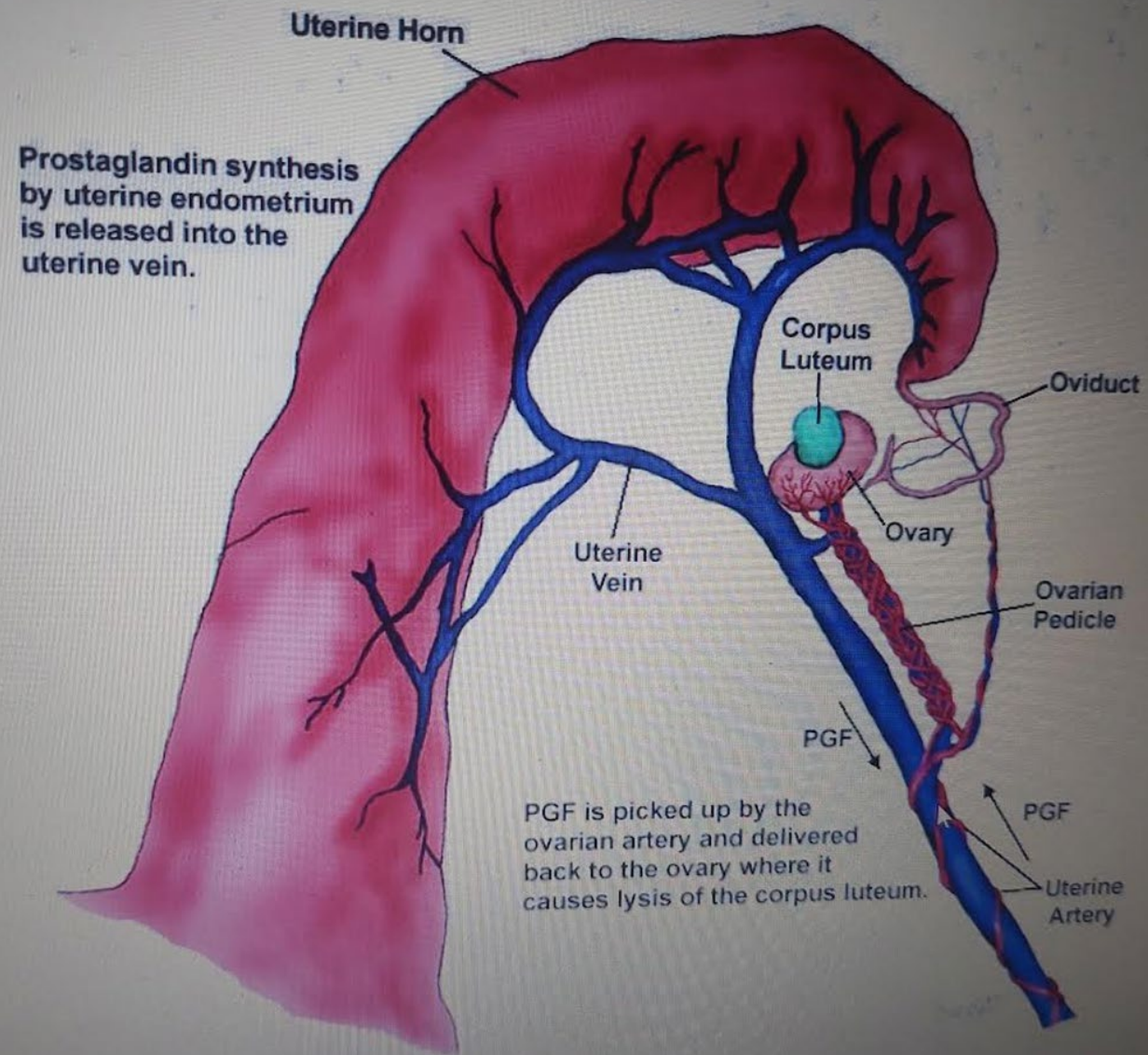


Figure 52.3 Schematic representation of types of anestrus conditions based on ovarian follicular dynamics. Reproduced with permission from Peter A, Vos P, Ambrose D. Postpartum anestrus in dairy cattle. *Theriogenology* 2009;71:1333–1342.

Vaskularizacija jajnika

- *A. Ovarica*
- *Vv. ovaricae*





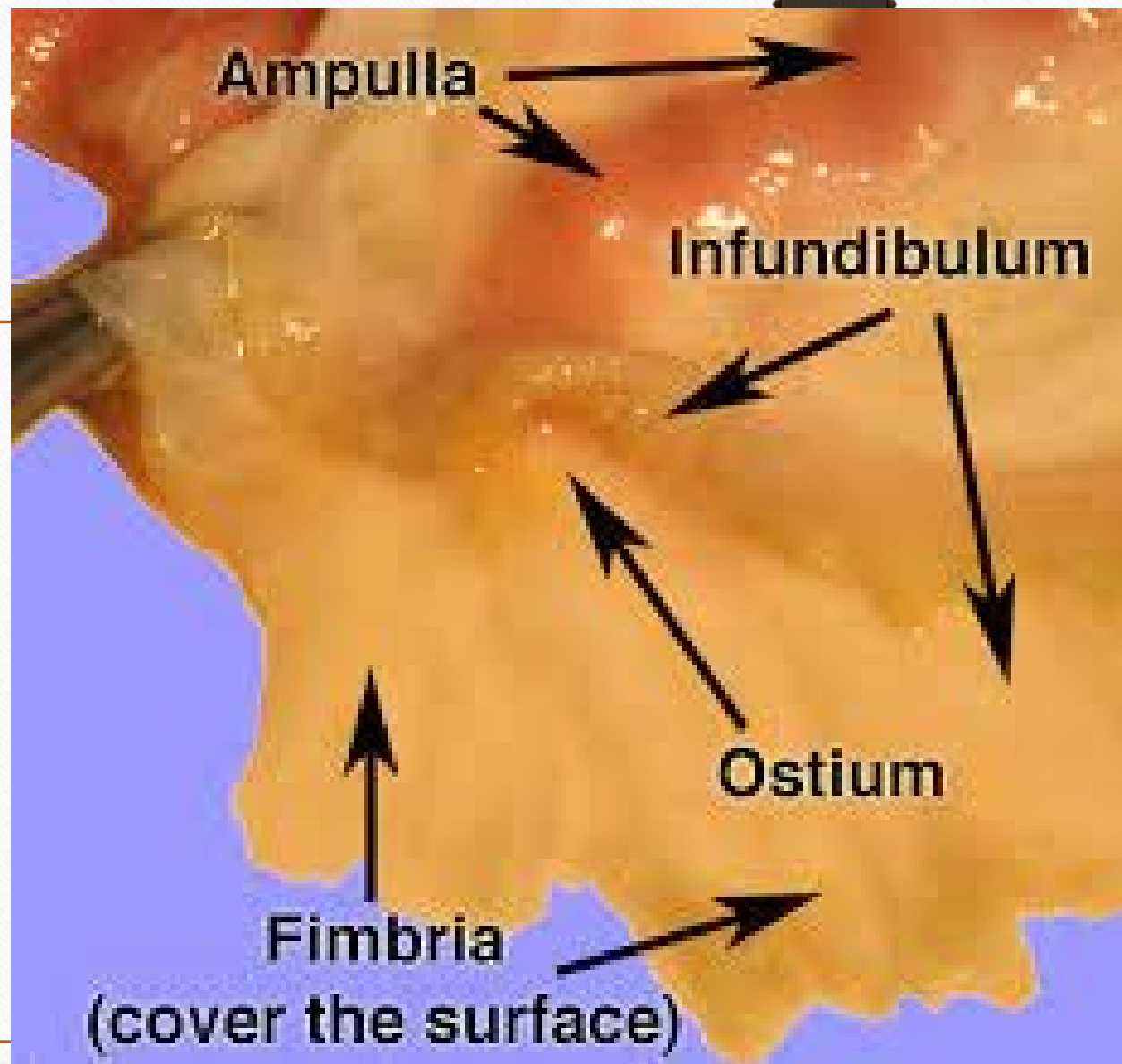
Prostaglandin Control in Luteolysis

Jajovod (*Tuba uterina, salpinx*)

- Sluzokožno mišićna cev
- Preuzima ovulirane jajne ćelije
- U jajovodu jajne ćelije dozrevaju i vrši se oplodjenje
- Posle toga prelazi u matericu

Jajovod (*Tuba uterina, salpinx*)

- Jajovod leži u duplikaturi seroze- *mesosalpinx*
- Jajovod se sastoji od:
 1. *Infundibulum tubae uterinae* (*fimbriae tubae uterinae*) na njegovom dnu nalazi se *Ostium abdominalae tubae uterinae*
 2. *Ampula tubae uterinae* – prošireni deo
 3. *Isthmus tubae uterinae*- suženi deo
 4. *Pars uterina*- na njemu se nalazi *Ostium uterinum tubae uterinae*



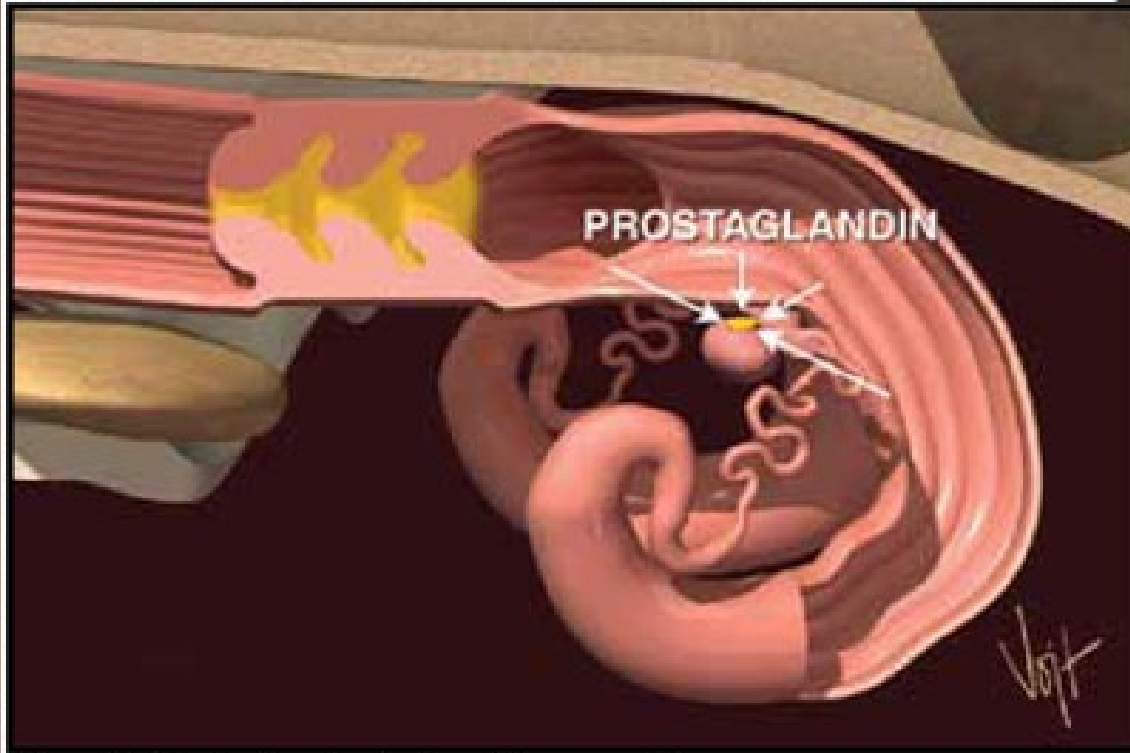
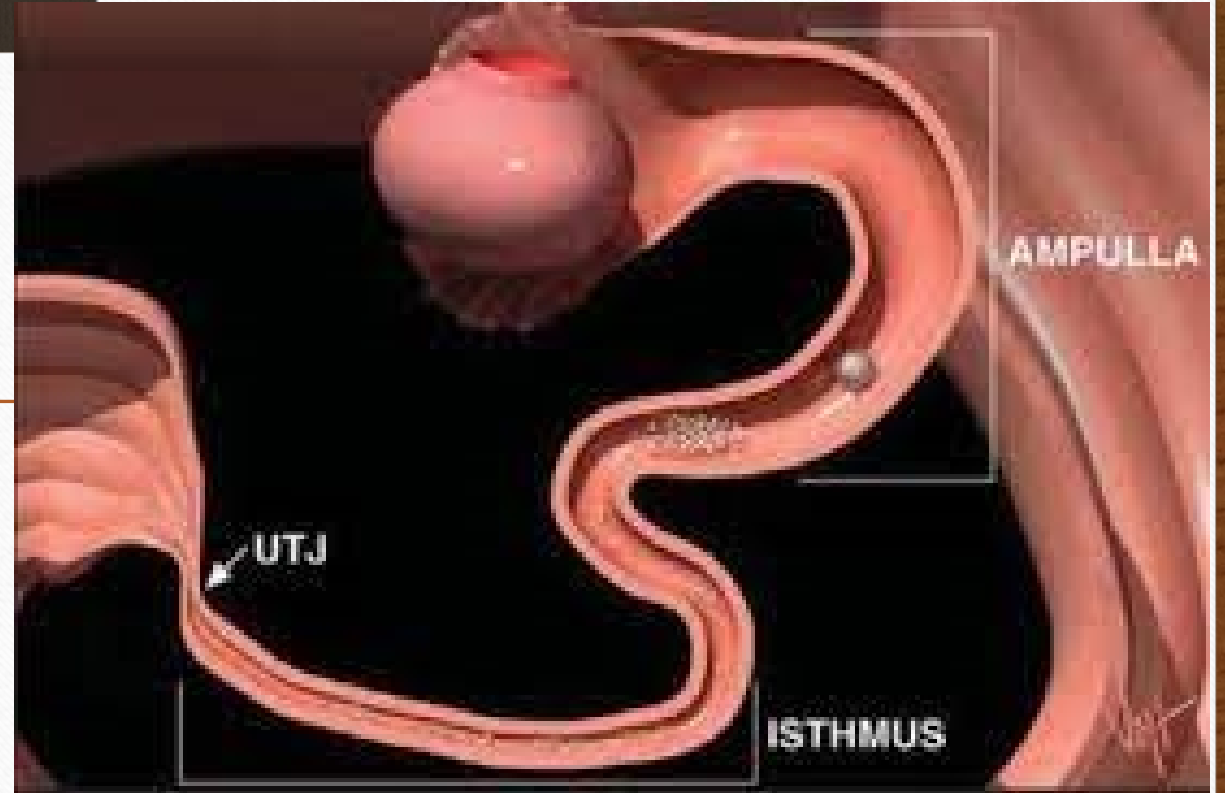


Figure 15. Prostaglandin destroys the corpus luteum.



Jajovod (*Tuba uterina, salpinx*)

- *Bursa ovarii* čini:
 1. *Ligamentum ovarii proprium*
 2. *Mesosalpinx*
 - Kod krava i krmača – delimično zatvorena
 - U kobilu –slabo razvijena
 - U kuja – potpuno zatvara jajnik

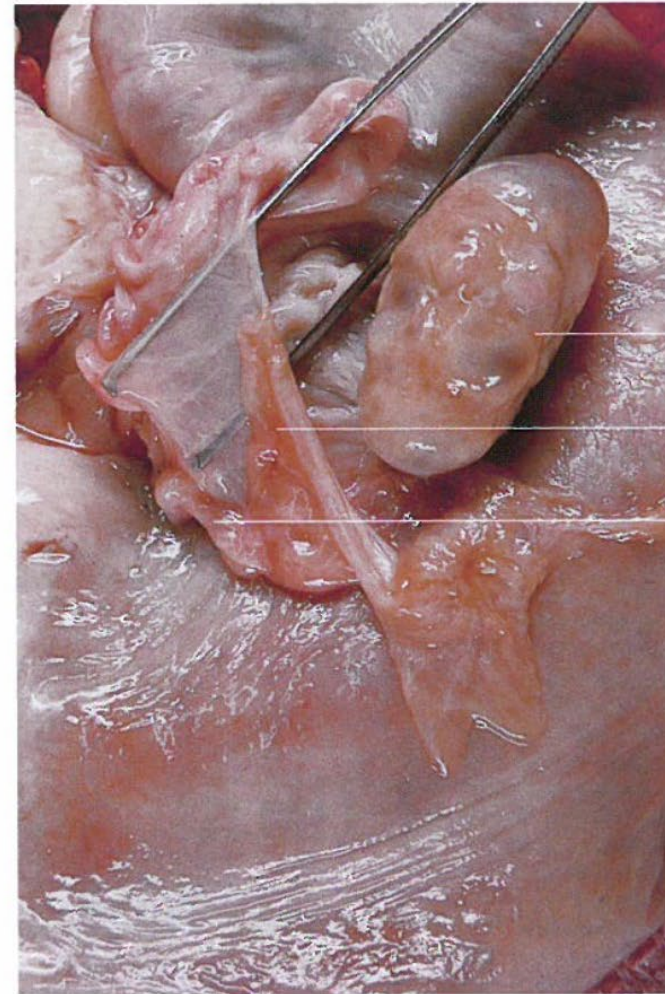
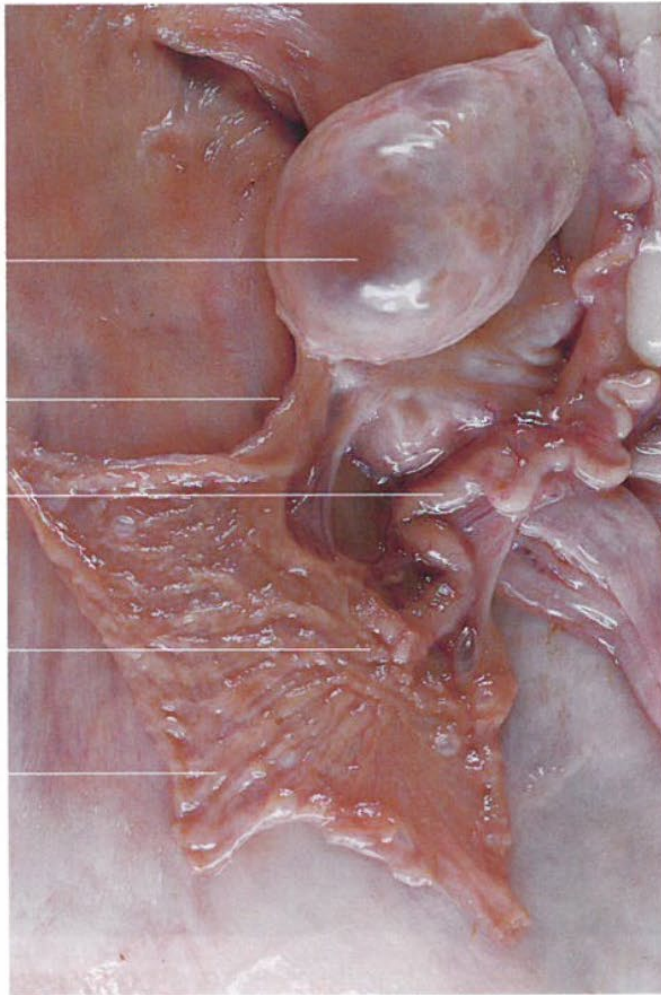
Graafov folikul

Fimbriae ovaricae

Tuba uterina

Ostium abdominale
tubae uterinae

Fimbriae tubae



Ovarium

Mesosalpinx

Tuba uterina seu
salpinx

Mesosalpinx

**Tuba uterina seu
salpinx**

**Ampulla tubae
uterinae**

Ostium
abdominale tubae
uterinae

Infundibulum
tubae i fimbriae

Isthmus tubae
uterinae

Mesosalpinx

**Tuba uterina seu
salpinx**

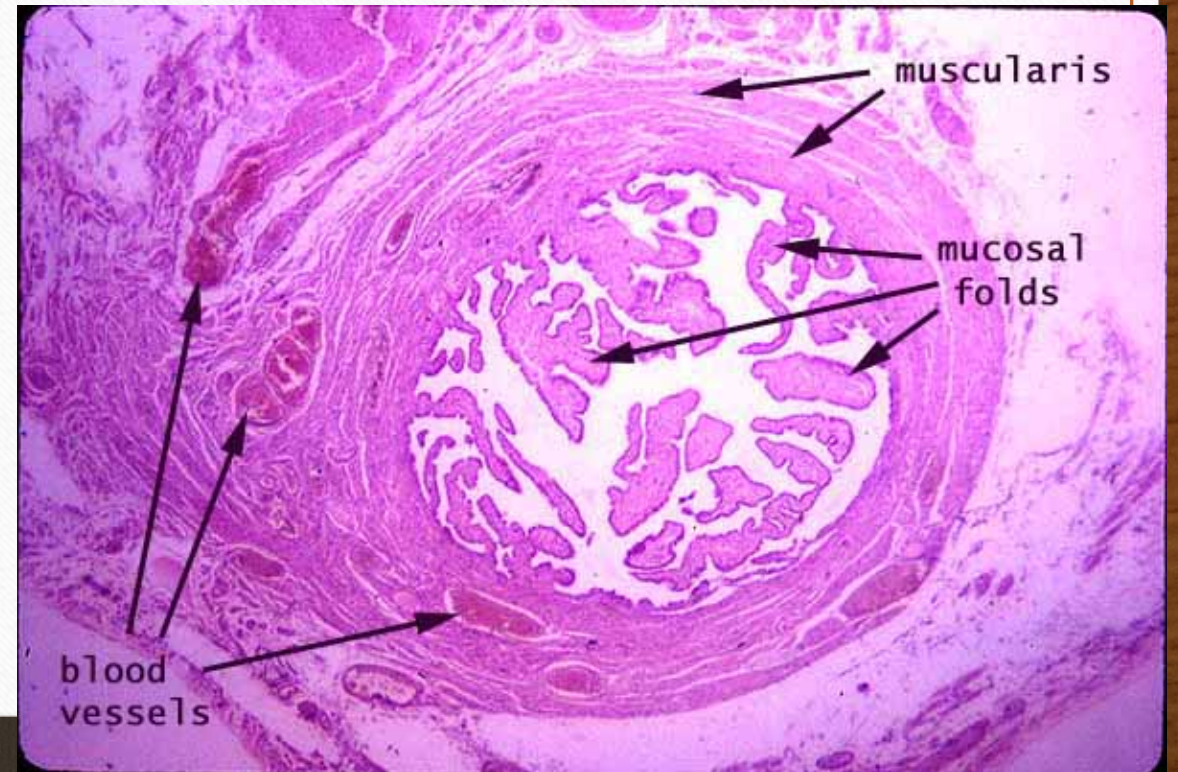
Cornu uteri, vrh



Grada jajovoda

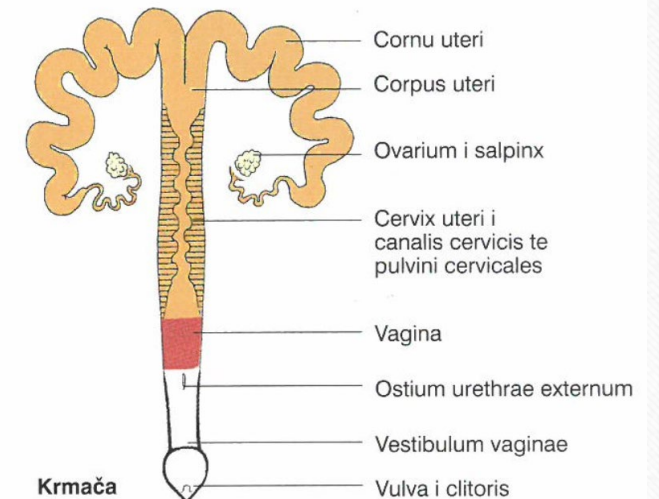
- Sastoji se od:

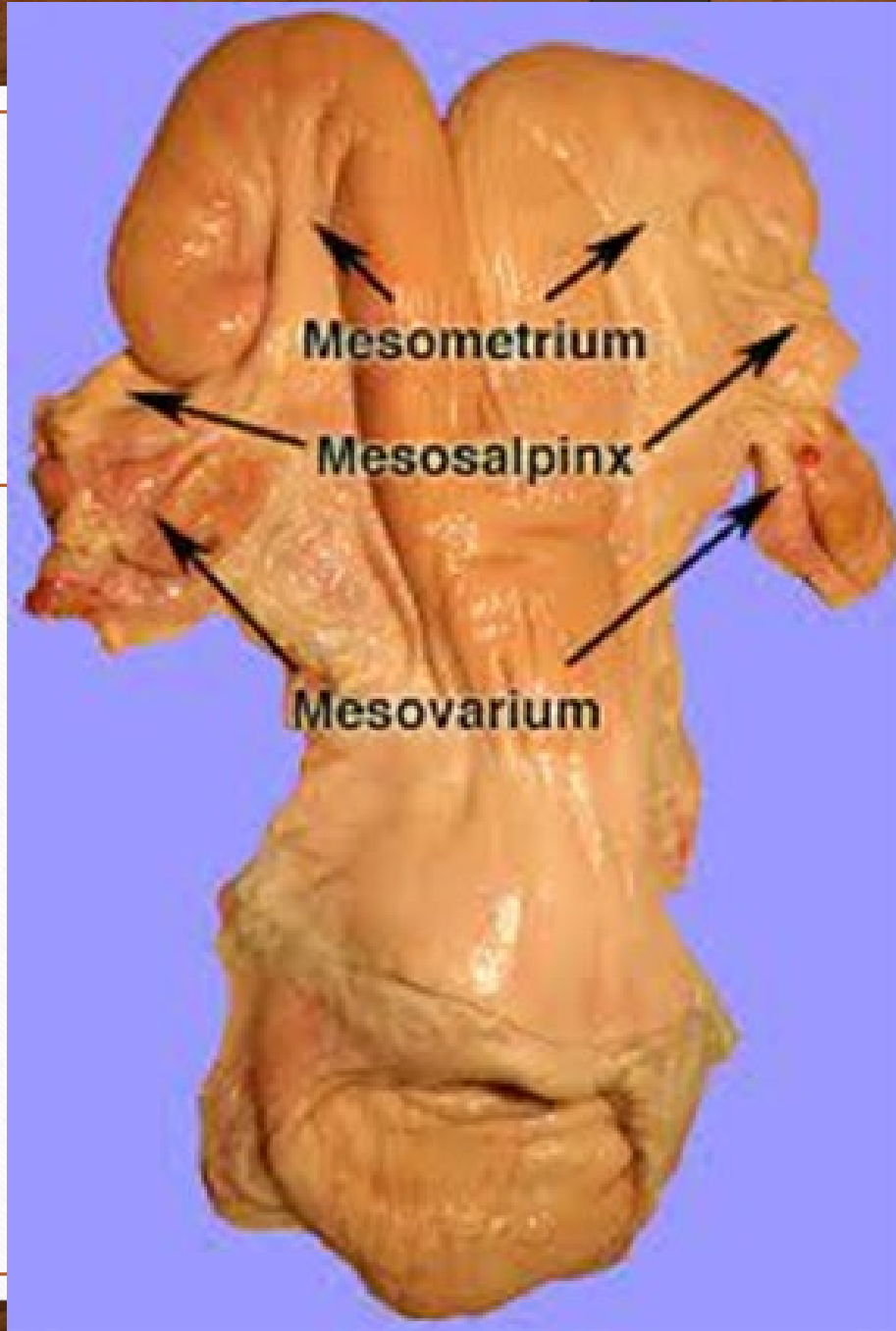
1. *Tunica mucosa*
2. *Tunica muscularis*
3. *Tunica serosa*



Materica (*Uterus, Hystera, Methra*)

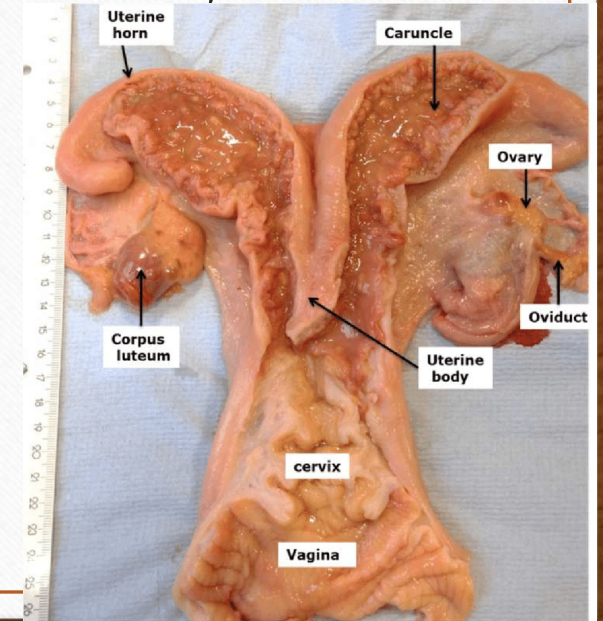
- Spada u generacione polne organe
- Ima funkciju da prihvati oplodenu jajnu ćeliju, nidira je, prepoznaje, i ishranjuje plod tokom čitavog graviditeta
- Materica svih domaćih životinja ima :
 1. 2 roga- *Cornu uteri (Uterus bicornis)*
 2. Telo materice- *Corpus uteri*
 3. Vrat, grlić (*Cervix uteri*)



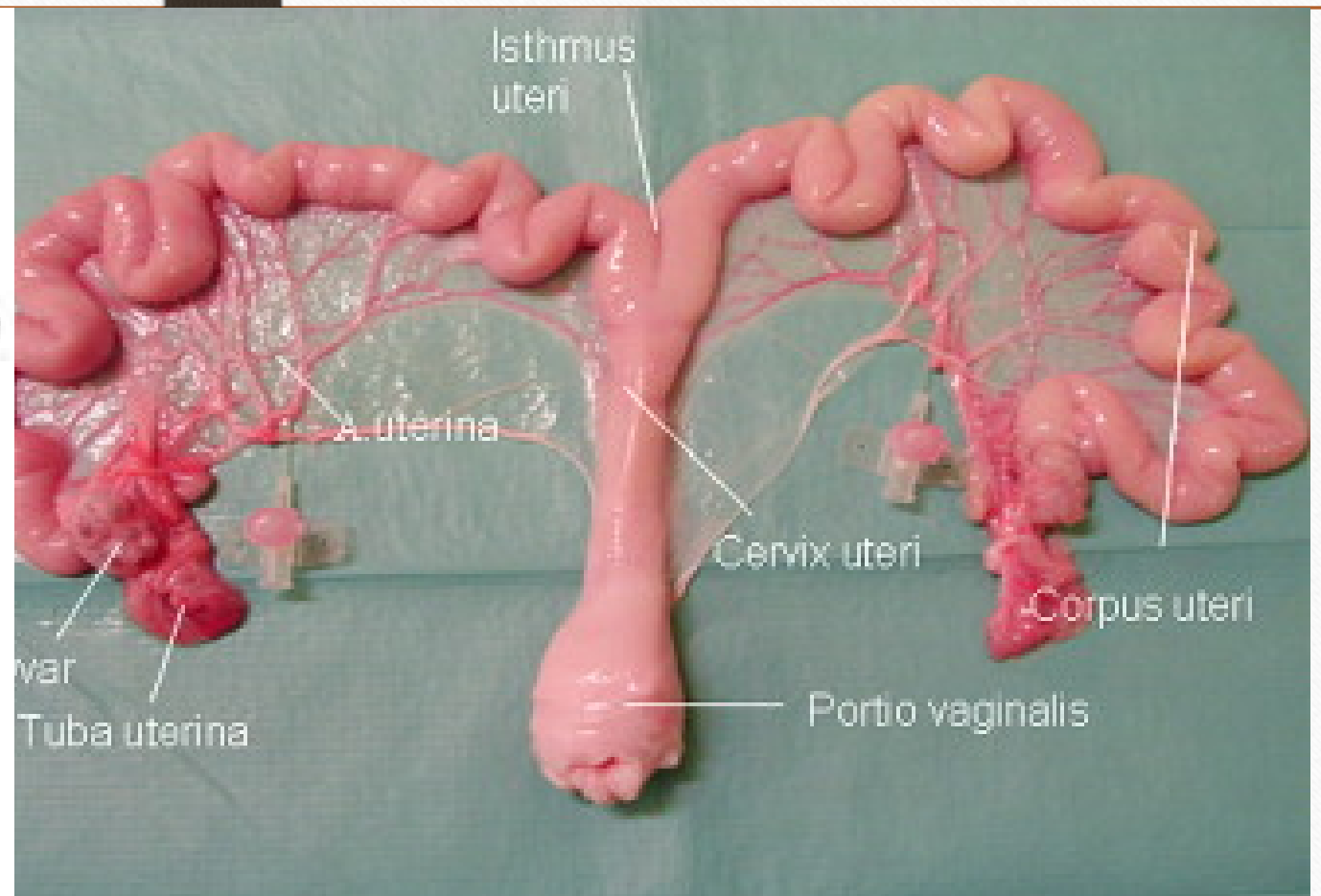
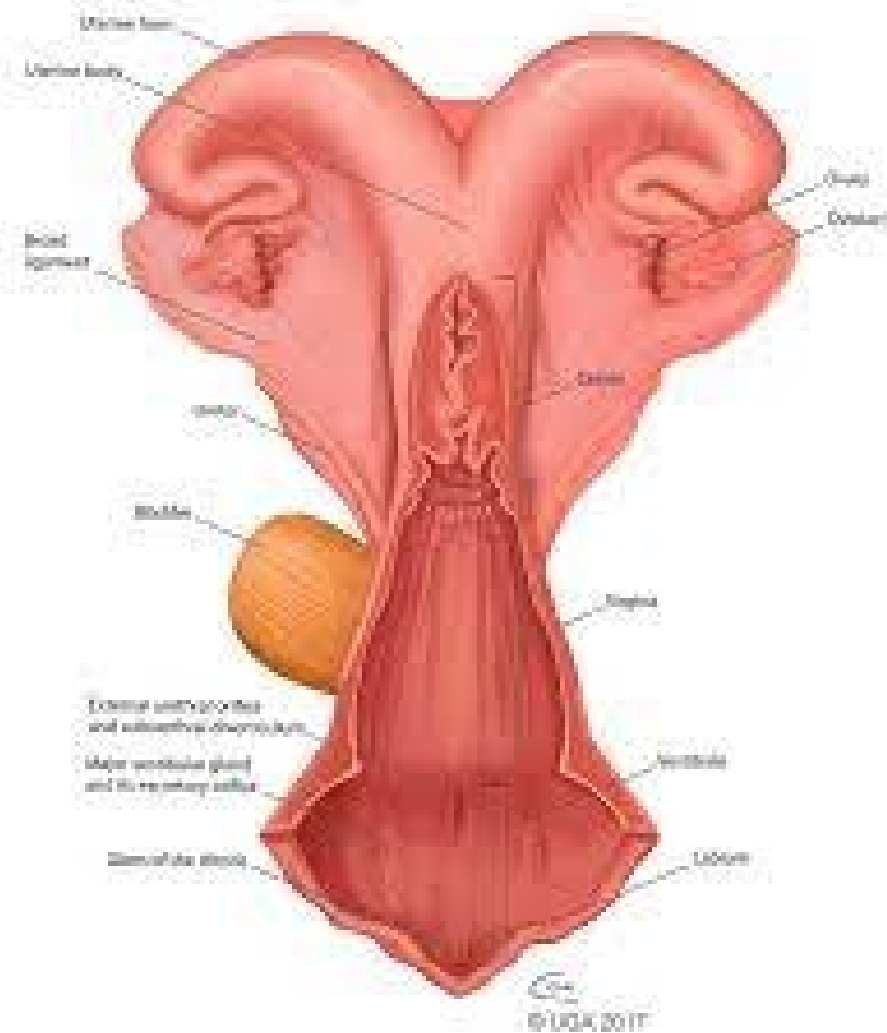


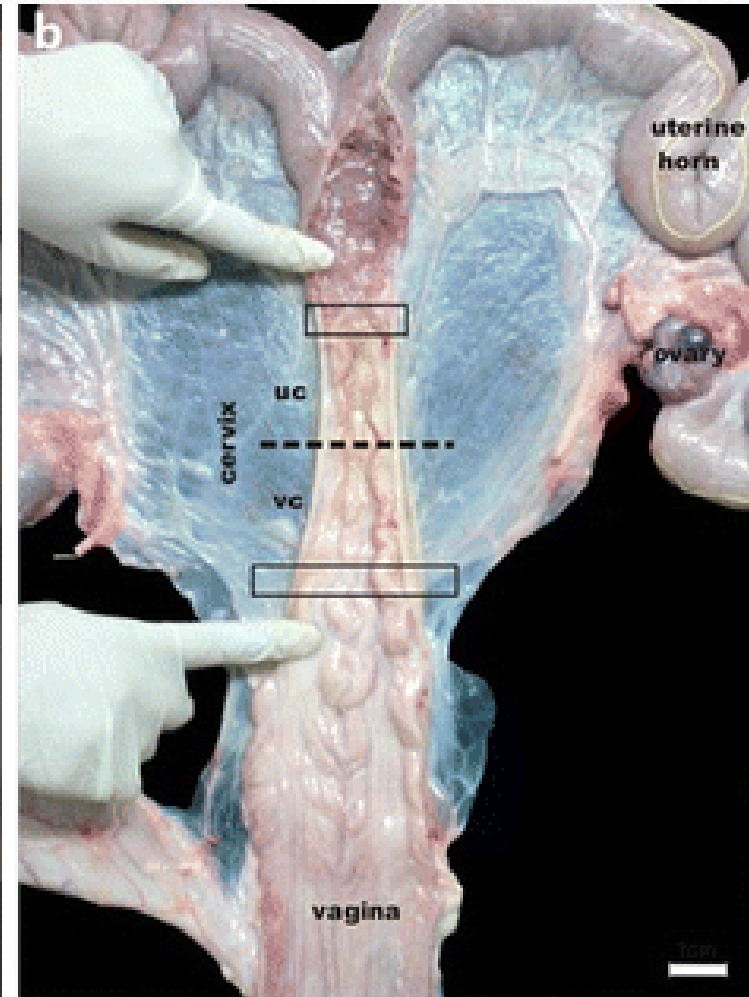
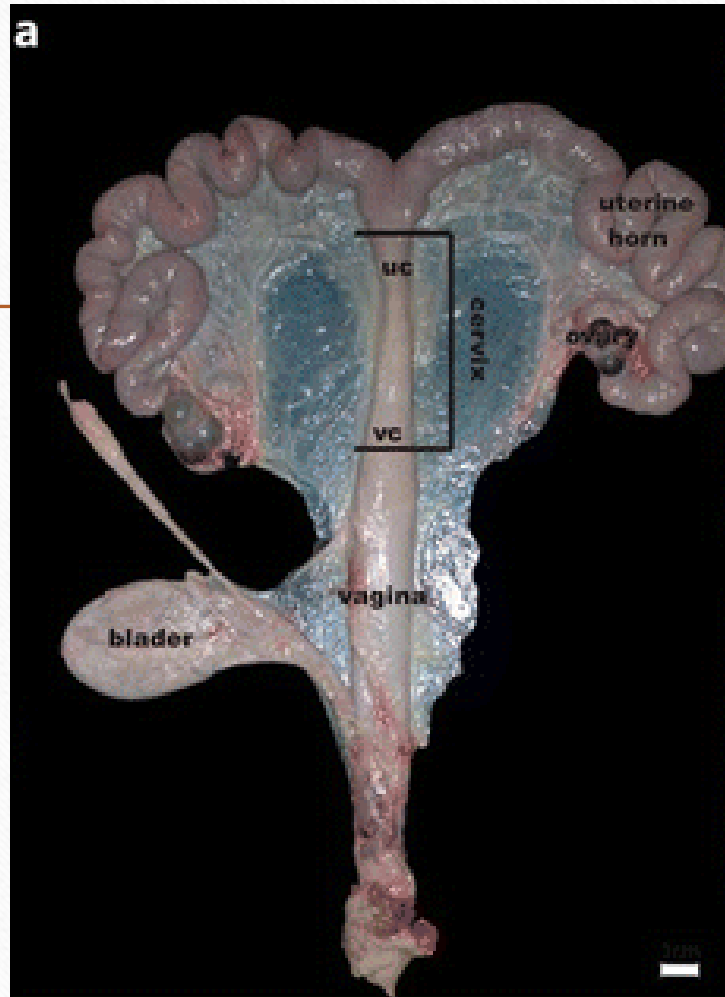
Cornu uteri

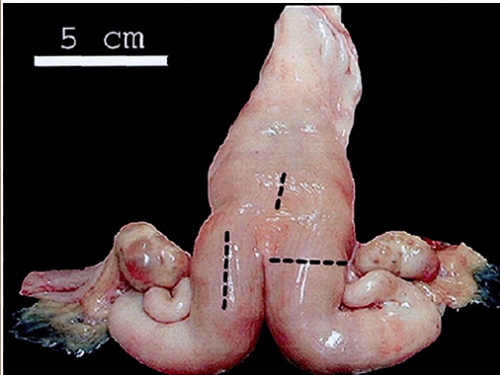
- Kranijalni delovi materice
- Deo materice gde se rogovi sastaju- *Fundus uteri* a kaudalno nastavlja u telo
- Različitog su oblika kod životinja
- Nalaze se u trbušnoj duplji
- *Ligg. Intercornualia (bo)*
- Rogovi materice vise na *Lig. lata uteri*



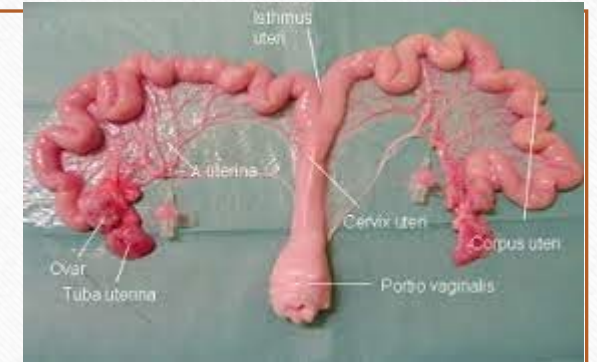
Dorsal view of the different components of the cow reproductive tract







Cornu uteri



- **Kod KRAVA-** slobodni delovi su spiralno uvijeni , pružaju se kranio-ventro-lateralno- **izgled ovnujskih rogova**
- **Kod KRMAČA-**vrlo dugi do 1,2 m, izgled **JEJUNUMA**
- **Kod KOBILA-** okrenuti dorzalno i ventro lateralno povijaju
- **Kod KUJA-** oblika latiničnog slova U

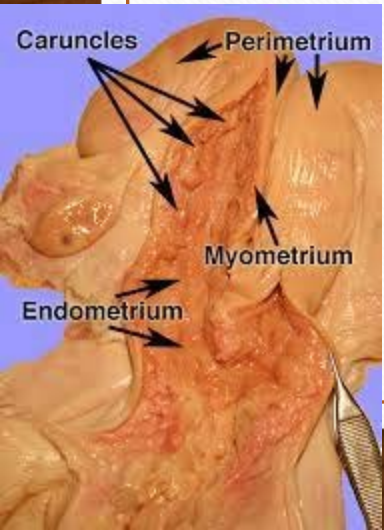




Cornu uteri

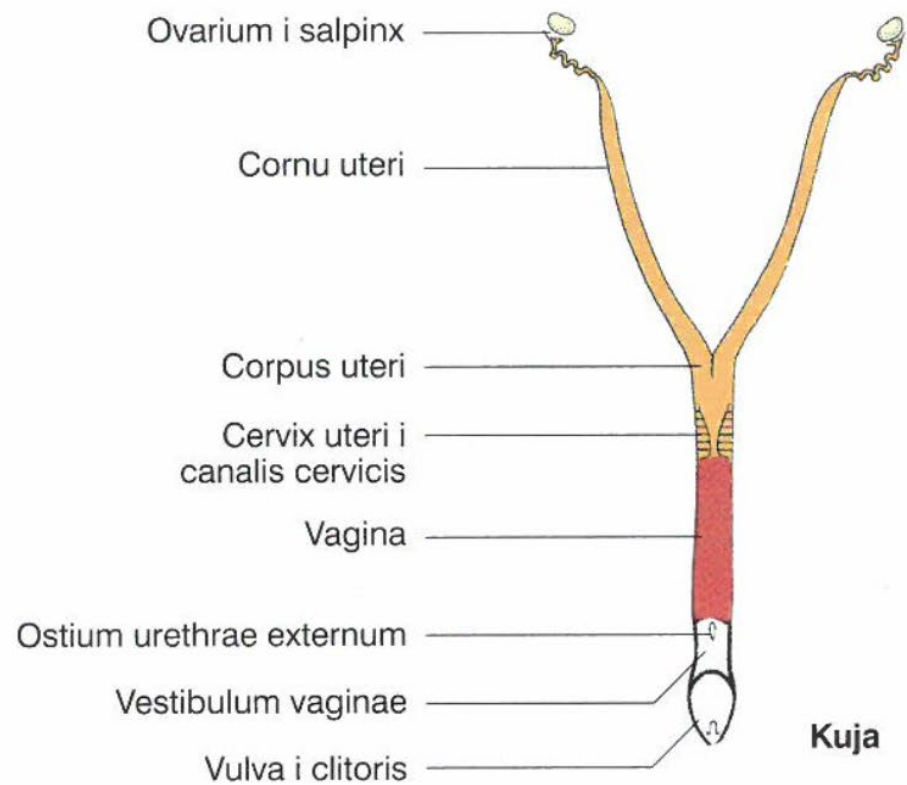


- U rogovim kod **PREŽIVARA** *endometrijum* gradi nabore sluznice u 4 reda 10-14 bradavica – ***CARUNCULE***
- Oni su u kontaktu sa **KOTILEDONIMA** placente
- ***CARUNCULA+KOTILEDON=PLACENTOM***

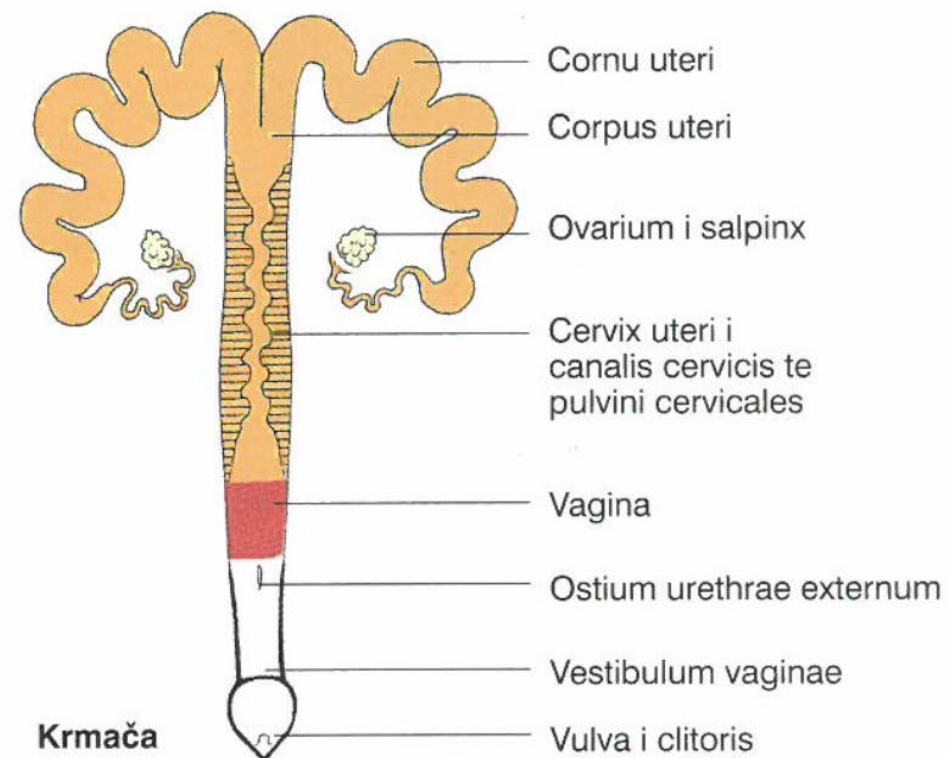


Corpus uteri

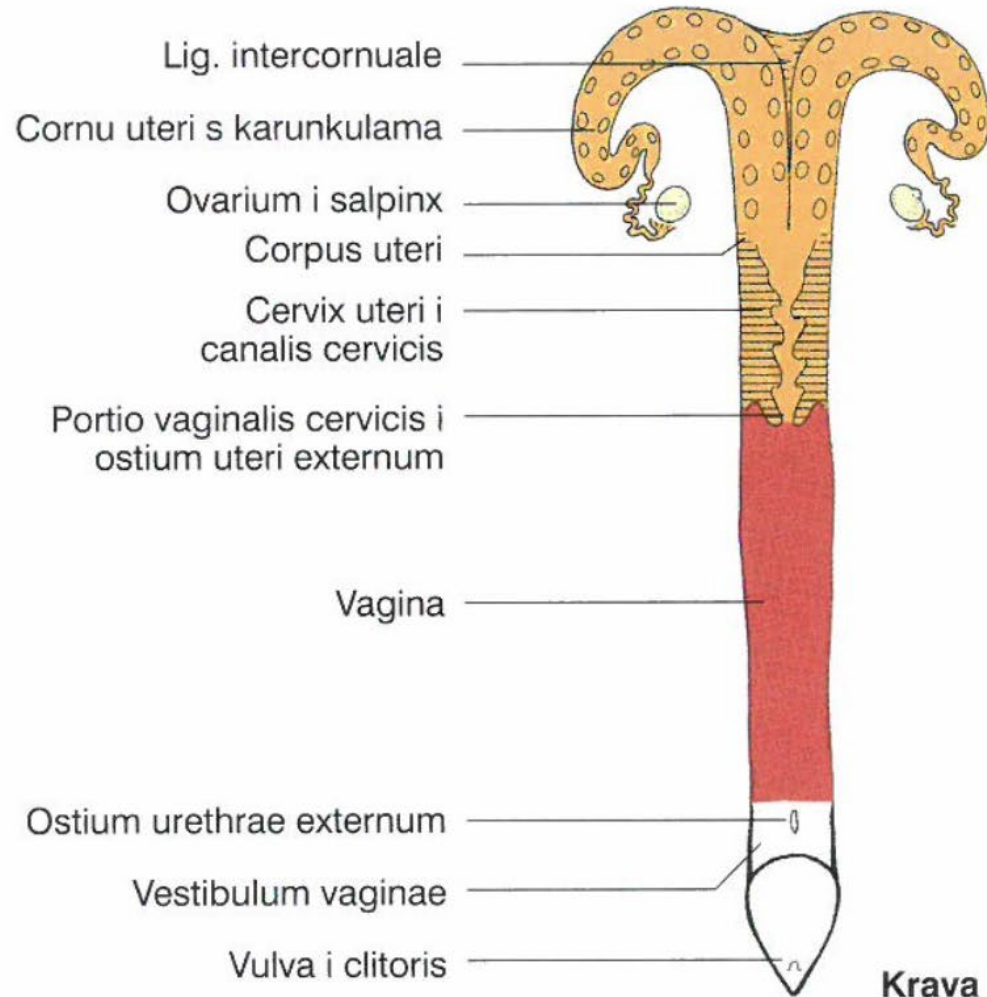
- Vellum uteri- prisutna pregrada kod svih vrsta osim **kobile**
- Na osnovu tela postoje 2 tipa materice:
 1. *Uterus bicornis subseptus: bo, ov, car, cap, su*
 2. *Uterus bicornis nonsubseptus: eq*



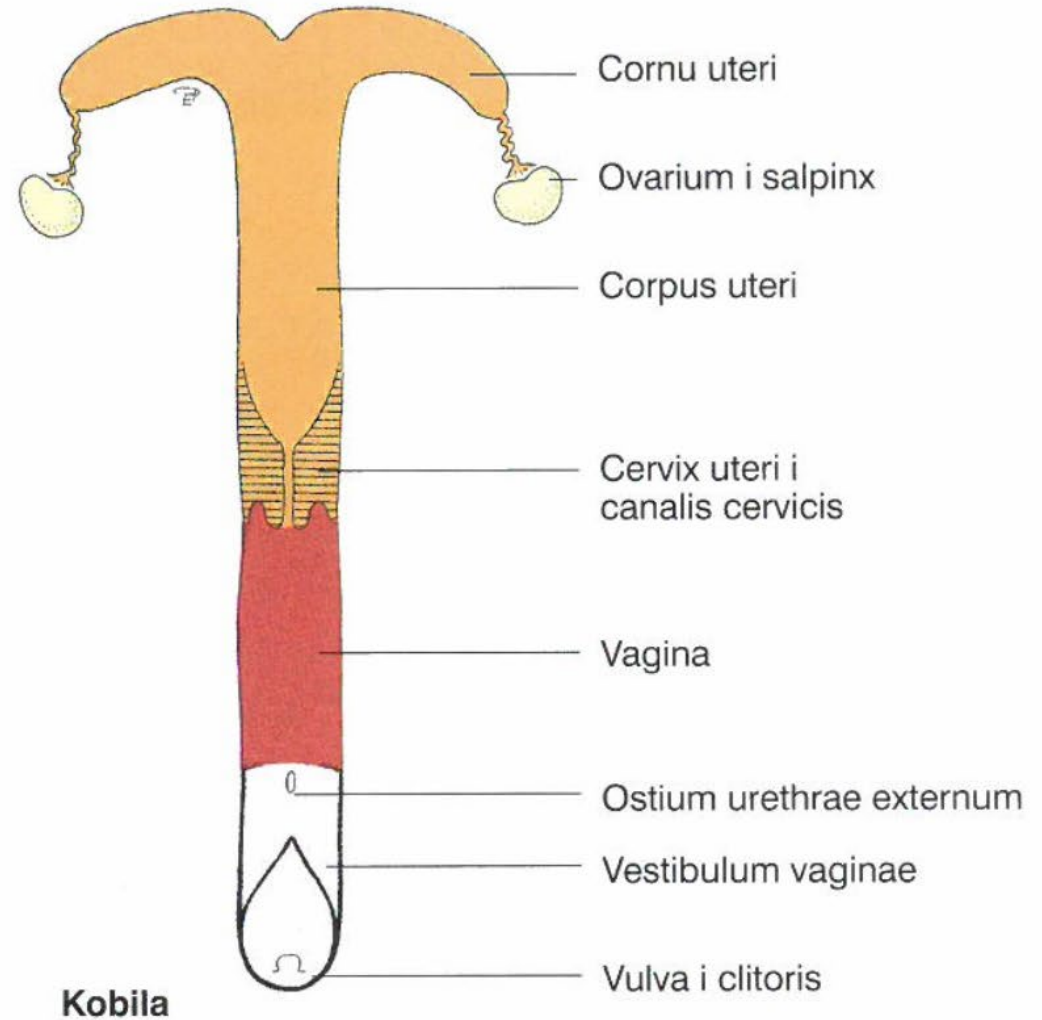
Kuja



Kрмаča



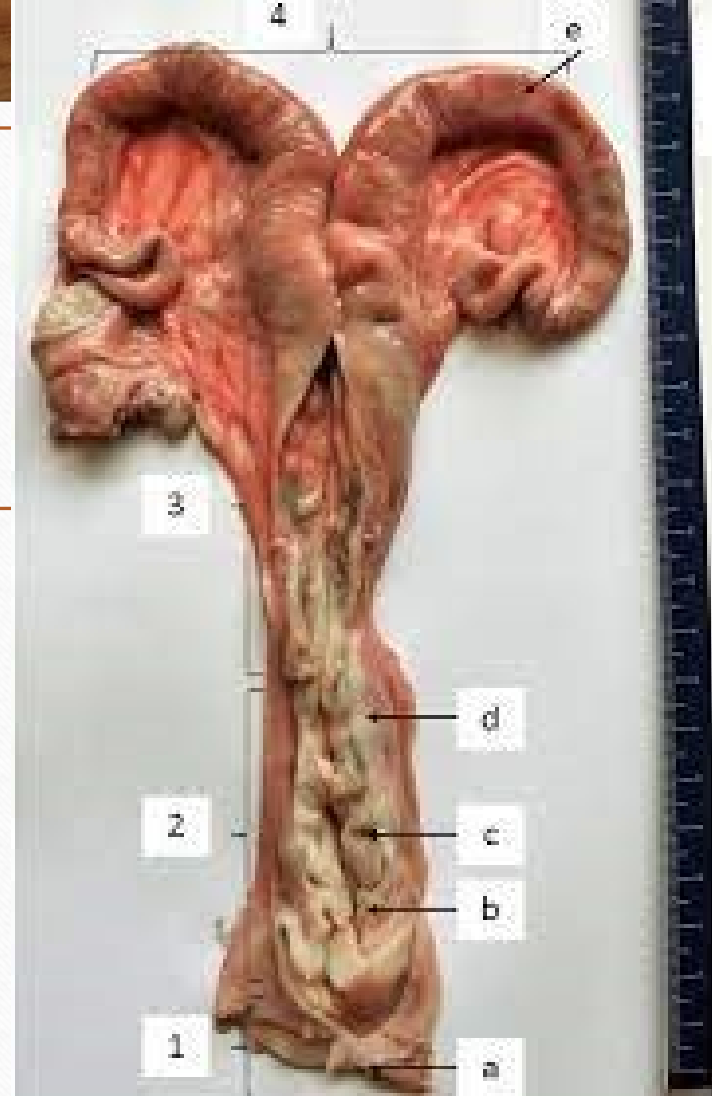
Krava



Kobila

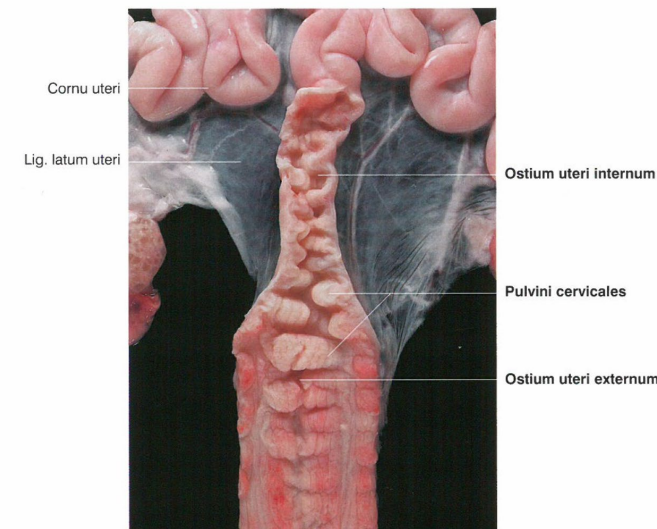
Cervix uteri

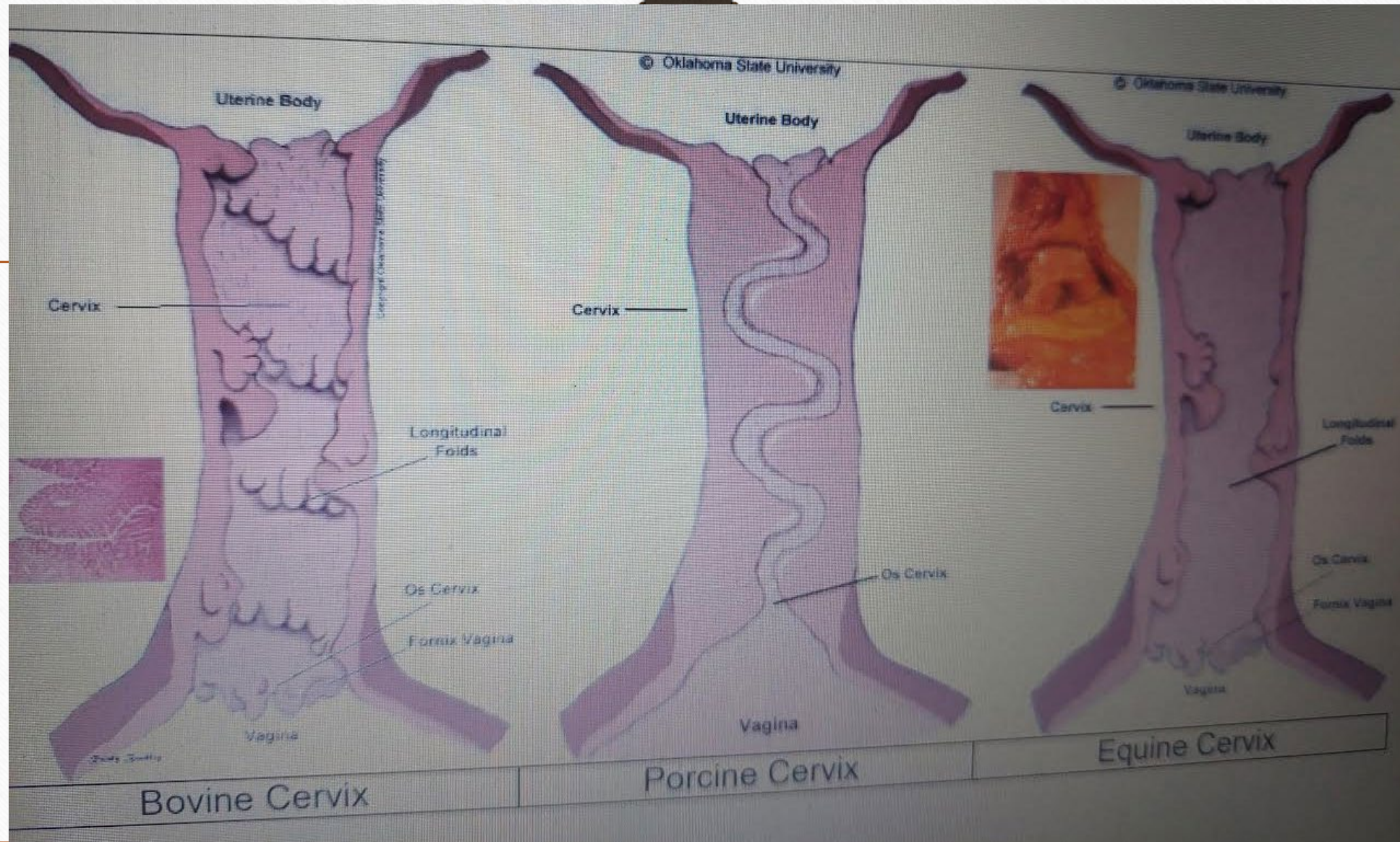
- Najkaudalniji deo materice
- U vratu nalazimo *Canalis cervicis uteri*
- Sa telom komunicira preko *Ostium uteri internum*
- Sa usminom komunicira preko *Ostium uteri externum*
- Otvoren fiziološki za vreme:
 1. Estrusa
 2. Porođaja

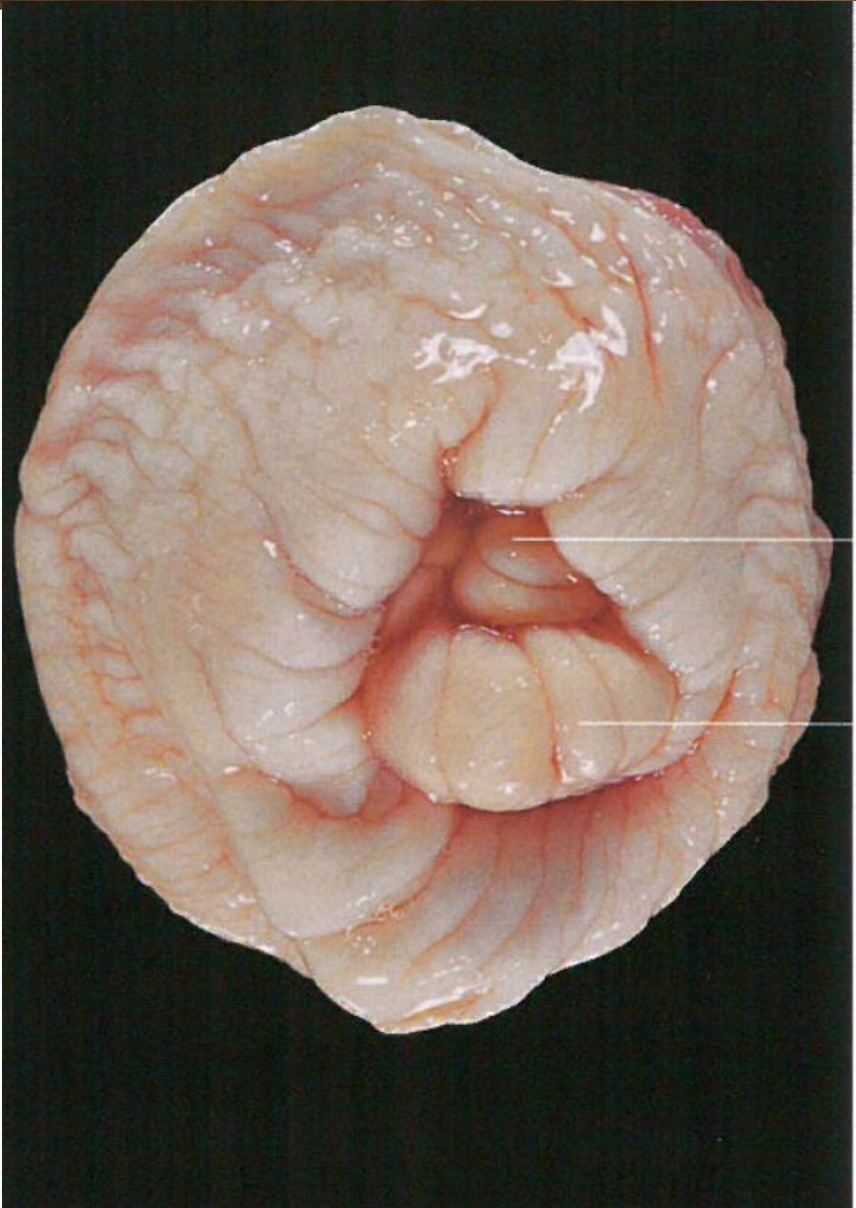


Cervix uteri

- Kaudalni deo vrata materice gradi *Portio vaginalis uteri*
- Postoji kod : **Eq, Ru, Car**
- Ne postoji kod: **Su**
- Kod krmača cirkularni mišićni sloj stvara nabore u vidu jastučića (*Pulvini cervicis*) ima ih 14-20







Ostium uteri externum

Portio vaginalis

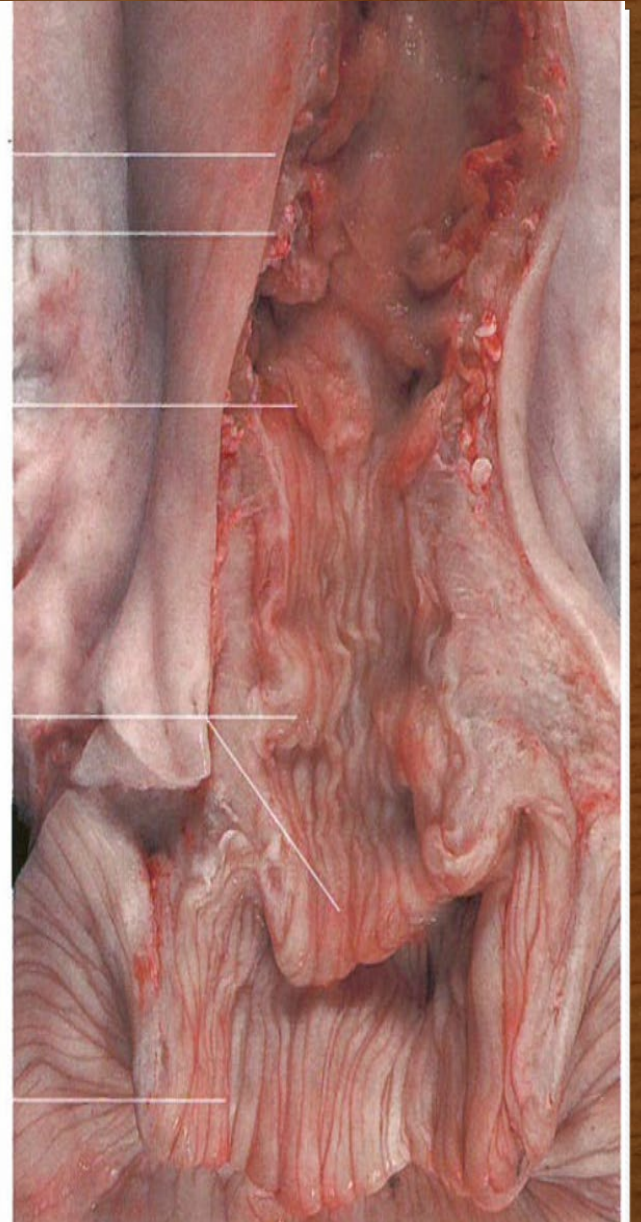
Corpus uteri

Caruncula

Ostium uteri internum

Plicae circulares

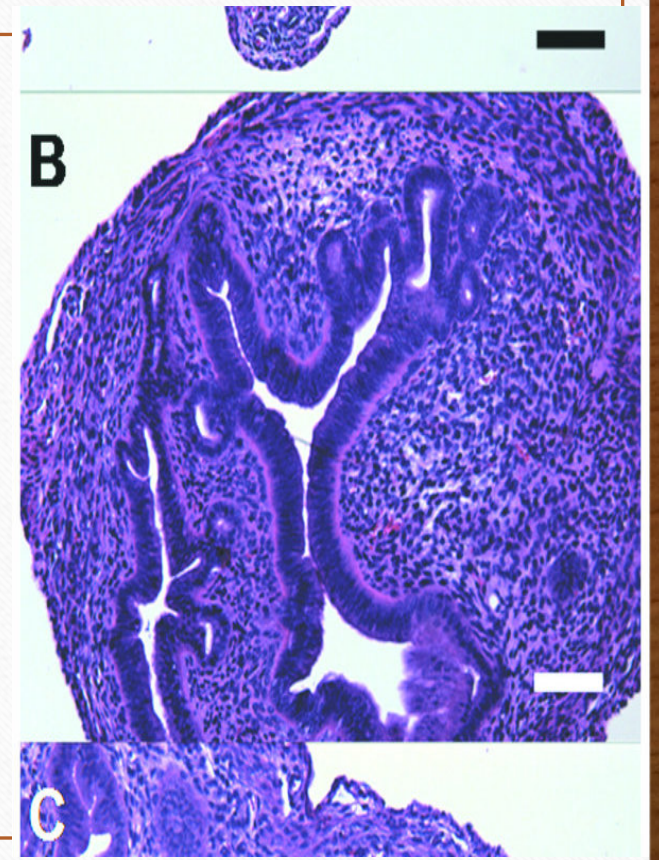
Ostium uteri externum
(Portio vaginalis)

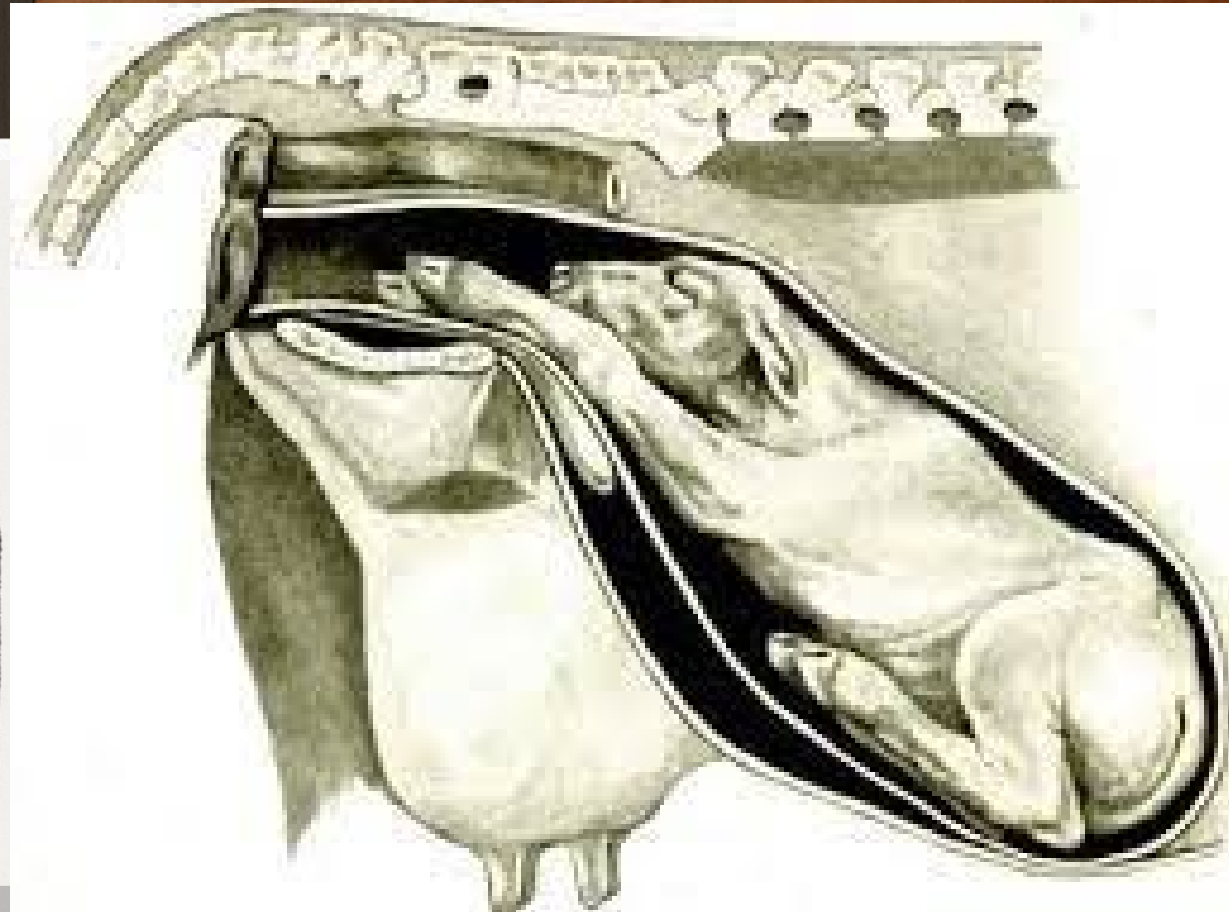
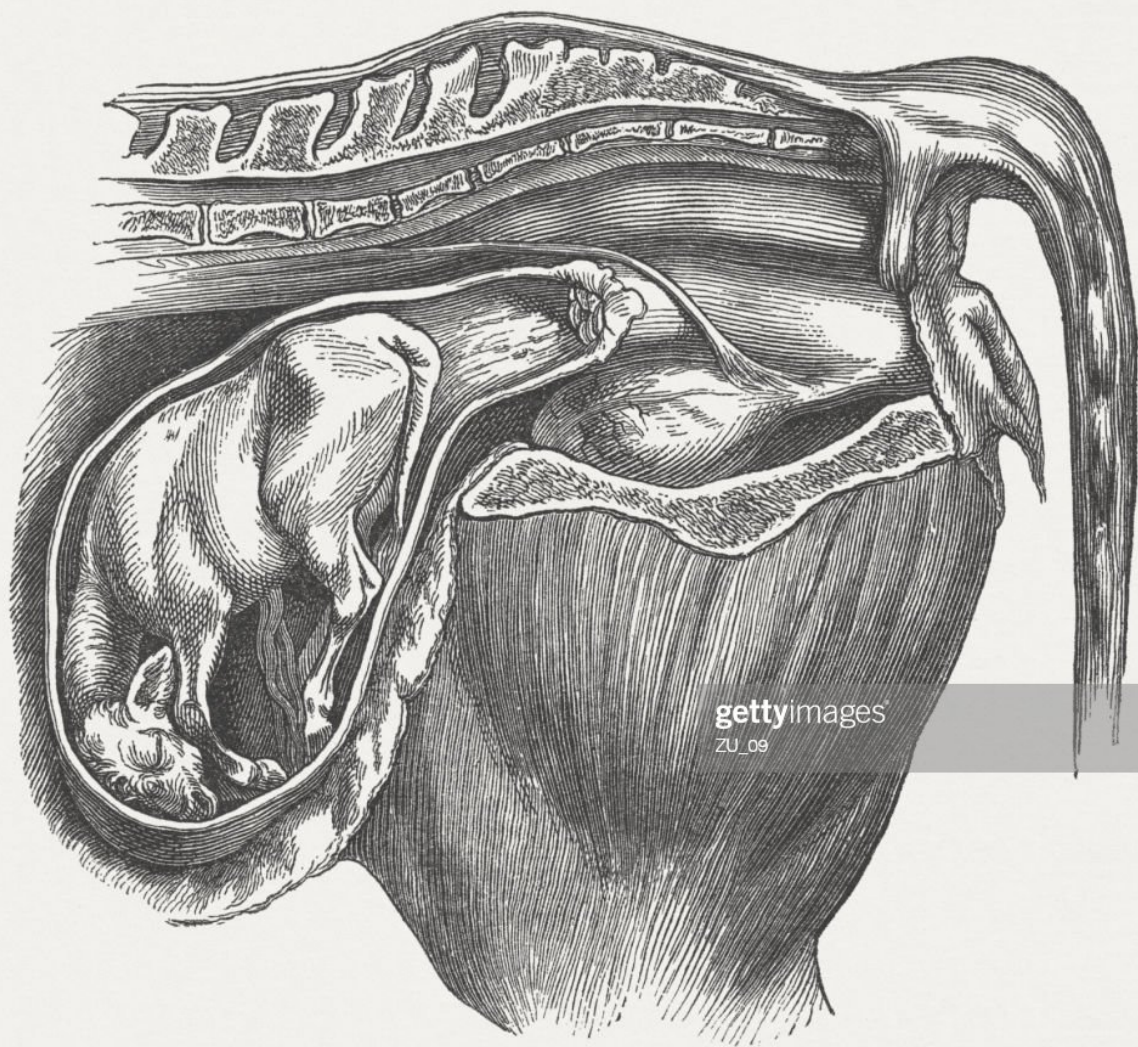


Slojevi materice

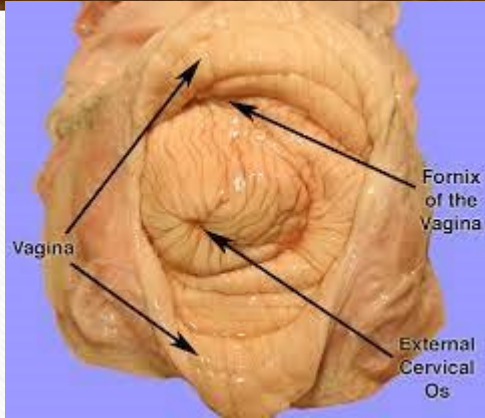
- Sastoji se od 3 sloja:

1. *Endometrium (Gl. uterinae et cervicis, karunkule)*
2. *Myometrium (St. longitudinale et circulare)*
3. *Perimetrium-serosa*



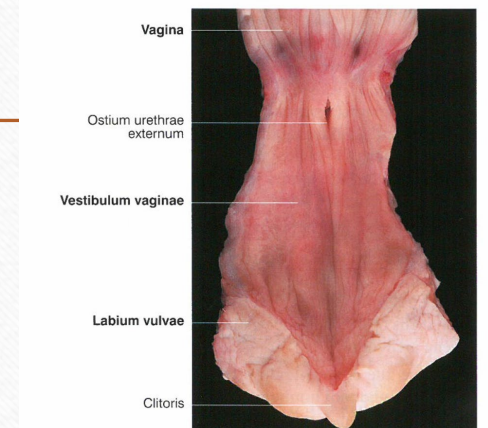






Usmina (*Vagina, Colpos*)

- Sluzokožno mišićna cev
- Spada u **Organa genitalia copulaciones**
- Počinje od vrata materice
- Kranijalni deo vagine opkoljava *Portio vaginalis uteri*, pa se taj deo vagine naziva *Fornix vaginae*
- Kaudalno prelazi u predvorje (*Vestibulum vaginae*)



Usmina (*Vagina, Colpos*)

- Između *Vestibuluma i Vagina propria* nema jasne granice spolja
- Kod juvenilnih životinja granicu čini (*Hymen, Plica vestibulovaginalis*)
- Kod starijih granicu čini ušće Uretre (*Orificium uretrae externum*)
- Kranijalni deo vagine prekriva *peritoneum*

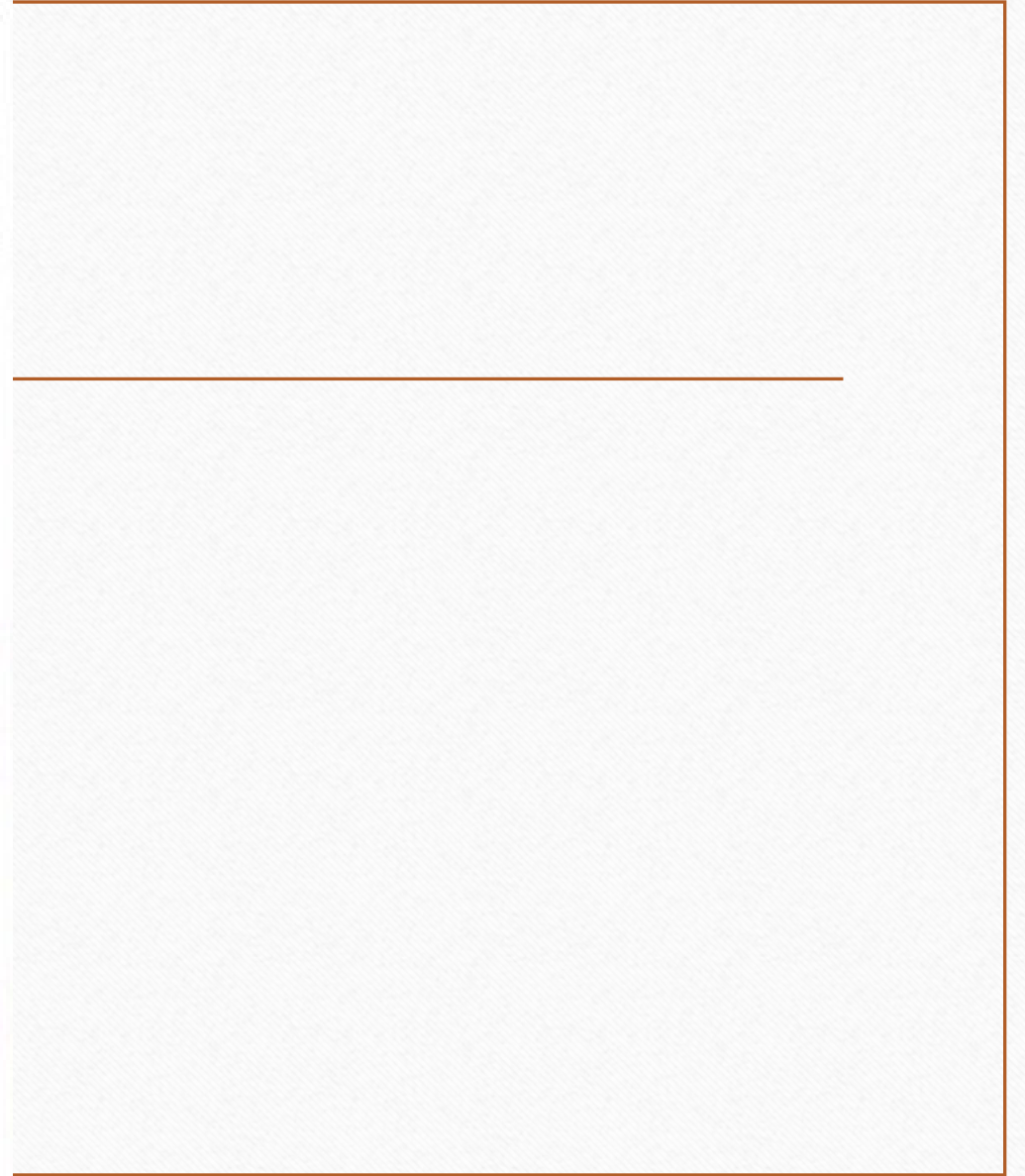
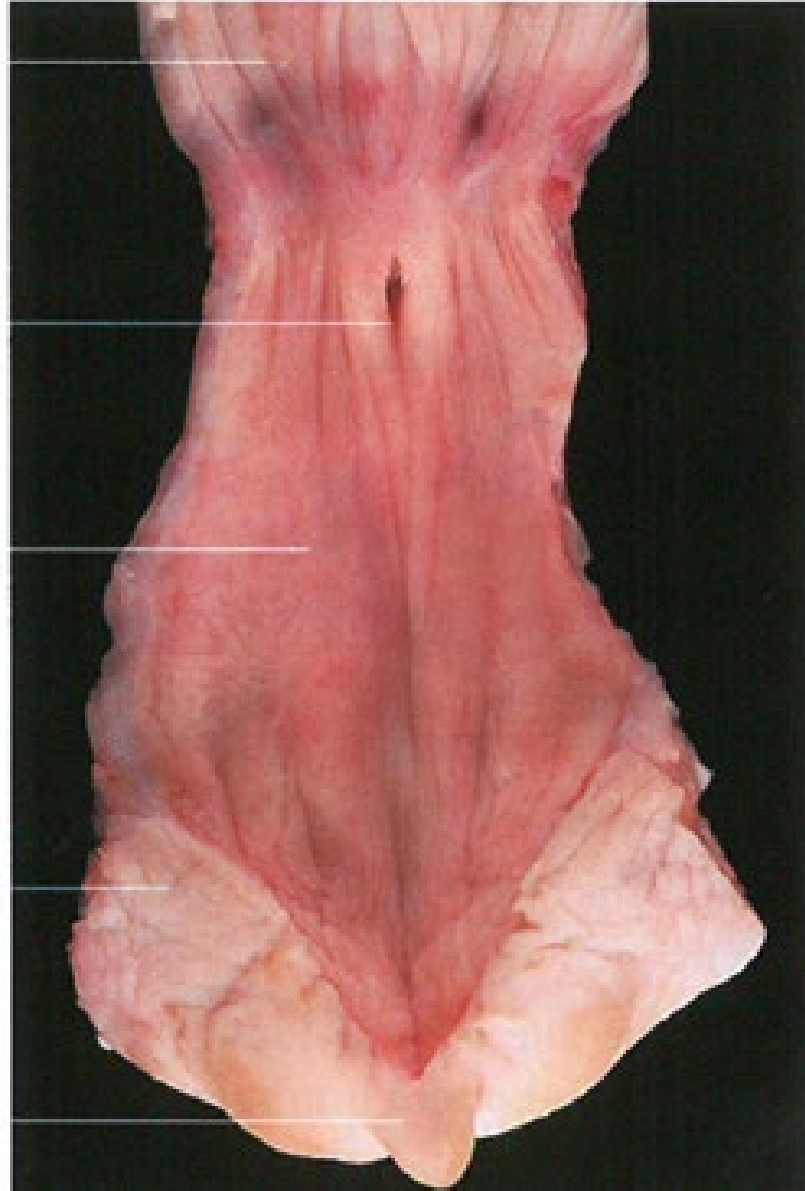
Vagina

**Ostium urethrae
externum**

Vestibulum vaginae

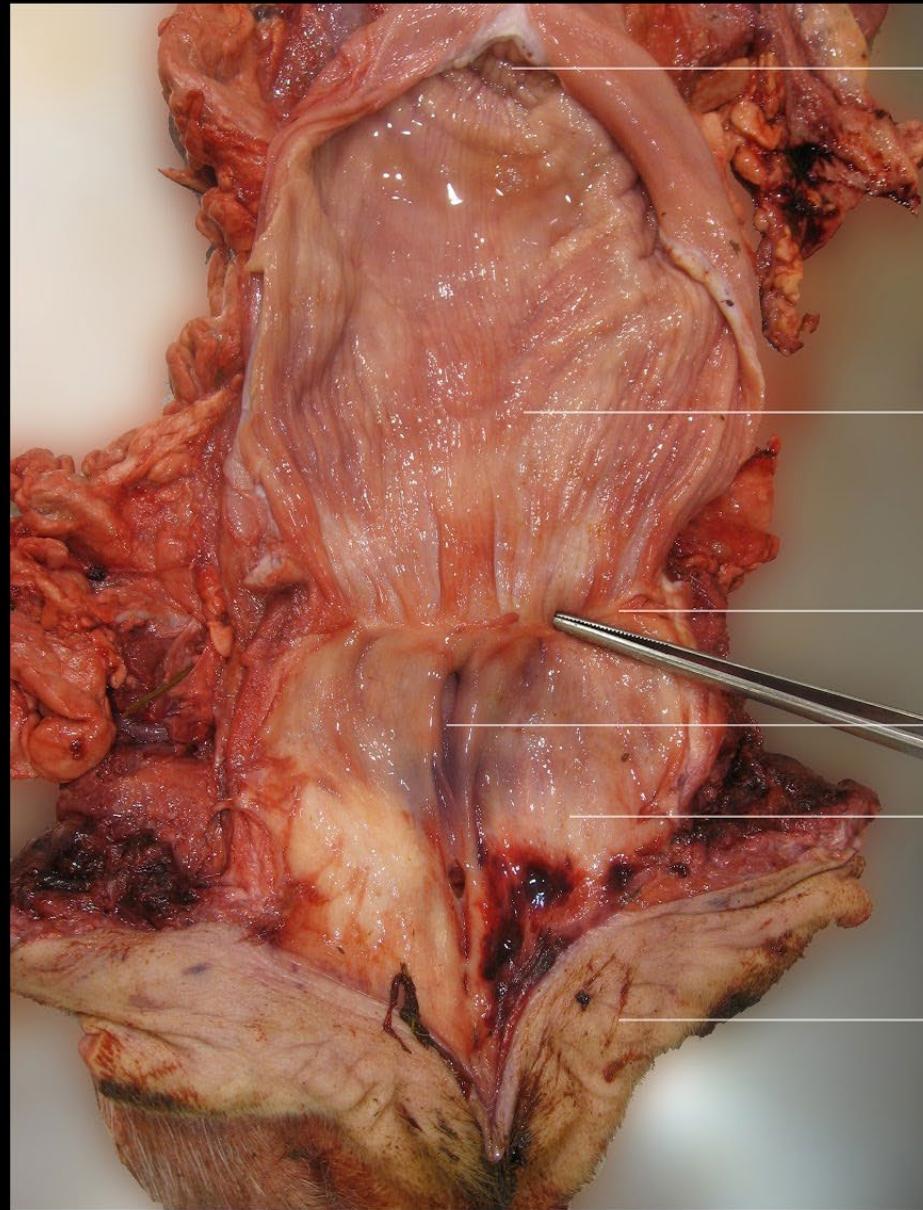
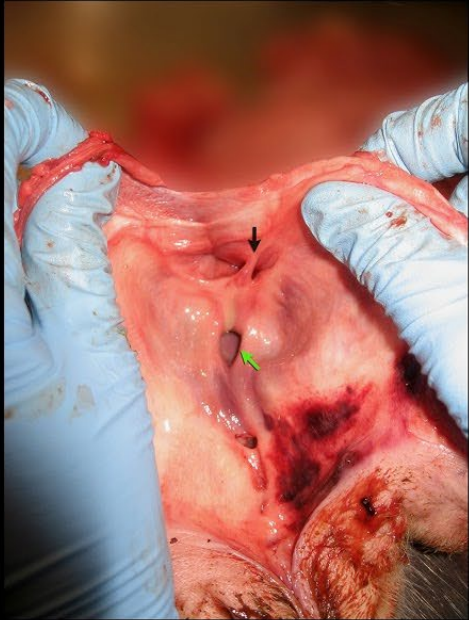
Labium vulvae

Clitoris



Vestibulum vaginae

- Kaudalni produžetak vagine
- Sinonim je *Sinus urogenitalis*
- Kod krava, krmača, ovca, koza –*Diverticulum suburethrale*
- Zid oblikuje kutana sluzokoža, vezivno tkivo i mišićni sloj
- *Gl. Vestibulares* u submukozi- izlivaju se u *Vestibulum* i ima 2 tipa:
 1. *Gl. Vestibulares majores Bartholini*- NASTAJE STAPANJEM MANJIH I IMA 2 IZVODNA KANALA U VENTROLATERALNOM DELU VESTIBULUMA KOD KRAVA
 2. *Gl. Vestibulares minores* (kuja, krmača, kobila)



Cervix

Cranial vagina

Location
of hymen

Urethral orifice

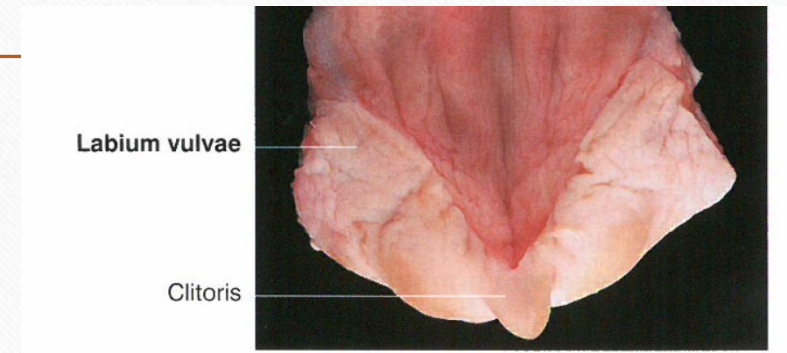
Vestibule
of vagina

Vulva lips



Stidnica (*Vulva seu pudendum femininum*)

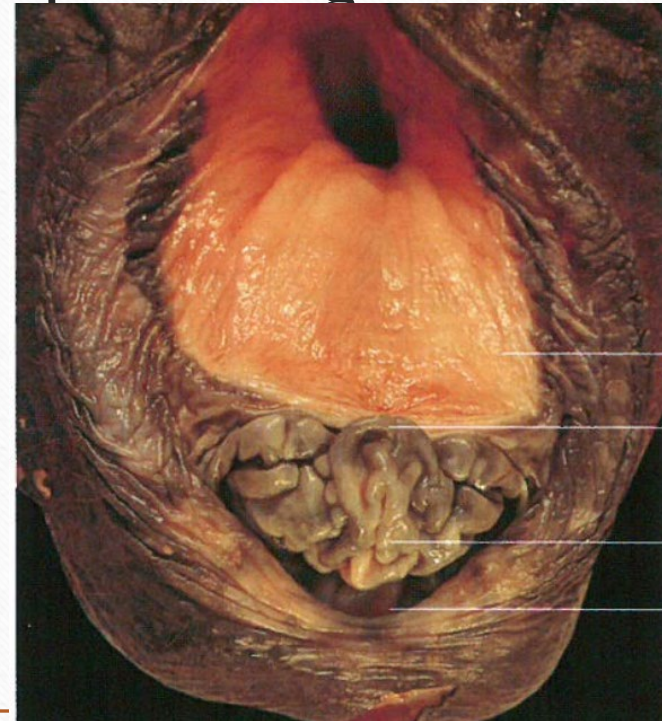
- Spoljni, završni deo polnog aparata
- Čine je:
 1. Dve usne (*Labiae vulvae*)
 2. Dve spojnice (*Comisura labiorum dorsalis et Comisura labiorum ventralis*)
 3. Otvor stidnice (*Rima vulvae*)
- U ventralnoj komisuri leži dražica (*Clitoris*)





Dražica (*Clitoris*)

- Organ homolog muškom kopulatornom polnom organu
- Smešten u *Fossa clitoridis*
- Počinje sa *Arcus ischiadicus*
- Sastoji se od:
 1. *Radix clitoridis*
 2. *Corpus clitoridis*
 3. *Glans clitoridis*



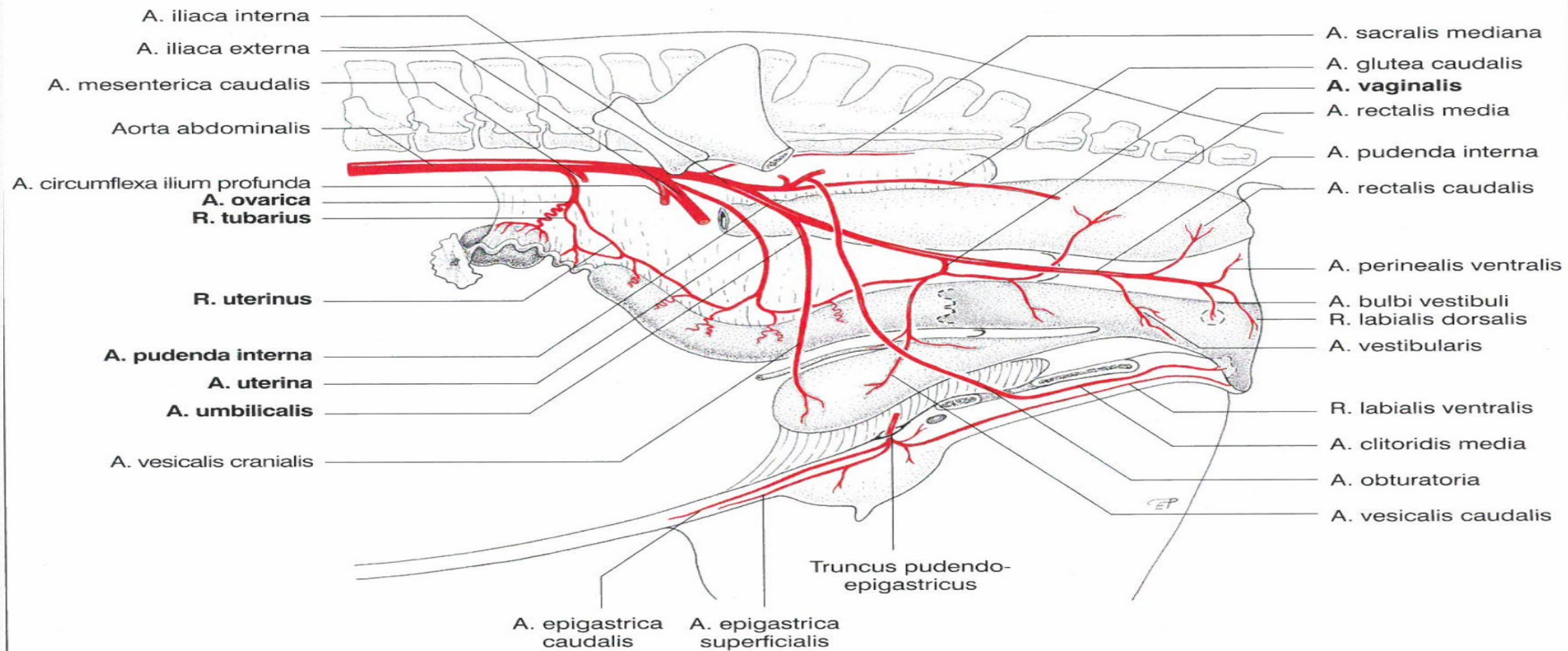
Vestibulum vaginae

Ulaz u medijano
izbočenje sinusa
clitoridis

Clitoris

Fossa clitoridis

Vaskularizacija ženskih polnih organa



Inervacija ženskih polnih organa

- 1. Simpatička vlakna
- 2. Parasimpatikus



