قسم الإنتاج الحيواني

Department of Animal Production

# Reproduction in Male Birds (1)

By

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Poultry Physiology (627 AAP)

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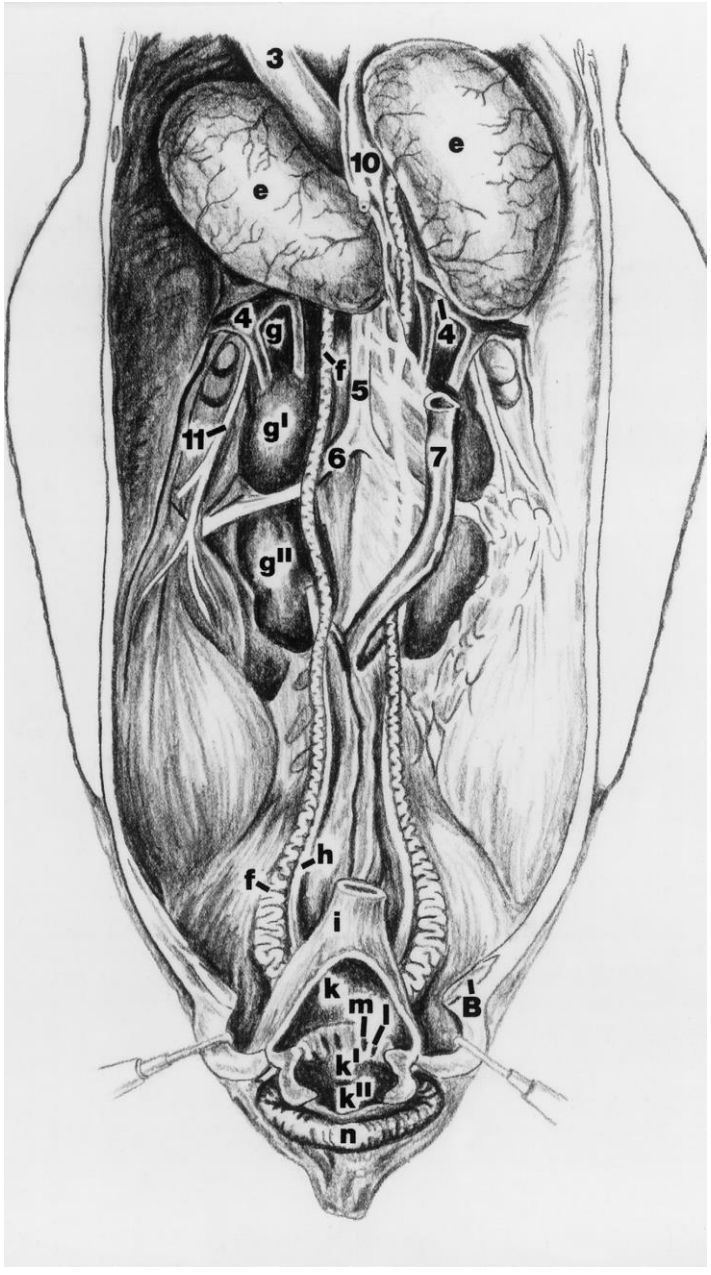
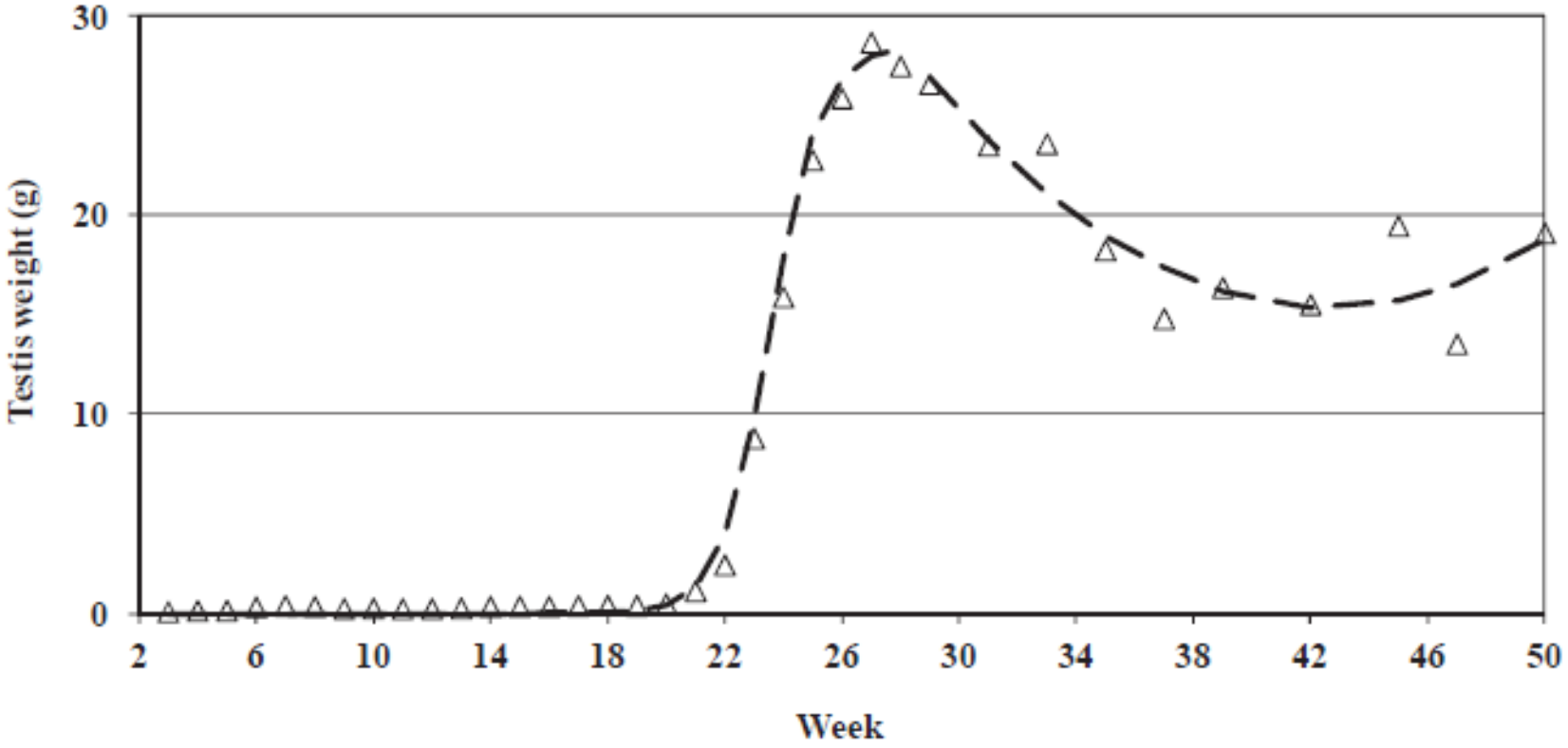
# Anatomy of reproductive tract



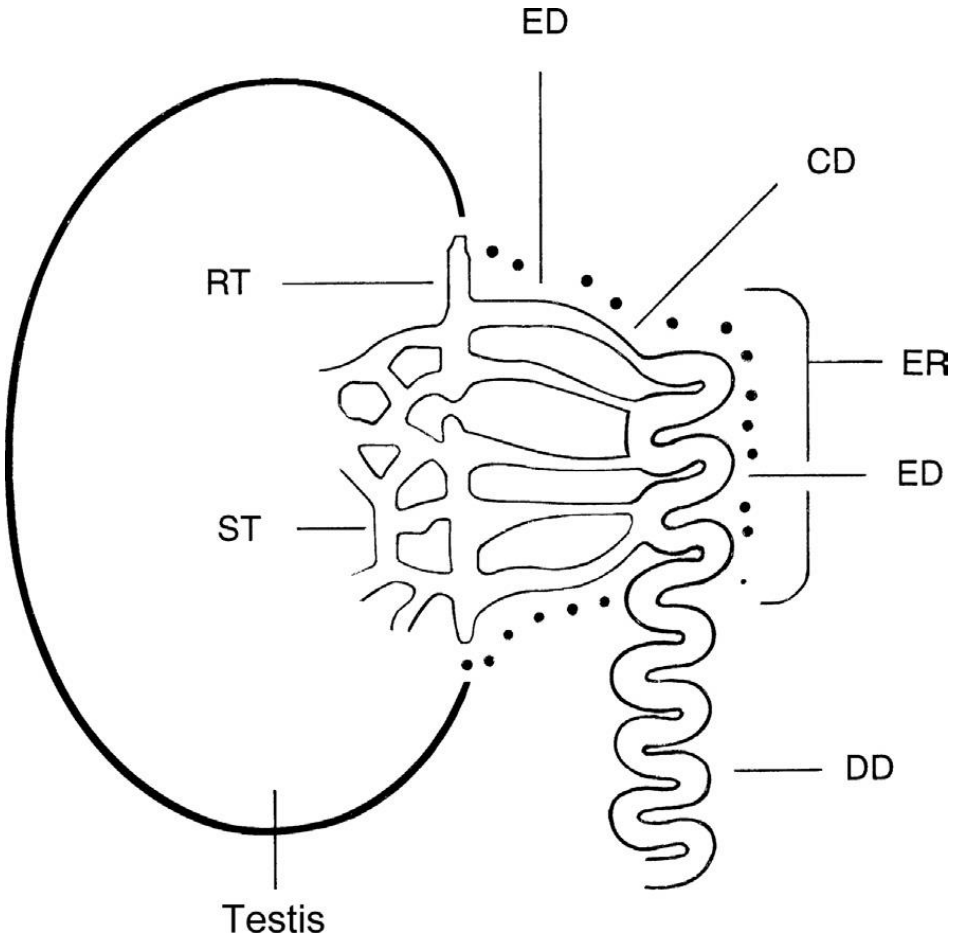

- e, testis;
- f, ductus deferens;
- g, g′, g″, lobes of the kidney;
- h, ureter;
- I, colon;
- k, coprodeum;
- k′, urodeum,
- k″, proctodeum;
- l, opening of left ductus deferens;
- m, opening of left ureter;
- n, anus.

# Testes weight in male broiler breeders



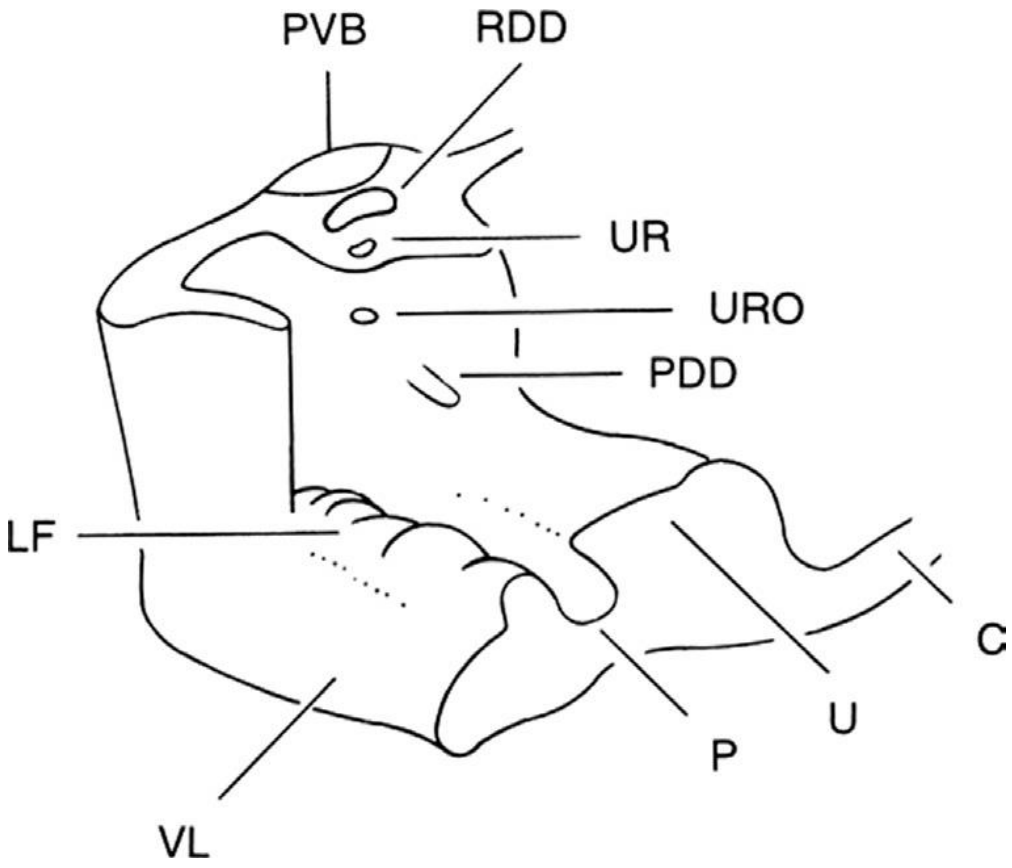

- Least squares regression (lines) and means (symbols) for testis weight in male broiler breeders

# Schematic of the excurrent ducts of the testis



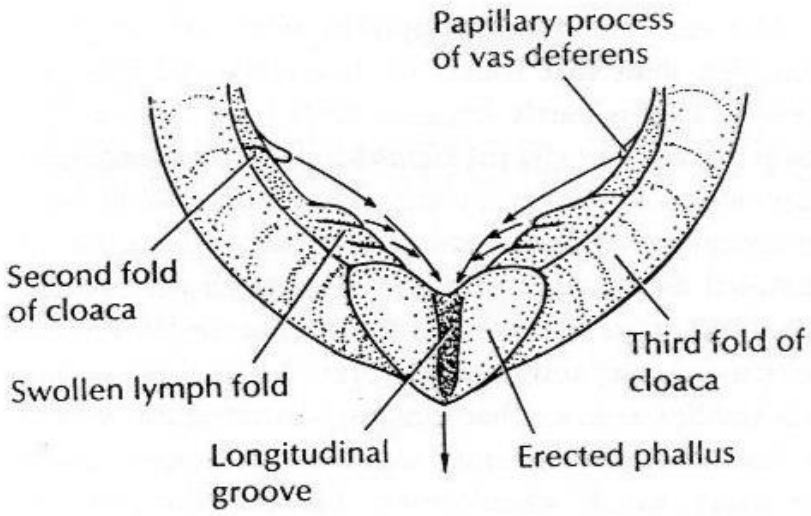

- **ST, seminiferous tubules; RT, rete testis; ED, efferent duct; CD, connecting duct; ER, epididymal region; ED, epididymal duct; DD, deferent duct.**

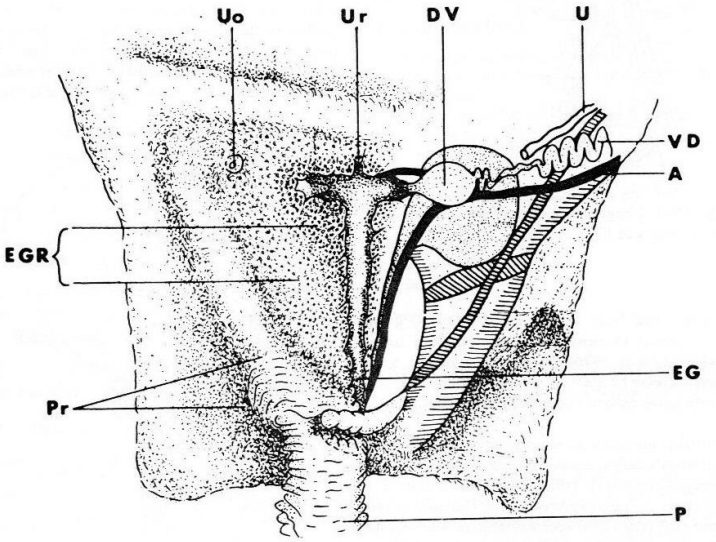
# Schematic of the lower left quadrant of the cloaca




- **PVB, paracloacal vascular body; RDD, receptacle of the deferent duct; C, ventral wall of coprodeum; U, ventral wall of urodeum; P, ventral wall of proctodeum; VL, ventral lip of vent; LF, lymphatic folds.**

# Schematic of the lower left quadrant of the cloaca

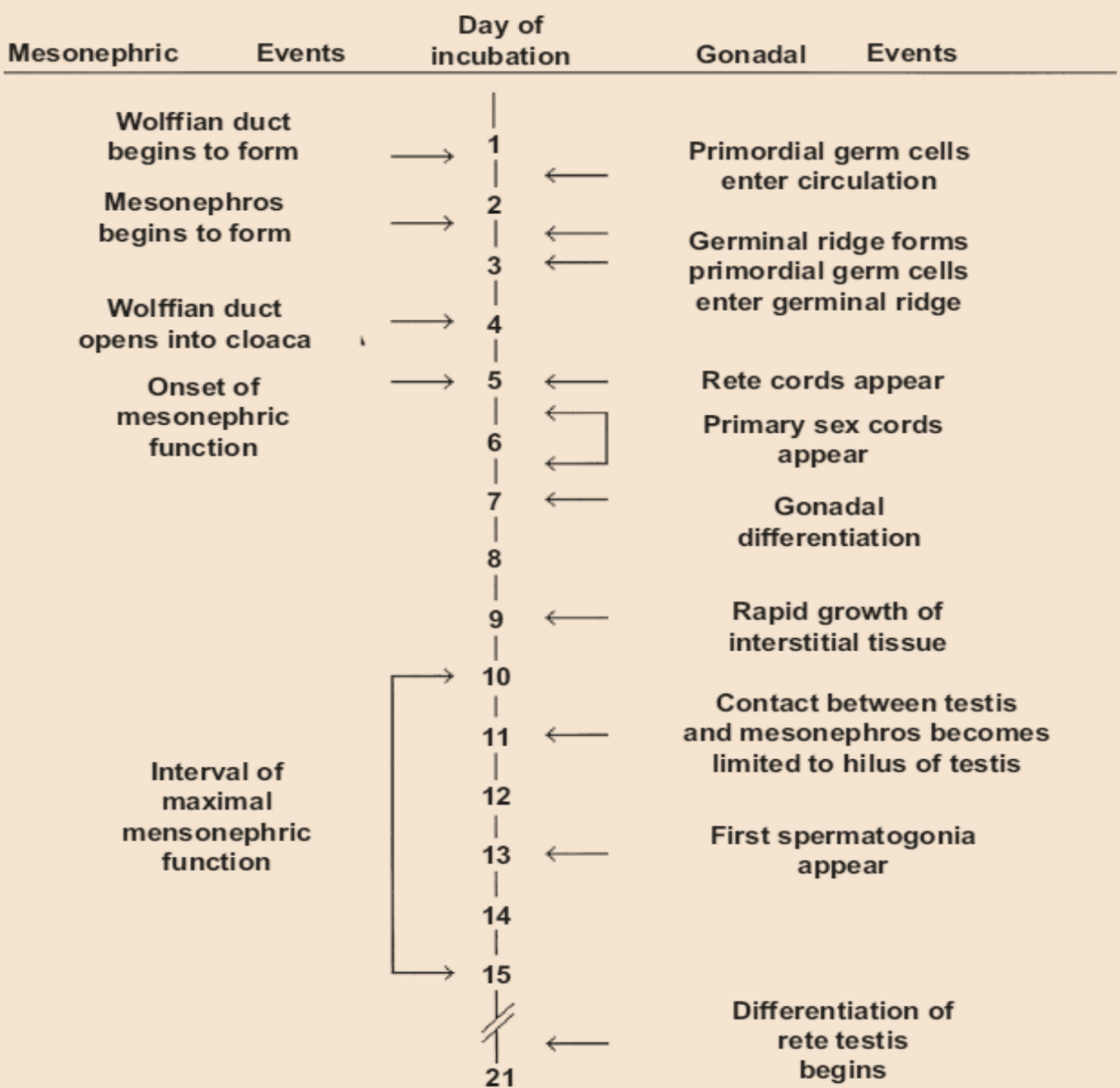



- **Non-intromittent phallus**
- **tumescent lymphatic tissue**
- **Cloacal kiss (sulcus spermaticus)**
- **In chickens**

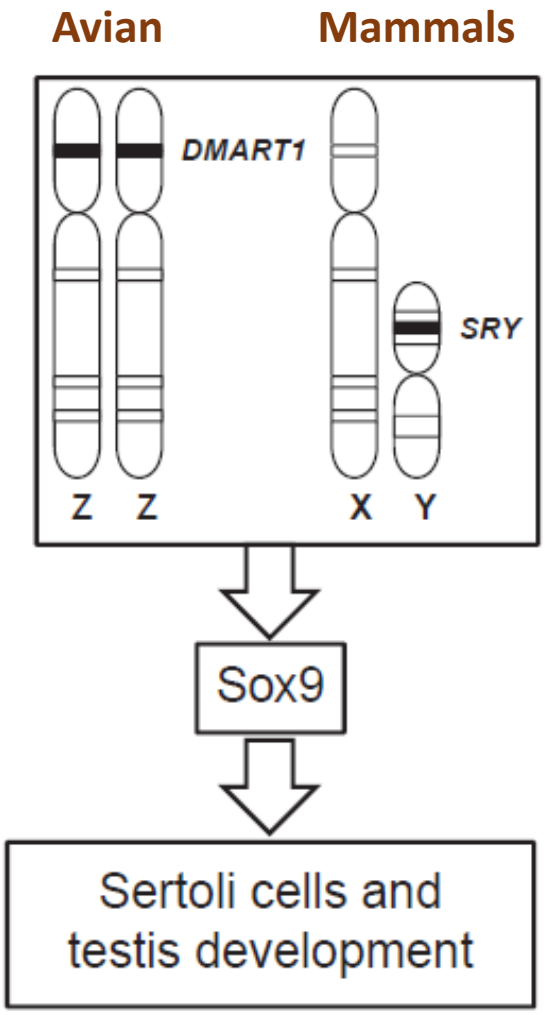
- **Intromittent phallus**
- **Only in 3% of birds**
- **Hormonal control**
- **In ratites and waterfowls**

## Chronology of developmental events associated with the formation of the male reproductive tract in *Gallus domesticus*



# Mechanism for sex differentiation

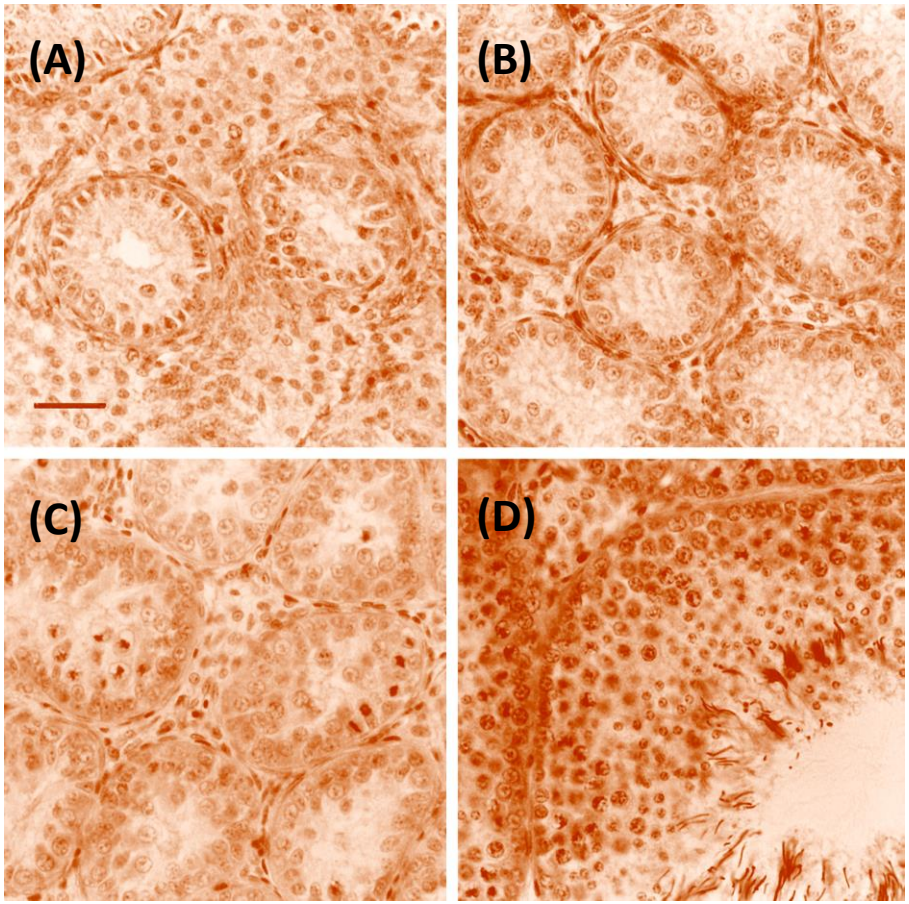
- Doublesex and Mab-3 Related Transcription factor 1 gene (DMRT1)
- linked Z chromosome in birds (dosage theory).




- Sex-determining Region Y gene (SRY)
- linked Y chromosome in mammals.

- SRY-Box Transcription Factor 9 gene (Sox9) facilitates Sertoli cell differentiation that, in turn, promotes testis development.

# Testis development




- (A) Cross-section of a testis from a 14 day old male.
- (B) Cross-section of a testis from a 56 day old cockerel.
- (C) Cross-section of a testis from a 140 day old cockerel.
- (D) Cross-section of a testis from an adult male.

# Hormonal control of testicular function

- **Photoreceptors (CNS)**
- **Medial basal hypothalamus (MBH) – GnRH**
- **Pituitary glands (adenohypophysis) – Gonadotropins (FSH – LH) + TSH**
- **TSH – Thyroid gland – T4 – T3 – deiodinase genes (dio2 + dio3) – hypothalamus-pituitary-gonadal axis**
- **FSH – Sertoli cells – spermatogenesis**
- **LH – Leydig cells – Androgens (testosterone) – spermatogenesis, maintain excurrent ducts & sexual behavior**
- **Excess testosterone – hypothalamus – GnIH x GnRH**
- **Dark (short days) – Pineal gland – Melatonin – GnIH x GnRH**


ANY QUESTIONS?