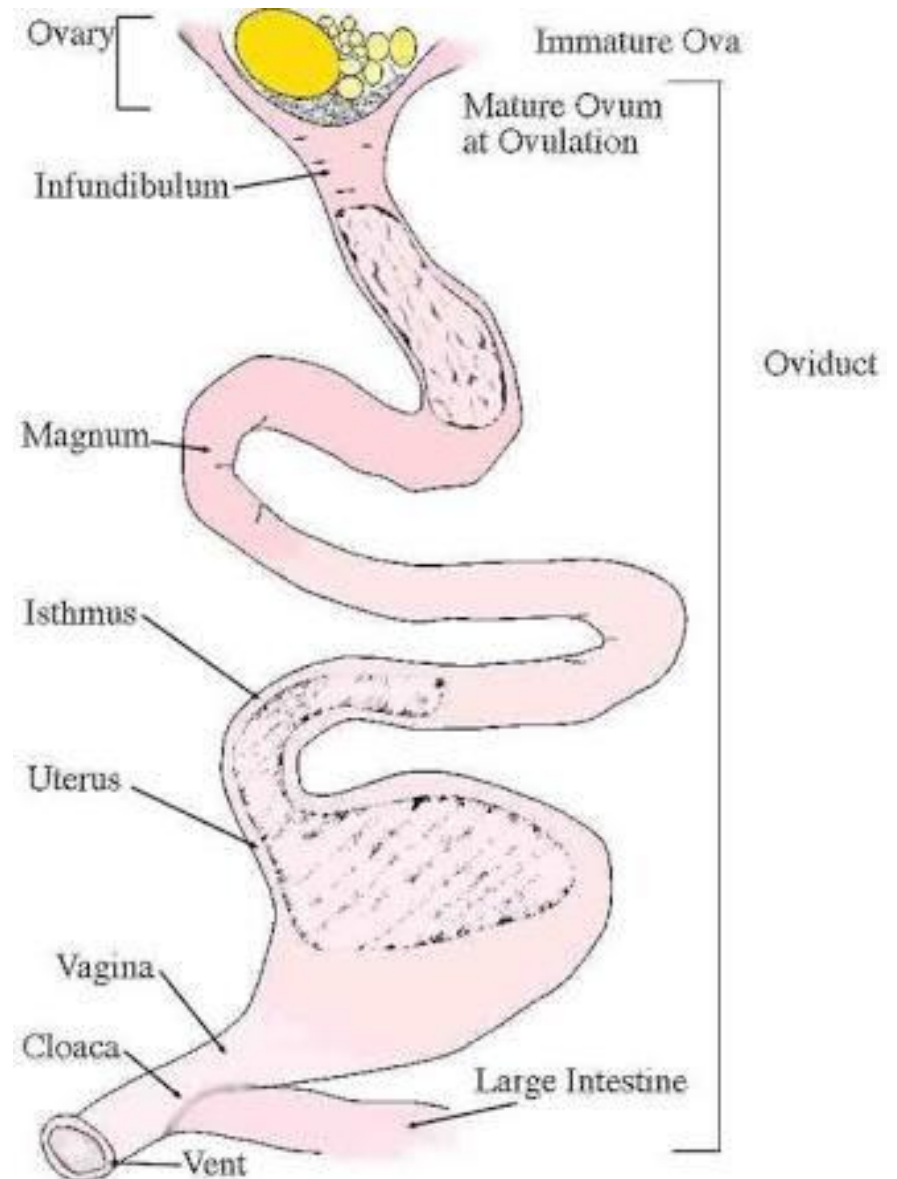


Female Reproductive System

- Consists of left ovary & left oviduct.
- Although the right ovary and oviduct are formed during embryonic life, they regress before hatching except in some species (raptors)



I- Ovary

- **The left ovary is situated on the left side of the body**
- **At the cephalic end of the kidney**
- **Attached to the body wall by mesovarian ligament**
- **It consists of:**
 - 1. An outer cortex: made of follicles containing ova**
 - 2. An inner medulla: made of blood vessels & nerve fibers**

Ovarian Follicles

- **The individual follicles vary in size according to the species & size of laid egg.**
- **Structure:**
 - **Oocyte**
 - **Vitelline membrane**
 - **Zona radiata**
 - **Previtelline layer**
 - **A single layer of granulosa cells**
 - **Basal lamina**
 - **Theca interna**
 - **Theca externa**
 - **Loose connective tissue**
 - **Smooth muscles near the stalk**
 - **No antrum**

Types of ovarian follicles

1. Large yolky follicles (preovulatory follicles):

- Yellow in color,**
- Arranged in hierarchy**
- Identified as F1,F2,F3, F4, F5 & F6**

2. Small follicles:

- a) Small yellow follicles**
- b) Large white follicles**
- c) Small white follicles**

3. Postovulatory follicles:

- Sac like structure containing all the cell layers present in the preovulatory follicles**
- Identified for 48 hrs after ovulation then regress**



Follicular hierarchy

- “ Gradation in maturation of developing ovarian follicles”
- The preovulatory follicles are arranged in a distinct hierarchy
- These follicles are attached to the ovary by follicular stalks
- The ovary looks like a bunch of grapes
- During the ovulatory cycles, the largest follicle will be ovulate, followed on successive days by the second, third, and fourth follicles, etc..
- Control:
 - a. FSH & LH
 - b. Proximity of the follicle to blood vessels → hormones, nutrients and lipovitelline may be the cause of growth of these follicles

Stigma



Ovulation

- “Release of ovum from the ovarian follicle”
- Caused by the rupture of the follicular membrane at the stigma
- Leaves the post ovulatory follicles attached to the ovary
- Control:
 - a. LH (peak level 4-8 hrs prior to ovulation

❖ No corpus luteum in poultry

Oviposition

“ Expulsion of the fully calcified egg from the reproductive tract”

I- Contraction of the muscles of the shell gland

- 1. As the ovum descends through the infundibulum, magnum & isthmus → weak & infrequent muscular contraction.**
- 2. The egg enters the shell gland → increased frequency & intensity of contraction**
- 3. Finally before oviposition → further increase in frequency & intensity of contraction**
- 4. Following oviposition → frequency & intensity of contraction diminished**

II- Hormonal control of oviposition

PGF₂α

Secreted from
granulosa cells of the
two largest
preovulatory follicles
& the two largest post
ovulatory follicles

↓
Smooth
muscle
contraction

PGE₂

Secreted
from
granulosa
cells of the
ovarian
follicles

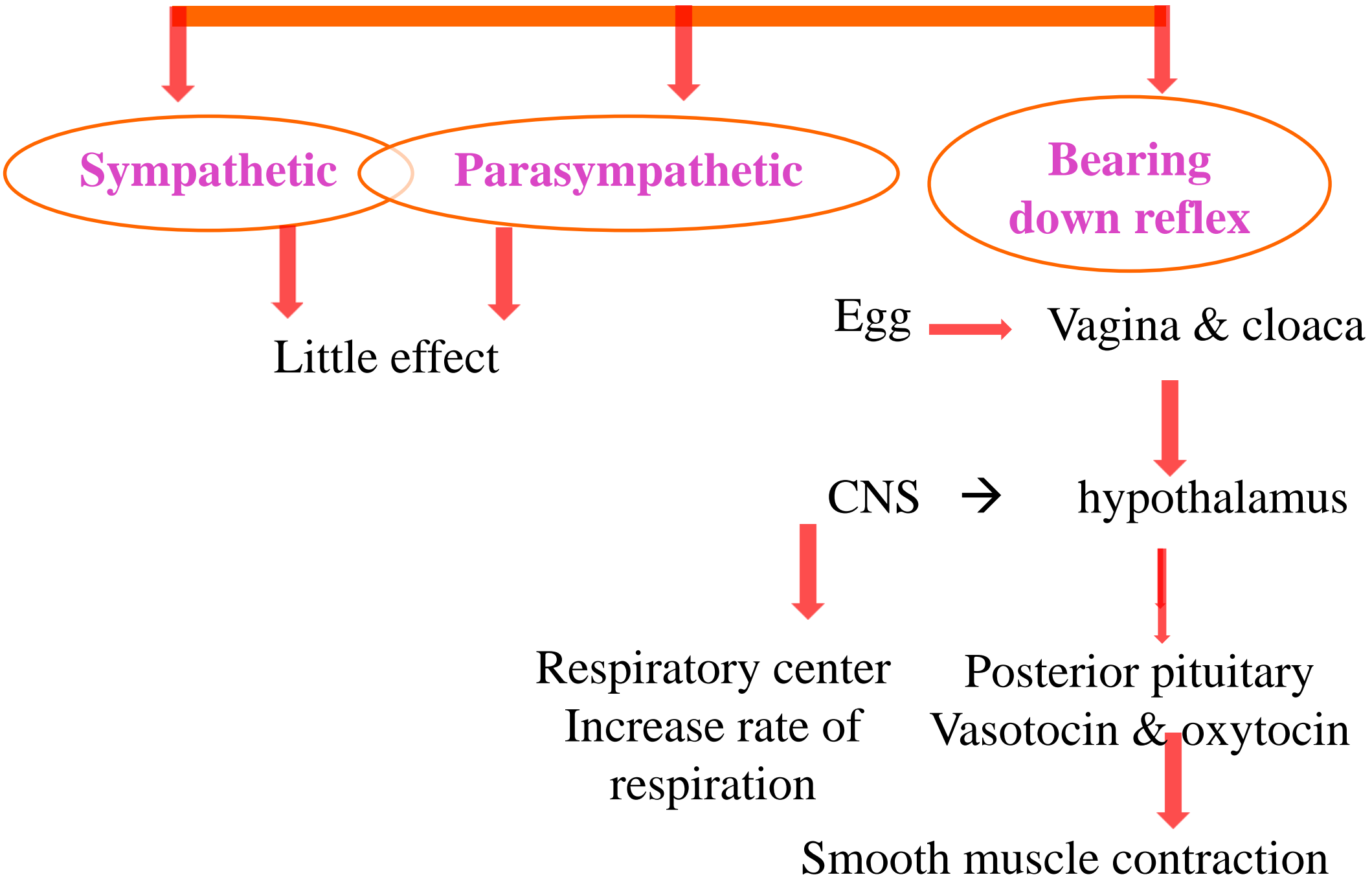
↓
Relaxation
of vaginal
sphincter

**Arginine
vasotocin**

Released
from
posterior
pituitary

↓
Smooth
muscle
contraction

III- Neural control of oviposition



Molting

“ Shedding of the old feathers & growth of new feathers”

□ Time:

- Molting occurs **once a year** & in some cases twice a year
- It extends from a month to 12 weeks

□ Events:

1. **Before molting** → Decreased egg production to 50 or 60% (indicator for prolonged interval between ovulations & slow follicle maturation).
2. **During molting**
 - a) Cessation of egg production (indicator for regression of reproductive tract)
 - b) Decreased liver and body weights
 - c) Loss of feathers (head → neck → body → tail feathers)
3. **After molting** → larger eggs & the egg production increased to 80 or 85 %the decreased gradually

Molting

□ Control:

1. **High corticosterone level** → regression of reproductive tract.
2. **Low LH concentration** → ovarian regression
3. **High level of thyroid hormones (T_3 & T_4)** → for growth of new feathers
4. **Low estrogen & progesterone concentrations**

□ Importance:

Molting provides the birds with a period of rest of egg production & allow tissue regeneration

□ Factors affecting onset & length of molting:

- 1) The weight and physical conditions of the bird
- 2) Nutrition
- 3) Environmental effects
- 4) Length of light exposure

Medullary bones

“A new type of bone formed only in ♀ birds”

- It is responsible for the increased skeletal weight occurs during the 10 days before sexual maturity

□ Sites:

- In marrow cavity of long bones except humerus (femur & tibia) accompanied by large blood supply

□ Control:

Synergistic action of estrogen, progesterone & parathyroid hormones

□ Importance: reservoir for calcium

Blood calcium level in birds

- **It is normally = 10 mg%**
- **Ten days before laying → 16- 30 mg%**
- **Shell formation needs 100 – 150 mg/ hr**

□ Sources of calcium:

1) Diet

2) Skeleton (medullary bones)