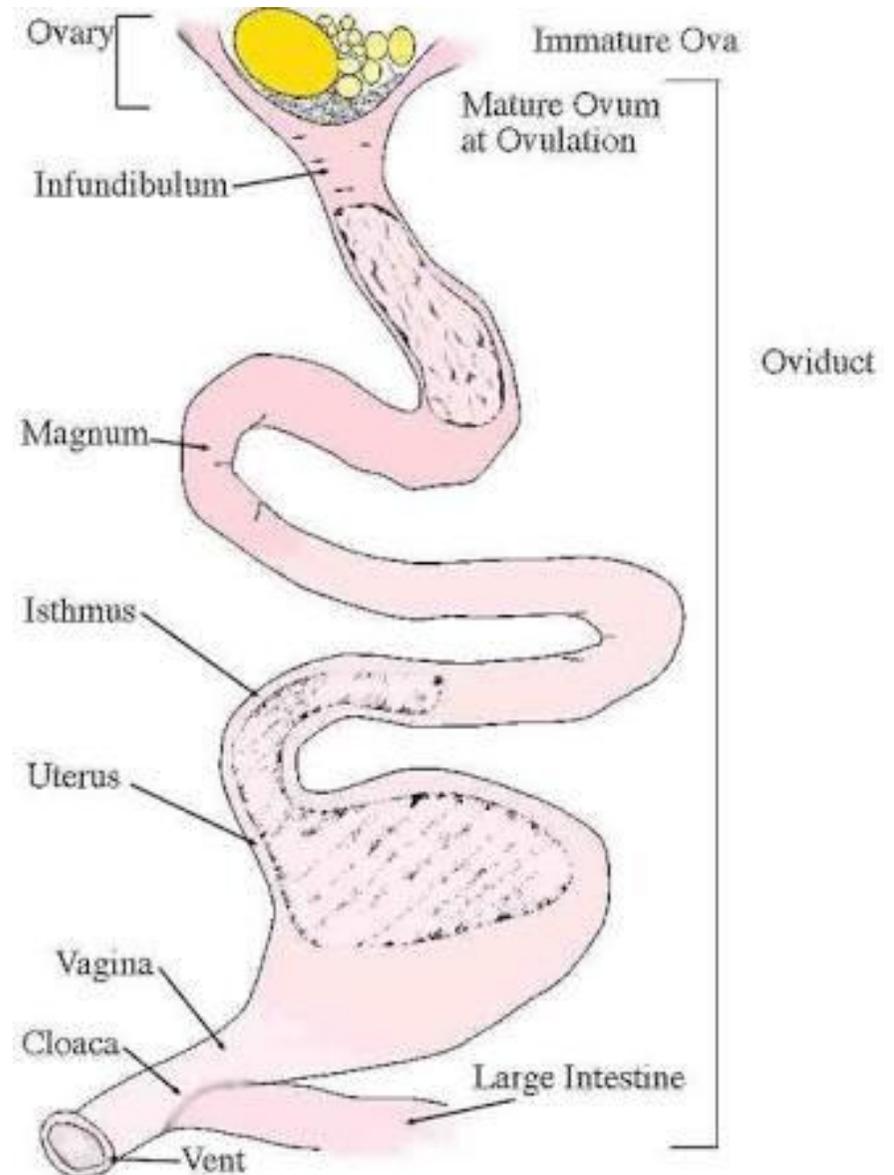


# *Female Reproductive System*

- 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 radiate**
  - **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

**PGF<sub>2</sub>α**

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

Smooth  
muscle  
contraction

**PGE<sub>2</sub>**

Secreted  
from  
granulosa  
cells of the  
ovarian  
follicles

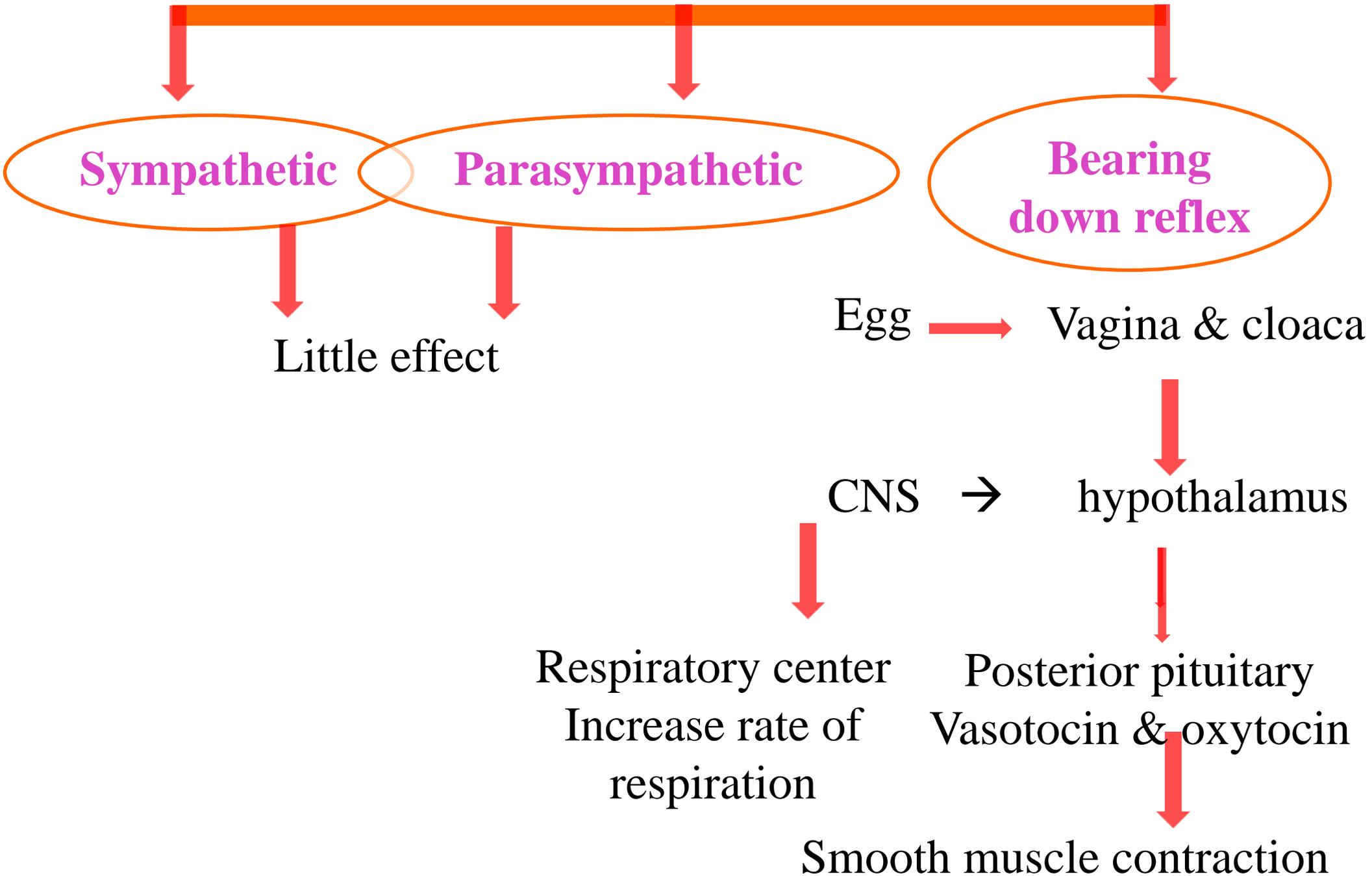
Relaxation  
of vaginal  
sphincter

**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)**