

Normal Chicken Embryo Development

About the Chicken

- The domestic chicken can be traced back to four species from Southeast Asia.
- Red jungle fowl is the most commonly found wild species in the world today.

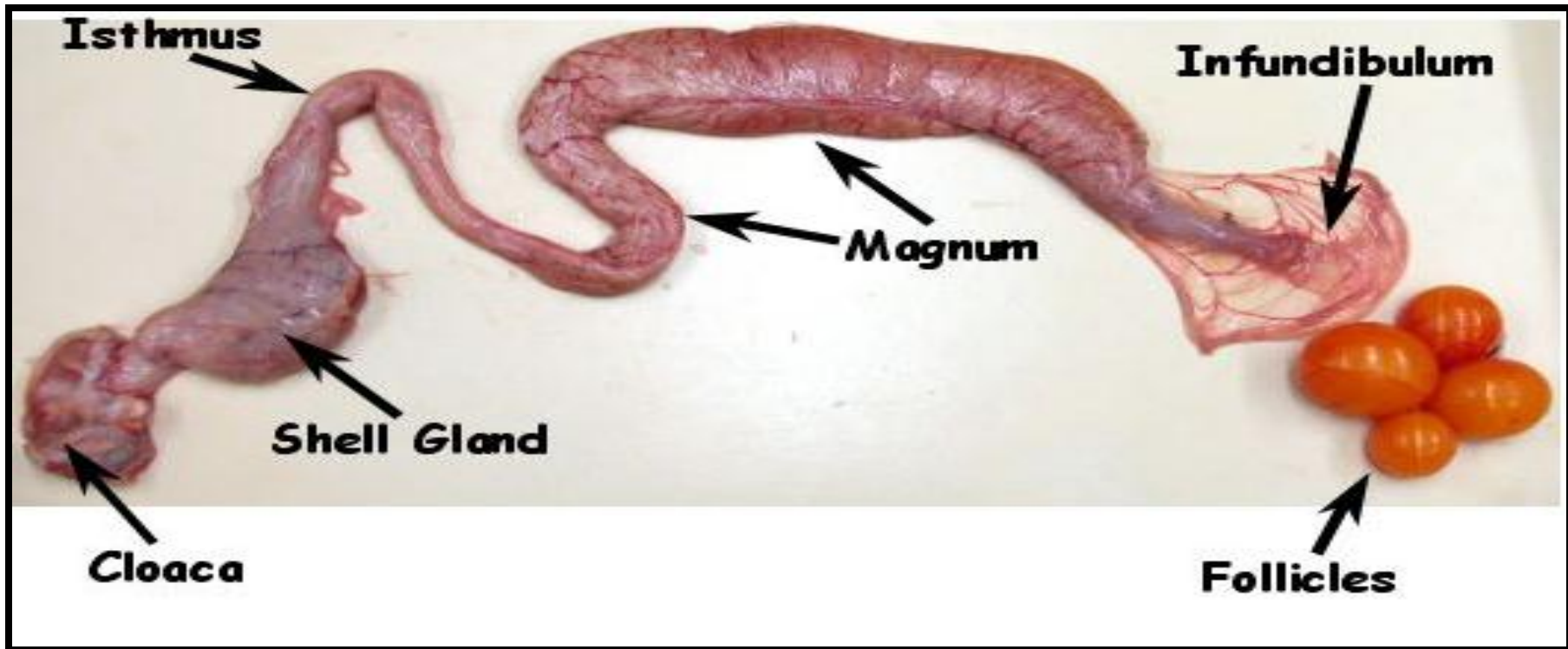


Chicken Reproduction

- The sperm is to putting on the vent of the hen. For a higher rate of fertilization, a rooster should be with no more than 6 hens together.
- The sperm live inside the female reproductive system and each time an ovulation occurs (every 24-26 hours in good egg producers) the egg can become fertile. This process continues and matings at 7 - 10 day intervals are necessary to maintain fertility.
- After fertilization occurs the egg albumen, shell membranes, and shell are added to complete the egg formation process.
- The chicken usually lays the egg about 24 hours after ovulation.

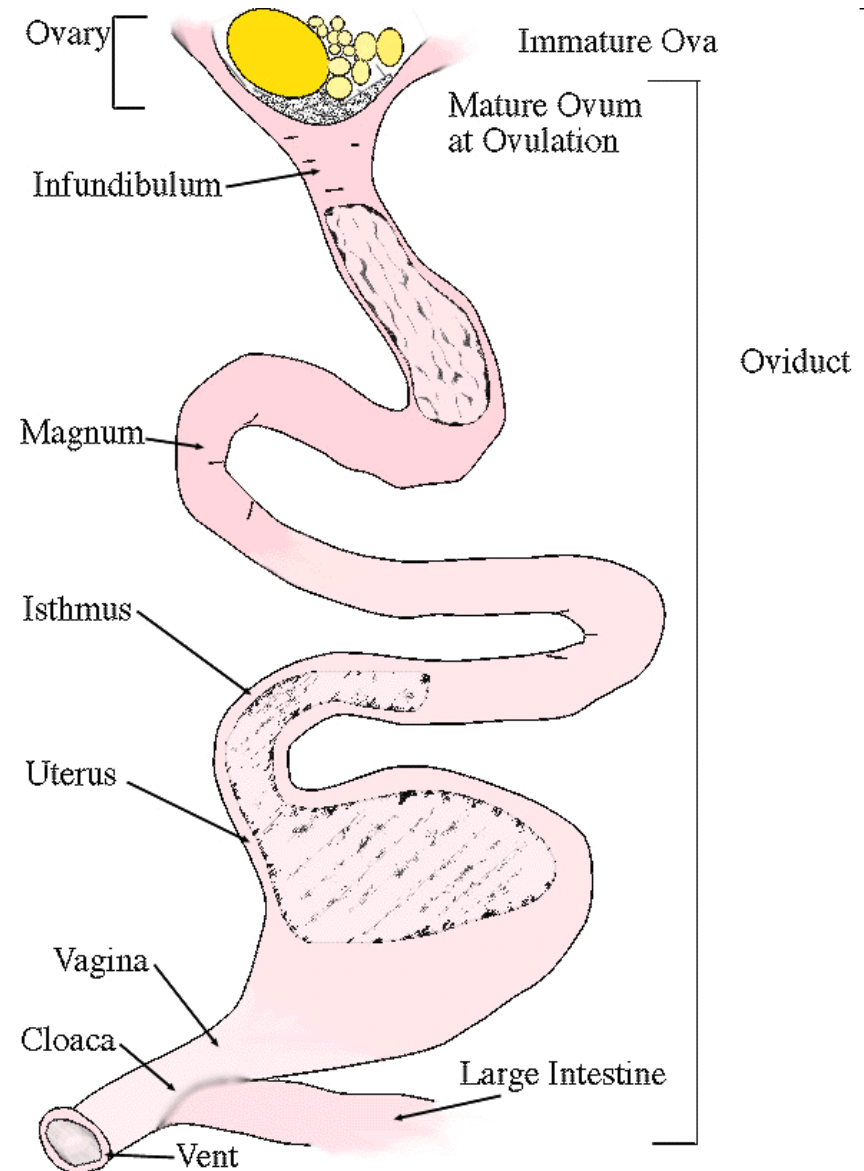
The oviduct

- The oviduct, a tube like organ approximately 26 inches long, is loosely attached to the backbone between the ovary and the tail.
- Most female animals have two functioning ovaries, but the hen uses only one, the left. The right ovary and oviduct remain dormant.

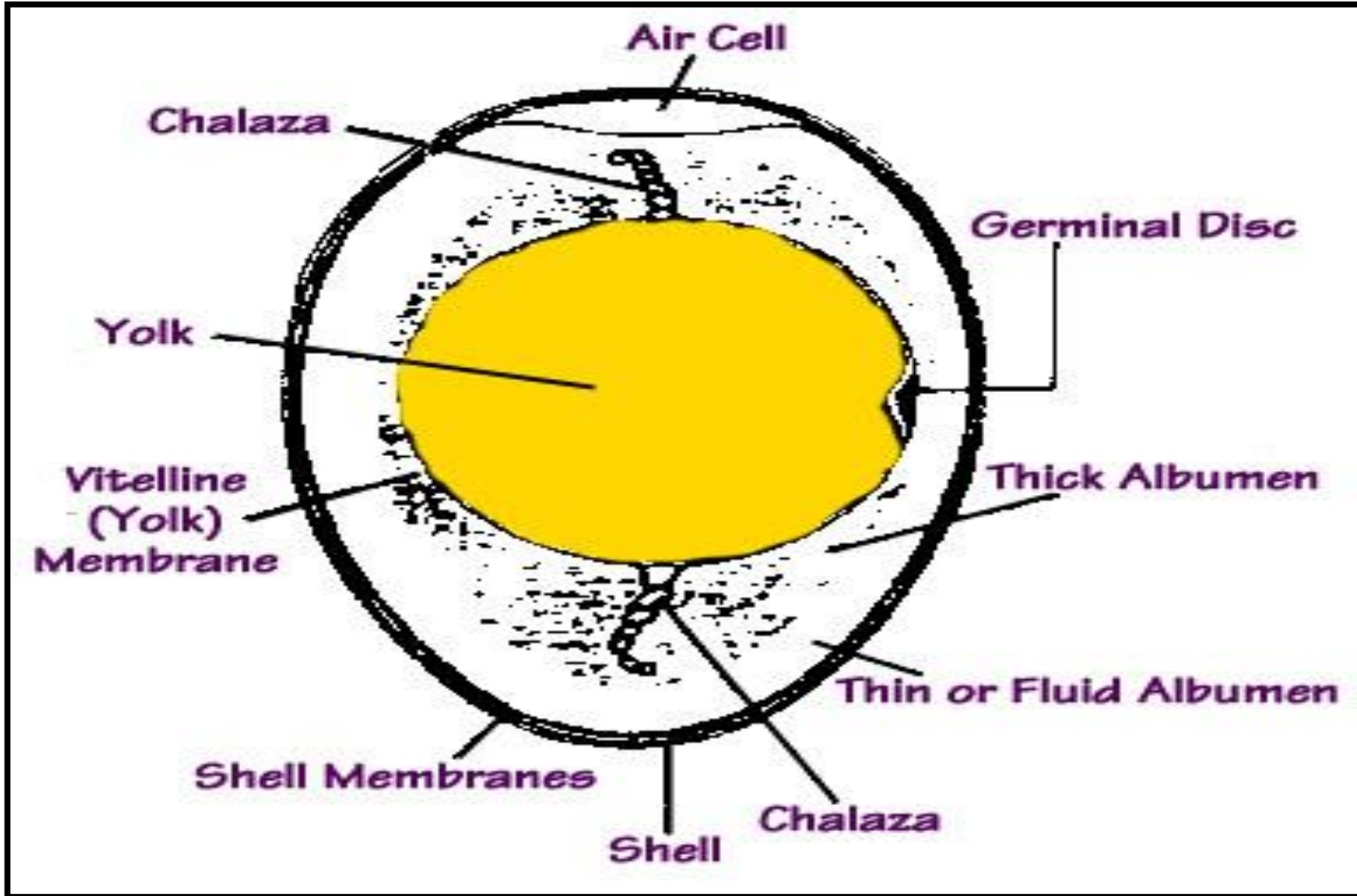


The oviduct

- The oviduct is divided into five distinct regions:
 - (1) infundibulum or funnel
 - (2) magnum,
 - (3) isthmus,
 - (4) uterus or shell gland,
 - (5) vagina.
- This is where fertilization, if/when it occurs, takes place. After about 15 minutes, the yolk rotates, twisting the albumenous fibers to form the chalazae.



Parts of the Egg



The Shell

- its a hard, protective covering made of calcium carbonate. The shell is porous. (There are about 7,000 pores in a chicken eggshell.)
- This allows the transfer of gases through the shell.
- Carbon dioxide and moisture are given off through the pores and are replaced by atmospheric gases, including oxygen.

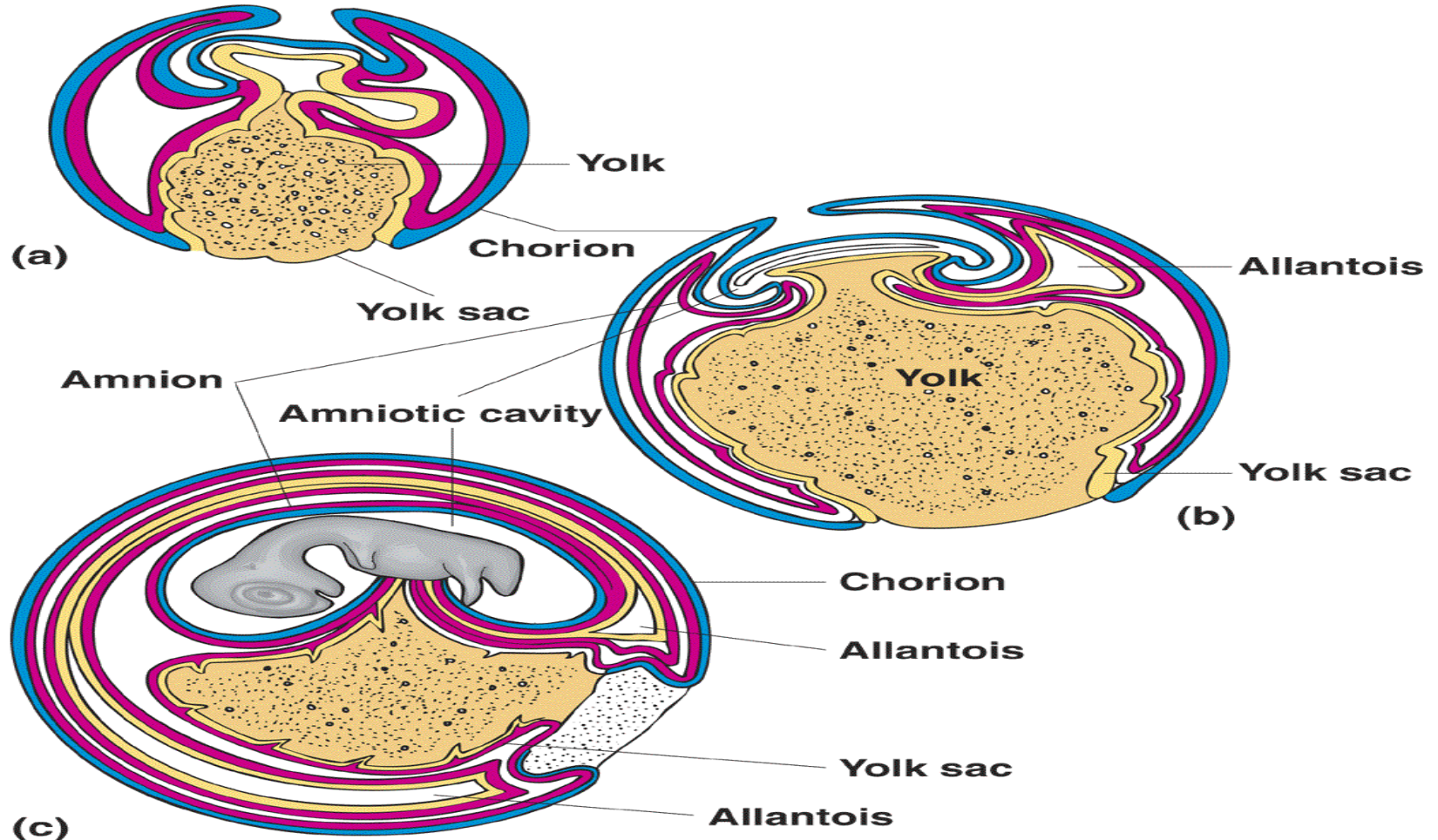


Extraembryonic Membranes

- 1- The **chorion** surrounds the entire embryo in birds and reptiles it functions in gas exchange.
- 2- The **amnion** encloses the embryo and forms an open volume between the embryo & the amnion called the amniotic cavity. The amniotic cavity fills with amniotic fluid, which envelops the embryo and cushions it
- 3- The *allantois* is an outgrowth of the gut In reptiles and birds, it stores nitrogenous wastes.
- 4- The *yolk sac* encloses the yolk in vertebrates with yolk-rich eggs.

Extraembryonic Membranes

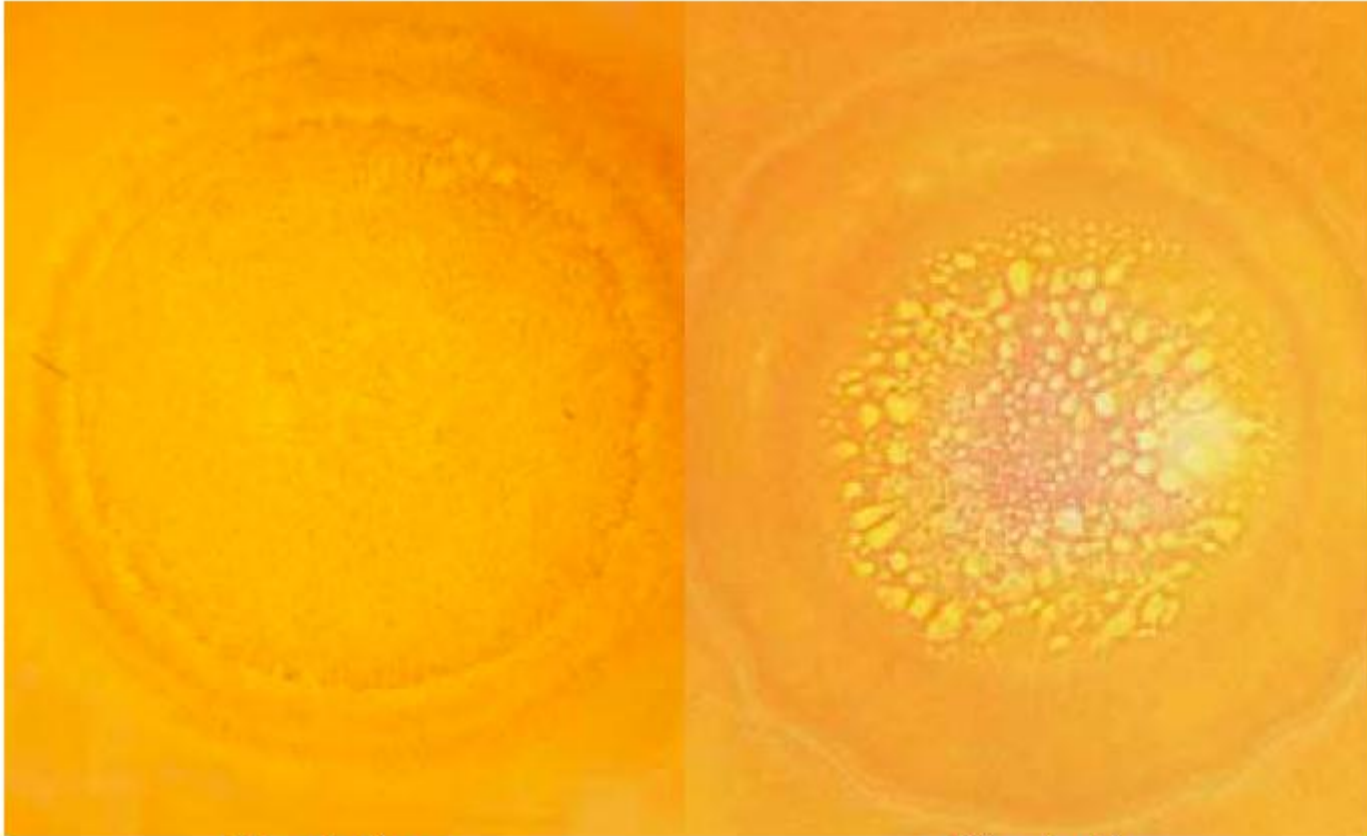
Solomon/Berg/Martin, Biology, 6/e
Figure 49.14



Embryonic Development

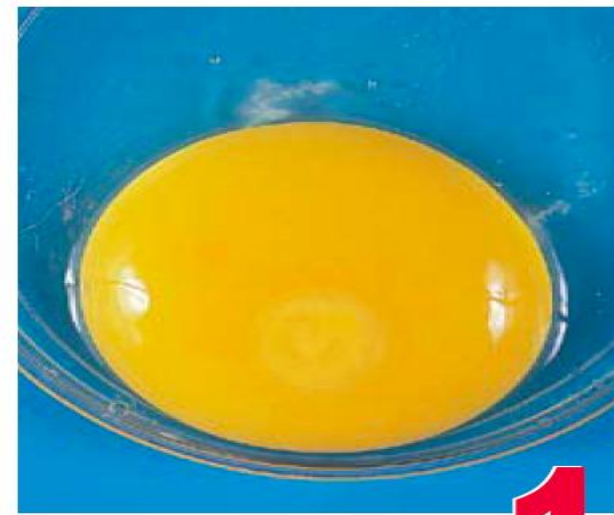
Fertile

Infertile



• Blastoderm

• Blastodisc

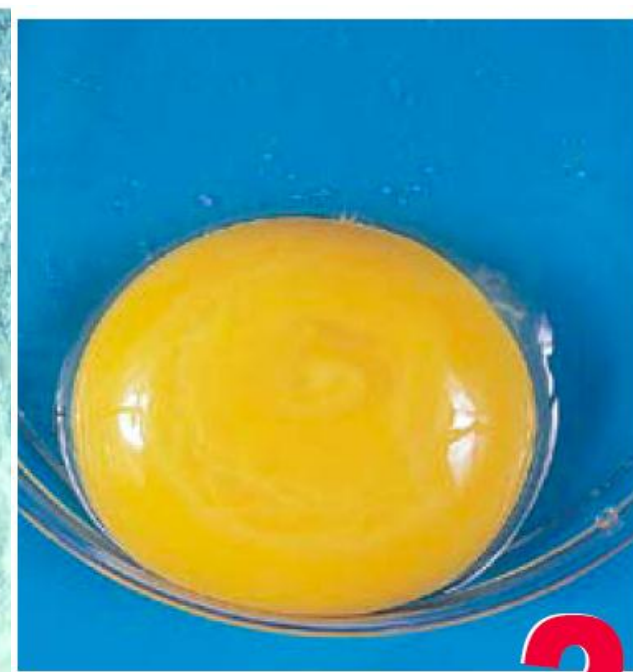
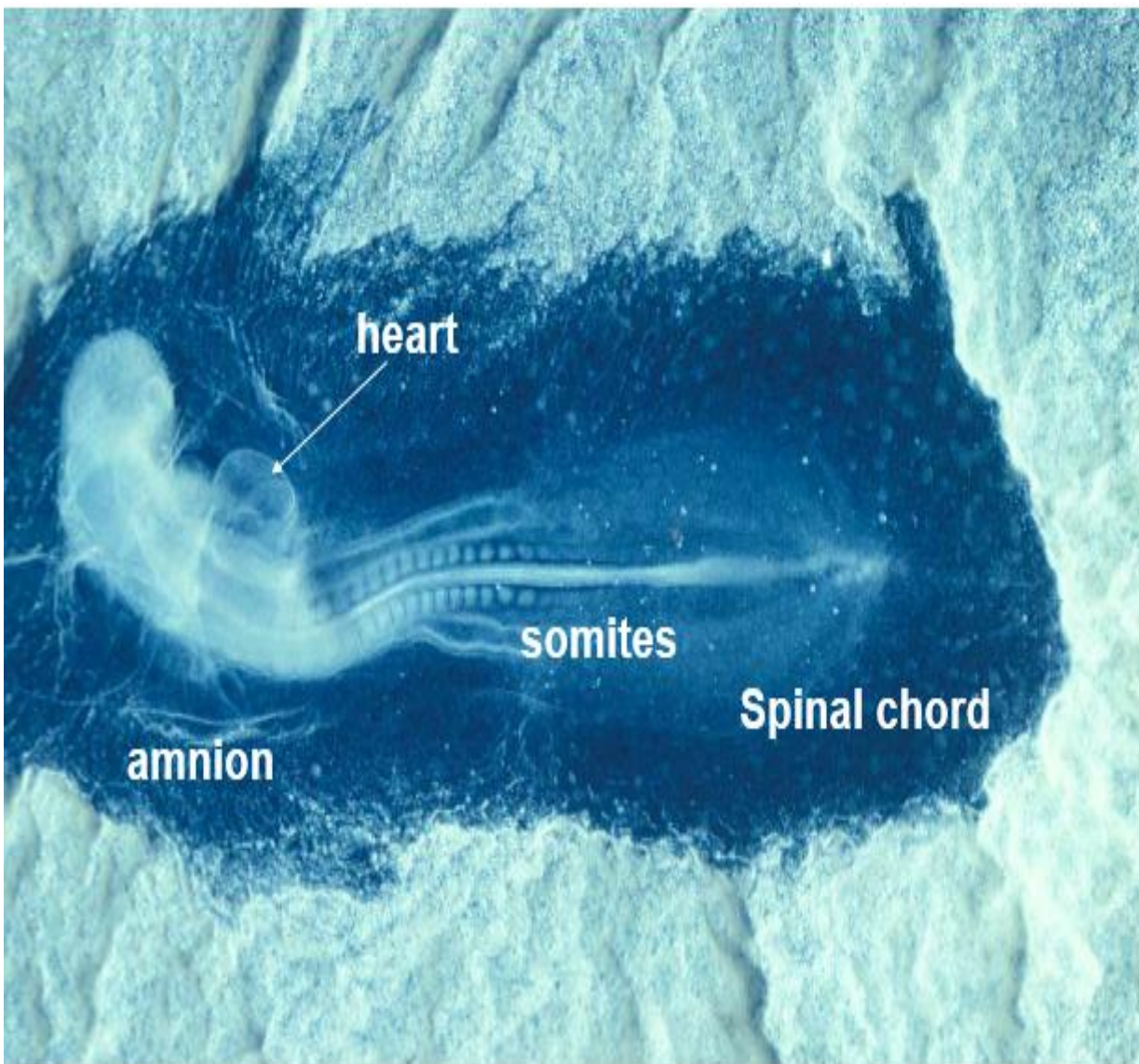


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Credit: © Carolina Biological/Visuals Unlimited

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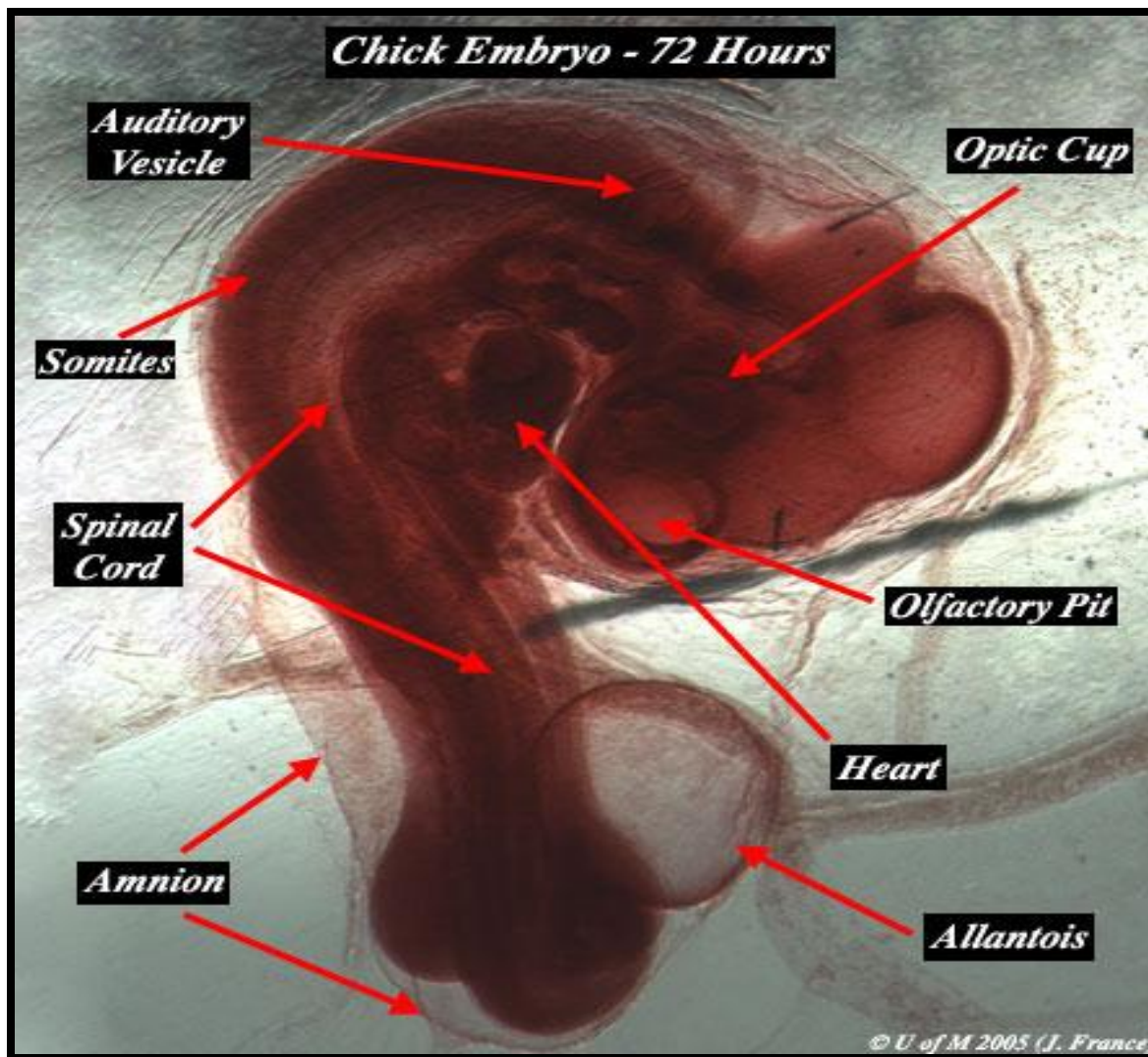
Chicken embryo, 21 hours.



2

Chicken embryo, 43 hours.

- 1-Tissue development very visible.
- 2-Appearance of blood vessels.

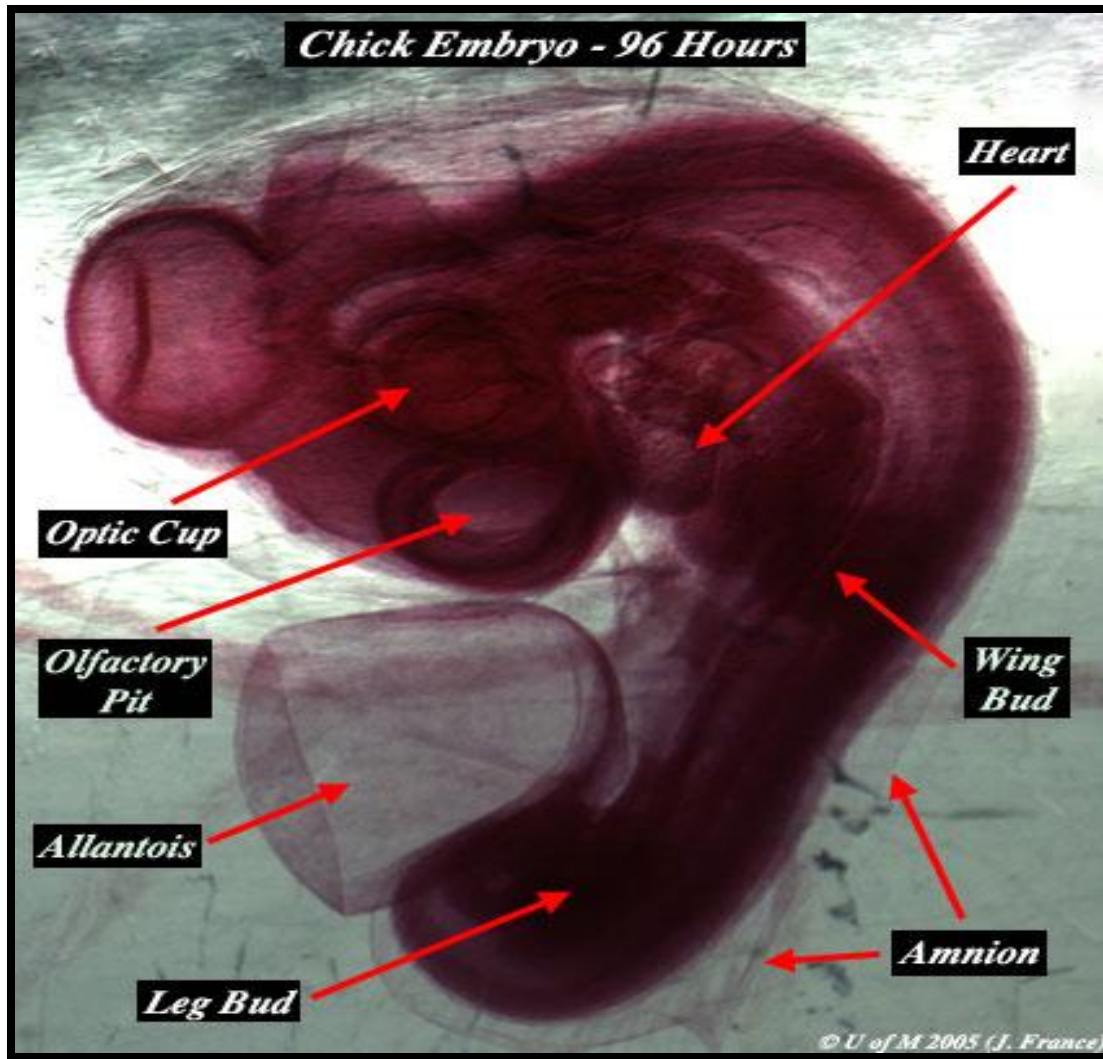


3

Chicken embryo, 72 hours.

1-Heart beats.

2-Blood vessels very visible.



4

Chicken embryo, 4-5 days.

1- Eye pigmented.

2- Appearance of elbows and knees.



6

Chicken embryo, 6days

1- Appearance of beak.

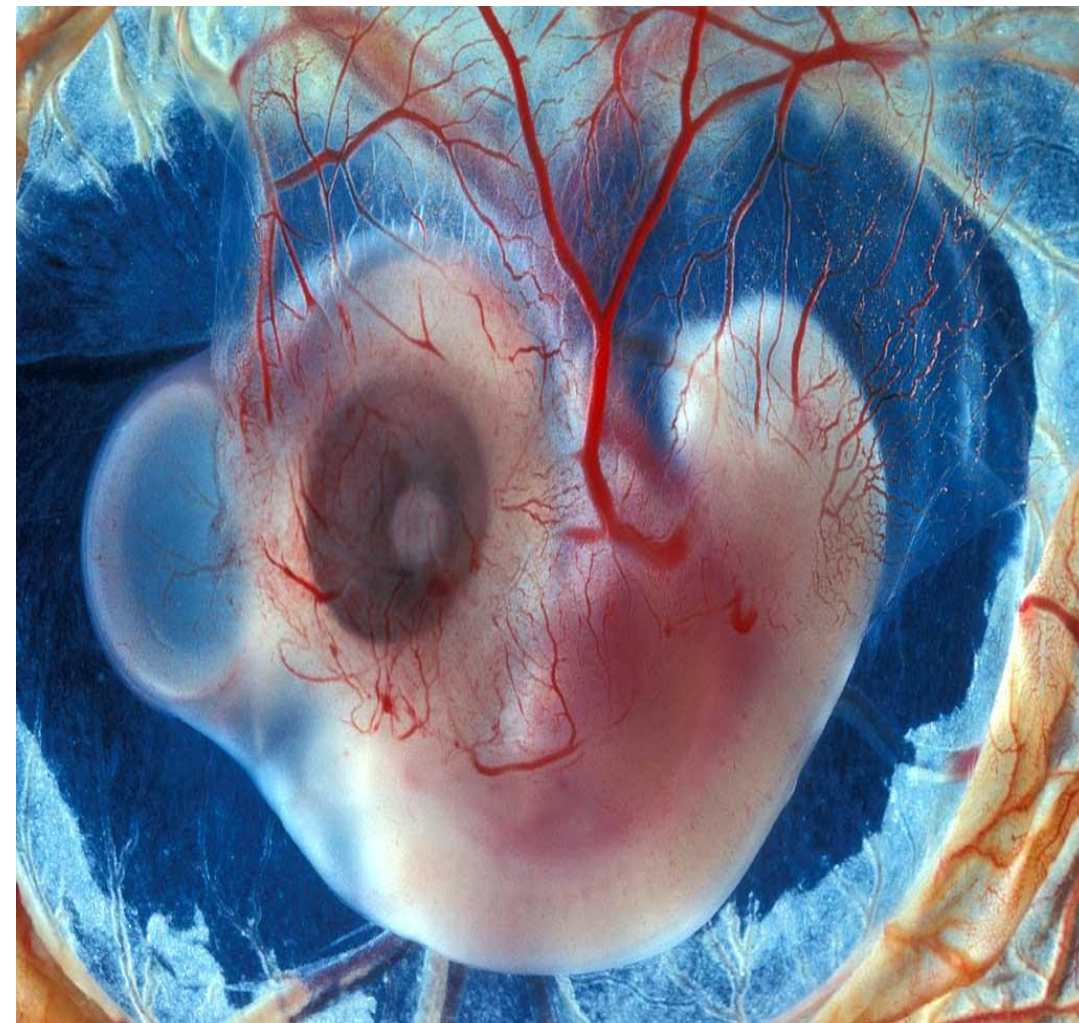
2- Voluntary movement begins

7th Day



Chicken embryo, 7 days

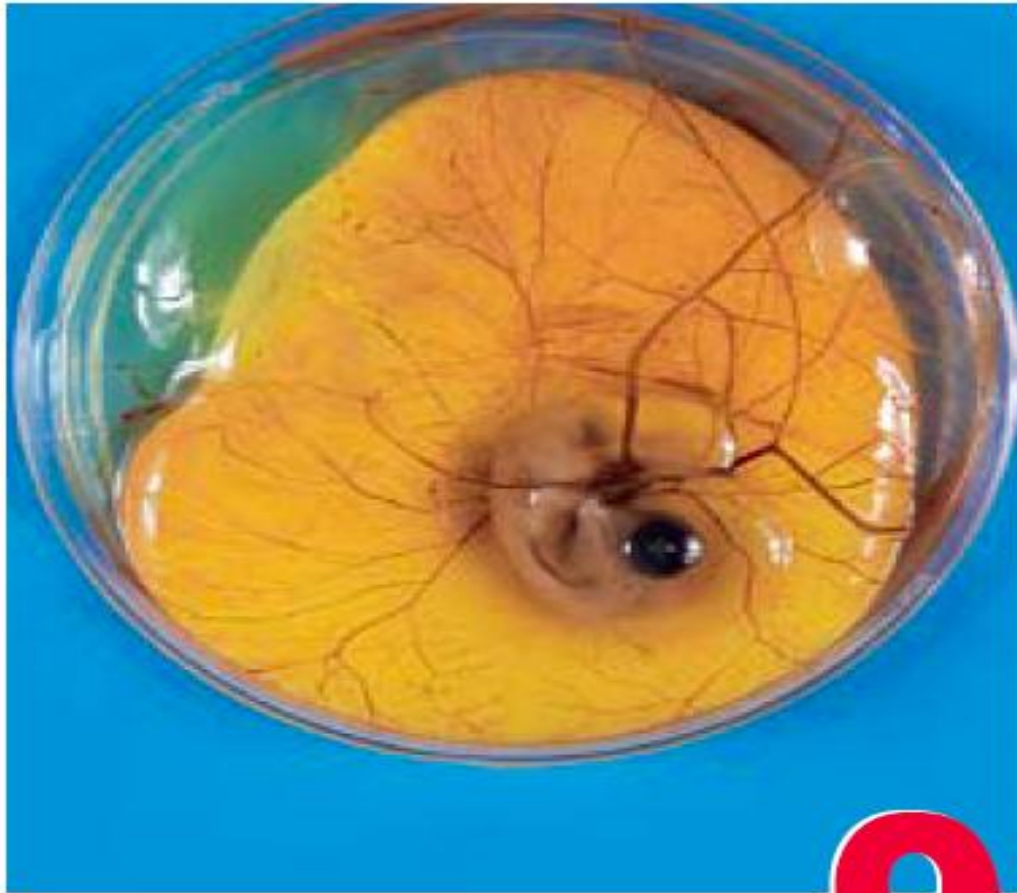
- Comb growth begins.
- Egg tooth begins to appear.



8

Chicken embryo, 8 days.

- Eye pigmentation is readily visible.
- The neck stretches and the brain is completely



9

Chicken embryo, 9 days.

- 1-Embryo starts to look bird-like.
- 2-Mouth opening appears.



10

Chicken embryo, 10 days

- Egg tooth prominent.
- Toe nails.



11

Chicken embryo, 11 days
-Tail feathers apparent.



12

Chicken embryo, 12 days

- Toes fully formed.
- First few visible feathers



13

Chicken embryo, 13 days

-Body covered lightly with feathers.



14

Chicken embryo, 14 days

Embryo turns head towards large end of egg.



15

Chicken embryo, 15 days

Gut is drawn into abdominal cavity.



16

Chicken embryo, 16 days
-Feathers cover complete body.



17

Chicken embryo, 17 days
-Amniotic fluid decreases.



18

Chicken embryo, 18 days

- 1-Growth of embryo nearly complete.
- 2-Yolk sac is still on outside of embryo.



19

Chicken embryo, 19 days

1-Yolk sac draws into body cavity.

2-Amniotic fluid gone.



20

Chicken embryo, 20 days

- Yolk sac drawn completely into body.
- Embryo becomes a chick (breathing in air cell).



21

Chicken embryo, 21 days

1-Chick hatches

2-Feathers dry

3-Should be pulled from hatcher before becoming dehydrated.

4-No longer an embryo - will require feed, water, and controlled climate.

- <http://www.thepoultrysite.com/articles/1459/embryonic-development-day-by-day/>
- <http://www.cobbvantress.com/docs/default-source/cobb-500-guides/embryo-flip-chart.html>