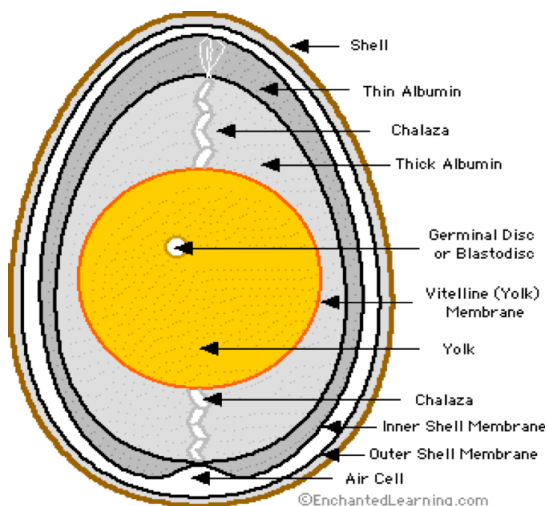


Egg Formation

Egg is formed inside the female reproductive system which consists of:

1. Ovary

Birds contain one ovary located in the left side from abdominal cavity above the kidney the right ovary decays during embryonic development. The ovary contains thousands of ovum but only hundreds of them are integrated and grow. The ovum contains egg yolk which has a small white point called germinal disc (It is proliferative cell) and after fertilization and embryonic development it is called blastoderm. On the surface of ovum (oocyte) blood vessels are called stigma from which break up occurs in the beginning of oviduct process called ovulation if the break up occurs outside of stigma bleeding occurs leading to formation bloody.



2. Oviduct

5 regions of oviduct:

A. Infundibulum (final)

-It is the first part of oviduct which is 11cm in length, ovum keep in it about 15 minutes, engulfs the ovum from the ovary.

-Site of fertilization.

B. Magnum

It is longest portion of the oviduct, it is length 33cm, ovum keep in it 3 hours it is function is formation and secretion of albumin (Egg white).

Layers of albumin:

1. Chalaziferous layers

It also called inner thick or chalaziferous white, it is the first and most central layer in the albumin. This layer twist and rotate 180o before going outside the body to form helical spring is called chalazae its function is to stabilize the yolk movement and keep the yolk at the center of the egg.

2. Outer thick white.

3. Inner thin white.

4. Outer thin white.

C. Isthmus

It is 10 cm in length, ova stay in this part 1-2 hours. Its function is formation of shell membranes (inner shell membrane and outer shell membrane) these membranes are attached together when the egg inside the body. In case of laying the environment temperature is lower than the body temperature that lead to shrinkages of the egg composition and separated of inner shell membrane from the outer shell membrane in the wide end of the egg to form air cell which is play an important role in fetus respiration.

D. Uterus

Its length 10cm, ova keep in it 18_ 26 hours it consists of:

☑ Egg spends the most amount of time here as this is where the shell is deposited.

☑ Mineral and water addition.

☑ Egg shell pigmentation.

The brown color egg shell is the result of the present pigment called **porphyrin**.

E. Vagina

It is 12cm length, the vaginal contraction push the egg to cloaca and this process called oviposition, the formation of egg take about 25 hours.



The structure of the egg

The formation of egg is influenced by the following factors:

- Genetic factors.
- Nutrition.
- Management factors.

Factors that affect egg shell:

1. Shell Strength

It is the amount of force that needed to break the egg shell. It is measured by its unity called newton.



2. Shell thickness

Shell thickness is measured by micrometer called Ames micrometer or use regular ferrite normal thickness of the egg is 0.35 mm in good quality egg.



3. Color of the shell

Color of the egg is measure either by visual scoring by comparing shell color with standard colors ranged from 9-11 and it ranges from white to brown. In addition, the most accurate way to measure color is photoelectric method by using a reflect meter.



protoporphyrin- , zinc chelate and biliverdin

4. Nutrition

The diet of laying hens should contain about 3-4% of Ca and it is added in a form of limestone.

5. Age of laying hens

Shell thickness decline with growing old and at the end of production period, this occur due to increasing in size and weight of egg with aging while the shell deposition stay the same.

6. Genetic factors

Heritability of shell thickness is 37% while 63% is related with environmental factors such as nutrition, age, tempura.

White layer ----- more thickness

Brown layer ----- less thickness

7. Environmental temperature

In open houses with 35C° shell thickness decrease compare with shell thickness in closed houses with 29C°. This decrease in shell thickness is due to decrease in Ca in blood which leads to hypocalcaemia due to heat stress. It is also due to change in Acid-base balance.

8. Time of oviposition

The egg that produced in the early morning has less shell thickness from the egg that produced in the evening.

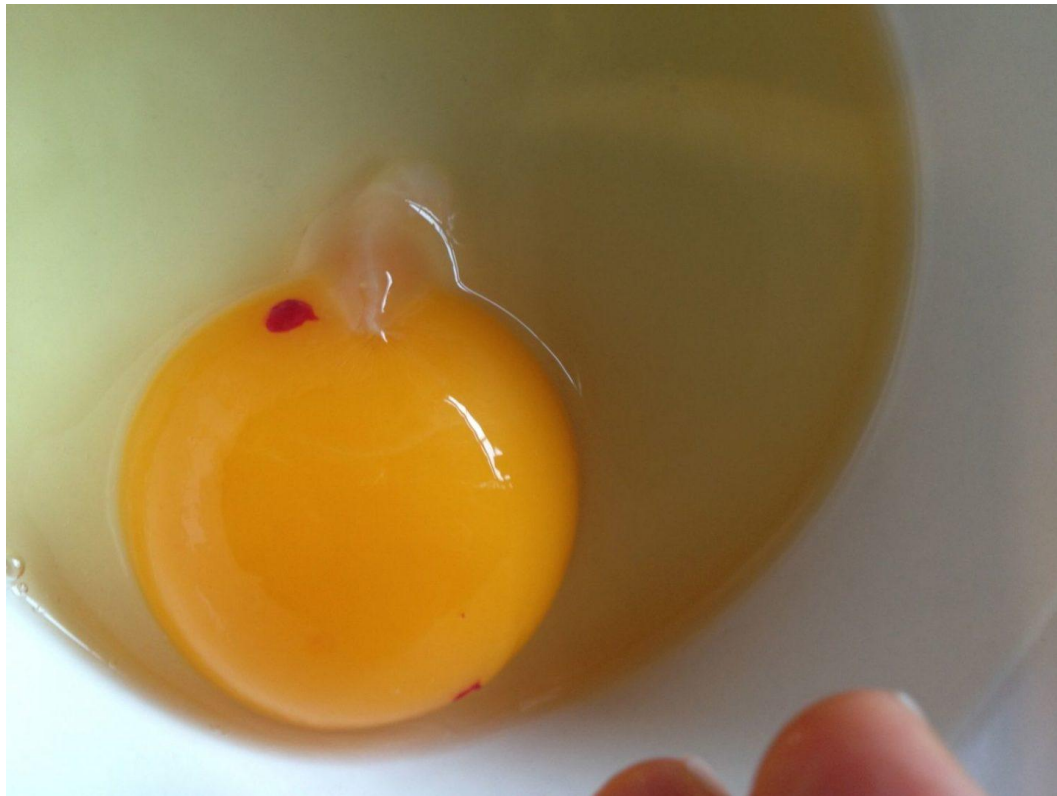


What Are Blood Spots In Eggs?

Blood spots are small red or pink spots that are sometimes found on the yolk or egg white. They are quite literally a small amount of blood. They are typically harmless and do not mean that the egg is unsafe to eat. While a blood spot might be unappealing, it doesn't affect the taste or nutritional value of the egg.

What Causes Blood Spots In Eggs?

Finding blood in an egg yolk can be off-putting, but it's not necessarily a cause for concern – for you or your hens. An egg blood spot can happen due to a variety of reasons. Often, blood spots are caused by the rupture of a blood vessel on the yolk's surface during formation, usually due to fluctuations in a hen's hormones. Sometimes, a hen's reproductive system experiences minor bleeding, leading to a bit of blood entering the egg as it's formed. In rare cases, nutritional deficiencies or diseases affecting the hen's reproductive system can lead to blood being present in her eggs.



Albumen Quality:

The albumen quality depends on the height of albumen which is measured by special scaled called micrometer with 3 stands and the unit of measurement is millimeter. The factors that affect albumen quality are:

- A. chicken age
- B. rearing system
- C. Environmental temperature

Steps to measure albumin quality:

- ☑ Fresh egg is not preferred to allow the stability of egg contents.
- ☑ The egg temperature preferred not to be more than 15° and not less than 7° during measurement.
- ☑ The height of the albumin should measure immediately after breaking the egg on flat surface.

We can measure albumen quality by :-

- 1- Albumen height
- 2- Albumin index
- 3- Haugh unit (haugh unit= $H + 7.57 - 1.7W^{0.37}$)

WE CAN MEASURE YOLK :

Yolk index = high yolk / diameter of yolk

