



Incubation and Hatching

By

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Incubation

is the process by which certain oviparous (egg-laying) animals hatch their eggs; it also refers to the development of the embryo within the egg under favorable environmental condition. Multiple and various factors are vital to the incubation of various species of animal

Types of incubation

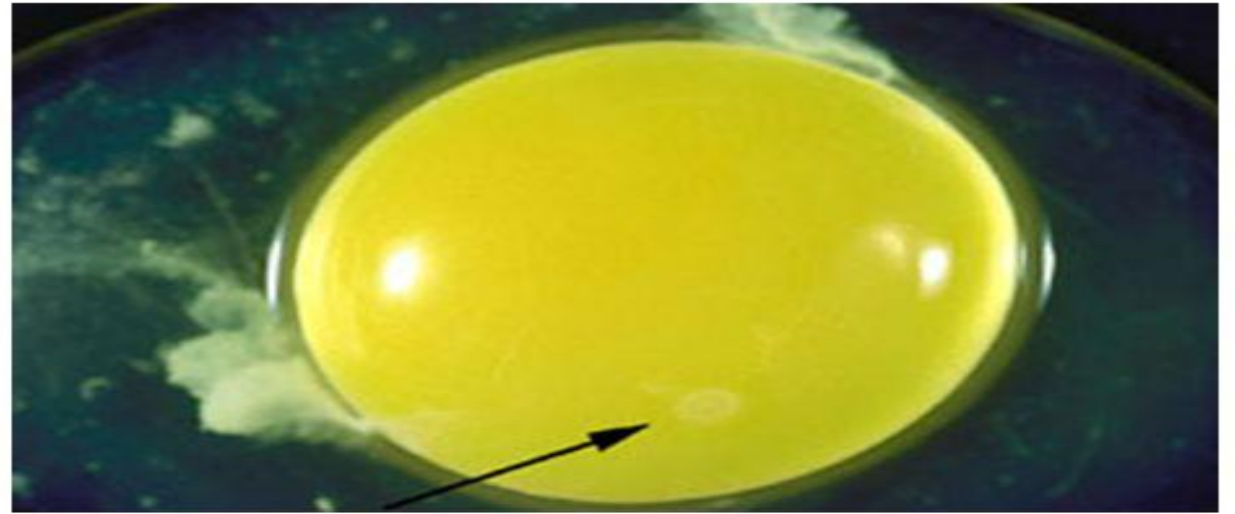
****Natural incubation:** at a small scale using broody hen

****Artificail incubation:** at large scale commercial purpose using different machines called incubatior



Principles of Incubation

- Fertile eggs
- Temperature
- Humidity
- Ventilation
- Turning of eggs



An **incubator** is a device simulating avian incubation by keeping eggs warm at a particular temperature range and in the correct humidity with a turning mechanism to hatch them.

The common names of the incubator in other terms include breeding / hatching machines or hatchers, and egg breeding / equipment



terms of Incubation period

- Place the incubator in a room with a constant temperature, no drafts or direct sunlight.
- Sanitize the incubator.
- Wash hands before touching eggs. Keep germs, dirt and oil away from incubating eggs.
- Only incubate eggs together from species with similar incubation periods.
- Keep the small end of the egg lower than the large end.
- Record of incubator data daily.
- Ensure that the humidifier is working or that the water pan is filled.
- Verify humidity levels are between 55 to 60 percent.
- Check temperature daily and keep it at 99.5°F to 100°F.
- Turn eggs at least 5 times a day until 3 days before hatch.

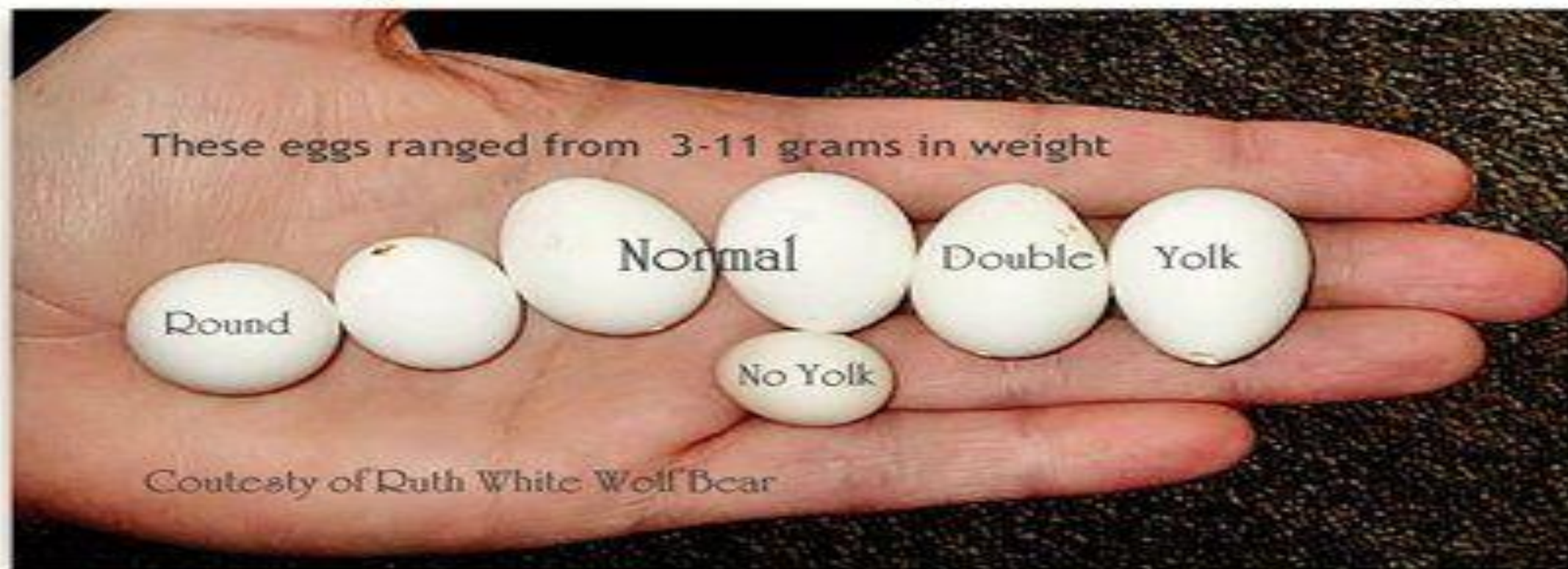
Egg size and hatch time

The size of the egg has an influence on the time the embryo needs to grow to fill the shell and with that on the hatch time. Bigger eggs need more total incubation time, as at the same egg shell temperature the embryo will grow at more or less the same rate, but as there are more grams of egg and grams of final chick, it will take longer to hatch.

A rule of thumb is that with an increase of the average egg weight of 1 gram, the total incubation time is extended with approximately 30 to 40 minutes. So when the average egg weight of a flock increases from 65 to 70 g, we need to set the eggs approximately 2.5 hours earlier if we want to pull the chicks at the same moment.

Cockatiel Eggs

Can vary in size, shape and weight



All the eggs should be consistent in size within the clutch
If there is one that is abnormally large or small keep an eye on the hen

20 COMMON EGG SHELL QUALITY PROBLEMS



Pale-shelled Eggs

The degree of brown color in the egg shell is determined by the quality of deposited pigment in the cuticle.

Causes:

- Infectious bronchitis
- Bird age (older hen)
- High stress in the flock
- Egg Drop Syndrome 76
- Use of chemotherapeutic agents (i.e. sulfonamides and nicarbazin)



Lilac Eggs/Pink Eggs

The egg appears to be pink or lilac due to the association between the cuticle and an extra calcium layer.

Causes:

- Stress
- Excess calcium in the feed



Dirty Eggs

If the egg shell is stained by feces, it is important to avoid feed ingredients which cause wet and sticky droppings.

Causes:

- Wet droppings
- Large amounts of indigestible compounds in the feed
- Poor gut health
- Electrolyte imbalance/saline water



Blood Stained Eggs

Usually from pullets in early lay, eggs are contaminated by smears of blood from a prolapsed cloaca, vent pecking, or cannibalism.

Causes:

- Overweight pullets
- Pullets coming into lay
- Sudden, large increases in day length
- Poor hygiene: Cage, trays, belt pick-up system



Shell-less Eggs

Laid without a shell layer, these eggs are protected only by the shell membrane.

Causes:

- Immature shell gland
- Disease: Avian Influenza NDV, infectious bronchitis, Egg Drop Syndrome 76
- Inadequate nutrition: Calcium, phosphorus, manganese, or vitamin D3



Soft-shelled Eggs

Laid with an incomplete shell, only a thin layer of calcium is deposited on the shell membrane.

Causes:

- Excessive phosphorus consumption
- Disease
- Heat stress
- Bird age (older hen)
- Saline water
- Mycotoxins



Cracks

This problem includes hair line cracks, star cracks, or large cracks that result in a hole in the shell.

Causes:

- Heat stress
- Saline water
- Bird age (older hen)
- Inadequate nutrition: Calcium and vitamin D3
- Mycotoxins



Corrugated Eggs

Characterized by a very rough, corrugated surface, these eggs are produced when plumping is not controlled and terminated.

Causes:

- Heat stress
- Saline water
- Bird age (older hen)
- Poor nutrition, especially calcium and vitamin D3
- Mycotoxins



Wrinkled Eggs

Eggs with thinly creased and wrinkled surfaces.

Causes:

- Stress
- Infectious bronchitis
- Defective shell gland
- Overcrowding



Pimpled Eggs

Classified by small lumps of calcified material on the egg shell, the severity of pimples depends on the foreign material present during the calcification process.

Causes:

- Bird age
- Strain of bird
- Inadequate nutrition



Calcium Coated Eggs

An extra layer of calcium can be seen all over the egg or on just one end.

Causes:

- Defective shell gland
- Disturbances during calcification
- Excess calcium in the diet



Calcium Deposits

These eggs are classified by white, irregularly shaped spots deposited on the external surface of the shell.

Causes:

- Defective shell gland
- Disturbances during calcification
- Excess calcium in the diet

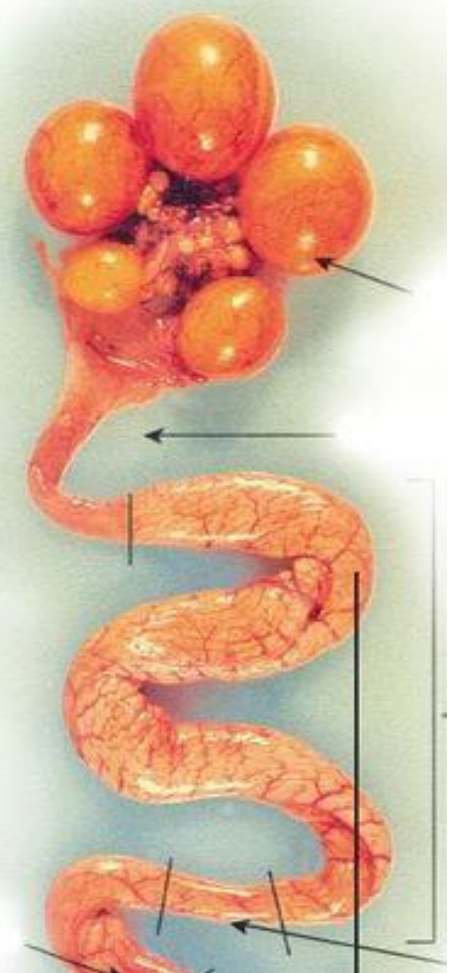


White/Brown Speckled

With smaller speckles than calcium deposits, these eggs may be laid down before or after the cuticle is formed.

Causes:

- Defective shell gland
- Disturbances during calcification
- Excess calcium in the diet



TUBULAR SHELL GLAND

A process called "plumping" occurs where water rich with electrolytes enters the albumen and the formation of

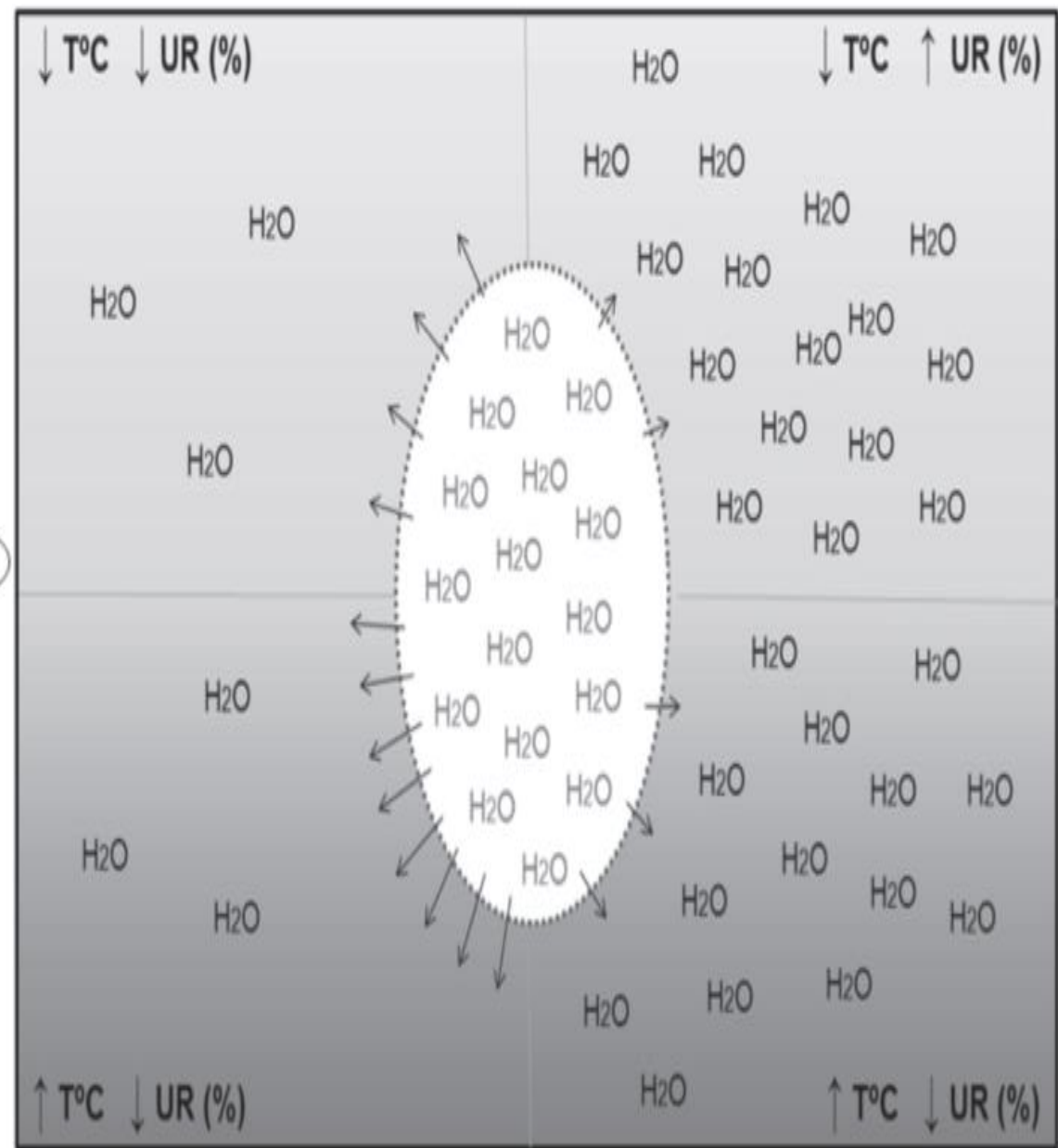
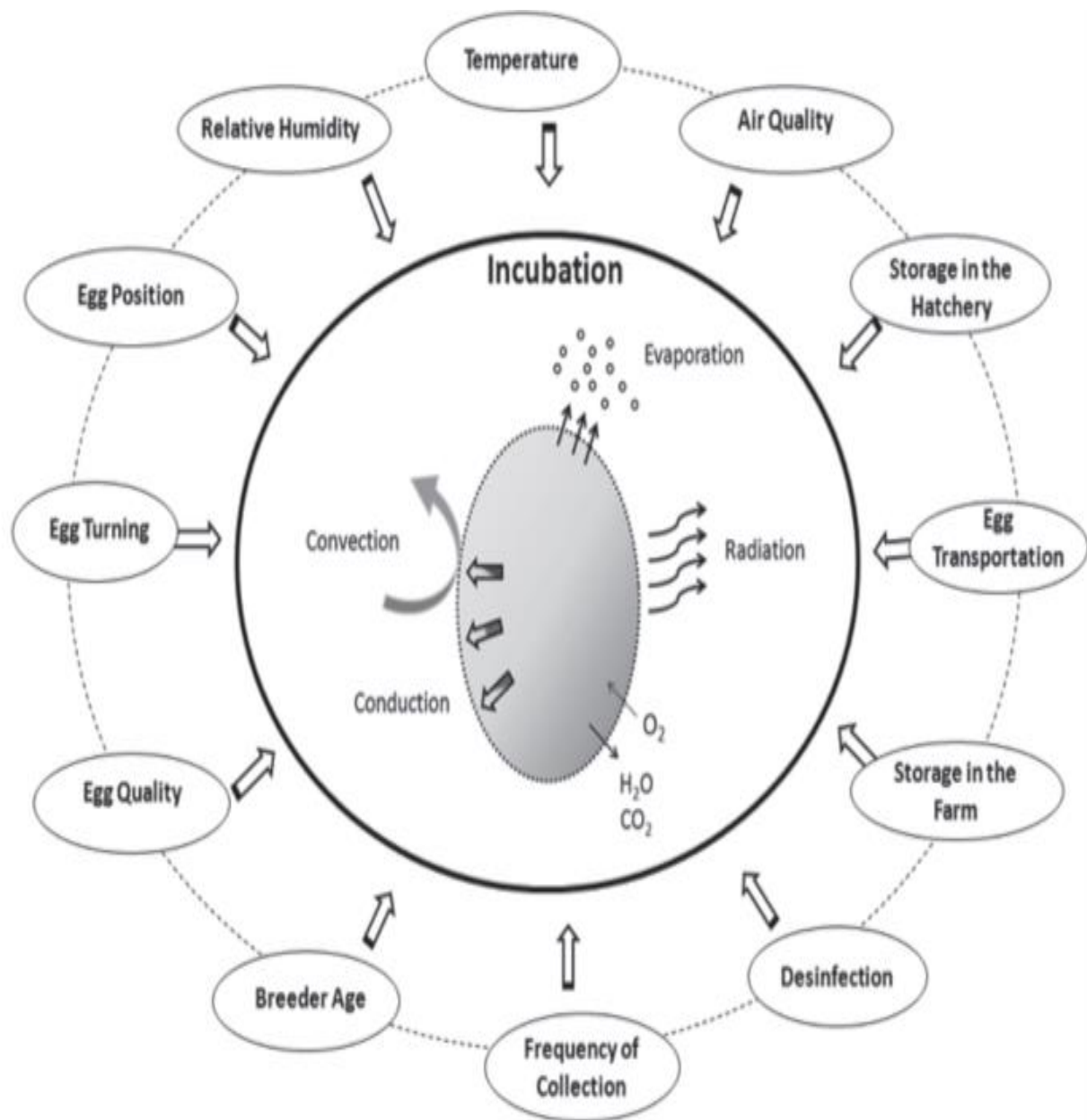
Temperature and humidity during storage

Fertile eggs should be stored between 55 and 65°F.

******If fertile eggs reach temperatures above 72°F, embryos will begin to develop abnormally, weaken, and die. Embryos stored below 46°F also have high embryo mortality. Room temperature is generally too warm and the refrigerator is too cold for storing fertile eggs. If you plan to store eggs in a refrigerator, adjust it to an appropriate temperature. Fertile eggs should be stored at 70 to 80 percent relative humidity. This can clog the pores on the eggshell and cause contamination, the same way washing does. Clogging the pores can also suffocate the embryo. Low humidity during storage can make the egg lose internal moisture and kill the embryo. To increase the humidity, place a pan of water in the storage room. It is the surface area of the water influences humidity, not the depth of the water. Avoid drafts; these can dry the eggs out even when humidity is within the appropriate range.

Incubation period to hatch time and when to transfer to hatcher. Temperature and humidity levels for common birds.

bird	incubation	period		Hatching	period	
	day	temperature	humidity	Day	temperature	Humidity
chicken	21	99.5	58	18	98.5	66-75
duck	58	99.5	58-62	25	98.5	66-75
goose	30	99.5	66-58	28	98.5	66-75
dove	14	99.5	66-58	12	98.5	66-75
Love bird	22-25	99.5	58-62	20-22	99	66-74
canary	13-14	100.5	58-56	11	99	66-74





Hatch period. This stage refers to final 2 to 3 days of incubation when chicks hatch out of the shell.

Transfer eggs to a dedicated hatcher for the last 3 days to 4 days of incubation and do not turn them. If a hatcher is not available, remove the eggs from the turner and lay them in the hatching basket or place them on cloth or rough paper (not newspaper) in the incubator. Make sure the cloth or paper do not cover vent holes, or touch the water or the heating element. During this stage, decrease the temperature 1°F and increase the relative humidity to 65 to 70 percent. You can increase the humidity by adding a wet sponge or wet paper towels to the incubator. The chicks should start to pip within a day of the incubation period listed for the species



Care newly chick hatching

After several weeks of incubation, your eggs will be ready to hatch. After they hatch, they cannot be kept in the incubator very long. It is time for them to move to a brooding area. A good brooding area is the key to chick survival and growth in their early stages of development. The important features of a good brooding area include:

- A safe, protected area, away from potential predators and cold drafts. This area should be in a location where you have easy access to it in order to give them care and check on them regularly.
- A dependable heat source with enough power for your particular brooder.
- A feeding and drinking area.



- A 'grippable' and absorbant floor. Grippable floors are important because if the chicks legs slide or skid as they learn to walk they can develop a variety of problems in their legs and feet. Absorbant floors will help keep your chicks clean and dry.
- Chicks only. Do not keep young chicks with older chickens.
- Sanitary. As your chicks develop, you will need to clean the brooder on a regular basis to prevent disease



