Most Valuable Creation of New Life with "R-COM"

INCUBATION
COMMON SENSE
## INCUBATION COMMON SENSE

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What is an Incubation Room?

The Incubation Room is a confined space for setting and operating an incubator. Because the incubation room environment has a considerable effect on hatch rate, it's recommended to control the environment for setting up an incubator; there should be little noise and vibration around and temperature ranging 20°C - 25°C (68-77°F) with small variation in temperature. Especially, if there are frequent occasions when the temperature drops suddenly at night, compared with daytime, be sure to check from time to time and pay attention so that the incubator is not directly exposed to sunlight during daytime.

Hatchery Egg

Selecting Hatchery Egg

Hatchery egg means fertilized egg for incubation. Hatchery egg should be fertilized egg, but it does not mean every fertilized egg can be hatched. Hatching result can be different from egg condition. For being a good hatchery egg, mother birds need to be under good nutritious state. Also, eggs should be incubated before 7 days passed after laid out. It's better to keep at the place with temperature of 10-16°C and 70% humidity avoiding direct ray of light before start incubation. Eggs with cracks on eggshell, abnormal shape or eggs with contaminated eggshell are not good as hatchery eggs.

Fertilized Egg

Fertilized egg is an egg laid by mating a hen and a cock. So, it can become a chicken.

Unfertilized Egg

Unfertilized egg is an egg we generally eat. As an unfertilized egg is laid by a hen alone, it cannot become a chicken.

Please make sure to check egg-laying date if you want to hatch eggs after purchasing fertilized eggs from shops or farm. Eggs younger than 7 days have high hatching rate.
Artificial Incubation Conditions

Most of birds can be hatched at the temperature of 37.5°C and hatching days by birds are as follow.

### Incubation Day and Recommended Temperature (Poultry)

<table>
<thead>
<tr>
<th>Type</th>
<th>Chicken</th>
<th>Quail</th>
<th>Duck</th>
<th>Pheasant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hatching days</strong></td>
<td>21</td>
<td>17</td>
<td>28</td>
<td>23</td>
</tr>
<tr>
<td><strong>Recommend Incubation Temp.(°F)</strong></td>
<td>37.5(99.5)</td>
<td>37.7(99.8)</td>
<td>37.5(99.5)</td>
<td>37.7(99.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Peacock</th>
<th>Goose</th>
<th>Golden pheasant</th>
<th>Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hatching days</strong></td>
<td>28</td>
<td>30</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td><strong>Recommend Incubation Temp.(°F)</strong></td>
<td>37.5(99.5)</td>
<td>37.5(99.5)</td>
<td>37.5(99.5)</td>
<td>37.5(99.5)</td>
</tr>
</tbody>
</table>

### Incubation Day and Recommended Temperature (Parrots)

<table>
<thead>
<tr>
<th>Type</th>
<th>Macaw</th>
<th>Cockatoo</th>
<th>Amazone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hatching days</strong></td>
<td>26-28</td>
<td>about 30</td>
<td>24-29</td>
</tr>
<tr>
<td><strong>Recommend Incubation Temp.(°F)</strong></td>
<td>37.1-37.2(99.0)</td>
<td>37.1-37.2(99.0)</td>
<td>37.1-37.2(99.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Love birds</th>
<th>African Grey</th>
<th>Falcon</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hatching days</strong></td>
<td>22-24</td>
<td>28</td>
<td>Around 32</td>
</tr>
<tr>
<td><strong>Recommend Incubation Temp.(°F)</strong></td>
<td>37.1-37.2(99.0)</td>
<td>37.1-37.2(99.0)</td>
<td>37.1-37.2(99.0)</td>
</tr>
</tbody>
</table>

User should be careful not to drop the temperature of egg especially in inspecting eggs as even small temperature drop in early stage of incubation affects the egg growing. It may affect hatching rate a lot.

As natural hatchery eggs are often stained with excrement, hatching with this condition may contaminate eggs due to breeding of bacteria. Therefore, it would be better to sterilize eggs contaminated with egg exclusive sterilizer like alcohol cotton in accordance with the instruction of the manufacturer.
**Humidity for Artificial Incubation**

Incubation humidity can be divided into initial humidity, middle humidity and last humidity, but it is commonly divided into initial humidity when starting incubation and last humidity of 2~3 days before hatching.

- There is no big humidity difference between initial and middle of incubation so it is managed as same. Most of birds need higher humidity about 65% at last stage of incubation.

- Normal humidity of initial and middle stage of incubation is as follow.
  - Poultry: 40-50% RH
  - Parrots: 35-45% RH
  - Waterfowl: 45-55% RH

* Humidity for last hatching stage of all bird is higher than initial humidity. It is about 65% RH.

Higher humidity is required at the time of hatching. It is to prevent the thin film covering embryo from drying or hardening before hatching. Therefore it is better not to open the cover of incubator often when eggs start hatching. Opening the cover may drop the humidity rapidly and it will take time to recover high humidity again.

⚠️ Please refer to related technical books for more information on correct hatching conditions.

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**Egg Turning**

In the egg which is incubating, both ends are fixed by egg string centering of egg yoke and embryo is located at the edge of egg yoke. If egg is positioned without movement, embryo may be pressed down and it may become arrested development egg or it may grow to deformed chicken due to insufficient brood circulation. Some eggs without egg turning can be hatched. Turning period of egg of general birds is 30 minutes to one hour and angle of egg turning is 90° to 180°. However, comparing with poultry, early matured bird like parrots needs bigger angle of egg turning and it is better to turn over 100° each time. Egg turning should be stopped 2~3 days before hatching.
**Egg Inspection**

Egg inspection is done to sort eggs into fertilized, unfertilized egg and arrested development egg and to inspect the embryo development process. Eggs with minute crack should be selected as they may smell bad by rotting with bacteria permeation and may contaminate other eggs. RCOM candler or Ez scope is recommended.

**First Inspection**

6th day after incubation starts
Blood vessels look like spidery and an embryo’s movement can be identified on inspecting carefully.

An unfertilized egg or a fertilized egg before incubation starts

**Second inspection**

12th day after incubation starts
Blood vessels become thicker and an embryo becomes bigger with brisker movement. If blood vessels fail to be vivid or there is no movement, it can be an egg which is stopped development.

If any blood vessel or embryo is seen during inspection, it is unfertilized egg, and remove from incubator.

6th day

12th day

**Third inspection**

18th day after incubation starts
As an embryo becomes bigger, all but an air chamber looks black. From this moment, stop egg turning.

An unfertilized egg or a fertilized egg before incubation starts

18th day

**During egg inspection, the ambient temperature is lower than incubator inside, and it is better to do egg inspection in worm room for less than 10 min. Be careful not to give impact to egg.**

**If a shell is think or dark, it can be difficult to do egg inspection.**

**Frequent egg inspection maybe cause incubation failure.**
How to Inspect Egg

In dark Place

Place an egg horizontally on smooth cloth, and stick the candler to the large end of egg. Then, you can see blood vessels or an embryo’s movement.

In daytime, do egg inspection in dark room.

In the light

- Roll black paper, which hardly lets the light in with a smaller size than your egg, and fix it with scotch tape.
- Cover the egg with the index finger, the middle finger, and the third finger of the left hand and stick the cylinder to the egg in order not to let the light in at the window exposed directly to the sun on a find day.
- Hold the cylinder with the right hand, apply one of your eyes to the upper hole again in order not to the light in, and observe the egg.
- Turn the egg carefully with the middle finger of the left hand to find a good place for egg inspection.

Wait a minute with an eye applied to the cylinder until eyes are adapted to the dark place.

Be careful not to hurt eyes at the edge of paper during observation.
Development

Development means the process in which a chick breaths with lungs for the first time after passing through air chamber and gets out of the egg shell with bill. In case of slow growing birds, newly hatched chicks should take a rest in incubator around for 24 hours after hatch until feather is dried completely. They just sleep without eating anything. After this, they should be fed with water and food after moving to brooding room. In case of early matured bird (birds born without feather), people should feed them (weaning diet) directly and raise them in warm brooding room as they can eat by themselves.

Brooding

Prepare a place with lights and heater to keep the temperature of 35°C ~ 37°C. Make the chicks to be adapted to circumstances by reducing the temperature gradually by week. In case of early matured birds such as parrots, feed weaning diet by every 3 hours and keep the brooding room clean all the time. Spreading sawdust or paper chops on the floor can prevent the contamination of brooding room.

Breeding

General poultries, as they are polyphagia, eat all including grains, vegetables and insects. However, for little chicks in brooding process, it is better to them with smashed boiled egg yoke together with ground grains or chopped vegetable. Please consult sufficiently with professional breeders or experts to breed parrots as it is not easy for a beginner to breed them. Little chicks will die if they get wet as body temperature drops. To prevent this, breeder should make the inlet of water feeder be narrow using tape and dry the feather promptly with hair dryer if they get wet. When breeding as a group, breeding room should be cleaned everyday.
**Keeping of Incubator**

Inside of incubator used for hatching and development will be good condition for propagation of bacteria due to egg shell, hair of chicks and liquefied material of egg. Therefore the parts without electronic board and heating devices should be cleaned well and dried sufficiently in well ventilated shady place. Please remove dust on electronic board and sensors using smooth brush. Inside of incubator can be cleaned with cloth or paper towel wetted by egg antiseptic solution. Or, just sterilization by sunning will be ok. To use the incubator for a long time without malfunction, it is better to make or purchase an extra incubator or brooder as breeding room.

**Frequently Asked Questions (FAQ)**

<table>
<thead>
<tr>
<th>Troubles</th>
<th>Expected Causes (Possibility)</th>
<th>Countermeasures</th>
</tr>
</thead>
</table>
| In case hatching rate is low | - When the egg is an unfertilized egg.  
- Getting infected by germs  
- Wrong incubation setting  
- Health condition of mother bird  
- Improper egg turning | - Check possibility of egg surviving  
- Disinfect the incubator  
- Check all settings of incubator. Especially, check them focusing on the temperature.  
- Review care of health of mother bird.  
- Check if egg turning is normal. |
| When a chick hatches out earlier than expected or a deformed chick hatches out | - Setting temperature too high  
- Egg turning was not operating normally | - Lower temp. setting of the incubator about 0.5°C (1°F)  
(ex) 37.5°C → 37.0°C  
- Check if egg turning function is OFF |
| When a chick hatches out later than expected | - Setting temperature too low | - Raise temp. setting of the incubator about 0.5°C (1°F)  
(ex) 37.0°C → 37.5°C |
| When hatching dates are so different from each egg (When all chicks don’t hatch out at the same time but over a long period) | - Eggs stored for different lengths of time  
- Different incubation temperatures | - Set limits to egg storage time properly  
- Check Temperature difference in the incubator. (sunlight, temp of incubation room, etc.) |
How to protect eggs being hatched from failure of incubator due to power cutoff or out of order

If electrical power is back on within 2-3 hours, it will hardly affect eggs being hatched. However, in case incubation stops due to failure of incubator, as a temporary measurement, insulating material (e.g. blanket) should be covered over eggs being hatched to keep their temperature from going down. Thereafter, immediately call incubator manufacturer or seller to ask for prompt assistance.

As an emergency measurement, use Styrofoam box or other boxes capable of keeping warmth to ensure that internal temperature be maintained at 37°C ~ 38°C (98.6°F - 100.4°F). However, though, in reality, it will not be easy to keep temperature exactly at 37°C ~ 38°C, it is proven by test that hatching rate is not seriously affected, though a little diminished, if temperature is kept in 35°C ~ 40°C range for 3~4 days.

Risk of electric shock.

How to make insulating box for temporary use
Make two vents of proper size in a Styrofoam box (30mmX 30mm)

For assembly of three-wave bulb, refer to ‘how to make brooder’ in Rcom website.

How to measure internal temperature of box ;
Put a thermometer mounted 25mm up from the bottom in an internal edge of Styrofoam box and then keep three-wave bulb turned on for about 30 minutes. Then, temperature is measured. If it is high, open vent wider and if low, open vent narrower. With this way, adjust internal temperature. Once the temperature is adjusted to 35°C ~ 40°C (standard 37.5°C), move eggs to box. At that time, be careful not the eggs collide each other so as to avoid causing cracks in egg shells. Cracks thus caused are likely to prevent eggs from being hatched and leave them under-grown. If cracks happen, instant adhesive should be glued around cracked area to stop infiltration of bacteria.

How to do egg turning manually:
Turn eggs around manually about 100-150 degree 3-4 times daily.

Hatching rate is hardly affected by no humidification for several days.

Hatching result could be affected with various factors, and manufacturer do not have any responsibility for loss of eggs or birds.