BREEDING AND EGG INCUBATION
DO YOUR POULTRY ROCK AND ROLL?

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HISTORY

- The practice of incubation originated more than 2,500 years ago in Egypt and China.
- Many different heat sources were tried.
GETTING STARTED

- What is the purpose of the chickens' offspring.
- Will they be used for strictly laying, or other purposes?
- If for eggs only, you should attempt to "breed out" several different traits, including **broodiness**.
  - Why? A broody hen stops her laying cycle, and this reduces the overall egg/chicken ratio.
One may also consider breeding for feed efficiency.

The less feed you have to feed them, the greater your profit.

Fecundity, or the ability to lay eggs, is of obvious to the producer wanting eggs from the flock.
WHAT IS THE PURPOSE OF THE BIRDS?

- What about meat birds? If you are trying to breed chickens for consumption, then breed the fastest growing birds in the flock.
- Breed for meat production- the conversion of feed to meat.
- The faster the bird grows, the less time and resources spent raising them and the larger your profit!
GETTING STARTED

- The eggs selected for incubation need to be fresh, biologically perfect eggs from healthy birds that have reached a certain age:
  - chickens, 8–9 months
  - ducks, 6–7 months
  - geese, 9–10 months
  - turkeys, 8 months.
- Birds should be examined for good health.
- Birds should have clear bright eyes, have a red comb without any blue edges and the birds should be bright and alert.
- Nostrils should be clear of mucus and breathing should be without any wheezing which could be a sign of respiratory problems.
A sound diet and good management of the birds during breeding is essential not only to maintain good health but also to provide good hatchability and healthy chicks.

A 16-20% protein diet for layers is recommended.
Production records for each hen can be useful.
Which were the good layers and which the bad?
Select eggs from the good producers.
It’s important to know that egg productivity is not a very heritable trait. The only way you can really tell if an unborn chick is going to be good at laying eggs is if you take the average egg productivity of It’s entire ancestral line.

How the hen looks and how quickly it fattens are both very heritable traits.
CHOICES

- Use an incubator for the incubation period.
- Allow the hens to “set” the eggs.
CHOICES

- If allowing the hen to set the eggs, keep nesting areas low so hatching chicks do not have a chance to fall.
- Keep drafts to a minimum
- Keep temperature in the hen shed as consistent as possible.
- Provide clean fresh water and plenty of appropriate feed.
GETTING STARTED

- Eggs for hatching should be checked for size, shape, color and texture.
- Do not use double yolk eggs.
- Do not use thin shelled eggs.
- The better the egg quality, the better the hatchability.
- **Fertile egg**
  The egg will appear to have a black spot which as the embryo grows and incubation continues will grow larger until light will only pass through the air cell end of the egg.

- **Infertile egg**
  Eggs appear clear.
THE BREEDING PROCESS

- Select the best birds.
- Set up or clean the breeding pen.
- Allow the cockerel 10 days with the hens before collecting eggs for incubation so that they are fertile.
- If changing cockerels or removing hens from a larger run with other cockerels present, it is necessary to wait 14 days otherwise you can get fertilized eggs from the wrong cockerel.
THE BREEDING PROCESS

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A Hen and Rooster will mate. 
Semen goes inside of the hen and is stored in her reproductive systems. 
Her body then delivers the semen onto the embryo at the correct time (before the shell forms around the embryo).
The hen can leave the nest and the egg cools down.
Incubation has NOT started.
The hen will lay several eggs—called a clutch.
The eggs start development at the same time and in extension they all hatch at the same time.
Gather the eggs daily to help prevent a hen from setting.

If eggs are stored before incubation, they should be kept in a cool place, away from bright sunlight and sources of heat.

Store them pointed end down and turned 90 degrees twice a day.
EGG CLEANLINESS

- Do not wash dirty eggs or wipe eggs clean with a damp cloth. This removes the egg's protective coating and exposes it to entry of disease organisms.
- The washing and rubbing action also serves to force disease organisms through the pores of the shell.
STORAGE BEFORE INCUBATION

• The easiest way to achieve turning is by placing eggs on an egg tray or large egg box and placing an empty half dozen box under one side of the tray in the morning and the other side in the evening so that they are lifted by 45 degrees from horizontal one way, then the other.

• Eggs can be stored for a week without degrading hatchability too much.
DID THEY HATCH YET?

How long do you have to wait?

- for chicken eggs is 20–22 days
- duck eggs, 27–28 days
- turkey eggs, 26–28 days
- goose eggs, 29–30 days
- If using an incubator- start the preparation process.
Before placing the eggs into the incubator, it should be set up and running for at least 24 hours. A week is even better.

This provides time to check the operation of the incubator and allows time to make any necessary adjustments before setting your eggs.
The main physical factors in the conditions of incubation are temperature, relative humidity, and rate of circulation of the air in the incubator.
An improperly adjusted incubator that reaches an internal temperature of 105 degrees can kill the viability of the eggs.

Don't confuse internal egg temperature with internal incubator temperature.

The temperature in an incubator changes constantly, rising and lowering. The temperature inside the egg will be an average of this temperature swing in your incubator.
CHECK YOUR DATA DEVICE!

• The accuracy of the thermometer is extremely important!
  
  • Thermometers go bad. Keeping the temperature accurate can be a struggle, even with very good thermometers. Have a back up.
  
  • After the first hatch, you can raise or lower the temperature by what the hatch tells you.
  • If they hatched early the temperature needs to be lowered. If they hatch late the temperature needs to be raised.
TEMPERATURE AND HUMIDITY

- Still-air incubator (no fan): 101.5 degrees F. measured at the **TOP** of the eggs.

- Fan Forced incubator: 99.5 degrees F. measured anywhere in the incubator.
TEMPERATURE AND HUMIDITY

- Humidity: 60-65% for the first 18 days, 80-85% for the last 3 days.

- Humidity can vary much more than the temperature can. The combination of poor humidity and temperature will definitely cause problems at hatch time.

- The bigger the deviation from the proper temperature, the bigger your problems will be!
CONTROLLING HUMIDITY

- Putting clean fresh water in a small pan will help increase humidity.
- Surface area is "the amount of surface of water exposed to air in your incubator".
- If the humidity is too low in your incubator, add surface area. Place another pan of water in the incubator, or some small, wet sponges.
- To decrease the humidity, reduce the surface area.
INCUBATORS COME IN MANY STYLES
- Humidity will be harder to keep at proper levels in the winter as the air is dryer.
- You cannot do the same things winter and summer to maintain the same humidity.
- The location of the incubator is also important. In a home with forced air heat, the humidity will be lower in the winter.
HYGROMETER

- To Measure Relative Humidity
DISEASE POTENTIAL- AVOID IT!

- Locate the incubator away from growing facilities.
- The equipment and newly hatched chicks can be contaminated by older birds, and the dust that accompanies growing birds.
TURNING EGGS- AUTOMATICALLY

- This can fit into a smaller incubator.
A LARGER AUTOMATIC TURNER INCUBATOR
The eggs of chickens, turkeys, and ducks are incubated in a vertical position (with the air cell on top), and those of geese are incubated in a slanting or horizontal position.
INCUBATION

- Place eggs on their side with small end pointed slightly down.
- Do not overcrowd the eggs.
- Use care in turning eggs to avoid shocks or jars that may rupture the blood vessels of the germ.
Eggs must be turned at least 4-6 times daily during the incubation period, this prevents the embryo and membranes from adhering to the shell and keeps the membranes from growing together.

Do not turn eggs during the last three days before hatching. The embryos are moving into hatching position and need no turning.
Can you tell the sex of the chicken from the feathers alone?

Yes, if the breed is feathersexed. The female chicks' primary feathers will be longer than the males. It is difficult to tell the sex of a newly hatched chick if the breed does not have the feathersexed characteristic.
- Chickens can be hatched in the incubator, but this increases the down and dust.
- If possible move the eggs to a hatcher two or three days prior to the expected hatch date.