POULTRY INCUBATION

HATCHING FOR SUCCESS

GRA MOORE

CAROLINA HERITAGE FARMS

FOUR BASIC REQUIREMENTS AN EGG NEEDS TO HATCH

Temperature	**99 - 102 Deg. F.**
Humidity	**50%-65% RH**
Egg Turning	**at least 2x/day**
Air Flow	**air and gas exchange**

TWO TYPES OF INCUBATION

ARTIFICIAL

INCUBATOR

NATURAL

BROODY HEN

NATURAL

1. The Broody hen is a time tested way to hatch eggs.
2. Very good at her job.
3. To use a hen for hatching you have to do one of two things
    a. Find a hen sitting.
    b. Induce a hen to sit.

SIGNS OF BROODINESS

1. Clucking
2. Stays away from the rest of the flock
3. Ruffled feathers
4. Aggressive and protective of nest
5. On the nest at night

CARE OF THE BROODY HEN

1. Hens like dark dry places to sit.
2. Needs to keep away from other hens (other hens will break her eggs).
3. Needs good supply of water and food.
4. Needs an area to stretch her legs and relieve herself.
5. Make sure hen is free from internal and external parasite.

BREEDS THAT MAKE GOOD BROODY HENS

- Silkies
- Cochins
- Game Hens
- Wyandotte
- Orpingtons

Barred Rock

Buckeyes

- Silver Leghorns
- (Non-Industrial)
- Most Heritage Breeds
  (They retain the broody characteristics)

Heritage Turkeys

PROS

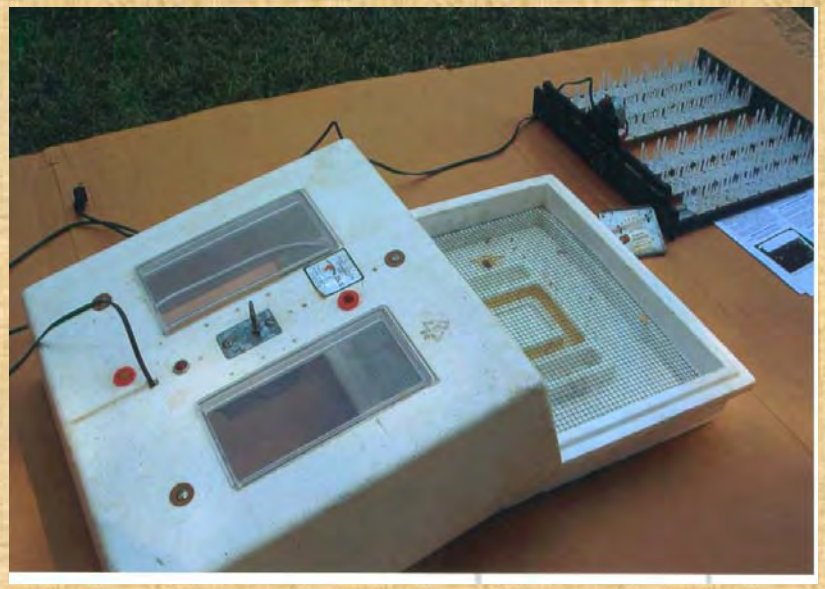
1. No electricity
2. Hen does all the work
3. Will brood chicks after they hatch.
4. High hatchability rate
5. Some breeds hatch better under hens (Nankin) than in incubators.
6. Good for hatching small # of chicks per year.

CONS

1. Hen sometimes breaks eggs.
2. Will occasionally quit and get off nest.
3. Hen sitting is 1 less not laying in the flock.
4. Can only sit on a small # of eggs at a time.
5. Disease transmission from hen to chick

ARTIFICIAL INCUBATION

Still Air Incubation:



1. No fan
2. Has a heating element
3. Uses a wafer thermostat
4. Humidity or water pans at bottom
5. Relative humidity of 50% -60%
6. Temperature 101-102 degree

7. Most made of Styrofoam or plastic (home made can be made of other material)
8. Screen for eggs to lie on
9. Egg turning kits are available for some models
10. Will hold a limited number of eggs
11. Operate in a room temperature of 50-80 degrees (out of sunlight)
12. Incubate and hatch on same wire floor

TYPES OF STILL AIR INCUBATORS

1. GQF
2. Little Giant
3. Brinsea
4. Home Made

PROS

1. Easy to use
2. Not very expensive
3. Does not take up much room
4. Good for hatching small to medium # of chicks
5. Does not use much electricity

CONS

1. Hatchability can be low
2. Temperature and humidity can be hard to regulate
3. Some models you have to turn eggs by hand
4. Hot and cold spots in incubator
5. Can have high number of deformities in chicks
6. Can be hard to clean

Forced Air Incubation

1. Fan
2. Coil heating element
3. Wafer or electric thermostat
4. Humidity pan
5. Relative humidity of 50% -60%
6. Ideal Temperature is 99.5 degrees F

7. Some models have hatching tray at bottom
8. Openings in back of incubator for humidity
9. Automatic egg turner (turns every 2 hours)
10. Large egg capacity
11. Operate in a room temperature of 50-80 degrees
12. Draft free room with fresh air

FORCED AIR TYPES

1. GQF
2. Dickies
3. Roll X-Incubators
4. Nature Form
5. Brinsea Bators
6. Hovabator & Little Giant still air with forced air fan kit
7. Home Made
8. Robbins – no longer made
9. Petersime – no longer made
10. Jamesway – no longer made
11. Buckeye – no longer made

Homemade type

Nature form “Safari”

PROS

1. Hatchability usually very good
2. Most Forced Air Styles will last for years
3. Incubators can easily hatch several thousand chicks per year
4. Fairly easy to clean
5. Almost a turn key system

CONS

1. Can take up a lot of room
2. Can be expensive to buy

FORCED AIR HATCHERS

1. Same as incubator but has hatching trays instead of turners
2. Hatcher temperature should be set at 98.5 deg. F and humidity 65% or higher.
3. High heat and high humidity is a lethal combination

EGG COLLECTION

1. Collect eggs every day
2. Should use a good nesting material
   a) hay
   b) wheat straw
   c) pine shavings
3. Only set good quality eggs
   a) no cracked eggs
   b) really small eggs
   c) really big eggs (double yolked)
   d) abnormally shaped eggs
   e) extremely dirty eggs
   f) thin shelled eggs

SANITATION OF EGGS

1. Warm water and bleach
2. Warm water and dish soap
3. Tek-Trol disinfectant
4. Extremely dirty eggs do not set
5. Pooled eggs
6. Custom hatching

EGG STORAGE

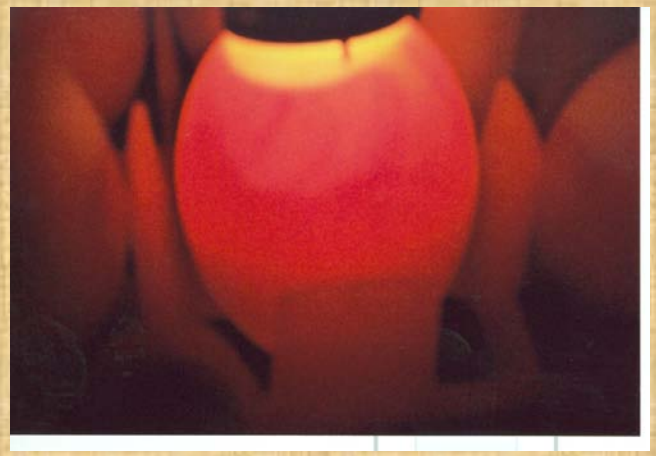
1. Ideal storage for eggs should be around 55 deg.-
   60 deg. F. at 70% -75% humidity
2. Cell division starts at 72 degrees F
3. Good places to store eggs:
   a) egg cooler
   b) closet in house
   c) shop or barn
   d) anywhere it is close to desired temperature
      and humidity
   e) does not have to be exact to be successful
4. Turn eggs at least 2 x a day to prevent yolk sticking.
5. Eggs should not be stored much longer than 10
   days.

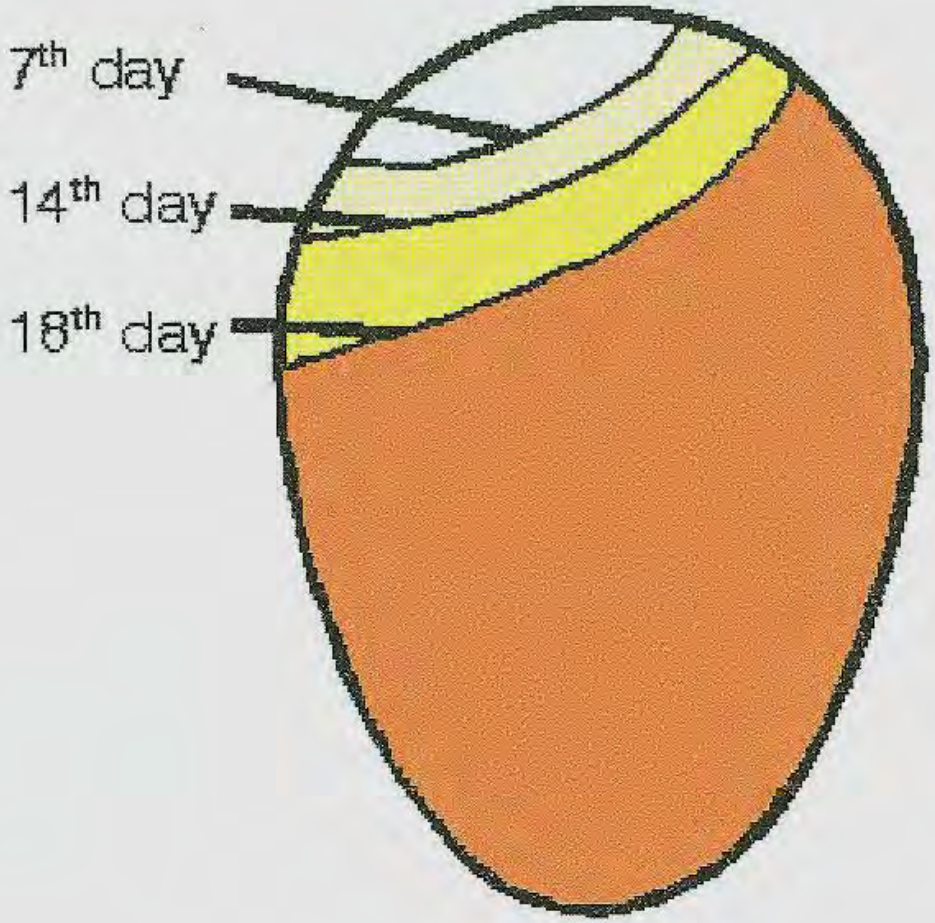
SETTING EGGS

1. Regulate incubator temperature and humidity and let run for 2-3 days.
2. Set eggs in trays little end down big end up (air cell).
3. After eggs are set, expect incubator temperature to drop, temperature will regulate.
4. Predation in incubator

CANDLING EGGS
(Candler, Flash light or Light Box)

1. Candle eggs after 7-10 days to check for clears and blood rings.
2. High number of clears could mean infertile roosters.
3. High numbers of blood rings could mean unhealthy or old breeding stock.
4. Good way to check on the progress of the embryo
5. Make more room in incubator or hatcher
6. Keep bacteria down
7. Good way to check humidity level





Size of air cell on 7th, 14th and 18th day of incubation

HATCHING PROCESS

1. Three days before eggs are scheduled to hatch; eggs should be placed on their side in the hatching tray.

2. Raise humidity to 60% or higher.

3. Lower temperature to 98.5 deg. F. @ 1 degree.

4. After chicks hatch leave in hatching tray for 24 hours to harden off.

5. Return temperature and humidity back to where it was.

6. Trouble shooting

7. Culling weak chicks (Methods)

8. Toe punching to identify matings

9. Keep good records to track your success

Having problems getting your eggs to hatch?
Use this chart to trouble shoot incubation problems.

Incubation Trouble Shooting Chart		
Symptoms	**Probable Causes**	**Suggestions**
Many clear eggs. No blood. (Determined by candling, then broken out appearance.)	1. Infertility. Too few males, too many males, males too old, males inactive, or frozen combs and wattles. 2. Embryo died early 1-2 days.	1. Use young vigorous males. 2. Do not hold eggs longer than 7 days. Keep at temperature of 50-55 degrees. In moist atmosphere. Gather often.
Slight blood rings	3. a. Improper temperature. b. Fumigation 4. Improper care of eggs before setting	3. a. Check accuracy of thermometer. Check thermostat, heating element, current supply. Check operating temperature against instructions. b. Do not fumigate at high concentrations during the first 5 days of age. 4. See suggestion (2) above

Many dead germs	5. Temperature too high or too low. 6. Improper turning of eggs 7. Improper feeding of flock 8. Breeding (low hatchability inherited). 9. Improper ventilation, insufficient oxygen.	5. see suggestion (3) above 6. Turn at least 3 times, preferably 5 every 24 hours. 7. Check vitamin and mineral content of breeder mash. 8. Avoid close inbreeding. 9. Increase ventilation of incubator and incubator room, avoid drafts.
Pipped eggs not hatching. **Hatch non-uniform.** **Hatching too early.** **Hatching too late.** **Sticky hatch.**	10. Insufficient moisture. 11. Too high temperature. 12. Too low temperature. 13. Probably too high temperature.	10. Increase evaporating surface for moisture. First 18 days wet bulb of 85-87 degrees, 3 day hatching period 89-90 degrees. 11. See (3) above. 12. See (3) above. 13. See (3) above.
Cripples or malpositions	14. Temperature too high. 15. Too low temperature. 16. Improper turning or setting. 17. Hatching trays too smooth.	14. See (3) above. 15. See (10) above. 16. See (6) above. Set eggs large end up. 17. Use wire bottom trays.
***Very large, soft-bodied, weak chicks.** **Mushy chicks.** **Dead on trays, bad odor.**	18. Low average temperature. 19. Poor ventilation. 20. Navel infection in incubator.	18. See (3) above. 19. See (9) above. 20. Careful cleaning and fumigation of incubator between hatches.

INCUBATOR SANITATION

1. Should clean incubator racks and trays every 2-3 hatches.
2. Chick fuzz and fecal matter will accumulate quickly.
3. Vacuum chick fuzz and dirt.
4. Use Tek-Trol or Bleach for cleaning.
5. Easy to let slide, but very important.

PROBLEMS ASSOCIATED WITH DIRTY INCUBATOR

1. Mold build-up
2. Bacteria contamination
3. Low hatchability
4. Deformities in chicks
5. Eggs exploding due to bacteria build- up
6. Disease problems

BIO-SECURITY

1. Wear certain clothes and boots only while tending your poultry or hatching area.

2. Clean boots and disinfect at the beginning and end of each visit to your poultry or hatching area.

3. Store feed out of reach of rodents and wild birds.

4. Regularly clean and disinfect buildings, pens, equipment, incubators and hatching area.

5. Use common sense if you tend a poultry sale or auction.

6. Have a quarantine area set up for new birds approximately for 30 days.

7. If you are pooling eggs with other breeders be sure breeders birds are clean.

8. Limit traffic on your farm.

9. Not wise to let people borrow your incubator.

10. Develop a bio-security plan for your farm and hatching area.

11. Visit the ALBC website section on bio-security.

12. Vaccinate your breeding flock.

13. Participate in the NPIP.

MARKETING YOUR POULTRY

Big demand for heritage poultry

1. **Exhibition poultry**
2. **Backyard flocks**
3. **Pasture poultry producers and niche marketing.**

GETTING YOUR NAME OUT

1. Put ad in state agriculture paper.
2. Join breed clubs and breed list-servers
3. Join ALBC and have your farm listed in the Breeders directory.
4. ALBC Classifieds
5. Develop a web site
6. Get to know the local farmers in your area
7. Develop relationship w/local feed stores.
8. Local processors
9. Animal Welfare Institute (encourage locally sourced chicks)