Incubation and Embryology - University of Illinois

Operating a Still Air Model Incubator

Note: It is recommended that you operate the still-air incubator with a small quantity of inexpensive eggs to be assured of your operating procedure and the performance of the incubator, before attempting to hatch large quantities of eggs or expensive eggs. **If you are using any other kind of an incubator besides still air, then follow the instructional manual of the incubator.**

Location

The location of the machine is important to successful operation. A room temperature of 70-80 degrees F. is ideal, and fresh air without drafts is necessary. A well-ventilated basement room is often just right. Be sure no direct sunlight strikes the incubator and that it sets level.

An incubator or brooder is designed to bring normal room temperature to the desired temperature. Room temperature of 60 degrees F. or below will reduce the temperature in the incubator. Room temperature changes of 10 degrees or more will change the temperature in the incubator. The change is more pronounced below a temperature of 70 degrees F.

Setting Up the Incubator

After removing the incubator, notice that the top has the windows, heater and thermostat. Place the bottom on the table. The thermostat adjusting screw and wing nut are stored beneath the **brass wafer** in the bottom of the incubator. Insert finger in slot and lift wafer to remove these items. See **Thermostat Operation** to install these items in the thermostat.

Some models of the incubator have printed on the rim of the top and bottom, the word **Front** to designate the front and back of the incubator.

Other models have two notches in one side of the rim of both the top and bottom that when matched up will permit the exit of the electric cord when using a turner. The side with the two notches is the back of the incubator.

Place the wire floor in the bottom of the incubator so that it lays flat.

Thermometer Instructions

Remove the thermometer from its box and place it in center of right side of the bottom, against rim and facing towards the center. This is the correct position when using an automatic turner and can be seen from the window. Adjust the thermometer stand so it can be seen from the window.

Place thermometer on floor of incubator where it can be read through the window. When using the automatic turner, the thermometer must be placed on the right side.

Remove the thermometer from the box and bend the metal stand so that the bend in the flange is 1/8" above the floor when sitting on the floor . This may be varied slightly for easier reading through the window of the incubator.

Thermostat Operation

Put wing nut on the adjusting screw about 3/4 of the way. Put adjusting screw through center hole of the top and screw into the thermostat about 1/2 inch. Screw wafer onto end of Adjusting Screw until snug. The incubator is now ready to operate.

Plug electric cord into electrical outlet. Turn thermostat adjusting screw clockwise until pilot

light goes out (you may hear switch click).

Turn adjusting screw four complete turns counter clockwise. The pilot light will come on. Any time the pilot light is on, the heater and fan (if you have one) will be on. Any time the pilot light is off, the heater will be off.

As incubator warms up, the thermostat wafer will expand, turning off pilot light and heater.

When pilot light goes out, check the temperature. If it has not reached 100 degrees F., turn adjusting screw counter clockwise one or two full turns. (To help in regulating, always leave adjusting screw pointing straight up, down, left or right. After each setting tighten the wing nut, so the adjusting screw will stay in place. For fine adjustment make corrections 1/4 or 1/8 of a turn). Permit time for incubator to heat up until light goes out.

If temperature has not reached 100.5 degrees F., repeat process until 100.5 degrees F. is reached. Fine adjust thermostat to hold as close to 100.5 degrees F. as possible. If it does not hold exactly on 100.5 degrees F., regulate so that it turns on and off the same above and below 100.5 degrees F.

Remember - Temperature setting can vary as much as 1/2 degree above and 1/2 degree below your desired temperature.

Important - Please Read Carefully

Please read the instruction on **Thermostat Operation** again. Some users will heat the incubator with thermostat wafer too far from the thermostat switch, over heating the incubator (above 110 degrees F.), which can break the thermometer and damage the thermostat wafer.

Temperature

The Thermometer will always be sitting on the wire floor of the incubator. In a still air incubator, the closer you get to the top of the incubator, the higher the actual temperature.

We have worked out scientifically the proper thermometer reading for different size eggs, when on their side on the floor and when they are in the automatic turner. When setting eggs of different sizes, you will have to use an average half way between temperature in the chart below.

Operating Temperature for Manually Turned Eggs Laying on Wire Floor (Do not use these temperature when using an automatic turner).	
Quail Eggs	100.5 degrees F
Bantam and Pheasant Size Eggs	100 degrees F
Chicken and Other Large Eggs (including Goose)	100.5 degrees F

Operating Temperature for Eggs in Automatic Turner	Summer	Winter*
Quail Eggs	99 degrees	98 degrees
Bantam and Pheasant Size Eggs	98 degrees	97 degrees
Chicken and Other Large Eggs	97 degrees	96 degrees
Duck Eggs	95 degrees	94 degrees

(Do Not Set Goose Eggs in Turner)

*Winter operation requires lowering operating temperature to prevent overheating top of eggs. Use these temperature throughout the entire incubation period. Three days before eggs are to hatch, remove the eggs from the turner, lay them on their side on the wire floor, and increase temperature two full degrees above your operating temperature for hatching.

When the turner is removed for hatching, turn adjusting screw one full turn counterclockwise. The motor on turner produces heat and this should correct this situation. Fine adjust after temperature stabilizes.

Caution - About half way through incubation process, you will note an increase in temperature, and you will have to adjust thermostat down nearly one full turn. This is normal and is caused by the embryos forming into chicks and generating heat. Check temperature daily.

Regulate the temperature for desired setting and be sure it holds this temperature for two to three hours before putting eggs in incubator. If using a turner, regulate incubator with the turner in the incubator and plugged into an electrical outlet.

When you put cold eggs in incubator, it can take three hours or more for eggs to warm up and temperature to stabilize at the setting you had before adding the eggs. Also, when you open the incubator, it can take up to two hours for temperature to stabilize.

If chicks hatch out a day early, it indicates temperature was a little too high, so on next setting lower temperature by 0.5 degrees for entire incubation period. If chick hatch a day late, raise temperature 0.5 degrees for entire incubation period.

Select and Grade The Eggs

Eggs must be fresh and fertile. Don't use eggs over 15 days old. Eggs being saved for hatching should be protected from freezing. Discard small or poorly shaped eggs and any with cracked or thin, porous shells. Set only eggs that are clean and of uniform size.

Setting and Turning Eggs

Manual Egg Turning - Place eggs on their side with small end pointed slightly down. Do not overcrowd the eggs.

The eggs should be turned three times a day. Turning the eggs is best done by removing about a dozen from the center and rolling the rest of them toward the center. Place the palms of your hands on the eggs and roll them around until you are sure all have been turned, and then put the eggs taken from the center around the outer edge. Use care in turning eggs to avoid shocks or jars that may rupture the blood vessels of the germ. Do not leave eggs standing on end. Keep them flat, pushing the pointed ends down a little with the hand. With a soft lead pencil, put a small "X" on one side of egg and "O" on the other side so you can be sure of turning the eggs.

Automatic Egg Turning - Place turner on bottom of incubator with the motor side to the back of the incubator (rim of bottom with notches is the back). Slide turner as close as possible to the front rim of bottom of incubator. Be sure the turner sits flat on the wire floor.

Use a serrated kitchen knife to cut out the notch in the corner by the motor. This will permit the electric cord from the motor to exit from the incubator.

Run the electric cord through the notch and press to the bottom of the notch.

(Do not set goose eggs in turner)

Note: This Turner runs very slowly--only one revolution in 4 hours.

Moisture

Moisture in an incubator prevents excessive drying out of the natural moisture in the egg. It is impossible to give any set rule for supplying moisture. If the incubator is operated in a damp cellar or in a room with considerable natural moisture, then it may not be necessary to supply artificial moisture. If operating in a dry climate or in dry room, moisture will be

needed. The important thing to watch is the air space in the egg. When testing eggs for fertility, note the size of the air space. If the air space is too large, provide moisture.

Moisture in the incubator is controlled by putting water in the small inner trough of the bottom. The small trough by itself will increase the humidity to take care of most climates. If you live in an extremely dry climate you may need moisture in the larger outer trough instead of the small trough. During time of hatching, you need higher humidity that is usually provided from moisture of hatched chicks drying off. Check and fill water trough twice a week.

Important: In the winter time, three days before time to hatch, put water in both troughs of bottom to compensate for extra dryness of air.

Special Notice: Spray duck and goose eggs thoroughly with water twice each week, and spray at least three times a week during the last ten days.

Hatching

Three days before total incubation and hatching time, discontinue turning eggs.

The automatic turner must be removed from the incubator or the eggs must be moved to a separate incubator for hatching. Do not attempt to hatch eggs while the turner is in the incubator, as the slow turning egg racks could crush the chicks.

Lay eggs on wire floor with small end pointed slightly down.

Plastic Vent Plugs

The front vent plug (just below label) is used to regulate humidity and the back vent plug (by electric cord) is used when there is excessive humidity, as follows:

When incubator is over 75 percent of capacity, remove the front vent plug one week before hatch date. The day that chicks start to hatch, remove the back vent plug. If incubator is over 90 percent of capacity and contains large chicks, it may be necessary to prop one side of the incubator top up about 1/8 inch to get chicks dry. Leave side propped up just long enough for most of moisture to clear on windows, but no longer than one hour at a time.

When incubator is from 25 to 75 percent of capacity, remove the front vent plug the day chicks start to hatch.

When there is moisture condensed on the windows, remove front vent plug.

Be sure to replace vent plugs before next setting of eggs.

If vent plug should be lost, close the vent hole with scotch tape.

Chicks may be removed 24 hours after they start to hatch. Extremely wet chicks should be left in incubator to dry.

Plan to remove chicks once a day, as every time incubator is opened, warm moist air escapes. Avoid chilling of wet chicks.

Some chicks may be late in hatching, so you can leave remaining unhatched eggs up to two days longer.

Brooding

When chicks are removed from the incubator they must have a place that is warm and dry. A brooder should have one section that is heated, with a temperature of 95 degrees F (for the first week) and an unheated section for exercise. Food and water should be partially in the heated area. Temperature should be reduced five degrees each week until it is down to 70 degrees F. Some types of chicks need a temperature around 70 degrees F. until they are nearly grown.

Incubator top is not satisfactory as a brooder, as there is not sufficient heat and the chicks may peck it to pieces.

Feed and water chicks at once. Check with your feed dealer for proper feed for type of chicks you have hatched.

Specials Points To Remember

Do not bother the regulator unless it is absolutely necessary. The working of the machine may be affected if the regulator is tampered with excessively.

If the machine does not heat, carefully investigate and see if you have all connections properly made.

Do not overcrowd the eggs.

Keep the eggs clean. Perspiration from the hands or any sort of grease stops up the pores of the shells.

Clean you incubator after each hatch with bleach water. Scrubbing of moisture troughs may cause leaks.

Return to **Resources**
