

In general for all incubators:

- The placing of the machine is most important.
- There must be no sunlight on machine.
- There must be no draft on the machine.
- The temperature in the room must be between 20 and 34 degrees centigrade, temperatures below 20 degrees will result in hot or cold spots throughout the machine.
- Some eggs will hatch and some won't hatch.
- If your temperature falls below 20 degrees, install a heater with a fan to increase the average room temperature.
- Higher temperature than 34 degrees will result in the eggs overheating. If your room becomes hotter than 34 degrees centigrade you have to cool it down.

There are various ways of cooling the room down.

- To have an extractor fan at the top to take the hot air out and cold air must be brought in at the bottom underneath the door or you can put in an air conditioner.
- The air conditioner must not be blowing straight at the machine because you will cool down the front section of the machine or the side section or the back section of the machine but not the whole machine evenly.
- You can also wet the roof or the exterior walls of the building, which will cool down the building itself.

Ventilation throughout the incubation room:

- There has to be enough fresh air in the incubator room.
- If there is not enough fresh air in the incubator room, there will be a lack of oxygen; there will be an increase in humidity especially when you're using a very small incubator room.
- The machine itself blows out hot humid air which will fill up the whole room and eventually the machine can't handle it anymore and the machines humidity goes higher, resulting in the chicks drowning inside the eggs because they cannot get rid of the excess water.

The basic roller machine

- To set up, plug in; fill the humidity evaporation bowl through the brass pipe, from the outside with normal tap water.
- Fill the plastic bottle either on the left hand or the right hand side with distilled water. The plastic bottle is then inserted into the round retainer upside down and screwed down with a steel screw.
- Insert the 300mm glass thermometer through the roof, through to the wick. Make sure it is properly inside. Then tie up the shoelace to the thermometer with a little bit of cotton. This wick must be cut at least 25 mm every 3 weeks.
- Leave the machine on for approximately 6 hours to stabilize.
- The machines are factory preset at 37, 3 degrees centigrade. If the temperature does not go up to 37, 3 degrees centigrade on the digital thermostat increase the room temperature.
- Insert the glass thermometer on the side of the machine through the temperature test hole, which is clearly marked with an arrow. That temperature on the glass thermometer should be in the region of 37, 3 degrees. It can be, 3 degrees out. So 37 up to 37, 6 degrees is good enough. Then put the glass thermometer back into the humidity wick and you adjust the humidity by opening and closing of the inlet and outlet vents. Which are the two square little metal pieces covering two holes on the outside of the machine. You must open them evenly. That means the one opening must be as big as the other. Thereby you can regulate the humidity wet bowl thermometer reading for incubation is 29, 5 degrees centigrade for most eggs. That is pheasants, chickens and waterfowl. It is different for other eggs, for instance parrots; it is only between 28, 9 and 29 degrees. That gives a humidity of 40 to 45 %. For chickens we need a humidity of 55 %. A humidity of 55 % is a wet bowl temperature of 29, 5 degrees centigrade at 37, 3 degrees incubation temperature.
- The temperature that you read on a wet bowl thermometer (that is the 300mm glass thermometer which you have put in to the wick) is lower than the temperature you read on the digital indicator/thermostat.
- The thermostat shows you what the real temperature is inside the machine. The wet bowl thermometer shows you what the temperature is inside the wick with the water evaporating. There is a vast difference between those temperatures. They should never be the same. When the machine has stabilized out as far as the 37,3 degrees temperature is concerned and you have adjusted the humidity to be stable at the setting that you want for instance if you want it to be 29,5 centigrade. You can then open the machine and start setting the eggs. In a roller machine you pack the eggs with the sharp ends towards each other. Mark every egg with the date that it is supposed to hatch. From time to time you have to check the turning. Press the test turn button, the roller trays should be turning. It is also advisable to make 3 marks on your roller tray. The one to the extreme left, one to the extreme right and one in the center of it. Then make a center mark on the glass on the inside of the machine so that you can see if from time to time the machine is turning automatically from left to right. It has happened in the past that the chain has fallen off. You would then open the lid and fit the chain.

Care and maintenance of all incubators:

- All machines are made out of timber. If you store and pack the machine away with the humidity bowl full of water there will very soon be fungal growth right throughout the machine. The best is, before you pack the machine away, remove all water as well as the humidity bottle and let the machine run for approximately 4 days to completely dry out. Oil the turning shaft. Or you can take the turning gear of when you look inside the control panel. And grease the shaft again. You must check in general that all bolts and nuts are tightened.

Turning methods:

- All eggs can be incubated successfully in a rolling method. However in machines you have to watch out that they don't end up with the sharp end pointing up, and then you'll have breeched chicks. But not all eggs can be

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incubated in a tilting method. You can roll most eggs in a tilting machine if you pack them with their sharp ends and blunt ends parallel to the tilting axes. That means in the length of the tilting tray. Then you have the same as a 90 degree tilting action. For old primitive type eggs such as emu and ostriches a 90 degree tilting action is absolutely sufficient. They should have between 80 and 84 % hatch. Emu eggs hatch perfectly in a tilting incubator; however they have to be packed parallel and flat to the turning axes. The reason for this is, the blunt edge and sharp edge of an emu egg is not visible. And very often people will put the egg upside down with the air sack at the bottom; the emu chick will drown in the last week. That is not the fault of the machine, it is your fault. An easy way to see whether the emu eggs are definitely alive on around about the 40th or 50th day is if you float them in a bowl of water which is at approximately 33 to 34 degrees centigrade. These eggs will then dance or jump around. But those that don't dance or jump around is not to say that they have died, it's just a matter of they aren't moving yet. Don't throw them all away. Those you can put separately.

Correct airflow:

- There is a difference in airflow requirements in machines that are hatching or incubating, emu eggs, duck eggs, geese eggs. With small eggs they take a short while in the machine. A reasonable amount of oxygen and airflow through the machine is sufficient, however with big eggs, like emu eggs or ostrich eggs, these eggs take far longer to hatch and at the end of the hatching period they need more oxygen because the chick is starting to breathe inside the egg even though it hasn't piped yet, so with all our machines we put in an additional airflow so that more oxygen is absorbed through all the latter stages of incubation.

Cooling off phase:

- The cooling off phase is important only with certain eggs. Most important with geese and emus. What they normally do is take the egg out of the Hatcher and let it cool off for approximately 30 minutes, that is not when its ice cold outside but in the middle of the day so that there's no shock to the egg itself. What happens in the cooling off phase is that the air sack shrinks and sucks in more oxygen. The chick can then absorb more oxygen. It is also the time when the chick can get rid of its excess heat that it generates. Some eggs will not hatch unless you give them a cooling off phase. Some machines have a cooling of phase built in with a timer.

The incubation room:

- You have to see that there is enough airflow, oxygen, the temperature between 20 and 34 degrees centigrade no direct sunlight and no drafts