

PLEYSIER INCUBATORS cc

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How to choose the right incubator.

The choice is usually too small, to get a small price, rather too big at slightly more money for the correct machine.

Setters, Hatchers and Combo incubators.

What is the difference? In chicken farming, you set the eggs in a setter for the first 19 days; the temperature must be at 37.3 degrees centigrade humidity 55% of the eggs are moved every hour, on the 19th day the eggs are transferred to the Hatcher. In the Hatcher the temperature is 36.9 the humidity is 65%, the eggs are not moving and the chicks can orientate itself to start piping (breaking out of its shell). This way the results are the best and the least risk of infection. However not everyone can afford a setter and Hatcher as 2 machines, so the combo machine is used. A combo Hatcher has a setting section where the eggs are moving and a hatching tray where the eggs are not moving so that they can hatch. In a combo the risk of infection is large; the combo has to be cleaned at least once a month or after every hatch.

How big a machine do you need?

This depends on how many chicks you want to produce per week. If you want to produce 100 chicks per week, the machine must hold at least 300 eggs in total, every week you load 100 eggs on Wednesdays, and remove 100 chicks between Tuesday and Thursday after 3 weeks this you do every week. To hatch 100 per week you need 25 hens and 6 roosters in the same camp. The breeding hens lay 4 eggs per week if fed the correct breeding mix so $25 \times 4 = 100$ eggs $\times 3 = 300$ (capacity of incubator required) Hens in batteries, and layer breeds lay more eggs than we suggest, our model is based on free range and acceptable shrinkage. Eggs for hatching must be collected twice daily and stored at below 20 degrees centigrade, and turned twice per day, set only eggs younger than 7 days.

Example of machine needed, Chicks Hatched weekly and hens needed:		Machine	chicks
hatched	hens needed	35 egg push and pull	= 35 chicks every 21 days
8/10 hens	350 combo auto tilt	= 90 chicks per week	25 hens
400 combo auto roller	= 100 chicks per week	25 hens	500 combo auto tilt
= 132 chicks per week	33 hens	1000 combo auto tilt	= 264 chicks per week
66 hens	3x1000 setters+ 1x1000 Hatcher	= 1000 chicks per week	250 hens

When you are buying fertilized eggs in bulk you cannot fill a combo machine all at once. You should only put 1/3 of the machine capacity every week. This is because you are limited by the hatching capacity and not the machine capacity. To do this it is recommended that you use a separate Hatcher and setter.

Why set eggs on Wednesday?

This means that you never have to work on weekends. If you want to supply chicks on weekends you need to set eggs on Saturdays.

THE ARTIFICIAL INCUBATION OF EGGS FOR BEGINNERS:

It is your fault if the perfect egg does not hatch in an incubator where the temperature, humidity, turning method and airflow was correct.

PERFECT EGGS:

What is a perfect egg?

A perfect egg is an egg that was laid by unrelated parents, without diseases; the correct breeding food was given and the appropriate nesting conditions.

Most exotic birds in South Africa have been bred from imported parent stock, and are all very much related, the result is that you get weak chicks that die either in the shell, or shortly after hatching, that is not the fault of the machine.

If the parent stock is diseased, this disease can be carried through and infect the eggs, this is also not a fault of the machine.

THE CORRECT FOOD:

You have to work with nature. There are four seasons in nature; there are seasons of plenty and seasons of many insects, and seasons of no insects. Just before the breeding season, there is an increase of insects that means by that time, you have to increase the protein content and mineral content of the normal food that you are feeding. Add "stress pack" with your normal rations.

After the breeding season, the parent stock should loose weight, feed them just the maintenance food. You must de-worm them properly and the youngsters that you are raising make sure that you are giving them the correct food.

Also check that during the breeding season you are not throwing the food on the same spot in the camp all the time, because it could be full of droppings, fungus, and old rotten food.

TEMPERATURE:

Make sure that you know what the correct temperature is for incubation for different types of eggs.

For ostriches and emus the temperature is about 1 degree lower than for chicken eggs. This temperature is 36, 2°c for ostriches and emus. The temperature for chicken eggs is 37, 3°c. The temperature is higher for smaller eggs, like for instance budgies and finches; their incubation temperature is 37, 7°c.

Make sure that the temperature inside your incubator is the same as what it showed on your test thermometer, your digital thermostat, or the little dial that you bought at the hardware shop. Very, very often you get the result that the eggs don't hatch in the incubator, because the inside temperature is two degrees or three degrees higher or lower than the actual temperature that you want.

Digital incubators have to be calibrated, that means it can show a temperature of 40°c inside as 37, 3°c on the outside, no eggs will hatch in that machine and it is your fault for not calibrating it. The best way to check the temperature in your machine is to buy four "clinical thermometers"; these are the little thermometers they put under your tongue when you are not feeling well.

It is no use putting them directly into a machine without covering the mercury bulb with plasticine clay or putty, because if you don't cover it with plasticine clay or putty it will only show you the spikes and the highest temperature that might be in your machine for a few seconds. That is not correct; you want an average temperature that is why you put a ball of 20 mm putty around the mercury bulb of the clinical thermometer. You leave that in between your eggs for approximately one day for the whole machine to stabilize out, then you take them out and you measure or you read that temperature, that temperature is usually correct.

After that, you can see by how many degrees or points of a degree your digital thermostat is incorrect or your alcohol thermometer is incorrect, you can adjust accordingly. In case your incubator is using mercury contact thermostats, which is still one of the best thermostats ever invented, you are responsible for checking that it hasn't split and stop and switches on and off at a higher temperature than what is necessary. Digital thermostats can be out by as much as 9°c above and 9°c below the actual temperature inside the machine. Alcohol, glass and plastic thermometers can be up to 1°c out.

WHAT NEXT?

Now there are problems!

The glass thermometer is wrong. The digital thermometer can be 9°c out. The analog thermostat has been set against the wrong testing thermometer. The contact thermostat has been bumped and works to high, this is exactly when you start blaming the incubator manufacturer, and you say that his incubator is no good. That is not so. It is entirely your fault. You have to check the temperature inside the machine, go and buy at least four clinical thermometers and test the temperature inside the machine.

HUMIDITY:

There is a large variation in humidity settings for various different types of birds.

However, they all have one thing in common, that is a 15% weight loss during the incubation time before the bird pips. So, if you increase the humidity the egg will lose less weight because it cannot get rid of its water, and the end result would be a bird that is fat and plump and does not hatch. It hasn't got the strength to pip. Or it drowns in the egg shell.

The other problem is if the humidity is too low, some of the chicks are stuck in the egg shell because there is not enough humidity to have the membranes soft so that it can turn around. Then it also dies.

How to check the humidity:

In our brochures all the instructions of our machines have the humidity's for various types of birds in hatchers.

THE WET BULB METHOD:

You must first know what a wet bulb thermometer is.

It is a normal thermometer that has been pushed into a "wick" or cotton wick or otherwise a shoe lace that is submerged in water, so that the water evaporates on the bulb, when water evaporates; the temperature is colder than inside the machine. The wet bulb thermometer reading is not the relative humidity. A wet bulb thermometer reading of 29, 5 degree centigrade is 55 percent relative humidity. A wet bulb reading for 24 degree centigrade to 26 degree centigrade is a wet bulb reading for a humidity of between 30 and 40 percent. Do not confuse the temperature of the wet bulb with the percentage humidity. We have charts in every instruction manual that goes with the machine.

DIGITAL HUMIDITY CONTROLLERS:

Digital humidity controllers must also be calibrated, they are not correct when you get them from the factory.

The factory assumes that you are intelligent enough to know that. Most people unfortunately assume that it is correct, and they are not correct, you have to calibrate them against a wet bulb thermometer. Usually, it is not always the case, usually in a "Hatcher", which is not the same machine as an incubator or a setter, in a Hatcher the humidity is 10% higher and the ruling temperature is 0.8 degrees lower than the incubation temperature.

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 because then you will have bridged chicks. But, not all eggs can be incubated in a tilting method, most eggs can, however you can roll most eggs in a tilting machine if you pack them with their sharp ends and their 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 like Emu and ostrich a 90 degree tilting action is absolutely sufficient and should have between 80 and 84% hatch rate. However, if you do it in a laboratory and you are doing one egg per time and watching the percentage weight loss as well as the rolling temperature and you monitor one egg at a time individually, then you can get up to 90% hatch rate. The other 10% is where the chicks would have died in nature anyway.

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 that the blunt edge and the sharp end of an Emu egg, the difference is not very visible, and very often people put them upside down in the machine then the air sack is at the bottom and this 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 Emu eggs are definitely alive on round 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 do not dance or jump around is not to say that they have died, it is just that they are not moving yet. Do not throw them away.

CORRECT AIRFLOW:

There is a difference in airflow requirements in machines that are hatching or incubating Emu eggs, duck eggs, geese eggs and finch eggs.

With small eggs they take a short while in the machine, so a reasonable amount of oxygen and airflow through the machine is sufficient. However, with big eggs like Emu eggs and 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.

With all our machines we put in an additional airflow so that more oxygen is absorbed in the latter stages of incubation.

COOLING-OFF PHASE:

A Cooling-off phase is important only with certain eggs.

Most important with geese, Emus and a few other geese type wild water fowl, what they normally do is they take the egg out of the Hatcher and let it cool off for approximately 20 minutes, in the middle of the day so there is no shock to the egg itself.

What happens in a cooling-off phase is that the egg shrinks, the air sack shrinks and sucks in more oxygen, the chick can then absorb more oxygen. It is also the time that a chick can get rid of his excess heat.

Some eggs will not hatch unless you give them a cooling-off phase, and some machines have got a cooling off phase built in with a timer.

THE INCUBATION ROOM:

You have to see that there is enough fresh air going through the room, not a

Draft, just enough fresh air. Do not close all the windows because you will take all the oxygen out of the air.

You have to see to it that a temperature of between 26°C to 33°C in the incubator. Room. The machines cannot tolerate a temperature lower than 26°C and not a higher temperature than 33°C.

There must be no direct sunlight on the machine. There must be no draught on one side of the machine. Make sure there is only pure new air through the incubator room and not old air that comes from another incubator room or from where you are rearing chicks that can infect the eggs inside the incubator. It must be fresh, clean sterile air.

DISINFECTING YOUR EGGS:

The fumigation of eggs with formalin and condies crystals:

You use 40% formalin solution and you pour approximately 25 ml into a whisky glass. You take the whisky glass and you put it on top of a saucer, then you put the whisky glass and the saucer inside the incubator on the base. You then pour 1 teaspoon of condies crystals into the whisky glass, it will start bubbling and release a most poisonous gas that can make you blind. Close your incubator and close all holes and keep it on. If there are no eggs in the machine you can do this for approximately an hour and a half, do it outside the house however if there is no ventilation through the incubator room, because if you continuously look at it you will go blind and that is not my fault.

However when you are fumigating the incubator with eggs inside the machine, you must fumigate for only 10 to 15 minutes. This will not harm the eggs, and then you have to put a fan in your incubator room and open the incubator and make sure that all the fumigation gasses are extracted. Sterilizing your eggs with Vero Kill: only use a 1% solution and not 10%, you will then kill your eggs.

A FEW REASONS WHY EGGS HAVE NOT HATCHED IN OUR MACHINES:

Nine out of ten people blame the machine for eggs that don't hatch.

The actual statistic is that nine out of ten people do it correctly and the other one out of ten doesn't know what he is doing and blame the machine.

A few examples;

We had a chap in the Free State that went and bought a thousand eggs, he put it in our machine and nothing hatched. After long discussions and ducking and diving, because it was all blamed on us, we found out that he had bought the eggs at a supermarket, these eggs were previously frozen, they came from batteries and there are no roosters with those hens, so the eggs are not fertilized. My machines can not fertilize your eggs.

We had a man up in TZANEEN who bought one of our machines and repeatedly he couldn't hatch an egg out of it, no eggs would hatch.

He then goes sheepishly and asks the president of their poultry club what is the problem? They took twenty of his eggs and put them in another machine, also one of my machines, yet again in that machine nothing hatched, then after a week of the eggs not hatching on time, these eggs were broken open and the president of the poultry club realized that they weren't fertilized. He said well, I better go and have a look at this mans, hens and roosters to see what the problem is. Upon arriving at his farm he said, but were are your roosters? Noticing there are no roosters in the camp. He says, "no, the hens are laying eggs anyway; they don't need roosters, what for?" Well needless to say I cannot comment on that.

In the Emu industry there are a whole lot of fallacies because it is a new industry and every body has his own ideas of what to do. For instance; storing Emu eggs for 6 months, this is not possible. You must load an Emu egg as soon as you can, the longer you delay loading the egg, and the more chance there is for infection. The egg must also not be "handled", it must be picked up immediately and placed into a machine. You can store the eggs in a fridge at a temperature of 12 degrees, for not more than a week because thereafter some of your embryos will not hatch.

DON'T MAKE THE SAME MISTAKES

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 eggs 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 stabled 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 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

What you are about to read are not jokes, but actual situations that arose due to ignorance, and not reading the manuals and just discarding the manuals. The result was bad mouthing our machines, blaming our machines for their own mistakes. These instances were particularly by previously advantaged communities. People that never will admit their own mistakes.

Example 1. "Dear Johan, we have now loaded 1,000 eggs in your machine and none of these eggs have hatched. We are unhappy with your machine!!!!!"

A technician was sent 650 km to the client's house to check machine, temperature, turning and humidity. All parameters were found to be correct. Unfortunately the eggs had been thrown to the pigs and could not be examined. The only reason for not hatching could be power outages as there are no eggs to examine. The farmer then loaded another 1,000 eggs. Again nothing hatched. He installed a generator and alarm to avoid power outages. After 3 weeks yet again nothing hatched. Again I was blamed that the machine does not work. Upon breaking all the eggs to check development of chicks inside, we found all the eggs infertile. The Farmer was then asked where he got the eggs and he proudly announced "Pick and Pay" (Local supermarket). We then advised him to rather buy at "Checkers" (another supermarket) because if he is that ignorant he should not have been hatching at all, as all supermarket eggs are infertile.(clockolan)

Example 2. "We keep on loading your machine and nothing hatches. If I could lay my hands on your neck I would squeeze the life out of you."

This fellow was advised to take 20 eggs to another breeder who had lots of success with our machines and incubate them there. Again nothing hatched. WE then inspected his breeding stock and found no roosters present. We asked him "Where are your roosters". He said "The hens are laying eggs, we don't need roosters." Please don't make the same mistake, and show your ignorance.(TZANEEN)

Example 3. "The humidity in your machine just does not work. Your machine must work under my conditions, and it does not"

Here is what the man did wrong. He had converted the guest toilet into an incubator room. Tiled it from top to bottom, and even closed up the air vents. He then installed 5 of our machines in this room. I must say it was a beautiful set up for parrots. When he closed the door the humidity inside the room rose to 75 % and no oxygen was going in. Not only did this man suffocate all the eggs, but he also drowned them all. To this day he blames us for his eggs not hatching after having told him to open the window.(klerksdorp)

Example 4. This situation has happened often." There is something wrong with your machine because the eggs only hatch on one side of the machine."

Upon inspection we found that this person had placed the machine half way across the window of his bedroom and it was heated up by direct sunlight to 50 degrees C, killing all the embryos. Needless to say, it was also our fault.(POLOKWANE /WITBANK)

Example 5. Show breeding of Buff Orpingtons.

These hens are well feathered around the vent, and often no penetration of sperm can take place. The solution was to pull the feathers out around the vent. Now the wise guys didn't want to pull out the feathers and they cut them, leaving sharp stubbles. The poor roosters stopped mating, because it hurt too much.

THIS IS WHY WE SAY "IF THE PERFECT DOES NOT HATCH IN OUR MACHINE, IT IS YOUR FAULT"