

3. Hatching egg storage: from the farm to the hatchery



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Once an egg is laid, the hatching potential can only be maintained, not improved. Thus, hatching eggs must be kept under optimal conditions to prevent egg deterioration.

On breeder farms, eggs are usually stored until being transported to the hatchery. The storage duration depends on the egg room capacity, supply of hatching eggs, hatchery capacity, and demand for day-old chicks. If the farm has an environmentally controlled egg storage room, eggs can be collected by the hatchery at least twice a week. If the farm has no dedicated egg storage room, eggs must be transported to the hatchery daily.

Egg collection

Egg collection should take place 4-6 times a day during peak production and as many times as possible in hot climates. Be sure to wash hands before and after each egg collection if handling the eggs. The eggs can be collected into fibre, plastic, or incubator trays; however, fibre trays will retain heat from the eggs longer than the plastic and incubator trays. Moreover, eggs will cool down more uniformly in open trays. Do not collect eggs in baskets or buckets. Piling the eggs can cause cracks and contamination.

Grade eggs right after collecting. Separate the clean eggs from the dirty, floor, cracked, and double-yolk eggs. Likewise, remove eggs with poor shell quality, small size, and misshapen forms. The dirty and floor eggs are a source of contamination. Therefore, if they are going to be delivered to the

hatchery, identify and segregate these eggs from the clean eggs. Place dirty and floor eggs in their own trolley or on the bottom tier of the trolley.

It is important that they are marked clearly so the staff in the hatchery know they are floor eggs. Washing of floor eggs is not recommended because these eggs may have cracks. Likewise, washing eggs with poor shell quality is often detrimental to hatchability.

Disinfection of hatching eggs on the farm

A critical issue for disinfection on the breeder farm is the temperature of the eggs at the moment of disinfection. There are several chemical disinfectants available for hatching eggs, including formalin, hydrogen peroxide, and peracetic acid. Before implementing any chemical programme, the effectiveness should be tested. It is also important to regularly assess the effectiveness of the disinfectant.

When applying the disinfectant, it is important to use the correct combination of concentration, temperature, relative humidity, and exposure time.

Use a separate room for disinfection to prevent re-contamination if they will be

stored for several days on the farm. When treating eggs, try not to wet them with disinfectant. If they become wet, let them dry before they are placed in the egg storage room. It is important to note that formalin can diffuse into the egg if the egg is in contact with formalin for an extended period. The fumigation room should have a good exhaust system to remove the formalin, and eggs should be dry when treating.

On-farm egg storage

After the egg is laid it must be cooled below 24°C (physiological zero) to stop further development of the embryo. Eggs should be cooled gradually from the point of lay to the egg storage room. It is recommended that the temperature of the farm egg storage room is higher than the egg transport truck and the egg transport truck temperature should be higher than the hatchery egg storage room (see Fig. 1). In other words, consistently decrease the temperature of the eggs until they reach the coldest point of storage: the hatchery egg storage room. As eggs are transferred along the storage continuum, do not expose cooled eggs to warm temperatures, as this can cause condensation on the eggs.

Hatching eggs are usually stored on the farm for 1-4 days. Temperature fluctuations during egg storage time will cause higher early embryonic mortality and poorer chick quality. The egg storage room should have good insulation and seals around the doors to prevent fluctuating storage temperatures. Keep doors closed as much as possible. Heavy foot traffic through the storage room can cause fluctuating temperatures. Therefore, do not store equipment, cleaning tools, or other materials that are regularly used in the egg room.

Do not place egg trollies together against walls. Space trollies so air can circulate around them. Ceiling 'punkah' fans can promote a uniform temperature and air

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Table 1. Hatchery egg storage temperature (°C) based on storage times.

Egg storage (days)	Temperature (°C)	Humidity (%)
1-6	19-21	50-60
7-10	18-19	50-60
>11	15-17	60-70

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movement around the eggs. However, do not blow cold air directly over the eggs as this can give a chill effect. Monitor the daily minimum and maximum temperature and humidity of the egg storage room. Do not place the thermometer against the wall as this can lead to inaccurate readings. Instead, hang them freely just above the trolleys. Likewise, thermometers should not be placed in the direct path of the cooling system which can also cause false readings.

Egg storage at the hatchery

The hatchery egg storage room should be the coldest storage point along the farm to hatchery continuum (Fig. 1). Table 1 shows the optimal temperature and humidity for egg storage based on time. Adjust the holding temperature based on storage time. The egg storage room should have a relative humidity of 50-70% to prevent egg dehydration and to maintain internal egg quality. The humidity should be a fine mist so the eggs do not get wet. Humidifiers should be maintained and cleaned regularly. Dirty humidifiers can be a significant source of bacteria and lead to egg contamination. Follow the same guidelines for trolley placement, spacing, and air circulation in the hatching storage room as the farm egg storage room. Likewise, the same recommendations apply for thermometer monitoring and placement.

Conclusion

Regular auditing of the storage conditions can detect issues with temperature and humidity conditions that may be suboptimal and impact the hatchability of eggs. Consider installing data loggers in the storage rooms as these can be valuable tools to identify and mitigate temperature fluctuations. For hatching egg storage, consistent and uniform temperatures with little fluctuation are keys to sustaining the quality of hatching eggs. ■

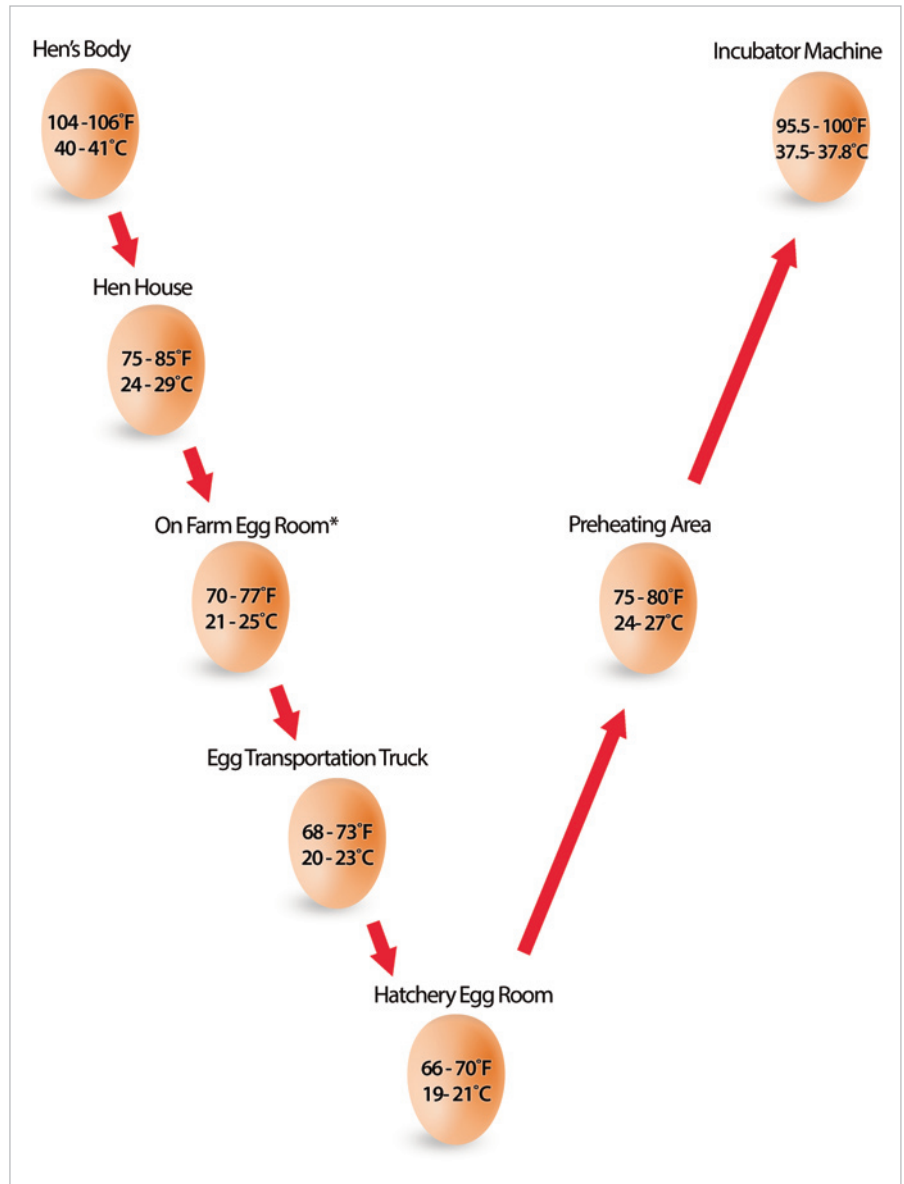


Fig. 1. The ideal temperature curve to follow for eggs after laying through storage. Note that the reduction of temperature occurs gradually until the storage temperature is reached with no elevation of temperature until preheating.

*Lower temperature for eggs stored at the farm. Higher temperature for eggs transported to the hatchery daily.