

Title: TECHNICAL GUIDELINES

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### **STORAGE, INCUBATION, AND USE OF SPF EGGS**

Charles River Laboratories' eggs are fertile specific pathogen free chicken eggs that are collected in the poultry houses at least five times daily.

Eggs are sanitized at the production sites and transferred to a centralized packing facility for final order processing. Eggs are stored in an environmentally controlled holding room at 55° - 70° F (13° - 21° C) prior to shipping.

#### **Storage of SPF Chicken Eggs**

Upon receipt of the eggs by the customer, it is important to hold these fertile eggs at a temperature of 66°F/19°C with approximately 72% relative humidity. Fertile eggs that are kept above 70°F (21°C) for an extended period of time will have beginning embryo development resulting in possible early embryo mortality.

If no special holding area is available, it is advised to keep the eggs in the unopened egg case and place the egg case on the floor in a cool corner of the laboratory. KEEP AWAY FROM HEAT! Storing the egg case at a 45° tilted angle and alternating from side to side each day has been reported to improve viability retention of the eggs. Another technique to retain higher viability during storage is to provide a high nitrogen atmosphere. This may be more manageable with smaller numbers, such as one full case or less.

If the eggs are incubated on the day of arrival by the customer, eggs should give 85-90% viable embryos. If the eggs are kept for 3-5 days, expected viability is 80-85%. For each additional day beyond 5 days, one can deduct an additional 3-5% of viability per day depending on the holding conditions. Eggs have been found to have maximum fertility rates between 3 and 7 days after lay (Brakestal, 1997).

#### **Incubation – General Guidelines**

For best results, follow cleaning and operational procedures provided by the incubator manufacturer and assure equipment used is validated accordingly.

Always warm your eggs to room temperature before setting them in the incubator. This provides for a “staged” temperature increase. Taking eggs from a 60°F cooler and placing them in a 99.5°F incubator is a 39.6°F temperature variation in minutes. In many cases, this can cause the eggs to sweat, which can lead to bacterial growth.

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If the eggs are used for **virus growth** (e.g. vaccine harvest) or cell culture preparation, the best conditions in the incubator are a temperature of 99.5 – 100° F/37.5°C with an 88° F/31°C wet bulb temperature for humidity.

If the eggs have to be **hatched**, the temperature is also 99.5 – 100° F/37.5° C with an 82° F/28°C wet bulb temperature for humidity.

The incubator should be clean and disinfected before eggs are set.

Incubating eggs should be turned at least every 4 hours. Generally, turning the eggs is a 45° angle turn. Turning is essential for proper embryo development to prevent the membranes in the egg from sticking to the embryo.

Small hand-operated incubators frequently have the risk of improper turning and too low humidity. Some type of supplemental humidity is usually needed.

If incubators are not properly cleaned and disinfected before setting eggs, they are prone to bacterial and fungal growth, which causes a bad hatch and poor quality chicks.

### **Pre-Incubated Eggs**

Pre-incubated eggs are available to US customers within the range of the distribution site located in Franklin, CT. Pre-incubated eggs can be delivered in and around the major cities such as Hartford, New Haven, Boston, Worcester, New York City, Philadelphia, Baltimore, and Washington, D.C. The delivery vans are specially insulated to control temperature and to reduce the possibility of damage to the eggs due to transportation. Pre-incubated eggs may be set 7 days a week upon request.

Pre-incubated eggs are available from 1 day through 17 days of incubation. Please note that all pre-incubated eggs are set by special order only. It is important to order well in advance so that the eggs can be placed in the incubators at the appropriate time. Once the eggs are placed in the incubator, they are the customer's responsibility; cancellations cannot be accepted after the eggs are set.

Prior to shipment, pre-incubated eggs are candled to remove infertile eggs and dead embryos. Orders for eggs that are incubated 1-3 days will have extra eggs added to the order, at no charge to compensate for any eggs lost due to infertility, since candling is not feasible at such an early stage of incubation.

Upon arrival, the pre-incubated eggs should be handled with extreme caution, as the embryos are very sensitive to shock from rough handling or extreme temperature changes.

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Pre-incubated eggs can be held at 72 – 80°F (22° - 27°C) for a short time during delivery but they must be placed in an incubator as soon as possible to prevent damage to the embryos.

Brake J., T.J. Walsh, C.E. Benton, Jr., J.N. Petite, R. Meyerhof and G. Penalva; Egg Handling and Storage. Poultry Science, 76:144-151, 1997.