E-NEWSLETTER • ISSUE 30 • NOVEMBER 2014

# e-news

News & Events for Poultry Producers from ChickMaster

***Welcome to the 30th edition of ChickMaster e-news!***

*In this e-news we continue to focus on Hatchery in Harmony with articles by Dr. Keith Bramwell of the University of Arkansas and Dr. Nirada Leksrisompong of Aviagen. In the previous e-news we presented, we looked at the whole environment of the hatchery and its effect on hatchability as well as its impact on farm performance.*

*In this issue, Dr. Bramwell focuses on the effects on hatchability by temperature fluctuations during farm egg storage. Dr. Bramwell participated and presented at a ChickMaster Seminar last August in Memphis, Tennessee. Dr. Nirada Leksrisompong made a presentation regarding the SPIDES process and how it can lengthen the life of the embryo during long periods of storage. For a hatchery to produce the best quality chicks, it needs to manage a Hatchery in Harmony.*

*We hope the articles in this publication help you achieve that goal. We look forward to meeting and communicating with you.*

*Please check our website for upcoming events and exhibitions where we will be participating.*

ChickMaster

Your friends at ChickMaster
**www.chickmaster.com**

# Introducing ENCORE

## The Best Way to Introduce SPIDES into a Hatchery

A hatchery that holds eggs for long periods of more than 7 days will incur loses in hatchability and reduced chick quality. Research suggests that performing short treatments of heating and cooling during storage can minimize these losses. The challenge is to create an environment where the temperature changes can be applied accurately, efficiently and the overall process can adapt to the day-to-day operation of the hatchery. For this purpose, we created the Encore System, a dedicated egg warming and cooling chamber to treat eggs which is based on the SPIDES principles (for a description of SPIDES, see page 4).

Encore is based on the Avida's single stage superior airflow. It uses hot water-heating and cold water-cooling to increase and reduce the temperature of the entire egg mass evenly, efficiently and economically. The hot and cold water are supplied by a CC3 system that controls the chamber conditions with a Zeus controller. The Encore System is designed with thick insulating walls so it can be placed inside the egg room where temperature differentials have to be considered between the Encore and the room environment.

CC3 2700 works with Encore to meet SPIDES heating and cooling requirements

### How does the process work?

Farm or setter trolleys are placed into the Encore chamber. The Zeus control increases the temperature gradually, sustains it for a few hours and then manages the necessary decrease to reach the egg room temperature. This process can be repeated several times according to the total storage time of the eggs. The Zeus control allows the hatchery manager to adjust and control all the required parameters and Maestro allows a complete view of the process.

Please contact ChickMaster for more information on Encore. •

## Keep your Maestro or Advisor System Up to Date

Many of you who receive this e-news are current users of either the Maestro or Advisor. Maestro is a key component of a Hatchery in Harmony. To receive the latest updates of either software package, please send us an email at maestro@chickmaster.com, and we will be happy to assist you.

# Effects of temperature variation in on-farm hatching egg holding units in commercial broiler breeder flocks

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Broiler breeder hatching eggs are commonly held in storage facilities at the breeder farm anywhere from one to four days and again at the hatchery until placed in the setters. Although the occurance of some pre-incubation of hatching eggs following oviposition and during storage is inevitable, efforts should be made to reduce this occurrence. The continued development of the poultry industry has led to tremendous advancements that have improved the equipment that maintain hen house temperatures, the quality of egg transportation vehicles, and egg storage facilities in the hatchery. With this improved technology, on-farm egg storage facilities have been largely neglected, making it extremely difficult for producers to maintain constant egg storage room temperatures at the farm level.

While one purpose of egg storage is to accumulate eggs to meet the demand for chicks and to best utilize hatchery facilities, ultimately the goal is to arrest further embryonic development while maintaining embryo viability. While an egg storage temperature of 68°F (20°C) is the most commonly practiced industry recommendation, the actual on-farm egg storage temperature can range from a low of 60°F (15.6°C) up to 75°F (23.9°C). The range in egg storage temperature from farm to farm is often due to different management programs. However, day to day fluctuations within the same company are a result of poor egg storage facilities that are unable to maintain a constant storage temperature. Hatchery egg storage conditions have been evaluated in the past, with recommendations presented to reduce losses in hatchability. However, research regarding the egg storage at the breeder farm is limited and incomplete. Therefore, the objective of this study was to determine the effects of oscillating and variable on-farm egg storage temperatures on hatchability and embryo viability in commercial broiler breeder flocks.

## Egg Storage and Hatching Procedures

Hatching eggs were obtained from the University of Arkansas' Broiler Breeder Research facility and were placed into two separate egg storage chambers, with all eggs stored at a control temperature of 70° F (21.1° C) for 0-24 hours. After the initial 24 hour period, selected groups of eggs were moved to separate storage chambers set at temperatures of either 66 (18.9), 68 (20.0), 72 (22.2), or 74° F (23.3° C) respectively, and stored at these temperatures for 24-48 hours. After 48 hours, eggs stored at 66° F were moved to 74° F, eggs at 74° F were moved to 66° F, eggs at 68° F were moved to 72° F, and eggs at 72° F were moved to 68° F for 48-72 hours of storage. One group of eggs remained at 70° F for the entire 72 hour storage period. After 72 hours of storage all eggs were returned to 70° F. This design ensured that all eggs in this experiment were held at an average of 70° F for the entire three day "on-farm" egg storage time period. In summary, the hatching eggs from the different temperature treatment groups were subjected to either a 2 or 4 degree F temperature fluctuation above and below the 70° F base temperature.

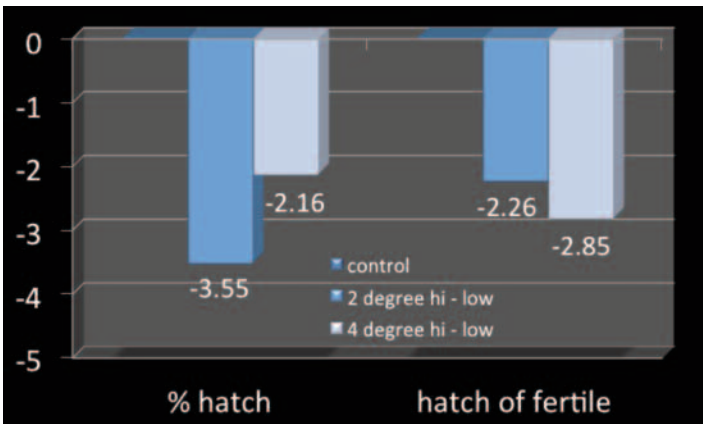
After the storage period, eggs were transported to their original commercial breeder farm where they were placed directly on a commercial hatching egg transportation truck and sent to a commercial hatchery for incubation.

## Results and Discussion

Hatching eggs that were subjected to either a 2 or 4 degree F temperature change from the basal 70° F temperature group,

had nearly a 2 percent reduction in hatchability as compared to the control group (74.48 vs. 76.47% hatch, respectively). Eggs that underwent a 4 degree F daily temperature change had nearly a 1% loss in hatch as compared to the control group (75.61 vs. 76.47%, respectively). It is interesting to note that the greater temperature variation did not necessarily result in a greater loss in hatchability.

However, regardless of whether the temperature variation was 2 or 4 degrees F, hatching eggs that moved from the hen house to 70° F then increased in temperature for 24 hours, then decreased after 48 hours then were returned back to 70° F (70 F-higher-lower-70 F) experienced a significant drop in hatchability as compared to the control stored eggs (3.55% and 2.16% loss in hatch, respectively).




Hatchability was reduced from 2 to 3.5% in the two groups that were exposed to this direction of oscillating egg storage temperatures. Eggs in this group experienced multiple changes in temperature from the hen house to the hatchery. From the time of lay, these eggs decreased in temperature to 70 F then the temperature was raised for 24 hours, then lowered for 24 hours, then raised for 24 hours, then lowered as they were moved to the hatchery (67 F) then raised when moved to the setters (three periods of decreasing temperatures and three with increasing temperatures).

Eggs that were stored at 70° F then decreased in temperature for 24 hours, then increased after 48 hours then were returned back to 70° F (70-lower-higher-70) experienced no difference in hatchability and less than 1% loss in hatch of fertile. Eggs in this treatment group basically underwent one change in direction of the temperature they were subjected to from the time they were laid until the eggs reached the commercial hatchery. These eggs decreased in temperature after lay to 70 F, then the temperature was decreased again for 24 hours, then raised for 24 hours, then lowered for 24 hours, then lowered again as they were moved to the hatchery (67 F) then raised when moved to the setters (two periods where temperatures were decreasing and two with increasing temperatures).

Each time the internal temperature of the egg is elevated to near 75 F, metabolic activity is again initiated and embryo development ensues only to be slowed again during additional egg cooling. While cooling hatching eggs is necessary, starting and stopping embryo development weakens the embryo and reduces its viability. The ideal situation is for hatching eggs to undergo only two temperature direction changes; one from the hen to the lowest temperature point at the commercial hatchery egg storage facility and the second temperature direction as eggs are moved into the egg setters.

## Conclusions

It is well known that most hatchability problems are a result of poor fertility. However, when egg production is attained and the flock maintains high levels of fertility, how we care for hatching eggs can have a tremendous effect on overall hatchability. While current industry recommendations vary from 63°F to 70° F for on-farm egg storage, data from this research indicates that variations in on-farm egg storage temperatures of as little as 2 degrees F can reduce hatchability by as much as 3.5%. Experience from evaluating current on-farm egg room temperature values indicates that variation in the actual temperature and the set temperatures are great and often exceed those parameters established in this study. Therefore, regardless of the equipment in the breeder house and the hatchery facilities, hatchability is routinely lost in commercial hatcheries due to neglect of the on-farm egg storage facilities. •

## ChickMaster Training

In October ChickMaster hosted a training seminar in our Medina factory for all our installation and service technicians in the Americas.

## Zeus RiO Ventilation Room Controller

# A Better Way to Manage your Hatchery Environment

***Zeus RiO Ventilation Controller*** provides an advanced platform that gives you the power and flexibility to manage each room in the hatchery more efficiently, resulting in reduced energy cost, and a more stable environment for the incubation systems and chicks in the hatchery.


The Zeus RiO Ventilation Controller is responsible for maintaining room and plenum pressures as well as temperature and humidity to ensure the proper incubation environment. Very easy to install and use, the Zeus is a valuable upgrade to managing each room in the hatchery. The Zeus can also be connected to your Maestro Control software giving you the ability and information to achieve a Hatchery in Harmony.

Based on a central PLC that enables advance environmental control in all areas, it uses true PID algorithms to maintain temperature, humidity, room and plenum static pressure on a very narrow band, minimizing swings and saving energy. Access the system on the control, from strategically located touch screens throughout the hatchery, or via Maestro. Hatcheries using Zeus RiO controls today already see the advantages. Consider upgrading your hatchery to Zeus controls. •

# SPIDES, a growing concept in incubation management

In our August seminar, Dr. Nirada Leksrisompong from Aviagen made a presentation on the value of the SPIDES process in long egg storage. The following is a short summary of the presentation. To learn more, please contact Aviagen for their recommendations on the SPIDES application.


Dr. Leksrisompong

"As a broiler breeding company, Aviagen offers advice on the best way to store hatching eggs between oviposition and the start of incubation. Ideally, all eggs should be set while still fresh — within a week of being laid. If longer storage is unavoidable, then storage temperatures should be reduced, and any temperature fluctuations avoided. The advice is safe, and offers minimal opportunities for misunderstanding. In contrast, when hens lay and incubate their own eggs, the eggs laid first will be rewarmed every time the hen returns to the nest to lay another egg. A series of experiments and field tests looking at short periods of incubation during egg storage (SPIDES) have shown that it is possible to recover 60-70% of the hatchability lost when storage has to be prolonged for more than a week. The technique is potentially of value to broiler grand-parent, layer parent and turkey breeder programmes where order patterns may be uneven, and egg storage unavoidable." •

# Upcoming Events

**Join us to learn how you can optimize your hatchability and chick quality with integrated equipment, management systems and environmental control at the following events:**

**Hatchery in Harmony Educational Series**
**A Seminar for Hatchery Management**
November 6 & 7, 2014
Best Western Hotel Konak, Turkey

**ANAVIP Panama**
**Panama City, Hotel Sheraton**
November 18 & 19, 2014
Booth 24

**IPPE ATLANTA International Production & Processing Expo 2015**
**Georgia World Congress Center**
**Atlanta, GA**
January 27 – 29, 2015
4019, Hall B

**VIV Asia 2015**
**Bangkok, Thailand**
March 11 – 15, 2015
Booth E031

Visit our website for more information:
www.chickmaster.com/cm_upcomingevents.html

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