

OPEN HOUSE 2006

You should have been there!



Left to right: Tom Solberg (Gold'n Plum, USA), Mike Wineland (NC State University), Jeff Beavers (Mountaire, USA) and David Marsh (Chick Master)

We recently held our Open House in Medina. Among the many excellent presentations was a fascinating presentation by Dr. Michael Wineland, one of (if not THE) leading minds in our industry. When it comes to understanding the nature of an egg, it's hard to find someone who knows more.

Among the many pearls of wisdom in his marvelous presentation we found a few things that helped us to further understand why the HOOCHO concept we introduced several years ago is the direction that we have to ensure our equipment is designed to support.

Three things in particular caught my eye. You need to be aware of these things, so just in case you missed hearing them first-hand (You should have been there!)

1) We have preached for some time that the elevation of carbon dioxide levels in the first 6 days or so of incubation produce noticeable improvements in chick weight (bone and muscle density) and chick hydration (moisture content of the tissue). We knew it was true we just couldn't explain why. There are many plusses, but Dr Wineland presented a new one. He presented some third-party research that showed strong evidence that the CO₂ has an impact on the formation of sub-embryonic fluid (SEF) produced by the egg (basically water movement from the albumen to beneath the developing embryo within the yolk sac membrane). The production of SEF is significantly increased in the presence of higher levels of CO₂. The SEF is the principal source of water for the embryo. This "reservoir" is created principally in the first six

days of incubation. First six days and improved by high levels of CO₂—sound familiar?

2) We noticed several years ago that the incidence of early embryonic death in the single stage systems varied significantly between newer and older eggs (age in storage days). We knew that older eggs tended to perform better in warm climate hatcheries than they did in cold climate hatcheries. It just didn't dawn on us what the reason might be. Dr Wineland showed the results of study on eggs stored from two days to fourteen days comparing how they fared in different temperature situations at the beginning of incubation. The results? The fresher eggs fared well in normal-to-lower temperatures for the first few days while

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To Our Hatchery Friends:

You Can Now Order Your Chick Master Parts Online
and start earning valuable points today

We are pleased to announce the launch of our online Spare Parts Shop. You can now order your spare parts directly from your computer saving you time and effort. Once your order has been received we will immediately acknowledge it and then email you a detailed invoice before dispatch of the goods.

If you complete the simple registration process you can purchase Chick Master parts immediately and start earning valuable points on every item that you buy to spend in our Points Shop.

Powerful search facilities help you to locate the exact part you want from the many thousands available. There is a handy 'My Favorites' facility to help you quickly locate your regularly-ordered parts. We will also be running regular Special Promotions and Points Shop offers to look out for.

Why not visit our website (see our home page below) and start shopping online today at:

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Where is the payback?

Hatchability, of course...or is it?



Over the past several years, Chick Master has developed kits to upgrade both setters and hatchers to give you the opportunity to get the most out of your equipment and the valuable fertile eggs that you place in them. Each of these kits offers benefits that can justify their purchase and installation either individually or in combination. Most of these kits are a great value both in terms of improved performance and reduction of operating costs, and this payback continues over many years of operation.

For many organizations, the only comfortable benchmark for return on investment is hatchability. This is a very important component in hatchery performance, but it is far from the only one.

A good hatch requires good quality eggs, proper egg and hatchery management, and properly operating equipment to maximize results. There is an optimum hatch for each set of eggs. It is defined partially on percentage, but more so on the number of chicks hatched during a defined time period. A tight hatch window is important for chick quality and uniformity. Trying to get the most chicks hatched may damage chicks that pipped early in the process. The decision to hold the hatch pull means the hatch percentage is higher, but the damage to chick quality would then reduce the return due to weak or overheated chicks. In other words, the highest percentage hatch may not be the best way to judge performance.

So what other ways can we judge performance? Cost per saleable chick is probably one of the best measures of hatchery operations. Among these costs, energy is certainly a major element. Great emphasis must be placed on reducing the energy cost per chick. There are many ways today to do that using more efficient cooling, intelligent controls that avoid wasted heating and cooling due to cycling, and higher efficiency fans that both improve air circulation and consume less energy. Lower energy and water usage offer great savings and payback. The savings due to a reduced load on a water chiller will not be measured at the setter, but it will show up in the monthly energy bill.

Energy management in the ventilation of the hatchery has been an area overlooked for many years. Air is being heated or cooled for the setters and hatchers and then removed from the hatchery. The heat from the exhaust air has usually been wasted. Energy is then consumed finding ways to treat new air going into the rooms. The old theory of continually changing the air in the setter (which also requires introduction of humidification) has proven to be the wrong way to operate. Older machines needed the help to keep cool, but the new systems are better designed to cool without huge volumes of air passing in and out of the setter. Better ventilation can reduce the load on the setters in heating, cooling, and humidification of the air. Today we can recapture the heat in the water cooling systems and the exhaust air to gain tremendous energy savings with huge paybacks year after year.

While we evaluate ways to reduce the operating costs in the hatchery, we also need to look at the final product, the baby chick. The chick quality is critically important whether it is produced for further processing or for sale to third parties. Livability has a value to all and certainly should be considered as part of the cost of operations. A stronger and better developed chick has proven to grow faster and achieve desired weight quicker, resulting in lower feed conversion ratio, better farm utilization, and more consistent birds being delivered to the processing plant. These savings, most which do not appear at the hatchery level, need to be considered when calculating the return-on-investment (ROI) on a potential hatchery investment.

It is not easy to track all these payback numbers for a hatchery but, from place to place, there are few dramatic differences. Most hatcheries run under similar conditions so what is proven in one facility should be achievable in others. The savings and justification are all there, you just need to know where to find them.

Maybe hatchability is not the only place to look.

Chick Master Open House Review continued

older eggs needed higher temperatures as quickly as possible. The conclusion? Older eggs fared better when the initial incubation temperatures were at or slightly over 100°F (37.7°C) and where that temperature was reached quickly. We immediately increased the heating capacity of our Avida single stage setters to allow a supercharged heat up when older eggs are set. We have no doubt that the excellent results we obtained in the past with the Avida will now be even better on eggs that have been stored longer. There are, of course, implications for multistage eggs as well, but there isn't much anyone can do to elevate the temperatures in the multistage setter. It does explain why the Classic's staggered setting pattern produces better results than block set machines. The eggs come up to temperature faster, so older eggs will have a better early mortality result!



3) The third significant finding was the research recently completed on turning angles. We've always heard and never believed that turning angles of 40-45° were required to hatch a bird. That was "supported" by various statements like "the membrane sticks to the side wall" or "the development of the vascular system is retarded" and so on. After studying turning angles of 15°, 30° and 45°, the conclusion was that there was NO appreciable difference in the development of any aspects of the internal extra-embryonic membrane structure. What they believe is that the amount of motion imparted to the albumen is what truly is critical. Lack of motion causes stratification of nutrients which in turn effectively starves the embryo. What's the conclusion? Turning angles are only important with regard to airflow required to transport heat and humidity. That's why we designed the Avida series of setters so that air only passes thru one trolley before returning to the fan. When air passes thru multiple trollies before returning the fan turning angles and frequencies become much more important!

We have strongly believed for several years that our HOOCHO principle of incubation and our single pass trolley system both were based on the soundest principles of incubation.

Now we actually know why! 

If Spare Parts are a puzzle to you...



visit our on-line shop at
www.chickmaster.com
and start earning points today.



The *Art of*

STAGE PROGRAMMING

Part Four: CO2 Concentration Phase

In continuation of the Articles which were contained in our three previous Chick Master E-news Bulletins, we are now in a position to look at the next stage of the “Step” program, again examining in detail what is happening, how it is happening and why it is happening.

This stage is shown below and is from a recommended stage program used in many Chick Master Avida hatcheries throughout the world.

Stage Number	4
Temp Set Point	100.4
Temp High Alarm	100.9
Temp Low Alarm	99.9
Humid Set Point	30.0
Humid High Alarm	100.0
Humid Low Alarm	60.0
Man. Damper Set Point	0.0
Min. Damper Set Point	0.0
Damper Mode	MAN
Cooling Mode	Wat
Aux Fan On At Damper	40.0
Aux Fan Auto/Man/Off	off
CO2 Set Point	0.0
CO2 High Alarm	2.0
CO2 Low Alarm	0.0
Turning Tilt Time	60.0
Level Time (mins)	1.0
Time In Hours	144.0
	CO2 Concentration

Chick Master stage program showing Stage Four

STAGE 4: CO2 CONCENTRATION

Having warmed the eggs up from storage temperature to a level above physiological zero during Stage 2 and then to temperature set point 100.4°F (or 38.0°C) in stage 3, we are ready to begin stage 4. Since there is little chance of very low temperatures, the low alarm set point can now be increased to within 0.5°F (of the temperature set point). The high temperature alarm can now be fixed at 0.5°F above the temperature set point.

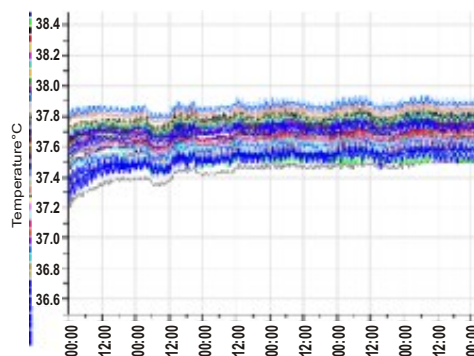
Again throughout this stage the dampers remain closed

(i.e. set on Manual Zero). We can allow the humidity to rise to a theoretical maximum of 100% RH. We can also continue with the “nominal set point” value of 30% RH.

Other values and settings remain the same as in stages 1-3. CO2 High Alarm setting of 2%, turning at 60 minute intervals with a minimal 1 minute in the level position to provide the optimal turning required at the beginning of incubation are maintained for the same reasons as previously stated.

We are now within perhaps the most exciting phase of the step program, which in many ways encapsulates the essence of the single stage process and what benefits are bestowed on the embryos within the Avida setter cabinet. These are detailed as below:

First, since the dampers of the setter are fully closed and the cabinet is very well sealed, the temperature profile is extremely even with very little disturbance. Having reached temperature set point, it will be noted that there is little or no activity from heating or cooling and the Avida setter will simply coast quietly along.



Graph of 40 dataloggers from an Avida setter with the damper closed

Second, with dampers fully closed and a well sealed cabinet, the relative humidity will increase to high levels. This is due, as already stated, to the moisture being released from the eggs as they begin incubation. The RH

Continued on page 4 column 1



David Marsh



Angel Salazar

Ask the Eggsperts

Your chance to ask our hatchery and embryology experts the questions.

Q

Will exposure to formaldehyde gas kill my embryos?

S.M. - Poland

A

Not necessarily . If fumigation procedures are being carried out correctly - e.g. the correct rate per volume used or the correct exposure time with adequate ventilation to exhaust the gas etc. If, however, embryos between 24 and 96 hours of incubation are exposed to formaldehyde gas, then —due to the fact that the cardiovascular system is developing very rapidly—the gas can be lethal between these hours of incubation.

Q

How important is egg shell temperature during incubation and how do I measure this accurately?

V.T. - UK

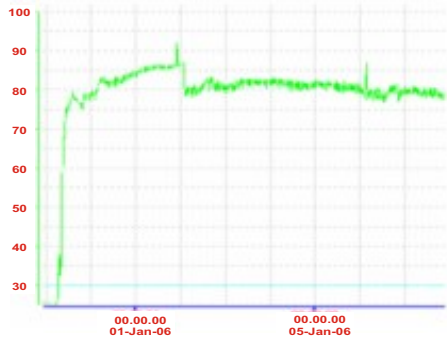
A

Egg shell temperature is very important and reflects the success, or otherwise, of the incubation run. Most people agree that it should be as close to 100°F (37.8°C) for the first 12 days and then 101.2°F (38.4°C) for days 13 to 18. There are many ways of assessing this, from very old manual techniques such as holding a fertile egg against your cheek, which obviously comes with a great deal of incubation experience, to the modern sophisticated infra red heat sensors that can check this temperature simply by directing a beam at the egg shell surface.

Most techniques only measure the temperature at a particular point in time and therefore can only give an indication of what egg shell temperature is. We believe that it is essential to have temperature readings throughout the whole incubation period. This can easily be achieved by placing Chick Master Temperature Data loggers, in the setter trays and even the hatcher baskets, in order to obtain data from the whole process. Through time this data can be used to help fine tune the incubation process and help to optimize your hatch results!

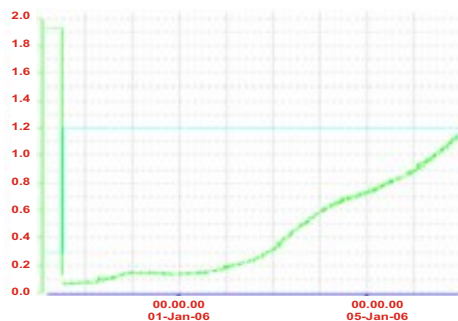
The Art of Stage Programming continued . . .

level can reach well above 80%. This is a good thing, since the moister the air, the better that the heat-transfer will be to the embryos, thus allowing them to start very well.



Graph in % RH from a typical Chick Master Galaxy System plot

Third, as the embryos develop and metabolic activity increases, the level of CO₂ within the sealed Avida cabinet begins to increase. The level to which the CO₂ ultimately rises will be affected by the fertility of the flock, the size of the eggs and whether the setter is at full capacity or not. In all cases, the developing embryos' cardiovascular system is encouraged in its growth, much like an athlete training at high altitude, in a lower oxygen/higher CO₂ environment.



Graph in % CO₂ from a typical Chick Master Galaxy System plot

These three elements combine to create a synergy, with each of the three elements contributing to help condition the developing embryos. This happens from the beginning of the single stage incubation process.

In the period when the dampers are closed, there is only a small amount of egg weight loss. Additionally, embryos are still absorbing heat, i.e. they are Endothermic.

The age of flock, therefore size of eggs, will determine how long the setter dampers are closed. Chick Master has developed a calculator to help determine this time frame

which is available if you contact us through our website at www.chickmaster.com.

We are now ready to advance to stage 5 where we have to take into account all the above elements in order to successfully continue incubation. This involves several major changes which are based on the changing requirements of the embryos. These will be detailed in the future editions of the Chick Master's e-News Bulletin as we continue with The Art of Stage Programming ☺

CM Sales Team Strengthened In North America



Claude Leroux



Greg Hanson

Chick Master is pleased to announce several changes in its sales team for North America. Lou Sharp has been promoted to Vice President of Sales for North America. Greg Hanson and Claude Leroux have joined the sales team as Territory Sales Managers. Greg will be concentrating his efforts in the US market while Claude will have responsibilities in both the US and Canadian markets.

FUN TIME

A pair of chickens walk up to the circulation desk at a public library and say, 'Buk Buk BUK.' The librarian decides that the chickens desire three books and gives the books to them...and the chickens leave shortly thereafter.

Around midday, the two chickens return to the circulation desk quite vexed and say, 'Buk Buk BuKKOOK!' The librarian decides that the chickens desire another three books and gives the books to them. The chickens leave as before.

The two chickens return to the library in the early afternoon, approach the librarian, looking very annoyed and say, 'Buk Buk Buk Buk Bukkkook!' The librarian is now a little suspicious of these chickens. She gives them what they request and decides to follow them.

She followed them out of the library, out of the town, and to a park. At this point, she hides behind a tree, not wanting to be seen. She sees the two chickens throwing the books at a frog in a pond who replies "Rredit Rredit Rredit..."



A FINAL THOUGHT...

"The creative person is the master rather than the slave of his imagination"

Michael LeBoeuf