BVS POULTRY Talk

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Summer 2013

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July 14-16, 2013
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The Liaison Hotel, Washington D.C.

June 27, 2013
PennAg Feed Grain & Allied Industry Council/
SEPAGBA Golf Outing & Grain Meeting
Tanglewood Golf Manor, Quarryville, PA

August 29, 2013
PennAg PAC Sporting Clays Shoot
Central Penn Sporting Clays, Wellsville, PA

Options for Cooling Turkeys in the Summertime

By John Menges
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Hot weather can have a negative impact on turkey performance. When turkeys are exposed to very high temperatures, especially for prolong periods of time, there is potential for increased mortality. At the same time daily weight gain and feed conversion will likely suffer as birds go into survival mode rather than growth mode. This is a drain on the overall energy utilization of the system. When turkeys begin to pant, the process of energy loss has already started. Therefore, any management techniques that can be implemented to reduce this stress and maintain bird comfort during hot weather will benefit the turkeys and the bottom line. These same techniques can also be a vital component in an animal welfare program which addresses bird comfort. Due to the current (or what seems like the consistent) slow economic state of the turkey industry, we need to evaluate each farm system separately to determine how we will improve the overall hot weather management on the farm. While tunnel ventilation is the most efficient method to cool birds and control the environment during hot weather, we must consider other alternatives if economics dictate this.

Tunnel ventilation has been utilized in the North American broiler industry on a large scale since the 1980's. In some broiler complexes 100% of broiler facilities have been constructed with or converted to tunnel ventilated systems. This has resulted in sustained improved performance throughout the year and improved the bottom line for producers. Tunnel ventilation is now rapidly gaining popularity in commercial turkey production. As bird weights have increased the need for improved ventilation and bird management has become critical. Over the past 10 years, typical turkey tom production in North America has seen weights increase from 35 lbs to over 42 lbs at the same age.

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Management Tips

Keep Cooling Systems Clean

Remember that fogger lines, sprinkler systems and cool pads all need cleaned and maintained. We spend a lot of energy to keep drinker systems free of heavy soils and scale. We must remember to do the same for our cooling systems.

For fogger and sprinkler systems, remove heavy soils and scale between flocks with CID 2000 just as it is done in a drinker line. During the flock, Pro Oxine can be used to keep the lines clean during the flock. Consult your local BVS salesperson for instructions.

For cool pad systems, use Virocid to maintain clean pads between and during flocks. Again, consult your local BVS salesperson for instructions.

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Options for Cooling Turkeys, *continued from cover*

Hen production has also seen improved weight gains and lower feed conversions (14 lbs in 14 weeks in 1987 to 14 lbs in 11 weeks in 2013). Interestingly, this has been done within same floor space per bird resulting in a significant increase pounds per square foot. This additional pressure on turkey facilities requires that producers evaluate their systems to be certain adequate management tools are in place.

This paper will focus on defining tunnel ventilation for the typical commercial turkey operation. It will compare the basic differences between conventional and tunnel ventilation. Emphasis will be placed on the importance of tunnel management during hot weather conditions. The following issues influencing bird comfort will be addressed:

- Definition for tunnel ventilation and the importance of maintaining effective cooling temperatures related to the bird's comfort zone
- Understanding heat production and it's removal from a turkey facility
- Designing a typical tunnel system and understanding fan efficiency
- Evaporative cooling in reducing temperature
- Importance of using environmental controls

1. Definition for tunnel ventilation and the importance of maintaining effective cooling temperatures related to the bird's comfort zone.

Tunnel ventilation can be defined as a type of ventilation where air enters at one end of a poultry barn and is exhausted by ventilation fans at the other end (www.epa.gov/oecaagct/ag101/porkglossary.html). The exhaust fans pull air out of the barn, creating a negative pressure as air enters inlets at the opposite end. As with any ventilation system, the goals for tunnel ventilation include removal of excess heat, removal of excess moisture, minimize dust and odors, reducing the build up of harmful gases (such as ammonia and carbon dioxide), and providing sufficient oxygen for efficient respiration. When this is accomplished turkeys are provided an optimal environment for growth and sound animal welfare. The difference (or advantage) of using tunnel ventilation compared to conventional hot weather systems, is that air speed creates a wind tunnel that improves effective cooling of birds in the barn through convective heat loss. This wind speed and effective cooling can then be controlled by farm management.

Tunnel ventilation differs from conventional open curtain sided or 'naturally' ventilated structures in its ability to maintain this wind tunnel. In a typical conventional barn, curtains are opened to allow natural winds and stir fans to attempt to cool birds during hot weather. Conventional systems are limited by the reliance on natural cross winds and low air speeds from typical circulation or stir fans. These stir fans normally reach air speeds of approximately 100-150 fpm for a short distance directly in front of the fan, allowing for very little cooling effect on large birds. Tunnel ventilation, if designed properly, can provide constant desired air speeds typically ranging as high as 700 fpm. The advantage of this constant wind speed is that it creates a wind-chill over the turkeys so they feel a lower 'effective temperature' than the actual ambient air temperature (Donald, 1995). Figure 2 shows that as the air speed increases, wind chill also increases thus lowering the effective temperature that the turkey feels.

It is important to understand how many circulation fans are necessary in a naturally ventilated barn to simulate tunnel ventilation in order to capitalize on wind chill effect across the barn. In most cases the simple calculation can be used to determine what area a fan can cover at acceptable speeds. This formula is 15' x Diameter' = length of throw, and 5' x Diameter' = width of throw.

Figure 1.

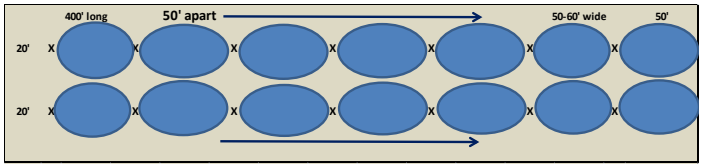
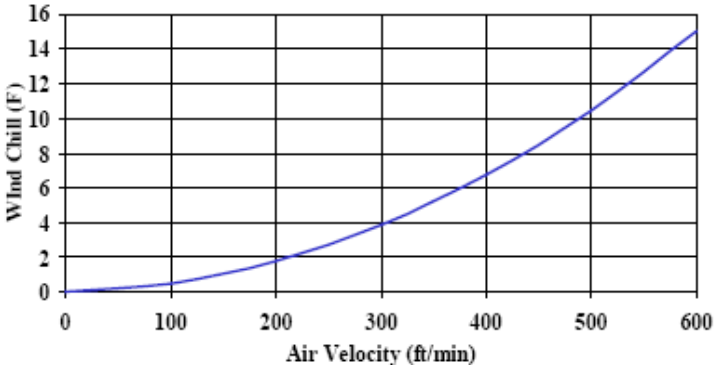


Figure 1 above shows the configuration and estimated number of fans in a 400' x 50' barn. It actually takes more fans and electricity in a naturally ventilated barn with adequate stir fans to simulate a tunnel barn at 600 fpm air speed.

Figure 2.

Wind Chill Effect at 85°F
Adapted from 2008 Univ. of Georgia



Ventilation Workshop

When air speeds reach as high as 600 fpm the effective temperature that the turkey feels is approximately 15°F less than the 85°F ambient temperature. In a tunnel ventilated barn, this wind tunnel or wall of air is relatively consistent from end to end and side wall to side wall (there is some reduction in air speed along the walls due to friction from building materials). This wind tunnel is also very effective at removing radiant heat that birds produce during hot weather.

This effective reduction in temperature (wind-chill) is extremely important in maintaining bird comfort. According to information published by the North Carolina State University (Anderson and Carter, 1993), poultry performance is negatively impacted when the

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Options for Cooling Turkeys, *continued from page 3*

temperature rises over 27°C (80°F). Table 1 demonstrates what occurs in a poultry barn as the temperature rises inside the facility.

Table 1. Heat Stress and Ambient Temperature

- **55°to 75°F** - Thermal neutral zone – bird does not need to alter its basic metabolic rate to maintain its body temperature
- **75°to 85°F** - Slight reduction in feed consumption, feed conversion compromised - panting
- **85°to 90°F** - Feed consumption falls further, weight gains lower, feed conversion further compromised – excessive panting
- **90°to 95°F** - Feed consumption continues to drop, birds in survival mode

Reducing the effective air temperature with wind speeds created in a tunnel ventilated barn enables producers to maintain temperatures within the bird's comfort zone. Evaporative cooling techniques employed in conjunction with wind speed can further improve the temperature reduction ability in a turkey barn, and will be discussed in more detail later. Not only will turkeys stay alive during extreme conditions, but tunnel ventilation will help them sustain body weight gain and feed conversion. Tunnel ventilation also keeps the production system efficient by allowing producers to maintain cool weather stocking densities during hot weather.

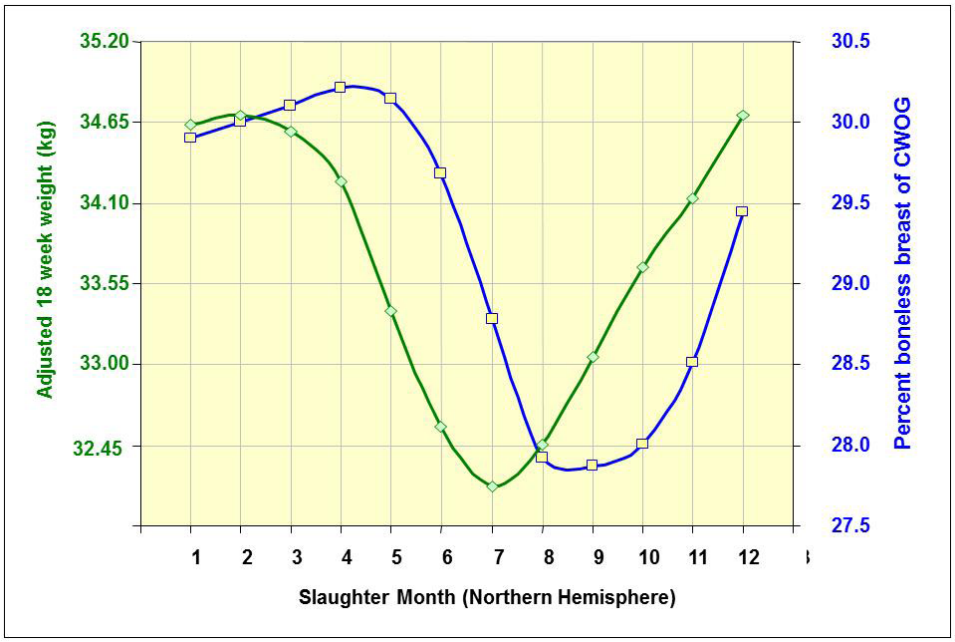
Table 2 illustrates an example of performance data from turkeys raised in tunnel ventilated turkey barns compared with turkeys raised in naturally ventilated barns during the 2012 summer months in the Midwest. This performance data demonstrates the possibility of improved weight gains and feed conversion when turkeys are raised in temperatures within their comfort zone during hot weather. Figure 2 illustrates what happens to the breast meat yield as a relationship to average body weight.

Table 2. Tunnel and Conventional Ventilation Comparison - 2008

	Tunnel	Conventional
Live Weight (lbs)	43.23	40.62
Age (days)	139	139
GPD	.3110	.2922
Feed Conversion (Actual)	2.58	2.66
Livability	87.39 %	81.30 %

2. Understanding heat production and removal in a turkey facility

Figure 2. Effect of hot weather on ADG and Breast Meat Yield



One of the primary goals of tunnel ventilation is to remove heat away from the birds and get it out of the barn. Understanding where this heat originates can be helpful. Many producers may look at increasing insulation values in ceilings and walls to keep heat out of the barn. While insulation is an important factor for conserving heat in the winter, it is not as important as removing the heat produced by the birds during the summer months. Table 3 shows the approximate heat balance of a typical 30,000 ft² finisher barn holding 8,500 toms weighing approximately 40 lbs.

Table 3.

30,000 ft² Turkey Finisher – heat calculation - 8,500 toms, 40 lbs

• Ceiling –	70,000 Btu/hr
• Side walls -	10,000 Btu/hr
• End walls -	3,500 Btu/hr
• Birds -	1,700,000 Btu/hr
• Lights -	8,100 Btu/hr
• TOTAL	**1,791,600 Btu/hr**

Clearly it is more important to remove the heat from the turkeys than to try to reduce heat entering the building structure from the outside. Sizing the ventilation system properly, including fans and inlets is necessary to remove the heat production and to provide the air speed necessary to create reduced effective temperatures.

Fan selection is critical when designing a tunnel ventilation system. Static pressure (Pascals), fan shutters, and building structure all affect the efficiency of the fan. Most fans in the North American market have been tested by the Air Movement and Control Association (AMCA) and test results can also be found on the Bess Labs web site at www.besslabs.com. This information will allow producers to make sound decisions relative to the power each fan will provide under different loads as well as how efficient they will be relative to utility demand. Choosing a fan based on price and ventilation capacity alone can cost money in the long run.

3. Designing a typical tunnel system

A common tunnel ventilation design allows for a complete air exchange in one minute. So for a 600 ft long barn, approximately 600 fpm will be necessary. A typical method for calculating the fan capacity needed is to consider the cross-sectional area of the barn. Therefore, a simple calculation taking the cross sectional area and multiplying it by the desired air speed will result in the total fan capacity needed. For a typical North American barn that is 50 ft wide with an average ceiling height of 12 ft and a desired air speed of 600 fpm, the result is a fan capacity of 360,000 cfm.

The inlet capacity must be enough to fulfill the needs of the exhaust fans without creating too much pressure so as to restrict the fan capacity. It is necessary to have enough inlet capacity to allow the air to

enter the barn at approximately 4" of water column (static pressure). In order to do this, a simple calculation can be made by dividing the cfm capacity by 525 fpm, which is the approximate air speed for this static pressure without cool pads. The result will be the total inlet opening for the necessary fan capacity. If cool pads are used, the incoming pressure will be approximately 0.06" static pressure, so a 375 fpm should be used as the divisor to get a larger opening due to restrictions.

In barns that may have open trusses with high ceilings, it is common to place baffles approximately every 30-40 ft that covers the exposed truss. This type of system, in effect, lowers the ceiling by forcing air to travel below these restrictions and must be accounted for when calculating average ceiling height for fan and inlet capacity. So, a barn with a peak of 18 ft and 9 ft sidewalls can reduce the average height from 13.5 ft to as low as 8 ft by using baffles. This will reduce the overall fan capacity necessary to maintain the desired air speed. Keep in mind, however, that the baffles will create a restriction to airflow and therefore more static pressure in the barn which reduces the efficiency of the fans. For this reason, a smooth ceiling surface is preferred.

Figure 3. Typical ceiling baffle

4. Evaporative cooling in reducing temperature

Evaporative cooling can be an effective method to reduce the temperature of incoming air. This method is most effective when relative humidity levels are below 80%. In some cases, depending on temperature and humidity levels, air temperatures can be reduced as much as 10°F or more. This reduction in actual temperature, in combination with high air speeds (lower effective temperatures), can take a 90°F room temperature and make turkeys feel like it is 70°F, well within the bird's comfort zone. Evaporative cooling can be accomplished with cool cell pads, high pressure fogging, or sprinkler systems.

Cool cell pads, typically 6 inch thickness, are mounted at the tunnel inlet end and water is slowly sprayed or trickled over the wet pads to cool the incoming air. While this system may be the most effective method to lower temperatures, it is also the most expensive and usually the most difficult to maintain. Also, in most commercial turkey production systems, cool cell pads are only used for a short period during the hottest time of the year, making them even less cost effective.

High pressure fogging is also used to evaporate water into the air lowering temperature. High pressure pumps running at 200 psi are used to push water though nozzles rated at 1 gallon per minute to create a fine mist. Nozzle lines are normally placed over each tunnel inlet as well within a line strategically placed, depending on tunnel or natural ventilation. Sprinkler systems are similar to high pressure foggers, but use a larger droplet of water for evaporation. High air speeds are critical for making foggers and sprinklers effectively in hot weather. The amount of water added should be regulated in stages – on hot days and low humidity all nozzles should be used for cooling and on cooler days one-half the nozzles should be used. Thus this system is generally set up with two alternating delivery lines so that intermittent cooling can be accomplished along the length of the barn for uniformity.

Evaporative cooling is effective when the temperatures are over 80°F and humidity levels are below 80% (Poultry Housing Tips, The University of Georgia, Vol.12, No.9). Evaporative cooling is detrimental when humidity and temperature levels are both over this mark, as turkeys can no longer lose heat through respiration. Overuse of evaporative cooling can cause high humidity levels in turkey barns causing wet litter and dangerous humidity levels if not monitored properly.

5. Importance of using environmental controls

Environmental controls can be useful tools to maintain an optimum environment when tunnel ventilating turkey barns. There are many good controllers on the market that have the ability to control tunnel fans, inlets, and evaporative cooling in stages so that the environment can be regulated slowly. It is important to remember the effect of air speed and evaporative cooling on turkeys so that younger birds that may not be fully feathered are not chilled too quickly. Chilling birds can result in making them sit down, not getting up to eat and drink, which can result in negative performance. At the same time, not using tunnel fans early enough on older turkeys can result in losing the performance advantages of tunnel ventilation. Many commercial producers make the mistake of delaying tunnel implementation until ambient air temperature reaches 80-90°F. By this time birds are already panting, negating any early advantages of tunnel ventilation. Table 4 is an illustration of a typical controller set up for tunnel ventilation.

Table 4. Controller set up for tunnel ventilation

Controller Stage	Degrees above Target Temperature	Approximate Air Speed
Stage 1	+ 8°F	300 fpm
Stage 2	+10°F	500 fpm
Stage 3	+ 12°F	600 fpm
Stage 4	+ 16°F	Initial evaporative cooling stage
Stage 5	+ 18° F	Second evaporative cooling stage

Conclusions

Tunnel ventilation can be an effective tool to maintain optimal performance and sound animal welfare during hot weather. As managers, we must look at the cost of constructing new turkey barns or converting existing facilities as well as the cost of maintaining and powering these systems. As with any system, if it is managed poorly and young turkeys are chilled or older birds are not cooled soon enough, tunnel ventilation will not perform to expectations. However, as we continue to improve the efficiency of our production systems by raising heavier and more efficient turkeys, we must also examine our facilities and make the necessary improvements to accommodate these additional pressures.

References

Anderson, K. and Carter, T. 1993. "Hot Weather Management of Poultry." Poultry Science and Technology Guide, North Carolina State University, Cooperative Extension Service.

Czarick, M. 2008. Tunnel Ventilation Workshop, Driftmier Engineering Center, University of Georgia.

Czarick, M and Lacy, M. 2000. "The 80 – 80 Rule…. and other facts about evaporative cooling." Poultry Housing Tips, Vol. 12, No. 9. University of Georgia, Cooperative Extension Service.

Donald, J. 1995. "Tunnel Ventilation in Poultry Housing." Alabama Cooperative Extension, 15 Dec. 2009. http://www.aces.edu/pubs/docs/A.ANR-0897/.

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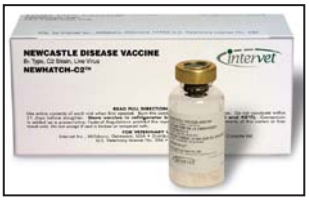

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BVS is the exclusive distributor and marketer of Merck turkey vaccines in the U.S.

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How effective is your drinking water vaccination?

Water is a perfect medium to offer vaccines or liquid feed additives to poultry. The commonly used nipple or cup drinker systems have proven to be excellent watering systems, provided the system is properly made, maintained and used. Still, a lot can go wrong in water medication.

By Wiebe van der Sluis

Water is the most important nutrient for any living species. Providing water requires a watering system which has been made out of material that can be easily cleaned and maintained. It is often thought that any system will do and once you have it installed nothing can go wrong. The reality however tells a different story.Field research done by CEVA Animal Health showed that the results of drinking water vaccination against Gumboro (IBD) at many farms did not meet the required coverage of 95+%. In reality about 27% of the birds were not vaccinated at all and almost 30% did not receive enough vaccine or not at the right time. These poor results required further investigations and showed that poor management practices were the cause of it. Most flock managers believed that they had done a good job until the facts were presented.

Apart from timing, they believed that at start of vaccination the pipes were clean and empty. A closer look however showed the opposite. Even those who properly cleaned the pipes had to accept that "empty" pipes were not empty. This was especially the case in those watering lines that have nipples attached to the pipe with a long screw pin inside the pipe. These may leave water at the bottom of the pipe, up to the top of the screw. The remaining water is thinning the vaccinated water and is reducing the effectiveness of the vaccine (Figure 1). Providing a higher dose is not a solution here, because most of the time the water left behind in the pipe is pushed forward in the pipe filling the end of the pipe with thinned or clean water. The CEVA field test showed that even within one house there can be huge differences between filling water lines with vaccinated water. Some can be properly charged with vaccinated water while the next line can be filled 50-90% with vaccinated water and 50-10% clear water (Figure 2).

When applying water vaccination one may find huge differences between vaccine concentration in water lines.

Clean and empty

To prevent problems caused by improper distribution of vaccines and or liquid feed additives it should be clear that the whole drinking water system should be cleaned before adding vaccinated water. There is a common misconception that chlorinated water does not require any maintenance and lines do not have to be flushed. This is absolutely incorrect. Public water, treated well or surface water may reduce the severity of contamination in the lines, but a biofilm may still appear. Regardless of the water quality or water source, it is highly recommended to clean the water lines between flocks and flush it properly with clean chlorine-neutralised water, so no disinfectant or cleaning solution is left behind. The grower will realise significantly higher productivity and profits over time with a proactive versus a reactive sanitation programme.

After flushing watering systems it should be clear that no water remains in the lines. Only then one can start preparing the system and the flock for vaccination by winching the empty lines up from the floor and leaving the flock without water for about two hours. In case lifting the system is impossible one should dim the lights to give rest to the birds.

Meanwhile the watering system can be prepared for filling the lines with vaccinated water. Make sure that every single line is filled to the end with the desired quantity of vaccinated water. This can be checked by using blue dye in the water solution. The coverage should be at least 90% to be effective. Once fully charged the drinkers can be lowered to provide access to the thirsty flock. To ensure that all birds will take in enough medicated water one should walk through the house to raise the birds and force them to get closer to the drinkers. Repeated walking in the house improves the intake of water and the serological result of the water medication. CEVA showed that the number of negatives dropped from 33% to 19% when the walking frequency over the 2-3 hour vaccination time went up from one to repeatedly.

Importance of water quality

As soon as the stock solution is finished the water lines including the dosing system has to be flushed with clean water so no residues will be left behind. Residues may have a negative effect on the functioning of the watering system and drop the flock performance. The question however is: "What is clean water?" Chickens, like people, require drinking water that is of good quality, safe and without an unpleasant taste. It should be tested for the presence of bacteria and other microbes, for the levels of minerals that occur naturally in the water, and for other chemical and physical factors.

Standards for animal drinking water indicate that there should be fewer than 100 bacteria of all types per millilitre (ml) of water and fewer than 50 coliform bacteria per ml (see Table 1). Recent field research indicates that a bacteria level of zero may be

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Drinking water

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desirable to obtain optimum performance.

Ensuring vaccine persistence

Poor water quality, can retard growth, curtail egg production, or produce lower egg quality. Feed conversion, for example, has been positively correlated to the presence of sulphate and copper concentrations in the water, and livability with potassium, chloride, and calcium. Body weight is positively influenced by water hardness and dissolved oxygen, and negatively influenced by total bacteria and a pH less than 6.0. While several elements can cause poor water quality, the interaction between elements is more significant in water quality problems than the simple fact of their presence.

When using well or surface water the use of a filter is absolutely necessary. This water may contain dirt and chemicals that may interfere with a proper functioning of the watering system and/or vaccines. A Vietnamese producer learnt this the hard way. He complained about leaking and blocked nipples, while filters had been installed. When watering system provider Impex director Richard Wentzel visited the farm to find the reasons for the problems he discovered that the farm workers had taken away the filters because they were fed up with cleaning the filters a couple of times per day. This proved to be 'a penny wise but pound foolish decision'.

Filters have limited or no effect on reducing the hardness of water. Hard water may cause stains, leave residues, or cause other physical problems in water-handling equipment, but seem not to have either a positive or a negative impact on poultry performance. In treating hard water that is to be used as drinking water for poultry, however, care should be taken not to increase any existing chemical imbalance in the water and that it does not interfere with the persistence of the vaccines.

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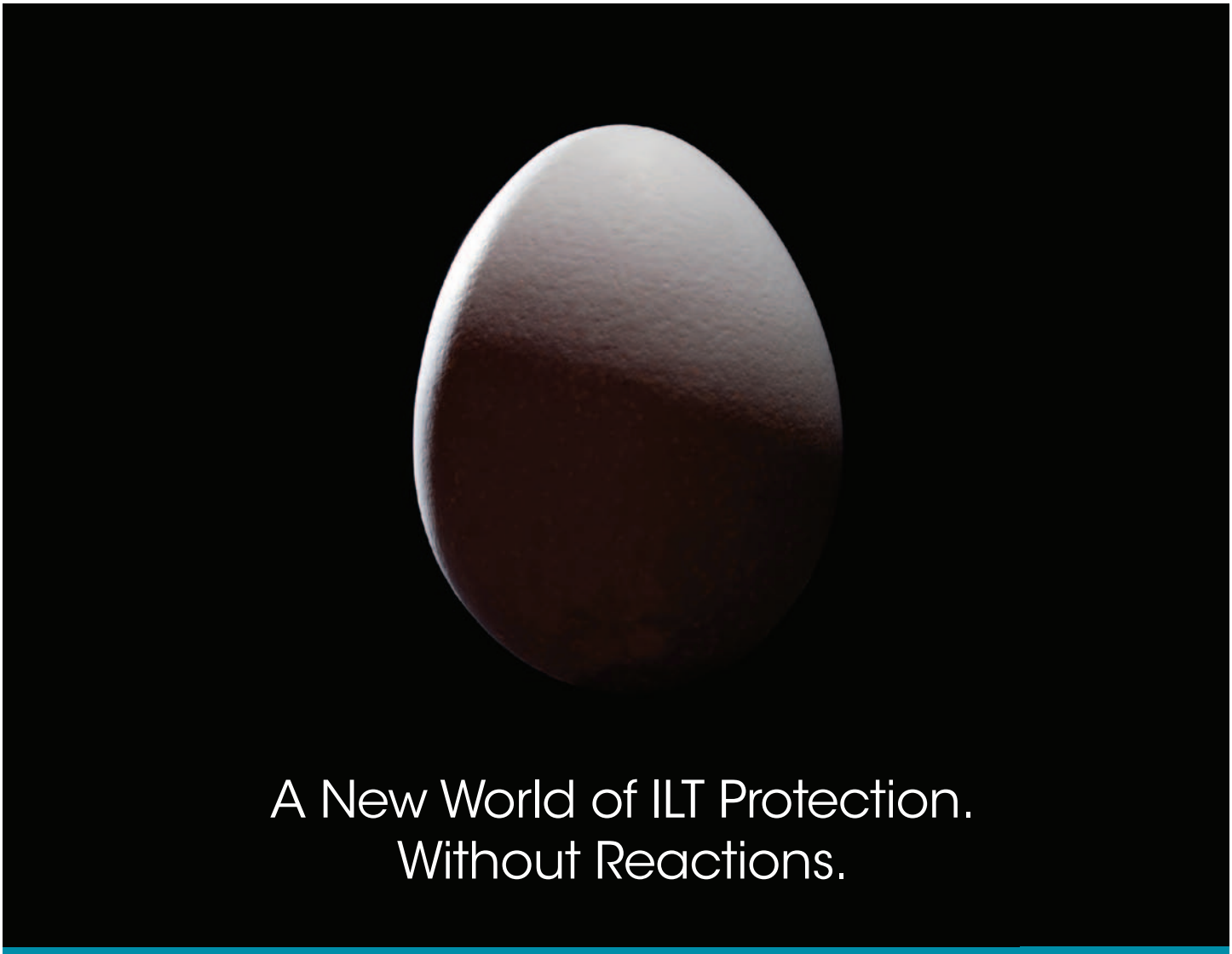

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Professional producers know that ILT can have a great impact on time, labor and production costs. And most methods of protection against ILT can present other problems for your flock.

But healthy day-old chicks treated with INNOVAX®-ILT show no adverse reaction to the vaccine. Because INNOVAX-ILT does not use conventional live ILT virus, the potential for vaccine induced outbreaks is eliminated.

So protect your flock from ILT without adverse reaction. With INNOVAX-ILT.

For more information, contact your Intervet/Schering-Plough Animal Health sales representative or vaccine distributor.

innovax® ILT

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Intervet
Schering-Plough Animal Health

Critical Control Points for Coccidiosis Vaccination

By: Kobus van Heerden, Ceva Animal Health

Introduction:

Vaccination against coccidiosis in poultry is used mainly in broiler, turkey and layer breeder flocks; commercial layer flocks reared on the floor; antibiotic free broiler operations and some commercial turkey grower operations. Attention to some critical factors will determine the level of success of establishing immunity against coccidiosis.

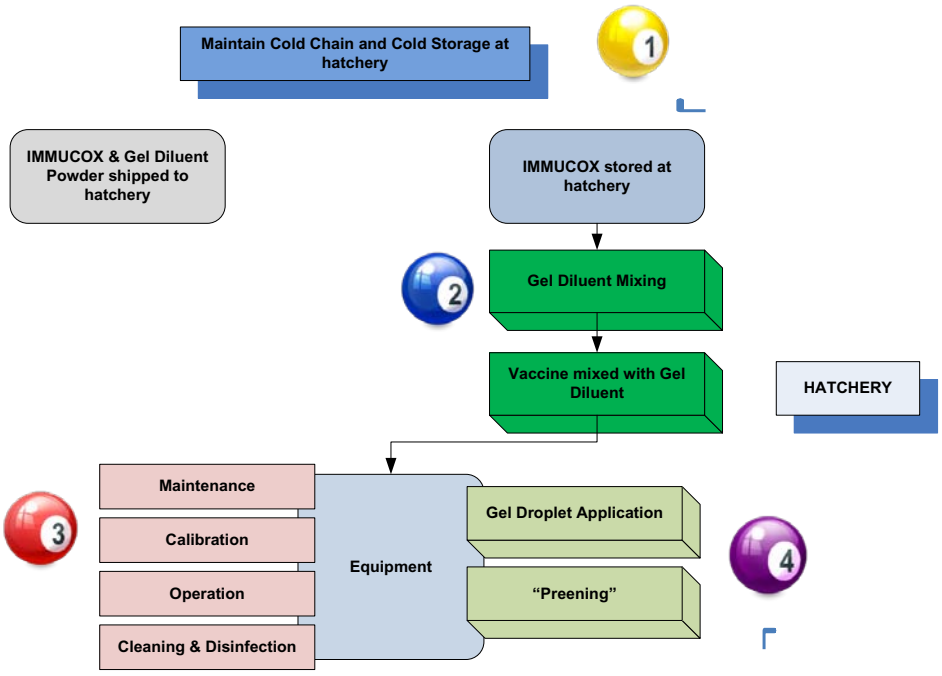
The *Eimeria* parasites given during the vaccination, infects the intestinal cells and continues its life cycle inside the gut. Unsporulated oocysts are excreted after 5-7 days, time depending on the species; the oocysts then sporulate outside the bird, given suitable environmental conditions exits, sporulates and after re-ingestion of these sporulated oocysts, infection and another cycle starts. Immunity development is therefor dependent on successful excretion of oocysts and then re-ingestion of these sporulated, shed oocysts. Depending on the species, 2-3 infection – excretion – re-ingestion – re-infection – excretion cycles are needed to aquire a protective immunity.

The vaccination process and the subsequent development of immunity, irrespective of the application method, can thus be divided in two distinct areas:

- Vaccine Application – ensuring homogenous uptake of the vaccine
- Post Vaccination Management – ensuring suitable environmentable conditions for sporulation exysts and recycling of the sporulated oocysts takes place

Vaccine application:

As most of the coccidiosis vaccinations, worldwide, takes place in the hatchery at day-old, the critical factors highlighted in the following are related to the hatchery:



Cold Chain:

- The first step in successful vaccination is the use of viable vaccine. Viable vaccine is vaccine that is used before its expiry date, vaccine that has not been frozen and vaccine that has not been exposed to too high temperature.
- Cold chain integrity involves the way it is shipped from the supplier to the user as well as maintaining the temperature between 2-8^{0}C while stored at the customer.

Vaccine Preparation:

- Following standard operating procedures in preparing the vaccine is essential.
- This is important not only to ensure vaccine integrity, but also to ensure the right concentration, compatible with the appropriate application rate is reached.

Equipment & Application:

- The equipment used should be clean, well maintained and in a good working condition.
- Check the calibration regularly to make sure the reccommended application rate is actually achieved.
- Adequate cleaning and disinfection procedures must be followed after use of the equipment as dirty equipment can be a source of contamination and / or significantly impacting on an even application rate as required.

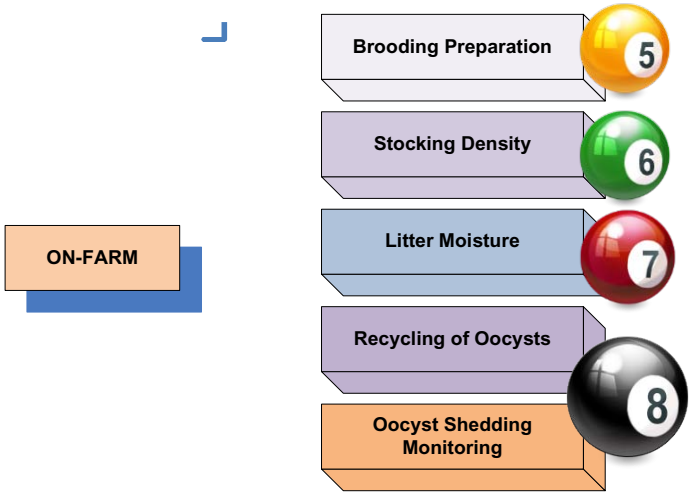
Evaluating Vaccine Application:

- The necessary procedures to actually check the vaccine uptake by the birds must be implemented.
- Adding a suitable dye to the vaccine makes this possible by randomly checking boxes/ crates of chicks/poults and see if they actually did ingest the vaccine by counting the number of chicks/poults in the box/crate with the dye coloured tongue.

Post Vaccination Management:

Brooding Preparation:

- Brooding area should be prepared according to breed recommendations.
- Particular care should be given to adequate feed and drinker space, temperature, ventilation and proper biosecurity measures.



Stocking Density:

- Allthough technically part of brooding setup, it is so important that it needs special attention.
- As the development of immunity is dependant on successful re-ingestion of sporulated, shed oocysts, stocking density plays a critical role in creating the environment for sporulation to take place. It further puts the birds in close proximity to these sporulated oocysts that creates the opportunity for the birds to actually ingest these shed sporulated oocysts.

Litter Moisture:

- Ideal moisture level, in the top 5-10mm of the bedding / litter is between 25-35%
- This is absolutely necessary in providing the moisture required for sporulation of the shed oocysts.
- Litter moisture can easily be measured with a handheld wood moisture meter, available at most hardware stores.
- Stocking density can be used in controlling the litter moisture:
  - If litter is too dry – keep birds at higher density
  - If litter is too wet – keep birds at a lower density

Recycling of Oocysts and Monitoring:

- Oocyst shedding can be measured by sending fecal samples to a lab that is capable of doing an Oocyst Per Gram (OPG) count.
- Fecal material (NOT bedding) is collected at specific intervals post vaccination:
  - Chickens DAY 7 / 14 / 21 / 28 POST VACCINATION
  - Turkeys DAY 6 / 13 / 20 / 27 POST VACCINATION
- The first count should be positive. This is a very good indicator of the effectiveness of the vaccine application done in the hatchery as well as an indicator that the vaccine that was used was still infective.
- The second count should show significant increase. This is used as an indicator that the shed oocysts sporulated and re-ingestion of these shed oocysts have taken place.

The world's leading disinfectant Virocid has become even more powerful.

Thanks to the extraordinary cleaning power of **Kenosan**, the world's most powerful disinfectant **Virocid** is able to penetrate deeper and disinfect even more thoroughly than you were used to.

Kenosan combines ultra-strong adhesion power and deep penetrating cleaning action at very low dilutions! The high-level formulation guarantees a unique cleaning result in the most heavy-duty circumstances in the pig, poultry and dairy houses. Even the most thick and dried up dirt (manure, litter, etc.) like in farrowing crates, fattening pens, turkey or broiler rearing houses, milking parlours etc. stands no chance against the penetrating and dissolving power of Kenosan. The cleaning action also gets amplified by extended contact time due to the sticky foam that remains attached upon all types of surface.

CID LINES
innovative hygiene solutions

www.cidlines.com

OMEGAMUNE GUT START

- **Extremely fortified probiotic for poults and chicks containing 6 strains of live (viable) naturally occurring micro-organisms**
- **Applied at the hatchery at 1 day of age (Hatch Day) or at placement**
- **Probiotic is applied with a gel spray diluent to provide better uptake and uniform coverage**
- **Gel appears as droplets on poults or chicks and is visible and readily picked up by the birds which increases the amount of product getting to the birds and the amount of birds that get the product.**
- **All droplets are gone within 2 or 3 minutes**
- **Unlike water spray, the gel spray does not soak the poults / chicks , keeping them dry and warm**
- **Can easily be mixed with IMMUCOX vaccines for same time application**
- **Contact your poult / chick supplier and ask them to apply Gut Start on your next order**

OMEGAMUNE® GUT PRO POULTRY PROBIOTIC

Contains a source of live (Viable) naturally occuring micro-organisms and stabilizing agents to help contain viability of product through administration.

Use Gut Pro to supply naturally occuring micro-organisms to poultry in the first 1 to 5 days of placement, at periods of unusual stress, before and after moving or after therapeutic antibiotic treatment

DIRECTIONS FOR USE:

For starting birds supply one Gut Pro 4 oz. jar per 5,000 birds in first 8 hours of morning drinking water for 3 consecutive days.

For periods of stress, before and after moving or therapeutic antibiotic treatment supply one 4.0 oz. jar of Gut Pro per 5,000 bbirds in first 8 hours of morning drinking water as needed.

Turn off chlorine or water sanitizer and neutralize water system with Vaccine Stabilizer before use of Gut Check.

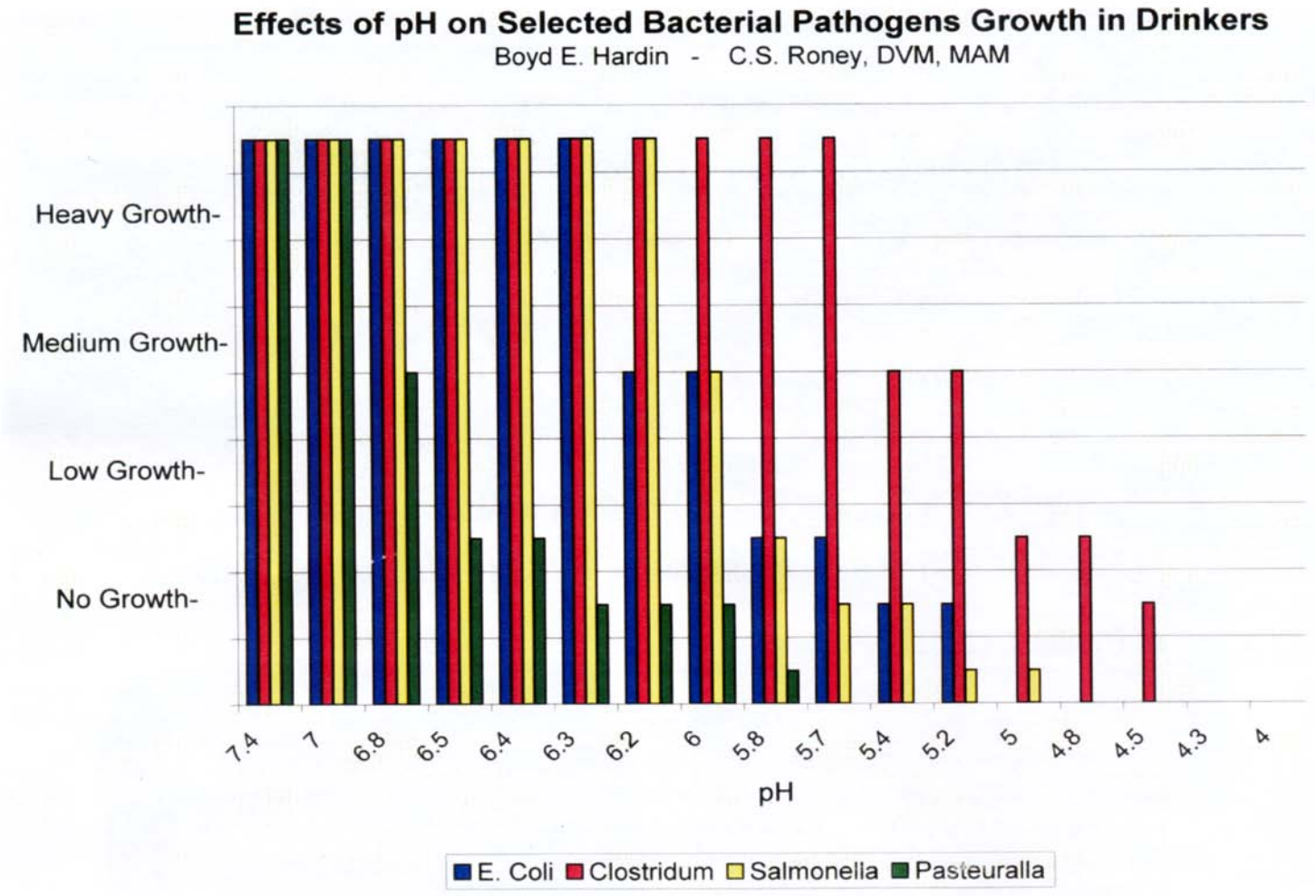
Make sure the entire watering system and stock solution are free of any anti-microbial agents.

GUARANTEE
11.2 billion CFU/gram total lactic acid producing bacteria
11.2 billion CFU/gram Bacillus cultures

INGREDIENTS: Milk products, sodium thiosulfate, magnesium chloride, gelatin hydrolysate, Enterococcus faecium fermentation product, Lactobacillus casei fermentation product, Lactobacillus acidophilus fermentation product, Lactobacillus plantarum fermentation product and Bacillus subtilis fermentation product and Bacillus licheniformis fermentation product, sucrose

Net Weight: 4.0 oz. (113.4 grams)

Manufactured for:
Best Veterinary Solutions, Inc.
Willmar, MN 56201
Best Veterinary Solutions, The Solution Company



OMEGAMUNE®-PLUS

JUST RECEIVED! Patents #8,298,593 #8,460,719

WITH ANTIOXIDANTS FOR TURKEYS & BROILERS

For Use in Closed Drinking Water Systems for Poultry

GUARANTEED ANALYSIS

$CuSO_4$.....18%

INGREDIENTS: Copper, Organic Acids, BioSupremeL, Buffers, Dye #40, Extract from Essential Oils.

Omegamune-Plus *Precautions*

- Acidic solution
- Corrosive to galvanized and mild steel equipment, piping ..... and/or fittings.
- Wear goggles or full face shield when handling
- For animal use only; not for human consumption
- Keep out of the reach of children

WARNING: ***Follow label directions***

MIXING DIRECTIONS

Standard Dosage - 1:1024 gallons drinking water. Administer 1 part Omegamune-Plus in 1024 parts drinking water. For injectors/proportioners administer 1 oz. stock solution per gallon drinking water. Prepare stock solution by mixing 1 gallon Omegamune-Plus with 7 gallons water.

Optimum Dosage - 1:512 gallons drinking water. Administer 1 part Omegamune-Plus in 512 parts drinking water. For injectors/proportioners administer 1 oz. stock solution per gallon drinking water. Prepare stock solution by mixing 1 gallon Omegamune-Plus with 3 gallons water.

Available in the following packaging:

4 x 1 gallon cases.....(Product # 100801)
5 gallon pails.....(Product # 100810)
55 gallon drums.....(Product # 100820)

Manufactured by: **Best Veterinary Solutions, Inc. • Willmar, MN 56201**
1-800-533-1899 • FAX 320-235-8629
"Marketed Exclusively by Best Veterinary Solutions"
Contact the BVS sales representative or distributor in your area for more details.

Get into the Zone

The Manage® Zone
Dietary Agent for Poultry and Swine

- is considered GRAS (generally recognized as safe).
- has a pH of 1.3.
- when mixed at recommended levels will reduce drinking water to pH 3.5-5.5.
- will hold pH down longer than other commercially available acidifiers.
- contains higher levels of copper than other liquid copper products on the market.
- is a dark purple solution that stays in solution without any settling out like that of competitive products.
- fits well into an antibiotic free program.
- works very well to maintain waterlines. Prevents scale build up.
- is friendly to the environment. 40% less copper excreted by using Manage versus feed grade copper.
- Is the only Patented product of its kind!

The Acid Sol® Zone
Dietary Agent for Poultry and Swine

- is considered GRAS (generally recognized as safe).
- has a pH of 1.3.
- when mixed at recommended levels will reduce drinking water to pH 3.5-5.5.
- will hold pH down longer than other commercially available acidifiers.
- is a red solution that stays in solution without any settling out like that of competitive products.
- fits well into an antibiotic free program.
- works very well to maintain waterlines.
- is a combination of buffered acids.
- contains No copper.

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- SACOX
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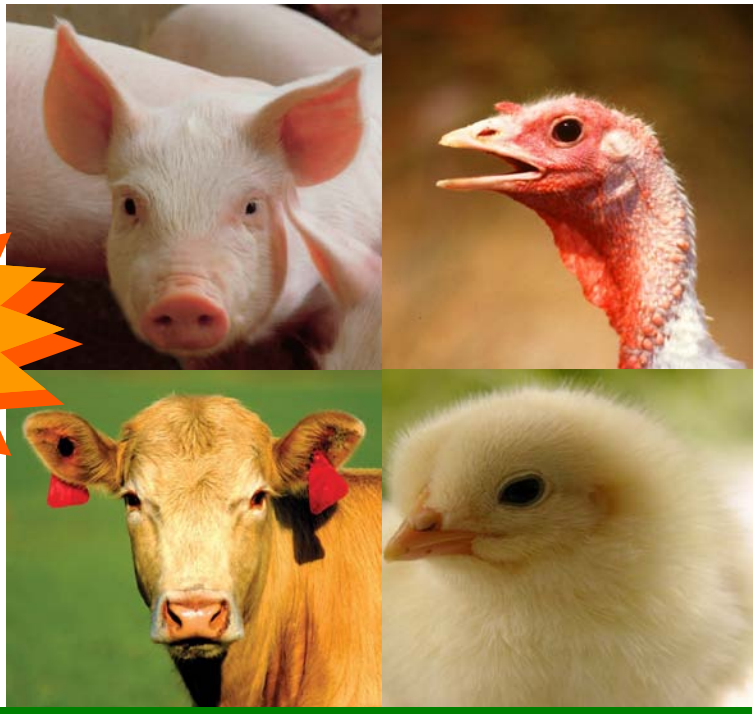
HUVEPHARMA®
We add performance to your business

Growing with You!

Thanks to your support, our business is growing! Not coincidentally, *supporting your growing business is our business*!

We are grateful and proud that as we work together, we are able to provide proven and dependable products that help our nation's livestock and poultry producers grow safer, healthier and more affordable food.



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CitriStim®

Unique...just like you and your operation.

CitriStim®, a unique yeast, balances the health and performance of your flock through beneficial immune modulation, research-proven immune benefits and enhanced digestive function.

A unique ADM Yeast (*Pichia guilliermondii)* for immune modulation and pathogen adherence...

CitriStim® may help the animal fortify its defense against health challenges.

The yeast component of CitriStim may manipulate pathogens and mediate gut immune activity. The overall result is enhanced performance and an animal that does not easily succumb to daily health challenges. It's an easy addition to diets for all life stages and classes of animals.

Check out our, ***CitriStim Impact on Intestinal Immunity in Poultry,*** article in this issue.

CitriStim has performance-proven health and production benefits, now brought to you by:

Best Veterinary Solutions, Inc.

ADM

CitriStim® Impact on Intestinal Immunity in Poultry

Referee Journal: *Poultry Science* 91: 107-111, 2012

Background:

The study was conducted on broilers to explore the impact of CitriStim on intestinal immunity at the Ohio Agricultural Research and Development Center, The Ohio State University, Wooster, USA. Dr. R. K. Selvaraj was the leader for this research.

Primary conclusions based on the study:

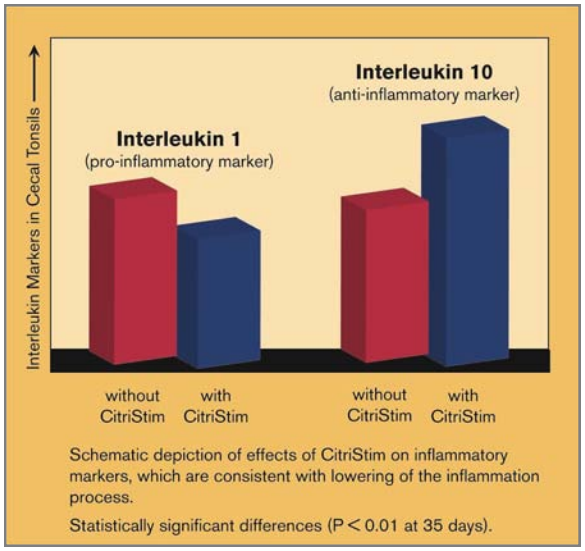
1. The experiments were conducted to determine the impact of CitriStim on intestinal immunity in broilers under laboratory conditions without any external stresses/immune challenges.

2. Since the intestine is a critical organ for immunity, the Regulatory T-cells, CD4+ T cell, and CD8+ T cell percentage in the cecal tonsils of CitriStim-fed-birds were measured. Increased Regulatory T cells, with no decrease in CD4+ and CD8+ T cell percentages, in CitriStim-fed-birds demonstrated that the intestinal immunity is optimal and the bird has an improved level of friendly microflora as a consequence of CitriStim. ***In conclusion:*** **the bird is able to use dietary nutrients for production rather than having to use some of the nutrients fighting infection/disease.**

3. Consistent with this balance of response (as described above):

    a. Interleukin 1, **a pro-inflammatory marker, was decreased** in the cecal tonsils of CitriStim-fed-birds. ***This finding is consistent with the reduction of inflammation.***
    b. Interleukin 10, **an anti-inflammatory marker, was increased** in the cecal tonsils of CitriStim-fed-birds.

4. Broilers fed CitriStim at 0.1% of the total diet exhibited a 4% increase in weight gain and 2% improvement in feed efficiency even in light of the absence of external stressors.



Schematic depiction of effects of CitriStim on inflammatory markers, which are consistent with lowering of the inflammation process.

Statistically significant differences ($P < 0.01$ at 35 days).

Why Go Soft On Rodents?

Because It's Their Favorite Last Meal.

Q: What is soft bait?
A: *Fast*Draw or Revolver no-wax rodenticide.

When you purchase an 18 pound pail of red or green wax blocks, you are spending money on approximately 4 pounds of wax filler.

When using *Fast*Draw or Revolver soft bait, rodents consume 0% wax and you gain 100% control in every bite they take!

FASTDRAW®
FastDraw takes 4-5 days to work.
SOFT BAIT

NEW
Revolver™
SOFT BAIT

*Fast*Draw & Revolver soft bait fit in hard to reach places where rodents live and breed

- *Outperforms red or green wax blocks or pellets*
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- *Fast acceptance & control*
- *Less bait waste, saving you money*
- *Will not melt in high temperatures*
- *Pouches fit in hard to reach places*
- *Single feed control*

No wax = no melting and maintaining palatability in hot & cold environments.

Contact your Liphatech District Sales Manager or Best Veterinary Solutions Sales Representative for samples or more information today!

LIPHATECH®

ProOxine®(AH) Disinfecting Solution

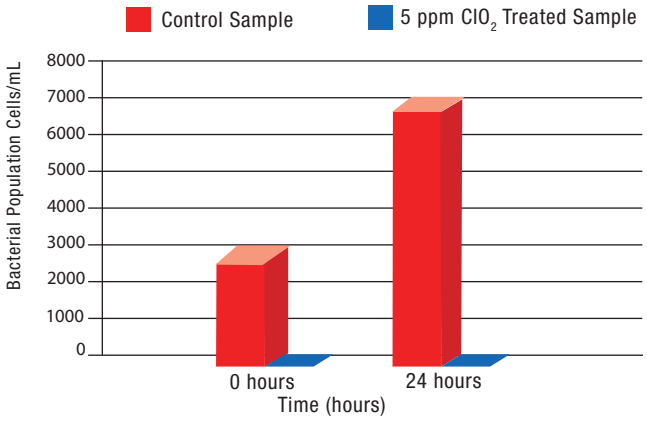
For Animal Drinking Water

ProOxine® is the most effective tool for water management in animal facilities. ProOxine® keeps the bacteria level down in the water lines, and prevents biofilm from developing thus keeping the animals healthier by keeping down the pathogen level that could potentially travel from one animal to another. ProOxine® makes drinking water more palatable to poultry and livestock and therefore they drink more. Additionally, ProOxine® is highly effective in keeping water systems free of build up.

Efficacy of ProOxine® against Biofilm

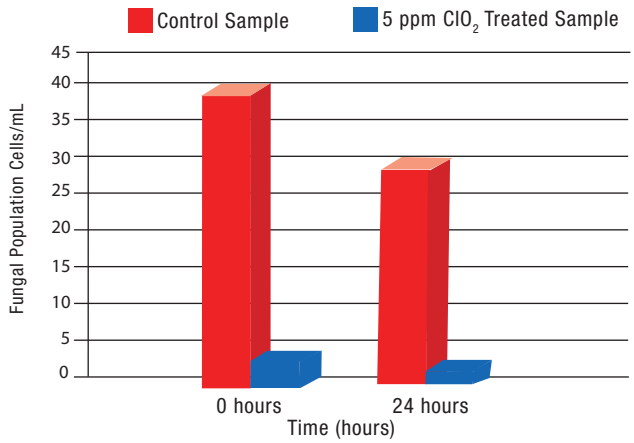
CONTROL EFFECT OF 5 ppm ClO_2 AGAINST BIOFILM BACTERIA

On Bacteria	Control Sample	5 ppm ClO_2 Treated Sample
0 Hour	3000	30
24 Hours	7000	2



CONTROL EFFECT OF 5 ppm ClO_2 AGAINST BIOFILM FUNGI

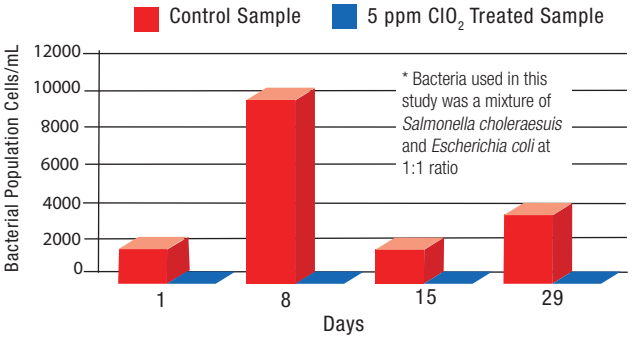
On Fungi	Control Sample	5 ppm ClO_2 Treated Sample
0 Hour	40	4
24 Hours	30	2



Efficacy of ProOxine® against Salmonella and E-coli

REDUCTION OF BACTERIAL POPULATION* IN WATER AFTER CONTACT WITH 5 ppm CHLORINE DIOXIDE

On Bacteria	Control Sample	5 ppm ClO_2 Treated Sample
1 Day	2000	20
8 Days	10000	2
15 Days	2000	2
29 Days	4000	2



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When used throughout the entire flock, water infused with the one-two punch of PWT® increases consumption for improved performance while simplifying waterline management. Call **1-888-858-4425** today to get clear, bottom line results in every drop.

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IT'S HARD TO FIX A REPUTATION.

When you make Bron-Newcavac™-SE part of your *Salmonella* control protocol, you protect your commercial layer flock, your business and your reputation. For the confidence that comes with long-lasting control, ask your Merck Animal Health representative for Bron-Newcavac-SE. Part of the Merck Poultry program of total bird health.

BronNewcavac™ SE

MERCK
Animal Health

Maintenance of Evaporative Cooling Pads

CID LINES
INNOVATIVE HYGIENE SOLUTIONS

takes **CARE** *for* **LONGEVITY** *of your*

EVAPORATIVE COOLING PADS

Spend little Save a lot

GENERAL MANAGEMENT TIPS TO IMPROVE EFFICIENCY AND LIFE OF EVAPORATIVE COOLING PADS

APPROPRIATE DESIGNING:

- Evaporative Cooling (EC) Pads should be installed with appropriate supports/frame.
- Avoid water absorbing material (such as cement) at EC Pads' bottom guttering as such material exposes them to continuous humidity which shortens the life of EC Pads.
- Water Tank should be, properly, designed (divided into 2-3 portions) to avoid re-circulation of dirty water through the system which, gradually, keeps on clogging EC Pads. It would be of an additional significance, if capacity of water tank is kept in accordance with the requirements of circulating water, through the system. Proper covering of tanks is necessary to avoid surrounding contaminations to get in it.
- During construction of farm house, the side for the installation of EC Pads should be designed as to avoid their direct exposure to sunlight (as in a **"EC Pads Room"** or **"Doghouse Plenum"** or simply curtains, otherwise, in front at suitable distance from them) to prevent algae or bacterial growth. For directly exposed EC Pads, in farm environment, the installation of nylon net about 1 m before them is recommended to prevent small insects, dust, or unwanted particles to clog the air channels of EC Pads.

FLOW AND QUALITY OF WATER:

- **Required Water Flow Rate, for 7 mm (0.28 ") flute height EC Pads, is 60 litres/minute/sqm (1.6 gal / min / sq ft) of top surface for up to 2000 mm (7.9 ") high EC Pads while Required Water Flow Rate, for 5 mm (0.2 ") flute height EC Pads, is 90 litres/minute/sqm (2.3 gal / min / sq ft) . of top surface for up to 1000 mm high EC Pads.**

OR

- To supply water for EC Pads; **water pump capacity should be around 5.5 litres/minute** (1.5 gal / min) for 2000 x 600 x 150 mm (6 ½ ' x 23.6 " x 6 ") EC Pads (7 mm or 0.28 " flute height) while the same for 1000 x 600 x 100 mm (3 1/3 ' x 23.6 " x 3.9 ") EC Pads (5 mm or 0.2 " flute height).
- The proper water flow on the top and uniform distribution along the length of EC Pads would reduce the mineral build-up on them.
- Avoid operating EC Pads beyond range of **pH of water between 6 and 8**.
- Proper treatment of water is significant, on regular basis.
- Avoid water with high concentrations of calcium, bicarbonates or sulphates (more than 100 ppm). Proper bleed-off design and pre-treatment of water should be utilised to reduce the potential danger for the life of EC Pads.
- Avoid contaminating oxidising agents such as chlorine or copper compounds into the water.
- Allow EC Pads to completely dry, periodically (overnight), to reduce the bacterial/algae/fungus growth on them.
- Water tank and distribution pipes should be cleaned, on weekly basis.

BLEED-OFF CONTROL:
Bleed-off mode is designed not only to make up evaporated water from the system but it, also, supports in preventing the built-up concentrations within the water that could be harmful for the life of EC Pads. Bleed-off can, simply, be done by adding proper amount of fresh water into the circulating water. To control the proper bleed-off amount, the following is recommended.

1-pH Control:

- Water pH is the proxy of calcification residual in the water. The higher the pH, the lower the dissolvability of calcium and bicarbonates while the higher the concentration of residual in the water.
- The simplest way, to control the bleed-off amount, is that the pH of water, to be circulating in the system, is not exceeding 8.

2-Concentration Control:

- The analysis of ion-concentration (ppm) of water input such as calcium, bicarbonates, sulphates and water pH are necessary inputs for this method.
- The higher the concentration and the pH of water, the higher the bleed-off amount.

BLEED-OFF RATIO:

- General-rule-of-thumb is between 1-1.5 times of water evaporation, that is, if water is being evaporated at the rate of 100 litres/minute then the proper bleed-off amount would be 100-150 litres/minute (26 – 40 gal / minute)

CLEANING & TREATMENT OF EVAPORATIVE COOLING PADS by CID LINES' Products

To keep Evaporative Cooling System, running efficiently, the water in the system must be treated with a wide spectrum biocide. The correct chemical(s) also increases its life and reduce the risk of contamination that could lead to a disease problem, as well. The recommendations of manufacturer(s) should be kept in considerations that the chemical(s), being used, should not damage the EC Pads/Systems. Check the water filters (if being used) and should remove sediments build-up, on monthly basis.

(I) Prior to Start-up of System:
Examine the EC Pads to determine if they are fouled with algae or heavy mineral scales.

To Clean Algae Build-up:

- Spray or foam on EC Pads with **CID 20** @ 6.6 - 15.0 ml/litre (0.66 - 1.5%) OR **VIROCID** @ 3.3 ml - 7.5 ml/ litre (0.33 - 0.75 % or ½ to 1 oz / gal) of water.
- Allow the product to remain on the surface of EC Pads for 10 minutes.
- Flush/spray off with clean water.
- Repeat, if necessary.
- Drain the system and flush with clean water.

(**CID 20 and VIROCID are bactericidal, fungicidal, virucidal, algaecidal that eliminates clogging up by algae or microbial contamination by "slime forming bacteria". These products have residual activity and inhibit bio-film as both of the products contain Quaternary Ammonium Compound and Gluteraldehyde**).

To Clean Mineral Scale build-up:
Choice of 2 methods;

(1) Add **PHO CID** to the system @ 7.5 - 15 ml/litre (0.75 - 1.5 % or 1 – 2 oz / gal) of water; Let this solution to circulate through the system until EC Pads are cleaned; Drain the system and flush with clean water.

(2) Foam or spray with **TORNAX-S** @ 30 - 45 ml/litre of water (3.0 - 4.5 % or 5 – 6 oz / gal) on the surface of EC Pads; Allow it to remain for 10 minutes; Rinse off with clean water; Drain the system and flush with clean water.

Refill the system with clean water.

(II) Initial Treatment:

Add **CID 20** @ 400 ml/1000 litres of water (0.04%) OR **VIROCID** @ 200 ml/1000 litres of water (0.02% or 1 oz / 40 gal) within the system as to acquire the desired results.

(III) Maintenance Treatment:

Add **CID 20** @ 110ml/1000 litres of water (0.011%) OR **VIROCID** @ 55 ml/1000 litres of water (0.0055% or 1 oz / 150 gal) within the system, continuously, with the help of medicator or treat this way, in general, on weekly basis.

(**Average consumption per US 22,000 broiler house is 7.6/3.8 litres/year (2 – 1 gal) while per 100,000 layer house 15.2/7.6 litres/ year (4 – 2 gal) respectively, for (II) and (III) combined**)

Chemical Name: **Virocid or CID-20**
Chemical Family: Quaternary Ammonia and gluteraldeyde
Active ingredient level: 36%
Manufacturer's Recommended Doseage:
VIROCID- initial treatment 2.5oz per 100 gals; maintenance treatment 1.25oz per 100 gals weekly, or as needed.
CID 20- initial treatment 5oz per 100gals; maintenance treatment 2.5oz per 100gals weekly, or as needed.

With little EFFORTS and nominal EXPENSES;
Let's assure you that you can save thousands on Evaporative Cooling Pads

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The Ag forum
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The Science of Litter Management®
SPRING 2013

Pad Acidification for Improved Performance

Often times, as poultry houses age, performance can begin to slip without any truly identifiable cause. The management of the houses can still be quite good but the flocks just don't seem to perform as well as they did in the past. One reason for this can be a shift in the microbial ecology of the house over time. Because poultry houses have dirt pads rather than concrete floors, the pads will absorb ammonia from the litter. The longer birds have been raised in the house, the more ammonia that is absorbed into the pad. It isn't unusual to have 60 PPM of ammonia at bird placement on new litter due to the ammonia release from the pad itself. As the ammonia content of the dirt pad goes up, so does the pH. As the pH shifts to levels above 7.5-8.0, the type of bacteria and other microbes that make up the typical flora of the dirt pad begins to shift into ones that aren't quite so good for chickens (Table 1). Because these are the bacteria that birds are exposed to upon placement, decreases in performance can be seen.

Level of Bacterial Growth at Varying pH levels.				
pH	E. coli	Clostridium	Salmonella	Pasteurella
7.4	Heavy	Heavy	Heavy	Heavy
7.0	Heavy	Heavy	Heavy	Heavy
6.8	Heavy	Heavy	Heavy	Moderate
6.5	Heavy	Heavy	Heavy	Light
6.4	Heavy	Heavy	Heavy	Light +
6.3	Heavy	Heavy	Heavy	Very light
6.2	Moderate	Heavy	Heavy	Very light
6.0	Moderate	Heavy	Moderate	Very light
5.8	Light	Heavy	Light	Very light
5.7	Light	Heavy	Very light	**ZERO**
5.4	Very light	Moderate	Very light	**ZERO**
5.2	Very light	Moderate	Very light	**ZERO**
5.0	**ZERO**	Light	Very light	**ZERO**
4.8	**ZERO**	Light	**ZERO**	**ZERO**
4.5	**ZERO**	Very light	**ZERO**	**ZERO**
4.3	**ZERO**	**ZERO**	**ZERO**	**ZERO**

Table 1. Effects of pH on bacteria growth (Hardin and Roney)

In order to get the house ecology back to the way it was when the house was new, growers should shock acidify both the dirt pad and the drinker system. While this doesn't always work 100% of the time, the vast majority of growers who have tried this have done so with success and seen a return to profitable performance. Research completed at the University of Arkansas shows that treating the dirt pad with 100 lbs./1,000 sq. ft. of PLT® litter acidifier will reduce the pH of the floors to below a 3.0 and results in a 99.99% decrease in bacteria, yeasts, and molds living in the dirt pad (see Figure 1). This shifts the microbial ecology of the houses back to the way they were when new in addition to neutralizing any ammonia trapped in the pad so that it won't be released upon heating.

	pH	Aerobic Bacteria	Molds	Yeasts
Pre-Treatment	7.17	6,732,500	21,750	6950
2 hours Post-PLT® Treatment at 100-lbs/1000 sqft	2.61	66	7	4

Figure 1. Microbial Levels Pre and Post PLT® treatment (Watkins et al 2003)

Benefits of Pad Acidification with PLT® Litter Acidifier: A Field Study of 100 Broiler Houses

In the United States, almost all poultry houses are constructed on top of a dirt pad. As more and more flocks are raised in a house, many growers notice that the performance of their houses begins to slip even under good management conditions. Many growers also observe that no matter how thoroughly they clean and disinfect a house after a disease outbreak, the disease challenges tend to linger on. This is because the dirt pad in a poultry house will absorb ammonia and the pH of the pad will increase to a level (pH 8-10) that is very favorable to bacterial and viral growth and survival. In addition, most disinfectants are very high in pH and are inactivated in the presence of organic material so they are unable to disinfect the dirt pad in the house and unable to shift the microbial ecology of the dirt pad back to one that is favorable for poultry.

One way to combat these problems is to use the same litter acidification techniques you use before bird placement on the dirt pad itself. One hundred broiler houses on 25 farms in five complexes were selected to test the field efficacy of PLT® litter acidifier in reducing pad pH and improving broiler performance (Donald, 2003). Farms were selected that had slipped in performance as the farm aged or had lingering disease challenges even after a complete clean-out or in-house windrowing of litter. After a very thorough cleanout all the way down to the pad, the houses were washed down and disinfected as usual. PLT® was then applied directly to the pad at a rate of 100 lbs./1,000 sq. ft.

The improvements seen on these farms compared to their previous performance was conclusive. Farms saw a 12 point improvement in feed conversion, a 4% improvement in livability, and a cost improvement of $0.0065 per lb (Figure 2) in the three flocks after treatment compared to the flocks the year prior to treatment. Growers were able to pay for the cost of the PLT® application and make a substantial profit from the improved performance. The average pH of the houses before treatment was 7.8 while the average pH after PLT® treatment was 1.8. This low pH makes the dirt pad very hostile to bacterial, viral, and fungal pathogens. In one study completed by the University of Arkansas (Watkins et al, 2003), the use of PLT® for pad acidification reduced the bacterial counts in the dirt pad by six logs, a 99.999% reduction in bacteria (Figure 3).

	PLT	pH	Difference from Standard	ADG	% Mortality	FC	% Condemn
Average	No	7.8	(0.0034)	0.1057	7.76	2.08	1.1938
	Yes	1.8	0.0031	0.1081	3.70	1.96	0.8080
Improvement			0.0065	0.0024	4.06	0.12	0.3858

Figure 2. Performance improvements with PLT® pad acidification. 100 houses in 5 complexes (Donald et al 2003).

House	Pre Application	24 Hours Post-Application	48 hours Post-Application
Control	8,525,000	22,380,000	28,250,000
PLT® Treated (100-lbs/1000 sqft)	6,732,500	91	22

Figure 3. Bacterial counts on the floor of a poultry house treated with PLT® litter acidifier (Total APC CFU/ Sample) (Watkins et al 2003)

More recently, integrators have been using a modified pad acidification technique in houses with long-term Clostridial challenges. After the houses have been properly cleaned-out and all the litter removed, the floors are treated with 175 lbs/1000 sq. ft. of PLT® litter acidifier. After the PLT® has been spread, the houses are sprayed with 5-gallons of a water solution to immediately activate the PLT® and facilitate acid absorption into the pad enhancing the shock effect.

Proper Steps to Pad Acidification:

1. Wash down or blow down the ceilings and side walls of the house.
2. Spray the ceilings, sidewalls, and equipment with a disinfectant, preferably one that is acidic.
3. Completely clean out all the old litter from the house down to the dirt pad.
4. Remove all litter from the corners and under fans. Sweep around footings if necessary.
5. Make sure that absolutely no litter remains in the house.
6. Be certain to completely remove the tarry, black layer (hardpan) just above the pad prior to acidification.
7. Apply PLT® litter acidifier evenly to the whole floor at a rate of 100-175 lbs./1000 sq. ft.
8. Let the acidifier sit for several days before spreading new litter in the house.

Pad Acidification During In-House Litter Composting for Microflora Manipulation

In today's economic environment, many growers find themselves unable to do a complete cleanout and are turning to in-house litter composting in order to manipulate the litter microflora and reduce pathogens after a disease outbreak or to improve performance. Acidifying the pad with PLT® while simultaneously composting the litter is important to fully break the cycle of disease in these houses. The following steps will help you to properly acidify the dirt pad:

1. After the litter has been fully windrowed for the first heat cycle, completely clean and scrape the area of the pad not covered by the pile. Be certain to completely remove the tarry, black layer just above the pad prior to acidification. This layer is high in anaerobic pathogens such as Clostridium.
2. Put the entire black layer you remove from the pad onto the piles so that it may be composted as well.
3. On the areas of exposed pad, evenly apply PLT® at a rate of 100-150 lbs./1,000 sq. ft.
4. Once the first heat is complete, turn the piles onto the treated area of the dirt pad.
5. Repeat steps 1-3 on the newly exposed areas of the dirt pad.
6. Continue to repeat all steps until the entire pad has been treated.

References

Jim Donald and Susan Watkins. Treating Poultry House Floors to Improve Poor Performance. The Poultry Engineering, Economics, and Management Newsletter. Auburn University. Issue 23. May 2003.

SE Watkins et al. Evaluating Effectiveness of Poultry House Sanitation. Proc. 2003 Virginia Poultry Health & Management Seminar. Pg 64-67.

Effects of pH on Selected Poultry Bacterial Pathogens, Boyd E. Hardin and C.S Roney, Alabama Department of Agriculture and Industries State Diagnostic Lab.

How does PLT® affect the dirt pH?

pH is the measure of the concentration of the hydrogen ions in solution. The greater the concentration of hydrogen ions, the lower the pH. Most dirt pads in broiler houses have a pH of 7.5-8.5 prior to PLT® application. Once PLT® is applied, the surface pH can drop to 1.8-2.0 making the dirt surface acidic. This is what neutralizes the ammonia being released from the dirt surface and creates an environment unsuitable for bacterial growth.

How long will PLT® last?

If you use the proper rate of PLT® for house conditions and follow the proper application procedures, you can expect PLT® to last for the entire growout period. In some cases, pH has been seen to stay low in the soil for multiple flocks.

Can you under apply PLT®?

Yes. Our rate of 100-150 lbs./1,000 sq. ft. is necessary to drop the pH sufficiently in the soil.

Should I use a specific type of disinfectant?

Disinfectants with an acidic pH are preferred. Be sure to allow time for the dirt pad to dry completely before applying PLT®.

I've cleaned out my houses, but I have cake along the side wall. Is that critical?

Yes. It's vital to remove all wet, decayed litter in the house and get down to the soil so you don't have carry over of disease or ammonia from previous flocks.

How close to placement should the pad be treated?

Treat the pad as close to placement as possible to get maximum effectiveness of the product.

Notes

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