

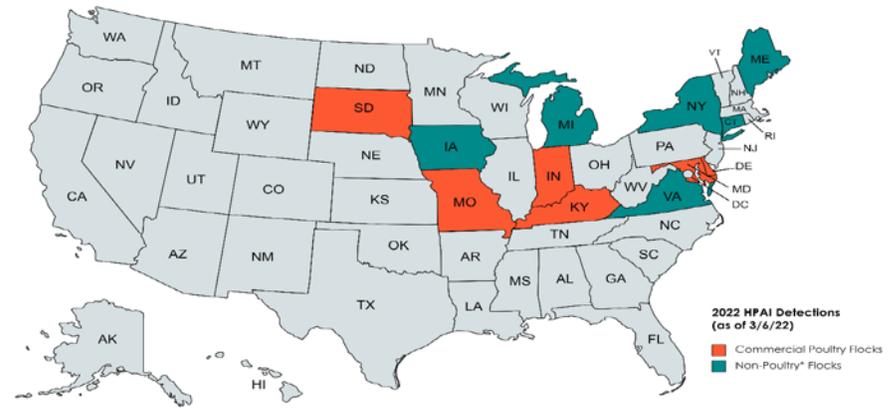


# Inside this issue

Hydr-Ate™ Organic .....	4
Save the date 03.23.22.....	5
Amasil® Formic Acid.....	6
Arko Laboratories.....	6
BASF Selontra® Rodent Bait .....	7
Best Veterinary Solutions, Inc.....	8
LiphaTech® .....	9
EDIE™ Electric Dual Injector - Enclosed.....	10
Aflorin® P L.....	11
Bifen I/T Insecticide/Termiticide .....	12
Pivot™ 10 Insect Growth Regulator Concentrate... 13	
Cleaning and disinfection review... part of a sound biosecurity plan.....	14-15
Gut Pro & Gut Restore™ .....	16
BVS Personal Protection .....	17
Lovit LC-Energy/Kaesler Animal Nutrition .....	18
Solutions for Organic Production.....	19
Enviro .....	20
Gut Pro & Gut Restore™ .....	21
BioProtektion by CID Lines .....	22
Virocid vs. Synergize.....	23
Virocid & Kenosan .....	24
depHender®, Manage®, Manage® Organic, Omegamune®-Plus, pH Safe.....	25
The 3 "E's" of Dry vs. Wet Footpans for Biosecurity: Economical, Effective, and Easy .....	26-29
PeraGuard® .....	28
Barnes Paper .....	29
Ceva Immucox®5 .....	30
Virkon™ S.....	31
Highlights from the 2021 Turkey Industry Annual Report .....	32-34
Huvepharma® .....	35
Jones Hamilton PLT® .....	36
Diamond V® XPC®.....	37
Neogen Synergize® .....	38
Agroin Biosupreme® .....	39
Anpario Orego-Stim™ .....	40
Celmanax™ .....	41
Elanco .....	42
ProOxine® (AH) Disinfecting Solution.....	43
Farmer Boy® Ag .....	44
Gilmer Industries, Inc. ....	45
Aurora Pharmaceuticals .....	46-47
BVS Private Label Products .....	back page

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# Biosecurity, continued from cover



Created with mapchart.net

Figure 2. 2022 HPAI Detections in US Commercial and Backyard Flocks. As of March 6, 2022, Eurasian H5N1 HPAI has been detected in 12 commercial (turkeys, broilers, layers) and 9 non-commercial\* (backyard, pet, captive wild birds) flocks by the NVSL (USDA APHIS) since February 8, 2022; 21 flocks total. Map created with mapchart.net. \*The OIE defines poultry as "all birds reared or kept in captivity for the production of any commercial animal products or for breeding for this purpose, fighting cocks used for any purpose, and all birds used for restocking supplies of game or for breeding for this purpose, until they are released from captivity," and non-poultry as "Birds that are kept in captivity for other reasons, including those that are kept for shows, racing, exhibitions, zoological collections and competitions, and for breeding or selling for these purposes, as well as pet birds, are not considered poultry."

Although this certainly isn't the first HPAI outbreak in the US, these are nonetheless unprecedented times for the poultry supply chain. Who would have thought that we'd be dealing with an active HPAI outbreak, hot on the heels of the global COVID-19 pandemic? Considering this, along with many other challenges of getting poultry to consumers, it is not the time to take the animals and people in our industry for granted. Everyone must play their part to keep things moving forward safely and efficiently during these difficult times.

Agriculture always continues despite the wide variety of challenges, and adaptations are made to rise to these occasions. Many of those involved with poultry production have been adapting and ramping up their biosecurity programs in response to the current HPAI challenge. This is because history has shown us that enhanced biosecurity practices are the most effective ways to reduce the risk of spreading HPAI. So how can risks be minimized while still getting everything you need to raise successful flocks?

Since you are the best advocate for your flocks, you must always be holding yourself and your visitors accountable to ensure that necessary measures are taken to keep your premise(s) safe. Additionally, biosecurity practices should travel with you when leaving the premise. Remember, not everyone knows about HPAI or that the virus can get tracked around easily; for example, off-site destinations (i.e., farm stores, hardware stores, grocery stores, etc.) carry an inherent risk of contamination. Herein lies the problem, on-farm deliveries and off-site supply runs are a necessary part of raising successful flocks, however there are epidemiologic risks associated with both. Thankfully, poultry industry partners know that HPAI situational awareness and promoting a "biosecure culture" can help control the spread of this costly disease.

At BVS, advocating for safe, healthy flocks is what we do best. We would like to take this opportunity to assure you that we are keeping biosecurity at the forefront of our business, since we know it is essential for yours. Continuing to fulfill customer orders and provide technical support are also vital pillars of our business. To ensure we are doing our part to minimize the spread of HPAI, we are elevating biosecurity protocols in all our territories. To demonstrate our

continued on page 2

## Biosecurity, continued from page 2

deep commitment to keeping poultry businesses safe, several highlights from our HPAI Risk Management programs are included below:

### All BVS Personnel:

- Employees are provided with Personal Protective Equipment (PPE) as necessary. This includes disposable coveralls, boot covers, hair nets, gloves, and masks.
- Only essential personnel are permitted to travel to poultry facilities, especially in affected areas by HPAI.
- Employees are encouraged to discuss biosecurity programs and needs with customers whenever possible.
- If a HPAI Control Zone impacts the travel of an employee, it is recommended to find alternative routes or discuss alternative travel options with their supervisor. If there are concerns about disease contact, processes to eliminate disease transmission will also be discussed with their supervisor.
- No employee is permitted to own or be in contact with backyard flocks.

### Technical Services:

- If technical services are required, our team will work with customers to determine the HPAI risk in the area, health concerns with flocks at the destination, and the urgency of the service required. This ensures that needs are met safely and efficiently.
- Technical team members will follow all customer biosecurity programs, in addition to the BVS biosecurity protocols, and are encouraged to discuss any biosecurity questions or needs.
- Technicians are required to don clean, disposable PPE to enter any poultry facility and dispose of all PPE prior to leaving the facility.
- All tools used by the technicians must be cleaned and disinfected before and after each visit.
- Service vehicles are maintained to high cleanliness standards. Before and after visiting poultry facilities the tires, wheels, undercarriage, and floor mats are sprayed with disinfectants. The vehicles are also completely washed at the end of the day and the interiors are fogged with Virocid<sup>®</sup>, which is a proven disinfectant against influenza viruses (Figure 3).

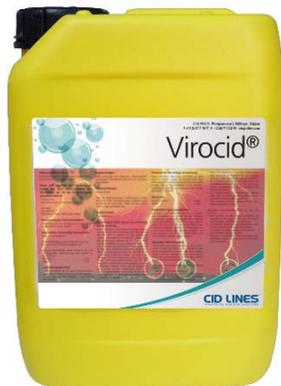


Figure 3. Virocid<sup>®</sup> disinfectant.  
<https://www.bestvetsolutions.com/products/search?criteria=virocid>

### BVS Transportation:

- Central (off-site) delivery locations are encouraged to minimize contact with poultry premises in areas associated with high disease risks. If on-site deliveries are required, drivers must communicate with the customer to determine designated areas for product drop-off and any customer biosecurity protocols. Drivers shall not enter barns during deliveries.
- All BVS vehicles have either installed tire sprayer systems or hand-pump sprayers on board which sufficiently apply Virocid<sup>®</sup> disinfectant solution to tires and wheels. These systems will be used before entering and exiting poultry facilities.
- Disinfectant spray (i.e., BioSentry<sup>®</sup> BioPhene<sup>™</sup>) is kept in each vehicle to spray footwear, floor mats, and equipment. Hand sanitizer and disinfectant wipes are also provided to keep hands, steering wheels, phones, and other small items clean.
- Vehicle exteriors are completely washed and disinfected each day, or as frequently as necessary. Vehicle cab interiors and trailer boxes will be fogged with Virocid<sup>®</sup> daily.
- Drivers are provided with disposable PPE (coveralls, boot covers, gloves, hairnets, and masks) to wear during deliveries. PPE will be donned as they exit the vehicle and will be disposed of before leaving the premise.
- In affected areas, drivers must do the following: plan least risk routes to avoid HPAI Control Zones as possible, prioritize travel from least risk to highest risk, and communicate with customers about their biosecurity procedures.

### Warehouse Locations:

Employees and customers are reminded that our warehouses involve poultry cross-traffic, and although we hold ourselves to the highest biosecurity standards, everyone must actively participate in the warehouse biosecurity plan for it to be successful.

- If designated pick-up areas have overhead doors, they will be foamed with Virocid<sup>®</sup>, inside and outside, and maintained daily.
- Each warehouse has footbaths and signage (Figure 4) to use footbaths at every entryway, including pick-up areas. Each footbath is rinsed and replenished daily. Shoes/Boots must be disinfected before entering and leaving the warehouse.



Figure 4. Disinfect shoes frequently, and do not wear designated barn footwear outside of your premise(s).  
<https://www.creativesafetysupply.com/wall-sign/biosecurity-in-place-step-into-footbath-before-entering-portrait-wall-sign/>

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## Biosecurity, continued from page 3

- If traveling through areas affected by HPAI, customers are encouraged to call the warehouse prior to arrival. The warehouse employees will assist customers in following extra biosecurity steps to safely pick up their orders.
- Over-the-Road trucks are frequently used to replenish and move inventory. Since OTR drivers may not be aware of the HPAI, warehouse employees will discuss HPAI with drivers traveling through high-risk areas, and tire spray/foam stations will be made available to disinfect truck tires and wheels prior to entering loading areas.

These are just some of the ways we are reducing risks to support the continuity of business for our customers. We at BVS pride ourselves on our high standards for biosecurity and we will stay vigilant as the HPAI situation continues to develop. With HPAI circulating in the US you can never be too careful; it is not the time for a false sense of (bio)security. Be aware of contact points between wild birds, backyard flocks, and commercial flocks; this can include people, places, equipment, and vehicles. Set high expectations of sanitation for those who

can impact your flocks. Openly communicate about HPAI - about its cost to the industry and what is needed to reduce risks of spreading and infections. Advocate your own biosecurity culture with visitors, and don't hesitate to ask about their programs, too.

We welcome questions and/or new ideas about how to keep your birds safe, especially during these challenging times. HPAI can persist in the US with migrating birds and infected poultry, and it is uncertain how long this outbreak may last. We can persevere as an industry when everyone does their part to keep the virus out of poultry facilities. As always, the BVS team is here to help, and together we will keep flocks moving forward. ■

#### Resources:

- Owen, Robert. "During these trying times we've got your back." BVS Poultry Talk. Biosecurity Edition, pp 1-3. April 2015.
- <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/avian-influenza/hpai-2022/2022-hpai-commercial-backyard-flocks>
- <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/avian-influenza/hpai-2022/2022-hpai-wild-birds>
- [https://www.oie.int/fileadmin/Home/eng/Health\\_standards/tahc/2018/en\\_chapitre\\_avian\\_influenza\\_viruses.htm#:~:text=For%20the%20purposes%20of%20the,%25%20mortality\)%20as%20described%20below.](https://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/2018/en_chapitre_avian_influenza_viruses.htm#:~:text=For%20the%20purposes%20of%20the,%25%20mortality)%20as%20described%20below.)
- [https://www.fao.org/ag/againfo/programmes/en/empres/Global\\_AIV\\_Zoonotic\\_Update/situation\\_update.html](https://www.fao.org/ag/againfo/programmes/en/empres/Global_AIV_Zoonotic_Update/situation_update.html)

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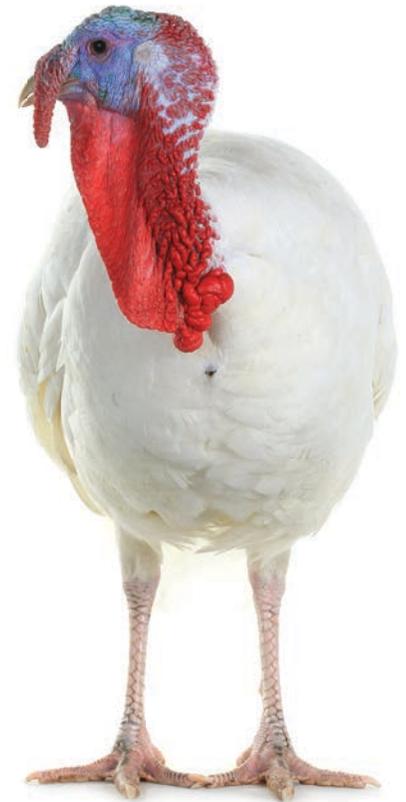


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<sup>1</sup> Controls infestations in 7 days in US Field Trials — Indiana Grain Farm (2017); NC Pig Farm (2016).

<sup>2</sup> E.F. Marshall. Cholecalciferol: A Unique Toxicant for Rodent Control. Proceedings of the Eleventh Vertebrate Pest Conference 1984. p. 95-98.

<sup>3</sup> Prescott, C.V., El-Amin, Vusa, and Smith, R.H. "Calciferols and Bait Shyness in the Laboratory Rat". Proceedings of the Fifteenth Vertebrate Pest Conference 1992. Paper 64. Whisson, Desley, "Rodenticides for Control of Norway Rats, Roof Rats, and House Mice". University of California Cooperative Extension, Poultry Fact Sheet No. 23, 1996.

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# Cleaning and disinfection review...part of a sound biosecurity plan

*John Menges, BVS Director of Technical Sales*

Cleaning and disinfecting (C&D) any poultry facility should be part of a sound biosecurity plan. Start clean...stay clean. If we do not start clean, there is no way to keep the facility clean and reduce the pathogen load on farm. By now you are thinking... NOT ANOTHER BIOSECURITY ARTICLE and stop reading. I completely understand that time is valuable, but this might be worth a look at to review.

I spend most of my time in turkey facilities working with BVS. I am privileged that BVS allows me to do this and actually get paid. Facility C&D is a process all turkey companies do in turkey brood facilities to ensure young poults have an opportunity to start in a pathogen free (or at least reduced) environment. This article is a review of the process. Pay special attention to the cleaning and rinsing areas. In my travels at BVS, this is one area that can be overlooked. I am a big believer in using a detergent to cut through the dirt to allow the disinfectant to be more effective. However, if the detergent is not rinsed off, we can be creating more biofilm on the surface (that cannot be seen), creating a layer that the disinfectant cannot penetrate, allowing for a potentially larger problem. I even tell customers – if you are not going to rinse the detergent, do not use it – wash with plain, clean water – do not add to the biofilm by letting the detergent dry on the surface. So, ask questions – are you sure you are getting the most out of your disinfecting?

It is also important to remember that once a facility has been cleaned and disinfected, it should be treated as a pathogen free area. All access points should be kept closed. No critters should be allowed to enter (this includes farm pets). Any human traffic must maintain clean footwear that are disinfected prior to entering and clean clothing. Any necessary equipment should be cleaned and disinfected on a concrete pad just prior to entering. Finally, rodents and insects must be controlled as both can rapidly infect a facility.

Table 1 below is an outline of disinfecting steps and products to be used. Each will be discussed.

## Cleaning and Disinfecting Key Notes:

- 1. Remove all organic matter – sweep floors and remove litter and mortality from the farm etc.**
- 2. Clean all surfaces – foam all surfaces with KenoSan**
  - Use Handy Foamer with the 1 oz (large silver) tip
  - Attach Handy Foamer to a high pressure washer (1200-2500 psi)
- 3. Rinse foam within 15-20 minutes. Do not allow it to dry on the surface.**
- 4. Allow surfaces to dry (typically wait 24-48 hours)**
- 5. Disinfect all surfaces – foam all surfaces with Virocid**
  - Use Handy Foamer with the 1 oz (large silver) tip at the same high pressure
  - DO NOT RINSE OFF
- 6. Disinfect floor with KenoX5 – mix at 1 gal to 200 gal equivalent**
- 7. House is considered cleaned and disinfected. Anyone or anything entering must be sanitary.**
- 8. Thermal fog Virocid as the last step after litter is added prior to birds being housed. Mix 1 gal in tank and fill rest with water.**

Table 1

1. Remove all organic matter. This is self-explanatory – remove all litter, blow heavy dust-off rafters, sidewall ledges, fans, etc. Then sweep this material out of the house. This will reduce the amount of water necessary to wash down and will create less mess. All used litter must be removed from the premise. Litter piles should also be treated with insecticide to control beetles. Otherwise, it is possible they will go right back into the house when the heat and feed arrive.

*continued on page 15*

## Cleaning and disinfection, cont. from page 14



2. Wash all surfaces with a heavy-duty alkaline cleaner, such as KenoSan. Alkaline cleaners are effective at removing manure, fat, proteins, and feed by-products. If scale is present, an acid type cleaner can be used (more corrosive). A thorough cleaning will reduce pathogen load by 80-85%, allowing the disinfect (step 5) to be more effective and efficient. Foaming the alkaline cleaner will allow the product to penetrate more and rinse the dirt easier compared to power washing. If foaming is not an option, then wet apply.

### Handy Foamer easily connects to any high pressure or washing system



Handy Foamer

3. Do not allow the cleaner to dry. **Remove by rinsing/washing off within 15-20 minutes after application.** Allowing it to dry on the surface will increase biofilm as noted above.

Rinse/wash soap off 15-20 minutes after applying foam. Do not allow it to dry on surface



4. Allow surfaces to dry before applying disinfectant. Downtimes are short, everyone wants to get done, but this is a key step to making sure the disinfectant is not watered down by remaining moisture. If drying is not an option, then additional disinfectant will be necessary.

### This is the goal..... CLEAN AND DRY before disinfecting



5. Apply disinfect to all surfaces. Foaming Virocid is the best option. This allows for additional contact time. If foaming is not an option, then wet apply. **Do not rinse disinfectant.**

Foam all surfaces in the house

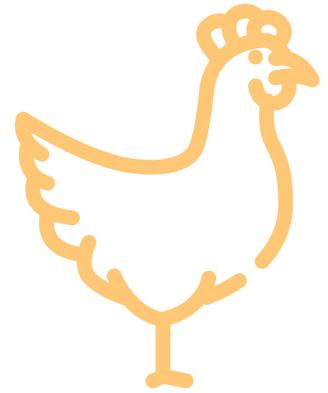
**DO NOT RINSE!**  
Contact time is the key



6. Apply disinfect on the floor. I prefer an acid type product such as KenoX5.
7. Consider the house sanitary. Anything or anyone entering the facility must be cleaned and disinfected prior to entering. Equipment should be cleaned and disinfected on a cleaned and disinfected cement pad immediately outside the door entering the house.
8. Finally, thermal fog the house with Virocid. There is some controversy over thermal fogging – is it effective or not... as a past production manager, I am a big believer. I typically do this after shavings have been spread in the house.

Cleaning and disinfecting...and then staying clean are keys to successful pathogen control. On farm people traffic control and a sound rodent and insecticide control is also necessary to stay on top of your biosecurity plan. Controlling all traffic on the farm along with a sound rodent and insecticide program is necessary to stay on top of your biosecurity plan.

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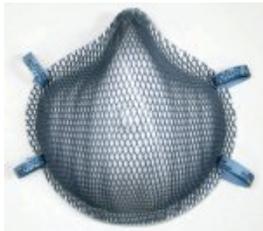
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Nitrile Powder Free Gloves



Yellow Rubber Boot Cover LG & XL



Moldex 1200N95 Mask



Moldex 2400N95 Mask



Moldex 2200N95 Mask



Nuisance Mask



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# The 3 "E's" of Dry vs. Wet Footpans for Biosecurity: Economical, Effective, and Easy

*Scott McKenzie, Ph.D. – Head of Technical Services, North America  
Enviro Tech Chemical Solutions – An Arxada Company*

The use of biosecurity footpans at critical entrance points into and throughout a live poultry production facility is again front-and-center in lieu of the current 2022 avian influenza status within the U.S. Complicating this issue even further is a continued raw materials supply-chain shortage plaguing nearly all global business sectors, including the chemical disinfectant, pharmaceutical, and materials manufacturing industries. Coupled with labor recruitment, training, and retention challenges also facing the poultry and livestock and food production pieces of the protein sectors, more than ever 2022 is a year to reflect on internal processes and procedures and how well the standard best biosecurity management practices are holding up to (employee execution) compliance, profitability, and true protection against animal and food safety pathogens.

The footpan is actually a very odd piece of our business in live poultry production...and not very many employees (if any) view the footpan as a welcomed, utilitarian and standard "every day" part of protocol impacting movement onto and within farms, offices, hatcheries, feed mills, and processing plants. At best it slows things down just a little and adds (nearly negligible) cost to live production, and at worst it feels like a waste of time and money to use properly.

Using footpans (and for most biosecurity protocols and materials, in general) often feels a lot like buying insurance; it simply operates in the background of your operation, without your thinking about it too often, and you hope it is ready, paid for and executed, and actually works in the rare case you might need it (to actually work properly)... but you really hope you never need it at all.

This disconnect between the actual proper set-up, use and enforcement of biosecurity is basically due to two things happening simultaneously: 1) The desired outcome of



biosecurity is that nothing at all happens, and 2) The culture of biosecurity (like establishing a culture of safety within a company) usually lacks "teeth," often taking a back seat to more pressing matters of day-to-day disease prevention and management, executing standard daily protocols with the labor available that day, and always keeping a keen eye on opportunities to either make things simpler or cheaper. This last piece can be the catalyst for re-thinking the footpan for your operation; simple, cost-effective and working the best to manage diverse pathogen challenges facing veterinarians and live production managers throughout the layer, turkey, and broiler businesses in the U.S.

## The Limitations of (Seemingly) Any Liquid Footpan Disinfectant

While biosecurity is a 24-7 year-round combination of materials and processes, certain weather and times of year can make this difficult...depending on the placement of the footpan. Despite the best efforts of live production staff and farm owners to identify the best location for footpans, they are universally very poorly maintained and mostly ignored. When the footpan is small enough, personnel will often step over or around the pan to avoid stepping into the pan.

This is most often a problem for wet footpans containing diluted disinfectant that can leak into footwear that may be damaged (holes) causing skin irritation or the discomfort of wet socks for an entire shift. Jumping over can also be dangerous for employees, potentially causing slip-and-fall scenarios.

Wet footpans containing diluted disinfectant have previously been shown to have a very short lifespan as an effective tool to kill pathogens on footwear. In a study performed at a Hubbard hatchery by Dr. Bob Owens et al (2006), the authors demonstrated two very distinct pieces of data showing liquid footpans are:

- 1) quickly inactivated after only a few uses (Figure 1), and that
- 2) this inactivation seemed mostly indifferent as to the chemistry applied to the footpan (quat vs. phenol; Figure 2).

	Fresh Solution	After 3 Hours
Active	% Change in Bacterial Count	% Change in Bacterial Count
Phenol	-45.8	130.5
Quat	-57.5	73.3
Water	87.2	44.8

**Figure 1. Total bacteria counts from Shoe Swabs.** Phenol and quat liquids kill bacteria in fresh disinfectant, but after only 3 hours bacteria actually increased on shoe swabs, suggesting non-protection of the deactivated disinfectant liquid footpans.

	Fresh Solution	After 3 Hours
Active	Before>After 25 exposures Increase in Bacteria	Before>After 25 exposures Increase in Bacteria
Phenol	36 -> TNTC	TNTC -> TNTC
Quat	1 -> 12	185 -> TNTC
Water	19 -> TNTC	TNTC -> TNTC

**Figure 2. Total bacteria counts in the Disinfectant Dilution Liquid.** Phenol and quat liquids are inactivated, allowing for bacteria to survive and/or grow in the footpan liquid after only 25 uses. After the solution sits for 3 hours, bacteria thrive in the organic material dilutions of quat and phenol.

The data is not only important because it shows that the organic material introduced into footpans inactivates the disinfectant solution, but also that the dirty, deactivated footpan can quickly become an actual reservoir to spread microbes after stepping into the liquid solution. As a follow-up to this date, the authors decided to test dry footpan materials and their ability to reduce microbial counts on boots.

At the hatchery prior to the chick room (break room entrance), employee's boots were swabbed prior to and then after stepping into either liquid phenol or quat disinfectant, or dry chlorine bleach powder (alone or with detergent) for 5 to 10 seconds. The results of the "Real world" trial are summarized in Figure 3. One important note is the poorest performance of phenol, the chemistry often touted as being "more resistant to high organic load," tolerant of dirty

surfaces when compared to other conventional disinfectants like quats, oxidizers, and alcohols (CFSPH 2021).

	% Change in Bacterial Count	Average Residual Life of Footpan
Active		
Dry Bleach + Soap	-92.6	14 days
Dry Bleach Powder	-98.1	14 days
Phenol (liquid)	10.8	<2 hours
Quat (liquid)	-23.6	<2 hours

**Figure 3.** Reduction in bacterial counts on hatchery employees boots after 5-10 second contact time with liquid and dry antimicrobials. Average residual lifespan estimated (calculated) based on available chemistry (molarity) and deactivation by organic load from all data (Owen and Lawlor, 2006).

Liquid disinfectant footpans have another few disadvantages besides being irritating on wet socks (leaky boots), slippery on spongy footbath mats, and rapid deactivation compared to dry products; wet footpans in poultry live operations quickly transfer organic material into solution, creating a visible messy and murky soup that no professional would ever encourage their employees to step into. This further impacts the "culture of biosecurity" problem:

How do poultry health professionals encourage, support and enforce biosecurity protocols that they themselves can not technically verify and demonstrate as visibly "making sense" (i.e., not a murky filthy footpan) to contract growers and flock management staff?

## Dry Bleach Can Be Challenging

While dry bleach proved itself to outperform liquid disinfectant solutions in footpans, this powdered chlorine has a few drawbacks that have created a challenge to becoming a clear replacement for biosecurity liquids. Off-gassing of chlorine is a notorious characteristic of di- and trichlor-based solid bleach powders. The chlorine released from the powder into the immediate space surrounding the dry bleach footpan is not only potentially annoying to employees and animals (due to the smell), but also can oxidize/rust metals on that area, including switches, controllers, and fixtures. When placed into foot pans in very wet areas, some dry bleach products can become "slick" causing a potential hazard for areas around high water usage on smooth floors, or complicated by melted snow and heavy rain at doorways.

## A Quat-Free and Bleach-Free Alternative; A 2022 Granular Spin on Old Liquid Chemistry

Organic acids have been well described as having diverse antimicrobial activity against diverse bacteria and fungi (Martin and Maris, 2005), with acetic acid and lactic acid having one of the the greatest efficacies in organic loads (Cherrington at al, 1992). Their even more powerful synergy

*continued on page 29*



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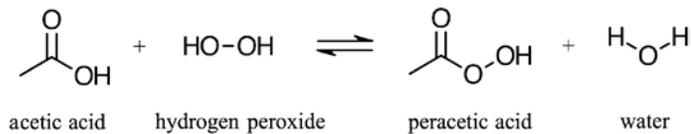


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## Dry vs. Wet Footpans, cont. from page 27

with the simple combination with hydrogen peroxide in a simple mixture was described by the same authors seven years later (*Martin and Maris, 2012*). The combination of when the chemistries of hydrogen peroxide and select organic acids combine under certain conditions, they form a new and very effective peroxyacid compound...having very interesting microbial killing capability characteristics. The one peroxy acid that has led the change into pathogen intervention is peracetic acid (or "PAA"; **Figure 4**).



Peracetic acid is normally (conventionally) formed in a liquid environment, the two reactants being added to a vessel and with a little help from an acid catalyst forms PAA. The formation of this molecule in liquid was industrialized for manufacturing prior to WWII, but was only been in commercial use for the last 50 years. In 2021, the EPA granted approval for pathogen claims for the world's first solid peracetic acid granule invented and commercialized by Enviro Tech (Harvey and Howarth, 2018). This specialized hygroscopic formulation uses a somewhat similar (but unique) approach to create biocidal PAA from the moisture activated powder without the need for vinegar (also known as acetic acid).

The **Peraguard AH** granule offered by BVS to their customers for the first time in 2022 breaks down into innocuous by-products, like soda ash, glycerin, water, CO<sub>2</sub>, and oxygen. The lack of vinegar means that there is not strong smell (like liquid PAA) or off-gassing like bleach powder, and the formula is not slippery or dusty. Further there is no known bacterial resistance to PAA and with the solid granule in a footpan, you only need to add more material to the pan as it contacts footwear and is carried out of the pan. The continuous release of PAA over time



gives a strong initial kill and long-lasting protection. When compared to other EPA-approved footpan powders, **Peraguard AH** has economic advantages, and is easy to use ("add to, no need to throw out and replace"). The simplicity of not having to empty and then clean dirty liquid footpans...or throw away old, expired powder after a few weeks...means better compliance, and a stronger culture of easy, enforceable biosecurity within poultry health leadership, contract growers, and integrator staff. If you can simply see the granules still there in the foot pan (and admittedly the pan is also not full of dried manure), then the moisture-activated **Peraguard AH** is still available to help control pathogens on boots into and within your poultry facility. Biosecurity in a footpan has never been so Economical, Effective, and Easy to accomplish! ■

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# Highlights from the 2021 Turkey Industry Annual Report - Current Health Issues Facing the US Turkey Industry

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In preparation for this annual report to the USAHA Committee on Poultry & Other Avian Species, the subcommittee chairman, Dr. Clark, surveyed turkey industry professionals and veterinarians representing (n=27) the US turkey production regarding the health status of turkeys produced in August 2020 through August 2021. The turkey industry reports several disease challenges for this 12-month period varying by geographic regions within a state and across the United States. This report lists, Table 1, the challenges by disease and issues. Of particular interest in 2021 are issues with lack of efficacious drugs, clostridial dermatitis, colibacillosis, *Salmonella*, ORT, and coccidiosis. The top-10 list for 2021 was near identical to 2020 with the notable exception clostridial dermatitis which jumped in rank to #2 since 2015. Blackhead ranking decreased to #21 from #11 the prior year, but the number of reported cases increased by 58% (Table 2). Also, reported cases of Bluecomb (Turkey Coronavirus) and MG increased. Cases of Turkey Reovirus decreased 55+% and dropped in rank to #19 from #9. New this year include *Streptococcus* ranking and reporting of health programs, reflecting antibiotic usage.

The industry was surveyed to classify their antibiotic programs (Table 5) defined by how anticoccidials and antimicrobials are allowed. Twenty-five percent (25%) of the industry turkeys were reared NAE/ABF category up 19% in 2016, as Conventional Use programs decreased to 38% (2021; 45% in 2016). **Conventional/Full Use** program permits the proper use of any FDA approved antibiotics, administered in the feed or drinking water, including ionophores, bacitracin, flavomycin, and /or those deemed medically important to humans by FDA.

**Reduced Use** would allow for the use of flavomycin or bacitracin but NAHMI (No Antibiotics of Human Medical Importance), and also does not use prescribed in-water medications and no in-feed tetracyclines or sulfa. The **Ionophores Only** program (reported <1%) is no growth promoting antibiotics, i.e., no flavomycin, no bacitracin allowed, and no in-water antibiotics. A fourth category titled “**No Growth Promotants, CRAU/CRAU-like**” (Certified Responsible Antibiotic Use), only permits the therapeutic uses under the prescription and supervision of a veterinarian. Thirty-six percent (36%) of turkeys reared were CRAU programs. **No Antibiotics Ever (NAE) /Antibiotic Free (ABF, RWA)**, does not permit either in-feed or in-water antibiotics. FDA has stated that ionophore anticoccidials are antibiotics.

The “**lack of approved efficacious drugs**” continues to be the top health issue (Table 1). Supply chain disruptions during 2020 and 2021 have affected the production and distribution of some animal drugs. Public concern over the use of antibiotics in animal agriculture remains an important issue for the turkey industry and for all of animal agriculture.

In 2020, turkey production decreased from 7,288,326 in 2019 to 7,192,443 pounds (live weight) and decreased to **223,003,000 head** with an average live weight of 32.25 lbs.<sup>1</sup> Per capita consumption for turkey products decreased from 16.0 in 2019 to 15.8 in 2020.<sup>2</sup>

<sup>1</sup> Sources: USDA Poultry Slaughter 2020 Annual Summary, Feb. 2021

<sup>2</sup> USDA, ERS, Livestock & Meat Domestic Data: <https://www.ers.usda.gov/data-products/livestock-meat-domestic-data/livestock-meat-domestic-data/#Livestock%20and%20poultry%20slaughter>

Table 1. Turkey health survey (August 2020 - 2021) of professionals in US turkey production (n=27) ranking current disease issues (1= no issue to 5 = severe problem). Data on file.

Issue	Score Average (1-5)	
Lack of approved, efficacious drugs	4.8	
Clostridial Dermatitis (Cellulitis)	3.9	
Colibacillosis	3.8	
<i>Salmonella</i>	3.7	
<i>Ornithobacterium rhinotracheale</i> (ORT)	3.3	
Coccidiosis	3.0	
Late Mortality	3.0	
Leg Problems	3.0	
Poult Enteritis of unknown etiologies	3.0	
<i>Bordetella avium</i>	2.9	
TR-DFTR (Turkey Reovirus Digital Flexor Tendon Rupture)	2.7	
Cholera	2.6	
Protozoal Enteritis (Flagellated)	2.6	
Cannibalism	2.6	
Tibial Dyschondroplasia (TDC, Osteochondrosis)	2.5	
Avian Influenza	2.3	
<i>Streptococcus gallolyticus</i> (aka, <i>S. bovis</i> )	2.3	
THR (Turkey Hepatitis Reovirus)	2.3	
Round Worms ( <i>Ascaridia dissimilis</i> )	2.3	
Breast Blisters and Breast Buttons	2.2	
Blackhead (Histomoniasis)	2.2	
Necrotic enteritis	2.2	
Heat stress	2.1	
Osteomyelitis (OM)	2.1	
Turkey Coronavirus (TCV; Bluecomb)	1.9	
Bleeders (aortic, hepatic ruptures)	1.9	
PEMS (Poult Enteritis Mortality Syndrome)	1.9	
Shaky Leg Syndrome	1.9	
<i>Mycoplasma gallisepticum</i> (MG)	1.8	
<i>Mycoplasma synoviae</i> (MS)	1.7	
Newcastle Disease Virus (NDV)	1.7	
Fractures	1.6	
H3N2 (H1N1) Swine Influenza	1.5	
Erysipelas	1.4	
Avian Metapneumovirus	1.3	
Spondylolisthesis (Kinky-Back)	1.1	
<i>Mycoplasma meleagridis</i> (MM)	1.0	
<i>Mycoplasma iowae</i> (MI)	1.0	

continued on page 35

# Turkey Industry, continued from page 33

Table 2. Turkey health survey (August 2020 - 2021) of professionals in US turkey production (n=26) reporting cases of diseases. Data on file.

Cases (##) of	2021	2020	2019	2018	2017	2016	2015
Blackhead (Histomoniasis)	130	82	96	127	109	101	55
<i>Mycoplasma synoviae</i> (MS)	34	21	25	35	33	20	24
Turkey Coronavirus (TCV)	117	27	95	185	12	6	119
Turkey Reovirus Digital Flexor Tendon Rupture	239	548	486	234	182	31	146
<i>Mycoplasma gallisepticum</i> (MG)	78	31	30	50	52	29	31

Table 4. Turkey survey (August 2020 –2021) of professionals in US turkey production (n=24, 89%) coccidia control programs (n=256.2 million head, surveyed). Does not total 100%. Alternatives (phytonutrients) and vaccines may be used to supplement the current ionophore or chemical anticoccidial program, or as the sole program for coccidia control. Data on file.

Program	How many head (count divided by total survey count)
Ionophore	66%
Chemical	33%
Alternative (Phytonutrients)	54%
Vaccine	15%

Table 5. Turkey health survey (August 2020 –2021) of professionals in US turkey production (n=24, 89%) by antibiotic program. Data on file.

	2021	2016
Conventional/Full Use <sup>1</sup>	38%	45%
Reduced Use/NAHMI <sup>2</sup>	0%	0%
Ionophores Only <sup>3</sup>	1%	0%
No Growth Promotants, CRAU/CRAU-like <sup>4</sup>	36%	36%
NAE /ABF, RWA <sup>5</sup>	25%	19%

<sup>1</sup>Conventional/Full Use (any antibiotics, including ionophores, bacitracin, flavomycin, and /or those deemed medically important to humans by FDA), allows in-feed and in-water administration of antibiotics.

<sup>2</sup>Reduced Use (allows use flavomycin, bacitracin for therapeutic or growth promotion) but NAHMI (No Antibiotics of Human Importance), such as, no prescribed in-water medications and no in-feed tetracyclines or sulfa.

<sup>3</sup>Ionophores Only (no growth promoting antibiotics, i.e., no flavomycin, no bacitracin allowed, no in-water medications).

<sup>4</sup>No Growth Promotants, CRAU/CRAU-like (Certified Responsible Antibiotic Use), permits only therapeutic uses.

<sup>5</sup>No Antibiotics Ever (NAE) /Antibiotic Free (ABF), Raised Without Antibiotics (RWA), does not use neither in-feed nor in-water antibiotics. No hatchery injection of antibiotics.

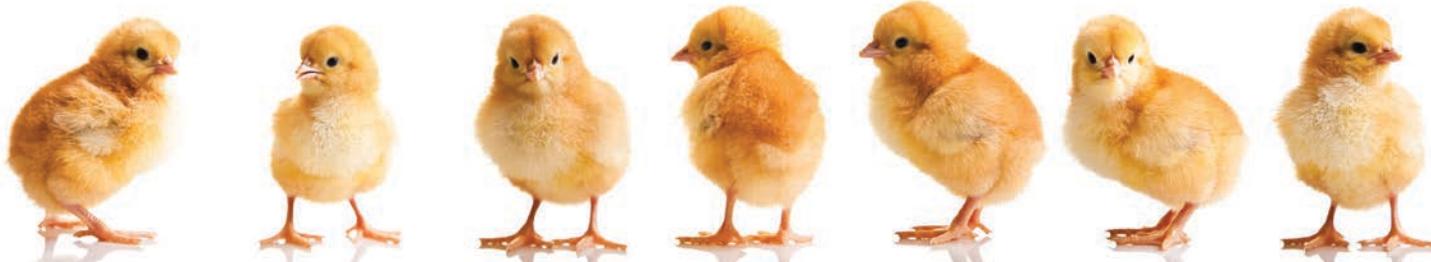
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*His specialty is turkey production and anticoccidial programs and intestinal health.*

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- Board Certified Diplomate (ACPV) (1997)
- PAACO Certified Poultry Welfare Auditor (2007)
- Turkey Course Master - World Veterinary Education Production Animal Health (WVEPAH, 2016)





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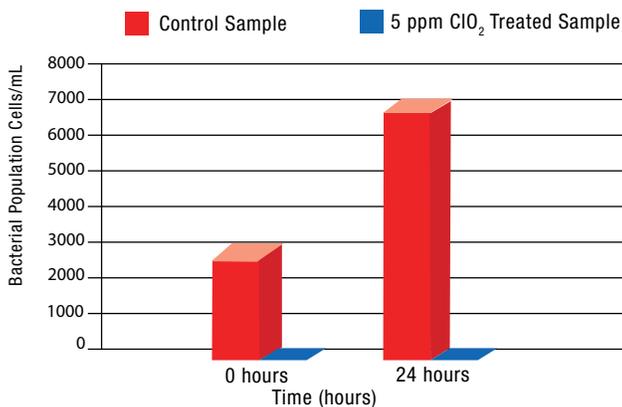
# ProOxine® (AH) Disinfecting Solution For Animal Drinking Water

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

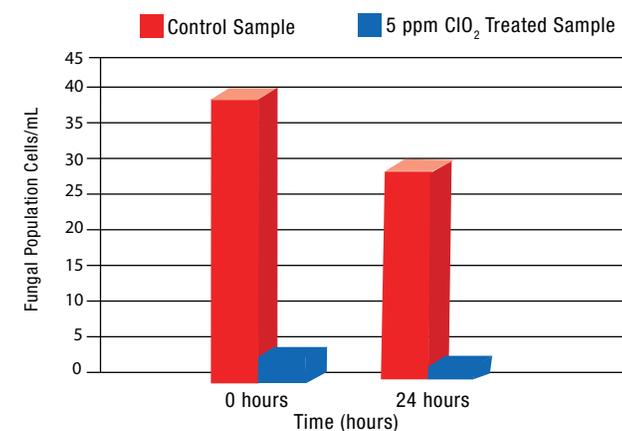
### CONTROL EFFECT OF 5 ppm ClO<sub>2</sub> AGAINST BIOFILM BACTERIA

On Bacteria	Control Sample	5 ppm ClO <sub>2</sub> Treated Sample
0 Hour	3000	30
24 Hours	7000	2



### CONTROL EFFECT OF 5 ppm ClO<sub>2</sub> AGAINST BIOFILM FUNGI

On Fungi	Control Sample	5 ppm ClO <sub>2</sub> Treated Sample
0 Hour	40	4
24 Hours	30	2

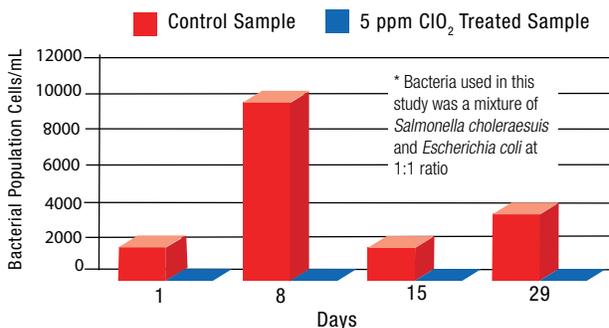


AANE (Automated Activation Non-Electric) System

## 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 <sub>2</sub> Treated Sample
1 Day	2000	20
8 Days	10000	2
15 Days	2000	2
29 Days	4000	2

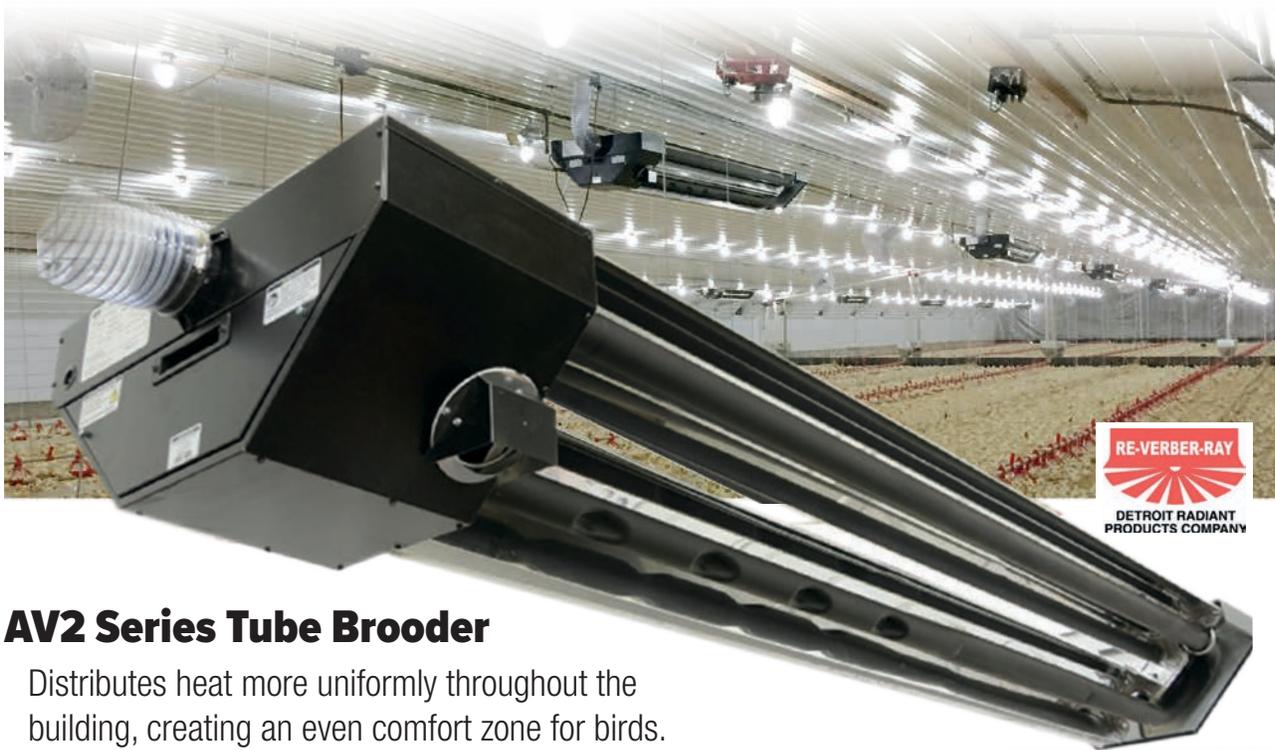


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11, 35, 50, 100  
and 400 pound  
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Containers

### DIRECTIONS

- Add as needed to foot pan to maintain a half-inch layer. (A thicker layer will not increase effectiveness.)
- Remove organic contaminants as necessary.
- Change out pan powder every 2 weeks for optimal results.

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# Knowledge

Through Production Tips

## The Solution to Stock Solutions

### Introduction

Medications – including vaccines, antibiotics and nutrients – are an expensive part of protecting swine from diseases and stress. The improper use of medicators, and especially the improper mixing of the stock solutions, can make the difference in delivering the appropriate dose per head or wasting the medication completely. For example, the results of inappropriate mixing in stock solutions can result in plugged proportioners, plugged nipples, low or no delivery of the medication to the animal, destruction of live vaccines or the inactivation of the medication due to reactions in the stock solution.

**The following is a practitioner's point of view on the "Solution to Stock Solutions"**

### The Problem

- Most products in a stock solution are at high concentrations
- Products may be acidic, basic or neutral
- Acid base reactions tend to precipitate and or destroy products
- There is a lack of published compatibility testing of drugs to guide mixing
- Producers often want to use multiple products at one time
- Most barns have a single medicator

### What I See in the Field

- Dirty buckets
- Buckets shared between products
- Buckets not cleaned on a daily basis
- Attempts to put (human) suspensions through the medicator
- The use of products where the maximum amount you can put in a stock solution results in under-dosing of the product and ultimately lack of efficacy
- Putting live vaccines into buckets previously used for antibiotics
- Using poor quality water for stock solutions

### Examples of Poor Stock Solution Management



Looks Good From Afar!



Effect of Previous Product?



Vaccine Bucket has Antibiotics in it!

### Combining Products Not Recommended



Not Recommended!



Wasted Outcome!

### The Results of Inappropriate Mixing in Stock Solutions

- Plugged proportioner
- Plugged nipples
- Low or no delivery of the medication
- Destruction of live vaccines
- Inactivation of the medication due to reactions in the stock solution

### BEST Practices for Stock Solution Preparation

- Use distilled water
- Product can be altered by tap/well water
- Chlorine/Iron/Other metals
- Q.S. (quantity sufficient)
- Add product then water
- Re-mix every 12 hours
- Use a different bucket for each medication
- Mark gallons on bucket
- Replace between groups of pigs
- Scrub the bucket between uses
- Break down and clean the medicator between products/uses
- Use liquid soap
- Rinse well
- Keep replacement washers on hand
- Clear the medicator and the water line between groups of pigs
- One cup bleach in a gallon of water (stock)
  - Can be corrosive to metal or concrete

### Presented By:

Grant Weaver, DVM  
 Technical Services Veterinarian  
 Aurora Pharmaceutical, Inc.

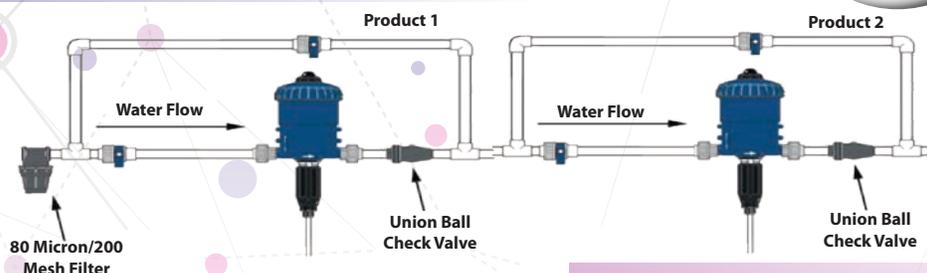


## My Practice Tip

- The use of multiple medicators in series can be a good solution to the problem of trying to mix products into a concentrated stock solution

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## One, Two or None



## The Advantages of This Approach

- Mixing products at 128 times less concentration
- Less chance of significant chemical or physical interactions in the dilute drinking water solution
- Aurora tested 27 common water-based preparations in all combinations and saw no interaction at the drinking water dilutions
- Those same 27 products mixed together in the stock solution reacted in 120 out of 408 combinations tried
- It is scalable

## ORAL-PRO™ Sodium Salicylate Concentrate 48.6% w/v

- Aids in reducing fever caused by viral and bacterial infections
- Aids in reducing fever caused by heat stress from transportation, vaccination and processing
- Offers water solubility in hard water
- Available in 1-gallon no-spill plastic jugs

## ORAL-PRO Sodium Salicylate Mixing Directions

### Water Administration

#### DOSAGE LEVEL

Water \_\_\_\_\_  
Medicator

#### WATER MEDICATOR

Add 8 oz (236 mL) to make 1 gal of stock solution and administer through a medicator metered at 1:128 (1 oz per gallon). This will achieve a daily target dose of 11.3 mg/lb (25 mg/kg) body weight daily

Tank \_\_\_\_\_

Add 8 oz (236 mL) to 128 gallons of drinking water. This will achieve a target dose of 11.3 mg/lb (25 mg/kg) body weight daily

## BALANCE™ Stress and Dehydration Aid

- Increases water consumption and reduces body temperature in high-heat conditions
- Quicker rebound from stress-related issues including excess heat and handling
- Increases yield due to better hydrated animals and improves meat quality due to better muscle pH in animals at processing
- Available in easy-to-measure 40-lb. pails or 780-gm foil packets



## BALANCE Mixing Directions

### Water Administration

#### DOSAGE LEVEL

780-gm foil pack \_\_\_\_\_

#### WATER MEDICATOR

Administer 1 packet per 5 gallons of stock solution metered at 1 ounce per gallon (1:128) of drinking water

40-lb. bucket with scoop \_\_\_\_\_

Administer 3 cups per 5 gallons of stock solution metered at 1 ounce per gallon (1:128) of drinking water

#### DOSAGE LEVEL

780-gm foil pack \_\_\_\_\_

#### WATER TANKS

Administer 1 packet per 640 gallons of water (each packet treats approximately 64,000 pounds of livestock)

40-lb bucket with scoop \_\_\_\_\_

Administer 3 cups per 640 gallons of water (each cup treats approximately 21,300 lbs of livestock or 213 gallons drinking water)

## Take Home Messages

- Mixing medications in stock solutions requires veterinary supervision
- Any mixing of medications causes them to fall under AMDUCA as an extra-label use
- Many products are not compatible when mixed in the stock solution
- Most products appear to be mixable at the drinking water concentration
- Always test product compatibility before mixing

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