LANXESS BIOSECURITY SOLUTIONS

Virkon® H2O

Multifunctional Swine Drinking Water Disinfectant and Acidifier

Disinfects and acidifies drinking water to help protect against infection and remove biofilm

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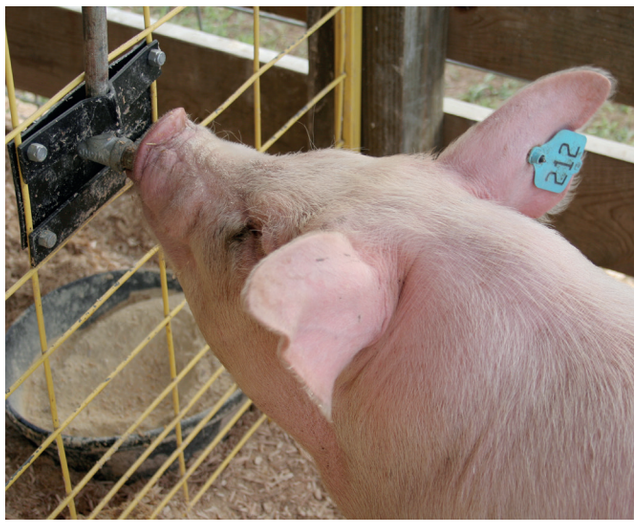
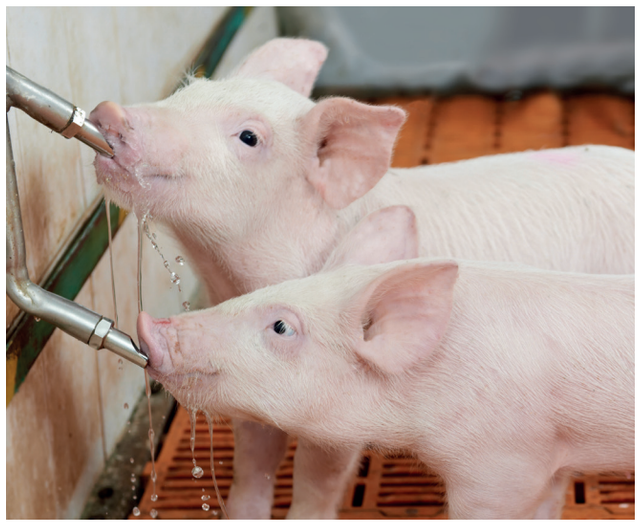
The ideal multifunctional disinfectant choice for enhancing swine drinking water quality and optimising grower herd performance.

Virkon® H2O helps protect against the risk of infection and reduces the risk of cross-contamination during the stress of the weaning period, ensuring the highest levels of biosecurity are maintained during management processes that inevitably cause stress.

In line with the Virkon® product philosophy "the science to kill pathogens," the unique and powerful oxidising formulation of Virkon® H2O has been specifically engineered to be used as part of a swine production drinking water quality management process, to help:

- Disinfect and acidify the waterline
- Reduce bacterial pathogen pressure during stress periods and disease outbreaks
- Prevent build-up and remove biofilms
- Inactivate antibiotic residues in the drinking waterline





Introduction

A sow's milk is high in essential nutrients and antibodies. This ensures the wellbeing of the piglet's immune system and robust gastro-intestine development, which reduces issues of diarrhoea.

During the separation period, where weaning takes place, the piglets are at their most vulnerable from infection.

Weaning is a stressful experience for young piglets, affecting them both socially and physiologically, which can result in severe growth checks and even deaths. Therefore, the importance of a clean, pathogen-free water supply for young pigs cannot be underestimated.

Operational benefits

Optimising grower herd performance.

Virkon® H2O can be dosed into the drinking water system continuously to disinfect and acidify the water during the antibiotic exclusion and weaning periods, when there is a greater risk of pathogen challenge. Its formulation includes an acidification system based upon the inclusion of naturally occurring organic acids.

Field trials and independent analysis have confirmed that there is no need for a Virkon® H2O withdrawal period.

Protects against infection, during stress and antibiotic withdrawal periods.

In times of stress such as; post vaccination, medical or micronutrient application periods, or during the weaning process, Virkon® H2O can be applied to the drinking waterline for a period of between 2-3 days to help ensure the highest level of biosecurity is maintained, optimising grower herd performance. Virkon® H2O has been formulated with enhanced solubility, to aid with easy preparation.

Inactivates residual antibiotics in the drinking waterline.

Due to its unique and powerful oxidising formulation, Virkon® H2O, at a 1:800-1:1500 dilution rate, has been shown to help inactivate some residual antibiotics in swine drinking water systems. The oxidative action of Virkon® H2O can irreversibly alter the structure of some antibiotic molecules, and this can prove beneficial if any traces of residual antibiotics may remain within the water system even after the specified withdrawal period has been observed.

Prevents biofilm build-up.

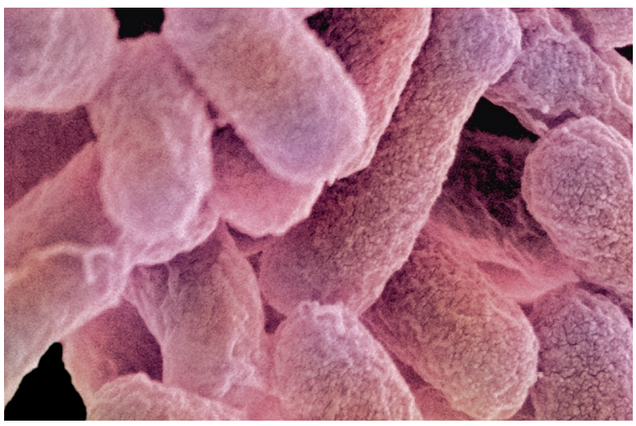
After periods of medication or feed additives to the waterline, there is an increased risk of biofilm build-up within the water system itself. Dosing Virkon® H2O post treatment helps to prevent biofilm build-up within the drinking water system.

Virkon® H2O is intended to be used as part of a water quality management system and supports improved production performance through biocidal control of pathogens, modification of water pH to achieve optimum conditions, prevention of biofilm build-up and inactivation of antibiotic residues. When used at higher concentrations during terminal use, Virkon® H2O will remove biofilms.

Supporting the reduction of antibiotics.

Governments worldwide are seeking reductions in the use of medicinal livestock antibiotics to limit the development of antibiotic resistance passing into the human population. Targeted legislation to reduce the use of prophylactic antibiotics in the food chain is now becoming a reality with the result that producers are taking steps to improve their biosecurity measures.

With proven efficacy against food poisoning disease-causing organisms, Virkon® H2O meets the toughest pig drinking water biosecurity challenges and leads the way in biosecurity 'best practice' programmes.



Excellent control of food poisoning pathogens (to EN test standards).

Independent studies conducted to European disinfectant EN test standards (EN 1276, EN 1656) have shown that Virkon® H2O is effective against key swine pathogens of concern.

These include the food poisoning pathogens Escherichia coli, Salmonella enteritidis and Campylobacter jejuni, and other organisms of concern, such as Pseudomonas aeruginosa.

Virkon® H2O is also approved under the UK DEFRA Approval of Disinfectants made under the Diseases of Animals (Approved Disinfectants) for General Orders 2007, at a dilution rate of 1:100*, and using the test organism Salmonella enteritidis.

Good operator safety profile.

Virkon® H2O powder concentrate is not corrosive to skin and does not cause sensitisation via the dermal and inhalation routes of exposure. A typical in-use dilution of 1:100-1:1500 is non-irritating to skin and eyes and is not a sensitising agent.

* Please refer to efficacy table on page 6 for approved UK DEFRA dilution rates and contact times.

Environmental profile.

The Virkon® H2O oxygen-based chemistry contains simple inorganic salts and organic acids and the active ingredient decomposes by a variety of routes within the environment, in soil and water, breaking down to form the naturally occurring substances, potassium salts and oxygen. The major organic components are classified as readily biodegradable according to OECD and EU tests.

Virkon® H2O is not classified as H413* and is not persistent in the environment, according to the standard European process for the classification and labelling of chemical preparations.

NB. Virkon® H2O is a biocidal product formulation, and is not classified as a licenced antibiotic material within the EU. Due to the potential for inactivation or interference with veterinary medicines (vaccines and antibiotics), do not apply Virkon® H2O to the waterline for 12 hours prior to, or 12 hours after the application of antibiotics, or up to 48 hours after the administration of a vaccine to the waterline. Consult your veterinarian for further advice.

*H413 – May cause long lasting harmful effects to aquatic life.

Swine Drinking Water Applications

Terminal disinfection.

All water systems can potentially contain some viral and bacterial contamination, especially header tanks where dust and debris can accumulate. Water quality, especially those sources which originate from a borehole, may be highly variable in respect to the microbiological status.

Virkon® H2O can be used for terminal disinfection of the drinking water system, as part of the ongoing biosecurity cleaning and disinfection programme.

TERMINAL DISINFECTION – HYGIENE FOR THE END OF THE PRODUCTION CYCLE

Operational Benefits

Any pathogen challenge from one production cycle can offer a risk to the following production cycle. To reduce this risk the water lines must be cleaned, cleared of biofilm and disinfected, including the evacuation of any water held in the drinking points/nipples. Virkon® H2O has been proven to remove biofilm in a 2-hour period when applied at a concentration of 1% (1:100).

Direct Water Feed Dosing Systems.

Virkon® H2O is effective at a 1:800 to 1:1500 dilution rate and can be applied via a dosing unit connected to the drinking water system. For example, in order to achieve the required 1:1000 (1.0g/litre dilution) of Virkon® H2O in the drinking water, a concentrated stock solution must be prepared and applied through a dosing unit set to add at either 1% or 2%.

Proven efficacy

Organism type	Swine Disease/ Related Condition	Pathogen(s) tested	Dilution Rate	Contact time (mins)
Bacteria*	Bacterial reference test strains	*Pseudomonas aeruginosa* *Staphylococcus aureus* *Escherichia coli* *Enterococcus hirae*	1:1000	30
Bacteria*	Bacterial reference test strains	*Pseudomonas aeruginosa* *Staphylococcus aureus* *Escherichia coli* *Enterococcus hirae*	1:1500	60
Bacteria	Food poisoning – humans	*Salmonella enteritidis*	1:1000	60
Bacteria	Food poisoning - humans	*Salmonella java*	1:1500	30
Bacteria	Food poisoning – humans	*Salmonella typhimurium*	1:2000	60
Bacteria	Food poisoning – humans	*Campylobacter jejuni*	1:1000	30
Bacteria	Food poisoning – humans	*Escherichia coli* O157:H7	1:1000	30
Bacteria	Respiratory infection, Septicaemia	*Pseudomonas aeruginosa*	1:800	60
Bacteria	Respiratory infection, Septicaemia	*Pseudomonas aeruginosa* (biofilm)	1:100 (terminal disinfection) 1:800 (water disinfection) 1:2000 (water disinfection)	120 120 240
Bacteria	DEFRA 'General Orders'	*Salmonella enteritidis*	1:100	30
Virus	Various mammalian diseases	*Paramyxovirus*	1:800	30

* Virkon® H2O was tested in the prescribed method using a temperature 15°C, under dirty conditions (>15mg/litre DOC), with contact times as specified in the table.

The specified uses and registered claims for Virkon® H2O may vary from country to country.
Please contact LANXESS directly to verify country specific approved usages.

Application methods

Virkon® H2O is intended to be applied to swine drinking water during periods when there is a greater risk of pathogen challenge, and to assist in the reduction of biofilm build up, as described in the following table:

Facility	Challenge period - examples	Application period
Weaners and Growers	During stress periods resulting from the process of weaning, grouping or movement, which often lead to reduced immunity and pathogen challenges.	Use for 10-17 days after weaning and after mixing, plus around particular stress points in the production cycle
Farrowing period	During stress periods such as piglet treatments or when particular challenges appear (to support the piglet)	Day 1 to day 30

Dilution rate

Virkon® H2O is effective against bacteria* in the range of 1.25 g/litre (1:800) to 0.67 g/litre (1:1500). The dilution rate should be selected based on the water pH recorded at the drinker point after initial dosing of Virkon® H2O. The target pH range when using Virkon® H2O is between pH 5.0 and pH 6.5. Simple experimentation may therefore be required in order to determine the necessary dilution for your water conditions.

It is advised to start with a dilution of 1 g/litre (1:1000) and in cases where acidity is too high (e.g. pH <5.0), the concentration of Virkon® H2O can be lowered to 0.67 g/litre (1:1500). Where acidity is too low (e.g. pH >6.5), the concentration of Virkon® H2O can be increased up to 1.25 g/litre (1:800).

In accordance with testing conducted according to European Standard EN 1276 (modified as per efficacy guidance for biocides intended for use in animal drinking water), in high soil conditions (15 mg/L Dissolved Organic Carbon).

Preparation and use for continuous application periods

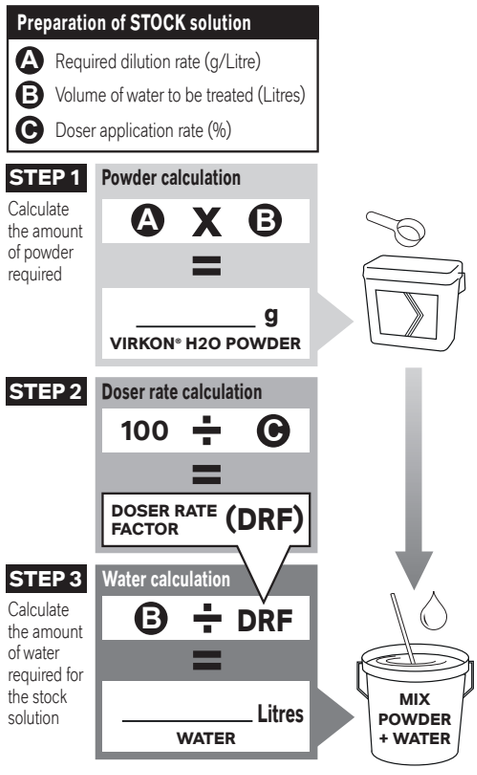
Virkon® H2O can be applied to closed drinking water systems as a measured application to the reservoir/header tank, or via suitable dosing equipment attached directly to the incoming water supply, on a continuous basis over a the prescribed number of days.

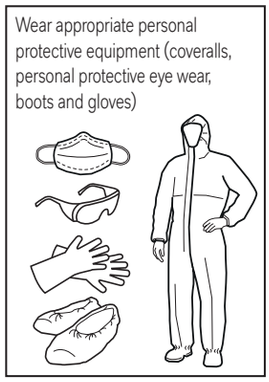
Application via dosing equipment

It is advised to apply Virkon® H2O via a dosing system set to an application rate of either 1% or 2%. In order to achieve the required dilution in the waterline, a concentrated stock solution of Virkon® H2O must be prepared.

To prepare the stock solution, follow the steps opposite:

Calculating the required amount of Virkon® H2O powder and water for the disinfectant stock solution:





Example calculation:
A. *1 g/litre (1:1000) dilution required.* ***B.*** *500 litres water to be treated.* ***C.*** *2% dosing rate.*

Step 1.
A(1 g/litre) x B (500 litres) = 500g powder required

Step 2.
100 / C (2%) = 50 (DRF)

Step 3.
B(500 litres)/DRF (50) = 10 litres of water required

Terminal disinfection for the end of the production cycle

Any pathogen challenge from one production cycle can offer a risk to the following production cycle. To reduce this risk the water lines must be cleaned, cleared of biofilm and disinfected, including the evacuation of any water held in the drinking points/nipples. Virkon® H2O has been proven to remove biofilm in a 2-hour period when applied at a concentration of 1% (1:100).

LANXESS
Energizing Chemistry

LANXESS BIOSECURITY SOLUTIONS
Shaping the Future of Biosecurity

Antec International Limited
LANXESS Material Protection Products
Windham Road, Chilton Industrial Estate,
Sudbury, Suffolk, CO10 2XD
United Kingdom

Tel: +44 (0)1787 377305
biosecurity@lanxess.com
biosecuritysolutions.lanxess.com
lanxess.com

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