

Disinfection:

the critical step in aquaculture and intensive farming

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Cleaning and disinfection play a major role in today's farming and aquaculture. A safe and reliable disinfectant is of major importance to ensure healthy animals and safe food.

From the production farm to the processing plant, hygiene is of major importance to prevent the dispersion of microorganisms, minimise the risk of related diseases and ensure safe food. Dramatic epidemic outbreaks, such as the avian influenza of last year or regular *Salmonella* induced food poisoning, remind everybody of the necessity to implement hygiene and biosecurity measures along the food production chain. However, this should not only be a concern when diseases make the headlines, it should be a daily routine.

A clear and easy to follow protocol should be provided to ensure the best results, and people should be aware of everyday hygiene as a key part of biosecurity.

CLEAN FIRST

Disinfection without prior cleaning is less effective, not only because organic matter would interact with the disinfectant and reduce its efficacy, but also because it would act as a physical barrier between microorganisms and the active ingredient. A thorough cleaning is always the first step to successful disinfection.

CHOOSING THE RIGHT DISINFECTANT

Among the large number of products available on the market, it is sometimes difficult to determine which one to choose to achieve the best results.



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WIDE ACTIVITY SPECTRUM

A disinfectant should be effective against different types of microorganisms: bacteria (gram positive and negative), viruses (naked and enveloped), fungi and parasites (for aquaculture application). Some disinfectants are not very effective against certain microorganisms and have 'holes' in their activity spectrum. Therefore the choice should be based on a product with a wide activity spectrum.

However, 'intrinsic' or 'natural' resistance to a disinfectant is not the only issue. Acquired resistance is also increasingly problematic. Several bacteria, such as *Pseudomonas sp.* for example, are known to develop resistance to disinfectants, particularly with some quaternary ammonium compounds.

To kill all microorganisms and avoid creation of resistance, rotation of disinfectants is still a common practice, but is not the best solution: logistic problems and potential human errors increase with the number of products. Disinfectants based on oxidation do not induce resistance and are a better choice.

NON-CORROSIVE

Non-corrosiveness to materials commonly found in farms should be a key point for disinfectant choice. Metals, aluminium and plastics are particularly at risk and special attention should be taken to their compatibility with disinfectants. What is important is the corrosiveness of the dilute solution. Do not simply rely on the product labeling, this is not related to material corrosion, but ask your supplier about potential damages to your equipment.

SAFE TO USE

Product safety is important for the product as such. This is however not enough: the main exposure route is during application, to a dilute solution. A disinfectant with favorable toxicological characteristics at in-use dilutions makes it both safer and easier to apply and also allows for a shorter down time in case of animal houses disinfection.

LITTLE INFLUENCE OF ORGANIC MATTER

Even after cleaning, some residual organic matter always remains. Thus it is important to select a product that is not, or only moderately, influenced by organic matter. This is particularly important for footbaths where the level of organic matter can increase rapidly.

STABLE

Heat, humidity and sunlight can have a negative effect on the active ingredient, and disinfectants are generally stored on the farm, mostly under non-ideal conditions. A stable product ensures you can use it even after a long time without risk of a lower activity due to degradation, which may occur with products like hypochlorites.

MAKE SURE IT DOES WHAT IT SAYS

Because efficacy results can easily be influenced by test conditions, make sure your disinfectant has been approved according to the official standards. It should have proved effective against problematic microorganisms, such as the avian influenza virus for example.

DISINFECTION IN INTENSIVE FARMING AND AQUACULTURE

A versatile disinfectant that you can use in every application is required, because disinfection is not restricted to animal houses or fish tanks but also includes footbaths, disinfection of vehicles (trucks, well boats...) and small equipment. One all-purpose disinfectant for everything will make things easier.

Finally, the application method plays a role: apart from the



Nebulisation and fogging systems are popular methods of disinfecting buildings in intensive farming

traditional portable spraying device, trailed sprayers as well as nebulisation or fogging systems are increasingly popular methods of disinfecting buildings in intensive farming. Not only do they make disinfection easier and faster, but they also lead to a lower exposure to the disinfectant.

Halamid® is an example of a product that is successfully applied to disinfect poultry barns using these systems.

AQUACULTURE NEEDS A VERSATILE AND SAFE DISINFECTANT

In aquaculture, cross contamination is even more prevalent than in land farming, not only between fish in the same tank but also from pond to pond. Thus disinfection is paramount both in fish and shrimp farming. Tanks, ponds as well as footbaths, vehicles and equipment are applications where this is critical in order to maintain a healthy status. A disinfectant used in aquaculture must present similar characteristics as a disinfectant for land farming in terms of activity spectrum, non-corrosiveness and stability.

Additionally, under practical conditions in aquaculture, it is almost impossible to avoid contact between the aquatic animals and the disinfectant. Therefore, a safe product (safe for the animals) is of major importance. Toxicity towards farmed aquatic animals and also wild aquatic animals is a major point. Only a few disinfectants present sufficient guarantees to ensure they can be used without any risk in aquaculture. You should make sure enough data and experience are available with your product for a safe application.

Some active ingredients are not only used as disinfectants but also have a positive effect on health status if used as a fish treatment. Hydrogen peroxide for fungicidal effect and chloramine-T for external bacterial infections are two of these products known to be helpful in cases of infection. ■