Disinfection in Poultry Operations – An Investment

"Prevention is Better than Cure" – an age old-but golden saying, for every Poultry and Livestock Industry. The success of a disease control programme and good performance of birds in any poultry farm is primarily depending on good hygiene disinfection.

Research farms worldwide have confirmed that exotic viral and bacterial diseases in poultry are increasing despite intensive any disease prevention programme. One is to "Strengthen the birds to resist infection by vaccination" and the other is to "keep the premises free from disease producing agents like bacteria, viruses and fungi.

Disinfection

Disinfection of buildings implies, the elimination of all the microorganisms from the house, which are pathogenic (or) have the ability to produce the disease and thereby making the house free from infection. "Disinfectant" is an agent, which is capable of killing the microorganisms, and is thus useful for maintaining an effective infection free status. A disinfectant can be bactericidal at one concentration and bacteriostatic at lower levels.

Natural Disinfectant

The value of "Sunlight" as a natural disinfectant in poultry house is unreliable. Desiccation from fresh air and wind will also contribute to the destruction of bactericidal load when microbes are exposed. The high temperature will accelerate the destruction of organisms.

Chemical Disinfection

Disinfection in the farm premises is generally carried out by using chemical-agents. The lethal action of the chemical is exerted by their ability to reach with proteins, particularly with the essential enzymes of the microorganisms, by coagulating or precipitating or denaturing their protein coat.

Chemical disinfectants exert their action in 3 ways:

1. Absorption of the compound by the cell wall of the organism
2. Penetration of the agents into the cell protoplasm
3. Reaction of the compounds with one or more cell constituents

The chemical disinfectants act very effectively when they are easily soluble. Emulsification of phenol in soap solution enhances the activity of disinfectants. Some of the chemical disinfectants, commonly used are discussed below:

Chlorine

Chlorine is the best used in the form of "Bleaching powder" and "Sodium hypochlorite" containing 20% available chlorine in 10-20 ppm strength is used in most of the poultry farms for disinfection of drinking water and cleaning the farm equipment.

Bleaching powder containing 33% available chlorine is being used effectively at the rate of 5 gm/1000 litres" for disinfection of drinking water.

Cresols

Cresols are coal tar derivatives, used along with soaps, slightly soluble in water and effective against spores (especially liquid cresol saponatum).

Cresol is having a strong odour and irritating to the skin. They are toxic to day old chicks also. Lysol in this group is also a good germicide and 3 times more effective than phenols.

Alcohols

Alcohols are bactericidal and not bacteriostatic. They have no action on spores. Isopropyl and ethyl alcohols are used to disinfect instruments, vaccinating needles and other small equipments. Alcohols cannot be used for larger objects or on wide environments as they are effective for a short duration due to evaporation and are flammable also.

Formaldehyde

Formaldehyde is a useful disinfectant in both gaseous and aqueous forms (5%). It is both bactericidal and fungicidal. It has a little penetrating power and is greatly affected by high temperature.

Formaldehyde has been used with potassium permanganate for fumigation of poultry houses and hatching premises. 100 ml of formalin should be used with 70 gm of potassium permanganate, preferably in a mud vessel, to disinfect "100 sq. ft." area in the poultry house. But the gas is very toxic to human beings and chicks and hence all safety precautions must be taken while using this. Now, there are several reports that formaldehyde is producing carcinogenic effect and its use in sanitation is a question in future days.

Iodophores

Iodine and iodophores are good germicides and can kill vegetative organisms, fungi and spores. These are best suited for acidic environments. They are used successfully and safely for sanitizing drinking water, as they have no residual activity.

These are used in dilutions of 25 ppm for cleaning utensils and is equivalent to chlorine concentration up to 200 ppm. But these iodophores cannot be used in the presence of organic matter.

Halogens

The hypochlorites, chloramines and halogens react with protein material of the organisms, but they are highly sensitive to organic matters, which reduce the germicidal action.

Glutaraldehyde

These are present in liquid form and are stable. They are best suited for alkaline surfaces and are non-corrosive to materials and equipments.

"Ammonium" 10% equivalent solution of ammonium is most effective agent for the destruction of oocytes of Coccidia.

Quaternary Ammonium Compound

Quaternary Ammonium Compounds are effective against wide range of bacteria virus and moulds and have long lasting residual effects. They are used for earlier disinfection, egg dipping and general disinfection around incubators and equipments. These agents are giving good results in pre-cleaned environments are neutralized by soap residues and organic matter. Eg: Benzalkonium chloride.

Phenols

Phenols are bactericidal and fungicidal, but have no action on spores and viruses. They are more active in hot and acidic solutions. Phenols are more active in saline rather than plain water and even the smallest dilutions have highest killing rate.

Phenols can also be used with metallic salts like mixture of ferric chloride or ferrous chloride.

Washing Soda

4% solution of washing soda, i.e., 0.5 kg in 10 litres of water is used for general cleaning and detergent action. Sodium hydroxide and sodium carbonate are also effective against viruses and bacteria.

Synthetic Phenols

Synthetic phenols are graded as “Fourth generation disinfectants”. These are most effective germicides when properly used. They are fast acting against microorganisms and are effective against bacterial spores also. They have longer duration of residual activity then any other disinfectant. They can be used directly on the walls, floors and roof without cleaning. In moderately cleaned houses even the process of cleaning can be avoided.

Oxidizing agents

Several oxidizing agents (e.g. hydrogen peroxide and peracids) have useful disinfectant activity.

Chlorine dioxide

Chlorine dioxide is one of the best-quality chlorine-oxygen compounds. Especially because of their oxidizing and very little chlorinating effect they are the most effective and, at the same time, environment-friendly disinfectants. They are even suitable to treat organically polluted wastewater. Chlorine dioxide belongs to the oxidizing biocides. It is not a metabolic toxic substance, i.e, it destroys the microorganisms by means of interrupting the food transport along the cell walls and not by interrupting the metabolic process.

Hydrogen peroxide

H_2O_2 is active against gram-positive and gram-negative bacteria and at high concentrations is sporicidal. It is believed to act as a generator of the free hydroxyl radical, OH, which can cause DNA stand breakage. It is a powerful oxidizer and looks like a water in appearance. H2O2 is one of the most powerful oxidizers known -- stronger than chlorine, chlorine dioxide, and potassium permanganate. And through catalysis, H2O2 can be converted into hydroxyl radicals (· OH) with reactivity second only to fluorine.

Conclusion

Everybody who works directly or indirectly with animal production is responsible for biosecurity measures. Biosecurity wins only if practiced diligently by everyone. When devastating disease hits the animal industry, practically everyone is impacted. Biosecurity is not just an issue for health of animals. Regardless of health status of animals, biosecurity is the key to maintaining productivity and profitability. So biosecurity issues are of such importance to our future well beings of the industry and there is a urgent need for the responsibility of each and everyone particularly connected with the industry to protect our trade and economic well-being.

For Further information please refer to our Product details of:

- **ViraCid-S**
- **TriQuat**
- **DiSan**
- **NeoDine**
- **Terminator III**
- **BioKleen**
- **TetraSan**
- **ChloraSan-T**

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