RESULTS ABOUT THE BACTERICID ACTIVITY OF THE DECONTAMINANT CID 20 ON BACTERIES OF THE *STAPHYLOCOCCUS* GENE

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Abstract

The objective of this paper was to determine the bactericidal activity of CID 20 decontaminant on a strain of Staphylococcus aureus, ATCC 25923.

To achieve this goal, the following work plan was prepared: Artificial contamination of 100 cm2 surfaces was made using an aluminum template with 10 x 10 cm sides; 1 bacterial strain of Staphylococcus aureus ATCC 25923 was used to prepare a bacterial suspension with a 1 McFarland density using a Biosan density.

From the 1 McFarland density bacterial suspension, several work solutions with different concentrations of 0.25%, 0.5%, 1% were made.

Several surfaces were contaminated with the Staphylococcus aureus suspension ATCC 25923, then these surfaces were sprayed with the CID-20 decontaminant and, finally, sanitation tests were taken to verify the effectiveness of the decontamination with this product.

The conclusion of our research was that decontaminant CID 20 with a concentration of 0.25% has an effective action on bacteria of the Staphylococcus genus but only when the contact time is prolonged to at least 20 d/min.

Key words: decontaminants, bacterial suspension, bacteria of the *Staphylococcus genus*

INTRODUCTION[1]

Decontamination is a very important process in the field of bird breeding; for this reason, the substances with which disinfection is carried out in broiler chickens are very carefully chosen in order to obtain the most efficient results.

Contamination of the environment plays an important role in the transmission of several key health care agents associated with pathogens. Effective and thorough cleaning / disinfection of the environment is essential. Space decontamination units (such as C-ultrasound systems and hydrogen peroxide) help reduce environmental contamination after cleaning and disinfection (5).

In the atmospheric air there is always a varied microbial flora, the number of which varies according to the place and time of harvest, having higher values near the soil than at altitude (4).

Biosecurity measures in broiler breeding farms can be grouped into two categories: - prevention measures that address the potential risk factors on the farm (biotic and abiotic); - organizational measures to prevent infectious and parasitic agents from entering the farm (7).

Ensuring optimum environmental conditions (temperature, humidity, nutrition, free germ-environment) will yield a good slaughter yield - the commercial yield of chicken broiler chickens should be between 80% and 84% with an average of 82% (6).

CID 20 is one of the decontaminants used in poultry units (figure 1) and is based on 5 different active ingredients:

1. Quaternary ammonium compounds: Alkyldimethylbenzylammonium chloride (61.5 g/l)

2. Aldehydes: Glutaraldehyde (58 g/l), Formaldehyde (84 g / l), Glioxal (19.8 g/l)

3. Alcohol: Isopropanol (40 g/l)

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The manuscript was received: 05.09.2017
Accepted for publication: 18.10.2017

4. Stabilizers, buffers, surfactants, agents, separators, foaming potentiators, nebulizing potentiators and corrosion inhibitors.

It is indicated in the rigorous cleaning of surfaces: animal shelters (birds, pigs, etc.); zootechnical equipment, milking parlors, incubators, livestock and food transport equipment, storage rooms and food processing rooms. The balanced formula of CID 20 determines extraordinary efficiency against bacteria, spores, viruses and fungi. Advantages of using CID 20: - is excellent for disinfection of animal shelters, materials, surfaces, transport equipment for birds, pigs, dairy and meat cows, incubators and processing plants; - financially advantageous; - has fast and long-lasting action; - contains only more than 90% biodegradable components, effective in hard water; - is suitable for use in foaming equipment without the need for foaming potentiators; - is non-corrosive; - has a guaranteed shelf life of 3 years.

Fig. 1 Decontaminating substance Cid 20

MATERIAL AND METHOD

To verify the bactericidal activity of the CID 20 decontaminant, the following working plane was prepared: an artificial contamination of 100 cm2 areas was made using an aluminum template with 10 x 10 cm sides; 1 bacterial strain of Staphylococcus aureus ATCC 25923 was used to prepare a bacterial suspension with a 1 McFarland density using a Biosan density.

From the 1 McFarland density bacterial suspension, several work solutions with different concentrations of 0.25%, 0.5%, 1% were made.

The work areas under investigation were initially decontaminated with Incidin solution, then sanitation tests were taken to verify that the surfaces were free of germs. Subsequently, the surfaces were contaminated with the strain of *Staphylococcus aureus* ATCC 25923.

After drying the surfaces, they were sprayed with CID 20 solutions prepared previously with concentrations of 0.25%, 0.5%, 1%. Each concentration of the CID 20 solution was allowed to act for 10, 20 or 30 minutes respectively.

The final stage of the experiment was the collection of sanitation tests on decontaminated surfaces and the performance of laboratory tests for the detection of bacteria of the Staphylococcus genus.

Laboratory analyzes were performed according to the working methods in force, which are performed in the specialized laboratories, strictly observing the working standards recommendations (8).

RESULTS AND DISCUSSIONS

As a result of the analysis, the CID 20 solution with a concentration of 0.25% and a contact time of 10 minutes was ineffective for the elimination of Staphylococcus genes. By increasing the contact time at 20 or 30 minutes, the microbial load on the surface initially contaminated with Staphylococcus aureus ATCC 25923 and subsequently decontaminated with 0.25% CID 20 was absent (Fig. 2; 3; 4).

Fig. 2 Baird Parker plates seeded with samples harvested after decontamination with CID-20 0,25% → contact time 10 '

Fig. 3 Baird Parker plates seeded with samples harvested after decontamination with CID-20 0,25% → contact time 20 '

Fig. 4 Baird Parker plates seeded with samples harvested after decontamination with CID-20 0,25% → contact time 30 '

In 2016, several Nigerian researchers have been studying to see if bursal disease virus in birds can be inactivated with polidin® (iodofor compound), V-ox® (inorganic peroxide compounds), CID20® (quaternary ammonium chloride, aldehydes and alcohol), terminator III (phenols) and glutasan (aldehyde and quaternary ammonium chloride). However, the results were not satisfactory, failing to eliminate the IBD virus in birds (1).

Researchers in China also conducted studies in 2007 to test the effectiveness of CID-20 in laboratory and equipment lab rooms.

The results obtained were satisfactory: the number of bacteria on the roof, wall and corridor dropped from 88.2% to 100% after disinfection, but the effect does not stay well after a long period of time, which is why the researchers concluded that the decontaminant Cid 20 can be used to disinfect premises and equipment intended for laboratory animals (3).

CONCLUSIONS

Analyzing the results, we can conclude that the CID-20 decontaminant with a concentration of 0.25% has an effective action on Staphylococcus genes but only when the contact time is extended to at least 20 minutes.

In order to reduce the contact time to 10 minutes, we need to increase the concentration of the solution, which will obviously lead to an increase in costs for decontamination.

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