

Effective cleaning of animal houses effective cleaning stables – a prerequisite for effective disinfection



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INTRODUCTION

Cleaning and washing stables after the removal of animals represents a major step towards effective reduction of infection pressure of rearing environment between two runs. Pre-wetting pens in the stables before washing is recommended as an integral part of the farm hygiene program.

Dependence of aerosol and dust particles size on the flying distance

Particle size	Time in the air	Flying time	Note
0.1 µm	72 hours	9 km	Smoke particles / very fine droplets of water
1-2.5 µm	27 hours	5 km	Self-raising dust particles
5 µm	7 hours	3 km	Danger zone (long range flying) The size of aerosol droplets created during high pressure washing (120 – 200 bar) with ceramic rotary nozzle
10 µm	30 minutes	1 km	
15 µm	15 minutes	0.7 km	
20 µm	5 minutes	0.2 km	Safe zone (short range flying) The size of aerosol droplets during low pressure washing (70 – 100 bar) with linear jet
30 µm	2 minutes	0.1 km	
50 µm	45 seconds	50 m	
100 µm	10 seconds	15 m	

OBJECTIVE

The presented paper is focused on comparing different methods of washing and determines the optimal ratio between effective cleaning and consumption of working time in the stables for pre-fattening pigs. Determination of the potential impingement distance of aerosol depending on the washing pressure.

MATERIAL AND METHODS

- Animals - pre-fattening pigs, all in - all out breeding system
- Pigs housing - group housing in 5 separated pens
- Materials of section: half slatted floor, plastic statts and concrete floors, plastic barriers with zinc tubes, tile wall facing in living zone combined with rendering iron-plate ceilings

- Basic parameters of each section:
 - length 8.0 m
 - width 10.0 m
 - height 2.3 m
- Total area of each section 322.8 m².
- The surface of the technological facilities 145.3 m²
- Total surface of each section was 468.1 m²

1) Without pre-soaking



2) Water pre-wetting during 1 day



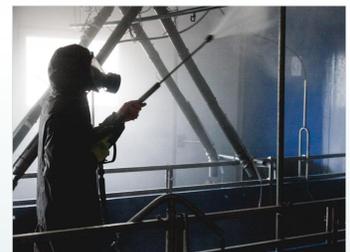
3) Pre-soaking low alkaline detergent



4) Pre-soaking medium adhesive gel detergent



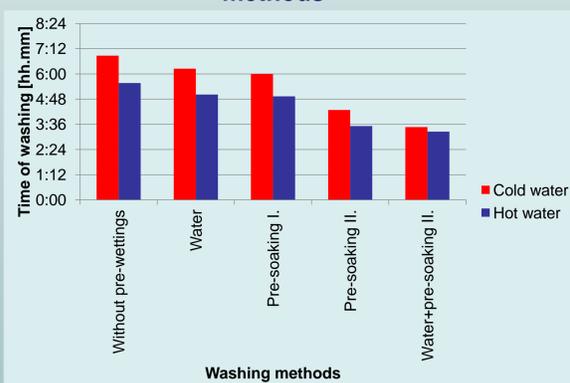
5) Combination of water + after gel



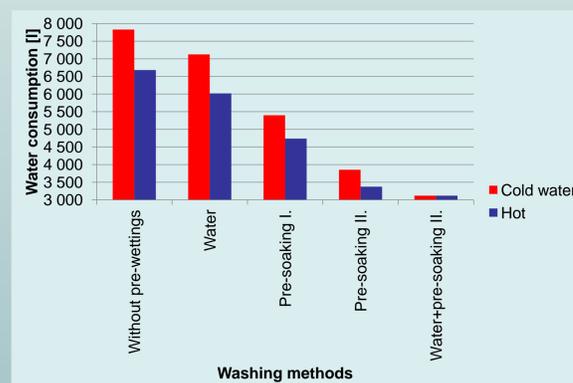
RESULTS

The least effective is high-pressure washing using cold water without pre-soaking. Washing with hot water is more effective but more expensive. Pre-soaked pens can be washed very much easier. Using proper surfactant for pre-soaking was found as the most effective because it can break the biofilm up and remove fats and protein deposits. The use of non-ionic surfactants for absorbing surface (wood, concrete, plastic) is also achieved by hitting the microscopic pores in the material below the surface. It helps to reduce the adhesion of organic residues in further batch. Moreover, it permits the use of the subsequent washing surfaces using cold water at a pressure up to 100 bars.

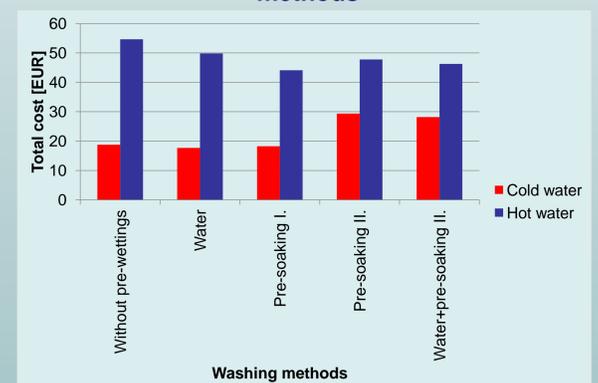
The time on section washed by different methods



The water consumption on section washed by different methods



The total costs on section washed by different methods



CONCLUSION

- Pre-soaking pens before their high pressure washing offers the farmers many advantages
- The most notable benefits that brings prewashing using the alkaline surfactant is - reduction of working time - amount of water used for cleaning and washing
- Correct implementation of wet cleaning have simultaneously a decisive influence on the effectiveness of disinfectants
- On the other hand, however, this phase of the disinfection program entails the risk of potential contamination of other stables in the farm area and even outside of the farm