

Research concerning the efficiency of hygienization of the working areas at pig slaughtering

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Abstract

The researches have followed the determination of the total number of aerobic bacteria TGN/cm² and of the presence of coliform bacteria/10 cm² work area within a unit of pig slaughtering

Keywords: hygienization, aerobic bacteria, coliform bacteria

1. Introduction

The bacteriological exam of work surfaces from slaughtering rooms offers information concerning their hygiene degree. A raised microbiological charge is unwanted because there might take place contaminations of the carcasses obtained after the pig slaughtering. In our country there have been established through OMS 976/98 some maximum admissible limits for the total number of germs (TNG) and for the coliform bacteria reported to 1 cm² surface, 10 cm² surface, respectively.

2. Materials and methods

The determinations were made through the following methods:

- For the TNGMA determination the methodology of the Romanian Standard SR EN ISO 4833/2003 was applied;
- The determination of the number of coliform bacteria – according to SR ISO 5541-2/1994. There have been established through work proceeding the following experimental variants:
- *The witness variant* W_v – the disinfection was made with NaOH solution 2,5%.

- *The experimental variants:* E_{v1} - the disinfection was made with Decontaminol solution 1%; E_{v2} : - the disinfection was made with Decontaminol solution 1% and use of new ways for improving hygienization.

The samples harvesting were made from 11 work areas within the slaughtering unit. There have been harvested 506 samples for the witness variant, 209 samples for the experimental variant no.1 (E_{v1}) and 121 samples for the E_{v2} .

3. Results and Discussion

The results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at pig slaughtering during experimental period is shown in fig. 1 and 2.

It was estimated the efficiency of the experimental procedures and means for improving hygienization through two indicators:

- *The degree of reducing TGNMA/cm² surface* in the experimental variants taken for the study;
- *The percentage weight of the not corresponding samples* of the total number of the samples examined.

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The degree of reducing TGNMA/cm² surface for the experimental variants taken for the study is shown in the 1st table.

By analysing the data from the 1st table, it is noted that the microbial charge of the surfaces has registered values, which weren't framed within the

maximum limits admitted by OMS no. 976/98. Practically all the medium absolute values presented in the table have exceeded the limit of 2 u.f.c./cm² surface. The samples for the test of coliform bacteria/10 cm² surface were also positively discovered.

Table 1. Degree of reducing TGNMA/cm² of surface at pig slaughter after replacing the mean of disinfection and use of new ways for improving hygienization

Crt. No	The examined objective	W _v	E _{v1}	Degree of bacterial reduction, %	E _{v2}	Degree of bacterial reduction, %
1.	Inside walls	445	750	-	6,5	98,5
2.	Floors	2511	515	79,5	330	86,9
3.	Meat trucks	115	580	-	6	94,8
4.	Meat hooks	2824	475	83,2	12	99,6
5.	Inoxidable tables	5158,3	622	87,9	7	99,9
6.	Organ hooks	90310	23056	74,5	543	99,4
7.	Saw blade	3920	1350	65,6	240	93,9
8.	Knife blades	31033	4400	85,8	600	98,1
9.	Inoxidable doors	52	395	-	12,5	75,9
10.	Aluminium trays	5031	900	82,1	9,5	99,8
11.	PVC aprons	750,5	470	37,4	10,5	98,6

Table 2. Number, share, respectively (%) of not corresponding samples from total of examined samples when TGNMA/cm² of surface were determined

Crt. No.	Experimental variant					
	W _v		E _{v1}		E _{v2}	
	No. of not corresponding samples	%	No. of not corresponding samples	%	No. of not corresponding samples	%
1.	82	16,2	22	10,5	5	4,1

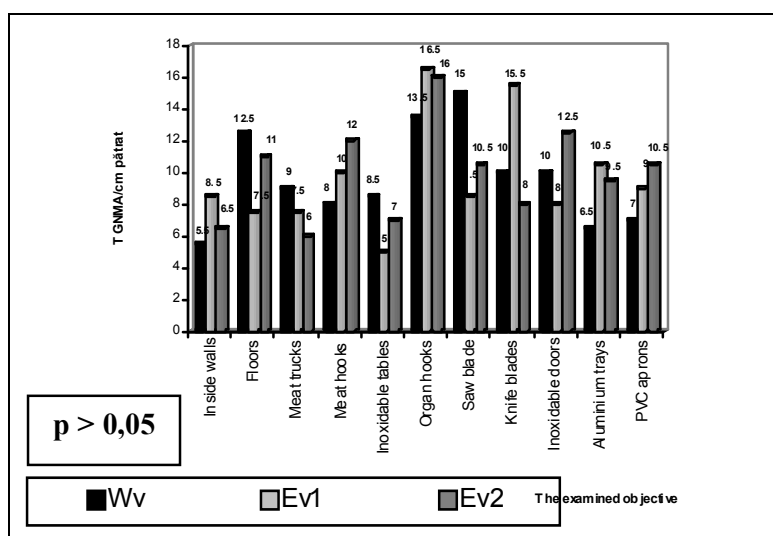


Figure 1. The results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at pig slaughtering during experimental period, n = 727

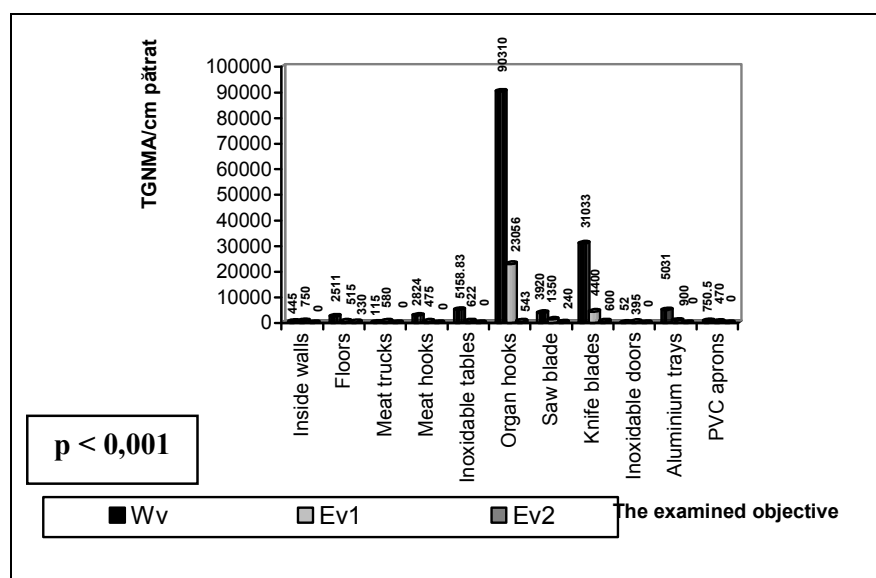


Figura 2. The results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at pig slaughtering within unity A, during experimental period, n = 109

The second criterion which was under discussion, **the number of not corresponding samples, their percentage weight**, respectively, from the total of examined samples in the experimental variants taken for the study, is a much more objective and representative criterion. Their values are presented in the 2nd table.

4. Conclusion

The research made within a cattle slaughtering unit, concerning the degree of bacterial contamination of work surfaces, tools, instruments and protection equipments made of impermeable materials, allowed the formulation of the following conclusions:

For the bacteriological examination of work surfaces, instruments and protection equipment there has been harvested and analysed a number of 836. The sample harvesting was made on 11 objectives which came in contact with the carcasses, organs and subproducts resulted from slaughtering (inside walls, floors, meat trucks, meat hooks, inoxidable tables, organ hooks, saw blade, knife blades, aluminium trays, PVC aprons). The examination pointed out the following:

- After the replacement of the disinfection mean and the use of some new procedures for improving sanitation, the statistic differences concerning TNG/cm² surface observed between

the experimental variants were very significant for all the analysed objectives.

- Among the studied objectives, the most pretentious and vulnerable at the same time have proved to be: the inside walls, the floors, the meat hooks, the inoxidable tables, the organ hooks, the knife blades and the aluminium trays, all of these, except the inside walls and the floors, coming in direct contact with the raw material.
- As reported to OMS 976/98 in the witness variant W_v 82 samples (16.2%) were not corresponding, for the experimental variant E_{v1} 22 samples (10.5%) were not corresponding, and for the experimental variant E_{v2} the number of not corresponding samples lowered at 5 (4.1%).
- After the substitution of the disinfection factor and the use of new procedures for improving sanitation, the degree of bacteriological reduction of the medium values of TGN/cm² area, presented values placed between 37.4% (PVC aprons) and 99.9% (inoxidable tables).
- The statistic differences concerning TGN/cm² area noticed between the experimental variants were highly significant for all the analysed objectives.
- For all not corresponding samples the presence of coliform bacteria was detected.

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