

STUDIES CONCERNING THE EFFICIENCY OF HYGIENIZATION OF THE WORKING AREAS IN THE CATTLE SLAUGHTERING PROCESS

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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 cattle slaughtering.

Keywords: *the degree of reducing TGNMA/cm² surface, work surfaces, bacteriological control, devices.*

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 cattle 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 surfaces, respectively. (Stănescu, 1998, Bărzoi, 2002, Apostu, 2004)

Experimental

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 preceding the following experimental variants:

- **The reference variant W_r** – 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 the HACCP plan was implemented.

The samples harvesting were made from 11 work areas within the slaughtering unit. There have been harvested 506 samples for the witness variant, 517 samples for the experimental variant no.1 (E_{v1}) and 385 samples for the E_{v2} .

Results and Discussions

For the bacteriological examination of work surfaces, instruments and protection equipment there has been harvested and analysed a number of 1408. 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 results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at cattle slaughtering during experimental period is shown in figures 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.

The degree of reducing TGNMA/cm² surface for the experimental variants taken for the study is shown in the table 1. By analyzing the data from the table 1, 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 surfaces. The samples for the test of coliform bacteria/10 cm² surface were also positively discovered.

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 table 2.

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

The examined objective	W _v	E _{v1}	Degree of bacterial reduction, %	E _{v2}	Degree of bacterial reduction, %
Inside walls	1012	2510.5	-	65	93.6
Floors	17515	5012.5	71.4	485	97.2
Meat trucks	685	564.5	17.6	375	45.3
Meat hooks	3524	2864	18.7	566	83.9
Inoxidable tables	19040	3015	84.2	1054	94.5
Organ hooks	3040	1798.3	40.8	467	84.6
Saw blade	651.5	494.5	24.1	197.5	69.7
Knife blades	24536	30425	-	830	96.6
Inoxidable doors	49	82	-	165	-
Aluminium trays	32526	6794	79.1	1665	94.9
PVC aprons	1463	482	67.1	519	64.5

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

Experimental variant					
W _v		E _{v1}		E _{v2}	
No. of not corresponding samples	%	No. of not corresponding samples	%	No. of not corresponding samples	%
102	20.2	46	8.9	28	7.3

The results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at cattle slaughtering during experimental period are presented in figures 1 and 2.

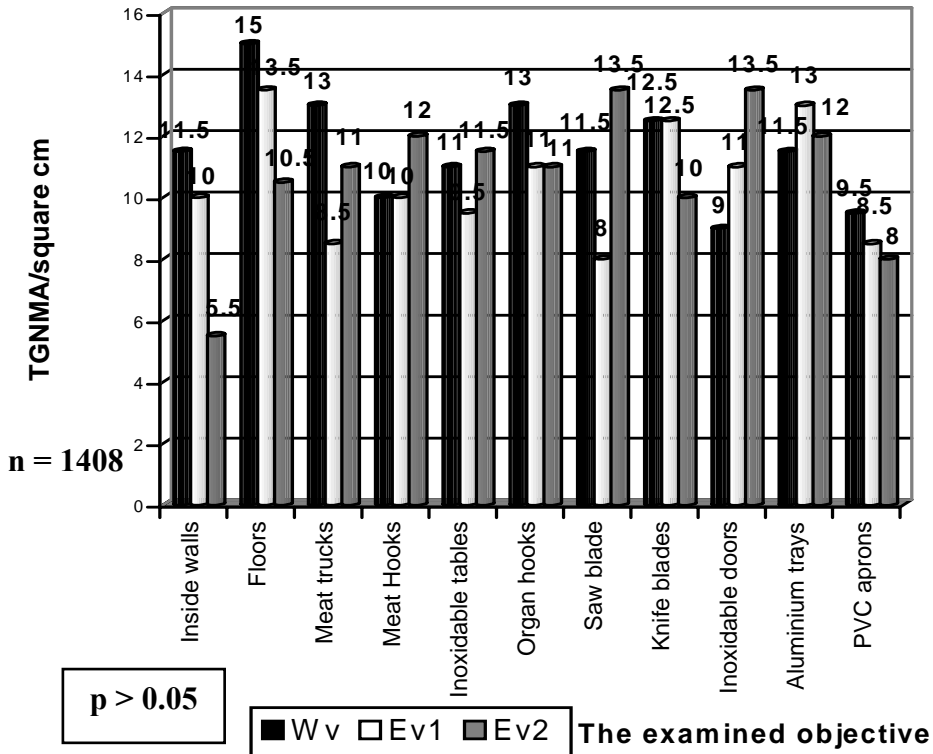


Figure 1. The results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at cattle slaughtering during experimental period, n = 1232

CONCLUSIONS

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:

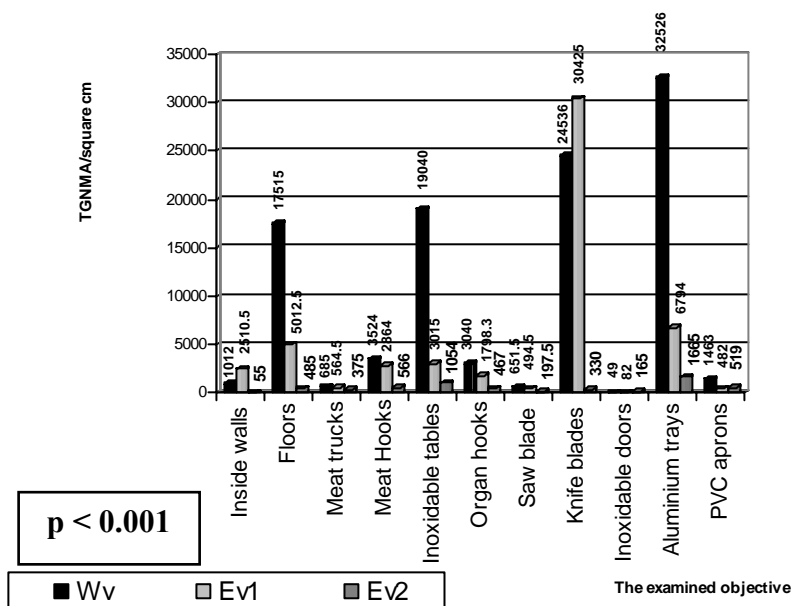


Figure 2. The results of bacteriological control (TGNMA/cm²) of work surfaces, devices, instruments, and protection equipment at cattle slaughtering within unity A, during experimental period, n = 176

- * 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 analyzed 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 102 samples (20.2%) were not corresponding, for the experimental variant E_{v1} 46 samples (8.9%) were not corresponding, and for the experimental variant E_{v2} the number of not corresponding samples lowered at 28 (7.3%).

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- * 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 45.3% (meat trucks) and 97.2% (floor). The statistic differences concerning TGN/cm² area noticed between the experimental variants were highly significant for all the analyzed objectives.
- * For all not corresponding samples the presence of coliform bacteria was detected.

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