

## STUDY REGARDING THE SANITARY-VETERINARY CONTROL OF THE CATTLE CARCASSES WITHIN S.C. SIMONA S.R.L. SLAUGHTERHOUSE OF BAL

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**Key words:** carcase; colonies; microbiological norm

### ABSTRACT

*After the results obtained from the five samples collected from 6 carcasses, we may conclude that, out of the total 30 samples examined according to the values obtained in a logarithm with base 10, there were 5 satisfactory samples, 21 acceptable samples and 4 positive-valued unsatisfactory samples. The carcasses samples were examined by means of the horizontal method of enumerating the total number of germs (NTG) according to SR EN ISO 4833/2003 by means of the technique of counting the colonies at 30°C, obtaining values in ufc/cm<sup>2</sup>, that by changing into log<sub>10</sub>/cm<sup>2</sup>, we could spotlight the contamination degree of the cattle carcasses within the microbiological norm (satisfactory, acceptable and unsatisfactory) according to the microbiological criteria stipulated in the (EC) Regulations no. 1441/2007, to the amendment of the (EC) Regulations no. 2073/2005 regarding the microbiological criteria for food products.*

### INTRODUCTION

Meat contamination with microbial flora is favoured by the hygienic-sanitary conditions of processing the carcasses and also by the chemical composition which represents a very favourable nutritive medium for the development of microorganisms (viruses, bacteria, yeasts, moulds) (Col M, 2010, Piscoi P, 2006).

The contamination of the muscles and/or of the muscular lymphatic lymphoganglions is considered as deep contamination. The superficial contamination of the animal and of the carcase is also described. The provenience of the microorganisms found in deep contamination is very diverse so that the contamination may be made as following: - contamination in vivo; - contamination during the primary processing (agonic contamination); - contamination post mortem: during the procedures of conditioning and depositing, during transport, during cutting, during pre-packaging, during sales (Rotar G, 1997). The dangerous germs that can be found in these cases, together with the saprophytic flora are: Salmonella, Yersinia, Clostridium, Staphylococcus aureus, enterotoxigenic Escherichia coli, Pseudomonas, Lactobacillus, Clostridium, Salmonella. (Savu, C., 1997, 2002). The veterinary sanitary controls of the animals (when receiving them, before and after slaughtering them) stipulate the following: confiscating the meat that is potentially contaminated in vivo, collecting samples in case of suspected contamination, sending these to the laboratory (in order to be subjected to the bacteriologic analysis), holding the meat and the organs under veterinary sanitary seizure until the arrival of the analysis certificate detailing the result of the bacteriologic analysis. (indrilar., E, 2000).

### MATERIAL AND METHOD

The studied material was represented by 5 samples collected from 6 carcasses, and for every carcase, the sample was collected from 4 spots on the surface of every carcase, obtaining finally a total number of 30 samples that were examined by means of the horizontal method for enumerating the microorganisms (NTG), according to SR EN ISO 4833/2003, by means of the technique of enumerating the colonies at 30 °C, after 72 hours of incubation.

Collecting the samples from the surface of the cattle carcasses was made by means of the destructive method with a template. For collecting the samples we used the sterile stainless template with the empty intern area of 5 cm<sup>2</sup> that was applied in 4 selected election places on the surface of the carcasses having the highest possibility of contamination in the process of carcase processing (the distal part of the posterior leg, the lateral part of the posterior leg, the lateral part of the abdomen and the median area of the abdomen). The samples collected from the carcasses were represented each by a 5 cm<sup>2</sup> flat totalising 20 cm<sup>2</sup>. The horizontal method for enumerating the microorganisms (bacteria, yeasts, moulds), by means of the technique of enumerating the colonies at 30<sup>o</sup>C, grown on a solid medium, supplies data on the contamination status of the analysed product (cattle carcasses).

The samples collected from the cattle carcasses were microbiologically investigated by the horizontal method of enumerating the microorganisms according to SR EN ISO 4833/2003, by means of the technique of enumerating the colonies at 30<sup>o</sup>C, after 72 hours of incubation.

The number N of UFC of microorganisms on cm<sup>2</sup> was calculated by means of the following formula:

$$N = \frac{\sum C}{(n_1 + 0,1n_2)d}$$

where: C – the sum of the colonies counted in all retained boxes;

n<sub>1</sub> - the number of the retained boxes where 10-300 colonies were counted at the first dilution;

n<sub>2</sub> – the number of the retained boxes where 10-300 colonies were counted at th second dilution;

d – the dilution factor corresponding to the first dilution.

If there are more than two retained dilutions containing between 10-300 colonies, the formula must be changed in order to consider also the following dilution:

$$N = \frac{\sum C}{(n_1 + 0,1 n_2 + 0,01 n_3)d}$$

Where n<sub>3</sub> is the number of the boxes where 10-300 colonies are counted.

The obtained result is estimated at 2 significant digits.

If the estimated number is 5, with no other significant digits, it is rounded so that the left-placed digit should be even, for example: 28.500 is estimated at 28.000, 11.500 is estimated at 12.000.

The result is considered to be the number of UCF of microorganisms on ml of initial suspension which is equivalent to 1 cm<sup>2</sup> of collected carcasses surface, expressed by a number between 1 and 9,9, multiplied by 10<sup>x</sup>, where x is the power assigned to 10.

## RESULTS AND DISCUSSIONS

After the microbiological exam of the cattle carcasses after slaughtering regarding the degree of contamination with microorganisms for the 5 samples collected from 6 cattle carcasses, we found the following values analysed and discussed for every carcase (table 1.). The carcase samples were examined by means of the horizontal method of enumerating the total number of germs (NTG) according to SR EN ISO 4833/2003 by means of the technique of counting the colonies at 30<sup>o</sup>C, obtaining values in ufc/cm<sup>2</sup>, by means of which, we could spotlight, after changing them into log<sub>10</sub>/cm<sup>2</sup>, the contamination degree of the cattle carcasses framed within the microbiological norm (satisfactory,

acceptable and unsatisfactory) according to the microbiological criteria stipulated in the (EC) Regulations no. 1441/2007, in the amendment of the (EC) Regulations no. 2073/2005 regarding the microbiological criteria for food products.

**For carcass number 1**, the resulted ufc values presented variations between 2894 - 24920 ufc/cm<sup>2</sup>, respectively 3,46 – 4,39 log<sub>10</sub>/cm<sup>2</sup> for the 5 samples, among which we can prove that two samples were framed as satisfactory (3,46; 3,47 log<sub>10</sub>/cm<sup>2</sup>), and three samples were framed as acceptable (4,33; 4,34; 4,39 log<sub>10</sub>/cm<sup>2</sup>).

**Table 1.**

**The results of the microbiological exam regarding the NTG determination for the samples from the surface of the examined cattle carcasses**

Unit Sample (carcass e)	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5	
	No. ufc/cm <sup>2</sup>	Log <sub>10</sub> /cm <sup>2</sup>	No. ufc/cm <sup>2</sup>	Log <sub>10</sub> /cm <sup>2</sup>	No. ufc/cm <sup>2</sup>	Log <sub>10</sub> /cm <sup>2</sup>	No. ufc/cm <sup>2</sup>	Log <sub>10</sub> /cm <sup>2</sup>	No. ufc/cm <sup>2</sup>	Log <sub>10</sub> /cm <sup>2</sup>
1	2894	3,46	21543	4,33	2986	3,47	24920	4,39	22345	4,34
2	126422	<b>5,10</b>	89365	4,95	118536	<b>5,07</b>	85342	4,93	21543	4,33
3	3112	3,49	38767	4,58	57311	4,75	56672	4,75	28484	4,45
4	46328	4,66	49843	4,69	47976	4,68	81387	4,91	85411	4,93
5	24920	4,39	28484	4,45	136822	<b>5,13</b>	3112	3,49	146842	<b>5,16</b>
6	2357	3,37	56271	4,75	59438	4,77	58314	4,76	46540	4,66

**For carcass number 2**, there were values between 21543 - 126422 ufc/cm<sup>2</sup>, respectively 4,33 - 5,10 log<sub>10</sub>/cm<sup>2</sup>. In this case, out of the five samples, three samples were framed as acceptable (4,33; 4,93; 4,95 log<sub>10</sub>/cm<sup>2</sup>) and two samples were framed as unsatisfactory (5,07; 5,10 log<sub>10</sub>/cm<sup>2</sup>)- graphics 6.1.

**For carcass no. 3**, the obtained results show that one sample was framed as satisfactory with 3112 ufc/cm<sup>2</sup>, respectively 3,49 log<sub>10</sub>/cm<sup>2</sup> and four samples were framed as acceptable with values between 28484 - 57311 ufc/cm<sup>2</sup>, respectively 4,45 - 4,75 log<sub>10</sub>/cm<sup>2</sup>.

Regarding the results obtained from the samples collected from **carcass number 4**, we found that all samples were framed as acceptable with values between 46328 - 85411 ufc/cm<sup>2</sup>, respectively 4,66 - 4,93 log<sub>10</sub>/cm<sup>2</sup>.

**For carcass number 5**, out of the five examined samples, we found that one sample presented satisfactory values with 3112 ufc/cm<sup>2</sup>, respectively 3,49 log<sub>10</sub>/cm<sup>2</sup>, two samples presented values framed as acceptable with 24920 and 28484 ufc/cm<sup>2</sup>, respectively 4,39 and 4,45 log<sub>10</sub>/cm<sup>2</sup>. Samples 3 and 5 presented positive values framed as unsatisfactory with 136822 and 146842 ufc/cm<sup>2</sup>, respectively 5,13 and 5,16 log<sub>10</sub>/cm<sup>2</sup>.

**For carcass number 6**, out of the five examined samples, sample 1 had values of 2357 ufc/cm<sup>2</sup>, respectively 3,37 log<sub>10</sub>/cm<sup>2</sup> framed as satisfactory and four samples with values between 46540 - 59438 ufc/cm<sup>2</sup>, respectively 4,66 - 4,77 log<sub>10</sub>/cm<sup>2</sup> were framed as acceptable.

The test results prove the microbiological quality of the technological process tested for the total number of aerobe colonies (NTG) in cattle carcasses, identified as u.f.c. and changed into log<sub>10</sub>:

1. satisfactory, if the daily logarithmic average is < M;
2. acceptable, if the daily logarithmic average is placed between m and M;
3. unsatisfactory, if the daily logarithmic average is > M.

## CONCLUSIONS

After the results obtained from the five samples collected from 6 carcasses, we may conclude that, out of the total 30 samples examined according to the values obtained in a logarithm with base 10, there were 5 samples registered as satisfactory, 21 samples registered as acceptable and 4 samples, having positive values, registered as unsatisfactory.

The registered positive results impose the revision of the slaughtering technology on the technological flow, in critical control points, specifying the stages with high risk of contamination (skinning and evisceration) which determined the high incidence of the total number of microorganisms on centimetre square of the carcass surface for the above mentioned samples.

After the conclusions regarding the results of the microbiological exam for the six carcasses, two of the carcasses had positive results above the admitted limit and the other four carcasses had satisfactory and acceptable results. For the positive results registered at the two carcasses, the revision of the HACCP system is imposed in the framework of the specialised unit of cattle slaughtering, in applying the hygiene norms on the technological flow of slaughtering the cattle carcasses in the critical control points (skinning and evisceration), that determined the high incidence of the microbial flora at the above mentioned samples.

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