



International 58th Meat Industry Conference “Meat Safety and Quality: Where it goes?”

The microbiological status of carcasses of goats slaughtered in an inadequate facility

Snezana Ivanovic^{a,*}, Ksenija Nesic^a, Boris Pisinov^a, Ivan Pavlovic^a

^a*Institute of Veterinary Medicine of Serbia, Autoput 3, 11000 Belgrade, Serbia*

Abstract

The microbiological contamination of goat carcasses slaughtered on a slaughter line under controlled conditions and in inadequate facilities was measured by determining the total number of aerobic mesophilic bacteria, *Enterobacteriaceae* and *Salmonella* spp. Wet swabs were taken from the carcasses of goats (in slaughterhouses $n = 115$ and in inadequate facilities $n = 80$). Test results showed that the total number of aerobic mesophilic bacteria and *Enterobacteriaceae* were mostly within satisfactory and acceptable categories. *Salmonella* spp. was not isolated from any of the goat carcasses.

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Keywords: goats; slaughterhouse hygiene; TMC; *Enterobacteriaceae*; *Salmonella* spp.

1. Introduction

In Serbia goat meat, and especially kid meat, is increasingly being consumed for its characteristic taste, desired chemical composition and nutritional properties. Like all other types of meat, goat meat can also be a source of pathogenic bacteria. Bacteria can reach the surface of the carcasses during slaughtering of healthy goats and carcass processing. The operations of skinning and evisceration are highly risky for carcass contamination by microorganisms^{1,2}.

* Corresponding author. Tel.: +381-11-260-4020; fax: +381-11-260-4020.
E-mail address: snezaivanovic@gmail.com

On the slaughter line, enterobacteria are the most common contaminants of carcasses. Family *Enterobacteriaceae* include 25 genera and more than 80 different species, among which are some pathogenic microorganisms. *Salmonella* is given the most attention. In slaughter houses, *Salmonella* is usually transmitted to the goat's carcasses from the skin or slaughtering equipment³.

According to the latest regulations^{4,5} for monitoring hygiene of a facility and covering hygienic principles in the slaughter line, determinations of the total number of aerobic mesophilic bacteria (TMC), the number of *Enterobacteriaceae* and *Salmonella* spp. are required. In addition to the pathogenic species of the family *Enterobacteriaceae*, there are also types which are not pathogenic, but are constantly present in the environment, so this family of bacteria can be used for routine monitoring. The aim of our study was to determine the microbiological contamination of goat carcasses processed on a slaughter line in a licensed premise, and in inadequate, unofficial slaughter facilities, by determining the TMC, number of *Enterobacteriaceae* and the presence of *Salmonella* spp, and then categorizing the bacterial levels according to the official criteria.

2. Materials and methods

Wet swab samples were collected and processed during a four year period according to the Commission Regulation (EC)⁴. Immediately after slaughter, wet swabs were taken using the non-destructive ISO⁶ method from a total of 115 goat carcasses slaughtered in a licensed slaughter house and from 80 goat carcasses slaughtered in inadequate unofficial facilities. At the same time, sampling for *Salmonella* testing was carried out by the swab method, using an abrasive sponge in accordance with Commission Regulation (EC)^{4,5}. In the wet swabs, the TMC (\log_{10} cfu/cm²) was determined by ISO EN⁷, the number of *Enterobacteriaceae* (\log_{10} cfu/cm²) by ISO⁸ and in the abrasive sponge swabs the presence of *Salmonella* spp. was determined by ISO⁹. Results were interpreted according to the Commission Regulation (EC)⁵.

3. Results and discussion

The categories as satisfactory, acceptable or unsatisfactory for TMC and *Enterobacteriaceae* are shown in Tables 1 and 2.

Table 1. Distribution of swab samples according to the criteria for the total count of bacteria on carcasses of goats slaughtered in the slaughterhouse and in inadequate facilities.

Criteria	Flank (n)	Chest, lateral side (n)	Perineal area (n)	Top of the chest, lateral side (n)
Total count of bacteria on carcasses of goats slaughtered in the slaughterhouse (n = 115)				
<i>Satisfactory</i>	85	91	80	100
<i>Acceptable</i>	25	20	24	12
<i>Unsatisfactory</i>	5	4 ^a	11 ^b	3 ^a
Total count of bacteria on carcasses of goats slaughtered in inadequate facilities (n = 80)				
<i>Satisfactory</i>	20	18	25	20
<i>Acceptable</i>	50	55	40	55
<i>Unsatisfactory</i>	10	7 ^a	15 ^b	5 ^a

^{a,b} – row means with different superscripts differ significantly at $p < 0.05$.

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