

MICROBIOLOGICAL CHARACTERISATION OF TURKEY CARCASSES BIG BUT 6

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Abstract

Turkey carcasses microbiological evolution is an important step in the state of hygiene interpretation necessary to produce food traceability. This study aimed to characterize microbiologically the turkey meat derived from hybrid Big BUT 6 slaughtered under SC Galli Gallo SRL. Microbiological evolution was monitored by flow slaughter realizing qualitative and quantitative determinations for: *Escherichia coli*, *Salmonella* spp., *Campylobacter*, *Staphylococcus aureus*, *Listeria* spp., *Yersinia enterocolitica*. The results obtained allow the assessment of the achievement of hygienic and technological conditions for obtaining microbiological level classification of carcasses with the legal standards.

Key words: turkey, microbiology, traceability

INTRODUCTION

Food safety is a international responsibility that includes all countries and societies of the world. Each country and region has its own food safety issues related to culture, climate, economic status and many other factors.

The frequency of pathogenic bacterial species present on the carcasses of turkeys differ from one country to another, from one farm to another. The remarks collected so far, show that even if the slaughtering process is performed on irreproachable hygienic conditions, however, contamination with pathogenic microflora can not be avoided, but only limited.

Although the meat is kept in natural conditions, at high temperature and humidity, along with the biochemical processes which determine the improvement of organoleptic properties occurs a development of microorganisms which amends the aerobic and also anaerobic processes, and the properties of meat.

Pathogenic bacteria capable of causing food-borne in humans can be found on / in turkey. Of these the most important are

Salmonella spp, *Campylobacter* spp, *Listeria monocytogenes* and enterohaemorrhagic and enteropathogenic strains of *Escherichia coli*. Other bacterial species such as *Yersinia enterocolitica*, *Staphylococcus aureus*, known for their pathogenicity, although they have been identified on turkey carcasses were not reported food poisoning caused by these bacteria as a result of the consumption of turkey meat.

MATERIAL AND METHOD

The biological material was represented by 50 individuals identified belonging hybrid Big BUT 6. Individuals were raised ground on permanent litter being subjected to continuous light program, provided for 24 lamps with 25 lux intensity, located at a height above ground of 2 m. The temperature of increase halls hybrid studied was 16°C and a humidity of 60%. „Ad libitum was done with finishing feed based on a crude protein content of 18% and 0,65% calcium and phosphorus.

Microbiological determinations respected standards legislation from out Romania aligned UE. For this determination were studied, aleatory, from technological line 5 carcasses of the study group. From they were harvested under sterile conditions from neck skin fragments of about 25 g. To obtain serial

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The manuscript was received: 24.04.2013

Accepted for publication: 22.05.2013

dilutions were complied with the SR EN ISO 6887-1-1996.

Bacteriological evaluation of poultry carcasses surface was under ANSVSA Program (National Sanitar Veterinary and Food Safety) 78323/1998 and 74032/1999.

Identification of *Escherichia coli* was made according to STAS ISO 4832/1992. Identification of biochemical characteristics of the species *Escherichia coli* was performed using API 20E galleries. Identification of microorganisms of the genus *Salmonella* was under programs of the National Sanitary Veterinary and Food Safety Authority, after standard SREN ISO 6579/AC/2006. Suspected colonies on selective media were inoculated on media polytrope: TSI (triple sugar iron), MIU (mobility, indole, urea) MILF (mobility, indole, lysinedecarboxylase, phenylalaninedeaminase).

Confirmation of *Campylobacter* species was performed by: examination of morphology and mobility, study of growth at 25°C (microaerob) and 41.5°C (aerobic) and detection oxidase. Determination of coagulase-positive staphylococci was performed after SR ISO 6888/1/2/2002. Isolation was done on the environment Baird-Parker where colonies of *Staphylococcus aureus* are black with a halo. Confirmation testing was performed using Api Staph. To determine the presence and number of *Listeria* spp method was used ISO 11290/2000, for *Listeria monocytogenes* was confirmed with tests: hemolysis test, carbohydrate utilization, CAMP test. *Yersinia enterocolitica* determination was made

according to ISO 10273/2003. Under this standard enrichment broth was made PSB (peptone, sorbitol and bile salts) and CIN agar isolation. Presumptive biochemical tests consisted of enzyme behavior isolates from urea, indole, glucose oxidase detection.

RESULTS AND DISCUSSIONS

Tests for *Escherichia* on turkey carcasses intended the presence for colonies of generic *Escherichia coli* (biotip1) on the surface of carcasses.

During the 5 visits to slaughterhouse it has been noted that the *Escherichia coli* species was isolated in most of examined carcasses, both the female carcasses with an incidence of 24% and to those of males with an incidence of 20% (Table 1, Table 2).

Salmonella spp. inhabits the intestinal tract of a wide range of animals and birds, including species of meat provider. The incidence varies depending on growth conditions and technology, hygienic processing of meat slaughter and subsequent handling. The main source of *Salmonella* contamination of turkey meat is the animal itself, so the incidence of bacteria on / in turkey is closely related to its incidence in flocks for slaughter.

L. monocytogenes may increase at low temperatures and therefore tends to colonize the surfaces in processing areas, not only during processing at the slaughterhouse to the level of carcass but more frequently during subsequent processing of carcasses (cutting, packaging, and so on).

Table 1 The incidence of isolated pathogenic bacterial species from female turkey carcasses aged for 124 days

Number of visits	<i>Escherichia coli</i>	<i>Staphylococcus aureus</i>	<i>Campylobacter jejuni</i>	<i>Yersinia enterocolitica</i>	<i>Listeria monocytogenes</i>	<i>Salmonella</i> spp.
1.	1/5	0/5	0/5	1/5	1/5	0/5
2.	2/5	1/5	1/5	0/5	0/5	0/5
3.	0/5	1/5	0/5	0/5	0/5	0/5
4.	2/5	0/5	1/5	0/5	1/5	0/5
5.	1/5	2/5	1/5	1/5	0/5	0/5
TOTAL	6/25 (24%)	4/25 (16%)	3/25 (12%)	2/25 (8%)	2/25 (8%)	0/25 (0%)

Table 2 The incidence of isolated pathogenic bacterial species from male turkey carcasses aged for 144 days

Number of visits	<i>Escherichia coli</i>	<i>Staphylococcus aureus</i>	<i>Campylobacter jejuni</i>	<i>Yersinia enterocolitica</i>	<i>Listeria monocytogenes</i>	<i>Salmonella spp.</i>
1.	0/5	1/5	0/5	0/5	1/5	0/5
2.	1/5	0/5	1/5	1/5	0/5	0/5
3.	2/5	0/5	0/5	0/5	0/5	0/5
4.	1/5	1/5	1/5	0/5	0/5	0/5
5.	1/5	0/5	0/5	1/5	0/5	0/5
TOTAL	5/25 (20%)	2/25 (8%)	2/25 (8%)	2/25 (8%)	1/25 (4%)	0/25 (0%)

The infection with *Campylobacter* was the most common food-borne bacterial diagnosed in humans in 2007, which is why reducing the incidence and level of contamination of turkey meat with *Campylobacter* is a priority for the authorities involved in protecting the health of consumers worldwide.

The contamination with *Campylobacter jejuni* species revealed a percentage of 12% at 124 days old female turkeys carcasses, while at 144 days old male turkeys carcasses the percentage being lower than 8%.

Since *Campylobacter spp.* is sensitive to high temperature, heat treatment of meat and the prevention of contamination after heat treatment, is the main method of reducing the risk of borne infections and intoxications with this bacterium.

The presence of *Staphylococcus* species on the carcass surfaces was evident, most frequently isolated were *S. aureus*, in terms of food safety, more important as it may produce enterotoxins. The provenance of *Staphylococcus* „endemic” strains is not fully elucidated but it is considered that most of the strains came from the turkeys skin which were brought to slaughtering.

The comparing results obtained from the carcasses of female and male turkey reflects an higher contamination in females carcasses 124 days old to followed parameters such as: *Escherichia coli* a percentage of 24%, for *Staphylococcus aureus* 16%, a percentage of 12% for *Campylobacter jejuni*.

The presence of the *Listeria monocytogenes* in the examined female carcasses showed a rate of 8% and the male

turkeys a rate of 4%, which indicates a major contamination during processing.

Salmonella species has not been identified on any surface of those cases examined.

CONCLUSIONS

The obtained data from the microbiological determinations and comparing the results obtained from the carcasses of turkeys reflect a higher contamination at the parameters examined, namely: *Escherichia coli* 24%, *Staphylococcus aureus* 16% and 12% for *Campylobacter jejuni*. The presence of *Listeriae monocytogenes* in examined carcasses was 8%, which indicates a major contamination of carcasses during processing.

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