
The incidente of *Salmonella* spp. in some poultry products

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Abstract

The goal of the proposed research was to determine the presence and variation of serotypes of Salmonella spp. in poultry meat and eggs which are commercialized in various units. In particular samples were taken from the commercial units placed in the Central Agricultural Market mun. Chisinau, where the poultry products are delivered from different districts of the country. Samples were taken from the refrigerated carcasses as well as current consumption eggs placed in the marketing network. The insemination of the lavages were made on cultural artificial medium as Salmonella Shigella Agar and Bismuth sulfite agar. The bacteriological investigations results have shown that about 12% of the samples from both examined poultry carcasses (including the samples of the depth of the muscle) as well as from eggs, demonstrated the presence of bacterial serotypes of Salmonella spp. The serotypes prevalence was S. infantis, S. enteritidis, S. typhimurium. The results confirmed the necessity for further multilateral and depth study of Salmonella spp. spreading in conjunction with the monitoring of public health sector.

Keyword: carcasses, microflora, serotypes, samples, colonies

Introduction

Both domestic and wild birds may be carrying and spreading Salmonella infections manifested through variable severe clinical forms that can often be fatal. It is noted that salmonellosis is in most cases the origin of food contamination in humans, the main sources being poultry and eggs contaminated with Salmonella spp. Despite the high performance of current technologies to slaughter birds, they still do not provide germ-free products. Theoretically, a healthy and rested bird doesn't have the bacterial flora in muscles and internal organs. In practice, this condition is not achieved because the sources of contamination of poultry meat are multiple and is difficult to remove them completely, also to obtain a sterile egg production is not possible. Most common the contamination of chicken carcasses takes place in the slaughter where man constitutes the main element, being the bearer of an important microbial flora, including salmonella (skin, hands, nose, mouth, intestine). Other important sources of microbial contamination could be water, air, bird feathers, equipment, tools, and insufficient cleaned and disinfected vehicles.

Following, are listed some pathogens that are more frequently meet on poultry: Salmonella enteritidis, Campylobacter jejuni, Yersinia enterocolitica, Clostridium perfringens, Staphylococcus aureus, Listeria monocytogenes, and some species of Bacillus. Although Salmonella is recognized as the most important pathogen associated with poultry, nobody knows the exact incidence of disease in humans associated with the consumption of poultry meat. It is estimated that of all cases of salmonellosis, approximately 20-25% of Salmonella illness occur due to poultry consumption.

The evolution of microorganisms that contaminate meat is influenced by many factors. Reducing the level of contamination with pathogens can be achieved only by respecting measures focused on the code of good working practices, using standard operating procedures for sanitation and avoiding dangerous practices that can lead to the contamination of critical points.

Analyzing the egg contamination, it was determined that they can be contaminated both internally, by the body of the bird during the formation as well as from contact with objects in the environment. Most frequently contaminations are associated with microorganisms such as Salmonella, Micrococcus, Staphylococcus, Proteus, Escherichia. Taking into account the above

mentioned, the purpose of our research was to establish the incidence of presence of bacteria of genus *Salmonella* spp. in poultry products (meat and eggs) used for human consumption.

Materials and methods

As research material served meat samples taken from carcasses of poultry (chickens, broiler) sold in commercial units of Central Agricultural Market in mun. Chisinau, which were delivered by poultry enterprises, from different districts of the republic, specialized in poultry meat production. In total there were 65 samples collected and examined. Simultaneously, were collected samples of table eggs (50 samples) from the units specialized in eggs production. The insemination was made on artificial culture medium as Nutrient agar, Endo Agar, SSA (*Salmonella Shigella* Agar), Sabouraud dextrose agar, bismuth sulfite agar. As indicators for monitoring was to establish the presence and morphological structure of the bacterial colonies grown on the culture medium. Some investigations have been carried out in the laboratory of Clinical Department II, SAUM, the subsequent investigations of serotyping of *Salmonella* spp. were performed in the laboratory of microbiology of Republican Veterinary Diagnostic Center.



Fig.1 Colonies of *Salmonella* spp. (medium BSA), insemination from the surface and depth of the sample



Fig.2 Colonies of *Salmonella* spp. (medium SSA), insemination from the surface and depth of the sample

Results and discussion

Monitoring the presence and morphological structure of colony of *Salmonella* spp. was studied both on the surface of the samples (poultry carcasses) as well as their depth. Some of the results of this study are shown in figures 1-4. The cases when the inseminations were performed on bismuth sulfite agar (figure 1 and 2) in all samples were detected growth of *Salmonella* spp. colonies. They were often placed in the form of chain or separated in piles their number having variations within at 122 to 265 colonies. However, when the inseminations were performed on samples taken from the depth the number of colonies had variations from 10 to 66.



Fig.3 Colonies of Salmonella spp. (medium SSA), insemmination from the surface and depth of the sample



Fig.4 Colonies of Salmonella spp. (medium SSA), insemmination from the surface and depth of the sample

On the Salmonella Sighella Agar (fig. 3 and 4), the number of colonies of Salmonella spp. had variation from 70 to 237 when the insemmination was performed from the surface of the samples and from 0 to 82 colonies, when the insemmination was performed from the depth of the sample.



Fig. 5 Colonies of Salmonella spp. (medium SSA), insemmination from the surface of the egg sample



Fig.6 Colonies of Salmonella spp. (medium SSA), insemmination from the surface and depth of the egg sample

Some of the researches which indicate the presence of colonies of Salmonella spp. in samples taken from the table eggs are presented in figures 5 and 6. In particular, an intensive growth of the colonies was established in the case where the insemmination was performed from the lavages collected from the surface of eggs, with values varying from 44 to 315 colonies, with an evident and massive growth on Salmonella Sighiela agar medium. When the insemmination was performed from the cavity of the egg, the number of colonies was less and had ranged from 0 to 25 coloni

Table 1. Serotypes of Salmonella spp. isolated from poultry products

| N. ord | Salmonella spp. serotypes | Products nime | Pozitive samples |
|--------|---------------------------|-----------------------------------|------------------|
| 1 | Salmonella Enteritidis | Poultry meat | 4 |
| 2 | Salmonella Infantis | Poultry meat | 10 |
| 3 | Salmonella Winneba | Poultry meat | 1 |
| 4 | Salmonella Newport | Poultry meat | 3 |
| 5 | Salmonella Uppsala | Poultry ground meat | 2 |
| 6 | Salmonella Fillmore | Poultry meat | 1 |
| 7 | Salmonella typhimurium | Mechanically deboned poultry meat | 1 |
| 8 | Salmonella Dessau | Poultry meat | 2 |
| 9 | Salmonella Farsta | Mechanically deboned poultry meat | 1 |
| 10 | Salmonella Infantis | Meat products | 5 |
| Total | | | 30 |

Bacteriological research showed that in about 12% of the samples taken from poultry carcasses and eggs for consumption isolated colonies of Salmonella spp. were present.

Some results of salmonella spp. monitoring and their serotype evidence were performed in collaboration with laboratory of microbiology of Republican Veterinary Diagnostic Center. Table.1 presents data of positive samples taken from poultry carcasses and confirmed positive with Salmonella spp.

Results of table 1 show that from the total number of examined samples 30 samples were confirmed positive with Salmonella spp., specifically was detected serotypes as S. Enteritidis S. Tiphimurium that represents a danger to public health. However, the highest rate of contamination of poultry carcasses was with serotypes S. Infantis - 15 samples, that is 50% respectively of the total number of salmonella serotypes.

Conclusions

1. The results of laboratory investigations confirmed that some pathogenic serotype of Salmonella spp., in particular S. enteritidis and S. typhimurium are persistent in poultry carcasses and in eggs of current consumption which represent a potential risk of birds and human contamination.
2. The microbiological tests of poultry carcasses and eggs sold in the Central agricultural market demonstrated that about 12% of the examined samples confirmed the presence of Salmonella spp., with prevailing serotype S. infantis, S. enteritidis and S. typhimurium, which confirms the need for multilateral examinations, including the public health sector.

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