

The Presence of Species of the Salmonella Gender, their Isolation and Identification in the Poultry for Production of Eggs in the Areas of Shtime, Lipjan and Ferizaj in Kosovo

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Abstract: *The study investigated the presence of bacteria Salmonella spp. gender in poultry for eggs production. The study was conducted in poultry and private farms in the region of Shtime, Lipjan and Ferizaj, Kosovo. Taken samples of feces, eggs and organs samples underwent in ISO 6579:2002 method, which is standard method for detection of the Salmonella spp., where 312 samples were investigated, 28 of them or 8.97% were confirmed to be Salmonella spp. The largest percentage of the total isolated strains is presented in Lipjan region with 39.28%, 32.14% in Shtime and 28.57% in Ferizaj. From the total number of isolated strains in this study, is illustrated that the largest number was found in feces samples 18 strains or 64.2% expressed in percentages, while in the eggs are isolated 7 strains (25%) and in organs 3 strains or 10.7 % of total isolation.*

Keywords: Salmonella spp, pathogens, poultry, serovars, strains.

1. Introduction

Poultry in region of Shtime, Lipjan, Ferizaj and wider in Kosovo, is the line that is developing quickly, especially in the production of eggs and meat poultry. Modernization of poultry breeding industry has played a crucial role in not spreading and transmitting salmonella's infections in poultry (VELGA et al., 2005). Poultry and their products are often connected with the outbreak of salmonella's epidemics in animals and in humans around the world. Poultry and farms are the main reservoir of infections caused by species of Salmonella gender (Luiz et al., 2004). The infection enters through oral routes, causing in the most cases difficulty of inflammatory processes of the digestive tract. The Salmonella typically recognized as zoonotic species, induced pathogens and are intracellular parasites. The bacteria of Salmonella gender is belong to the Enterobacteriaceae family with 2400 serovars. In poultry the most known types of Salmonella spp serovars are: Salmonella enteritidis, S.typhi, S.gallinarum, S.typhimurium, who also are the most significant agents of salmonellas food transited in humans (Popoff et al., 2004). Serotype is an important tool to understand the epidemiology of infections caused by species of Salmonella gender, which develops according to White Kaufmanns scheme(1920), and based on the discovery of H flagella antigen, somatic antigen O and the surface antigen Vi (Cabeli P., 2006).

2. Material and Methods

The samples for isolation and identification of species of the Salmonella gender were taken from organs, eggs, feces from poultry and private farms, during January-April 2014 in the region of Shtime, Lipjan and Ferizaj. Totally were taken: 63 feces samples, 189 samples from internal organs (liver, spleen, intestine and cloaca) and 60 egg samples. The isolation and identification is based on ISO 6579:2002 method, and was conducted at the Microbiological Laboratory of Food in the Food and Veterinary Agency of Kosovo. For diagnosis was used this material: BPW, RVS, BG-agar, XLD-agar, TSI-agar, Salmonella LATEX TEST - Oxoid England, Salmonella antiserum Siffin Berlin (Anti-Salmonella A-67 omnivalent, Anti-Salmonella I (A-E) and Anti-Salmonella F-67. 25 gr. of feces were taken for each sample and transferred into 225 ml of BPW. 25 gr. of each egg (white, vitellus and eggshell) were transferred into 225 ml BPW richen field. 25 g. of organs (liver, spleen, intestines and cloaca) were planted in 225 ml BPW. All cultures were cultivated in thermostat at 37°C for 18-24 hours. After incubation, 0.1 ml of the cultures were transferred into tubes with 10 ml RVS (selective richen field) and incubated for 24 hours at 41.5- 42 °C. Further crops were planted in the selected solid field BGA-agar and XLD-agar, than those were cultivated in the incubator for 24 hours at 37°C. Five suspicious colonies were re-planted in Nutrien-agar and underwent biochemical confirmation tests using sugars, in TSI - agar 37°C for 24 hours. Biochemical evidences were followed by serological tests such as Salmonella LATEX TEST-OXOID and use of antiserum as Anti-Salmonella A-67

omnivalent, Anti-Salmonella I (A-E) and Anti-Salmonella F-67.

3. Results and Discussion

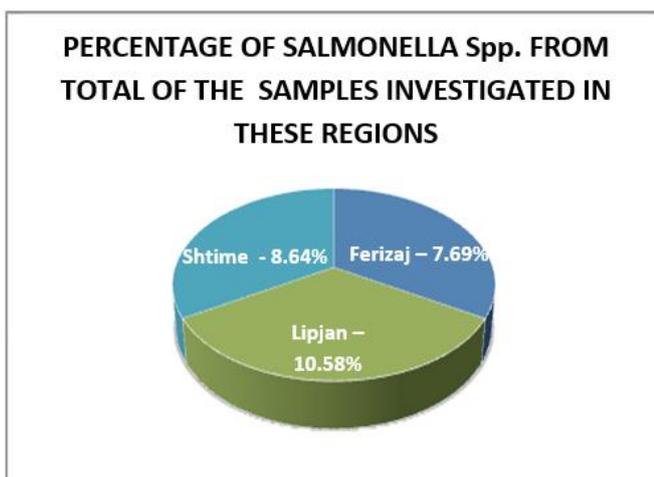
From this study, after analyzing 312 samples from organs, eggs and feces of poultry for egg production, based on ISO 6579:2002 method, were isolated 28 strains of Salmonella gender or 8.97% of the total analyzed. The same results are also found in other researches that have been done in other countries of the world. While the same studies were conducted in Montreal Canadas, where about 264 samples were investigated, 8.7% of them were infected by Salmonella spp, whereas in the Mekong Delta Vietnam, from 302 samples inspected, 7.9% were infected with salmonella spp.

4. Tables

The tables and graphs below are the results obtained from this study.

Table 1: Percentage of Salmonella spp., from the total of investigated samples

Region	Total sample	Salmonella spp.	Percentage of the total number
Shtime	104	9	8.65%
Lipjan	104	11	10.58%
Ferizaj	104	8	7.69%
Total	312	28	8.97%



Graphic 1: Percentage of Salmonella spp., from the total of investigated samples.

The above results show that from 312 feces samples, eggs and organs analyzed, 8.97 % of them belong to the species of

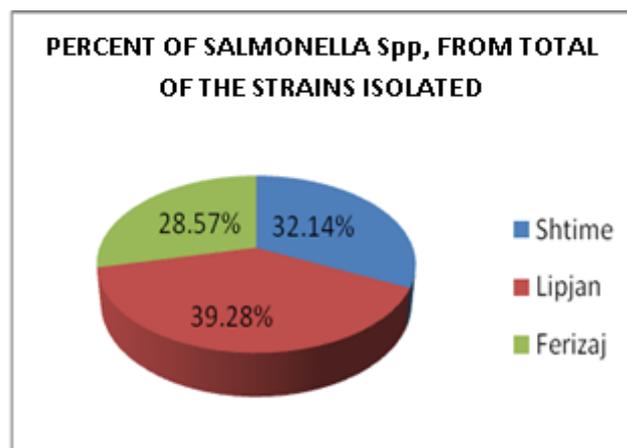
Salmonella gender, indicating the presence of the infection in the three regions: Shtimje, Lipjan and Ferizaj. In the chart and graphic below in percentages are given species of isolated Salmonella gender comparing with total number, analyzed in the studied regions.



Photo 1: Salmonella spp.of in TSI-agar

Table 2: Percentage of Salmonella spp., from the total of investigated samples

Region	Strains Total	Salmonella spp.	Percentage %
Shtime	28	9	32.14%
Lipjan	28	11	39.28%
Ferizaj	28	8	28.57%



Graphic 2: Percentages of Salmonella spp, from isolated strains

As might be seen from the chart and graphic above, higher presence of cases is presented in Lipjan region with 39.28%, further Shtime region with 32.14% and 28.57% in Ferizaj.

In chart.3 are given the results of Salmonella spp expressed in percentages, in analyzed samples: feces, eggs and organs.

Chart.3: Percentages of Salmonella spp, in feces, eggs and organs

Region	Strains Total in Region	Feces		Egg (the white, vitelus and bark)		Organs (liver, spleen, intestine and cloaca)	
		Strains	%	Strains	%	Strains	%
Shtime	9	6	66.60%	2	22.20%	1	11.10%
Lipjan	11	7	63.60%	3	27.20%	1	9.10%
Ferizaj	8	5	62.50%	2	25%	1	12.50%
Total	28	18	64.20%	7	25%	3	10.70%

The above results indicate that from 28 isolated strains the highest percentage of samples are observed into feces, where 18 strains of Salmonella spp. are isolated or 64.2% of the total, in eggs are isolated 7 strains of Salmonella spp. or 25% of the total, and in the organs are isolated only 3 strains of Salmonella spp. or 10.7%.

This study will continue further by conducting of biochemical tests, which will be followed by serological tests such: Salmonella LATEX TEST-OXOID, and use of antisera as Anti-Salmonella A-67 omnivalent, Anti-Salmonella I (A-E) and anti-Salmonella F-67, which will facilitate further identification of the Salmonella species present in eggs, feces and organs samples in the poultry of Shtime, Lipjan and Ferizaj regions.

5. Conclusion

- From 312 analyzed samples by ISO 6759:2002 method, in three studied regions was found a prevalence of Salmonella spp, about 28 strains or 8.97% of the total analyzed samples.
- The highest prevalence of Salmonella spp, has the region of Lipjan with 39.28%, than Shtime 32.14% and 28.57% in Ferizaj to the overall total.
- The highest percentage is found in feces, where 18 strains were isolated or 64.2%, in eggs were isolated 7 strains or 25% and in organs were isolated 3 strains with 10.7%
- Comparing the presence of Salmonella spp, with the total number of isolated strains, results that obtained feces from Shtime region has a higher percentage with 66.6%, followed by Lipjan 63.6%, and finally Ferizaj with 62.5%.
- Comparing the presence of Salmonella spp, with the total number of isolated strains, comes out that in eggs, the percentage of salmonella infection in Lipjan region is the highest with 27.2%, than in Ferizaj with 25%, and Shtime 22.2%.
- The comparison of the Salmonella spp, presence with the total number of isolated strains in organs show that samples taken from Ferizaj have the highest percentage with 12.5%, followed by Shtime with 11.1% and Lipjan 9.1%.

References

- [1] Dr. Jose C. Jimenez (Edited by), (2012) Biochemical Testing, 4.
- [2] Çabeli, P. a. (2006). Bakteriologjia-Mykologji Veterinare. Tiranë: Universiteti Bujqësor i Tiranës.
- [3] F. Polo a, M. F., & *, I. I. (2006, January 17). <http://onlinelibrary.wiley.com>. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1574-6968.1998.tb12919.x/references>.
- [4] García C, S. J.-G. (2011, Jul). <http://www.ncbi.nlm.nih.gov>. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/21673175>.
- [5] Luiz Ade F, M. F. (2004, August). <http://www.ncbi.nlm.nih.gov>. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15543409>.
- [6] Messier, S. Q. (1992). PREVALENCE OF SALMONELLA SPP., CAMPYLOBACTER SPP. AND LISTERIA SPP. IN RING-BILLED GULLS (LARUS DELAWARENSIS). October 1992, Vol. 28, No. 4, pp. . Journal of Wildlife Diseases, No. 4, pages 526-531.
- [7] Programme, J. F. (2010). CODEX ALIMENTARIUS COMMISSION. Rome, Italy: FAO/WHO.
- [8] Popoff YM: Institut Pasteur France: Antigenic formula Salmonella serovar, 9 edition WHO. Collaborating Centre for Reference and Research on Salmonella. 2007.
- [9] Report of the Task Force on zoonoses Data Collection on the Analysis of the baseline study on the prevalence of Salmonella in holdings of laying henflocks of Gallus gallus 1 Question No EFSA Q-2006-039 The EFSA Journal 2007.97.
- [10] Salm-Surv, G. (2003). Laboratory Protocols. In R. S. Hendriksen, Laboratory Protocols Level 1 Training Course Identification of Salmonella. Global Salm-Surv.
- [11] Tran TP(1), L. T. (2004 Aug). Prevalence of Salmonella spp. in pigs, chickens and ducks in the Mekong Delta., J Vet Med Sci, 66(8):1011-4.
- [12] Waltman WD, Mallison ET: Isolation of Salmonella from poultry tissue and environmental samples national wide survey. Avian Diseases, 1995.39,45-54.
- [13] Vegle H, C. A. (2005). Emergence of Salmonella epidemics: The problem related to Salmonella Enterica serotype Enteritidis and multiple antibiotic resistance in other major serotypes. Veterinary Research 36,267-288.

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