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The presence of Salmonella Enteritidis in Faecal Samples, Eggs and Poultry Bodies Isolated for Egg Production in Some Regions (Lipjan, Shtime and Ferizaj) of Kosovo

Hyzer Rizani[1], Pranvera Çabeli[2]

[1] Food and Veterinary Agency, the Food and Veterinary Laboratory, Pristina, Kosovo

[2] Agricultural University of Tirana, Faculty of Veterinary Medicine, Tirana, Albania

Abstract: ***In this study the isolation was done of Salmonella enteritidis from poultry for egg production. Salmonella enteritidis is recognized as the most common serotypes in the emergence of salmonellosis worldwide. The survey included private poultry farms of the region of Lipjan, Shtime, Ferizaj in Kosovo. Samples have been taken mainly from the stool, eggs (white, vitelusi and shells) and organs (liver, spleen, intestines and cloaca), which have been subjected to the method ISO 6579: 2002 standard method for detection of Salmonella enteritidis. Extraction and transport of samples collected from farms and private poultry has been done by Codex Alimentary. Examinations are conducted in the Second Level Security Laboratory. In three areas have been explored total 312 samples, where 28 or 8.97% of them were confirmed to be Salmonella spp. and from these strains 13 were confirmed to be positive for Salmonella enteritidis, expressed as a percentage 4.16% of total samples analyzed. From total number of isolated strains of Salmonella entertidis in the region of Lipjan, 6 strains or 54.5% are S.enteritidis by 11 strains of Salmonella spp, from the region of Shtime, 4 strains or 44.4% belong S.enteritidis from 9 strains total of Salmonella spp. and the Ferizaj Region, a total of 3 strains are identified or 37.5% of S.enteritidis from 8 strains of Salmonella spp. The largest number of Salmonella enteritidis strains isolated in stool samples obtained from 10 strains, the bodies of two strains and the egg only one strain.***

Keywords: Salmonella enteritidis, poultry, serovars, strains, samples.

1. Introduction

Sharing in the region of Shtime, Lipjan, Ferizaj and beyond in Kosovo is the line, which is developing quickly, especially in the production of eggs and poultry meat. To this rapid development is the answer of rising number of infections salmonellare, which constitute a problem not only for poultry farming economies, but also to public health. The possibility that the infection caused by Salmonella enteritidis spread and become a national and international problem, is enormous, if the chain of animal-human infection fails to be interrupted. Salmonelar outbreaks of infection are often caused by interruption of the cooling chain of animal products from their manipulation Defective hygiene or storage of eggs, poultry meat and their products in unsuitable environments. Salmonella bacteria gender belong to the family Enterobacteriaceae in which are recognized 2400 serovars. In poultry serovars of Salmonella spp, most expressed are: Salmonella enteritidis, S.typhi, S.gallinarum, S.typhimurium, who are also the most important agents of food salmonelosis transmitted to humans (Popoff et al., 2004). Serotipizm is an important tool to understand the epidemiology of infections caused by Salmonella species gender, which takes place under the White Kaufmanit scheme (based on flagellar H antigen detection, somatic O antigen and the surface, Vi (Cabeli P., 2006).

2. Material and Methods

Samples for isolation and identification of gender Salmonella species were taken from organs, eggs, and poultry faeces from private farms in the region of Shtime, Lipjan and Feriyaj, during January-April 2014. There were championed in total: 63 faeces samples, 189 samples from internal organs (liver, spleen, intestine and cloaca) and 60 egg samples. Isolation and identification method based on ISO 6579: 2002, was conducted at the Laboratory of Food Microbiology at the Food and Veterinary Agency of Kosovo. For diagnosis of gender Salmonella species was used this material: BPE, RVS, BG-agar, Xld-agar, TSI agar, Salmonella LATEX TEST - OXOID England, Berlin Siffin Salmonella antiserum (Anti-Salmonella A-67 omnivalent, Anti -Salmonella I (AE) and Anti-Salmonella D, Anti-Salmonella enteritidis). It took 25 gram faeces for each sample and transferred to 225 ml BPW. 25 gr for each egg (white, vitelusi and shells) were passed in 225 ml BPW parapasurues. 25 gr of organs (liver, spleen, intestines and cloaca) were planted in 225 ml BPW. All cultures were cultivated in thermostat at 37^0C for 18-24 hours. After incubation, 0.1 ml of the cultures were transferred to 10 ml tubes with RVS (selective parapasurues ground) and incubated for 24 hours at 41.5-42 ^{0}C. Further crops were planted on solid grounds selective Xld-agar and BGA-agar, then cultivated in an incubator for 24 hours at 37^0C. Five suspicious colony were replanted in Nutrien-agar and confirmation underwent biochemical tests, using sugars, the TSI - agar 37^0C for 24 hours. Biochemical evidence was followed by serological tests such as Salmonella LATEX

TEST- Oxoid, and use of antisera as anti-Salmonella A-67 omnivalent, Anti-Salmonella I (AE) and Anti-Salmonella D, Anti-Salmonella enteritidis.

3. Results and Discussion

The results obtained from this study, after analyzing all prelevuara samples from organs, eggs and poultry's stools for egg production, according to the method ISO 6579: 2002 are provided in the following tables and graphs. There were isolated 28 strains of Salmonella spp. or 8.97% of the investigated samples of which 13 strains were confirmed to be positive to Salmonella enteritidis, expressed as a percentage 46.42% of the total isolated strains of Salmonella spp. In the Region of Lipjan were isolated 11 strains of Salmonella spp. and of this number have been confirmed 6 Salmonella enteritidis strains or expressed in percentage 54.54%. Even in Shtime region were isolated 9 strains of Salmonella spp. and from the number of strains of Salmonella spp. 4 strains or in percentage 44.44% are Salmonella enteritidis. The smallest number of isolated strains of Salmonella enteritidis is presented in Ferizaj Region, with 3 strains or 37.5% of total strains of Salmonella spp. that is 8 strains.

4. Tables

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

Table 1: Total Salmonella enteritidis strains to strains of Salmonella spp. of the total samples investigated

Region	Total Sample	Salmonella spp.	Salmonella enteritidis
Shtime	104	9	4
Lipjan	104	11	6
Ferizaj	104	8	3
Totali	312	28	13

Table 2: Isolation results of the Salmonella enteritidis

Region	Salmonella spp.	Salmonella enteritidis	TSI	Salmonella Latex Kit	A 67	Gr. A-E	Gr. D	O 1	O 9	O 12	Hg, M	Salmonella enteritidis
Shtime	9	4	+	+	+	+	+	+	+	+	+	+
Lipjan	11	6	+	+	+	+	+	+	+	+	+	+
Ferizaj	8	3	+	+	+	+	+	+	+	+	+	+

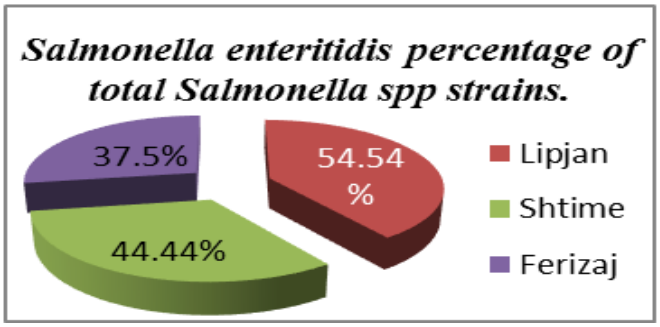
On the table and graph below are given as a percentage of the gender Salmonella species isolated to the total analyzed in the study regions.

Table 3: Salmonella enteritidis percentage of total Salmonella spp strains

Region	Salmonella spp.	Salmonella enteritidis	Percentage %
Shtime	9	4	54.54%
Lipjan	11	6	44.44%
Ferizaj	8	3	37.5%

Photo 1: Salmonella enteritidis. in TSI-agar

5. Graphics



Graphic 1: Salmonella enteritidis percentage of total Salmonella spp strains

Table 4: Percentage of Salmonella enteritidis in faecal samples, eggs and organs

Region	*Salmonella enteritidis strains in regions*	*Feces*		*Egg (white, vitelusi and shells)*		*Organs (liver, spleen, intestine and cloaca)*	
		Strains	%	Strains	%	Strains	%
Shtime	4	3	75%	1	25%	0	0.0%
Lipjan	6	5	83.3%	0	0.0%	1	16.6%
Ferizaj	3	2	66.6%	0	0.0%	1	33.3%
Total	13	10	76.92%	1	7.69%	2	15.38%

The above results show that of the total sample surveyed, 63 samples of faeces, 189 egg samples and 60 samples bodies were isolated 13 strains of Salmonella enteritidis. The highest rate was noticed in faeces, of which were isolated 10 strains *Salmonella enteritidis* or 76.92% of total in general, from the bodies were isolated two strains of *Salmonella enteritidis* or 15:38% of the total and in the egg is isolated only one strain of *Salmonella enteritidis* or 7.69%. These results are progressively in accordance with the research done by García C, Soriano JM, Benítez V, Gregory P.2011 Català-Jul; 90 (7): 1581-5. doi: 10.3382 / ps.2010-01104. PubMed PMID: 21673175 that showed that Salmonella spp. is more present in the faeces (92%), followed by eggs (34%) and bodies (4%). This study will continue beyond with the performance of biochemical tests, which will be followed by serological tests such as Salmonella LATEX TEST- Oxoid, and use of antisera as anti-Salmonella A-67 omnivalent, Anti-Salmonella I (AE) and Anti-Salmonella F-67 for further identification of the gender *Salmonella* species present in samples of eggs, poultry faecal and bodies in the regions of Shtime, Lipjan and Ferizaj.

6. Conclusion

- Of the 312 samples analyzed by method ISO 6759: 2002 in three regions in the study was found a prevalence of Salmonella enteritidis, about 13 strains or 4.16% of total samples analyzed.
- The comparison of the presence of Salmonella enteritidis 28 strains of Salmonella spp. isolated, 13 of them found to be Salmonella enteritidis, which belongs 46.42%.
- In the Lipjan region is the highest prevalence of Salmonella enteritidis where 6 strains were isolated or expressed in percentage 54.54% of the total strains of Salmonella spp, further on in Shtime with 4 strains or 44.44% and Ferizaj with 3 strains or 37.5% to the total in general strains isolated in this region.
- The highest percentage is found in faeces, from which were isolated 10 strains or 76.92%, in bodies are isolated 2 strains or 15:38% and in the egg is isolated 1 strains with 7.69%.
- From the comparison of the presence of Salmonella enteritidis, with the overall number of strains isolated results that from faeces obtained Lipjan region has a higher percentage of 83.3%, further in Shtime with 75% and finally Ferizaj with 66.6 %.
- From the comparison of the presence of Salmonella enteritidis, the total number of strains isolated it appears that in bodies in the region of Ferizaj percentage of salmonelar infection is higher, at 33.3%, followed by 16.6% Lipjan.
- From the comparison of the presence of Salmonella enteritidis, with the total number of strains isolated in eggs it shows that samples taken from Stimlje have the highest percentage of 25% to total isolated strains of Salmonella enteritidis.

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Author Profile

Hyzer Rizani received the M.S. degrees in cell biology, from Faculty of Natural Sciences of Prishtina during 2007-2010. Is professor at Mehmet Akif College.

Pranvera Çabeli is working as Professor Microbiology, Faculty of Veterinary Medicine, Tirana, Albania.