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THE ANTIMICROBIAL RESISTANCE OF THE BACTERIUM SALMONELLA ENTERITIDIS ISOLATED FROM POULTRY FOR THE PRODUCTION OF EGGS IN KOSOVO.

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Abstract. Salmonella Enteritidis represents a group of bacteria known to cause typhoid fever, food poisoning, gastroenteritis, enteric fever, and other diseases in humans. People are mainly infected with contaminated water or foods, especially meat, chicken meat and eggs. Salmonella gender includes over 2300 bacterial serotypes. Salmonella enteritidis and Salmonella typhimurium are responsible for over 50% of all infections caused in people anywhere in the world. The purpose of the study is to determine the sensitivity and resistance to antibiotics of some isolated strains of Salmonella enteritidis in private farms and eggs for egg production in several parts of Kosovo. Isolation and identification is done according to ISO 6579: 2002. The antibiotic test was performed on 13 strains of Salmonella enteritidis with the Kirby-Bauer method. Disk diffusion test method must be in compliance with the standard of CLSI clinical institutes and laboratories. Mueller Hinton agar was used with antibiotic disks of various groups where we obtained these results in sensitivity and resistance: Gentamicin 10mcg-S / 66.2%, I / 12.4% and R / 21.4%, Trimethoprim-sulfamethoxazoleSxt 25 mcg - S / 33.4, I / 48.3% and R / 18.3% Ampicillin Amp 2 mcg S / 15.6%, I / 23.5 and R- 60.9% and Cephalexin CL 30mg-S / 16.4, I / 77 and R / 6.6%.

Keywords: Salmonella, I-intermediate, resistance, strain, sensitivity.

INTRODUCTION

In the research we have done antibiotics-resistance of Salmonella enteritidis in the samples of eggs, stool and bodies in farms and the poultry region of Lipljan, Shtime and Ferizaj-Kosova to create an overview presence of this pathogen in these types of samples and determinationof sensitivity to certain antibiotics. Salmonella enteritidis is a gram-negative bacterium rod shaped known as the cause of the prevalence of diarrheal disease in humans (Çabeli, P. a. (2006). Humans become infected mainly between contaminated water or food, especially meat, poultry and eggs. Moreover, the growth of fast food consumption of animal productsand the international trade between countries have also played an important role in the spread of S. enteritidis (Landeras et al., 1998). S. enteritidis can also be spread in the environment by fecal contamination of human beings and animals (Okafo et al., 2003).

Due to major economic losses, as well as public health problems, detection and eradication of S. enteritidis from chicken farms is of primary importance. The large usage antibiotics can cause

the selection and spread of resistant pathogens as S.enteritidis that are transmitted to humans through different contaminated food (ESRB H, CA (2005). The conventional methods for Salmonella detection are based on cultures by using the enrichment of selective and half selective media and characterization of suspicious colony from biochemical and serological tests of S.enteritidis. Serotyping is an important tool to understand the epidemiology of infections caused by Salmonella genus species, which takes place under the scheme of White Kaufmanit (1920), based on the discovery of flagellar H antigen, somatic O antigen and the surface, Vi (Cabeli P., 2006).

MATERIAL AND METHODS

The study is made on the Laboratory Agency of Food and Veterinary in Kosovo. The study was conducted in the period, from March to October 2014, with the samples of eggs, stool, and organs. A total of 312 samples were investigated, from 13 isolated strains of Salmonella enteritidis. There have been tested 13 Salmonella enteritidis strains in sensitivity and resistance to various groups of antibiotics. Testing is performed by Kirby-Bauer, a disk diffusion method in accordance with the CLSI standards [1].

The used material for testing: the ground Mueller Hinton Agar 2 rehydrated in plates of 90 mm, NaCl 0.9%, antibiotics, Gentamicin 10mcg, Trimethoprim-sulfamethoxazole SXT 25 mcg, 2 mcg Amp Ampicillin, Cephalexin CL and 30mg.

S.enteritidis strains are prepared in advance on the enrichment ground of BPW , then are transferred in plates of MHA-2 where the extension is done uniformly across the surface of the platter. Later are placed the antibiotics drives at a certain distance and the plates are inserted in incubation- 37 0C for 24 hours. After incubation, the results are examined by the measurements using the nonius (calliper) for each disk (antibiotic).

RESULTS AND DISCUSSION

The results obtained in this study, as are shown in the tables below, which are investigated the stool samples, organ samples, samples of eggs and 13 isolated strains of Salmonella enteritidis. All these strains were isolated by the standard method ISO 6579: 2002. These strains of Salmonella enteritidis were tested by antibiogram method. The results obtained for strains in the study were as follows: 66.2% sensitivity gentamicin, the antibiotic sulfamethoxazole 33.4%. Salmonella enteritidis strains showed the highest resistance to Ampicillin 60.9%, while the average sensitivity is shown 77 % antibiotic cephalexin.

Table.1. The expression in percentage of the sensitivity of Salmonella enteritidis resistance to some antibiotics.

Region	**Strains**	Gentamicin 10mcg		Trimethoprim-sulfamethoxazole Sxt 25 mcg		Ampicilin Amp 2 mcg		Cephalexin CL 30 mg	
		Sensitiv	Resistent	Sensitiv	Resistent	Sensitiv	Resistent	Sensitiv	Resistent
Total	13	66.2 %	21.4%	33.4 %	18.3 %	15.6 %	60.9%	16.4 %	6.6%

These strains of Salmonella enteritidis were tested by the antibiogram method. The results obtain

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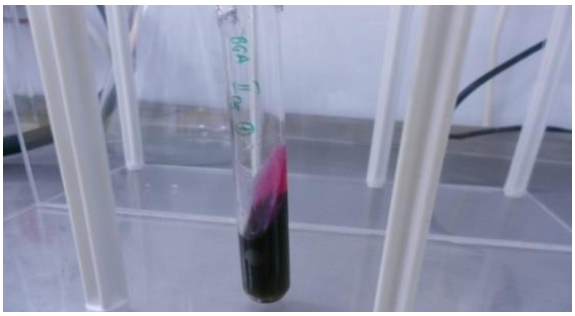

Fig. 1. Salmonella enteritidis, the TSI agar

As seen from the table above, 13 Salmonella strains enteritidis in the study were tested in the Laboratory Agency of Food and Veterinary in Kosovo, the method of Kirby Bauer's showed these results in sensitivity, 66.2% gentamicin 10mcg, and less sensitive to Trimethoprim-sulfamethoxazole 33.4% SXT 25 mcg, resistan is shown to the antibiotic Ampicillin Amp 2 mcg with 60.9% and the average sensitivity antibiotic cephalexin CL 30 mg with 77%. Salmonella enteritidis strains continue to be resistant toantibiotic Ampicillin where from the 32 isolates, 21 are presented for resistance to the antibiotic Ampicillin or expressed in percentage 65.62% in national center for toxicological research in Iraq (Mezal EH, 2013).

CONCLUSIONS

Isolation, identification and determination of sensitivity and resistance of Salmonella enteritidis in three regions determines not only the number of the bacteria and their geographical distribution, epidemiological consequences, economic and health.

• From the total of 312 total samples analyzed, by the method ISO 6759: 2002 in three regions in the study found a prevalence of Salmonella enteritidis, about 13 strains or 4.16% of total samples analyzed
• Comparing the presence of Salmonella enteritidis by the total isolated Salmonella strains spp., appears that Salmonella enteritidis has a prevalence of 46.4%.

• The highest percentage is found in faeces, from which 10 strains were isolated or 76.92%, in organs were isolated two strains or 15:38% and in eggs are isolated 1 strains with 7.69%.The gained results on strains of Salmonella enteritidis with sensitivity testing and antimicrobial resistance are as follows:

• Salmonella enteritidis has shown great sensitivity to the antibiotic Gentamicin 10 mcg in percentage 66.2%, also slightly lower percentage of sensitivity shown in antibiotic Trimethoprim-sulfamethoxazole SXT 25 mcg with antibiotic cephalexin 33.4% and 15.6% CL 30 with.

• Salmonella enteritidis strains are resistant to the antibiotic Ampicillin Amp 2 mcg with percentage of 60.9%.

• While the antibiotic cephalexin CL 30 mg of Salmonella enteritidis strains presented intermediate 77%, also in antibiotic Trimethoprim-sulfamethoxazole SXT 25 mcg presented a percentage of 48.3%.

The first results show that the use of antibiotics in poultry industry in Kosovo becomes uncontrolled. This underlines the need to use antibiotics carefully in veterinary practice to avoid growing antibiotics problems and resistance in human medicine, as well.

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