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THE SAFETY OF FOOD PRODUCT FROM WILD ANIMALS HUNTER RESERVES

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Abstract

The study was conducted in a hunting reserve in northeastern areas, Albania, in animals and wild birds such as stock dove, partridges, turtledoves and boars. The Institute of Food Safety and Veterinary (IFSV) Tirana, Albania, conducted the test in 158 samples taken from animals and birds. In order to achieve the analytical procedure of isolation and identification of Salmonellas the Standard method (ISO) was used, whereas for the serological identification, antiserum salmonele were used according to the White-Kayffmann scheme. The latest was mainly used to determine the exact species that used salmonelare antisera, Kauffmann-White scheme. After checking, the total positive samples resulted 49.31%, from which the E. coli 20, or 12.6% and salmonella 29, or 18.4%. Positive samples from poultry meat resulted in E. coli 13.3% and salmonella 10%, positive samples of pork resulted in E. coli 5% and salmonella 25%. Positive samples of eggs: E. coli 11.1%, salmonella 22.1%. The results also show that the samples with higher positivity result were turtle eggs, and less positive were doves and quails. Tests were also conducted from stool samples the results show as follows: Birds E. coli 8% and salmonella 16%, whereas pork with E. coli 10% and salmonella 30%. From the examined samples 5 strains of Salmonella spp were isolated and identified, the larges affected was that in birds i.e stock dove, partridges, turtledoves. Due to this 4 types of Salmonela were isoleted and detected: Salmonella agony, Salmonella entertidis, Salmonella infantis, from birds and also one from boar Salmonella typhimurium.

Key words*: food safety, wildlife, production, Salmonellas, Escherichia coli.*

INTRODUCTION

Salmonellas and *Escherichia coli* are organisms that colonize the gastrointestinal tract of a wide range of animals, including wild animals and household animals (Sofos et al., 2008). They are part of the normal intestinal flora and are quite isolated in birds, including pass.,erinet, stock dove, pheasants, partridges and water birds, ausing them to occasionally even sporadic damage, and can also cause serious injuries to birds. *Salmonellas* are part of the *Enterobacteriaceae* family which are rod-shaped microorganisms and vary in size from 0.7 to 1.5x2.0 - 5.0 μ, gram negative, oxidase negative, catalase positive. They ferment glucose, produce H_2S, and are able to transform amino acids lysine and ornitin (FAO and WHO, 2002). Over many decades *Salmonella spp* has been a major cause of food intoxications in humans, but in the last 10-year *Salmonella enteriditis* has the highest incidence in poultry products (Chapman et al., 2001) and *E. coli* has played the same role in food pathologies. Food contamination by *Salmonellas* and *E. coli* is general created in many ways, which are associated with many factors and their epidemiology is complicated. The daily movement and the constant contact with animals, people, food and the environment remain permanently a source of contamination. As pathogens in animals and in humans these microorganisms cause diseases, which in many cases, especially in young people, is followed by the loss of human life or animal. Today there are more than 2,500 *Salmonellas* serovars circulating in the nature, where most are serogrupet hasurit *Salmonella enteritidis, typhimurium* and she Heidelberg (Bell et al., 2000), where all groups of isolated strains are pathogenic to humans. Controling the animals, be these domestic or wild, people and food, remains a priority for the prevention of food

intoxications, to prevent endangering the publics health. Risk assessment of salmonellas and *E. coli* remains one of the main tasks of protecting public health. Many authors stress that poultry is the main source and route of transmitting salmonellas whilst other cases are encountered by other foods, the main food are those with animal origin. Since the 1970 is proved that serovari *S. enteritidis*, colonizes bird ovaries which gets transmitted to humans through their shells and eggs, although at a lower effect than when these pathogens are present in poultry carcasses (Cox et al., 2002). Even foods like meat are the source of many species salmonelars intoxications. *Salmonellas* and the pathogenicity of *E. coli* is dependent on the cell number and virulence of the strains circulating in nature. The incidence of food *Salmonellas* differentiates and depends on the food type. Poultry and its by-products have higher incidence of which in some cases amounts to 60% of samples contained. The content of *Salmonellas* and *E. coli* found in meat also depends on the way the animal is slaughtered, preserved, storaged, and transported if the meat is intended for human consumption. A small number of salmonella cells can cause infections in food, and the infectious dose suggested by some authors is considered to be between 15-20 cells (Wooldbridge M., 2005). The Isolation and identification of their biochemical nowdays is accomplished by performing a series of biochemical tests made possible by using the API 20E system. To increase the accuracy of serological identification the molecular biology methods are used (PCR, PFGE, etc.). Serological identification performed based on somatic O antigen which is the presence in the cell membrane and also in flagellar H antigens of two stages H_1 and H_2. We have to bear in mind that for some strains that form the antigen capsules V. Modern methods can be used for serological identification, characterization of strains by the fagëve or those DNA fragmentation help to find the genetic relatedness of different strains circulating in nature *Salmonellas* and to clarify the epidemiology of food toxins, infections caused by them.

MATERIALS AND METHODS

Food samples were used for the study and the conclusion of this material, meat and eggs obtained from stock doves, turtledoves, partridges and boars. Also in association with seasonal hunters feaces were use from damaged animals and birds. Samples were sent to the laboratory with the accompanying documentation, which were stored at 0-8 °C for a time no longer than 6 hours from the time the sample was taken. Tests were conducted at the Institute of Food Safety and Veterinary (IFSV) Tirana as the average sample units were used not less than 5 units sampled. The standard methodology (ISO) was used, and a sample of 25 g taken as an average of analytical procedures performed isolation and identification of *Salmonellas* (Millán J., 2009). Isolation and identification of *Salmonella* spp was conducted using the ISO standard methodology. Pepto water was used to dilute 25 g food sample with 225 ml (peptone water). The pre cleaning phase was conducted by incubating the above mixture at 37^{o}C for 24 hours. After the incubation period the subculture method hapened by taking 2 times of 5ml mixure, which was passed respectively in 50 ml Selenite and Rappaport Vassiliadis Cistine brotha in temperatures 37 ^{o}C (SCB) and 42 ^{o}C (RV). The Incubation lasted 24 hours, which coincides with the phase enrichment culture prepared. By SC cultures and RV Bujon moved with microbial material with Anze respectively shtrimje every two terrain tiles selective Hektoen agar, XLD agar and BPLS agar. Tablets were planted treated in the 37 ^{o}C for 24-48 hours. Suspekt colonies determined by the type of terrain used in terrain was passed in which the thieves were tested H_2S production and fermentation with acid reaction (Bolton et al., 1996). Suspekt colonies were tested with polyvalent anti-sera salmonelar performing agglutination reaction on glass (Allen et al., 1998). In positive cases conducted biochemical were identified using API 20E biochemical system. To determine the Serological identification in the exact species the SLI Kauffmann-White scheme was used. The determination of *Coliforms* and *E. coli* was performed by standard methodology of counting the colonies formed by microbial cells

in the samples raised in a dish with agar solid ground.
This increase may be due to the different requirements of certain microorganisms, thus resulting that the the number is not deffinite, whereas the interpretation of the results was conducted using a special formula.

RESULTS AND DISCUSSIONS

From the analytical control of the samples taken from 158 positive samples the following results (Tables 1 and 2) were recorded from a total of 49.31%, *E. coli* 12.6% and *Salmonella* 18.4%, samples of meat pigeon, quail and turtledove: *E. coli* 13.3% and *Salmonella* 10%, of pork samples: *E. coli* 5% and *Salmonella* 25%, samples of bird eggs: *E. coli* 11.1%, and *Salmonella* 22.1%, faeces samples from birds: *E. coli* 8% and *Salmonella* 16%, samples of pig faeces: *E. coli* 10% and *Salmonella* 30%. In the examined samples were isolated and identified five strains of *Salmonella* spp samples with different kind of meat and its derivatives. With greater incidence was confirmed in the flesh of a dove, doves and patridges at 42.8%, which were isolated from four strains such as *Salmonella agony, Salmonella entertidis, Salmonella infantis*, and the pork just a strain, *Salmonella typhimurium*. The izolated strains used during the analitic control with VRI were identified in SLI with antisera salmonelar Kauffman White scheme. Many literatures mention that *Salmonella entertidis*, often found in meat and poultry (Centers for Disease Control and Prevention, 2001) and *Salmonella typhimurium* is more isolated in the flesh of swine carcasses (Casoli et al., 2005). Facts that are known in processes such as water rinsing, cooling and implementation of good conditions of hygiene can significantly decrease the incidence of poultry meat *Salmonellas* in 2.5-4% of the carcasses and other animal less than 1% (Duffy et al., 2001).
On the other hand to increase the probability of detection in foods *Salmonellas* samples required to be taken as representative. If a sample will be the deputy of a large number of carcasses, the probability of detection is greater *Salmonellas*. The life spam of *Salmonella* in food depends in many factors these affect cell damage and replication of the pathogen. Factors such as temperature, sunshine, humidity, water free active in the food product, thermal treatment, washing, treatment with different radiation etc., reduce the minimum number of cells per unit weight or volume. Identification of fecal *Coliforms* and *E. coli*, among other factors have also been correlated to the lack of sanitary conditions during handling hygjieno meat. *Salmonella* and *E. coli*, have been associated and is evident in about 50% of cases, therefore increasing the probabilty of complications in animals (Lutful Kabir S.M., 2010). High values shown in warm weather, are a function of the existence of several factors favorable climatic, environmental, and increased activity of creatures such as turtles and other reptiles, which have served as vectors for transmitting infection. Also the high increase of these values are due to seasonal factors such as increased humidity, and stay in the group of animals, mainly of young in the nest.
In the nest were found 26 birds and 5 heads of dead piglets with the following symtoms: a change in colour of the liver, kidneys spleen, pancreas hypertrophic, necrotic foci due to the effect of the septicemia (Hanninen et al., 2000). Some of the factors related to the sustainability of these agents are: their rural and urban life, the migrating birds are not effected by these factors, reproduction and growth of offspring in stable habitats. Some birds like dove, partridge, turtle, and several other wild animals have the instinct of preserving not only theei territory, but also nests for a relatively long time. But the location of these agents in the intestinal tract and elimination of faeces, enabling their continuous activation: nest-egg-bird-bird-egg (Brooks et al., 2001). The development cycle is enabled through circulation sustainability in these pathogens in animals and their products and by several citations in the literature, can reach up to 90% of cases.

CONCLUSIONS

Salmonella and *E. coli* remains a major problem in food products originating from wild animals. Despite control and measures taken to reduce their presence in these foods, there are enough customers whom prefer these foods, there are enough customers whom prefer these

Table 1. The positivity according to the species

Samples taken		Spring			Summer			Autumn			Winter			Annual		
		No. Samples	***E. coli***	***Salmonella***	**No. Samples**	***E. coli***	***Salmonella***	**No. Samples**	***E. coli***	***Salmonella***	**No. Samples**	***E. coli***	***Salmonella***	**No. Samples**	***E. coli***	***Salmonella***
Stock dove	Poultry heads	5	-	1	5	1	-	10	1	1	10	2	1	30	4	3
	Birds-3M damaged	2	-	-	5	1	1	5	1	-	3	1	-	15	3	1
	Egg	4	1	1	-	-	-	3	-	1	3	-	-	10	1	2
	Faeces	5	-	1	5	-	1	5	-	-	5	1	-	20	1	2
	Positive samples	**16**	**1**	**3**	**15**	**2**	**2**	**23**	**2**	**2**	**21**	**4**	**1**	**75**	**9**	**8**
Partridge	Poultry heads	5	1	-	7	1	1	6	1	1	6	1	-	24	4	2
	Birds-3M damaged	-	-	-	5	1	1	-	-	-	3	-	1	8	1	2
	Egg	5	-	1	-	-	-	-	-	-	-	-	-	5	-	1
	Faeces	5	-	1	-	-	-	5	1	1	-	-	-	10	1	2
	Positive samples	**15**	**1**	**2**	**12**	**2**	**2**	**11**	**2**	**2**	**9**	**1**	**1**	**47**	**6**	**7**
Turtledoves	Poultry heads	6	-	1	-	-	-	4	1	-	-	-	-	10	1	1
	Birds-3M damaged	-	-	-	3	-	1	-	-	-	-	-	-	3	-	1
	Egg	3	1	1	-	-	-	-	-	-	-	-	-	3	1	1
	Faeces	-	-	-	5	-	1	-	-	-	5	1	-	10	1	1
	Positive samples	**9**	**1**	**2**	**8**	**-**	**2**	**4**	**1**	**-**	**5**	**1**	**-**	**26**	**3**	**4**
Boar	Fledgling-8m. Damaged	-	-	-	2	-	1	2	-	1	1	-	-	5	-	2
	Pork meat	5	1	1	7	-	2	8	-	2	-	-	-	20	1	5
	Faeces	4	1	1	3	-	1	3	-	1	-	-	-	10	1	3
	Positive samples	**9**	**2**	**2**	**12**	**-**	**4**	**13**	**-**	**4**	**1**	**-**	**-**	**35**	**2**	**10**

Table 2. Data of the epidemiologic situation of the *E. coli* and *Salmonellas*

Samples according to the animal and bird		Spring		Summer		Autumn		Winter		Annual	
		E. coli	***Salmonella***	***E. coli***	***Salmonella***	***E. coli***	***Salmonella***	***E. coli***	***Salmonella***	***E. coli***	***Salmonella***
Stock Dove	Poultry heads	**-**	20	20	-	10	10	20	10	13.3	10
	Birds-3M damaged	**-**	-	20	20	20	-	33	-	20	6,6
	Egg	25	25	-	-	-	33	-	-	10	20
	Faeces	**-**	20	-	20	-	-	20	-	5	10
	Positive samples	**6.25**	**18.7**	**13.3**	**13.3**	**8.69**	**8.69**	**19.1**	**4.76**	**12**	**10.6**
Partridge	Poultry heads	20	-	14.2	14.2	16.6	16.6	16.6	-	16.6	2
	Birds-3M damaged	-	-	20	20	-	-	-	33.3	12.5	25
	Egg	-	20	-	-	-	-	-	-	-	20
	Faeces	-	20	-	-	20	20	-	-	10	20
	Positive samples	**6.66**	**13.3**	**16.6**	**16.6**	**182**	**18.2**	**11.1**	**11.1**	**12.7**	**14.8**
Turtle Doves	Poultry heads	-	15.1	-	-	25	-	-	-	10	10
	Birds-3M damaged	-	-	-	33.3	-	-	-	-	-	33.3
	Egg	33.3	33.3	-	-	-	-	-	-	33.3	33.3
	Faeces	-	-	-	20	-	-	20	-	10	10
	Positive samples	**11.1**	**22.2**	**-**	**25**	**25**	**-**	**20**	**-**	**11.5**	**15.3**
Boar	Fledgling-3m.damaged	-	-	-	50	-	50	-	-	-	40
	Pork meat	20	20	-	28.4	5.5	25	-	-	5	25
	Faeces	25	25	-	33.3		33.3	10.5	8.2	10	30
	Positive samples	**22.2**	**22.2**	**-**	**33.3**	**5.5**	**30.7**	**10.5**	**8.2**	**6.71**	**9.57**

foods, which are often a source toxi-infection for them. From the isolated examined samples *Salmonella* spp *was identified* and all 5 of the large incidence were confirmed in poultry such as: pigeons, partridges, doves. These were isolated from four strains as *Salmonella agony, Salmonella entertidis*, *Salmonella infantis*, and boars had just a strain *Salmonella typhimurium*. Despite the incidence of these pathogens, prevention can be achieved by carrying out regular testing of animal products and to keep up with the implementation of hygiene when handling food products made from them

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