

# E.coli. in Chicken Meat in Slaughterhouses and at Retail Shops in Tirana

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**Abstract—** The successful identification of risks at their early inception (emerging risks) is at the heart of public health and environmental protection. Escherichia Coli is one of the major contaminants of foods and also one of the major representatives of foodborne pathogens. The primary habitat of Escherichia coli is the vertebrate gut, where it is the predominant aerobic organism, living in symbiosis with its host. VTEC (verocytotoxin-producing Escherichia coli) is one of the major foodborne pathogens. According to EFSA report 2015 (published on 28 January), there has been 6043 confirmed cases from verocytotoxigenic Escherichia coli in 2014 from which 922 cases of human infection resulted in hospitalization and 13 cases were fatal. Human infection cases from broiler meat were 502,634 in the same EFSA report 2015, thus indicating broiler meat as an important source of foodborne diseases. To the knowledge of the authors there has not been yet an investigation on the incidence of VTEC E.coli in the broiler carcasses in Albania. 56 samples of broiler carcasses have been investigated from 2 important slaughterhouses and retail shops from Tirana in order to assess the contamination with E.coli O157 with Food system (Validated ISO 16140). The presence of *E. coli* and *E. coli* O157 is shown by the red to blue color change of the well 7-ESC and by the formation of a pink-red coloring following the addition of Kovac's reagent into the well 8-IND. During Mars 2015– september 2015 were collected 56 samples were tested for E.Coli O157 samplesend they are tested 16 samples resulted positive for E.coli O157 (28.57%). More specifically there were 14.28% (2/14) positive samples collected at the slaughterhouse of operator A and 50% (7/14) of samples from the same operator collected at the retail shops in Tirana. The samples collected at the slaughterhouse of operator B resulted 21.42% (3/14) positive for E.coli O157 and samples collected from the same operator at the retail shops resulted 28.57% (4/14) positive for E.coli O157.

**Keywords—** poultry; carcasses broiler; pathogen; E.coli157; microorganisms; food-borne

## I. INTRODUCTION

### POULTRY MEAT

Poultry meat is one of the main sources of protein in the human diet. The consumption of poultry meat is increasing because of its cost, nutritional characteristics, and the lack of religious taboo. In Albania broiler production is increasing every year. According to the Albanian authorities poultry meat consumption is increasing from 4000 tons in 2001 to 17100 ton in year 2012 (Instate 2013). Production of safe poultry meat requires systematic and continuous control of the carcasses during all the production steps including slaughterhouses and retail shops. Microbiological risk from poultry meat is due to contamination during rearing, slaughtering process, and the marketing conditions at the retail shops. Contamination with specific pathogens is common and one of the main concerns of the public Health authorities worldwide (Mead at al, 1994). The importance of this study is linked to the role of poultry meat as one of the main sources of food borne diseases (Fitzgerald at al, 2000). This study aims to evaluate the microbiological characteristics of poultry carcasses at the end of the slaughtering process (after chilling) in two slaughterhouses and also to evaluate the microbiological quality of poultry carcasses from the same slaughter plants at the retail shops in Tirana market. The evaluation of the microbiologic quality of carcasses at the slaughterhouses and at the retail shops will shed a light at the factors influencing the microbiological loads of the carcasses before consumption. The duration of this study is one year, permitting also to evaluate the differences of the microbiological loads of the carcasses during the different seasons of the year.

## II. DESCRIPTION OF THE ORGANISM

*E. coli* O157:H7 can naturally be found in the intestinal contents of some cattle goats, and even sheep. Cattle lack the Shiga toxin receptor, globotriaosylceramide, and therefore can be asymptomatic carriers of the bacterium. The prevalence of *E. coli* O157:H7 in North American fedlot cattle herds ranges from 0 to 60%. Some cattle may also be so-called 'super-shedders' of the bacterium. Super-shedders may be defined as cattle exhibiting rectoanal junction colonization and excreting  $>10^3$  to  $4^4$  CFU  $g^{-1}$  feces. Super-shedders have been found to constitute a small proportion of the cattle in a

feedlot (<10%) but they may account for >90% of all *E. coli* O157:H7 excreted. *Escherichia coli* O157:H7 is able to induce AE lesions in the alimentary tract of humans and animals, and isolates are typically positive for one or more of the Stx subtypes, and therefore are classified as EHEC. AEEC that do not elaborate Stx but that are associated with diarrhoeal disease are generally referred to as enteropathogenic *E. coli* (EPEC).

### III. MATERIALS AND METHODS

Samples were collected during March 2015-September 2016. A total of 56 broiler carcasses, n=56 were randomly collected in Tirana. From those, 28 samples were collected from different shops (market and supermarkets where the slaughterhouses distribute in Tirana), the other 28 samples were collected from industrialized slaughterhouses at 2 week intervals. All samples were sent to the laboratory in sterile bags at 4°C within 2 hours. A portion 25g of each sample were homogenized with 225 ml of buffered peptone water. The final dilution of the sample was 1:10. 10 ml of the homogenized sample were transferred into a suitable tube and incubated (dil. 1:10) at 36±1°C for 4-6 hours. 0.5 ml was transferred into a vial of physiological solution provided with the kit. Into each well of the system was distributed 0.2 ml and incubated at 36±1°C for 18-24 hours.

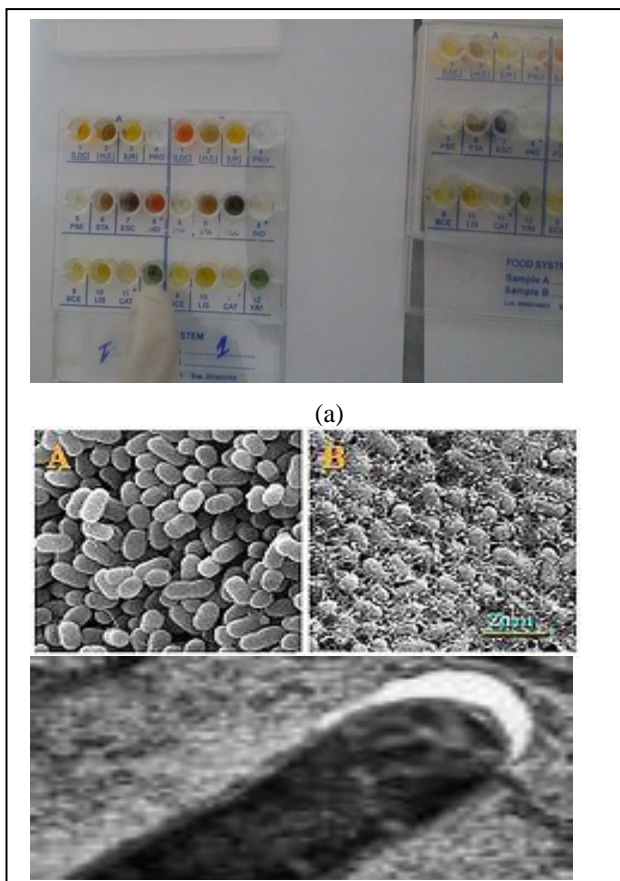


Fig. 1. (a) food system during the test, (b) *e.coli* o157

TABLE 1. THE MONTHLY AND SEASONAL DISTRIBUTION OF *STAPH. AUREUS*

E.coli o157						
	Positive sample/ Analysed sample					
	Slaughterhouses		Market		Total	
	OBU					
	B	A	B	A	B	A
03/2015	0/2	0/2	1/2	1/2	1/4	1/4
04/2015	0/2	0/2	0/2	2/2	0/4	2/4
05/2015	1/2	0/2	1/2	1/2	2/4	1/4
06/2015	0/2	0/2	2/2	2/2	2/4	2/4
07/2015	2/2	2/2	0/2	1/2	2/4	3/4
08/2015	0/2	0/2	0/2	0/2	0/4	0/4
09/2015	0/2	0/2	0/2	0/2	0/4	0/4
Total	3/14	2/14	4/14	7/14	7/28	9/28

### IV. CONCLUSION

Direct Identification of *E. coli* O157 during Mars-September. From analyzes performed in 56 samples collected in slaughterhouses and at the retail shops in Tirana, 16 of them resulted contaminated with *E. coli* O157 (Figure 1). During the study the incidence of *E. coli* O157 expressed in both operators as we slaughter and the market.

We found the operator A is 32.14%.(9/28) the operator B is 25% (7/28) incidence of *E. coli* O 157 H. In the slaughterhouse of Operator A resulted positive for *E. coli* O:157. 14.28 % (2\14) of the samples from the same operator collected at the retail shops resulted positive for *E. coli* O:157 50% . The samples collected at the slaughterhouse by the operator B resulted positive for *E. coli* O:157.21.42% of the samples from the Operator B collected at the retail shops resulted positive for *E. coli* O:157 in 28.57% (3/14). The presence of *E. coli* O157 is a risk to the public health, although it is important to assess the isolated strains for the genes responsible for producing toxins as not all *E. coli* O:157-H7 strains have this capability. It is to be noted that the contamination of meat with this pathogen might happen in the slaughterhouse and during storage and handling at the retail shops.

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