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Short communication

Post-harvest *Salmonella* spp. prevalence in turkey carcasses in processing plant in the northeast part of Poland

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Abstract

Turkeys carcasses at selected point after slaughter on dressing line in poultry were sampled and analyzed for *Salmonella*. These slaughter turkeys came from the northeast part of Poland. The examinations were carried out in each month of 2009. Three hundred turkeys were selected at random from a commercial slaughter line, immediately after completing the cooling process. The percentage of these 300 turkeys from which *Salmonella* spp. were isolated was relatively high (8.3%; *Salmonella* positive results were observed in 25 cases). The lowest *Salmonella* spp. rate (1.3 %) for slaughter birds was found in the fourth quarter, and the highest contamination rate at 18.6% was found, in the third quarter. The serological types of *Salmonella* spp. isolated from the whole turkey carcasses were *S. Saintpaul*, *S. Senftenberg*, *S. Anatum*, *S. Heidelberg*, *S. Hadar*, *S. Typhimurium* and *S. Infantis*.

Key words: *Salmonella* spp., turkey, slaughtering

Introduction

Salmonella are one of the more important food-borne pathogens in many countries (EFSA-European Food Safety Authority, 2010). In the European Union, comprehensive programs have been developed for administrative control of salmonellosis in layers, broilers, turkeys and pigs. Veterinary services of the EU have issued appropriate regulations ordering the Member States the control of infections with *Salmonella* transmitted through food. The European Commission, in an attempt to reduce the incidence of human salmonellosis in the European Union, set targets to reduce *Salmonella* prevalence in food of animal

origin, including turkey flock (EC, 2003). Therefore, this study was undertaken to determine the degree of *Salmonella* spp. spread in slaughter turkeys at selected point after slaughter on the dressing line in poultry plants.

Materials and Methods

Samples of slaughter turkeys in this investigation came from the northeast part of Poland. They were delivered for slaughter on the day they were taken from the farm. The examinations were carried out in each month of 2009. Three hundred turkeys were

Table 1. Presence of *Salmonella* spp. in slaughter turkeys from the slaughter line after cooling at poultry processing plant.

Quarter of 2009	Month	Samples			% of positive samples in individual year quarters	Isolated serotype of <i>Salmonella</i>
		tested	positive			
			number	%		
I	January	25	1	4	2.6	<i>Salmonella</i> Anatum 1
	February	25	0	0		
	March	25	1	4		<i>Salmonella</i> Heidelberg 1
II	April	25	0	0	10.6	<i>Salmonella</i> Saintpaul 7 <i>Salmonella</i> Senftenberg 1
	May	25	0	0		
	June	25	8	32		
III	July	25	6	24	18.6	<i>Salmonella</i> Infantis 6
	August	25	7	28		<i>Salmonella</i> Saintpaul 7
	September	25	1	4		<i>Salmonella</i> Hadar 1
IV	October	25	1	4	1.3	<i>Salmonella</i> Typhimurium 1
	November	25	0	0		
	December	25	0	0		
Total	12	300	25	100	8.3	

selected at random from a commercial slaughter line, immediately after completing the cooling process. All the birds were determined to be healthy by a veterinary inspection. From each carcass, a ca. 25-gram fragment of the skin from the neck was collected. Each time, 5 samples were taken for analyses (ISO, 2003). Presumptive positive isolates were confirmed serologically with polyvalent A-I and Vi somatic O antisera, specific somatic group (O) antisera, and polyvalent a-z flagellar (H) antisera (Immunomed, Gdańsk, Poland). Specific serovar identification was carried out on the basis of the White-Kauffmann serological scheme and was represented according to the criteria of Poipoff and LeMinor.

Results and Discussion

The results of tests for the presence of *Salmonella* spp. in turkeys after slaughter on the dressing lines of poultry plants are presented in Table 1. In 2009, 300 whole turkey carcasses were examined. The percentage of these 300 turkeys from which *Salmonella* spp. were isolated was relatively high (8.3%; *Salmonella* positive results were observed in 25 cases). After cooling, 8.3 % of turkey carcasses were contaminated with *Salmonella* and could be the cause of the incidence of food-borne diseases. The lowest *Salmonella* spp. rate (1.3 %) for slaughter birds was found in the fourth quarter, and the highest contamination rate at 18.6%, was found, in the third quarter. Other authors also have drawn attention to the fact that the highest recovery effectiveness takes place during the third quarter (Van der Fels-Klerx et al. 2008). The serological types

of *Salmonella* spp. isolated from the whole turkey carcasses were: *S. Saintpaul*, *S. Senftenberg*, *S. Anatum*, *S. Heidelberg*, *S. Hadar*, *S. Typhimurium* and *S. Infantis*.

Studies conducted in numerous countries during the last few years indicate that slaughter turkeys are frequently asymptomatic carriers of those bacteria (Mikołajczyk and Radkowski 2002, EFSA 2008). In Poland, various authors conducted studies on *Salmonella* carrier state in case of turkeys (Final report 2010). *Salmonella* contamination of turkey flocks has ranged from 33% in the United States (Rostagano et al. 2006), to 54% in Canada (Arsenault et al. 2007). The reported in EU *Salmonella* prevalence of 30.7% means that almost one in three fattening flocks in the EU harbours *Salmonella* within three weeks prior to slaughter. The samples were collected only once from one flock. The observed flock-prevalence of *Salmonella* spp. varied widely between the Member States (from 0% to 78.7%) (EFSA 2008). The scale of the poultry production and the level of infection with *Salmonella* detected in the flocks represent a real hazard for the public health. This is confirmed by the analysis of frequency of *Salmonella* serotypes presence in slaughter turkeys. In the district of Warmia and Mazury in Poland and in the other EU countries, the *Salmonella* serotypes are of the largest epidemiological importance.

Investigations have recently been conducted in Poland on the contamination of turkey meat with *Salmonella* (Mikołajczyk and Radkowski 2002). They have revealed the presence of *Salmonella* from the skin surface and body cavity of the whole bird after cooling in the continuous cooling plant at the end of production day in 4%. The present results slightly differ

from the above-cited findings. In the year 2009, the percentage prevalence of *Salmonella* after the cooling process reached 8.3%, and hence was insignificantly higher (Table 1). The findings presented above are consistent with the results of epidemiological investigations carried out in Poland regarding food poisoning. Poultry meat and other poultry products are one of the main vehicles of *Salmonella* spp. infection. Despite numerous attempts undertaken to avoid secondary contamination with *Salmonella* spp. during the slaughter and processing stages, the process of searching for effective methods of eliminating these bacteria continues worldwide. Slaughter turkey carcasses are contaminated with *Salmonella* spp. after the cooling process on the dressing line at an average rate of 8.3%.

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