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Survey of Poultry Carcass Condemnations in Abattoirs of West Azerbaijan Province (North West of Iran)

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ABSTRACT. Post mortem inspection records of poultry carcasses at 11 abattoirs in West Azerbaijan province, from March 20, 2008 to March 20, 2015 were used to investigate the prevalence of poultry condemnation. The daily condemnation records were used as the sources of data. In this study 171,297,886 poultry were slaughtered and 1,580,570 (0.92 %) poultry carcasses were condemned. Septicemia (25.7%) and Cachexia (34.6%) were the most common reasons for the condemnation and included 60.3% of the total condemnation. The financial loss as a result of the condemnation of poultry carcasses was estimated as high as 3,731,905 USD within the present study. If the local producers get acquainted with these facts and via extension educational programs the carcass condemnation and economical losses in industrial slaughterhouses could be reduced.

Keywords: Abattoir, Condemnation, Poultry.

INTRODUCTION

Poultry production has grown dramatically in last decades. Poultry meat is one of the most important sources of protein in many countries including Iran (Ansari-Lari and Rezagholi, 2007). Many diseases and many pathological changes can affect the carcass physical appearance and cause economic losses due to the condemnation of carcasses or viscera following veterinary inspection at the time of slaughter. Also some zoonotic diseases threaten the public health (Gracey et al., 1999). Besides, many studies have shown that transport and slaughter conditions can lead to substantial economic losses and affect the sanitary quality of the products.

Abattoirs play a significant role in poultry disease monitoring, because many diseases are detected at slaughter line (Herenda and Jakel, 1994). Hygienic carcass inspection in abattoirs can be used as a pointer of meat quality and for monitoring production management and slaughtering process. The hygienic inspection in abattoirs can help to reduce mortality rate and rejections in slaughterhouses because it identifies the existing problems in poultry farms (Mukaratirwa et al., 2009).

The aim of the present study was to determine the various causes of broiler carcass condemnation and their economic losses during a 7-year period in West Azerbaijan Province (North West of Iran). The result

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of this study may help reduce carcass condemnation and economical losses in industrial slaughterhouses.

MATERIALS AND METHODS

Post-mortem inspection records of poultry carcass condemnations in 11 industrial poultry abattoirs in West Azerbaijan province, northwest of Iran, from March 20, 2008 to March 20, 2015 were gained through the veterinary services of the province. The data, containing the total number of chickens slaughtered, the total condemnation rate and the number of those condemned for particular conditions were used as a source of the study.

Trained poultry meat inspectors make decisions on carcass condemnation on the basis of the visual inspection of pathologic changes. Particular disease conditions include bronchitis/CRD, cachexia, Marek's disease, poisoning, septicemia, ascites, synovitis/arthritis, tuberculosis, contamination and overscalding.

The economic losses due to poultry carcass condemnation were calculated for each year through the following formula: $DFL = C \times P \times W$.

Where: DFL is- Direct Financial Losses; C is- Number of Condemned poultry carcass; P is- Average poultry carcass Price (USD/Kg); W is- Average poultry Weight (Kg). The average condemned poultry weights were calculated as 1.7 kg in the region. The average poultry price (P) of carcass for each year was gained surveying local markets in West Azerbaijan Province from 2008 to 2015. The seasonal difference of carcass condemnation was analyzed statistically by Chi square method (P-value less than 0.01 was considered statistically significant).

RESULTS

In the study period, a total number of 171,297,886 birds were slaughtered in West Azerbaijan Province

abattoirs from 20th March 2008 to 20th March 2015 and the total rate of carcass condemnation was 0.92% (1,580,570). The most common reasons for carcass condemnation were septicemia (34.6%), cachexia (25.7%), and ascites (14.7%), respectively. The other causes of condemnation and the percentage per total condemnation rate were: bruises 10.3%, poisoning 4.7%, bronchitis/CRD 3.6%, contamination 2.4%, synovitis/arthritis 2.2%, miscellaneous causes 1%, Marek's and lymphoid leukosis disease 0.8% and tuberculosis almost 0 %, respectively (Table 1).

In Table 2 the estimated averages of direct financial losses (annual and total) are shown. The total direct financial loss during the survey period was 3,731,905 USD, which is almost equal to 104,493,340,000 Rials.

Variations in the number of chickens slaughtered the rate of carcass condemnation and direct financial losses for each year, during the period of study are shown in Figure 1. A significant seasonal pattern was observed and the highest rates were occurred during the colder months.

DISCUSSION

Every year extensive research on the causes of poultry carcasses condemnation is performed all over the world that plays an important role in the prevention of diseases and the reduction of financial losses (Ansong-Danquah, 1987; Santana et al., 2008; Dzoma et al., 2009; Ferreira et al., 2012). The results of postmortem inspections of carcasses and internal organs showed that the total number of condemnation and the causes of condemnation are varied in different countries, which seems reasonable as a result of different ecologic conditions, epidemiologic aspects, management practice and health status in each country (Ansari-Lari and Rezagholi, 2007).

In the present survey, the average condemnation rate was 0.92% of the slaughtered poultry, the most common reason was septicemia (34.6%) and the

Table 1. Causes of poultry carcass condemnation in abattoirs of West Azerbaijan province, Iran, during 2008-2015.

Cause of condemnation	Poultry condemned of total slaughtered No.	%	Relative % of condemnations
Cachexia	406,417	0.238	25.7%
Septicemia	546,717	0.320	34.6%
Poisoning	73,894	0.043	4.7%
Bronchitis/CRD	56,799	0.033	3.6%
Ascites	232,297	0.136	14.7 %
Marek's and lymphoid leukosis disease	13,528	0.007	0.8%
Synovitis/arthritis	34,105	0.019	2.2%
Tuberculosis	53	0.000	0.0%
Contamination	39,067	0.023	2.4%
Bruises	161,785	0.094	10.3%
Miscellaneous	15,908	0.009	1.0%
Total condemnations	1,580,570	0.922	100%
Total slaughtered	171,297,886		

Table 2. Direct economic losses due to carcass condemnation in abattoirs of West Azerbaijan Province, Iran, during 2008-2015.

<i>Year</i>	March 2008 to March 2009	March 2009 to March 2010	March 2010 to March 2011	March 2011 to March 2012	March 2012 to March 2013	March 2013 to March 2014	March 2014 to March 2015	Total
Slaughtered poultry	14,945,648	17,348,090	23,743,537	23,729,776	25,453,556	34,685,507	31,391,772	171,297,886
Condemned carcasses	235,472	180,941	220,056	228,517	208,429	263,344	243,811	1,580,570
(%)	(1.57%)	(1.04 %)	(0.92%)	(0.96%)	(0.81%)	(0.75%)	(0.77 %)	(0.92 %)
Direct financial losses (USD)	321,671	254,868	383,447	434,263	607,421	775,454	954,781	3,731,905

second common reason was cachexia (25.7%). A survey of poultry carcass condemnation was carried out in Poland, 1986–1991, in which 37,779,959 carcasses were examined and 1.66% was condemned and the most common reason for condemnation was Marek's disease (Radkowski et al., 1996). In England and Wales, 1992–1993, 1.3% of slaughtered broilers were condemned and septicemia/toxaemia/fever was the most common causes of condemnation (Bremner, 1994). From April 1991 to March 1992, in Ontario, Canada, 9,829,296 poultry were slaughtered and 100,369 carcasses (1.02%) were condemned; ascites and cellulitis were the most frequent causes of condemnation (Herenda and Jakel, 1994). In a study by Haslam et al. (2008) in England, the mean percentage of condemnation was 1.23% and the main reason of carcass rejection was acute internal pathology. A survey done by Petracci et al. (2006) in Italy, from 2001 to 2005, showed the incidence of death on arrival (DOA) in broilers was 0.35 % in slaughter plants, with highest risks occurring in summer.

Various studies on poultry carcass condemnation have also been performed in different provinces of Iran. Ansari-Lari and Rezaghali (2007) reported that 0.73 % of total slaughtered poultry (130,967,021) in Fars province were condemned from 2002-2006. The cachexia (37.7 %) and septicemia (24.3%) were the most important causes of rejection (Ansari-Lari and Rezaghali, 2007). 214,997,429 birds were slaughtered in abattoirs of Tehran province from 20th March 2009 to 20th March 2011 and the carcass condemnation rate was 0.33%, and almost half of condemnation was due to cachexia (46.6% Gholami et al., 2012). In another study 380,140 birds were slaughtered in the slaughterhouses of Nowshahr (Mazandaran province), 2540 birds (0.67%) were rejected and the dead on arrival was the main reason for condemnation (26.6%)(Hosseini Aliabad, 2011).

In the present study, septicemia was the most common cause of carcasses rejection (34.6% of total condemnations). Septicemia, also known as toxemia, is a general condemnation category that includes clear signs of systemic disease involve-

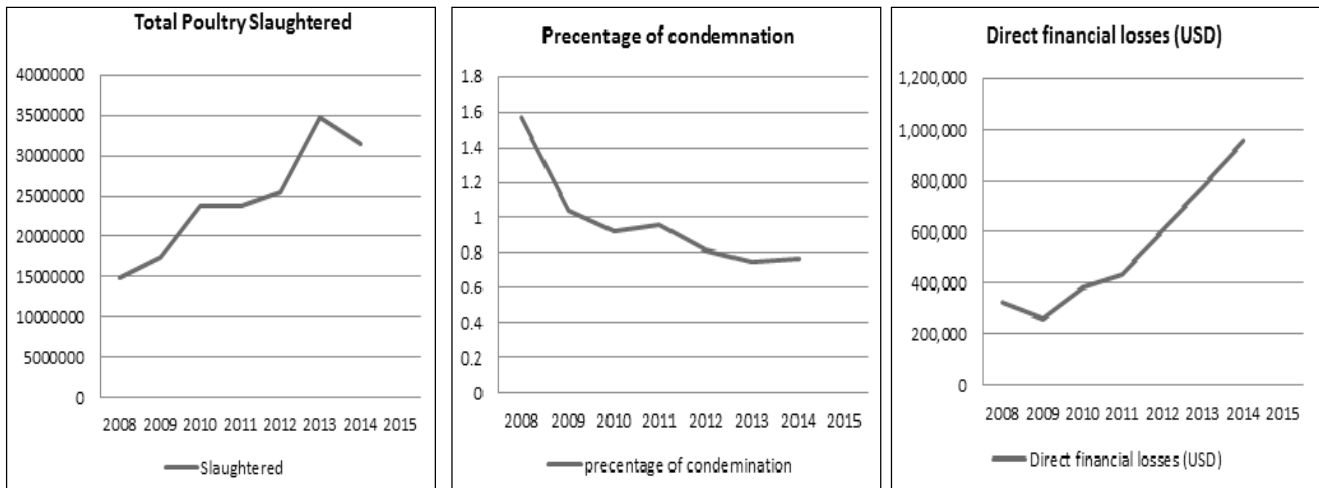


Figure 1. Changes in the amount of chicken slaughtered, carcass condemnation rate and direct financial losses during the seven years (2008-2015) in abattoirs of West Azerbaijan province, Iran.

ment. Septicemia is manifested by a group of clinical signs such as congested, darkened muscles with inflammatory lesions such as airsacculitis and perihepatitis, not all of which will be present in a single carcass (Gracey et al., 1999).

Early detection of microbial contamination by bacteriological examination in septicemia has important public health implications because microbial causes such as *Escherichia coli*, *Pasteurella multocida* and *Salmonella enteritidis* are important pathogens of human relevance (Fisher, 1998).

The second most frequent cause of condemnation found in this survey was cachexia (25.7%). Cachexia is secondary to some diseases such as anorexia and malabsorption and it is unlikely to be a result of malnutrition because chickens are fed on ad libitum in industrial poultry production (Ansari-Lari and Rezagholi, 2007).

Ascites is a multi-factorial syndrome caused by interactions between physiological, environmental, and management factors. Associated with inadequate supplies of oxygen, poor ventilation and physiology (oxygen demand may be related to type of stock and strain). Ascites is a disease of broiler chickens occurring worldwide. The disease has a complex etiology and is predisposed by reduced

ventilation, high altitude, and respiratory disease (Decuypere, 2000).

CONCLUSIONS

In conclusion, most of the poultry carcass condemnation is due to disease occurrence. Disease prevention is much less stressful and costly than disease control and recovery. Prevention of disease in commercial poultry requires the producer to actively engage in effective and comprehensive biosecurity program and to maintain an intact and functional immune system in the chickens. Considering mentioned facts can help reduce carcass condemnation and financial losses in industrial slaughterhouses.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests. ■

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