



# Major causes of organ/carcass condemnation and financial loss estimation in animals slaughtered at two abattoirs in Bursa Province, Turkey



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## ABSTRACT

An abattoir survey was conducted from July 2012 to December 2012 to determine the major causes of organ and carcass condemnation and to estimate the associated direct financial loss at two abattoirs in Bursa Province in Turkey. A total of 22,872 sheep and 5363 cattle were examined by postmortem inspection using standard inspection procedures. The total economic loss in two abattoirs was estimated from the summation of organ and carcass condemnation in six-month period. The retail prices of offal (lung, liver, kidney, heart, and spleen) and kg price of cattle and sheep carcasses were obtained from local markets. The results of postmortem examination indicated that a total of 658 (2.33%) offals and 93 (0.32%) carcasses were condemned. While the main causes of organ condemnation were hydatidosis and fasciolosis, carcasses were condemned mainly due to tuberculosis and jaundice. The total revenue in 2012 for all animals (164,080 sheep and 56,035 cattle) slaughtered in 15 abattoirs in Bursa Province was 144,401,765 USD. This study showed that financial loss due to organ and carcass condemnations at two abattoirs in six-month period was 245,483 USD (0.17% of the total annual revenue of all slaughtered animals at 15 abattoirs). In sheep, six-month financial loss was estimated at 3281 USD and 4015 USD from organ condemnation due to fasciolosis and hydatidosis, respectively. In cattle, total loss was calculated as 4042 USD and 12,321 USD due to fasciolosis and hydatidosis, respectively. A common cause of carcass condemnation in cattle was tuberculosis, totalling 214,995 USD in losses, whereas condemnation due to tuberculosis was not determined in sheep. The current study also showed that six-month monetary losses from carcass condemnation of sheep and cattle due to jaundice were 8099 USD and 6026 USD, respectively.

From the data obtained in this study, it can be concluded that bacterial and parasitic diseases remain common and cause considerable economic loss in Bursa Province, Turkey. The result of this abattoir study provided regional information on major causes of organ and carcass condemnation in sheep and cattle slaughtered at two abattoirs as well as giving an estimation of the direct financial losses.

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## 1. Introduction

The human population is growing fast in different countries around the world. Mainly in undeveloped and developing countries, this growth rate is faster than the

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growth rate in animal production (Steinfeld et al., 2006). The main source of red meat includes sheep, cattle, goat, and their products. However, bacterial, viral, and parasitic diseases limit livestock production (Bin Kabir et al., 2010; Borji et al., 2012; Fekadu et al., 2012). These diseases cause significant losses resulting from the death of animals, inferior weight gain, and condemnation of offal and carcasses at abattoirs. Parasitic diseases such as cysticercosis, echinococcosis, and fasciolosis cause great economic constraints in the livestock industry as a result of mortality; reduced milk, meat, wool, hide production; and infertility. Moreover, cattle and sheep are capable of carrying a wide range of zoonotic pathogens (Mellau et al., 2010; Fromsa and Jobre, 2012). These zoonoses can be transmitted to humans by several routes: consumption of infected raw milk, raw meat, and by direct contact with aborted fetuses from infected animals. However, most meat-borne zoonoses are acquired through the consumption of infected and improperly cooked meat and organs (Jibat et al., 2008; Komba et al., 2012; Swai and Schoonman, 2012). Meat consumption is increasing worldwide to meet protein demands, which raises concerns and challenges regarding hygiene and food safety. Therefore, meat should be clean and free from diseases such as tuberculosis, cysticercosis, and *Salmonella* in order to protect public health. To limit zoonoses transmitted to humans via meat, such as tuberculosis and hydatidosis, meat is condemned at slaughter when zoonotic diseases are detected (Jibat et al., 2008; Komba et al., 2012). Esthetic changes caused by diseases and mechanical damage during slaughtering procedures are additional reasons that meat is condemned from human consumption. For these reasons, surveillance of emerging infectious and zoonotic diseases in food animals is an important component of food safety systems. Consequently, abattoirs and their regulations play a significant role and represent importance in food safety and hygiene (Jibat et al., 2008; Komba et al., 2012).

Meat inspection records provide an easy source of data for evaluation of epidemiological aspects of animal diseases. Abattoirs provide very important information on public exposure to certain zoonotic diseases and estimates of financial losses incurred through condemnation of affected organs and carcasses. Additionally, abattoir records assure planning strategies for the control of livestock diseases (Borji and Parandeh, 2010; Getachew et al., 2012; Ogbaje et al., 2012).

Livestock industry is an important segment of agricultural production in Bursa Province, where the study was performed. Various studies were carried out in this region to determine the epidemiological aspects of bacterial and parasitic diseases. However, none of these studies considered economic losses due to partially condemned organs (liver and lungs) or carcasses that have minor parts trimmed or lost. In other words, information on the food and money lost as a result of parasite and bacteria-related condemned offal and meat in this region's abattoirs does not exist.

Therefore, this study aimed to determine the major causes of organ and carcass condemnation and to assess the associated direct financial losses due to both partial and total condemnation.

## 2. Material and methods

### 2.1. Study area and animal husbandry

Bursa Province is located (40°E, 28–30°N) in the south-eastern part of the Marmara Region of Turkey. The altitude of the area is approximately 100 m above sea level (Fig. 1). The province has very important potential for cattle and sheep production because of its geographical location and also a wide range of modern farms located at the region, contributing to the economy with its employment rate and values of products. Intensive breeding is widely applied in open and close barns. According to the Turkish Statistical Institute, approximately 327,052 sheep, 96,916 goats, and 188,673 cattle were kept in 2012 in the province (Anonymous, 2013). There are 15 abattoirs in the study area, two of which were selected for data collection.

### 2.2. Study period

The study was carried out over a period of 6 months (between July 2012 and December 2012).

### 2.3. Study animals and design

A total of 22,872 slaughtered sheep and 5363 slaughtered cattle (overall: 28,235 animals) were included to the study. Animals were brought to the abattoirs from all nearby districts and were examined to determine major causes of organ and carcass condemnation. A convenient sampling method was employed and sex, breed, age, number, and origin of the animals were recorded in a standardised data sheet.

### 2.4. Meat inspection

Bacterial (tuberculosis, etc.) and parasitic infections (fasciolosis, hydatidosis, cysticercosis, etc.), or pathological lesions (jaundice) responsible for the condemnation of the carcasses and viscera during meat inspection, were determined. Postmortem inspection and data collection were performed by both the resident veterinarians involved in routine meat inspection at the abattoirs and authors of this study. For these purposes, abattoirs were visited periodically for six-month period by the authors. Postmortem examination procedure employed visual examination, palpation, and systematic incision of each carcass and visceral organs, particularly the lung, liver, spleen, kidney, heart, and various regional lymph nodes. For some diseases, such as bovine tuberculosis and hydatidosis, further detailed examinations of other parts or body systems were considered whenever lesions were detected in any of the examined organs. Inspection of the skulls, brains, and spinal cords was not permitted due to the abattoir formalities. Therefore, it was not possible to assess the status of *Coenurus cerebralis*. The results were recorded and the decisions were classified as totally approved, partially approved, and conditionally approved as fit for human consumption, or totally condemned as unfit for human consumption. Organs were totally approved for human consumption only if they were free from abnormalities.

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