

## Prevalence of Hydatidosis in Slaughtered Animals of South West of Iran

<sup>1</sup>P. Parsaei, <sup>1</sup>M. Mohammad Hosseini Anari, <sup>2</sup>M. Riahi and <sup>3</sup>E. Rahimi

<sup>1</sup>Young Researchers Club, Shahrekord Branch, Islamic Azad University, Shahrekord, Iran

<sup>2</sup>Department of Food Hygiene, College of Veterinary Medicine,  
Shahrekord Branch, Islamic Azad University, Shahrekord, Iran

<sup>3</sup>Biotechnology Research Center, Shahrekord Branch, Islamic Azad University, Shahrekord, Iran

**Abstract:** *Echinococcus granulosus* infection is a problem about public health issue in livestock-rearing regions in Middle eastern countries specially, Iran. A total of 70333 sheep, 22769 goats, 43231 cattle were examined for hydatid cyst infection in 10 large standard industrial slaughter house in 10 large cities of Lorestan province that located in south west Iran during 2011. Results indicated that In this period, 11,586 (8.4%) livers and 14,540 (10.6%) lungs were condemned totally for *Echinococcus* cyst lesions. Hydatidosis was responsible for 10.86 and 13.58% of liver and lung condemnations in cattle in this period; respectively that is the highest rate between all slaughtered animals. Location of hydatid cyst lesions in the carcasses shows lung to be the most predominant site in all animal species with cattle having 5875 (13.58%), sheep 6665 (9.47%) and goats with 2000 (8.78%).

**Key words:** Hydatidosis • Slaughtered animals • Iran

### INTRODUCTION

Hydatidosis is caused by the larva stage (Metacestode) of the dog tapeworm of *Echinococcus granulosus* (*E. granulosus*), [1, 2] which is one of the most important zoonotic diseases that leads to medical, veterinary and economic problems and constitutes a major public health issue that is prevalent in different parts of middle east specially Iran [3, 4].

*E. granulosus* has a great reproductive potential and requires two mammalian hosts. This parasite is transmitted in a anthropic cycle involving dogs and livestock like sheep, cattle, camels, goats and equines [1, 2]. In addition, widespread recovery of adult worms has been reported from dogs, jackals and wolves all over Iran, that specially in rural areas are the main definitive hosts and responsible for the contamination of water and food and the risk to contaminate farm animals and human by dissemination of eggs [1-4].

In according to FAO report from south west Asia and middle east and Results of studies on Hydatidosis in Iran showed considerable variations of infection rates among farm animals specially sheep, cattle and goat as an important intermediated host that affecting human health [1, 5-10].

In the other hand Hydatidosis in animals lead to significant economic loss of meat industry through condemnation of infected organs such as liver, lungs and other organs in apart from reduced quality of milk, meat and wool. These losses have economical significance effect in countries of low economic output where sheep production is particular importance like Iran [9, 10, 11].

The present work was conducted to determine the prevalence of *E. granulosus* in carcass of livestock as sheep, goat and cattle that slaughtered in Lorestan Province in south west of Iran.

### MATERIALS AND METHODS

The present work performed on slaughterhouses of Lorestan province on south west of Iran that is a pathway of herds of the largest migratory sheep producers.

In this study, a total of 70333 sheep (Gazel, Kordi and Lori-Bakhtiyari breeds), 22769 goats (Maghoz and Black Native breeds), 43231 cattle (Holstein, brown swiss and Native breed) were examined for hydatid cyst infection at 10 slaughterhouses of 10 large standard industrial slaughter house in (Koohdash, Azna, Aleshtor, Nour Abad, Khorram Abad, Boroujerd, Oshtorinan, Doroud, Aligudarz and Poldokhtar ) cities of Lorestan province

that located in south west Iran during 2011. The species of the animals, living region and organ location (lung and liver) of the cysts were recorded and each animal carcass was inspected by slaughter house veterinarians and tested for their health. At last infected organs include lung and livers that have cysts were taken to the laboratory and only metacystodes with viable protoscolices were recorded and used in the investigations.

For evaluation of viability of the protoscolices was assessed by motility of flame cells as well as ease of staining with 0.1% aqueous eosin solution and examination by a light microscope (Olympus BX40, Olympus optical Co., Ltd. Tokyo, Japan) [25].

And end all the data were analyzed by SPSS v16 software and Chi-square and Student's t-tests were applied for comparison of the rate of infections in different Organs, species and seasons.

## RESULTS AND DISCUSSION

Total of 136,333 animals slaughtered (70,333 sheep, 22,769 goats and 43,231 cattle) in the one year period from 20 Sept 2010 to 19 Sept 2011 (Table 1). In this period, 11,586 (8.4%) livers and 14,540 (10.6%) lungs were condemned totally for EC lesions. Hydatidosis was responsible for 10.86 and 13.58% of liver and lung condemnations in cattle's in this period; respectively that is the highest rate between all slaughtered animals. Location of hydatid cyst lesions in the carcasses shows lung to be the most predominant site in all animal species with cattle having 5875 (13.58%), sheep 6665 (9.47%) and goats with 2000 (8.78%).

The seasonal prevalence rates for this parasitic infection are shown in (Table 2) that shows the most prevalence in cattle at summer with 11.53% (1367) for liver infection and 16.1% (1743) in cattle lungs at spring but a meaning full decrease are seen in both lung and liver infection at winter in all species in both liver and lung except the percent of infected lung with 7.13% in compare to spring with 6.58%.

There was significant association ( $p = 0.00$ ) between the species of animals and infection.

Hydatid cyst disease is an important medical and veterinary problem in all over the world especially in Middle East countries that humans live with their farm animals in urban societies and migrate with their herds [4].

About this disease domestic intermediate hosts (cattle, camel, sheep, goats and buffaloes) are major reservoirs for the disease in humans by transmission of infective eggs of the cestode *E. granulosus* [9]. On the other hand Hydatidosis causes considerable economic loss in livestock due to condemnation of organs like lung and liver, So it's necessary to find reliable data for monitoring epidemiologic aspects of disease and prepare a base line data for future comparison to screen the infection rate [7].

According to results *E. granulosus* lesions of sheep in different regions has been reported in western Iran about 11.1% [4], but it was lower about 8.68% In this work and cyst were found in liver 7.89% and 9.47% lung.

Also 7.32 of the goats were found infected with hydatid cyst (5.86% of livers and 8.78% lungs), while the mean prevalence of infection in goats of western Iran has been reported 6.3% in earlier studies. Since goats feed

Table 1: Prevalence of hydatidosis in liver and lung samples of cattle, sheep and goat in Lorestan province, Iran

	No of samples	Liver Condemnation	Lung Condemnation
Cattle	43231	4695 (10.86%)	5875 (13.58%)
Sheep	70333	5555 (7.89%)	6665 (9.47%)
Goat	22769	1336 (5.86%)	2000 (8.78%)
Total	136333	11586 (8.49%)	14540 (10.66%)

Table 2: Prevalence of hydatidosis in liver and lung samples of cattle, sheep and goat in each seasons, Lorestan province, Iran

		Spring		Summer		Fall		Winter	
		Total	Contaminated	Total	Contaminated	Total	Contaminated	Total	Contaminated
Liver	Cattle	10823	1241(11.46%)	11856	1367(11.53%)	10351	1159(11.19%)	10201	928(9.96%)
	Sheep	17701	1404(7.93%)	17658	1760(9.96%)	16978	1367(8.05)	17996	1024(5.69%)
	Goats	5039	261(5.17%)	6229	364(5.84%)	6290	486(7.72%)	5211	225(4.31%)
Lung	Cattle	10823	1743(16.10%)	11856	1754(14.79%)	10351	1333(12.78%)	10201	1045(10.24%)
	Sheep	17701	1803(10.18%)	17658	1824(10.32%)	16978	1694(9.97%)	17996	1344(7.46%)
	Goats	5039	332(6.58%)	6229	608(9.76%)	6290	688(10.93%)	5211	372(7.13%)

mainly by browsing, rather than grazing, they usually show lower rates of infection than other species but we have observed a higher considerable rate of infection than earlier studies [4].

About cattle 12.22% of the examined animals to be found infected with hydatid cysts (liver infection 10.86% and lung 13.58%), while the mean prevalence of infection in cattle of western provinces of Iran has been reported 16.4% [4] and this is the highest infection rate in all slaughtered species in this region.

Some decrease in rate of infection in sheep and cow may be related to increasing the awareness among farmers by governmental teaching by jihad agriculture, destruction of organs containing hydatid cysts and prevention of access of dogs to raw offals and national program to control of rabies that during this action, many stray dogs were eliminated [19].

In other middle east countries specially Iraq that have Neighborhood in the west of Iran borders, hydatidosis had been reported, 4.3-13.9% in cattle, 4.5-44% in sheep, 3.1-26.7% in goats, [12, 4]. In the eastern part of Kuwait, 10.4% of sheep [13, 4], in Jordan 1.3-71.1% of sheep, 0.1-3.6% of goats and 1.3-12.9% of cattle [4, 14-17] and in Syria, 4.5% of sheep, 2.3% of goats and 5.2% of cattle [18, 4] were reported infected with *E. granulosus*.

Generally the site of infection in livestock of Lorestan province, is similar to the other endemic zone in the west Iran and The most prevalence of hydatidosis infection is in lungs followed by liver in all species (Table 1), that is in agreement with similar studies reported that lungs were more frequently affected than liver [20, 21, 22] but against some surveys in middle east that in sheep was reversed [14-16].

In according to our data showed significant seasonal variation in prevalence of liver and lung condemnation in about cow, goat and sheep in all seasons ( $p < 0.01$ ). Highest prevalence of liver hydatidosis in summer for sheep and cattle also lung hydatidosis in summer and spring was observed in sheep and cattle respectively, but both lung and liver Condemnation increase in fall. This changes about sheep and goats are related properly to increasing the number of slaughtered animals that supported by herds of migratory tribal people with comes to this province in summer and beginning of fall and they are in the risk of infection than other resistant herds and farms [23, 24, 26].

Considering the rate of infection and seasonally prevalence of infection in animals slaughtered in Lorestan slaughter house in this period, recommended that

increasing the rate of knowledge in farmer and tribal men lead to preventing the hydatidosis infection by cutting off its cycle. Also government ecological politics for extinct the stray dogs can be improve this process. At the end, although abattoir surveys have limitations, they are an economical way of gathering information on livestock disease that lead to human diseases and affect public health. Also, a feedback from the slaughterhouse to the individual farms of great value in the field of preventive medicine in social health care.

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