



Prevalence of dicrocoeliosis in slaughtered herbivores animals in Arak city of Markazi province in Iran

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ABSTRACT

Dicrocoeliosis is one of the zoonotic diseases in the world that have public health and economic perspectives. The aim of this study was to investigate the prevalence of dicrocoeliosis in slaughtered animals in the industrial slaughterhouse of Arak, Iran (2007–2010). In this study, we investigated 648,994 head of animals including, 292,797 sheep, 81,012 cows and 275,185 goats. Their carcasses were inspected using macroscopic method for hydatid cyst in livers and lungs. Data analysis was performed by Chi-square test and IBM SPSS software (version 16.0). The prevalence frequency of dicrocoeliosis in slaughtered cattle was 7550 head with the most infected animals of 3359 goats, 3198 sheep, and 993 cows, respectively. Meanwhile, the year 2008 with the 1.9% of infected cattle and year 2010 with a 0.7% of infected cattle were the highest and lowest infected cattle years. Dicrocoeliosis prevalence of infection is relatively low, but incurring economic losses due to the deleting of infested organs of animals and decrease in livestock products, indicates the existence of conditions for health risks for residents which requires more inclusive and comprehensive sanitary and control measures due to this parasite's life cycle and transmission.

1. Introduction

Due to population growth, demand for high quality and healthy protein sources increases. Totally, 77,250,000 head of sheep and goats and 8,588,000 head of cows are raised in Iran. These folks of livestock are the main protein sources for the society. In spite of qualitative and quantitative improvement of health and disease prevention measures, there is still a great deal of financial loss sustained all around the word due to parasite caused diseases transmittable by food. Estimates show that the figure of losses hits a considerable amount annually. The losses are comprised of costs to diseases treatment, and prevention spread of diseases, economic losses due to increase in mortality rate of livestock, measures to dispose of livestock corps, and loss of profit (1,2). Dicrocoeliosis is one of many health threats that cause a reduction of dairy

and meet production and many financial losses by threatening public health. The disease is spread by ants infected by metacercariae wondering on fodder and vegetable. Dicrocoeliosis is a threat both for human and livestock and there are reports of human infections in Iran (3,4). Livestock infection has been reported by all Iranian provinces. Usually, dicrocoeliosis infection among livestock results is a considerable decrease of dairy, meat, and wool. In addition, contaminated liver of the livestock must be disposed of at slaughterhouse. In addition, the contaminated fodder and vegetable is one of the main ways of spread of the disease (3,4,5). Dicrocoeliosis larva in the liver and yellow bile duct has no symptom and infected cases are mostly found during inspections after slaughtering. Contamination surveys in slaughterhouses nationwide showed 0.1% infection in Yazd, 4.5% in Khorramabad, 4.2% in Urmia, and 29.32% in East Azerbaijan (5,6,7). Public health concerns are important as are economic concerns regarding damages caused by the parasite (8).

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The present study aimed to determine the spread of infection by dicrocoeliosis in farms of Arak city on the bases of annual seasonal reports and livestock types. The results may help the officials to take more proper preventive measures.

2. Materials and methods

2.1. Sampling and sample examination

The study was conducted as descriptive and cross-sectional study with a statistic society of all livestock slaughtered in industrial slaughterhouse of the city between 2007 and 2010. Sampling was conducted randomly by attending the site. According to the data, about 50 heads were slaughtered per day during a 4 years period, which comes of 648,994 heads of livestock (54.11% sheep, 12.48% cow, and 42.40% goat). Thus, 292,797 heads of sheep, 81,012 heads of cow, and 275,185 heads of goats were adopted.

2.2. Calculation of prevalence rate

This study used questionnaire and direct microscopic observations so that samples were examined visually and under the microscope at site. Tested for infection by dicrocoeliosis, appeared in the bile ducts of the liver were studied. Dicrocoeliosis prevalence was calculated as the number of livers found to be untrimmed with parasites, expressed as a percentage of the total number of cattle, sheep and goat slaughtered. A percentage to measure prevalence was the statistical tools applied.

3. Results

The results showed 1.16% (7550 cases) infection by dicrocoeliosis, so that goats with 3359 contaminated cases were at the top, followed by sheep (3198) and cows (993). Moreover, maximum and minimum rate of contamination among the sheep were 1480 (2008) and 165 (2010) respectively; among the cow were 301 (2008) and 114 (2010) respectively; among the goat were 1258 (2008) and 232 (2010) respectively (Table 1). On the seasonal bases, the surveys showed that maximum and minimum spread of the disease were in the fall and winter respectively (Figure 1). In general, 2008 was the most contaminated years (1.9%), while 2010 won as the year with minimum contamination (0.7%) (Figure 2).

4. Discussion

This study was carried out during a 4 years period at an abattoir in Arak region, Markazi province in the center of Iran. The results demonstrated a high rate of infection with dicrocoeliosis in the study population (slaughtered livestock) in Arak city (2007–2010).

In the current study, the annual prevalence of dicrocoeliosis was (2007–2010) 0.8%, 1.9%, 1.5%, and 0.7% respectively. Several studies have been

Table 1. Prevalence of Dicrocoeliasis infection in slaughtered animals in the Arak, Iran (2007–2010)

Seasons	Total slaughter	Dicrocoeliosis
Cattle		
2007		
Winter	21,532	60
Spring	3967	82
Summer	5162	94
Autumn	4250	65
Total	34,911	301
2008		
Winter	4697	58
Spring	3567	57
Summer	5296	82
Autumn	4428	102
Total	17,988	299
2009		
Winter	4141	70
Spring	3047	107
Summer	4423	43
Autumn	3405	59
Total	15,016	279
2010		
Winter	3460	46
Spring	3326	35
Summer	3347	8
Autumn	2964	25
Total	13,097	114
Total	81,012	993
Sheep		
2007		
Winter	82,394	176
Spring	14,773	210
Summer	19,171	184
Autumn	14,181	303
Total	130,519	873
2008		
Winter	15,068	239
Spring	18,357	196
Summer	38,941	694
Autumn	14,959	351
Total	87,325	1480
2009		
Winter	11,229	391
Spring	10,268	126
Summer	19,282	55
Autumn	8660	108
Total	49,439	680
2010		
Winter	7991	67
Spring	8496	33
Summer	3170	22
Autumn	5857	43
Total	25,514	165
Total	292,797	3198
Goat		
2007		
Winter	85,342	382
Spring	14,854	185
Summer	16,879	183
Autumn	15,467	320
Total	132,542	1070
2008		
Winter	10,164	323
Spring	12,248	226
Summer	15,982	385
Autumn	15,310	324
Total	53,704	1258

Table 1. Prevalence of Dicrocoeliasis infection in slaughtered animals in the Arak, Iran (2007–2010) (Continue)

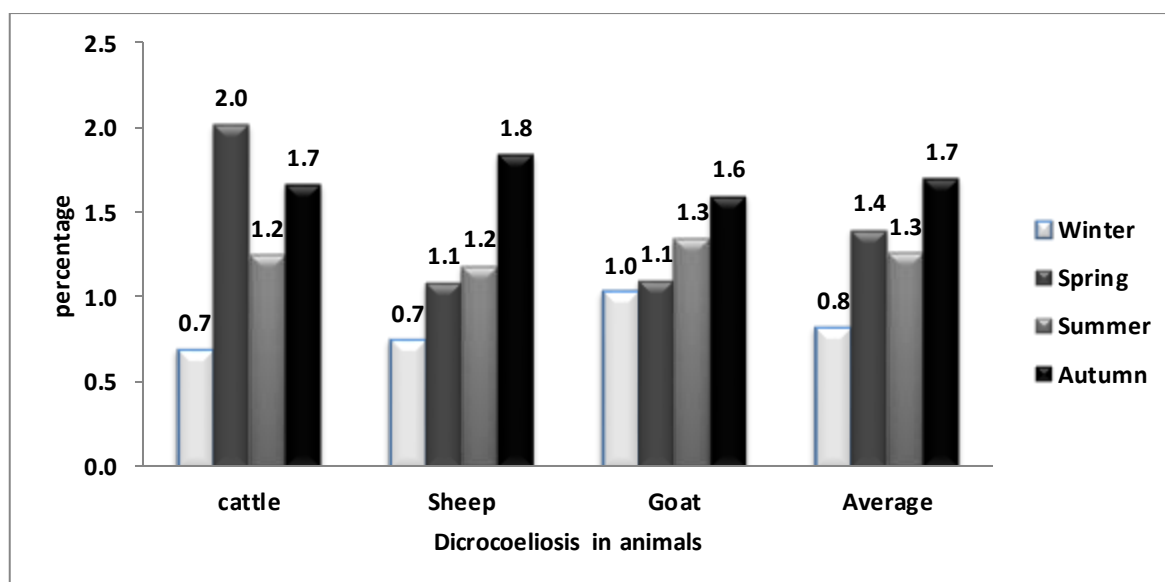
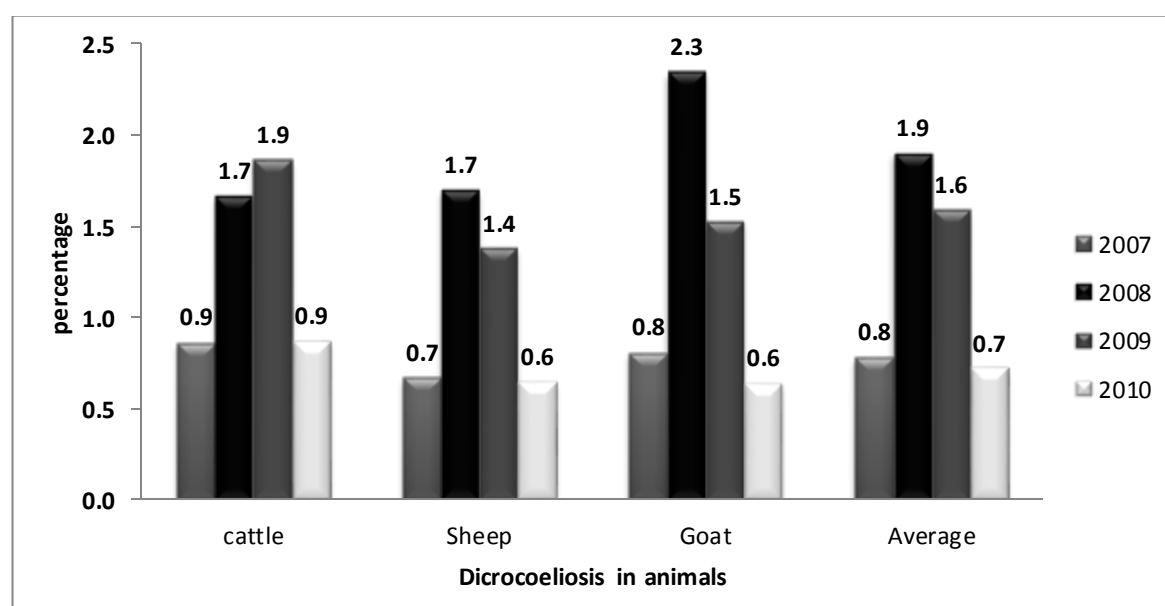
Seasons	Total slaughter	Dicrocoeliasis
2009		
Winter	12,155	390
Spring	12,630	85
Summer	16,975	210
Autumn	10,757	114
Total	52,517	799
2010		
Winter	6791	85
Spring	8420	34
Summer	10,770	40
Autumn	10,441	73
Total	36,422	232
Total	275,185	3359

conducted regarding the outbreak of dicrocoeliasis among livestock's. In the study by Kara et al. (9), rate

of infection among the cow and the sheep were reported 4.67% and 3.8% respectively. In a study conducted by Maqbool et al. (10), seasonal breakout of platyhelminthes in sheep in Ganderbal-Kashmir was examined and 11.45% infection with dicrocoeliasis was reported. In the present survey, mean prevalence of dicrocoeliasis in those animals was 0.11%, 0.09%, and 0.19%, respectively.

In the study performed in a slaughterhouse of Khuzestan in the 9 years period, liver parasite infection showed that outbreak of dicrocoeliasis 2.28% for sheep, cow, and goat (11).

In a study conducted by Ahmadi et al. (12), showed that outbreak of dicrocoeliasis in the cow, sheep and goat in Gilan province was 88%, 66%, and 23.25% respectively. In a survey conducted by Jahed

**Figure 1.** Seasonal prevalence (%) of dicrocoeliasis in slaughtered animals**Figure 2.** Annual prevalence (%) of dicrocoeliasis in slaughtered animals

Khaniki et al. (13), in slaughtered animals of Iran and reported the infection rate of *Dicrocoelium* spp. with 3.65 % in cattle, 2.66 % in sheep and 2.19 % in goats. Ansari-Lari and Moazzeni (14) performed a retrospective survey of liver fluke disease in livestock based on abattoir data in Fars, Iran and found that dicrocoeliasis were responsible for 21% of total liver condemnations. The inconsistency between our results and those by other studies might be due to climate and health condition differences that resulted in a higher rate of infection.

5. Conclusion

We found a generally low prevalence, also great reduction of liver condemnations in sheep, cattle and goats due to liver infections during a 4 years period. This survey has helped to illustrate the usefulness of meat inspection records in monitoring disease situations and demonstrating possible long term trends. Furthermore, it provides a preliminary baseline data for the future monitoring of these potentially important parasitic diseases.

Conflict of Interests

Authors have no conflict of interest.

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