

ECONOMIC LOSSES FROM FASCIOLIASIS IN SLAUGHTERED ANIMALS: AT ABATTOIRS LEVELS

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ABSTRACT

This study was carried-out on 2000 slaughtered animals in abattoirs of Motobus (Kafr-El-Shaikh Province) and Damanhour (Behaira Province) from them 920 slaughtered animal (800 animal its ages ranged from 2 – 3 years and 20 animal its age over 3-years) in abattoir of Motobus and 1080 slaughtered animal (1000 animal its ages ranged from 2 - 3 years and 80 animal over 3-years) in abattoir of Damanhour during the period extended from year 2006 to year 2007.

The data collected from the abattoirs included weight and prices of livers and weight and prices of trimmed parts of livers due to fasciola infection, weight and prices of the condemned animals resulted from severe form of jaundice resulted from fasciola infection and the data that collected were analyzed statistically and economically.

This study indicated that the incidence of fasciola in young animal higher than that of old ages animals as the incidence rate of fasciola ranged from 13 % to 55 % for young and old age animals , respectively, and the number of animals that occur to it liver trimming ranged from 56.76 % to 22.70 % for young and aged animals and the animals that condemned due to fasciola infection ranged from 13.51 to 7.03 % for young and old aged animals, respectively, and the losses in meat due to liver trimming ranged from 21 Kg to 12.6 Kg for the infected animals of either young or old age animals, respectively, but the weight of animals that occur to it condemnation ranged from 160 Kg to 200 Kg for young and old age animals, respectively, and the return losses due to liver trimming ranged from 525 to 315 LE for young and aged animals, respectively, but the return losses due to condemnation of infected animals ranged from 200000 to 130000 LE for young and aged animals, respectively.

This study concluded also that, the fasciola causes severe economic losses in slaughtered animals at abattoir level and there is a probability for economic losses to the animal during slaughter in abattoir to suffer from economic losses about 24.34 LE/ slaughtered animal under Egyptian conditions.

INTRODUCTION

Cattle and beef animals considered as a main source of animal protein in Egypt (El-Shazly et al., 2005). One of the main causes of economic losses to cattle is the parasitic diseases especially during slaughtering (Kithuka et al., 2002; Theodoropoulos et al., 2002 and El-Shazly et al., 2005). The most economic parasitic diseases that causes severe economic losses to cattle meat during slaughtering is the fascioliasis (Saleha, 1991; Kithuka et al., 2002 and Pritchard et al., 2005).

Fascioliasis, caused by fasciola species and it has a great zoonotic importance world wide especially in Egypt. The estimated number of people currently having fascioliasis in Egypt to be 830,000, in Bolivia about 360,000, 20,000 in Ecuador and 10,000 in Islamic Republic in Iran, 742,000 in Peru and 37,000 in Yemen. The total estimated number of people infected with fasciola is 2.4 million in 61 countries, and the number at risk is more than 180 million throughout the world (Haseeb et al., 2002).

The economic losses resulted from fasciola infection resulted from trimming of the liver leading to severe economic losses (Chen, 1991 and Saleha, 1991).

In severe cases of fasciola infection that associated with severe jaundice to the carcass it will lead to severe economic losses via total condemnation of the infected carcass (Chen, 1991; Saleha, 1991; El-Shazly. et al., 2005 and Shirai et al., 2006).

The total economic losses incurred by the country during the 10-year period because of condemnation of the infected livers were approximately US \$ 2.6 million. The total annual economic losses during this period ranged from approximately US \$ 0.2 - 0.3 million (Kithuka et al., 2002 and Gajewska et al., 2005).

The aim of this study is to study the economic losses resulted from trimming and condemnation of infected cattle carcass by fasciola during slaughtering in abattoir.

MATERIAL AND METHODS

This study was carried-out during the period extended from the year 2006 to year 2007 on the random samples of cattle slaughtered during this period at abattoir of Motobus –Kafr – El-Sheikh province and abattoir of Damanhour at Behera province according to the methods implied by (Kithuka et al., 2002; El-Shazly et al., 2002; Theodoropoulos et al., 2002 and Sanad and Al-Megrin, 2005).

The information obtained from the abattoir were obtained according to the methods of (Ansari-Lari and Moazzeni, 2006) and it include:

-Number of cattle slaughtered.

-Age of cattle: The cattle were classified according to the age as in Table (1) according to method of (Pfukenyi and Mukaratirwa, 2004 and Phiri et al., 2005 a,b).

Table (1): Number of animals taken from abattoirs of different provinces (Kafr El-Shaikh and El-Behira).

Province	Animal type	Age	Number of animals
Kafr El-Shaikh	Young	2 - 3 years	800
	Aged	Over 3-years	120
El-Behaira	Young	2-3 years	1000
	Aged	Over 3-years	80
Total			2000

-Weight of liver and the weight of the trimmed parts of the liver in addition to the determination of price of the trimmed parts according to the methods of (Schweizer et al., 2005).

-Weight of the condemned parts and meat from the infected carcasses and even the weight of the all carcass and determination of its prices (Wamae et al., 1998 and El-Shazly et al., 2005).

Statistical analysis:-

Chi²-test was used to determine the significance of incidence of fascioliasis among young and old age cattle, in addition to the determination of the significance of the losses in between old and young cattle according to (SAS, 1996).

RESULTS AND DISCUSSION

Tables (2, 3, 4, 5 and 6) indicated that, there is a significant ($P < 0.01$) effect for the age group of the (Young or old) age for its effects on incidence of fasciola among them and the losses due to trimming or the condemnation losses resulted from fasciola infection.

I-Incidence of fasciola among examined animals:

The incidence of fascioliasis among young animals that its age ranged from (2 – 3years) higher than that of aged cattle (over 3-years) as the incidence percentage for them about 13 % and 55 % for the young and aged animals, respectively (Table, 2).

This results agreed with those of (Molina et al., 2005 and Murphy et al., 2006) where they reported that, the liver fluke, or varying degrees of pathology attributable to fasciola hepatica, were present in 65 % of the livers and the adult cattle should be considered in preventive approaches to bovine fascioliasis than the young cattle. Also this results lower than that of (Salim-Bejestani et al., 2005), where they observed that, the incidence of *F. hepatica* infection in England was estimated to be 48 % and in Wales 86 % . The differences in incidence of fascioliasis among animals attributed to the difference in local climatic factors , cattle trades resulting and population numbers and the presence of the snail intermediate hosts are probably the main factors influencing the incidence of the diseases in the various regions of the country (Kithuka et al., 2002 and Phiri et al., 2005 a, b). While, (Dar et al., 2001 and El-Aziz et al., 2001), found that the incidence of fascioliosis in native cattle about 83.33 %.

II-Fate of infected animals with fasciola:

Table (3) indicated that, the percentage of animals that occur to it trimming ranged from 56.76 % to 22.70 % for young and aged animals, respectively, with a total percentage 79.46 % for the total animals examined. This results agreed with those of (El-Shazly et al., 2002 and Phiri et al., 2006) where they found that the incidence rate of fascioliasis in liver of cattle about 69.10 % for cows. While, the percentage of condemned animals were ranged from 13.51 to 7.03 % for young and aged animals, respectively, with a total percentage of 20.54 % for the total condemned animals. This results exactly similar to that obtained by (Phiri, 2006), who found that fascioliasis made liver and lungs the most condemned offals (20.10 % and 0.7 %), respectively.

III-Weight losses per animals due to fasciola infection:

The total weight losses due to trimming of infected liver about 100 gm and 150 gm for young and aged animals, respectively, with an average trimming losses about 125 gm/ per animal and the total trimming losses of liver about 21 and 12.6 Kg for the total animals examined of either young and aged animals, respectively, with an average trimming weight losses from liver by about 16.8 Kg (Table, 4).

The total condemned losses reached to 160 Kg and 200 Kg for young and aged animals, respectively, with an average total losses about 180 Kg per animal, while, the total condemned losses for the examined animals about 8021 Kg and 5212.6 Kg for young and aged animals, respectively, with average total weight condemnation losses about 6616.8 Kg per animal. This results agreed with those of Phiri et al. (2005 a,b) where they indicated that fascioliasis is an important condition that leads to high liver condemnation and / or trimmings in cattle tendered for slaughter.

IV-Return losses from trimming and condemnation of infected animals due to fasciola infection:-

Either the return losses resulted from trimming and condemnation of infected animals due to infection of cattle of either young or aged cattle with fasciola were clear in table (5).

The liver trimming losses ranged from 2.5 to 3.75 LE/animal with average return losses per animal about 3.125 LE/animal, while the total trimming losses ranged from 525 to 315 LE for trimmed animals of young and aged animals, respectively, with an average economic losses about 420 LE.

The condemned losses per animal ranged from 4000 to 5000 LE/animal for young and aged animals, respectively with an average losses due to condemnation about 4500 LE/animal.

Meanwhile, the total return losses due to condemnation of the animals ranged from 200000 to 130000 LE for young and aged animals, respectively, with average economic losses for the all condemned animals about 165000 LE/of either young or aged animal.

The total return losses due trimming of the liver and condemnation of the infected animals with fascioliasis were 200525 and 130315 LE for young and aged animals, respectively, with an average total economic losses about 165420 LE for the all examined animals.

V-Average economic losses of infected animals with fasciola:-

From Table (6) we can concluded that, the average economic losses for examined animals due to liver trimming about 2.5 and 3.75 LE/ animal for young and aged animals with an average losses about 0.017 LE/ examined animal, while the economic losses resulted from condemnation of the carcass about 4000 LE and 5000 LE/ examined animal for young and aged animal with an average losses about 24.32 LE /examined animal. And the total average economic losses about 4002.5 and 5003.75 LE for young and aged animal,

The average economic losses due to infection of cattle with fascioliasis resulted from liver trimming and condemnation of infected animals with fascioliasis about 24.34 LE/ slaughtered animal under Egyptian condition.

This results agreed with those of (Gajewska et al., 2005), they indicated that, the economic significance of fascioliasis is mainly due to direct losses caused by confiscation of altered livers in slaughterhouse , in contrast to this

results (Schweizer et al., 2005), reported that smaller losses from fascioliasis are due to reduced meat production and the condemnation of livers.

This study concluded also that, the fasciola causes severe economic losses in slaughtered animals at abattoir level and there is a probability for economic losses to the animal during slaughter in abattoir to suffer from economic losses about 24.34 LE/ slaughtered animal under Egyptian conditions.

Table (2): Incidence of fascioliasis among different examined animals of both young and aged animals and the number of healthy and infected animals.

Animal type	Animal age	Number of animals	Animal status			
			Healthy		Infected	
			No	% from total number of animal examined	No	% from total number of animal examined
Young	2 – 3 years	1800	1540	77	260	13
Aged	Over 3-years	200	90	45	110	55
Total		2000	1630	81.5	370	18.5

Chi² = (6.73)

** Significant at (P < 0.01).

Table (3): Fate of infected animals with fasciola (Trimmed or condemnation) and the percentage of each from the infected animals.

Animal type	Number of infected animals	Fate of animals			
		Trimmed		Condemnation	
		No	% from total number of infected animals	No	% from total number of infected animals
Young	260	210	56.76	50	13.51
Aged	110	84	22.70	26	7.03
Total	370	294	79.46	76	20.54

Chi² = (7.75)

** Significant at (P < 0.01).

Table (4): Weight losses per animal infected with fasciola resulted from liver trimming and carcasses condemnation.

Animal type	No of infected animal	Trimming			Condemned			Total
		No of animal	Weight losses of liver	Trimming total	No of animal	Losses per animal	Total condemned losses	
Young	260	210	100 gm	21	50	160 Kg	8000 Kg	8021 Kg
Aged	110	84	150 gm	12.6	26	200 Kg	5200 Kg	5212.6 Kg
Average	370	294	125 gm	16.8	76	180 Kg	6600	6616.8

Chi² = (8.75)

** Significant at (P < 0.01).

Table (5): Return losses per animal infected with fasciola resulted from liver trimming and carcasses condemnation.

Animal type	No of infected animal	Trimming losses (LE)			Condemned losses (LE)			Total losses (LE)
		No of animal	Per animal	Total	No of animal	Per animal	Total	
Young	260	210	2.5	525	50	4000	200000	200525
Aged	110	84	3.75	315	26	5000	130000	130315
Average	370	294	3.125	420	76	4500	165000	165420

Chi² = (9.75)

** Significant at (P < 0.01).

Table (6): Average economic losses (LE) of infected animal with fasciola.

Animal type	No of animals	Losses of trimming Per animal (LE)	Losses of condemnation (LE)	Total losses (LE)
Yong age	260	2.5±0.01 ^B	4000±10.50 ^A	4002.5±14.51 ^B
Aged	110	3.75±0.02 ^A	5000± 9.50 ^B	5003.75±15.75 ^A
Total	370	6.25±0.03	9000 ± 15.50	9006.25±19.17
Average		0.017±0.001	24.32 ± 1.02	24.34 ± 1.24

Means within the same column of different litters are significantly different at ($P < 0.01$)

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المخلص العربي

الخسائر الاقتصادية للذودة الكبدية فى الحيوانات المذبوحة : على مستوى المجازر

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أجريت هذه الدراسة على عدد ٢٠٠٠ حيوان مذبوح فى مجزرى مطوبس بمحافظة كفر الشيخ ودمنهور بمحافظة البحيرة منهم ٩٢٠ حيوان (٨٠٠ حيوان تتراوح أعمارهم من ٢ - ٣ سنوات ، ١٢٠ حيوان فوق ٣-سنوات) بمجزر مطوبس ، وعدد ١٠٨٠ حيوان (١٠٠٠ حيوان تتراوح أعمارهم من ٢ - ٣ سنوات ، ٨٠ حيوان فوق ٣-سنوات) فى مجزر دمنهور ، وذلك فى الفترة الممتدة من عام ٢٠٠٦ حتى عام ٢٠٠٧ ، وشملت البيانات التى تم الحصول عليها من المجازر وزن الكبد ووزن وقيم الاجزاء التى تم اعدامها من الكبد المصاب بالديدان الكبدية ، ووزن وقيم الحيوانات المصابة والتى تم اعدامها نتيجة لإصابتها باليرقان الشديد الناتج من الإصابة بالديدان الكبدية وتم تقييم وتحليل هذه البيانات إحصائيا وإقتصاديا.

حيث أوضحت هذه الدراسة أن معدل إصابة الحيوانات الصغيرة بالديدان الكبدية فى الحيوانات الكبيرة أعلى من معدل الإصابة فى الحيوانات الصغيرة حيث وصلت نسبة الإصابة فى الحيوانات الكبيرة ٥٥ % بينما فى الحيوانات الصغيرة وصلت نسبة الإصابة الى ١٣%. ونسبة عدد الحيوانات التى حدث بها اعدام جزئى للكبد حوالى ٥٧,٧٦ % و ٢٢,٧٠ % للحيوانات الصغيرة والكبيرة على التوالى بينما الحيوانات التى تم اعدامها تراوح من ١٣,٥١ الى ٧,٠٣ % للحيوانات الصغيرة والكبيرة على التوالى.

بينما تراوحت كمية الفقدان فى اللحوم نظرا للاعدام الجزئى للكبد بين ٢١ كجم الى ١٢,٦ كجم للحيوانات المصابة ككل، بينما الفقد فى الوزن نظرا لإعدام الحيوانات المصابة باليرقان الناتجة عن الإصابة بالديدان الكبدية تراوح بين ١٦٠ كجم الى ٢٠٠ كجم للحيوان الواحد وللحيوانات كلها التى تم اعدامها كان الفقد فى الوزن متراوفا بين ٨٠٠٠ الى ٥٢٠٠ كجم للحيوانات الصغيرة والكبيرة التى تم فحصها على التوالى.

وتراوح النقص فى العائد من ذبح الحيوانات من ٥٢٥ الى ٣١٥ جنيه للحيوانات الصغيرة والكبيرة نظرا للاعدام الجزئى للكبد ، بينما الخسارة الناتجة عن الإعدام الكلى للحيوانات المصابة باليرقان الشديد تراوح بين ٢٠٠٠٠٠ الى ١٣٠٠٠٠٠ جنيه للحيوانات الصغيرة والكبيرة على التوالى.

وخلصت الدراسة الى أن الديدان الكبدية تؤدى الى إحتمال معدل خسارة إقتصادية للحيوان المذبوح فى المجازر المصرية بمقدار ٢٤,٣٤ جنيه / للحيوان سواء أكان صغيرا أم كبيرا.