

**Prevalence of Meat Borne Parasites in Slaughtered Animals in Markaz Ashmoon Abattoirs with Special References to Their Economic Losses**

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**ABSTRACT**

A total of 28767 cows; 14499 buffaloes; 145 camel and 2338 sheep were slaughtered during the period January 2020 to December 2021 at seven abattoirs in Markaz Ashmoon, Monufia Governorate, Egypt to assess the prevalence of Cysticercosis, Hydatidosis, Sarcocystosis and Fascioliasis infections in the slaughtered animals. The prevalence of *Cysticercus bovis* in slaughtered cows and buffaloes were 68 (0.24%) and 160 (1.1%), respectively. while the prevalence *Sarcocystis* were 36 (0.13%), and 90 (0.62%) respectively, and in *Fasciola* were 84 (2.9%), 65 (0.45%) and 35 (1.49%) in slaughtered Cows, Buffaloes and Sheep, respectively. Meanwhile the prevalence of Hydatid cysts were 18 (12.4%) and 13(0.55%) in slaughtered camel and sheep, respectively. The total prevalence of *Cysticercus bovis*, which spp *Sarcocystis* spp., and Hydatid Cysts in relation to the total slaughtered animals and to the total infected animals were 0.5% - 40% ; 0.4% -32.33%; 0.28% -22.14% and 0.06% -5.4% respectively. The total economic losses as a result of parasitic infestation reached 111040 LE.

**Key words:** Cysticercosis, Economic loss, Fascioliasis, Hydatidosis, Sarcocystosis and Saughtered animals.

**INTRODUCTION**

Food-borne parasitic infections have not gotten the same level of attention as other food-borne biological and chemical hazards. Nonetheless, they create a high disease load in humans, can have long-term, severe, and sometimes deadly consequences, and cause significant difficulty in terms of food safety, security, quality of life, and economic consequences. Foodborne Parasites play a significant role in the global public health burden (FAO 2014, Keener and koutchama, 2021). The Zoonotic parasite diseases constitute a considerable socio-economic effect on the society and can have a significant impact load of disease in people and great economic losses to food animals. The most important parasites in meat hygiene are those which are direct or indirect transmissible to man by consumption of under cooked meat,

while other which are not zoonotic may render the slaughtered animal carcasses repugnant and unmarketable (Thornton and Gracey, 1976). "Top Ten" list of the most dangerous food-borne parasites worldwide concern was now enumerated. Every year, parasites infiltrate epilepsy, anaphylactic shock, and amoebic infections in muscular tissues and organs dysentery, and other disorders in millions of people. Some can survive for decades in our bodies. Echinococcosis was tabulated as the third of the top ten. Despite their enormous socioeconomic costs and worldwide consequences, little is known about where these parasites originate, how they thrive in the human body, and, most crucially, how they make us sick (FAO, 2014). Hydatidosis is an important veterinary and medical constrain in the underdeveloped countries worldwide. The

condition is now classified as a neglected tropical disease, and it is part of the WHO's strategic plan. (Da ilva 2010 and Abbas et al., 2016) .Meat borne parasites are considered the main source of human parasites infection. The infections arise from sheep, goats, cattle and camels. Therefore, it is strongly advised that effective, accessible, and controllable inspection rules should be implemented for animals, abattoirs, and meat processing industries (Emameh et al., 2018). Parasitic infection is considered as one of the major causes of economic losses worldwide, these losses include partial or total condemnation of viscera and carcasses, also reduction of meat production is considered one of the important losses (Hassanin et al., 2013). Therefore it is necessary to continue surveillance considering the current state of parasitic infections in terms of their frequency and negative economic impact Therefore, The current study's goals were to figure out how often it was to have Cysticercosis, Hydatidosis, Sarcocystosis and Fascioliasis infections in slaughtered animals, which are who is to blame for the condemnation of carcasses, organs and offal among Markaz Ashmoon abattoirs and calculating economic losses associated.

## **MATERIAL AND METHODS**

### **Study area**

The present study was conducted during the period January 2020 to December 2021 at seven abattoirs in Markaz Ashmoon, Monufia Governorate, south Nile Delta, Egypt.

### **Slaughtered animals**

A total of 28767 cows, 14499 buffaloes, 145 camel and 2338 sheep were slaughtered throughout the study period.

### **Postmortem Examination**

Slaughtered animals were examined by a qualified veterinarian according to the methods recommended by Meat Inspection Regulation, Egyptian Legal Notice No 517 for (1986), FAO (1994) and Collins and Huey (2015) for the presence of any abnormalities which required partial or total condemnation.

For the presence of parasitic Cysts; visual, palpation and incisions of heart, diaphragm, esophagus, tongue, masseter muscles, liver, lung and shoulder muscles if necessary.

## **RESULTS AND DISCUSSION**

The results given in table (1) revealed that *Cysticercus bovis* prevalence in slaughtered Cows, Buffaloes and Sheep were 68 (0.24%), 160 (1.1%) and 0 (0%), respectively. The results obtained in this study were lower than that recorded by Zdolec et al. (2010), Abay and Kumar (2013), Álvarez (2013), Fahmy et al. (2015), Adem and Alemneh (2016), Assefa et al. (2017), Bekele et al. (2017), Dyab et al. (2017), Nzeyimana et al. (2017) and Geinoro and Bedore (2019) and higher than that reported by Khaniki et al. (2012), Oryan et al. (2012), Yassien et al. (2013), Teklemariam and Debash (2015), Jemal and Kebede (2016), Saeed et al. (2016), Atawalna et al. (2017), Cheru and Zerihun (2017), Faraji et al. (2017), Sara Taha (2018), Hubener et al. (2019), Comin et al. (2021), Kheder and Mohamed (2021), Abd El-Aziz (2021) and Abdel Aziz et al. (2022). The variation in the results obtained may be attributed to environmental, social and economic factors in addition to the methods of breeding, increasing knowledge and decrease illiteracy, discover new and effective antiparasitic drugs, increasing veterinary care and awareness among peasants.

The results given in table (1) revealed that the prevalence of *Sarcocystis* in slaughtered Cows, and Buffaloes were 36 (0.13%) and 90 (0.62%) respectively. The results obtained in this study were lower than that reported by Yassien et al. (2013) in buffaloes while in cattle could not be detected, Nahed Ghoniem et al. (2014), Ahmed et al. (2016), Ibrahim et al. (2018), El-Sharawy (2018) and El-Bahy et al. (2019) in buffaloes while in cattle lower results obtained, Metwally et al. (2014) El-Alfy et al. (2017). These Variation in the obtained results was attributed to either closed system fattening of buffaloes or rearing on free range, spreading of carnivorous. The prevalence of *Fasciola* in slaughtered Cows, Buffaloes and Sheep as given in Table (1) were 84 (2.9%), 65 (0.45%) and 35 (1.49%) respectively. The results obtained were lower than that reported by Yassien et al. (2013), Assefa et al. (2017), Elmonir et al. (2017), Elshraway et al. (2017), Jaja et al. (2017), ,Nzeyimana et al. (2017), Amer et al. (2018), Sara Taha (2018), Odeniran et al. (2020),

Abdel-Aziz et al. (2021 and 2022b), Ola-Fadunsin et al. (2020) and Rassol et al. (2020). These variations in the obtained results were attributed to environmental change, improved awareness, relying on dry fodder and reducing grazing, in addition to resisting snails in canals and rivers. The results given in table (1) revealed that the prevalence of hydatid in slaughtered Camels and Sheep were 18 (12.4%) and 13 (0.55%) respectively. The results obtained were lower than that reported by Rahman et al. (1992), Oryan et al. (2012), Girma (2013), Al-Shaibani et al. (2015), Elmajdoub et al. (2017), Abd El-Aziz et al. (2021), El-Bahy et al. (2019) and El-Dakhly et al. (2019) and higher than that mentioned by Boru et al. (2013), Abbas et al. (2016), Toulah et al. (2017) and Sara Taha (2018). Echinococcosis is the most important parasitic disease which is of medical and public health importance and is found on every continent except Antarctica (WHO, 2022). The variations in the prevalence among different authors were attributed to promote safe handling and disposal of offal, and personal hygiene, wide spread of wild dogs and cats, environmental condition. The results given in Table (2) revealed that the prevalence percentages of the meat borne parasites assessed in this study in relation to the total number of slaughtered animals and infected animals in descending values for *Cysticercus bovis*, *Fasciola*, *Sarcocystis* and Hydatid Cysts were 0.5% - 40.0% ; 0.40% - 32.33% ;0.28% -22.14% and

0.06% - 5. 4%, respectively. The economic losses for the detected parasitic in Egyptian currency as given in tables (3, 4, 5 and 6) and it was estimated by multiplication of the total weight of condemned organs multiplied in kg by current market price in Egyptian currency reached were 24000 LE for head and heart, 8000 LE in both cow and buffaloes respectively due to *Cysticercus bovis* infection the results were lower that reported by Sara Taha (2018) Hiko and Seifu (2019), Henckel et al. (2020). For Hydatid it researched 2250 LE for lung and 1760 LE for liver in both camel and sheep respectively, with total economic losses reached 4010 LE. The economic losses due to *Sarcocystis* infection in cow and buffaloes esophagus reached 2350 LE and for Tongue and muscles reached 2240 LE respectively. Meanwhile the economic loss due to *Fasciola* infection were 33600, 26000,2800 for cow, buffaloes and sheep respectively with total economic loss reached 62400LE. The results obtained were higher than that reported by Abd El-Aziz (2021b) and lower than reported by Yatswakoa and Alhaj (2017), Dahourou et al. (2018) Ola-Fadunsin et al. (2020). Several reports stated that Fasciolosis led to significant economic losses to Livestock, estimated annually by not less than 3 billion USD, through liver condemnation, milk reduction and meat yields (Khaita et al., 1994; Mas-Coma, 1997; Abunna et al., 2010 and Rassol et al., 2020).

**Table (1):** Prevalence of meat borne parasites in slaughtered animals in Markaz Ashmoon Abattoirs, Monufia Governorate:

Cystic type and Parasite	Slaughtered animals species		
	Cows	Buffaloes	Sheep
<i>Cysticercus bovis</i>	68 (0.24%)	160 (1.10%)	-
<i>Sarcocystis</i>	36(0.13%)	90(0.62%)	-
<i>Fasciola</i>	84( 2.9% )	65(0.45% )	35(1.49% )
<b>Cystic type</b>	<b>Camel</b>	<b>Sheep</b>	
Hydatid Cysts	18 (12.4%)	13(0.55%)	

**Table (2):** Total prevalence of surveyed zoonotic parasite:

Parasitic types	Prevalence/Total	Prevalence/Total infected
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	slaughtered animals	animals
<i>Cysticercus bovis</i>	228(0.5%)	228(40.0%)
<i>Fasciola</i> spp.	184(0.40%)	184(32.33%)
<i>Sarcocystis</i> spp.	126(0.28%)	126(22.14%)
Hydatid Cysts	31(0.06% )	31(5.4% )
<b>Total</b>	<b>45745(1.25%)</b>	<b>569 (100.0%)</b>

**Table (3):** Economic losses due to *C. bovis* infection in Markaz Ashmoon Abattoirs:

Animal Species	condemned head	Price /Head	condemned heart	price / heart
Cow	20	6000 LE	48	3840 LE
buffaloes	60	18000 LE	100	8000 LE
Total EL /LE*	24000 LE		11840 LE	
**Over all TEL	35840 LE			

\* EL Egyptian currency

\*\*Total Economic losses

Price for head = 300LE

Price for heart= 80LE

**Table (4):** Economic losses due to Hydatid cyst in Markaz Ashmoon Abattoirs:

Animal Species	No. of condemned lung	Price /lung	No. of Condemned liver	Price /liver
Camel	14	2100LE	4	1600LE
Sheep	5	150LE	8	160LE
Total EL /LE*	2250		1760	
Over all TEL	4010LE			

Price of camel lung /150- Sheep lung /30 EGP (LE)

Price of Sheep Liver /80 EGP (LE)

Price of camel Liver/400 EGP (LE)

Price of camel kidney/70 EGP (LE)

**Table (5):** Economic losses due to *Sarcocystis* infection in Markaz Ashmoon Abattoirs:

Animal Species	No of condemned esophagus	price / esophagus	No of condemned Tongue/ Muscles	price / Tongue/ Muscles
Cow	24	600LE	12	840LE
buffalo	70	1750	20	1400LE
Total EL/organs	2350LE		2240LE	
Over all TEL	4590LE			

Estimated price of Muscles and Tongue=70 LE

Estimated price of esophagus =30LE

**Table (6):** Economic losses due to *Fasciola* infection in Markaz Ashmoon Abattoirs:

Animal species	condemned liver	Weight / Kg	Economic loss/ Egyptian currency
Cow	84	336	33600LE
Buffalo	65	325	26000LE
Sheep	35	70	2800LE
Over all TEL	184	731	62400LE

Price of Cow liver/kg = 100LE

Price of buffaloes liver/kg = 80LE

Price of Sheep liver / kg = 40LE

- These prices according to The Authority of Monufia Governorate as compensatory prices.

## CONCLUSION

Results obtained could be concluded that from the public health point of view *Cysticercus bovis* infection stand on the top flowed by *Sarcocystis* infection of the prevalence for meat borne parasite of slaughtered animals in Markaz Ashmoon abattoirs which need more attention from the authorities responsible for human health to get rid of *Taenia saginata* infestation and not to expose animals, which act as a mediating agent to reduce the infection if the infected meat was undercooked consumed. From a purely economic point of view, infection with *Fasciola* is the cause of the highest loss in the slaughtered animals among parasite infection followed by Cysticercosis. More effort should be done to raise the efficiency of hygienic disposal of condemned parts with eradication of wild carnivores and rodents.

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