

## AN ABATTOIR SURVEY OF METACESTODES AMONG THE SLAUGHTERED RUMINANTS AT AL- QASSIM AREA, SAUDI ARABIA

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Received: 9/11/1998.

Accepted: 10/2/1999.

### SUMMARY

An abattoir survey of a total of 6358 animals slaughtered at Bureidah abattoir, Saudi Arabia, throughout the year of 1997, revealed that 6.0 per cent of 2742 camel, 14.90 per cent of 3045 sheep, 29.48 per cent of 312 goats and 3.08 per cent of 259 cattle were found to be infected with metacestodes. The overall rate of infection with the parasite was 11.32 per cent, being 13.51 per cent for the imported breeds and 9.65 per cent for the indigenous one. The calcified cysts were the most predominant metacestodes (8.57%) among the slaughtered ruminants. The majority of the cysts were found in liver. Both hydatid cysts and *Cysticercus tenuicollis* were recorded with nearly equal incidence (1.27% & 1.25%, respectively). The other metacestodes; *Cysticercus bovis* and *C. ovis* were observed with comparatively lower infection rate (0.13 & 0.29%, respectively). Detailed prevalence of the metacestodes for every positive animals was recorded in the study.

**Key words:** Metacestodes, *hydatid cysts*, *Cysticercus bovis*, *C. ovis*, *C. tenuicollis*, ruminants, camels, cattle sheep and goats, Al-Qassim, KSA.

### INTRODUCTION

Metacestodes is the larval stage of the tapeworms inhabiting in intermediate hosts. The Middle East, southwestern Asia and the Mediterranean coast were considered of high endemic area for metacestode infection (Acha and Szyfres, 1987). The parasite is of economic and public health importance. The most obvious economic losses are caused by the confiscation of the viscera especially livers and sometimes all carcasses and also reduce the meat, wool and milk production. Little information is available on the prevalence of metacestodes in Saudi Arabia. The studies which were carried out during the last 10 years have recorded the existence of *Echinococcosis* and *Cysticercosis* among the slaughtered ruminants at Jeddah (Ghandour et al., 1989, Saleh and Ghandour, 1983).

Hasa region (Cheema et al., 1988) and in Bureidah (Farah et al., 1984 and Al-Saif et al.1997).

This paper reports the incidence of the different species of metacestodes among the slaughtered ruminants at Buriedah abattoir.

## MATERIALS AND METHODS

A survey on metacestodes was conducted from October to December 1997 at Bureidah abattoir. During this period; 6358 animal were slaughtered comprising of 2742 camel; (2362 indigenous and 380 imported); 3045 sheep (857 ind. and 2188 imp.); 312 goats (127 ind. and 185 imp.); and 259 crossbred Friesian cattle (all indigenous).

Each carcasses was examined grossly as well as using technique described by Gracey and Collins, (1992).

## RESULTS

A total of 6358 animals , comprising 2742 camels, 3045 sheep, 312 goats, and 259 cattle, were examined for the existence of metacestodes in a period from October to December, 1997 at Bureidah abattoir. It has been found that the overall infection percentage among the slaughtered ruminants was 11.32%, being 13.51% for the imported breeds and 9.65% for the indigenous one. The most prevalent parasite among the metacestodes was the calcified cyst (Table 2), and it was located mostly in the liver tissue and rarely in the lungs. Both of *hydatid cysts* and *Cysticercus tenuicollis* were recorded

with nearly equal infection percentage (1.27 & 1.25% respectively). The incidence of *Cysticercus ovis* among sheep and goats was slightly higher than that of *C.bovis* collected from cattle (Table 2).

In camels : It has been found that 166 (6.05%) of the examined camels were infected with metacestodes. The incidence was higher in the imported breeds than the indigenous one. The calcified cysts were the most prevalent metacestodes and the liver was more frequently affected than the lungs. The number of the parasite observed in the infected liver varied from one to uncountable number . The cysts were observed on both surface and parenchyma of the organ. The size of the cyst was usually 0.5cm indiameter. *Echinococcosis* was observed in 7 (0.25%) out of 2742 examined camel and the infection was only recorded from lungs .*C.bovis* was observed once (0.07%) in the heart muscle in calcified form.

In sheep: out of 3045 slaughtered animal, 454 (14.90%) were found infected with metacestodes. The infection rate among indigenous breed was nearly double that of the imported one (Table 1). Calcified cysts were the most predominant metacestodes (10.41%), and usually inhabits liver tissues. *Hudatid cysts* were also observed with low infection rate (2.13%), and had the predilection seat in liver, lung, and rarely spleen. *C.ternucollis* was also recorded with the incidence of 2.10% . It was mostly collected from abdominal cavity, mesentery, on the surface of all organs even uterus and urinary bladder. *C.ovis* was rarely detected (0.26%) from sheep



**Table (1):** The number of slaughtered ruminants and the percentage of infection with metacestodes at Bureidah abattoir, 1997.

	Camel		Sheep		Goats		Cattle (Indigenous)
	Ind.*	Imp.	Ind.	Imp.	Ind.	Imp#	
No. Exam.	2362	380	857	2188	127	185	259
Positive No.	100	66	215	239	25	67	8
% of infection	4.23	17.36	25.08	10.92	19.68	36.21	3.08
Total animal Exam	2742		3045		312		259
% of infection	6.05%		14.90%		29.48%		3.08%

**Table (2):** Incidence and infection percentage of different species of metacestodes among slaughtered ruminants at Al-Qassim Region.

Species Parasite	Camel	Sheep	Goats	Cattle	Total
Hydatid cyst +ve No.	7	65	9		81
%	0.25	2.13	2.88	0.0	1.27
C.tenuicollis +ve No.		64	15	1	80
%	0.0	2.10	4.80	0.38	1.25
Calcified cyst +ve No.	157	317	66	5	545
%	5.72	10.41	21.15	1.93	8.57
C.bovis +ve No.	2			2	4
%	0.07	0.0	0.0	0.77	0.13
C.ovis +ve No.		8	2		10
%	0.0	0.26	0.64	0.0	0.29

and it was only collected from the heart muscle.

In goats: the survey on 312 slaughtered goat revealed the high incidence (29.48%) of metacestodes than any other examined ruminants. The infection rate was higher in the imported breed than the local one (Table 1). The incidence of the calcified cyst in goats was the double that of sheep. Also, the infection with *C.tenuicollis* was double that of sheep, while the incidence of *hydatid cyst* in the two hosts was nearly equal (Table 2). *C.ovis* was observed in the heart muscle of two goats giving the minimum incidence of the metacestodes in the host.

In cattle; the collected metacestodes from cattle were; the calcified cyst, as usual the most frequent parasite observed only in liver, *C.bovis* was recorded from 2 (0.77%) out of 259 examined bulls, the infection was in heart and tongue muscles *C.tenuicollis* was observed once in bull and it was located in the perirenal area.

## DISCUSSION

In the present study, the overall infection percentage with *hydatidosis* among the slaughtered ruminants, either imported or indigenous breeds was 1.27%. The achieved results agreed with that reported by Saleh and Ghandour (1983) from Jeddah (1.02%), and Cheema et al. (1988) from Hasa region (01% to 1.22%). The latter authors agreed with obtained result where the infection percentage was higher in the imported breed than the indigenous one. In

contrast, Hassounah and Bahbehani (1976) recorded high incidence rate (39.93%) with *hydatidosis* among the slaughtered animals in Kuwait.

In the present results *hydatidosis* was not observed in the slaughtered cattle. Such findings disagreed with that result recorded by Saleh and Ghandour (1983) and Farah et al (1984) where they recorded *hydatid cysts* from cattle during their studies at Jeddah and Bureidah respectively. Another studies by Ghandour et al (1989) also in Jeddah, where they failed to record *hydatid cyst* from animals other than imported sheep.

The negative results of *hydatid cysts* in cattle during this study may be due to that cattle in Saudi Arabia are not grazing animals as sheep and it was reared indoors. Meanwhil, it was far away from infection. In other countries the incidence of *hydatidosis* in cattle was very high, as in Pakistan (31.05%), Pal et al. (1986), and in India (22%), Kulkarm et al (1986).

In the present study, *hydatidosis* was recorded in 2.13% of the examined sheep and 2.88% of goats. The results agreed with that reported from Bureidah by Al-Saif et al. (1997), in contrast, Saleh and Ghandour (1983) in Jeddah recorded lower infection percentage (0.87%) from the previous two hosts. Also, Ghandour et al. (1989) recorded high infection rate with *hydatidosis* (7.15 to 28%) among the imported sheep in Jeddah. In some Arabian countries as Libya, the incidence of *hydatidosis* in sheep was estimated



by 7.85% (Gusbi et al. 1987). In Morocco, Pandey et al. (1986), reported the infection was 0.7% (ranged 0.4-38.5), while in goats it was 1.4% (ranged 0.2-7.7%).

It has been found that 0.25% of the examined camels at Bureidah were positive for *hydatidosis*, while it was recorded 3.5% in camels that examined at Jeddah abattoir (Saleh and Ghandour, 1983). The present results agreed with the data recorded by Cheema et al. (1988) in Hasa region where the incidence in camels and other animals ranged from (1 to 1.22%). Negative result was obtained from camels that examined in Jeddah (Ghandour et al. 1989). In contrast to the previous results, 80% of camels in Morocco were positive for *hydatidosis* (Pandey et al. 1989).

In the present results the incidence of *C.tenuicollis* ranged from (0% to 4.80) among the slaughtered ruminants with a mean of 1.25%. The obtained results agreed with that recorded by Ghandour et al. (1989) in Jeddah abattoir where they recorded that the incidence among the imported sheep ranged from 0.21 to 1.62% and the other animals were free from infection. In other country as Ethiopia, 37.1% of sheep was found infected with *C.tenuicollis* (Bekele et al., 1989).

The present data revealed that the most common and frequent parasite among the slaughtered ruminants was calcified cyst. The incidence ranged from (1.93 to 21.15%) with a mean of 8.57%. In fact, there was no records about this

problem from the kingdom in the available literatures. The calcified cysts that collected from the infected ruminants were difficult to identify because they were degenerated and calcificated, but they might be *C.tenuicollis* which failed to reach the liver surface and undergo degeneration and calcification (Gracey and collins 1992).

Sometimes the larval stage of *Taenia multiceps* fails to reach the brain tissue and undergo degeneration and calcification in any other organ. In Libya, Gushi et al. (1987) reported 7.96% of the positive cases of sheep infected with hydatid cysts were calcified and sterile.

In the present study both *C.bovis* and *C.ovis* were recorded from the slaughtered ruminants with low infection rate (0.13% & 0.29%) respectively. The parasites were collected only from the heart muscle in calcified form and they were identified only through their predilection seats (heart & tongue muscle). The results agreed with that recorded in Belfast (N.Ireland) where the incidence of *C.bovis*. among cattle in 1989 was 0.4% (Gracey and Collins 1992). Also, similar results were obtained from sheep slaughtered at USA (1989) and UK (1960) where the incidence of *C.ovis* was 0.007% and 0.2% respectively (Gracey and Collins 1992).

The low incidence of metacestodes in Al-Qassim region in related to other countries could be attributed to the unsuitable environmental conditions for the cestodes eggs, where the weather was hot and dry during most of the year.



In addition to the strict hygienic measures that applied in the abattoir reduced the infection of dogs.

## ACKNOWLEDGEMENT

The author would like to thank Dr. M. Al-Saif, Bureidah municipality and Dr.M.Marzouq, the veterinarian of Bureidah abattoir for their kindey assistance during this study.

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