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## ENTEROBACTERIACEAE AMONG SLAUGHTERED CAMELS WITH SPECIAL REFERENCE TO SALMONELLAE

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### INTRODUCTION

Enteric organisms such as Coliforms frequently contaminate meat, indicating that the gut is a common source of contamination. The food poisoning organisms of most concern with meat, Salmonellae and probably enteropathogenic *Escherichia coli* are associated with enteric contamination (ICMST, 1980).

Coliform microorganisms have probably received more attention than most other groups of bacteria occurring in meat for their significance as indicator organisms in the routine analysis necessary for estimating the microbiological quality of meat. Therefore, presence of coliforms may be responsible for the inferior quality grading of meat resulting in economic losses. Moreover, their presence in great numbers may give rise to public health hazard. (Freeman, 1960, THATCHER & CLARK, 1968, and ICMST, 1980).

Foods implicated as vehicles in food-borne illness sometimes contain bacteria of uncertain significance to human health, as *Proteus*, *Providencia*, *Citrobacter*, *Klebsiella*, *Enterobacter*, *Pseudomonas*, *Arizona*, *Edwardsiella* and *Aeromonas*. Some of these intestinal flora are from animals or man, and many of them appear as ubiquitous food contaminants. (BRYAN, 1969).

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Therefore this work based on the isolation and identification of the members of enterobacteriaceae group.

### MATERIAL AND METHODS

A total of four hundred samples, each weighing 25 gm. from each of muscles (Diaphragmatic muscles), liver, mesentric lymph nodes and faeces, were collected from one hundred camels slaughtered at Cairo abattoir. The collected samples were prepared and examined for isolation and identification of members of enterobacteriaceae according to the techniques recommended by Cruickshank, et al. (1975), ICMSF, (1978).

### RESULTS AND DISCUSSION

The present investigations revealed that Enteric groups were commonly isolated from muscles (7.13%), followed by liver (12.56%), mesentric lymph nodes (27.64%) and faeces (52.74%) as shown in Table (1). Such findings were similar to those obtained by Elias (1982) and Yassien (1985).

The high frequency of Enterobacteriaceae in muscles, liver, mesentric lymph nodes and faeces of slaughtered camels may be attributed to the probable contamination from hide, faecal materials and water supply during preparation of the carcasses due to unsatisfactory hygienic measures and or low standards of hygiene and sanitation in the slaughter house. These findings agree with that reported by Newton et al. (1978). In addition, the presence of coliform bacteria in meat is an undesirable finding and possible presence of enteric pathogens may constitute public health hazard for human consumers (FRAZIER, 1967, FRAZIER AND WESTHOFF, 1978).



Table (1)

## Enterobacteriaceae isolated from examined camel's carcasses

Microorganisms	No. of Muscles isolates	% Liver	% Mesenteric lymph nodes	% Faeces	% Total
- <i>Arizona, species</i>	11	-	0.42	8	3.35
- <i>Edwardiella tarda</i>	15	1.26	0.84	5	2.09
- <i>Escherichia coli</i>	122	2.09	3.77	22	9.21
- <i>Klebsiella oxytoca</i>	4	-	0.42	3	1.26
- <i>Klebsiella pneumoniae</i>	15	1.68	0.42	6	2.51
- <i>Proteus morgani</i>	42	1.68	2.92	13	5.44
- <i>Proteus rettgeri</i>	7	-	0.84	2	0.84
- <i>Proteus vulgaris</i>	7	-	0.42	3	1.26
- <i>Salmonella typhimurium</i>	3	-	-	2	0.84
- <i>Shigella boydii</i>	13	0.42	2.51	2	0.84
<b>Total</b>	<b>239</b>	<b>17</b>	<b>7.13</b>	<b>30</b>	<b>12.56</b>
					<b>66</b>
				<b>27.64</b>	<b>126</b>
					<b>52.74</b>
					<b>100.07</b>

*N. Yassien et al.*

In this respect, Arizona have been encountered within cases of diarrhoea, gastroenteritis and enteric fever (FRANKEL et al. 1970). *Edwardsiella tarda* was also found to be responsible for meningitis, liver abscess (FRANKEL et al. 1970). Enteropathogenic *E.coli* have been implicated in cases of gastroenteritis, epidemic diarrhoea in infants, sporadic summer diarrhoea in children as well as in cases of food poisoning (ANON, 1978, HAYDEN et al. 1980 and KORNACHI & MARTH, 1982). Moreover *E.coli* was found to be responsible for cases of cystitis, pyelitis, pyelonephritis, anginocolitis, salpingo-oophoritis, appendicitis, peritonitis, otitis and puerperal sepsis (PYATKIN and KRIVOSKEIN 1980).

On the other hand, food contaminated with *Klebsiella* organisms is found to be implicated in many human infections as respiratory infection, gastroenteritis and urinary infections (HECHELMANN, 1974).

*Proteus* species have been also implicated in cases of summer diarrhoea in infants, sinusitis, otitis as well as urinary tract infection (FRAZIER 1967 & WASSEF 1969).

The most troublesome are probably *Salmonella* pathogens. Outbreaks caused by *Salmonella* from meat and meat products are prominent in the food poisoning, records of various countries (ICMSF, 1980).

The *Shigellae* are not indigenous in foods. However, they cause outbreaks of enterocolitis and have been shown to be transmitted through food or water contaminated by human excretors (HOBBS, 1974, a).

Therefore; strict satisfactory hygienic measures during slaughtering and dressing with high sanitary circumstances are recommended to reduce contamination and spoilage with members of *Enterobacteriaceae* as well as to prohibit or minimize their hazard for human consumers. Therefore, the recommended international codes of hygiene practice for fresh meat (Joint FAO / WHO food standard programme, Codex Alimentarius Commission, CAC/PCP 11/13 - 1976) should be followed.



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### SUMMARY

A total of 400 samples from muscles, liver, mesenteric lymph nodes and faeces, were collected from 100 carcasses of camel slaughtered at Cairo abattoir and examined bacteriologically for the presence of Enterobacteriaceae.

*Escherichia coli* was of the highest incidence (51.05%), followed by *Proteus morganii* (17.57%), *Edwardsiella tarda* and *Klebsiella pneumonia* (6.28% of each), *Shigella boydii* (5.45%), *Arizona* (4.61%), *Proteus rettgeri* and *Proteus vulgaris* (2.94% of each), *Klebsiella oxytoca* (1.68%) and *Salmonella typhimurium* (1.26%).

Public health significance of the isolated microorganisms have been discussed. Recommended measures for attainment fresh meat of good microbiological quality have been mentioned.

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