YERSINIA ENTEROCOLITICA AMONG MUTTON CARCASSES

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ABSTRACT

Y. enterocolitica was recovered from 16 % of the examined slaughtered mutton carcasses in Benha abattoir. The highest recovery rate was reported from the rectal content (16%) followed by the inner surface (12%) and finally the low recovery from the outer surface of carcass (10%).

INTRODUCTION

Y. enterocolitica organism was reported as a new human pathogens, previously named Bacterium *enterocoliticum* 50 years ago in the U.S.A. by **Schleifstein and Coleman, (1939)**. Food of animal origin and water act as a source of the oral infection in man (**Rabson and Koornhof, 1972 and Martin *et al.*, 1982**). Whereas authors had incriminated *Y. enterocolitica* as a meat borne pathogens causing gastrointestinal infection in man (**Hanna *et al.*, 1976; Mollare and Alanso 1979 and Lee *et al.*, 1981**). *Y. enterocolitica* infection in man was studied by **Zen-Yoji and Moruyama, (1972), Schieven and Randall, (1975), Rabson *et al.*,(1975) and Martin *et al.*, (1982)**. Strains of *Y. enterocolitica* were isolated from aborted lamb suffering from acute enteritis (**Brewer and Corbel, 1983**) and also from feces of slaughtered mutton (**Ludes, 1983 and Ludes and Weiss, 1984**). These isolated strains were serologically similar to those pathogenic to man. Moreover, Y. enterocolitica had been isolated from vacuum packaged beef and lamb which stored at 1-3C° and the highest incidence were recorded in cuts packaged under high vacuum condition (**Hanna *et al.*, 1976**). Furthermore, the same organism had been isolated from raw beef and chicken in Barazil and 80% of examined samples revealed Y. enterocolitica, while 60% from ground beef and liver were positive. (**Warnken *et al.*, 1987**).

In addition, it was found that the dominant flora in vacuum packaged Dark Firm and Dry (DFD) meats held at 2 C° for 6 weeks were revealed Y. enterocolitica, *Serratia liquifaciens*, *Salmonella putrefaciens* and *Lactobacillus sp.*(**Gill and Newton, 1979**). Lastly, it was reported that all types of vacuum packaged meats may be regarded as being safe and generally

free from food borne pathogens with the possible exception of Y. enterocolitica and *S. aureus* (**Jay, 1996**).

Therefore, the present study was planned to monitor mutton carcasses slaughtered at Benha abattoir for the presence of Y. enterocolitica.

MATERIAL AND METHODS

Fifty mutton carcasses slaughtered in Benha abattoir were sampled from three sites for detection of *Y. enterocolitica*. The outer and inner surfaces for each carcass were sampled by using 5 sterile swabs for each 50 cm^2 area for each of right and left sides of the carcass. Rectal contents were sampled by taking 10 C.C. of rectal contents in sterile test tubes. All samples were transferred to the laboratory in an icebox with a minimum time of delay. The obtained materials were subjected to the following:

1- Cold enrichment using Phosphate Buffered Saline (PBS) and incubation at 4C° for 4 –12 days according to **Varnam and Evans, (1991)** was applied.

2- Plating on specific media :- A loopful was seeded onto Cefsulodin Irgasan Novobiocin (CIN) medium and incubated at 25C° for 48 hours (**Warlker and Gllmour, 1986**). Suspected *Y. enterocolitica* colonies (having a deep red center " bull eye" surrounded by a transparent border and the edge of the colony was entire or irregular) were subcultured on Trypticase Soya Agar (TSA) slants and incubated at 25C° for 24 hours. The pure culture was subjected to further identification as method recommended by **Krieg and Holt, (1984)**.

3- Identification of *Y. enterocolitica*:

a) Microscopic examination:

Films from the pure suspected colonies were stained with Gram stain and microscopically examined. The organism appeared as Gram negative rods, arranged single or in short chain or heaps.

b) Motility test at 25C° according to **Cruickshank *et al.*, (1975)**.

c) Biochemical reaction: It was done according to **Schieman and Davenish, (1982)** which revealed the reaction on Kligler iron agar, urea hydrolysis and salicin fermentation were sufficient for differentiating *Y. enterocolitica* from other organisms which was able to grow on CIN medium and for distinguishing their pathogenic forms.

d) Biotyping: It was done according to technique recommended by **Wauter, (1970)** and **Abou EL-Ela, (1994)** by using the following tests:-1 – Lecithinase 2 – Indole 3 - Trehalose

RESULTS AND DISCUSSION

*** Frequency of *Y. enterocolitica* in the examined samples:**

Samples	Number	Positive samples	
		Number	Percent
* Rectal contents	50	8	16 %
* Carcass samples :			
- Outer surface	50	5	10 %
- Inner surface	50	6	12 %
Total animal examined	50	8	16 %

The obtained results recorded in the above mentioned table were nearly similar to those reported by **Ludes and Weiss, (1984); Marielli *et al.*, (1985); De Boer, (1986); Ahmed, (1989); Cox *et al.*, (1990); Hamdy *et al.*, (1990); Khalaf-Alla, (1990); Shahat, (1995); Hegazi, (1995); Hafez, (1996) and El-Morsi (1998)**. In this respect **Nielsen and Zeuthen, (1985)** stated that *Y. enterocolitica* was widely distributed in the terrestrial environment and lakes and stream water which are sources of the organism to warm blooded animals. Animals from which *Y. enterocolitica* had been isolated include cats, birds, dogs, beavers, Guinea pigs, rats, camels, horses, chickens, raccons, chinchillas, deer, cattle, swine, lambs, fish and oysters. The fact that *Y. enterocolitica* was recovered from the rectal contents in a higher frequency than from the outer and inner surfaces of carcass; it was reflected the possibility of cross contamination from the already infected rectal contents to the carcass surfaces during evisceration and primary processing. The unhygienic state prevailing at the traditional slaughter houses in Egypt and the neglecting of prevention of contamination during carcass preparation was contributed in contamination. In this respect **Menge *et al.*, (1986)** in a laboratory investigation on mice supports the view of **Gutman *et al.*, (1973)** that the oral route is the possible way for human infection. While **Shayegani, (1986)** reported that *Y. enterocolitica* maintained at low temperature are more likely to be pathogenic when ingested by consumer. Therefore, it could be recommended that cross contamination, must be prevented during abattoir practice and this may be occurred by decontamination for reduction of contamination of meat with *Y. enterocolitica*. From the public health point of view *Y. enterocolitica* lead to pronounced clinical polymorphism, acute

enterocolitis which is the most common symptoms according to statistics, pain in the right iliac fossa interfere with appendixitis. Mescentric adinitis, terminal ileitis, erythema nodosum, with or without abdominal symptoms and reactor arthritis were recorded. Septicemia rarely occurs and usually in patient with another underlying disease. Also it associated with microorganisms cause traveler's diarrhoea syndrome (**Klaus Gerigk, 1985, and Jay; 1996**).

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الملخص العربي

تواجد ميكروب اليرزينيا انتروكوليتكا في ذبائح الضأن

يحيي السيد علي محمود - قسم المراقبة الصحية علي الأغذية

كلية طب بيطري كفر الشيخ - جامعة طنطا

تم عزل ميكروب اليرزينيا انتروكوليتكا من ١٦% من ذبائح الضان بمجزر بنها والتي تم فحصها. وقد وجد أن أعلي نسبة عزل للميكروب كانت من محتويات القولون١٦% يليها السطح الداخلي للذبيحة ١٢% وكانت أقل نسبة عزل من السطح الخارجي ١٠% وقد تم مناقشة النتائج وإظهار خطورة هذه المعزولات علي الصحة العامة وعلي المستهلك لمثل هذه اللحوم.