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YERSINIA ENTEROCOLITICA AMONG SHEEP CARCASES

(With One Table)

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ميكروب اليرزينيا انتيروكوليتيكا في ذبائح الضـــــأن

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تم عزل ميكروب اليرزينيا انتيروكوليتيكا من ٥ر٧٪ من ذبائح الضأن التي تم فحصها . وقد وجد أن أعلى نسبة لعزل الميكروب كانت من سطح الذبائح ٥ر٧٪ يليها السطح الداخلي وكان ٥٪ وبنسبة ٧٥ر٢٪ في محتويات القولون .

SUMMARY

Y. enterocolitica was recovered from 7.5% of the examined slaughtered sheep carcases. The highest recovery rate was from the outer surface (7.5%) followed by the inner surface (5%) and least the rectal contents (3.75%).

INTRODUCTION

Y. enterocolitica organism was reported as a new human pathogen named Bacterium enterocoliticum 50 years ago in the USA by SCHLEIFSTEIN and COLEMAN (1939). The organism was named later as Y. enterocolitica according to BERGY (1984).

Since the last decade several authors had incriminated Yersinia enterocolitica as a meat borne pathogen causing gastrointestinal infection in man (HANNA et al., 1976; MALLARET et al., 1979 and LEE et al., 1981).

Y. enterocolitica infections in man were studied by ZEN-YOJI & MARUYAMA, 1972; SCHIEVEN & RANDALL, 1974; RABSON et al., 1975 and MARTIN et al., 1982. Authors frequently incriminate food of animal origin and water as a source of the oral infection in man (RABSON & KOORNHOF, 1972 and MARTIN et al., 1982) and house hold animals for contact infection (GUTMAN et al., 1973).

Strains of Y. enterocolitica were isolated from aborted lamb suffering from acute enteritis (BREWER and CORBEL, 1983) and also from feces of slaughtered sheep (LUDES, 1983 and LUDES & WEISS, 1984). Two of the isolated strains are serologically similar to those which are pathogenic for man.

The present study was planned to monitor sheep slaughtered at Cairo abattoir for Y. enterocolitica.

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MATERIALS and METHODS

For the purpose of monitoring slaughtered sheep (80 animals) for Y. enterocolitica, the outer and inner surfaces of the carcases were swabbed in double, in addition, the rectal contents were also sampled by taking 10 g of rectal contents in sterile test tubes. All swabs and smaples were transferred to the laboratory in an ice box within 2 hours.

The materials obtained were subjected to :

1- Enrichment using Phosphate buffered saline (P.B.S) according to BREWER & CORBEL (1983) and Trypticase soya broth (T.S.B) according to DUDLEY & SHOTTS (1979).

2- Plating on solid media (DUDLEY & SHOTTS, 1979 and BREWER & CORBEL, 1983) using S.S agar, MacConkey agar and Cellobiosargenine lysine agar plates.

3- Identification of isolates:

- Morphologically using Gram's stain after SWANINATHAN et al. (1982).
- Biochemically according to BERCAVIER and MOLLARET (1984).

RESULTS and DISCUSSION

Obtained results were similar to those reported by LUDES & WEISS (1984). The fact that Y. enterocolitica was recovered from carcase surfaces in a higher frequency than from the fecal samples reflect the possibility of cross contaimination from the already infected rectal contents to the carcase surfaces during evisceration and primary processing. This is because the unhygienic state prevailing at the old slaughter house in Cairo and the neglection of prevention of contamination during carcase preparation.

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 a low tmeperature are more likely to be pathogenic when ingested.

Therefore, it could be concluded that cross contamination, must be prevented during abattoir practice. Moreover, decontamination should be performed for reduction of contamination of meat with Y. enterocolitica.

Table (1): Frequency of Y. enterocolitica in the examined samples.

Samples	No.	+ ve samples	
		No.	%
Rectal contents	80	3	3.75
Carcase:			
Outer surface	80	6	7.5
Inner surface	80	4	5.0
Total animal	80	6	7.5

REFERENCES

Bercovier, H. and Mallaret, H. (1984): Yersinia, P. 498 "Bergey's mannual of systematic bacteriology, Vol. I. Williams and Wlkins, Baltimore, London.

Bergey, (1984): Bergey's manual of systematic bacteriology, Vol. I. Williams and Wilkins, Baltimore, London.

Brewer, R.A. and Corbel, M.J. (1983): Characterization of Yersinia enterocolitica strains isolated from cattle, sheep and pig in the United Kingdom. J. Hyg. Camb., 90: 425-433.

Dudley, M.V. and Shotts, E.B. (1979): Medium for isolation of Y. enterocolitica. J. of Cl. Microb., 10: 180-183.

Gutman, L.T.; Ottesen, E.A.; Quan, T.J.; Noce, P.S. and Katz, S. (1973): An interfamilial outbreak of Y. enterocolitica. New England J. of Medicine, 288: 1372-1377.

Hanna, M.O.; Zink, D.L.; Carpenter, Z.L. and Vanderzant, C. (1976): Yersinia enterocolitica like organisms from vacuum packaged beef and lamb. J. Food Sci., 41: 1254-1256.

Lee, W.H.; Vanderzant, C. and Stern, N. (1981): The occurrence of Y. enterocolitica in foods. In: E.J. Bottone (ed) Yersinia enterocolitica CRG Press Inc. Boca Raton. Fla., p. 161-171.

Ludes, A. (1983): Occurrence of Y. enterocolitica in sheep. Dissertation, Justus Liebig Universität, Giessen.

Ludes, A. and Weiss, R. (1984): Zum Vorkommen von Y. enterocolitica bei Schafen. Berl. Münch. tierarzth. Wochr., 97: 198-202.

Martin, T.; Kasian, G. and Stead, S. (1982): Family outbreak of Yersiniosis. J. Clin. Microbiol., 16: 622-626.

Menge, M.; Ziegler, K.; Skubis, R.; Simes, G.; Hahn, H. and Riecken, E. (1986): The murine Yersiniosis as a model for human Yersinia enterocolitica enteritis. 2nd World Congress, foodborne Infections and Intoxications.

Mollare, H. and Alonso, J. (1979): Summary of the data received at the WHO reference Center for Yersinia enterocolitica. In: Contributions to Microbiology and Immunology, Vol. 15, Y. enterocolitica, Biology, Epidemiology and Pathology, p. 174-184, Basel, Karger.

Rabson, A.R. and Koohof, H.J. (1972): Y. enterocolitica infections in South Africa. S. Afr. Med. J., 46: 798-803.

Rabson, A.R.; Hallett, A.F. and Koornhof, H.J. (1975): Generalized Y. enterocolitica infection. J. of Inf. Dis., 131: 447-451.

Schieven, B.G. and Randall, G. (1974): Enteritis due to Y. enterocolitica. J. of Pediatrics, 84: 402-404.

Schleifstein, J.I. and Coleman, M.B. (1939): An unidentified microorganism resembling B. lignieri and past Pseudotuberculosis and pathogenic for man. New York State J. of Medicine, 39: 1749-1753.

Shayegani, M. (1986): Investigation of food and water borne infections with emphasis on Y. enterocolitica outbreak in new state. 2nd World Congress Foodborne Infections and Intoxications.

Swaminathan, B.; Harmon, M. and Mehlman, I. (1982): Yersinia enterocolitica, A review. J. Appl. Bact., 52: 151.

Zen-Yoji, H. and Moruyama, T. (1972): The first successful isolation and identification of Yersinia enterocolitica from human cases in Japan. Japan. J. Microbiol., 10: 443-500.