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**ROLE OF ABATTOIR EFFLUENTS IN CONTAMINATING  
CARCASSES WITH SOME FOOD POISONING BACTERIA**  
(With Two Tables)

By

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دور الصرف داخل المجازر في تلوث الدبائح بميكروبات  
التسمم الغذائي

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تم جمع ٤٠ عينة من مياه المجارى الداخلية من ٢٠ مجزرا في محافظتي الغربية  
والاسكندرية كذلك ١١٠ مسحة من اللحوم المدبوحة في نفس المجازر وفحصت بكتريولوجيا  
لوجود ميكروبات التسمم الغذائي . لقد تم عزل ميكروبات السالمونيلا والميكروب الذهبي  
المتفرد والميكروب القولوني من مياه الصرف الصحي داخل المجازر وأيضا من الدبائح مما  
يعكس خطورة هذا التلوث ويجب عمل الاحتياطات اللازمة للحفاظ على اللحوم من مثل هذا  
التلوث .

**SUMMARY**

100 body swabs were taken from the exterior surfaces of 50 carcasses (2 swabs from each carcass) produced in the different abattoirs in the vicinity of Gharbia and Alexandria Provinces. In addition 40 swabs were collected from internal sewers inside such abattoirs for investigating food poisoning bacteria.

Salmonella typhimurium, Salmonella enteritidis and Salmonella newport were isolated from meat at a rate of 2,2 and 4% respectively. The same bacteria were also isolated from sewer swabs at a rate of 10,5 and 5% respectively.

Staphylococcus aureus were detected in 75% of sewer swabs and in 10% of meat carcasses swabs. Moreover, E.coli were isolated at a rate of 80% and 100% from meat carcasses and sewers swabs respectively.

Suggested hygienic measures should be undertaken to prevent contamination of meat and environment.

## INTRODUCTION

Meat could be considered as an important vehicle in transmitting food borne diseases from animal to man (ALABOUDI, *et al.* 1987). Some outbreaks of food poisoning were found to be due to consumption of meat contaminated with *Salmonella* organisms (MOUSTAFA, *et al.* 1948; HORWITZ, *et al.* 1977 and GEARTENER, 1988).

*Staphylococcus aureus* is one of the most important pathogens responsible for food poisoning in human beings (JAY, 1970 and SALEM, 1989). *E.coli* was detected also from contaminated meat and incriminated in cases of gastroenteritis in man who consumed such meat (MOUSA and YASSEIN, 1987 and HEGAZY, 1990).

The possible source of meat contamination inside the abattoir is sewage and effluents (MC DONAGH and SMITH, 1958). In Egypt, many abattoirs has the problem in disposal of its effluents owing to the great amount of water drains and the unhygienic measures used in its disposal. The present study was conducted to investigate the role of abattoir sewage in contaminating meat with food poisoning bacteria.

## MATERIAL and METHODS

### I- SWABBING:

#### A) Total body carcass swabs:

From different abattoirs located at Alexandria and Gharbia Provinces, 100 surface meat swabs were wrapped according to HEGAZY (1990). Two swabs were rolled over the surface of each meat surface.

#### B) Effluents swabs:

40 fluid drain swabs were collected from 20 abattoirs located at Alexandria and Gharbia Provinces according to HARVEY and PHILLIPS (1961). Two swabs were collected from each internal sewers inside the slaughter halls.

Of the two swabs from each sample, one was immersed in sterile saline and the other in sterile selenite F. broth solution.

### II- DETECTION OF FOOD POISONING BACTERIA:

#### A) Isolation of *Salmonellae* organisms:

The techniques used in this study for isolation of salmonellae as that described by EDWARD and EWING (1972).

#### B) *Staphylococcus aureus*:

Isolation and identification of *Staphylococcus aureus* was carried out according to MERCHANT and PACKER (1961).

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### C) E. Coli:

Isolation and identification of E.coli was carried out according to EDWARD and EWING (1972) and EL-SHENAWI, et al. (1976).

## RESULTS

Are presented in tables (1 & 2).

## DISCUSSION

The data presented in Table (1) revealed that the meat surface of slaughtered animals was contaminated with salmonella species at a rate of 8%. These findings substantiates that has been reported by GEARTENER (1988) and HEGAZY (1990). Salmonella typhimurium, Salmonella enteritidis and Salmonella newport were the isolates from exterior surface meat at an incidence of 2,2 and 4% respectively (Table 1).

Staphylococcus aureus was isolated at a rate of 20% (Table 1) from meat swabs. The results were nearly similar to those by JOY (1970) and SALEM (1989). On the other hand, E.coli was present in 80% of the examined meat swabs (Table 1) which was in agreement with that recorded by MOUSA and YASSEIN (1987) and HEGAZY (1990). It was clear from Tables (1 & 2) that such organisms isolated from the exterior surface of carcasses were revealed in higher percentages from drains and sewage in abattoirs which were in agreement with that obtained by EL-WAKEEL (1971) and EL-BASSIOUNY, et al. (1989).

Consulting the obtained results, there is no doubt that the isolated organisms affect the keeping quality of meat and hazards to the health of consumer as well. Therefore, improved sanitary conditions in slaughter houses as well as hygienic disposal of such effluents could be helpful in producing meat of good quality and save gaurd the consumer from food poisoning. Moreover, all these measures together with thorough heat treatment of meat before consumption must be borne in mind.

## REFERENCES

- Alaboudi, A.; Nased, R. and Ahmed, N. (1987): Hygienic quality of beef carcasses produced at Mousl abattoir. *Vet. Med. J.*, 35: 73-82.
- Edward, P. and E. Wing, W. (1972): Identification of Enterobacteriaceases. 3rd Ed. Burgess publ. Co. Minneapolis.

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- El-Bassiouny, A.; Saad, S.; Edris, A. and Mousa, M. (1989): Nile fish as a carrier of some fungi and food poisoning bacteria in connection with River Nile pollution by abattoir sewage. *Alex. J. Vet. Sci.*, 5: No. 1: 76-82.
- El-Shinnawi, M.; Sabry, M. and Abdel-Wahab, Z. (1976): A simplified technique for serological typing of E.coli. 13<sup>th</sup> Arab. Vet. Congres Cairo.
- El-Wakeel, M. (1971): Studies on infectivity and disinfection of abattoir sewage. M.V.Sc. Thesis Fac. Vet. Med., Cairo Univ.
- Geartener, A. (1988): *Breslauer art.*, 10, 249, *Korrespbl: arzH Ver. Thuriagen*, 17, 573.
- Harvey, R.W. and Phillips, W.P. (1961): An environmental survey of bake-houses and abattoirs for salmonellae. *J. Hyg. Comb.*, 59: 93-99.
- Hegazy, S. (1990): The role of meat and the its products in transmitting microorganisms causing food poisoning in man. M.V.Sc. Thesis, Fac. Vet. Med., Alex. Univ.
- Horwitz, M.; Rollared, R.; Merson, M. and Martin, S. (1977): A large outbreak of food borne Salmonellosis on Navafo Nation reservation. *Epidemiology and secondary transmission. Amer. J. Pub. Hlth.*, 67: 1071-1080.
- Jay, J. (1970): *Modern food microbiology on meat Hygiene* 4<sup>th</sup> Ed. Lea and Febiger Philadelphia.
- Mc Donagh, V. and Smith, H. (1958): The significance of the abattoir in salmonella infection in Bradford. *J. Hyg. Comb.*, 56: 271-298.
- Merchant, I. and Packer, R. (1961): *Veterinary bacteriology and Virology*. 6<sup>th</sup> Ed. Iowa state Univ. Press. Amer.
- Mousa, M. and Yassein, M. (1987): Enterobacteriaceae of slaughtered carcasses of sheep and goats with special references to salmonellae. *Alex. J. Vet. Sci.*, Vol. 3, No. 1: 57-64.
- Moustafa, N.; Elion, A. and Goehar, M. (1948): Bacteriological and incidence of food poisoning in Egypt. *J. Egypt Med. Associ.*, 13: 556-560.
- Salem, M. (1989): Microflora of Pasterma. M.V.Sc. Thesis, Fac. Vet. Med., Alex. Univ.

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Table (1): Showing the frequency of the isolated food poisoning bacteria.

| Bacteria              | Meat Swabs     |       | Sewer Swabs    |       |    |     |
|-----------------------|----------------|-------|----------------|-------|----|-----|
|                       | No. of samples | +ve % | No. of samples | +ve % | %  |     |
| Salmonella species    | 50             | 4     | 8              | 20    | 4  | 20  |
| Staphylococcus aureus | 50             | 10    | 20             | 20    | 15 | 75  |
| E. Coll               | 50             | 40    | 80             | 20    | 20 | 100 |

Table (2): Showing the percentages of salmonella serotypes isolated from meat and sewer swabs.:

| Type of Salmonella     | Antigenic structure |           |         |                  |                   |   |    |
|------------------------|---------------------|-----------|---------|------------------|-------------------|---|----|
|                        | O antigen           | H antigen |         | Meat Swabs +ve % | Sewer Swabs +ve % |   |    |
|                        |                     | Phase I   | Phase 2 |                  |                   |   |    |
| Salmonella typhimurium | 1,4(5)12            | 1         | 1,2     | 1                | 2                 | 2 | 10 |
| Salmonella enteritidis | 1,9,12              | 9,m       | (1,7)   | 1                | 2                 | 1 | 5  |
| Salmonella newport     | 6,8                 | e,h       | 1,2     | 2                | 4                 | 1 | 5  |