

Isolation of the *Salmonella* Serotype San-Diego from Lymph Nodes of Slaughtered Goats

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ملخص البحث

جمعت عينات من العقد الليمفاوية المساريقية من 78 من الماعز المذبوحة بسلخانة أمدرمان المركزية أجريت عليها عمليات الزرع البكتيري لاستنبات بكتريا السالمونيلا. تم عزل السالمونيلا المعوية، نوع المعوي ذات النمط المصلي سان دييجو (4,12:e,h:e,n,z₁₅) من ثلاث من الماعز (3.84%). تم التعرف على هوية السالمونيلا المعزولة على أساس الخصائص الشكلية و المزرعية والتفاعلات الكيميائية والحيوية والتركيبة المستضدية. شدد البحث على ضرورة تقصي أهمية داء السالمونيلا في الماعز وإظهار أثره على الصحة العامة في البلاد.

Summary

Mesenteric lymph nodes samples were collected from 78 goats slaughtered at Omdurman Central Abattoir and bacteriologically examined for presence of salmonellae. *Salmonella enterica* subspecies *enterica* serotype San Diego, 4, 12: e, h:e,n, z₁₅, was isolated from three animals (3.84%). Identification of the isolated *Salmonella* organisms was based on morphological and cultural characteristics, biochemical reactions and antigenic structure. Its possible undisclosed public health involvement was discussed and the urgent need for an extensive further work on caprine salmonellosis in the Sudan is stressed.

Introduction

Salmonellosis causes great economic losses to animal industry particularly poultry (Khan, 1969) as well as an increased public health problem (Corrier *et al.*, 1990). Although Sudan has great potential as an exporter of refrigerated meat, little bacteriological work has been done in the field of fresh meat (Salih, 1971; Hussein, 1987, Abusalma, 1995). However, previous attempts to isolate Salmonellae from lymph nodes of slaughtered cattle were carried out by Khan (1969), Salih (1971), Adel Rahman (1987), Adam (1989) and Abusalma (1995).

The ratio of *Salmonella* isolation from mesenteric lymph nodes, collected from various animals, may represent two fifths of the actual number of animals examined (Gunee *et al.*, 1964). Moreover,

mesenteric lymph nodes of animals that had traveled for a long distance or were held for several days before slaughter are prone to harbouring *Salmonellae* and, thus, may constitute a source of meat contamination with them. However, 3.1 % of sheep and 3.8% of goats examined were infected with salmonella organisms in India (Kumar *et al.*, 1973). Furthermore, in Nigeria, Okolo (1985) isolated salmonellae from 8 out of 180 (4.44%) samples of market goat meat.

Few reports have been published on caprine salmonellosis in the Sudan; *S. amager*, *S. amersfoort*, *S. derby*, *S. kandla*, *S. muenster*, *S. pomona*, *S. reading* and *S. salford* were incriminated (Khan, 1961, 1962; 1971).

As goats are widely used as a source of milk and meat in the Sudan, this study was carried out to investigate the possible presence of salmonella organisms in the mesenteric lymph nodes of slaughtered goats and to point out their public health hazard.

Materials and Methods

Collection of specimens:

Mesenteric lymph nodes samples were collected in sterile plastic bags from 78 goats slaughtered in Omdurman Central Abattoir. They were labelled and placed in an ice-box, transported to the laboratory and kept in refrigerator at 4°C till cultured within 18 hr. following collection.

Bacteriological examination:

The fat surrounding the lymph node was removed by sterile scissors and forceps. The remaining fat adhering to the node capsule was seared with a red-hot large spatula. The node was thereafter dipped in 95% ethyl-alcohol and flamed twice. Small pieces of the internal lymph node tissue were removed (approx. one gram), dropped into 10ml of sterile selenite broth (Oxoid, CM 396+L121) and incubated for 18-24 hrs. at 37°C. Subcultures were made onto MacConkey (Oxoid, CM7) *Salmonella* *Shigella* (Oxoid, CM99) and desoxycholate citrate (Oxoid, CM 227) agars and incubated overnight at 37°C.

Non-lactose fermenting suspect *Salmonella* colonies were picked up and their pure cultures were tested for their production of

urease, indole, H₂S, and acetylmethylcarbinol, hydrolysis of gelatin and fermentation of glucose, lactose, xylose, mannitol, salicin, maltose, sucrose and adonitol. Identification was carried out according to the methods described by Barrow and Feltham (1993).

Results and Discussion

The three suspect *Salmonella* isolates fermented glucose, maltose, mannitol and xylose and produced H₂S. They failed to ferment lactose, sucrose, salicin and adonitol, to produce indole, acetylmethylcarbinol (VP) and urease, to hydrolyze gelatin and, with exception of one strain, to reduce nitrate. The identity of these *Salmonella* organisms was serologically diagnosed by Salmonella Reference Laboratory (NRL-Sal), Federal Institute of Health and Veterinary Medicine Berlin, Germany, as *Salmonella enterica* subsp. *enterica* ser San Diego; 4, 12: e, h: e, n, z₁₅.

The Sudan has recently become a regular exporter of chilled goat meat to the Gulf States and some other Middle East countries. Blamelessly, relevant earlier reports have primarily dealt with *Salmonella* carrier state in cattle and sheep and its public health hazard to consumers of beef and mutton (Khan, 1969; Salih, 1971; Abdel Rahman, 1987; Adam, 1989; Hussein, 1987; Abusalma, 1995). Thus, the present study had to be carried out to shed more light on the carriage rate of *Salmonellae* in slaughtered goats, although the number of animals examined was small.

The strains of the ser San-Diego, isolated from three out of 78 goats examined (3.84%), represented a percentage of a carrier state that is similar to that reported by Samuel *et al.* (1980), more or less similar to those reported by Zwart (1962) in Ghana, Sharma and Singh (1961) and Kumar *et al.* (1973) in India and, different from those of Smith and Buxton (1951) and Mann (1963) in England and America respectively.

Ser San-Diego was firstly serotyped following its isolation from two patients who were suffering from food poisoning in San-Diego city, USA (Kauffmann, 1940). It had thereafter assumed a world-wide distribution and was isolated from different sources particularly human beings (Kauffmann, 1967). In the Sudan, this is its first isolation from goats. Ironically it can not be confirmed whether

it had any previous involvement in food poisoning or not because identification of *Salmonella* organisms was rarely carried out to the serotype level. However, the Ser Dublin was once held responsible for an incidence of food poisoning following consumption of improperly cooked beef (Horgan, 1947). In addition, carcasses harbouring salmonellae may contaminate other animal carcasses during dressing operations, meat inspection procedures or transportation to butchers shop, restaurants, etc. (McDonagh and Smith, 1958; Kumar *et al.*, 1973; Okolo, 1985; Abusalma, 1995).

The present report is most alarming especially for the sector of the public that includes butchers, veterinarians, public health workers, people who are involved in the trade of goat meat, and those who are in the habit of eating raw goat livers- seasoned with lime juice, bile and spices, and/or partially cooked goat meat. Moreover, it is hoped that this study would direct the attention of scientific investigators towards an animal that had received little attention and confronts them with a situation where there is no room for complacency.

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