

ISOLATION OF *SALMONELLA* SPP. FROM SLAUGHTERED SHEEP IN BASRA

Wessam M. Mohammed Saleh,

Department of Internal Medicine, College of Veterinary Medicine, University of

Basrah, Basrah Iraq

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ABSTRACT

This study was carried out for detection of *Salmonella* isolates from 309 different apparently healthy samples (97 fecal, 71 bile, 102 intestinal content, 18 livers and 21 spleen) collected from slaughtered sheep in a slaughterhouse in Basra during the period between September to November 2010. The results revealed that the incidence rate of *salmonella* isolates in fecal samples was 7.2 %, in bile samples 8.5 % and in intestinal content 9.8%.

While no isolations were obtained from the liver and spleen samples.

The total positive sample of salmonella isolates was 23 (7.4%).

INTRODUCTION

Salmonellosis is a disease caused by a wide variety of *salmonella* in various hosts including human beings, this disease is also considered as an important bacterial disease in sheep (1).

Intensive livestock production is associated with an increased incidence of salmonellosis, the risk of infection and the subsequent public health concern is attributed to increased pathogen exposure and disease susceptibility due to multiple stress experienced by livestock from farm to feedlot (2). Animal exhibits an important source of food chain contamination with different food poisoning micro-organism due to direct and sometime close human – animal contact (3). *Salmonella* Spp. One of the common serotypes in sheep carcasses getting contamination from visceral organ, bladder, intestine and liver which can be transferred from meat to human (4).

Salmonella which remains as a serious problem with public health significance throughout the world (5).

Which causes infection in all ages of sheep and responsible for a considerable loss in lambs (6).

While many other *salmonella* Spp. May cause disease, the most common once in sheep and goat are as follows: *S. Typhimurium* , *S. Dublin* , *S. Anatum* , and *S. montevideo* (7).

The genus *Salmonella* Spp. Comprises approximately 2,200 serotypes and although infection by *Salmonella typhimurium* is the most common cause of food poisoning in Europe, America and Australia, *S. enteritidis* has exceeded those due to *S. typhimurium* in Britain. (8).

The aim of this study was to determine the incidence of *salmonella* isolates in fecal, bile, intestinal content, liver and spleen samples from slaughtered sheep in Basra.

MATERIALS AND METHODS

The present work was under taken to isolate and identify *salmonella* isolates from apparently healthy Iraqi Arabi sheep through cultural, morphological and biochemical characterization, from different carcass points.

A total of 307 of sheep samples (97 fecal, 71 bile, 102 intestinal content, 18 liver and 21 spleens) were collected from slaughtered house in Basra and transmitted immediately to clinical pathology laboratory in Internal Medicine Branch in Veterinary Medicine College, University of Basra during the period from September to November 2010.

Collection of samples:

Fecal samples were collected directly from the rectum by placing agloved hand in rectum and obtaining a small quantity of feces that was immediately placed in a sterile containers and transported to laboratory for bacteriological examination. While bile, intestinal content (lower ileum and large intestine), liver and spleen samples were collected after slaughtering and evisceration of the carcasses. Samples were then transferred to laboratory for bacteriological isolation of salmonella micro-organism.

Culture:

The presence of *salmonella* in samples were detected using selective enrichment media (tetrathionat broth) and incubated at 37°C for 24 hours then subculture on *salmonella – shighella* agar (SSA) and Brilliant green agar (BGA) with incubation at 37°C for 24 hours.

Colony characterization of *salmonella* on *salmonella – shighella* agar and brilliant green agar were similar to those reported by (9),and (10).

Biochemical test:

Suspected colonies (may not agglutinate) were tested biochemically and confirmed serologically by using polyvalent O and H *salmonella* antigens (11).

Table (1) Biochemical test for isolates.

Test	Substrates	Enzymes Reaction	Negative	Positive
ONPG	artheo-nitrio phenol glycoside	Betacalactosidase	no color	yellow
ADH	Argenin	argenin dihydrolase	Yellow	red-orange
LDC	Lysine	lysine decarboxylase	Yellow	orange
ODC	Orthenin	orthenin decarboxylase	Yellow	blue greenish /green
CIT	sodium citrate	citrate utilization	Green	black
H ₂ S	sodium thiosulfate	H ₂ S production	no color	red-orange
URE	Urea	Urease	Yellow	dark brown
TDA	Trptophan	trptophan deaminase	Yellow	red ring
IND	Trptophan	indol production	yellow ring	pink - red
VP	sodium pyrovate	acetone production	no color	change in color
GEL	Cohen blatin	Algelenase	black	yellow
GLU	Glucose	oxidation / fermentation	blue / blue greenish	yellow
MAN	Mannitol	oxidation / fermentation	blue / blue greenish	yellow
INO	Inositol	oxidation / fermentation	blue / blue greenish	Yellow
SOR	Sorbitol	oxidation / fermentation	blue / blue greenish	Yellow
RHA	Raphenol	oxidation / fermentation	blue / blue greenish	Yellow
SAC	Sucrose	oxidation / fermentation	blue / blue greenish	Yellow
MEL	Selebose	oxidation / fermentation	blue / blue greenish	Yellow
AMY	Amcdalin	oxidation / fermentation	blue / blue greenish	Yellow
ARA	Arabinose	oxidation / fermentation	blue / blue greenish	Yellow

Serological testing

A standard antisera polyvalent O and H *Salmonella* antigens were used in this test according to the method of (12) as a follow:

1. Two drops of saline solution were placed on a cleaned slide and each drop was mixed with turbid suspension of *Salmonella* growth.
2. To one suspension the antisera was added and the other remain as control.
3. Appearances of agglutination after one minute indicate appositve result.

RESULTS

In order to determined the incidence rate of *salmonella* isolates from different slaughtered sheep samples, a total of 309 different samples were examined during the present study. The incidence of *salmonella* in fecal samples (7.2%), bile samples (8.5%) and intestinal content (9.8%) were reported in Table (2). It was further observed from the present study that the *salmonella* isolates were not obtained from liver and spleen samples.

The higher rate of *salmonella* spp. isolation was observed in intestinal contents (9.8%).

Taking in to consideration all the *salmonella* isolates, the total incidence rate was 23 (7.4%).

The results of *salmonella* isolation shown in table (2).

Table (2): Distribution of *salmonella* isolates from different slaughtered sheep tested samples.

Type of samples	Number of samples tested	Number of samples found positive	Incidence rate (%)
Fecal samples	97	7	7.2%
Bile samples	71	6	8.5%
Intestinal samples	102	10	9.8%
Liver samples	18	0	0%
Spleen samples	21	0	0%
Total	309	23	7.4%

$$\chi^2 = 3.4$$

Statistical analysis by mean of χ^2 revealed no significant differences between samples.

Identification of isolates:

Salmonella isolates were identified by biochemical agglutination test as in the following table:

Table(3) Results of biochemical tests and agglutination test for *Salmonella* isolates:

Test	Sample				Spleen samples
	Fecal samples	Bile samples	Intestinal samples	Liver samples	
ONPG	-	-	-	-	-
ADH	+	+	+	-	-
LDC	+	+	+	-	-
ODC	+	+	+	-	-
CIT	+	+	+	-	-
H ₂ S	+	+	+	-	-
URE	-	-	-	-	-
TDA	-	-	-	-	-
IND	-	-	-	-	-
VP	-	-	-	-	-
GEL	-	-	-	-	-
GLU	+	+	+	-	-
MAN	+	+	+	-	-
INO	+	+	+	-	-
SOR	+	+	+	-	-
RHA	+	+	+	-	-
SAC	-	-	-	-	-
MEL	+	+	+	-	-
AMY	-	-	-	-	-
ARA	+	+	+	-	-
Agglutination test	+	+	+	-	-

DISCUSSION

Salmonella infection in sheep continues to be a significant problem in intensive production systems (13).

It cause substantial economic loss both directly through mortality, carcasses condemnation, and poor growth after clinical disease and in directly from animal carriage leading to cause of human *salmonella* infection which is a serious food-borne infection in man (14). To obtain more information of the prevalence of salmonella infection of sheep a more extensive study was initiated, in addition to obtaining better data on the prevalence of salmonella infection of sheep we were also interested in tracing the origin of the infection, i.e. whether the singed sheep heads got contaminated in the slaughterhouses during the processing or if the sheep were infected in the field.(15). Therefore this study aimed to find *salmonella* spp. Isolates from local slaughtered sheep in Basra.

Our findings of *salmonella* infection (total positive samples) were (7.4%) which is in the line of (16) who reported (3.24%), (17) who reviled (13.1%) , (18) record (10%) , and (1.3%) in (15).

Our results have shown a low incidence of *salmonella* infection in Iraqi Arabi sheep in Basra, because of that infection in sheep is apparently rare (19), however; the disease was very important because of the contamination of the products can often be traced to slaughtering and processing, it is well known that animals can be healthy carriers of salmonella (20), (21).

There are some sporadic reports of the occurrence of salmonella infection in sheep (22) reported 33.3%, and same results in (20),(23).

In this study, the highest incidence rate of salmonella isolation was obtained in intestinal samples. This finding may due to rout of infection, it is usually orally and after infection the organism multiplies in the intestine and cause enteritis (7).

There are no *salmonella* isolates from tested samples of liver and spleen; these results may be due to absence of *salmonella* in these organs or there is no contamination during slaughtering and processing of sheep meat (mutton), the occurrence of pathogens such as *salmonella* in lamb and other animal carcasses varies greatly, the overall contamination of meat with these pathogens depended not only on the prevalence and numbers of the pathogens on hair, skin, and in the intestinal tract of the animal, but is also significantly affected by the degree of cross-contamination occurring from these sources during slaughter and processing (24).

عزل جراثيم السالمونيلا من الاغنام المذبوحة في مجزرة البصرة

وسام منذر الدغمان

فرع الطب الباطني والوقائي، كلية الطب البيطري، جامعة البصرة، البصرة، العراق.

الخلاصة

اجريت هذه الدراسة لعزل جراثيم السالمونيلا من 309 عينة جمعت من الاغنام السليمة ضاهريا والمذبوحة في مجزرة محافظة البصرة (97 عينة براز ، 71 عينة من الصفراء ، 102 عينة من محتويات الامعاء ، 18 عينة من الكبد و 21 عينة من الطحال).
اظهرت النتائج ان نسبة عزل جراثيم السالمونيلا في عينات البراز هي 7,2% وفي عينات الصفراء كانت نسبة عزل السالمونيلا 8,5% بينما كانت نسبة عزل السالمونيلا في عينات محتويات الامعاء 9,8%. اما عينات الكبد والطحال فلم نلاحظ فيها اي نسبة عزل لجراثيم السالمونيلا.
وان نسبة عزل جراثيم السالمونيلا من مجموع العينات المفحوصة هي 7,4% (23 عينة).

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