

## The Bacteria contamination of red local meat and white imported meat in Samaraa and Al-Dour districts

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### Abstract

This work conducted to detect the presence of some types of microbial contaminants in local red meat (beef and sheep) and imported white meat found in local markets in Samaraa and Al-Dour district. Were two hundred samples were collected randomly from samara and Al-Dour within Salah Al Din province the samples were planted on different planting medias to show the presence of bacterial contaminants likely to be found in the studied meat samples, The results showed the highest contamination of beef meat with *staphylococcus aureus* 12.07%, *staphylococcus epidermidis* 3.45%, *E-Coli* 10.43%, *Salmonella* 8.62% and *Bacillus* 1.72%. For sheep meat the highest contamination with *staphylococcus* was 6.90%, *E-Coli* 6.90%, and *Salmonella* 3.45% while did not appear any contamination in *staphylococcus epidermidis* and *Bacillus* in sheep meat. In poultry imported meat , *staphylococcus aureus* conducted high percentage of pollution in three types of imported meat :American 6.90%, Turkish (Goza) 6.90% and Turkish(Asma Uglo)5.17% while Brazilian chicken conduct lowest percentage of pollution was1.72%. About *E-Coli* the percentage were high in the four type of white imported meat. *Salmonella* did not showed any percentage of pollution in three types of white imported meat except the American type (drum stick) was3.45%. Also about *Bacillus* did not showed any percentage of pollution in three types of white imported meat except the American type (drum stick) was3.45%.

**Key words** :( meat contamination, red meat, white meat, *staphylococcus aureus* , *Salmonella*, *staphylococcus epidermidis* )

### Introduction

Meat is a perishable substance because of the biochemical reactions caused by enzymes during the formation and maturation of the food tissue from the one hand, on the other hand, meat is vulnerable to attacking microorganisms (1989، السلمي واخرون).

That is for this reason, meat industry is important because it play important role in transforming perishable meat into more stable substances, they prevent or delay food corruption at least by using low heat , high temperature , radiation, shortwave and other methods used in food (2004، القيسي واخرون).

The most important contaminants of meat are salmonella and bacteria staphylococcus aureus that grow on food and produce toxic toxins to public health.

Meat can be a medium to transport pathogenic microorganisms without helping to grow such as tuberculosis and cholera, or to be a center of growth and access to a number of its susceptibility to infections as in salmonella(2000، الشوابكة واخرون).

So the study aimed to:

- To Know the bacteria content of these meat from *staphylococcus*, *E.coli*, *salmonella* and *bacillus* in imported chicken meats

-Know the bacteria content of these meat from *staphylococcus*, *E.coli*, *salmonella* and *bacillus* in beef and sheep meat

-Study the replication of these bacteria in two areas in Salah aldin ( Samarra , Al- Dour)

### Materials and method

The study included (200 samples) of local red (beef and sheep meat) from (butchers shop) collected from (Samaraa and Al- dour) in Salah Al Din province. and four types of imported white meat: American(drum stick) Brazilian (Sadia) Turkish(Goza) and Turkish (Asma uglo) collected from the markets in Samara an Al-Dour.

Plant and count the bacteria were according to (مهدي 1987) method:

- 1- The samples were subjected to scanning directly into the laboratory and when we can't we put it in the refrigerator to complete work on the second day.
- 2- The samples were sliced in a grinder machine to obtain a homogeneous sample.
- 3-We add 25g of meat sample to 225ml of the physiological salt solution and mixed with the mixer at 2000r/min for 3min.

- 4-We took 1ml of the first dilution and added to the tube containing 9ml of physiological dilution to obtain the desired dilution.
- 5-One ml of the base model was transferred (in a sterile conditions) were applied to the petri dish and the refractory was each diluted.
- 6-In sterile conditions, added 15-20 ml of medium to each petri dish and mix well with the model by moving the dish forward, back, left and right in a circular way, then wait until the center became hard.
- 7-Incubate the dishes upside down in the incubator at 37°C for 24hrs.
- 8-After the incubation period was completed, the number of constituent units was calculated.
- 9-Bacterial isolates were identified using biochemical diagnostic tests.

Planting Media : according to (هاشم، 2005)

#### 1-Mannitol salt agar:

Used as an electrophysiological medium to isolate staphylococcus bacteria with the present (NaCl) in concentrate 7.5%. Received by (H-media) indian company.

#### 2- Salmonella agar:

Used as an electoral medium to isolate salmonella bacteria received from (H- media) Indian company.

### Preparation of cultivation:

#### 1- Mannitol salt agar:

Prepared this medium with a liquefaction of 111g in 1L of distilled water and heated until boiling to dissolve the mixture and adjust the pH to 7.4, after sterilization, refrigerate the medium into 45-50 in a water bath and distribute in Petri dishes and leave to be hard.

#### 2- Salmonella agar:

Prepared by dissolve 60g of medium in 1L of distilled water and protect until boiling with continuous mix, then wait until be cool and put it in a Petri dishes

## Results and discussions

### 1: Percentage of local beef meat contamination with bacteria in samara district

The results of this study showed the presence of bacterial contamination in five bacterial strains of beef in samara district , *staphylococcus aureus* were isolated by 3% , 12.07% and 8.62 % respectively compared with local studies , this results don't agree with (حمزة 2010، واخرون) found , as the percentage of isolation was 34.4% in beef meat . While it was higher than what (2006، الجهاز المركزي للتقييس والسيطرة النوعية) found , it was 5.55% . the contamination of carcasses by *staphylococcus aureus* , came from either the animal itself or from the hands of the cutters so the intensification of awareness of health and care during the meat trading is important to reduce pollution .

Well for *staphylococcus epidermis*'s we noticed the high percentage was in beef meat 12.07% this may be due to the length of time the animal is exposed to contaminants due to aging.

As for the *E-coli* , it was isolated in percentage 2% , 10.34% and 5.17%, respectively compared with the local studies, it was much less than what (الاسود، 1987) found it was 80% in minced beef meat . That is may be due to the low numbers of cattle carcasses.

Also Salmonella Spp. was isolated in 2% 8.62% and 5.17% respectively this difference in percentage may be due to different age of slaughtered animals.

Finally, Bacillus Spp. was isolated in 1%, 1.72% and 0.00%, respectively. It is not agree with (Bergdoll, et al 1990) he found the isolated 22.4% the source of meat contamination in bacillus spp either from the contents of the intestine or the surrounding environment (Oauttara et al , 2002).

**Table 1.** Percentage of local beef meat contamination with bacteria in samara district (%)

Local	Samples	Mannitol salt agar		Salmonella shigella agar		
		staph. Aureus	Staph. epidermidis	E.coli.	salmonella Spp.	Bacillus Spp.
Sammaraa	Calf meat 3 months age	3	1	2	2	1
Sammaraa	Calf meat 1 year age	12.07	3.45	10.34	8.62	1.72
Sammaraa	Minced calf meat	8.62	1.72	5.17	5.17	0.00

### 2: Percentage of local sheep meat contamination with bacteria in

#### Al-Dour district.

The results of this study showed the presence of bacterial contamination in five bacterial strains of sheep in Al-Dour district , the isolate of *staphylococcus aureus* showed 6.90% , 6.90% and 3.45% in sheep meat (10months) , (12months) and ( minced meat), respectively. The minced meat was conducted the low percentage and it was low than (12, 13) found 23% in

sheep meat inspite of the low percentage but always prefer to intensify awareness of health among employees and care and hygiene during meat trading to reduce pollution. As for staphylococcus epidermis's isolate did not show a percentage of it in three types of meat .

E-coli isolate was 0.00 % , 6.90% and 3.45% respectively, this percentage was much low than (Chang et al , 2007) found it was 29.2%. It is may be because

the carcasses wash after the removal of bowels (Alfred et al, 1971).

*Salmonella* isolate was 0.00% , 3.45% , 0.00% respectively the contamination appeared just in sheep meat (12 months) it was high than the percentage isolate (Fox et al, 1987) found it 2% in Baghdad , and low than (Acottand et all, 1975) found in Mousl it was 7% , this

difference may be due to the applicability of the applicable health conditions. Finally didn't appear isolated percentage in *Bacillus* in three types of meat , that is may be because of the removal of the contents of the intestines from the carcass as an important source of *bacillus* infection.

**Table 2.** Percentage of local sheep meat contamination with bacteria in Al-Dour district (%)

Local	Samples	Mannital salt agar		Salmonella shigella agar		
		staph. Aureus	Staph. epidermidis	E.coli.	salmonella Spp.	Bacillus Spp.
Door	Sheep meat 10 months age	6.90	0	0.00	0.00	0.00
Door	Sheep meat 1 year age	6.90	0	6.90	3.45	0.00
Door	Minced meat 3 years age	3.45	0	3.45	0.00	0.00

### 3: Percentage of imported chicken meats contamination with bacteria in Samaraa and Al-Dour districts.

The results of this study showed the presence of bacterial contamination in five bacterial strains in four types of imported chicken meats , so the isolate of *staphylococcus aureus* showed a percentage 6.90% , 1.72% and 6.90% , 5.17% to the four types of imported chickens meats , the lower percentage was in (Sadia) chickens . These percentages were agree with the results of (Desrosier et all, 1975) he note the fluctuation in the numbers of *staphylococcus aureus* in frozen chicken meat in the market. This is due to the pollution that may occur as a result of the process of packaging or trading as well as the process of transport and the time spent and temperatures used during storage in the local markets. As well as the value of the PH may be the cause of the growth of these bacteria because they cannot live in conditions with the pH close to the neutral (Ranjan, 2007).

As for *staphylococcus epidermidis* the isolate show low percentage it was 1.72% to the three types of imported chicken meats while the percentage in American chicken was 0.00 % . despite the little percentage of these bacteria, but their presence in the samples under study in our climatic and environmental conditions of the hot atmosphere and power outages lead

to the development of these bacteria quickly compared to environment of the importing countries.

For E-Coli bacteria the isolate show high percentage in Turkish chickens 6.90% while the low percentage was in Brazilian chickens 3.45% this may be due to not exposure to suitable environment stress, making them vulnerable to low temperature resistance (Noyes, 1969) which lead to a decrease in the number of bacteria in frozen storage, it means the freezing was not correct because of the power outages.

The results of Table (3) free of salmonella except the American imported chicken sample it was 3.45% , were found to be in violation of the Iraqi standards (Central Organization for Standardization and Quality Control,2006) the frozen chicken should be completely free from salmonella .

Also Table (3) showed the samples free from *bacillus* except the American imported chickens showed 3.45%, the reason may be due to the lack of safety of the equipment and not follow the health conditions properly, as well as pollution during transportation in the hot weather conditions and long exhaustion that takes in the transport vehicles until the arrival to the consumer because of the current conditions of the country.

**Table 3.** Percentage of imported chicken meats contamination with bacteria in Samaraa and Al-Dour districts (%)

Local	Samples	Mannital salt agar		Salmonella shigella agar		
		Staph. Aureus	Staph. epidermidis	E.coli.	salmonella Spp.	Bacillus Spp.
Samaraa/AL-Dour	drum sticks	6.90	0.00	5.17	3.45	3.45
	American					
Samaraa/Al-Dour	Sadia Brazilian	1.72	1.72	3.45	0.00	0.00
Samaraa/AL-Dour	Goza Turkish	6.90	1.72	5.17	0.00	0.00
Samaraa/AL-Dour	Asma Oglo Turkish	5.17	1.72	6.90	0.00	0.00

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## التلوث البكتيري في اللحوم الحمراء والبيضاء المحلية والمستوردة في قضاء سامراء والدور

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اجريت هذه الدراسة لغرض الكشف عن وجود بعض أنواع الملوثات الجرثومية في اللحوم الحمراء المحلية في العراق (لحوم ابقار وأغنام) والبيضاء المستوردة الموجودة في الاسواق المحلية في قضائي سامراء والدور ، حيث تم جمع 200 عينة وبصورة عشوائية من قضائي سامراء والدور ضمن محافظة صلاح الدين . زرعت النماذج على أوساط زرعية مختلفة للكشف عن وجود بعض الملوثات الجرثومية التي من المحتمل تواجدها في أنواع اللحوم المدروسة وأظهرت النتائج أعلى تلوث للحوم العجول بالمكورات العنقودية 12.07% والمكورات العنقودية البشروية 3.45% والأيشيريشيا القولونية 10.34% والسالمونيلا 8.62% والباسلس 1.72%. أما بالنسبة للحوم الأغنام فان أعلى تلوث لها بالمكورات العنقودية الذهبية 6.90% والاشريشيا القولونية 6.90% والسالمونيلا 3.45% بينما لم يسجل أي تلوث في المكورات العنقودية البشروية والباسلس في لحوم الاغنام .اما بالنسبة للحوم الدواجن فان المكورات العنقودية الذهبية سجلت نسب تلوث عالية تقريبا في الانواع الثلاثة من لحوم الدجاج المستورد الأمريكي 6.90% والتركي (كوزة) 6.90% والتركي (اسما اوغلو) 5.17% بينما سجل الدجاج البرازيلي اقل نسبة تلوث بلغت 1.72% ، أما بالنسبة لبكتيريا الأيشيريشيا القولونية فقد كانت مرتفعة في الانواع الأربعة من اللحوم المستوردة ، أما السالمونيلا فلم يسجل تلوث بها بالأنواع الثلاثة باستثناء اللحم الأمريكي فقد سجل نسبة تلوث 3.45% وكذلك بالنسبة لبكتريا الباسلس أيضا فانه لم تظهر نسب تلوث بالأنواع الثلاثة من الدجاج باستثناء اللحم الأمريكي فقد سجل نسبة تلوث بلغت 3.45% .

الكلمات المفتاحية: ( تلوث اللحوم، اللحوم الحمراء،اللحوم البيضاء، بكتريا القولون، المكورات العنقودية الذهبية، السالمونيلا)