

**Republic of Iraq  
Ministry of Higher Education  
& Scientific Research  
University of Al-Qadissiya  
College of Veterinary Medicine**



# **Isolation and Detection of Bacteria genus in the urine of Dairy cattle**

A Graduation Project Submitted to the Department  
Council of the Internal and Preventive Medicine-College  
of Veterinary Medicine/ University of Al-Qadisiyah in  
partial fulfilment of the requirements for the Degree of  
Bachelor of Science in Veterinary Medicine and Surgery.

**By  
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**1439 A.H.**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

فَنَعَلَى اللَّهِ الْمَلِكُ الْحَقُّ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَىٰ  
إِلَيْكَ وَحْيُهُ، وَقُلْ رَبِّ زِدْنِي عِلْمًا ﴿١١٤﴾

صَدَقَ اللَّهُ الْعَظِيمُ،

من سورة طه

# **Certificate of Supervisor**

I certify that the project entitled (**isolation and detection of bacteria in the urine of dairy cattle**) was prepared by **Muamar Fouad** under my supervision at the College of Veterinary Medicine / University of Al-Qadissiya.

Supervisor

**Dr Ghassan Al-Khuzaay**

Dept. of Int. And Prev. Med

Coll. Of Vet. Med/ Univ. of Al-Qadisiyah.

/ 03 / 2018

## **Certificate of Department**

We certify that **Muamar Fouad** has finished his/her Graduation Project entitled (**isolation and detection of bacteria in the urine of dairy cattle**) and candidate it for debating.

**Dr.Ghassan Al-Khauzaay**

/ 03 / 2018

Head of Dept of Int. And Prev. Med.

**Dr. Muthanna H. Hussain**

20 / 03 / 2018

# Dedication

## الاهداء

إلى معلم البشرية الاولى وهاديتها، إلى النور المبين رسول الله صلى الله عليه وآله وسلم....

وإلى من رضا الله برضاها، أبي و أمي إلى سندي في شدتي ورخائي ...

إلى اللذين ينظرون إلى بعين الفخر، أخوتي وأخواتي

إلى من تابعتني ووجهني ونصحتني حتى اتممت بحثي الى استاذي أفاضل

إلى من لولا هم لما كنا نكمل حياتنا ....شهداء الحشد الشعبي المقدس  
إلى بلدي العراق الحبيب ...

أهدي ثمرة جدي المتواضع

الباحث

معمر فؤاد طالب

## Acknowledgement

شكر وتقدير

اتقدم بالشكر الجزيل الى اساتذتي في جامعة القادسية/كلية الطب البيطري لجهودهم المتميزة خلال سنين الدراسة ولتوجيهاتهم لي اثناء كتابة البحث فجزاهم الله خيرا عن العلم وأهله...

كما أسجل شكري وتقديري الى استاذي المشرف (م. غسان خضير اسماعيل) لما احاطني من رعاية علمية وما بذله من جهد ثمين، ومنحني ثقة وإيمان بالعمل...

وأنتقدم بالشكر الجزيل ووافر الامتنان للجنة المناقشة التي تحملت عناء قراءة البحث وتعزيدها لما قد يعتبر من زلل او خلل فجزاهم الله خير الجزاء...

والى جميع اساتذتي في جامعة القادسية/كلية الطب البيطري.

وبالأخص (م. جنان ناظم صادق، م. زينة فؤاد صالح)

اما من خارج كادر الكلية اتقدم بالشكر الجزيل الى كادر محطة تاج النهرين على رأسهم الاستاذ المهندس علي ... والطبيب البيطري علي نائر والمضمد البيطري محمد وزميلي مصطفى صبار على مرافقته لي اثناء عملي الميداني، وأتقدم بالشكر الجزيل لكل من مد يد العون من التوجيه وتوفير المصادر

الى كل هؤلاء شكرا جزيلا

## Summary:

The A current study aims to investigate in bacterial infections of the urinary system in dairy cattle in AL-Qadisiyah governorate and differential among them and identification of causative agents. Our study was done by collecting thirteen urine samples randomly from dairy cattle from several regions from AL-Qadisiyah province. The area is including Al-Dhagara city, Al-Mhanawi city and AL Badiar city. All samples submitted to the culture on nutrient agar for enrichment, after the culture was done, tested by several biochemical tests to confirm the diagnosis of an eitological agent such as catalase, oxidase and coagulase after stain it by gram stain to see its type, shape and arrangement under a microscope. Results of our study showed total contamination is (29/30) 96.6% by bacteria. Its included *E.coli* is (21/29) 72.4%, *Staphylococcus spp* was (1/29) 3.4%, *Kelpsella spp* was (2/29) 6.8%, and *Corynebacterium spp* was (5/29) 17,2%. the current study are showed the infection by *E.coli* is higher percentage while the infection by *Staphylococcus spp* showed lower rate as compared with another bacteria.

## Introduction

The people over the world kept with dairy cattle especially close to urban areas. The dairy cow is a very valuable animal. The biggest risk is losing the animal by diseases that infect all bodies tissues. Low productivity of milk and meat occurs due to a bacterial infection will also lead to animals losses (1). One of the problems in dairy cattle is the bacterial infection of urinary tract, the sources of urinary tract infection (UTI) are varied and may be related to ascending infection from the urachus in neonatal animals, which can involve the urinary bladder, ureter and kidney (2). Another pathway for UTI in animals is through the vulva, which may play an important role as a site of entry of several urinary infections in bovine species. Moreover, septic catheterisation, post-calving disorders and bacteremia, may also act as predisposing factors for UTI in cattle (3). UTI may also elicit vascular damage to the urinary bladder and decrease kidney function competence, with subsequent disturbances in protein, acid-base, water and solute homeostasis and the excretion of final metabolic products. When the kidneys can no longer regulate body fluids and solute composition, renal failure occurs and consequently the loss of affected animals (7,8). Additionally, mortality and involuntary culling rates can be as high as 47% among lactating cows with UTI(4). Examination of a urine sample is one of the most important diagnostic aids that help in the diagnosis of causes and site of UTI in animals (5). A urine culture is essential to step to determine the type of bacterial infection(6). Microorganisms cause urinary tract infections. There are several different types of microorganisms which include bacteria, protozoa, fungus and algae. These organisms live both on the skin and inside of humans and other animals. They are present in water, soil, food, in the air, and on surfaces of objects. While microorganisms do cause disease and infection, the majority of them are essential in everyday life(7). The goal of our report is to knowledge epidemiological aspects of the bacterial percentages that associated with urine samples in dairy cattle in AL-Qadisiyah province.



## Material and methods:

### Material and apparatus:

**Table(1): show the name of the apparatus and Manufactured country.**

<b>The apparatus</b>	<b>Manufactured</b>
Hood	UK
Microscope	Olympus
Incubator	France
Loop and benzene lamp	China
Test tube and petri dish	China
Cotton and gloves	China
Refrigerator	Turkey

### Methods :

#### Sample collecting:

The female cattle is subject to our study. However, the urine samples were taken from animals by massaging upper area of the vagina to help the animals to urinate, then keep the sample in the sterile test tube then charged to the lab to make some tests.

#### Sample treatment in the lab:

All samples are cultured on nutrient media directly then incubated in the incubator 37 C for 48 hours for enrichment.

#### Biochemical tests :

After growth on the nutrient media, (29) sample submitted to the examination by some biochemical tests such as oxidase test, coagulase test, catalase test, motility test, haemolysin, lactose fermentation, indole test, etc. for confirming final diagnosis.

#### Identification :

Identification of Bacteria spp is made depending on biochemical tests

#### Statistics analysis:

The data were analysed by using statistical package for the social sciences(SPSS)version 16 software program (2007).

## Results:

Twenty-nine (29) samples of thirteen samples (30) are positive for contamination of the bacteria as the table below:

**Table (1): Number and Percentage of infected and non- infected.**

Total	Infected		Non- infected	
	N	%	N	%
30	29	96.6	1	3.94

The study founded many of bacteria that isolated from urine sample as the table below and figure below:

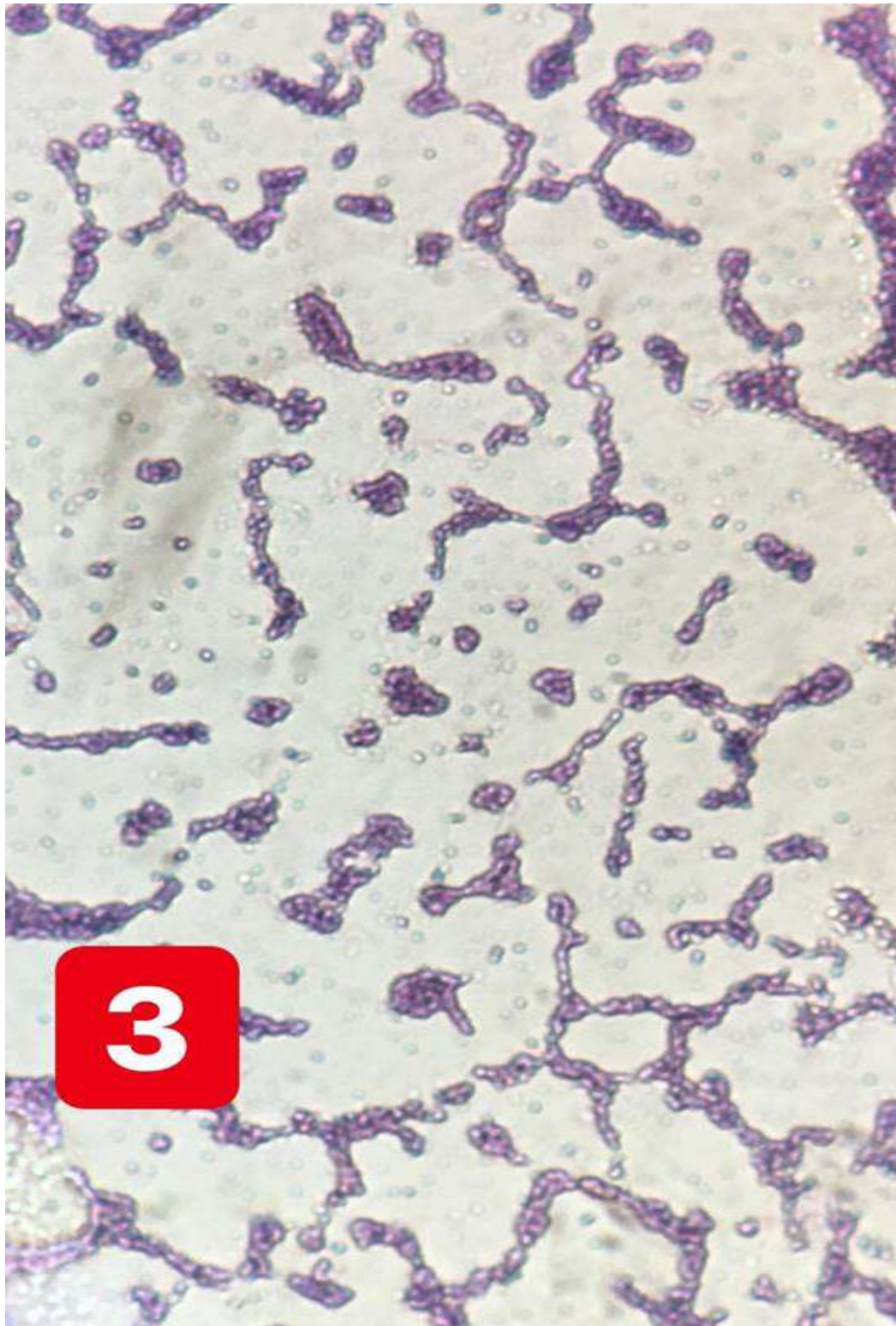
**Table (2): Number and Percentage of bacteria that isolated in the study.**

The Organism	Number	Percentage
<i>E.coli</i>	21/29	72.4%
<i>Staphylococcus spp</i>	1/29	3.4%
<i>Kelsella spp</i>	2/29	6.8%
<i>Corynebacterium spp</i>	5/29	17, 2%.
Total	29	100%

**Figure (1): show colony on nutrient agar.**



**Figure (2): Show blue cocci bacteria.**



**Figure (3): Show staining by gram stain.**



**Figure (4): Show culture on nutrient media.**



The *E.coli* isolates showed biochemical activities as the table below:

<b>The test</b>	<b>Result</b>
<b>Gram stain</b>	<b>Pink negative bacilli</b>
<b>Oxidase test</b>	<b>Negative</b>
<b>Urease test</b>	<b>negative</b>
<b>Catalase test</b>	<b>Positive</b>
<b>Indole test</b>	<b>Positive</b>

The *Staphylococcus spp* isolates showed biochemical activities as the table below:

<b>The test</b>	<b>Results</b>
<b>Gram stain</b>	<b>Blue cluster cocci</b>
<b>Citrate test</b>	<b>Positive</b>
<b>Lactose test</b>	<b>Positive</b>
<b>Coagulase</b>	<b>Positive</b>
<b>Indole test</b>	<b>Negative</b>
<b>Urease test</b>	<b>Positive</b>

The *Corynebacterium spp* isolates showed biochemical activities as the table below:

<b>The test</b>	<b>Result</b>
<b>Gram stain</b>	<b>Positive blue bacilli clup shape</b>
<b>Catalase test</b>	<b>Positive</b>
<b>Motility test</b>	<b>Non</b>
<b>Gelatin liquefaction test</b>	<b>Negative</b>
<b>Catalase test</b>	<b>Positive</b>
<b>Oxidase test</b>	<b>Positive</b>

**The *Klebsella spp* isolates showed biochemical activities as the table below:**

<b>The test</b>	<b>Result</b>
<b>Gram stain</b>	<b>Negative pink</b>
<b>Oxidase test</b>	<b>Positive</b>
<b>Motility test</b>	<b>Negative</b>
<b>Catalase test</b>	<b>Positive</b>
<b>Indole test</b>	<b>Negative</b>
<b>Lactose fermentation</b>	<b>Positive</b>

## **Discussion:**

No doubt infection of the urinary tract in dairy cattle will effect on quality and quantity of animals products such as meat and milk and will result in public health (8).

If the urinary tract infected by inflammation, it will directly reflect on the general health of the animal and it will cause a large economic loss in animals section (8).

Our study showed the total percentage of contaminated bacterial samples was (29/30) (96.6%) by bacteria, That agreement with results of (9) wherever found percentage 92%.

And disagreement with (10) wherever found the percentage of bacteria is near to 48%

While our report found the percentage of *E.coli* is (21/29) as represented 72.4%, that agreement with (11) where the founded rate is 77%.

The rate of *Staphylococcus spp* was (1/29) 3.4% depending on our results, that likely to results of (12), Wherever the last recorded percentage 5% that near to our results.

Also, our study founded the percentage of *Klebsiella* spp was (2/29) that represent 6.8%, that agreement with (13).

And *Corynebacterium* spp was (5/29) 17, 2% as a percentage that near to result of (14).

The contrast in the prevalence may become to different of environments, different seasons, sex, age, and sure depend on the type and immune status of the animals.

Finally, should beware and should take care of any changes in urination function and should keep attention to this problem through early diagnosis and treatment without waiting.

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