

## **BACTERIOLOGICAL , PHYSICAL AND CHEMICAL EVALUATION OF SHEEP'S URINE**

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**Key words** :Ketone bodies,E coli,BHB.

### **ABSTRACT**

This study conducted to evaluated 150 sheep urine sample [91 female (59) male] for the physical characteristic (color, odor, and specific gravity), chemical characteristic (ketone bodies and glucose) and for the presence of bacterial isolates.

Most urine samples have amber color and ammonia odor especially the samples which show positive results in bacterial isolate, while presence of ketone bodies was indicated by the appearance of fruity odor.

This study showed that 48 (32%) of urine samples are ketone positive [34 (37.36%) females and 14 (23.72%) males], and 42 (28%) of samples are glucose positive[26 (28.57%) females and 16 (27.11%) males]. Where as the bacteriological examination of urine revealed that 38 (32%) of female urine samples show positive results in bacterial isolation including 15 (16.48%) *Escherichia coli*, 11 (12.08%) *Staphylococcus aureas*, 6 (6.59%) *streptococcus* spp., 4 (4.39%) *Proteus* spp. and 2 (2.19%) *Klebsilla* spp. . While the results of bacterial examination of male urine samples revealed that 20 (33.89%) show positive bacterial isolation including 8 (13.55%) *E. coli*, 6 (10.16%) *Staph. aureus*, 3 (5.08%) *Sterpt. Spp.* and 3(5.08%) *Proteus* spp.

### **INTRODUCTION**

Ketone bodies are intimidated metabolic products from mobilization of body fat reserves .The major ketone bodies are B-hydroxybutarate (BHB), acetoacetate and acetone. They provide energy to peripheral tissues when carbohydrate level are limitedtained. As the levels of ketone bodies continue to increase and are sustained at an elevated level, an abnormal state known as subclinical ketosis or ketosis occurs. The elevated ketone bodies are present in blood, urine and milk (1). During period of negative energy balance large quantities of nonestrified fatty acid (NEFA) are released from adipose tissue. Abortions of these are converting to ketone, primarily in the liver. These are the major sources of ketone during ketosis (2).

Ketonuria is a more common finding in ruminant; it occurs in starvation, pregnancy toxemia of ewes and does (3). The renal threshold to ketone bodies is low, and ketonurea usually precedes detectable ketonemia (4). No glucose present in normal urine, there is complete re absorption of glucose in renal tubules. If the load in the blood exceeds the renal threshold, glucose may appear in the urine (glucosuria) (5).

The significance presence of bacteria in urine is related to the method of collection and age of the specimen. The present of bacteria is an indication of infection (5).

Bacteria are more easily seen by gram staining the centrifuged deposit , there finding on microscopy indicate that they are present in very large number and , if the specimen is fresh and uncontaminated , strongly suggested that the urine is infected (6).

The objective of this study is to evaluate sheep urine for the present of ketone body, glucose and survey about the presence of any bacteria species in urine.

## **MATERIAL AND METHODS**

The study was conducted to evaluated (150) urine samples collected from sheep slaughtered in Basrah slaughter house (91 female and 59 male). The animals at the age of 2-4 years. The urine was collected under aseptic condition from urinary bladder directly using sterile syringe.

The urine have been examined for: the physical characters of urine were noted at the time of collection (color, odor and specific gravity).

Biochemical examination which include: evaluation for the present of ketone bodies by using Rothera's test and glucose estimation by using Benedict's test according to (6).

Bacteriological examination:

The urine samples were cultured on Nutrient and Blood agar and incubated for 24 hours. The isolates were identified according to their cultural, morphological and biochemical test.

- a) *Staphylococcus aureus* by using coagulase test according to (7) and catalase test according to (8).
- b) *Streptococcus* spp. diagnosed according to (9)
- c) *Enterobacteriace* spp.: biochemical test was conducted to identified the isolates; Indol test, Citrate utilizing test, Triple sugar Iron and Urease test according to (10).

## RESULTS

At the time of urine samples collection the physical characteristics were observed such as color, odor and specific gravity. Amber color and specific gravity between 1.015-1.06 were observed in all urine samples. Ammonia odor appeared in 63 urine sample while fruity odor appeared in 48 sample. Table 1 display the results of ketone body examination. As these results revealed that 48 (32%) were positive, [34 (37.36%) female and 14 (23.72%) male]. Also this table showed that 42 (28%) of urine samples are glucose positive, [26 (28.57%) female and 16 (27.11%) in male].

The results of bacteriological examination reveal that 38 (41.75%) of female urine samples show different type of bacterial isolate including *E. coli* (16.48%) , *Staph. aureus* (12.08%) , *Streptococcus* spp. (6.59%) , *Proteus* spp. (4.39%) and *Klebsiella* spp. (2.19%). While 20 (33.89%) of male urine show that samples with different bacterial isolates including , *E. coli* , *Staph. aureus* , *Streptococcus* spp. and *Proteus* spp. (13.55%) , (10.16%) , (5.08%) and (5.8% ) respectively (table2).

## DISCUSSION

The higher percentage of positive results of ketone bodies was observed in urine samples of female (37.36%) in comparison to male (23.72%) these results are in agreement with that reported by (11, 12, 13, 14), who found that negative energy balance during the transition period around birth is regarded as the primary cause for the development of the disease and development of hyperketonemia in ewe and dairy cow. Also ruminant are equipped to metabolize the butyrate by ruminal fermentation (about 750 g/day), mostly by using it as metabolic fuel for the ruminal musculature .About 75% of the additional ruminal butyrate is converted to blood BHBA, the direct cause of ketosis (15).

In case of glucose, the higher percentage was also observed in females urine sample (28.57%) these finding is in line with (16), who reported that the total body's glucose requirement are increasing during pregnancy and lactating because of glucose needs of the fetuses and milk lactose production respectively. It can be state , therefore, that the areas of the body that utilize significant amount of glucose , at least in the ruminant , are the nervous system , fetus , mammary gland , and the portal-drained viscera. On the other hand high of BHB concentration significantly suppressed endogenous glucose production but showed no effect on glucose utilization (17).

The higher percentage of bacterial isolation was observed in female's urine sample in comparison to male's urine sample, explanation for these differences between them may be refer to the stresses of

parturition, peak lactation and high protein diet, which increase the pH of the urine and is therefore conclusive to colonization of the attacking organisms are all contributing factors in female (18).

On the other hand, the higher percentage of bacterial isolation in case of female's and male's urine sample was observed in *E.coli* (16.48%) and (13.55%) respectively followed by *Staph. aureus*. These results are in agreement with that reported by (19, 20, 21) who found that the most common bacterial isolation from sheep urine are *E.coli*, *Staph. aureus* and *Streptococcus* spp. . *E.coli* is a commensal organism of warm-blooded animals, it can also cause various diseases, both intestinal and extraintestinal, in these hosts, most *E.coli* strains responsible for urinary tract infection.

**Table (1) Number and percentage of ketone –bodies and glucose in urine samples**

| No. of urine samples | No. of ketone bodies positive | No. of glucose positive |
|----------------------|-------------------------------|-------------------------|
| <b>Total (150)</b>   | <b>48(32%)</b>                | <b>42(28%)</b>          |
| <b>Female (91)</b>   | <b>34(37.36%)</b>             | <b>26(28.57%)</b>       |
| <b>Male (59)</b>     | <b>14(23.72%)</b>             | <b>16(27.11%)</b>       |

**Table (2) Number and percentage of Bacterial isolation from urine.**

| Animal sex         | No. of Bacterial infection | <i>E.coli</i>     | <i>Staphylococcus aureas</i> | <i>Streptococcus ssp.</i> | <i>Proteus spp.</i> | <i>Klebpsilla</i> |
|--------------------|----------------------------|-------------------|------------------------------|---------------------------|---------------------|-------------------|
| <b>Female (91)</b> | <b>38(32%)</b>             | <b>15(16.48%)</b> | <b>11(12.08%)</b>            | <b>6(6.59%)</b>           | <b>4(4.39%)</b>     | <b>2(2.19%)</b>   |
| <b>Male (59)</b>   | <b>20(13.33%)</b>          | <b>8(13.55%)</b>  | <b>6(10.16%)</b>             | <b>3(5.08%)</b>           | <b>3(5.08%)</b>     | <b>(0)</b>        |

## التقييم الجرثومي والفيزيائي والكيميائي لإدرار الأغنام

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### الخلاصة

أجريت هذه الدراسة على ( 150 ) نموذج إدرار لأغنام ( 91 إناث و 59 ذكور). حيث تم تقييم الصفات الفيزيائية ( اللون ، الرائحة ، الكثافة النسبية ) والصفات الكيميائية ( الأجسام الكيتونية والكلوكوز ) . واجري الفحص البكتريولوجي لعزل أهم الجراثيم الموجودة فيه.

كانت معظم نماذج الإدرار ذات لون تبني وذات رائحة تشبه الأمونيا وخاصة النماذج التي أظهرت نتائج موجبة للعزل

البكتيري في حين كانت رائحة الإدرار تشبه رائحة الفاكهة في النماذج الموجبة للأجسام الكيتونية.

أظهرت الدراسة أن 48 ( 23%) من النماذج كانت موجبة لوجود الأجسام الكيتونية ، [ 34 ( 37.36%) إناث و 14 ( 23.72%) ذكور ] بينما [ 42 ( 28%) كانت موجبة للكلوكوز ، 26 ( 28.57%) إناث و 16 ( 27.11%) ذكور ] بينما اظهر الفحص البكتريولوجي إن 38 ( 32%) من نماذج إدرار الإناث موجبة للعزل البكتيري ، حيث عزلت *Escherichia coli* 15 ( 16.48%) و *Staphylococcus aureas* 11 ( 12.08%) و *streptococcus spp.* 6 ( 6.59%) و *Proteus spp.* 4 ( 4.39%) و *Klebsilla spp.* 2 ( 2.19%) أما نتائج فحص إدرار الذكور كانت 20 ( 13.33%) من النماذج موجبة للفحص البكتريولوجي . واهم البكتريا هي *E. coli* 8 ( 13.55%) و *Staph. aureas* 6 ( 10.16%) و *streptococcus spp.* 3 ( 5.08%) و *Proteus spp.* 3 ( 5.08%).

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