

Animal Health Research Institute  
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**BACTERIOLOGICAL STUDIES OF SUBCLINICAL  
MASTITIS IN FRIESIAN CATTLE  
IN ASSIUT GOVERNORATE**  
(With 3 Tables and 2 Figures)

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دراسات بكتريولوجية عن التهاب الضرع الخفي  
في الأبقار الفريزيان الحلوب في محافظة أسيوط

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لقد اجريت هذه الدراسة على ٥١ حيوان مصاب بالتهاب الضرع الخفي من بين عدد ٤٨٨ أبقار فريزيان في ثلاثة مزارع هي مزرعة بنى مر - مزرعة العوامر - مزرعة مدرسة الزراعة الثانوية وكانت نسبة الإصابة الكلية تمثل ١١,٣٨% بينما كانت نسبة الإصابة في بنى مر - العوامر - مزرعة الزراعة الثانوية هي على الترتيب ٧,١% , ٢٩% , ١٤,٣% ولقد اوضحت النتائج عن عزل ٥٥ عزلة بكتيرية , ١٦ عزلة للميكروب العنقودي الذهبي بنسبة ٢٩,١% , ١٠ عزلات للميكروب العنقودي الجلدي بنسبة ١٨,٢٠% والميكروب القولوني ١١ عزلة بنسبة ٢٠% وميكروب الكوريني بكتريم يوفس ٦ عزلات بنسبة ١٠,٩٠% والميكروب السبحى الاجلاكتيا ٧ عزلات بكتيرية بنسبة ١٢,٧% والميكروب السبحى الديس اجلاكتيا ٣ عزلات بنسبة ٥,٤٦% وميكروب الستروباكتري ٢ عزلة بنسبة ٣,٦٤%. ولقد تم اجراء اختبار الحساسية لهذه العزلات البكتيرية على عدة انواع من المضادات الحيوية المختلفة وكانت معظم العزلات البكتيرية شديدة الحساسية لكل من السبكترام, الكلورامفينيكول والسيفالوكسين والريمكتان والجنتاميسين ومتوسط الحساسية للكاناميسين وقليلة الحساسية لكل من التتراسيكلين والاستربتوميسين ومقاومة لكل من البنسلين والاموكسيلين.

### SUMMARY

This study was carried out on 51 Friesian cows out of 488 suffering from sub-clinical mastitis in 3 farms at Assiut Governorate (Bani-mor, El-Awamer and Secondary Agriculture School). The obtained data showed

that the total incidence of subclinical mastitis (S/C/M) in Assiut Governorate was 11.38%, while the incidence in 3 farms (Bani-mor, El-Awamer and Secondary agriculture school was (7.1%, 29%, and 14.3%) respectively. The number of the bacterial isolates in this investigation was 55: The number and frequency percentages of the isolates were *Staphylococcus aureus* 16 (29.1%), *Staphylococcus epidermidis* 10 (18.20%), *E. coli* 11 (20%), *Corynebacterium bovis* 6 (10.90%), *Streptococcus agalactiae* 7 (12.70%), *Streptococcus dysagalactiae* 3(5.46%) and *Citrobacter* 2 (3.64%) respectively. Also the sensitivity of the isolated organisms to eleven antibiotics were discussed. It was found that most of the isolated species was highly sensitive to Spectram, Chloramphenicol, Cephaloxine, Remectan and Gentamycine, moderate sensitive to Kanamycin and less sensitive to Tetracycline and Streptomycin but was resistant to penicillin and Amoxicillin.

**Key words:** *Subclinical, Mastitis in Friesian*

## INTRODUCTION

Milk is considered as a complete food, it is easily digestible when consumed by either human (old or young) or suckling animals. These suckling animals have simple and incapable digestive system to deal with apparently healthy milk but otherwise containing an infectious organism and secreted by cows suffering from subclinical mastitis (Keisler, 1981). The economic significance of the disease varies among herds and depends upon its system of management (Blood *et al.*, 1983). In addition to that, the subclinical mastitic milk may have a public health importance, since it may be due to a human pathogen which will cause an infection to the consumers of raw or inadequately heated milk (Wilesmith *et al.*, 1986).

The subclinical mastitis constitutes a herd problem and the loss is nearly three times that of the clinical form. More attention had been focused for the diagnosis of subclinical mastitis (Joshi *et al.*, 1976). On the other hand the most predisposing factors causing a lower resistance of udder for bacterial invasion are the general healthy condition of animal, the milking machine and bad milking habits (Tawfik *et al.*, 1984).

The subclinical mastitis problem was studied by several authors in different localities, Narendra *et al.* (1982) in India, Hussian *et al.* (1984)



in Pakistan, Lopes *et al.* (1990) in Brazil and Controbi *et al.* (1992) in Argentina.

In Egypt this problem was studied by different authors, (Aziz *et al.*, 1975; Farid, *et al.*, 1975; Abdel Karim and El-Ashmawy, 1979, Bakr, 1986; El-Bayomi and Mohmoud, 1987; Aki, 1988; Bahy El-Gamal, 1989; Amal *et al.*, 1990 and Nawal *et al.*, 1996).

**This work aimed to find out:**

- Incidence of the disease in some governmental farms,
- Identification of the bacterial causative agent (s),
- Sensitivity of the isolated organisms to different antibiotics.

## MATERIAL and METHODS

51 milk samples were collected from 3 farms in Assiut Governorate from dairy Friesian cows suffering from subclinical mastitis. The milk samples were subjected routinely to examination using Frieso test.

The first stream of milk was discarded, then about 10-15 ml of milk were aseptically drawn from the udder into a sterile vacuum tube. The collected tubes were labelled and transported immediately to the laboratory where they were kept in refrigerator until examined. The milk samples were centrifugated at 300 rpm for 15 minutes and a loopful from the sediment was streaked on blood agar and McConkeys agar plates. The inoculated plates were incubated at 37°C for 48 hours. Pure colonies were subcultured on the appropriate media for identification by microscopic examination and biochemical reactions according to Chruichshank *et al.* (1975) and Cowan and Steel's (1974). All the isolated strains were tested against eleven antibiotics: Trimethoprim (25 µg), Streptomycin (30 µg), Amoxicillin (25 µg), Penicillin (10 IU), Cephaloxine (30 µg), Tetracycline (30 µg), Gentamycin (10 µg), Kanmycin (30 mg), Spectram (10 µg), Chloramphenicol (30 mg) and Rimactan (30 mg), according to Finegold and Martin (1992).

## RESULTS

The results are tabulated in Tables 1,2,3 and Figures 1& 2.

In this study the high incidence of *Staph. aureus* (29.1%) isolated from S/C/M may be attributed to that *Staph. aureus* can be isolated from the teat skin and the external orifices of the teat canal before and after parturition and has a wide spread among the different seasons of the year. The increased incidence of *E. coli* in the present study may be due to the heavy contamination of bedding and it is the main common organism which also has a wide spread among all the seasons (Liebisch et al., 1994 and Roberson et al., 1994).

Mixed infection had been observed in this study mainly *Staph. aureus* with *E. coli* denoting the complexity of the disease; this is in agreement with Jain (1979) who stated that the *Staph. aureus* may predispose the herd to infection by coliforms and other pathogens. Moreover Hillerton and Walton (1991) mentioned that the influence of Staphylococcal infection on adjacent quarters may be through the destruction of the udder tissue by the toxins produced and their effect on epithelial permeability where it ease the invasion of udder tissue by other microorganisms. Also El-Rihawy (1969) explained that mixed infection would mean that either one organism was the etiological factor and the rest were commensals or one organism provoked primary infection and the rest were secondary invaders.

As regards the sensitivity test of the bacterial isolates the obtained results showed that Chloramphenicol, Cephaloxin, Gentamycin, Spectram and Rimactan were highly sensitive agents against most of the strains. Kanamycin came in the second grade of efficiency having moderate effect while Tetracyclin and Streptomycin were the least effective. On the other hand, most of the strains were resistant to Penicillin and Amoxicillin. Trimethoprim was variable in its potency between sensitive to resistant. The previously mentioned results are supported by several authors (Jha et al., 1994; Aydin et al., 1995 and Nawal et al., 1996).

In conclusion, the S/C/M in a dairy farm is one of the important serious diseases due to its public health importance, since streptococci, staphylococci and *E. coli* which are pathogenic for human being, are excreted in milk and would give rise to scarlet fever, septic sore throat, pyogenic infection and food poisoning to those consuming raw milk. Therefore, good management practices such as milkers hygiene, sanitization of milking machine, healthy environment as well as controlling the predisposing factors should be considered among the major prophylactic measures to minimize the occurrence of the disease.



Identification of the causative agent and its sensitivity testing are important measures for the treatment and prevention of the disease.

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Table(1): Incidence of subclinical mastitis in Friesian cows in Assiut Governorate.

Farm	Total Number of examined animals	Postive cases of animals by F/ test	Percentage
Bani-mor	323	23	7.1
El-Awamer	69	20	29
Sec.Agriculture School	56	8	14.30
Total	448	51	11.38

Table (2): Numbers and frequency percentages of bacterial isolates from subclinical mastitic milk sample.

Isolated bacteria	Farms						Total	Frequency %
	Bani-mor		El-Awamer		Sec. Agri. School			
	(23+)	frequency %	(20+)	frequency %	(8+)	Frequecy %		
<i>Staph. aureus</i>	6	25	8	36.40	2	22.22	16	29.1
<i>Staph. epidermidis</i>	4	16.66	5	22.70	1	11.11	10	18.20
<i>E. coli</i>	6	25	3	13.60	2	22.22	11	20
<i>C.bovis</i>	3	12.5	2	9.1	1	11.11	6	10.90
<i>Strep. agglactia</i>	2	8.34	2	9.1	3	33.34	7	12.70
<i>Sterpt. dysagglactiae</i>	1	4.16	2	9.1	-	-	3	5.46
<i>Citrobacter</i>	2	8.34	-	-	-	-	2	3.64
Total	24	100	22	100	9	100	55	100

N.B.: 4 cases were mixed infection; *Staph.aureus* and *E.coli*

Table (3): Antibigram for bacterial isolates of sub-clinical mastitis in Ferezian cows

Isolates	Tri (25 mg)	Str (10 µg)	Amx (25 mg)	Pen (10 IU)	Ceph (30 mg)	Tetr (30 mg)	Gent (10 µg)	Kan (30 mg)	Spect (10 µg)	Chlor (30 mg)	Rem (30 mg)
<i>Staph. aureus</i>	-	-	+	-	+++	-	+++	++	+++	+++	++
<i>Staph.epidermidis</i>	++	+	+	-	+++	+	+++	++	+++	+++	++
<i>E. coli</i>	+++	++	-	-	+++	-	+++	++	+++	+++	++
<i>C.bovis</i>	-	-	+	-	+++	+	+++	+	+++	+++	++
<i>Strept. agglactiae</i>	-	-	-	-	+++	+	+++	++	+++	+++	++
<i>Strept. dysagglactiae</i>	-	-	+	-	+++	+	+++	++	+++	+++	++
<i>Citrobacter</i>	+++	+	-	-	+++	+	+++	++	+++	+++	++

Tri = Trimethobrim Str. = Streptomycin Amx = Amoxicillin Pen = Penicillin Ceph. = Cephaloxene Tetr. = Tetracyclin  
 Gent = Gentamycin Kan = Kanamycin Spect = Spectran Chlor = Chloramphenicol Rem = Remactan  
 \*Highly sensitive = + + + + + , + + + + \*Moderate sensitive = + + + \*Less sensitive = + + \*Resistant = -

Fig. (1): Incidence of subclinical mastitis in 3 farms in Assiut Governorate

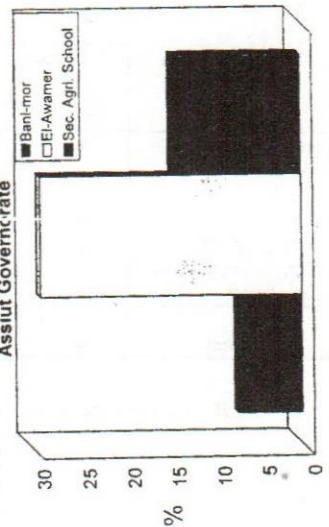


Fig (2): Percentage of bacterial isolates from subclinical mastitis from 3 farms in Assiut Governorate

