

## THE EFFECT OF SOME DISEASES AND ABNORMALITIES ON MILK PRODUCTION IN A HERD OF FRIESIANS

### I.—Mastitis

*By*

M.T. RAGAB

*Faculty of Agriculture, Cairo University*

### SUMMARY

From 2027 calvings of Friesian cows during the period from 1957 to 1962, a number of 171 mastitis cases took place. The percentage of mastitis cases was 8.44 all over this period ranging from 10.19 to 4.94%. The attack of mastitis reached its maximum at 1957 when the animals were first imported to the project (Tahreer Province), then decreasing as the conditions of milking and management were improved.

Order of lactation was proved to be of pronounced effect on the incidence of mastitis. The percentage of mastitis cases was 23.39 at the first lactation and 26.31, 21.64, 17.55 and 11.11 for the second, third, fourth and fifth lactations respectively. Also, it was found that the incidence of mastitis occurred in most cases at the first month of the lactation then decreasing as the lactation advanced. The number of cases occurring during the first four months of the lactation amounted to 65.27% of the total number of cases.

It was also found that the average milk yield for the animals which caught mastitis was more than the average of the normal ones in the first and second lactations but less in the cases of the third, fourth, fifth lactations.

The duration of the disease differed from one lactation to the other. The hind-quarters were found to be more susceptible to mastitis than the fore-quarters.

The results obtained indicated the fact that mastitis could not be considered as a limiting factor to the establishment of the standard dairy breeds of cattle in this country.

### INTRODUCTION

Newly imported standard breeds of cattle to tropical and subtropical countries are subject to many diseases and troubles that in some cases they could be considered as detrimental. In the case of Friesians in this country, two diseases were of some serious considerations as to the life of animals *viz*, Contagious Abortion and Pleuro Pneumonia. But as far as milk production is concerned it was interesting to investigate the effect of mastitis, abortion and retention of placenta ; in this work the effect of mastitis will be discussed.

### MATERIALS AND METHODS

A number of 2027 calvings from 1957 to 1962 were obtained from the records of the Tahreer Province. Cases of mastitis were recorded as to the date of infection, the condition and effect of the diseases as to the milk and to the udder.

Animals loosing any of their quarters in the udder were indicated and also the date of recovery was recorded and therefore the duration of the infection was made possible. For tests of significance between groups, t test, was used when it was necessary (Snedecor 1949).

### RESULTS AND DISCUSSION

#### 1.—*Effect of Year*

A total number of 171 cases of mastitis were recorded along the period of study. This represented a percentage of 8.44 which is rather reasonable specially when the conditions of milking are taken into consideration. The percentage of diseased cases was 10.01, 10.19, 9.14, 8.16, 4.94 and 7.47% for the years 1957, 1958, 1959, 1960 1961 and 1962 respectively, Table (1).

It seems difficult from those results to conclude that there is a yearly trend as no significant differences were found between years.

#### 2.—*Effect of Stage of Lactation*

In a total number of 167 cases of mastitis identified for the date of infection it was found that 31.14% of the cases caught the disease at the first month of their lactation, followed by 14.37% at the second month, 8.98%, 10.78%, 4.79%, 5.99%, 4.19%, 7.78%, 5.99%, 3.99%, 1.20% and 1.8% for the third till the 12th month of lactation respectively. This proved that animals are very susceptible to catch the infection at the early stages of the lactation as about 65.27% of cases took place during the first 120 days from calving. It seems that the heavy impulse of milk secretion during this period of the lactation is one of the reasons which helps the infection to be abundant at that time. Cleanliness of milking, animals and utensils should be taken care of seriously at that stage in order to knock down the percentage of cases to the minimum.

It was also proved that there is no relation between the time of infection and the duration of the disease since there was a non-significant correlation coefficient of 0.082 between the duration of the disease and the month of infection.

TABLE 1.—Percentage of mastitis cases during the period from 1957 to 1962

Season	Total No. of calving	No. of cases of Mastitis	Percentage
1957	197	20	10.01
1958	336	40	10.19
1959	350	32	9.14
1960	478	39	8.16
1961	385	19	4.94
1962	281	21	7.47
	2027	171	8.44

TABLE 2.—Incidence of mastitis according to stage of lactation (in percentage)

Season	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	
1st Number	17	5	3	2	1	3	3	4	1	1	1	—	
2nd "	11	7	5	6	1	1	2	4	3	3	—	1	
3rd "	12	2	1	5	2	3	2	2	5	—	1	1	
4th "	7	6	2	3	3	3	—	3	1	—	1	—	
5th "	5	4	4	2	1	—	—	—	—	1	—	1	
Total	(Number	52	24	15	18	8	10	7	13	10	5	3	3
	(Percentage	31.14	14.37	8.98	10.78	4.79	5.99	4.19	7.78	5.89	3.99	1.20	1.8

\* The total number is 171 all included except three cases not identified for the month of attack.

TABLE 3.—Mastitis cases distributed according to order of lactation.

Lactation	Mastitis cases	Total No. of calvings %
First . . .	40	23.39
Second . .	45	26.31
Third . .	37	21.64
Fourth . .	30	17.55
Fifth . . .	19	11.11
All lactation	171	100.00

### 3.—*Effect of Order of Lactation (Age)*

The percentage of mastitis cases taking place at the first lactation was 23.39% compared to 26.31%, 21.64, 17.55 and 11.11% from the second, third, fourth and fifth lactations. Although these results indicate that animals are less susceptible to mastitis when they advance in age, yet it is contrary to what is recorded as far as the effect of age is concerned. In the case of this study, most of the animals completing more than one record are those which have stayed at the project for longer period. Therefore, with the improvement of the management of the animals including the milking and skill of milkers one of the important predisposing factors of the diseases was dismissed and less cases were obtained at such stage of age.

### 4.—*Effect on Milk Yield and Lactation Period*

In comparing the average milk yield and lactation period of the normal animals and those which caught mastitis no significant differences were found, Table (4). However, in the first and second lactation the mastitis animals secured higher yield than the normal ones while at the 3rd, 4th and 5th lactation the normal animals exceeded the sick ones in milk production. All differences between groups were not significant.

### 5.—*The Nature and Cause of Injury To The Udder*

In a number of 167 cases, 101 animals have had slight inflammations while 10 animals had abscesses and two were suffering from oedema. A number of 44 cases have had some fibrosis in the udder tissues in varying degrees, as it is given in table (5).

TABLE 4.—Effect of Mastitis on total Milk yield

Order of lactation	*Total milk yield				Diff.
	Total No.	No. of mastitis	Average milk yield, kg.	Average milk for mastitis, kg.	
First . . . . .	354	40	2316	2387	+ 71
Second . . . . .	350	42	3088	3310	+ 222
Third . . . . .	315	49	3472	2813	— 659
Fourth . . . . .	326	27	3392	2827	— 565
Fifth . . . . .	295	17	3116	2391	— 725
Total and av. . . . .	1640	175	2811	3068	+ 257

(\*) Milk yield based on 305 days.

TABLE 5—Cases of fibrosis in the udder

Part of udder	No. of cases
Fore-Quarter R . . . . .	7
Fore-Quarter L . . . . .	5
Fore-Quarter R+L . . . . .	2*
Hind-Quarter R . . . . .	13
Hind-Quarter L . . . . .	10
Hind-Quarter R+L . . . . .	2*
Left Half . . . . .	4*
Right Half . . . . .	1*
Odd cases . . . . .	4
Complete loss . . . . .	1*
<b>Total . . . . .</b>	<b>44</b>

(\*) Those animals were culled.

It seems from those results that the hind-quarters are more susceptible to the diseases than the fore-quarters. Again the pressure of milk as well as the activity of the glands seem to have something to do with the susceptibility to catch the infection of mastitis.

#### GENERAL DISCUSSION

The percentage of mastitis cases arrived at in this work ranged between 4.94% and 10.19% with an average of 8.44% compared to 30% reported by Deb (1959) for Indian cattle and buffaloes and 26.9% found out by Vallis and Rasaschina in Italy (1959). Kruger (1953) has reported a percentage of 57 for positive cases in Schleswig-Holstien during the period from 1928-1930 which ran down to 10.6% in 1952 as a result of the use of antibiotics. He also indicated that the incidence of mastitis was greater in large than in small herds. Naryanaan and Iya (1953), reported that in 156 Indian cows tested for mastitis the positive cases reached 45.5%.

Bratlie (1954) reported that new infections of mastitis occurred most frequently in 5-6 years old cows in their second lactation and when they are on pasture.

It seems that the incidence of mastitis in this herd was not a serious one since it was less than all results reported.

It seems that in spite of the new conditions under which the animals were exposed, the early diagnosis and prompt care of mastitis, along with the following of clean milking procedure were the main factors that led to such low percentage of positive cases.

As far as the relation between the order of lactation and the incidence of mastitis, the second lactation was found to have the highest percentage of cases (26.31), followed by the first (23.39), the third (21.64) then the fourth and fifth and more lactations (17.55). This agreed with the findings of Kruger (1953) who reported that infections were most common in the second lactation and less in both first and third lactations. He also reported that 30% of all first infections occurred in the first three lactations. This also agreed with the results obtained in this work. Also Naryanaan & Iya (1953) pointed out that the incidence of mastitis increased with advancing lactations.

However, it was found that the animals are more susceptible for infection during the first four months of the lactation than during any other period as 65.27% of the infections occurred during this time. It seems that the conditions of the udder at the beginning of the lactations are more prone for the attack of the organisms causing mastitis than later on.

The results obtained here indicated to the fact that the incidence of mastitis did cause a depression in milk yield in all lactations studied except the first. Donovan *et al* (1960) have reported that the animals mainly infected with staphylococcus pyogenes caused depression of 10% in their milk yield. The injury, variation blocking, and inflammation which take place in the tissues of the udder as result to the infection may cause this observed depression in production.

The predisposing causes of mastitis are many but it seems that the laying of the animals along with the possibility of pressing certain parts of the udder to the floor of the stable is one of the most important reasons for catching the infection of this disease. It was observed, however, that the hind-quarter were the most frequent parts of the udder where infection took place.

Noarlander (1959) pointed out the importance of mastitis incidence as a source of environmental error in sire selection while Bratlie (1954) stated that the average annual culling rate for the herds studied was 17.6% and 18% of this culling rate was due to mastitis.

Culling due to mastitis becomes a must when the milking ability of the animals is seriously endangered, the matter that depends upon how far the infection went. When half the udder is distructed, or at least a good part of it, the animals should be sold. However, as the number of animals culled as a result of mastitis were 10 animals out of a total culled animals of 179 (Ragab & Asker 1959) the percentage of culling due to this reason will be 10% of the total culling. This is a low percentage compared with the findings of the previous workers.

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## تأثير بعض الأمراض والتشوهات على إنتاج اللبن في الفريزيان أولا - التهاب الفرع المعدى

محمد توفيق رجب

### الملخص

تبين من هذا البحث الذى شمل ٢٠٢٧ ولادة من أبقار الفريزيان خلال المدة من ١٩٥٧ الى ١٩٦٢ أن هناك ١٧١ حالة من حالات التهاب الضرع المعدى وكانت النسبة المئوية ٨ر٤٤٪ وتراوحت نسبة الإصابة عاما بعد عام بين ٤ر٩٤ و ١٠ر١٩٪ وقد بلغت الاصابات ذروتها في عام ١٩٥٧ وهو العام الأول لاستيراد هذه الحيوانات ويرجع ذلك الى عدم توافر الخبرة اللازمة للحليب الصحيح عند بدء المشروع . وقد نقصت النسبة بعد ذلك نتيجة لتحسين هذه الظروف .

وقد تبين أن ترتيب موسم الحليب له أثر على نسبة الإصابة بالمرض فقد كانت نسبة الاصابات ٢٣ر٣٩٪ ، ٢٦ر٣١٪ و ٢١ر٦٤٪ ، ١٧ر٥٥٪ و ١١ر١١٪ في مواسم الحليب الأولى والثانية والثالثة والرابعة والخامسة على التوالي . كما تبين أيضا أن الإصابة بهذا المرض في معظم الحالات كانت تحدث خلال الشهر الأول من الحليب وكانت نسبة الاصابات تقل بتقدم موسم الحليب وكانت النسبة المئوية للاصابات التى حدثت في الشهور الأربعة الأولى من فصل الحليب هي ٦٥ر٢٧٪ من جملة الحالات .

هذا وقد كانت انتاجية اللبن للحيوانات المصابة أعلى من الحيوانات التى لم يصبها المرض في موسم الحليب الأول والثانى وانعكس الوضع في موسم الحليب الثالث والرابع وقد تبين أيضا أن طول مدة الإصابة بالمرض تختلف من موسم الى آخر كما أن الأرباع الخلفية أكثر قابلية للإصابة بالمرض من الأرباع الأمامية للضرع . هذا وتدلل هذه النتائج على أن التهاب الضرع المعدى لا يمكن اعتباره عاملا من عوامل تعويق تربية ماشية اللبن الأصيلة في مصر .