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CLINICAL AND HAEMATOLOGICAL INVESTIGATIONS ON THE HOLSTEIN DAIRY FARM STATION AT NORTH OF SINAI

(With 1 Table & 1 Fig.)

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دراسات اكلينيكية ومعملية على أبقار الفريزيان الهولندية في محطة لانتاج الألبان في شمال سيناء

ثروت نافع

أجريت هذه الدراسة على محطة انتاج الألبان الحكومية بمدينة العريش محافظة شمال سيناء والمكونة من أبقار فريزيان هولندية نقية · كانت الشكوى الرئيسية في المزرعة من نقص انتاج الألبان والنحافة المرضية وتساقط الشعر مع تأخر سن البلوغ واضطراب الحالة التناسلية · تم فحص نظام التربية وأسلوب ادارة المزرعة ونوع الغذاء المقدم للحيوان ونوعية المياه التي تشرب منها تلك الحيوانات والحالة الصحية لعنابر ايواء الأبقار ··· لذلك قسمت جميع الإناث حسب الحالة الانتاجية والسن والسجلات إلى منخفضة ومتوسطة وعالية الانتاج ثم عجلات أقل من سنتين وعجول أقل من سنة في العمر كما أخذت عينة من المياه التي تقدم إلى تلك الحيوانات · أوضحت النتائج عدم توفر المواصفات الملائمة لمواجهة متطلبات الحيوانات عالية الانتاج من نظافة وغذاء واضافات غذائية هامة ··· كما لوحظ أن المياه المستخدمة للشرب عالية الملوحة (أكثر من ٥٠٠٠ جزء في المليون) ··· كما أوضحت الفحوص الاكلينيكية والمعملية أن الحيوانات تعاني من الأنيميا والهزال وتساقط الشعر ونقص الانتاجية ··· كما إختلفت مستويات العناصر الهامة اختلافا معنويا فيما بين المجموعات مما يفسر نقص الانتاج من الألبان وظهور الأعراض الاكلينيكية سالفة الذكر.نوقشت كل العوامل المتداخلة والمتسببة في هذه الظواهر المرضية ·

SUMMARY

The study was carried out at the governmental Holstein dairy farm station located beside El-Arish City at the eastern north of Sinai. Decreased milk production of the highly producing cows, emaciation, alopecia, delayed puberty and prolonged anoestrus periods were the most common anamnesis.

Examination of the managerial system, including feeding, feed additives and source of water was carried out. Females were classified according to the productivity and age into low, medium and high producers, heifers under 2 years and calves under one year. Blood samples were taken for haematological investigations.

The results indicated bad managerial system, undernutrition in addition to the bad hygienic conditions. Macrocytic normochromic anaemia was evident among lactating cows while microcytic hypochromic anaemia was evident among heifers and calves.

INTRODUCTION

Holstein cows, as a highly producing animals, were introduced to Egypt to increase milk production. Several governmental and private dairy farms were established to fulfil this demand. However, various depressive factors affect the productivity of these animals. Hot climate, reduce feed intake and milk yield (BEEDE and COLLIER, 1986). Furthermore, indigestion and lower concentration of volatile fatty acids were also reported during heat stress (KELLY, et al. 1967 and SCHNEIDER, et al. 1987). SCHNEIDER et al. (1988) observed that high levels of sodium and potassium salts in drinking water altered the digestive, acid base and mineral status of heat stressed lactating cows. More dramatic decrease in milk yield was recorded by JASTER, et al. (1978) in high producing dairy cows consumed salt water especially for a prolonged periods. SAUL and FLINN (1985) reported that the ingestion of saline water is considered detrimental to health and could induce scouring, ill-thrift and even death of the exposed animals. Decreased live weight and feed intake was also recorded in cases in which drink water contained 5000 ppm (total solids). This decrease in live weight was initially preceeded by loss of productivity. CROOM, et al. (1985) recorded that high sodium and limestone in deinking water decrease the growth rate and feed utilization. They attributed this adverse effect in part to the reduction of the microbial function. HARVEY, et al. (1986) recorded that high levels of sodium chloride decrease the performance of the growing cattle.

At El Arish City a governmental dairy farm was constructed to produce milk for consumption at the north of Sinai. However, the production of milk was observed to be at the lowest level in most dairy cows at the time of this study. Hence, the aim of this work was to investigate some of the contributing factros.

MATERIAL and METHODS

I - Materials:

Animals:

A sample consisted of 405 Holstein females of several age groups and productive states were reared in the governmental farm station located at El-Arish, North of Sinai governorate. All investigated animals were not pregnant and classified into:

A) Lactating group which is subdivided into:

1- Low producing cows (n = 140)
2- Medium producing (n = 90)
3- High producing cows (n = 25)

B) Non pregnant heifers under two years (n = 80)
C) Female calves under one year (n = 70).

According to the history and the farm records, the 1st line of mothers were highly producing cows. However, year after year the productivity of these cows decreased. Furthermore some of them secrete no milk. At the time of this study, the number of the highly producing animals was not more than 25 cows.

Management:

All animals were kept in open yards with front sheds. The yards were seen dirty with the accumulation of several layers of dirts. Animals were fed on insufficient amount of commercial concentrate mixture (3-5 kg/head/day) added twice daily. Dry rice straw was offered. The only source of drinking water was the underground one which was obtained by using a suction pump.

Samples:

Whole blood samples from all animals were obtained using dry clean heparinized syringes from the jugular vein.

II- Methods:

1 - Clinical examination was adopted according to ROSENBERGER, et al. (1979) including anamenesis, examination of the animals and the environment.

2 - Haematological investigations were carried out according to JAIN (1986) including total erythrocytic count (T/1). Haemoglobin (gm/dl), Haematocrit (HT %), Mean corpuscular volume (MCV, FL), Mean corpuscular haemoglobin (MCH, p g) and the mean corpuscular haemoglobin concentration (MCHC, g/dl).

3 - The statistical analysis was carried out using the design of complete randomized block analysis and analysis of variance (ANOVA). The comparison between means was conducted using the least significant range at a significant level of 1% and 5% (SNEDECOR and COCHRAN, 1967).

RESULTS

1 - History and clinical examination:

Examination of the farm records revealed that all mothers were of the highly producing cows (20-25 kg milk/day). However, the productivity of these dams decreased gradually year after year. The production of the 2nd, 3rd and the following generations was sharply decreased. Emaciation, pale mucous membranes and lethargy were mostly present. The skin was dry, and covered by scales with patchy alopecia. The udders of the lactating cows were shrunken, small in size and some of them were thin and elongated. Delayed maturity of the heifers and low conception rates in mature animals were predominant. Haematological investigations (Table 1, Fig. 1) of the examined animals revealed highly significant variations in the total erythrocytic count, haematocrit, MCV and MCHC. It was also observed that the group which have the lowest erythrocytic count was the largest cell size. The younger animals have the most reliable picture, while the low producing group have the lowest picture. Analysis of water revealed high values of total solids 6541 PPM.

DISCUSSION

Several problems were detected by close clinical examination of the dairy herd of El-Arish Farm Station. Errors of the management were defined to be the most serious group. Insufficient concentrated diet, bad quality roughage, deprivation from the essential micronutrient and increased salinity of drinking water were contributed to be the primary etiological factors of the macroeconomic losses in the investigated dairy farm. Increased requirements due to high growth rates, high milk production and pregnancy could be considered as important contributory factors (BLOOD, et al. 1986).

The sharp decrease in milk production, severe emaciation, pale superficial mucous membranes, lethargy, dry skin, shrunken udder, patchy alopecia and easily removed hair all indicate nutritional deficiencies (ROSENBERGER, et al. 1979 and BLOOD, et al. 1986).

The Erythrocytic indices recorded highly significant variations between the different investigated groups including the TEC, PCV, MCV and MCHC. It was also observed that the decrease in TEC was followed by a parallel increase in the MCV and MCH in lactating animals while a decrease in the MCV and MCH was noticed in the non lactating animals. That is to say, in lactating cows the type of anaemia was macrocytic normochromic (Nutritional deficiency anaemia) which could be attributed to protein or cobalt or both deficiencies (COLES, 1986). Such fact could explain the presence of alopecia and lethargy of lactating cows. Contradictory, the type of anaemia in growing calves and heifers under two years was microcytic hypochromic which mostly related to the primary deficiency or subnormal utilization of Iron (COLES, 1986). It was noticed that under unsuitable conditions, animals could survive through minimizing its production and the mobilization of haemodynamics.

Lastly, it could be concluded that Holstein cows need the optimum condition of management, feeding and water of good quality to give the maximum productivity otherwise the animals metabolism will be devoted only to keep it survived through the mobilization of haemodynamics. Consequently high economic losses in production and reproduction arised. Furthermore several health problems will be spreaded.

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Table (1) : Mean haematological values in different groups

No.	Animals Condition	T.E.C. Trea/L	Hb gm/dl	Ht %	MCV Fl	MCH Pg	MCHC Gm/dl
1	Low producing cows	c 5.1±0.2	7.4±0.2	a 28.4±0.6	** a 55.7±1.7	** a 14.0±0.6	b 26.1±0.6
2	Medium	cb 6.4±0.5	8.1±0.4	b 25.1±0.3	b 39.2±2.3	a 12.6±1.1	** a 32.3±1.5
3	Highly	b 7.0±0.5	8.5±0.3	a 30.2±1.8	b 43.1±0.8	a 12.1±0.5	b 28.2±0.8
4	Heifers under 1 y	a 9.0±0.6	7.8±0.8	a 28.0±1.3	c 31.1±1.6	b 8.7±1.02	b 27.9±3.2
5	Calves under 1 y	** a 10.3±0.6	8.1±0.5	** a 30.3±0.8	c 29.1±1.9	b 7.9±0.3	b 27.0±2.1
	Normal mean vale	7.0	10	36	50	19	30
	ROSENBERGER et al (1979)	(5-8)	(8-12)	(30-40)	(40-60)	(14-24)	(26-34)

**, a, b, c significant at (p < 0.01 & P 0.05)

DAIRY FARM, NORTH SINAI

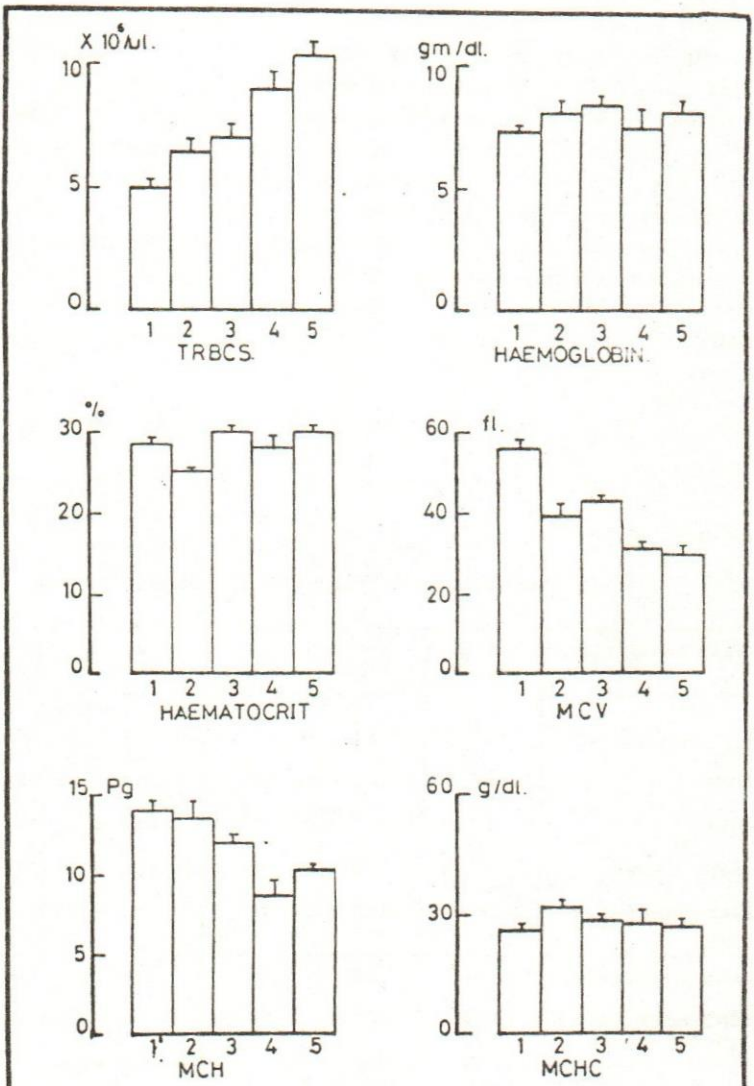

Fig (1)-Hemogram of cattle at north of sinai.