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ظاهرة التشحم في الأبقار ملاحظات اكلينيكية وكيميائية على قطع لماشية اللبن الفريزيان

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أجري البحث على عدد عشرون بقرة فريزيان - ظهرت عليها علامات التشحم بالاضافة الى عشرة أبقار بحالة صحية جيدة استخدمت للمقارنة . كانت العلامات المرضية التي ظهرت على الحيوانات هي فقد الشهية ، نقص ملحوظ في ادرار اللبن قلة الاخراج بالاضافة الى ظهور الاستون في البول . كانت السمة المميزة لهذه الظاهرة هي الزيادة الملحوظة في الدهن المختزن في منطقة المناعم وعند منبت الذيل .

أوضحت التحاليل المعملية زيادة ملحوظة في نسبة الدهون الكلية في السيرم والتراي جلسيران بالاضافة الى زيادة في نسبة الالبيومين .

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FAT - COW SYNDROME :
A CLINICAL AND BIOCHEMICAL OBSERVATIONS ON HOLSTEIN-FRIESIAN
DAIRY HERD
(With 5 Tables)

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SUMMARY

Twenty holstein-friesian dairy cows showing sings of fat-cow syndrome were included in this investigation. Ten healthy cows were kept as a control group. Clinical sings were depressed appetite, drop in milk yelid, scanty faeces, and ketonurea. Cows were too fat and have body condition scare 3-5.

Serum total lipids and serum triglycerides values were markedly increased slight increase in the values of serum total protein, while a marked dropp in Albumen value. A/G ratio was increased.

INTRODUCTION

Fat-cow syndrome is a metabolic disease which causes problems in dairy cows, that are too fat (McCORMACK, 1978).

Over feeding of cows during the dry period, lasts longer than normal (RADOSITS and BLOOD, 1985), and when the ration rich in protein poor in Fiber (STOBER and DIRKSEN, 1983), are the common causes of fat-cow syndrome. In many dairy stations over feeding of cows during the dry period is more commen than under feeding because the cows are group-feed with lactation cows (ROBERT et al., 1981). Fat-cow resulting from over feedig are more susceptible to calving difficulties, metabolic disorders and infectious disease (MORROW et al., 1979).

Excess fat on the cows can reduce feed intake after calving, possibly by reducing gastrointestinal capacity and by release of larger than normal amounts of free fatty acids into the blood, thereby depressing appetite after parturation, that may result in a marked shortage of nutrients (BINE, 1979, and BOSTER et al., 1979). Visual inspection of fat-cow from the rear with determination of flat lumbosacral area and base of the tail, can help the evaluation of body condition (RADOSTITS and BLOOD, 1985). STOBER and DIRKSEN (1983) reported that there were increase in the levels of total lipids, triglycerides and serum biliruben. Further more the serum Albumen level is also increased (ROBERT et al., 1981).

The aim of present investigation is to study the possibility of incidence of fat-cow syndrome in imported holstein friesian dairy herd under our feeding circumstancses with the aid of clinical examination and some biochemical parameters.

MATERIALS and METHODS

This observation was carried out on a holstein-friesian dairy hard in Sohage Governrate. This herd composed of 250 cows in the third season of laction. Some cows appear too fat, with marked drop in milk yeild. Twenty cows were selected according to body condition score and the clinical sings. Ten clinical healthy cows were used as a control group.

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Informations about the herd history were collected, and careful clinical examination were carried out.

Body condition scoring :

Body condition of cows was scored by visual inspection and palpation of the loin area and tail-head of the animal. The degree of fatness over these area is assessed and scored from 0-5 (LOWMAN *et al.*, 1976, and WILDMAN *et al.*, 1982).

Two blood samples were collected from jugular vein, anticoagulated one used for cell count, and the second used for serum separation albumen total protein, serum albumen serum total lipids, and triglycerides were determined using biomerieux* reagent kits and measured by the use of PYE-UNICUM uv/visib. Spectrophotometer Mod. 8800. Red cell, white cell count and hemoglobin concentration were determined using cell-Dyne-300 electronic cell counter.

RESULTS**Herd History :**

All diseased cows were in the third season of lactation and appeared too fat.

Deposition of fat were in subcutaneous tissue at the lumbosacral and the tail-head areas.

Marked drop in milk yield, and different degree of anorexia observed.

An additional information is, that the cows were over fed with concentrates during the dry period, (3 - 4 months).

Clinical Observations :

The collected clinical signs are present in table (1). Appetite was varied from partial anorexia to complete refuse to eat, faeces was in some cases dry and scanty; in some other cases soft.

The most common and constant signs were the cows appeared too fat, with appreciable increase in body weight due to excessive deposition of fat in subcutaneous tissue at the area of lumbosacral and the tailhead, with exception two cases showed loss of bodily condition.

Milk production was markedly dropped in comparison with the previous lactation season. Urine analysis for ketone bodies revealed the presence of keton urea in different degrees.

Biochemical Aspect :

In tables 2,3 and 4 the values of serum total protein, serum albumen, serum globulin, serum total lipids and serum triglycerides were illustrated. In table (5) the mean values of such parameters in addition to mean values of blood cell count were tabulated.

Mean values of serum total protein, serum albumen and serum globulin for healthy cows were 83.60 g/L, 39.60 g/L, 39.33 g/L and 48.56 g/L respectively while the mean values for cows showing a signs of fat-cow syndrome were 105.97 g/L, 63.04 g/L and 42.92 g/L. respectively. Mean values of total lipids and triglycerides in healthy cows were 4.16 g/L and 1.82, mmol/L and in fat cow syndrome 14.95 g/L and 4.46 mmol/C.

* : Biomerieux - France.

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DISCUSSION

The nutritional objectives during the dry period depend on the body condition of the cows at the end of lactation, under optimum conditions cows should be dried off in a good bodily condition score (2.5 - 3.5).

Inspection and palpation of the diseased cow revealed that all cows had a body condition score varied from 2.5 - 4.5, with exception 2 cows which had a body condition score 2, table (1). The above mentioned scores lied on the scale of heavy moderate to very flat that reported by (WILDMAN, 1982). Such increase and excess gain of body weight is due to over feeding durin the dry period which is uneconomic and may result in metabolic diseases after parturation.

The observed clinical signs in the form of depressed appetite marked reduction in milk yield, dry scanty faeces. Obvious increas in body condition scoring and the presence of keto-urea, are in agreement with classical signs mentioned by McCORMACK, 1978 and REID, 1980 and STOBER and DIRKSEN,1983). Determination of total lipids and triglycerides revealed significant increase in their values (P 0.01) which reached to 14.95 g/L and 4.46 mmol/L respectively. Similar results were published after REID (1980) and STOBER & DIRKSEN (1983), possible explanation of such alteration in the values of serum total lipids and triglycerides may due to dietary intake in early lactation cannot meet the energy requirment for milk yield, ad subsequently the cows undergo a period of energy deficit. During this period cows mobilize-body fat reserves for milk production and subsequently lead to liberation of a lрге quantities fatty acids and total lipidis in the plasma.

Mean value of serum total protein in diseased cows was elevated (105.97 g/L) in contrast to the mean values in healthy cows (83.60 g/L) in addition to significant increase in the mean value of serum albumen (P 0.01). This observation was agreed with data published after ROBERTS *et al.* (1981) and STOBER and DIRKSEN (1983). Additional information could be taken from serum protein essay in fat-cow syndrum is that the mean values of globulin are dropped from 48.56 g/L in healthy cows to 42.94 g/L in diseased ones (P 0.05). The A/G ratio was significantly increased. Blood Red cells and White cell count in addition to hemoglobin estimation showed no significant variations between the healthy and diseased cows.

Conclusions :

- 1- The diet fed to dry cows should e formulated to minimize the incidence of fat-cow syndrome.
- 2- Obviously, the dry cows should be seperated from the milking cows to prevent improper dietary practice.
- 3- The ideal body condition for pregnant non-lactating dairy cows that allow them to attain maximl milk production and minimal metabolic disorders during the subsequent lactation has not been defined. Recommendation for satisfying the neutritional requirment of dairy cows at given body weight and with additional needs for milk production or gestation or both.

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Table (1): Clinical findings in cases of fat-cows syndrome.

	Appetite	Body condition score*	Milk production	Ketonurea**	Faeces	Percussion of liver
1	depressed	4	decreased	++	Scanty	enlarged
2	depressed	3-4	decreased	++	dry-Scanty	slight enlargement
3	normal	2	slight	+	Scanty	not significant
4	depressed	3-4	decreased	+	normal	not significant
5	depressed	4	markedly dropped	++	dry-Scanty	markedly enlarged.
6	slight depression	3	decreased	+	dry	not significant
7	depressed	3	slight	+	Scanty	not significant
8	depressed	4	decreased	++	dry-Scanty	enlarged
9	Normal	3	Normal	+	Scanty	not significant
10	depressed	4	decreased	++	dry	enlarged
11	Slight depression	4	markedly dropped	++	Scanty dry	Slight enlarged
12	depressed	4	dropped	++	Scanty dry	enlarged
13	Normal	2	Slight decreased	+	dry	not significant
14	depressed	4	markedly dropped	++	dry-slimy	enlarged
15	Slight depression	3	dropped	+	Scanty	not significant
16	Normal	2.5	normal	-	Scanty soft	not-enlarged
17	marked-dropped	4.5	dropped	+++	dry-Scanty	enlarged
18	dropped	4	Slight-dropped	+	dry	not significant
19	decreased	3	Slight decrease	+	dry	not-significant
20	decreased	2-5	dropped	++	dry-scanty	enlarged

Remarks

* Body condition scoring was determined according to Scale mentioned by wildman et al 1982 and Iowan et al 1976

** Ketonurea was detected by the use of sodiumnitroprosside powder.

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Table (2) Serum total protein, Serum albumen, Serum globulin level and A/G ratio in healthy control cows.

Nr	Total protein g/L	Albumen g/L	globulin g/L	A/G ratio
1	88.11	32.24	55.87	0.57
2	63.07	24.15	40.15	0.60
3	69.25	32.66	36.65	0.89
4	79.87	37.87	41.33	0.9
5	79.10	32.84	4.26	0.7
6	85.57	38.83	46.74	0.83
7	90.71	40.15	50.56	0.79
8	88.88	34.09	54.79	0.62
9	99.33	34.84	64.49	0.54
10	91.12	41.66	49.46	0.84
X	83.60	39.33	59.46	0.74
S.D.	6.90	4.4	13.25	0.13

Table (3) Serum total protein, Serum albumen, Serum globulin level and A/G ratio in cows having fat-cow syndrome

	Total protein g/L	Alb. g/L	Glob. g/L	A/G ratio
1	108.02	68.18	39.84	1.71
2	100.90	61.10	39.80	1.53
3	110.30	64.73	45.57	1.42
4	101.90	59.60	42.30	1.40
5	108.20	65.08	43.12	1.50
6	107.10	70.13	36.97	1.89
7	106.06	63.99	41.07	1.55
8	101.95	59.02	41.85	1.41
9	114.03	64.17	49.86	1.28
10	103.10	58.98	44.12	1.33
11	108.90	64.01	44.89	1.42
12	100.70	58.31	42.39	1.37
13	99.90	57.06	42.84	1.33
14	101.40	59.20	42.20	1.40
15	105.60	66.10	39.50	1.67
16	100.30	59.17	41.13	1.43
17	110.70	68.16	41.91	1.62
18	101.90	58.13	43.77	1.32
19	113.87	69.14	44.73	1.54
20	114.70	66.40	48.30	1.37
X	105.97	63.04	42.80	1.47
S.D.	4.94	4.14	2.90	0.15

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Table (4): Serum total lipids and serum triglycerides values in healthy and diseased cows.

Healthy Cows			Fat-cow-syndrome		
	Total lipids g/L	triglycerides mmol /L		total lipides g/L	triglycerides mmol/L
1	4.33	1.57	1	11.39	4.30
2	4.73	2.02	2	14.16	4.18
3	3.98	1.60	3	13.70	3.89
4	4.60	1.99	4	23.15	4.19
5	3.33	1.35	5	14.30	4.50
6	3.89	2.15	6	12.60	5.01
7	4.10	1.75	7	15.07	4.18
8	4.17	2.70	8	12.70	4.70
9	4.38	1.13	9	15.30	3.84
10	4.11	2.04	10	13.60	4.30
			11	18.17	4.80
			12	16.46	4.19
			13	13.73	6.80
			14	13.76	5.13
			15	12.30	4.10
			16	15.34	4.20
			17	16.40	4.91
			18	18.30	3.80
			19	16.10	4.17
			20	13.71	4.30
\bar{x}	4.16	1.82	\bar{x}	14.95	4.46
S.D	0.39	0.44	S.D	2/64	0.66

Table (5): Mean values of serum total protein, serum albumen, serum globulin, total lipids, triglycerides, red cells, white cells in healthy and fat-cows.

	Total protein	Albumen	Globulin	Total lipids g/L	Triqly- cerides mmol/L	R.B.Cs T/L	W.B.Cs million G/L	Hb g/L
Healthy-cows	\bar{x} 83.60	39.33	59.46	4.16	1.82	7.94	14.31	14.60
	S.D 6.90	4.4	13.25	0.39	0.44	1.83	3.50	1.84
Fat-cow syndrome	\bar{x} 105.78**	63.04**	42.80**	14.95**	4.46*	6.89 ^{n.s}	11.53 ^{n.s}	12.34 ^{n.s}
	S.D 4.94	4.19	2.90	2.64	0.66	2.73	2.53	3.50

n.s = not significant

P<0.05 = significant

P<0.01 = highly significant