

الصفات الطبيعية والكيميائية لعصارة الكرش
فى الأغنام بعد تغذيتها على بعض مخلفات المحاصيل

١٠ ح . طمر ، س . العمروسى ، سناء نصاره ، ع . عبد المطلب ، ط . أ . العلوى

تم فى هذا البحث دراسة الصفات الطبيعية والكيميائية لعصارة الكرش فى الأغنام البلدية بعد تغذيتها بخمسة مواد غذائية من مخلفات المحاصيل التى تتوفر فى محافظة أسيوط (عباد الشمس ، سيقان الفول الأخضر ، درنات البطاطس ، صلبة القصب ، وعروش البسلة) . ولقد ظهرت النتائج التالية :-

أولاً : بدأت تظهر بعض الاعراض الأكلينيكية المرضية على هذه الحيوانات بعد ٢٤ ساعة من تغذيتها .

ثانياً : حدث تغير فى خواص عصارة الكرش الطبيعية حيث أصبحت شبيهة سائلة وأحياناً غليظة القوام ، كما لوحظ أن البروتينات صفيرة الحجم

أصبحت بطيئة الحركة من حيث كانت الأنواع الكبيرة منها نشطة تماماً .
ثالثاً : أنخفض الأسى الهيدروجينى لعصارة الكرش فى حين ارتفعت الكمية الكلية للأحماض الدهنية الطيارة ، وقد اعتمدت هذه الاختلافات على نوع التغذية المستخدمة .

رابعاً : أنخفض تركيز الامونيا فى عصارة الكرش فى جميع حالات التغذية بهذه النباتات فيما عدا التغذية على عروش البسلة حيث ارتفع تركيز الامونيا .

Dept. of Vet. Med. Fac. of Vet. Med. Assiut University.
Head of Dept. Prof. Dr. S. El-Amrousi.

RUMINAL CHANGES IN SHEEP AFTER OVER FEEDING
WITH SOME FEED STUBBLES
(With 3 Tables)

By

A.A. AMER, EL-AMROUSI, SANAA, M. NASSAR.

A.MOTTELIB, A.A. and EL-ALLAWY, T.A.

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SUMMARY

Five trials of forced over feeding of sheep with *Hilianthus annus*, *Vicia Faba*, *Solanum tuberosum*, *Saccahrurn officinarum* and *Pisum sativus* were tried in starved 25 male rams.

The present study revealed:-

1. Clinical signs of illness appeared 24 hours after over feeding.
2. Used feed stuffs dramatically affected physical character of rumen juice. It became putrid, of fluid to semifluid or even thick consistency with delayed sedimentation activity. Smaller sized protozoa were sluggish in movement while large ones were completely inactive.
3. Rumen pH. was dropped while T.V.F.A. concentration were elevated. Severity of variation was largely dependent on type of feed.
4. Rumen juice ammonia concentration was dropped except in over feeding with *Pisum sativus* where it increased.

INTRODUCTION

Farm flocks may accidentally gain entrance to fields where vegetable fields, fruit orchards or stored grain in excessive amounts are available. Moreover some animals eat large amounts of stubbles after the main crop has been the-
red, Clinical signs of over feeding develop when the affected animals are metabolically unable to accomodate these
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quantities of the food consumed. Violent illness with high mortality may occur. Farm flocks of ewes, lambs and rams may develop the disease.

It was noticed also that feed stuffs which may cause clinical signs of over feeding when consumed in access are those containing, as a main components, carbohydrates, protein and non-protein nitrogen.

In Assiut province sheep may be forced, when normal ration are deficient, for consmption of some feedstuffs as Hilianthus annus, Saccahrurn officinarum, Pisum sativus, Vicia Faba, Come were delivered to the clinic as sick animals with history of indigestion.

The aim of the present study was to force the animal to eat these feedstuffs to have an idea about the clinical picture as well as to study the biochemical changes that could occur in rumen of sheep.

MATERIALS AND METHODS

This work was carried out in the Clinic of the Department of Vet. Medicine Assiut University from March to August 1976.

Animal Used:

Twenty five rams of local breeds, of one year age and of about 27 - 30 Kg BWT were used. They were proved to be clinically normal and were ~~parasite~~ free before the begining of the experiment.

Induction of Over feeding:

Rams were fed barseem 30 days before the experiment after which they were divided into five seperate groups with individuals each.

RUMEN JUICE ANALYSIS IN OVER FED SHEEP

- 23 -

Five common local feed stuffs were respectively offered to each group. These were:-

- | | |
|----------------------|----------------------------|
| 1. Hilianthus annus. | 2. Saccahrurn officinarum. |
| 3. Pisum sativus. | 4. Solanum tuberosum. |
| 5. Vicia Faba. | |

The chemical analysis of these feed stuff is present in table (1).

Drinking water was left in front of the animals add lib. All animals were kept 24 hours without being offered any feed. The vegetated feed stuffs and potatoes were charfed into very small pieces to be easily prehended and swallowed.

Collection of Rumen Sample:

Twenty four hours after starvation as well as after offering the used feed stuffs clinical examination of animals was studied; Rumen fluid samples, at the same time, were collected by stomach tube, connected with suction pump. About 150 ml of rumen fluid were collected from each animal. The fluid was then strained through four folds of surgical gauze. Physical and biochemical examination as well as the motility of protozoa in freshly strained rumen fluid was conducted in the same manner as described by EL-SEBALI, (1974).

The basis of the statistical analysis of the present data was performed according to SNEDECOR, (1956).

RESULTS AND DISCUSSION

CLLNICAL EXAMINATION OF OVERFEED ANIMALS:

One day after having the respective meals some sheep (12) stood and pressed their head in the corner of the crates or stood with their head lowered and ears down. Most sheep (13) eventually assumed ventral recumbancy and are unwilling, when forced, to move. Their eyes were fixed in starry gaze.

Assiut Vet. Med. J. Vol. 4 No. 8, 1977.

Some sheep salivated, all has serous nasal discharge. Slight constipation was observed at the first twenty four hours, that subsided and followed by diarrhoea of very offensive odour. Body temperature remained normal. Pulse and respiratory rates slightly increased.

Clinical signs observed here were in accordance with these observed by JENSEN, (1974); and VESTWEBER, (1974).

By palpation of the rumen, a doughy material was detected that yields dull sound on percussion. Rumen motilities was detectable in almost of all animals while in the rest (8) ones ruminal motility was severely depressed (one every three minutes).

PHYSICAL EXAMINATION OF RUMINAL JUICE:

Table 2 shows physical characteristics of strained ruminal juice obtained after feeding of used feedstuffs.

Variations in the colour of ruminal juice, in over fed animals, changed with the types of food used i.e light yellow in experiment with *Pisum sativus*, yellowish to light green in experiment with *Saccharum officinarum* and *Hilanthus annuus* while dark green colour of rumen liquor was detected in experiment with *Vicia Faba*. Putrid odour of rumen juice existed in but all the collected ruminal juice.

BIOCHEMICAL CHARACTERS OF RUMEN JUICE:

Table (3) shows some of the biochemical changes of rumen juice in experimental sheep. The various constituents will be dealt separately.

a) REACTION (PH):

A general hyperacidity (5.92 - 7.00) of rumen juice was evident in all experimental groups when compared with data in starved sheep (7.12 - 7.42). Most lowered PH value was seen

in overfeeding with *Pisum sativus* (5.92) while highest figures was seen in experiment with *Saccharum officinarum* (7.00). This fact was expected since all used feedstuffs were considered as containing easily digestable carbohydrates with exception of *Pisum sativus* which is comparatively rich in protein. ASH (1959) showed lowered rumen PH (up to 5.00) in cases of over feeding with carbohydrate rich diets in sheep.

b) TOTAL VOLATILE FATTY ACIDS CONCENTRATION (T.V.F.A):

In coincidence with significant changes of rumen PH, seen in cases of over feeding, similar phenomena was observed in the concentration of T.V.F.A. since a close interrelation ship existed between rumen and concentration of these acids (VESTWEBER, 1974).

Hilanthus annus and *Vicia Foba* could be considered as a roughage containing easily digestable carbohydrates.

This can account for the maximal values of T.V.F.A. concentration in rumen juice of sheep overfed with such diets; 152.0 and 165.2 millmol/L for the first and second diet respectively; instead of 33.2 to 55.0 millmol/L in starved sheep.

Solanum tuberosum and *Saccharum officinarum* could be tabulated as carbohydrate diets but not of easily digestable category. Overfeeding with such diet highly significantly increased concentration of T.V.F.A. however obtained data are lower than in cases of *Hilanthus annus* and *Vicia Foba* (Table 3).

Pisum sativus is considered comparatively as a roughage containing higher amount of crude protein that undergoes fermentation in the rumen with the production of higher T.V.F.A. concentration (107.8 instead of 75.00 millmol./L in starved sheep).

c) AMMONIA CONCENTRATION (mg%) IN RUMEN JUICE:

Overfeeding with easily digestible carbohydrate diets lowered the level of rumen ammonia concentration that reached only 16.82 mg% in cases of *Vicia Foba* and 26.22 mg% in cases of *Hilianthus annus* in comparison with 26.08 to 35.00 mg% in starved sheep. Unvaluable change were evident in overfeeding with *Solanum tuberosum* and *Saccahrum officinarum* (Table 3). Ammonia concentration (mg%) in the rumen juice was significantly increased ($P \leq 0.001$) when *Pisum sativus* was offered to starved sheep (49.98 mg% and 32.62 mg% respectively). It may be explained by the fact that synthesis of ammonia from such diets occurs. Such result was supported by those obtained by ANNISON et al. (1957) and LEWIS, (1961).

As a conclusion, the present study revealed that either accidental or forced feeding of sheep with such feedstuffs may severely disturbs the biochemical processes occurring in the rumen with resultant illness.

Care, thus must be taken in gradual accomodation of such animal when these feedstuffs are the only source of diet.

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RUMEN JUICE ANALYSIS IN OVERFED SHEEP

- 27 -

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Table (1)

Chemical analyses of used food stuffs in percent

Constituents	Food stuffs	Meisture %	Grude Protein %	Ether extract %	Ash %	Carbohydrates d %	Crude fibers %
Barseem		86.31	2.54	0.46	1.92	6.39	3.80
			18.00			46.00	28.00
Vicia Foba		84.40	3.35	0.73	2.11	5.92	3.49
			21.50			38.00	22.40
Pisum sativus		7.96	7.70	0.85	7.70	39.20	36.51
			8.40			42.60	39.80
Sacchrum officinorum		65.76	1.01	0.46	0.99	20.89	10.89
			2.10			61.00	31.80
Solanum tuberosum		79.10	1.66	0.05	1.10	17.74	0.35
			8.70			86.00	1.30
Hilanthus annus		70.26	0.44	0.21	1.67	12.90	12.54
			1.48			43.40	48.80

* Technical boluten of minestry of agriculture (1968)

** Abou Akkada et al. (1958).

*** The second figures are calculated according to dry matter.

Table (2)
PHYSICAL CHARACTER OF RUMEN JUICE

Groups	Color	Consistency	Sedimentation activity in min.	Protozoal motility
Bepere Indigestion	Green	Aromatic	Fluid	15 - 30
			Semiliquid (2)	Smaller active Medium Sluggish
Hilienthus annus	Light greenish	Foul	Fluid	40 - 60
				Smaller and medium Sluggish
Saccabrum officinarum	Yellowish to light green	Foul	Fluid	over 60
				Smaller active medium Sluggish
Pisum sativus	Light yellowish	Foul	Thick	over 60
				Smaller active medium Sluggish
Solanum tuberosum	Light yell-owish	Slightly putrid	Semisolid	over 60
				Smaller active medium Sluggish
Vicia Foba	dark green	Very Foul	Thick	40 - 60
				Smaller and medium Sluggish

N. B. Larger types of microflora are completely inactive either in starved or in an indigested sheep.

Table (3)
Rumen juice characteristics in over fed sheep.

Feed stu- stuffs	Ph	TVEA millmol/L		Ammonia mg%		
	Starvation	Indigestion	Starvation	Indigestion	Starvation	Indigestion
Hillanthus annus	7.12±0.15 T= 9.25 ^{xxx}	6.38±0.20 T= 9.25 ^{xxx}	55.00±11.22 T= 16.900 ^{xxx}	14.23 T= 16.900 ^{xxx}	35.00±5.26 T= 4.5535 ^{xx}	26.22±3.34 T= 4.5535 ^{xx}
Saccharum officinarum	7.42±0.11 T= 5.82 ^{xxx}	7.90±0.20 T= 5.82 ^{xxx}	39.80±15.07 T= 3.819 ^{xx}	50.80±6.02 T= 3.819 ^{xx}	21.20±5.8 T= 0.02	21.22±6±5.30 T= 0.02
Pisum sativus	7.18±0.13 T= 18.00 ^{xxx}	5.92±0.18 T= 18.00 ^{xxx}	75.00±6.33 T= 6.995 ^{xxx}	107.80±13.39 T= 6.995 ^{xxx}	32.62±4.39 T= 10.789 ^{xx}	49.99±8±5.13 T= 10.789 ^{xx}
Solonom tuberosum	7.32±0.30 T= 4.914 ^{xxx}	6.72±0.25 T= 4.914 ^{xxx}	48.40±13.14 T= 4.529 ^{xx}	78.20±16.14 T= 4.529 ^{xx}	29.88±7.55 T= 0.39	28.77±6±4.94 T= 0.39
Vicia Faba	7.14±0.04 T= 8.606 ^{xxx}	6.14±0.15 T= 8.606 ^{xxx}	33.20± 8.76 T= 14.829 ^{xxx}	165.20±26.75 T= 14.829 ^{xxx}	26.08 T= 6.99 ^{xx}	26.22±2±17 T= 6.99 ^{xx}

xx P / 0.01

xxx P / 0.001

TVFA = total volatile fatty acids.