

Natural Cases of Rickets in Baraki Goat Kids

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Abstract: Rickets was evaluated in 6 kids out 100 from different farms in Monofia Governorate of both sex, under 8 months of age. Clinical signs included anorexia stunted growth arched back, joint enlargement and abnormal, curvature of fore limb bones of the kids. Fed consisted of yellow corn 60% and dried trifolium Alexandrun 22% they housed in door, the main biochemical serum analysis recorded were hyperphosphatemia hypoc-alcemia and decrease the activities of Alkaline phosphatase significant increase of cortisol hormone. Urea, creatinine, glucose. P.C.V, and hemoglobin in blood. The results indicated that rations containing high level of com caused decreased digestion coefficient of all nutrients for both growing goat kids (healthy and Rickets). Also Rickets disease decreased digestibility, and nitrogen balance for kids fed two experimental rations. This study recommended that using balanced diets affect decreased significantly in digestion coefficient, feed intake and nitrogen balance.

[Mona.S. Zaki, Awadalla. I.M, Mohamed. M.I, Iman. M. Zytaun, Sami Shalaby, Nagwa Atta, and Suzan.O. Mostafa.. **Natural Cases of Rickets in Baraki Goat Kids**. Life Science Journal. 2012;9(1):184-188] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 26

Keyword: Natural Cases, Rickets, Baraki, Goat Kids.

1. Introduction

Rickets is among the most devastating crippling disease-that affect lambs & kids young animal fed diet deficient in Vit.D and rich in phosphorous and housed in doors without exposure to ultraviolet irradiation develop Rickets, calcium deficiency, also will result in Rickets because of the failure to maintain an adequate ion product of serum calcium and phosphorous at (the zone of mineralization is bones enlarged of joints in a typical signs of rickets it involves lung bones and is usually accompanied by lateral or medial deviation. **Julb et al (1993)** Eruption of teeth is delayed and irregular severe deformity of chest h-one -and chronic ruminal tympany **R-adostits et al (2000)**.

The most consistent clinicopatho-logical finding in Rickets is change in serum sodium serum calcium phosphorous with hematological alteration hyperphosphatemia and drop of serum Alkaline phosphatase (**Elsayed & Siam 1992**).

* Aim of the present work: this work was conducted to study some Nutritional & clinicopathological findings in naturally affected kids in monofia governorate. to avoid the occurrence of this disease and correction of diet offered to kids.

2. Material and Methods

Out of 100 kids under 8 M. age were included in this work, 6 kids showing clinical signs of Rickets, this study was conducted in Manrofia governorate. and 6 apparently healthy control kids of same age.

All animals were examined clinically and blood samples were collected from jugular vein with & without EOT A. Blood samples were collected for determination of Hemoglobin, P.C.V volume were made, according -to **Hunger "ford (1989)** serum total protein, sodium, potassium, chloride, Urea. Creatinine, glucose, the activities of alkaline phosphatase and lactate dehydrogenase. **L.D.H**, calcium, phosphorous were measured colorimetrically by using commercial available test kits supplied by Bio Merieux lab. Reagent and instruments France. Cortisol hormone was measured according to **Kuehen and Burvenich (1986)**. Statistical analysis: statistical analysis of the obtained data were statistically analysed by T. test according to **Petrie & Waston (1999)**.

Twelve growing goat kids (6 normal and 6 Rickets Kids), 8-9 months old with an average body weight of 18.23 ± 1.87 kg were randomly assigned to

examine the effect of Rickets and high level of corn in the experimental rations on digestion coefficient and Nitrogen utilization by normal and Rickets Kids. Animals of each (normal and Rickets disease kids) were divided randomly into two equal groups. Animals of the first group were fed complete feed mixture ration (R₁, control), the second group was fed a complete feed mixture containing high level yellow corn (R₂). Tables (1) and (2) showed "The composition of experimental rations and its chemical composition. The animals are belonging to farm in monofia governorate to the sheep and goats research unit. El-Bostan -Nubaria, Animal Production. Dep. National" Research Center. Cairo, Egypt. Animals were individually placed into 12 metabolic cages and adapted for 21 days as a preliminary period followed by 7 days as a collection period. Faeces and urine were collected and sampled properly. Rations and water were available ad libitum. Samples from the residuals, faeces and urine were analysed for proximate analysis by **A.O.A.C (1980)**.

The data of nutritional parameters were analysed according to **SAS (1993)** procedures. The significance among means was tested by pie rang test (1959).

3. Results and Discussion

There was a significant decrease in total protein and alkaline phosphatase in groups (2) sodium, potassium, chlorine, and calcium and significant increase in serum Urea, creatinine, glucose, phosphorous and cortisol level. In diseased animal there was also significant increase in P.C.V & Hemoglobin as show in Table (3). A common cause of rickets is grain over load in support of t-his carbohydrate over load has been a reliable way to reproduce Rickets and housing indoors. In this study several reports of naturally occurring rickets **Crowley (1961)**, **Elsayed and Siam (1992)** in this work clinical Rickets was evidenced by anorexia, arched backs, stiffness in gait joint enlargement, similar signs were recorded by **Charyrabarti (2000)** **Radostities et al (2000)** **Smeth (1996)** and **Sonnenrirth & Jaratte (1580)** enlarge of joints are the most characterisitic features in our diseased kids. **Sonnenrirth & Jaratte (1980)** reported that phosphorous deficiency has commonly been in animal as major factor in the cause of Rickets sometimes alone or in association with Vit D deficiency our study disagree with this opinion. In this investigation there was no evidence of Hypophosphatemia, serum Kypocalcemia. and decrease in serum Alkaline phosphatase. This opinion agrees with. **Agag et al (2002)** in serum phosphate & serum calcium but disagree in serum alkaline phosphatase. The most prodominents

Biochemical finding in this study. The significant hyperphosphatemia was the results of elevated dieatry phosphorous this observation was previously recorded by **Mahin in et al (1984)** and **Haward (1982)** in lambs fed diets rich in cereal, and wheat bran respectively. **Hurgerfood (1989)** and **Agag et al (2002)** they described that concentrate which are particulary rich in posphorous and poor in calcium will cause bone abnormality and joint tranlules. The observed hypoproteemia in our work, could be attributed to prolonged anorexia, our study agree with **Agag et al (2002)**, this indicated by increase P.C.V & Hemoglobin concentration this finding attributed to loss of plasma water through large intestine of kids because of anorexia and adipsia. (**Beech 1994**). Hyperglycemia in diseased kids was probably due to hydrocortisone which has been indentified as the major free plasma **keneta (1989)**. **Field et al (1975)** glucocorticoid Rickets mentioned that increased hydrocortisone was probably responsible to some degree of leukocyte changes and the **hyperglycemia Somth (1996)** **Nislet et al (1966)**.

The elevated value of serum urea, creatmine and change in soduim and potassium value in disease kids may attribute to dehydration, glumerulonephrities, and medullary necrosis **Mahim et al (1984)** **Koneka (1989)**. L.D.H-, the significant increase in L.DH value may be due to hepatocellular changes from endot-oxin delivered in portal circulation of secondry bacterial invasion due to immunoligical suppression this result confirmed the result of **jull (1993)** who mentioned that there were muscular-and hepatic disorders associated with inmmunological suppression in animals suffered from Rickets. Concerning electrolyte changes were similar, to those reported by **Agag (2002)** A marked hypochloremia was recorded in diseased animal the obtained results may attributed to severe dehydration caused by excessive loss of fluid electrolytes this observation supported the results that, recorded by. **Oviisten (1964)** **Koneko (1989)**. We can concluded from this-study that Rickets in kids is a complex disorder and despite our best effect to p-revent treatment of diseased kids by offered a.balanced ration rich in mineral and put them in sun shine for at least 5-6 H every day **it is often featal to kids** and treatment should be given as soon as possible after clinical sign develop or preferably before, the best policy is to use high quality of roughge and to supplement with minimum grain.

Apparent digestibility and nutritive values:

Results in Table (4) indicated that rations containing high level of corn with normal kids did not affect the apparent nutrients digestibilites. While the apparent digestibility (%) of DM. OM,

CP, CF and NFE of experimental rations fed to the Rickets Kids were significantly ($P < 0.05$) decreased for both rations and increasing- level of corn (R_2) decreased the apparent digestibility than Rickets kids fed (R_1 , control) however, either extract digestibility was not significantly affected neither by Rickets disease or by high level of corn in the experimental rations. The significant reduction of nutrient digestibilities (**DM, OM, CP, CF and NFE**) as a result of high level of corn and Rickets disease by (CF in $R_1 = 15.61$) and (CF in $R_2 = 11.22$) was related to the increasing percentage of CF content of R_1 (Blaxter, 1967). Contrariwise, the DCP % increased ($P < 0.01$) for experimental ration (R_1 , control) containing high level of CP percentage (13.63% US 12.25%).

Highest nutritive value as **TDN** was observed for the control ration with normal kids followed by ration 2 with normal kids also. The results revealed also that TDN more affected by kids health, the lowest TDN was recorded by Rickets kids with R_1 followed by Rickets kids with R_2 . These results proved that Rickets disease of kids was reduced the total digestible nutrients intakes which consequently causing a reduction in TDN values recorded by Rickets kids. The due to the lower feed intake by Rickets kids and lower CP and CF content in R_2 than in R_1 .

Nitrogen utilization:

Results in Table (5) indicated that nitrogen intake expressed as (g/h/d) were significantly ($P < 0.05$) affected among rations. Whereas, high level of corn in R_2 decrease significantly ($P < 0.01$) the nitrogen intake from control ration (R_1). This difference could mainly due to the high level of corn and its lower contents of CP (El-Shaer and Kandil, 1990). For the above reason nitrogen losses in both faeces and urine were followed the same trend of nitrogen intake. Rickets kids fed experimental rations. Showed significant ($P < 0.01$) differences in nitrogen retention compared to the healthy kids fed the same rations. Nitrogen balance as percent of nitrogen intake (NB/NI) value for healthy kids fed control ration (R_1) was significantly ($P < 0.01$) higher than the other goat kids groups fed the control ration (Rickets kids) or highly corn in the other ration (R_2). (Normal and Rickets Kids) due to the rickets disease and the higher nitrogen intakes from rations.

In conclusion, under conditions of this study, data indicated that ration containing normal level of corn and balanced diet was the best ration for healthy kids to obtain satisfy digestion coefficient and nitrogen balance and reduced feeding cost. Rickets disease decreased digestion coefficient for all nutrients and nitrogen balance. In the two experimental rations.

Table (1): Ingredients of experimental ratios used.

Item	Exp. Complete feed mixtures	
	R_1 (control)	R_2
Yellow corn	22	60
Wheat bran	25	5
Undecorticoated colton seed cake	20	10
Barssem hay	30	22
Lime stone	1.9	1.9
Common salt	1.0	1.0
Minerals mixtures	0.1	0.1
Vit& minerals mixtures	498	600
Total	100	100
Price of 1 ton. L.E	584	670

Product of RoviGypt Contain: 70g manganese, 20g copper, 50g zinc. 0.25 selenium, 4.0g iodine, 1.0g cobalt, 12×10^6 IU vit. A, 2×10^6 IU vit D3 . 15×10^4 IU vit E in 3.0 kg calcim carbonate.

Table (2): Chemical composition of experimental ration used.

Item	DM	% as DM basis					
		OM	CP	CF	EE	NFE	ASH
R_1 (control)	93.6	92.77	13.63	15.61	2.90	60.63	7.23
R_2	92.8	94.03	12.25	11.22	2.27	68.29	5.97

Table (3) Some biochemical & hematological parameters in diseased and control kids. Animal groups

parameters	Control kids	Diseased kids
Alkaline. phosphatase U/L. 216.2 10.24	216.210.24	189.2 9.47*
Total protein g/dl.	8.23 0.14	6.14 0.17*
Urea mg / dl	7.79 0.84	8.94 0.14*
C reatinine mg/dl	0.83 0.03	1.2 0.17*
Glucose mg/dl	6.70 1.79	7.84 0.80*
Sodium m. Eq/L	157.08 0.89	138 0.98*
Potassium m. Eq/L	2.70 0.54	1.98 0.64*
Chloride mmol / l	76 0.78	60 0.13*
Cortisol Hormone ug/dl	0.98 0.03	1.94 0.45*
p.c.v.%	32.9 0.78	40.2 1.70*
Hemoglobin g/dl	10.23 0.33	13.27 0.84*
L.D.H u/I	228.5 63.4	398 48.33*
Calcium ma / dl	1 1.33 9.78	9.24 0.54*
Phosphours. mg/dl.	8.94 0.27	12.42 0.13*

* P< 0.01

Table (4): Apparent nutrients digestibility and nutritive value of the experimental ration fed to growing goat kids.

Item	R ₁		R ₂		Significance
	Normal kids	Rickets kids	Normal kids	Rickets kids	
DM	'7-2.27 2.31a	68.33 1.23	70.26 1.22	66.82 1.42	*
OM	71.90 1.76	66.17 2.14	71.22 2.36	63.19 1.97	*
CP	70.81 1.11	67.12 1.26	70.96 1.86	64.89 1.62	*
CF	71.66 1.92	66.71 1.55	71.12 1.01	62.37 2.67	*
EE	72.18 2.27	70.12 2.18	70.86 2.36	68.12 1.06	NS '
NFE	70.73 1.27	65.56 0.99	71.36 1.26	61.16 1.49	*
TON	'68.44 1.41	63.89 1.17	68.93 1.27	60.19 0.09	**
DCP	9.66 0.56	9.15 0.27	8.69 0.15	7.95 0.17	**

A.b.c values in the same row with different superscripts are significantly different *(P<0.05) **P<0.01

1) Apparent digestibility, %

2) Nutritive values. %

Table (5): Nitrogen utilization (g/h/d) of growing goat kids fed experimental rations.

Item	R ₁		R ₂		Significance
	Normal kids	Rickets kids	Normal kids	Rickets kids	
BW,Kg	17.9 1.26	18.0 1.47	18.6 1.13	18.4 0.97	*
DML,g	530 0.13	480 0.37	505 0.80	440 0.43	*
DML/BW,%	3 0.86	2.7 0.74	2.7 1.10	2.4 0.85	*
Faecal,N.	3.36 0.11	3.44 0.26	2.87 0.46	3.03 0.47	*
Urinary,N	4.67 0.66	517 1.16	4.81 0.70	4.13 1.11	NS '
N-balance	3.52 0.23	1.86 0.30	2.22 0.66	1.46 0.14	*
NB of NI,%	30.48 1.26	17.77 1.23	22.42 1.11	16.94 0.80	**
Nitrogn I,g	11.55 0.17	10.47 0.37	9.90 0.44	8.62 0.31	*

A,b,c values in the same row with different superscript, are significantly different (p<0.05).

* p<0.05** p<0.01 NS=non-significant

Acknowledgement:

This work supported from internal project belonging National Research Center. Project No 10/8 the 1st research Dr. Mona. S. Zaki Associated Prof. of Clinical pathology and Awadalla I.M First researcher of project 107 64 and Mohamed I.M First Researcher of project 10/62.

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12/20/2011

Filename: 026_7566life0901_184_188.doc
Directory: G:\net_fulltext2012010911222\journal\life\life0901
Template: C:\Users\Administrator\AppData\Roaming\Microsoft\Templates\Normal.dotm
Title: NATRAL CASES OF RICKETS IN BARAKI GOAT KIDS
Subject:
Author: PC
Keywords:
Comments:
Creation Date: 1/22/2012 6:17:00 PM
Change Number: 20
Last Saved On: 1/25/2012 11:22:00 PM
Last Saved By: Administrator
Total Editing Time: 27 Minutes
Last Printed On: 1/25/2012 11:22:00 PM
As of Last Complete Printing
Number of Pages: 5
Number of Words: 2,749 (approx.)
Number of Characters: 15,671 (approx.)