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Some Physiological and Histological Changes in the Broilers Fed Gagoz Seeds (*Narbon vetch*)

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Abstract: This study was conducted at Al-sha'ulla Research Station, Ministry of Agriculture on 32 ISA broilers to study the replacing of *Narbon vetch* for soybean at 0, 10, 20 and 30% in the feed. The following parameters were examined, body weight, relative organs weight, haemoglobin concentration, packed cell volume, cholesterol, alkaline phosphatase enzyme and glutamic oxaloacetic transaminase enzyme. Liver and kidney tissues were also examined for histological changes. The data shown that *Narbon vetch* decreased significantly ($p < 0.01$) body weight and increased ($p < 0.01$) relative kidney weight. Haemoglobin concentration, packed cell volume and alkaline phosphatase activity were also decreased significantly ($p < 0.01$). Histological examination of the kidney revealed a cute tubular nephrosis.

Key words: Gagoz seeds, broilers, blood parameters

INTRODUCTION

In the recent years there is a trend towards the use of un-conventional materials in the animal feed in an attempt to decrease its costs. Among the materials used Vicia Faba^[1,2] Rape seed^[3], Salseed^[4] and in fattening of Awassi lambs using ground sun flower residues^[5] and natural zeolites^[6]. Previous studies, however, have shown that some of the alternatives are of limited use because they affect growth^[4,7].

Recently in our experimental station the possibility of using local bean *Narbon vetch* (Known as gagoz) in partial replacement of soybean and corn has been investigated.

The purpose of this study was to examine the effect of gagoz on some blood parameters, relative organs weight and on liver and kidney tissues.

MATERIALS AND METHODS

Thirty two ISA birds, eight weeks of age were taken at random from four groups of broilers fed diets containing 0, 10, 20 and 30% of gagoz in replacement of soybean and corn. The study was carried out at Al-sha'ulla Sheep Station, Ministry of Agriculture.

Birds were decapitated and blood was collected for the determination of haemoglobin concentration^[8], packed cell volume (using haemofuge, Heraeus, Christ) and

glucose^[9]. Serum separated was used for the following measurements, cholesterol^[10], total serum protein^[11], alkaline phosphatase^[12] and glutamic transaminase activities^[13]. Immediately after decapitation the kidneys and liver were excised and weighted. Slides for histological examination of kidney and liver were prepared by fixing the tissues in the 10% Formalin. Paraffin sections of 5-8 micron thickness were stained by routine Harris haematoxylin and eosin method^[14].

The effect of *Narbon vetch* in the feed of broilers on some blood traits were analyzed using the General Linear Model (GLM) procedure of the SAS^[15], also the means were compare by Duncan Multiple Range Test.

RESULTS AND DISCUSSION

The chemical composition of the *Narbon vetch* seeds was listed in Table 1, while the amino acids contents was summarized in Table 2.

Mean body weight and relative organs weight of kidneys and liver are shown in Table 3. Feed containing 20 and 30% *Narbon vetch* had significantly ($p < 0.01$) decreased weight of birds. The major effect on relative organ weight was on the kidneys were it caused it to enlarge at all percentages used. The increase in kidney weight was highly significant ($p < 0.01$) in an all treatment groups. The increase is probably due to an increase in cell mass since the histological examination of kidneys of the

Table 1: The chemical composition of the *Narbon vetch* seeds

Ingredients	(%)
Crude protein	26.80
Ether extract	1.50
Soluble CHO	54.40
Fiber	8.80
Ash	2.20
Ca ⁺²	0.14
Pb	0.28

Table 2: Amino acids contents of the *Narbon vetch* seeds

Amino acid	(%)	Amino acid	(%)
Aspartate	1.75	Methaionine	0.69
Serene	0.98	Isoleucine	0.84
Glutamic acid	2.45	Leucine	1.48
Alnine	0.69	Tyrocine	0.30
Cystine	0.16	Phyinel alanine	0.89
Thiamine	1.35	Histidine	0.42
Lysine	1.45	Arginine	2.15

group fed 30% *Narbon vetch* showed a hyperplastic reaction.

The increase in liver weight was in the 10% group only and higher percentages of *Narbon vetch* in the feed did not show the effect. Haemoglobin concentration and packed cell volume were highly affected ($p < 0.01$) by the treatment (Table 4). Both values decreased indicating probably a decrease in the red blood cells. This effect can be caused by lysis of cells or formation of aggregates in the intestine, beans in general are now to produce such effects^[1]. Blood glucose levels decreased in birds fed 20 and 30% *Narbon vetch*. There is no information to explain this decrease, but we can speculate two reasons, one would be interference with glucose absorption since similar effect on absorption of certain minerals have been reported^[7]. The other probable explanation would be

loss of glucose through the kidneys since our histopathological findings have shown degeneration in the tubules which might affect reabsorption of glucose.

The effect of *Narbon vetch* on some serum values shown in Table 5. The serum protein is contradicting where it increased significantly ($p < 0.05$) in birds fed 10% *Narbon vetch*, while it decreased (though not significant) in the other two groups. At the present time we are not able to explain this effect and this merits further experimentation.

The activity of alkaline phosphatase enzyme was decreased significantly ($p < 0.01$) in the three treatment groups. Also the glutamic oxaloacetic transaminase enzyme was decreased in birds fed different percentages of *Narbon vetch* but the differences were not statistically significant.

Examination of the kidney and liver slides of the group fed 30% *Narbon vetch* showed the followings: In the kidneys there was a cute tubular nephrosis characterized by mono nuclear interstitial infiltration and hyper plastic reaction in some of the tubules with crystalline yellowish deposits and haemorrhage. These changes seem to be similar to those caused by toxic drugs on the kidneys^[7]. Liver examination revealed some distension of the hepatic sinusoids together with multifocal areas of mononuclear cellular infiltration predominantly lymphatic scattered throughout.

It can be concluded that *Narbon vetch* fed at 20 and 30% level in replacement of soybean and corn has harmful effects on most of the parameters studied. The effect in the 10% group was not so

Table 3: Effect of different percentages of *Narbon vetch* in the feed of broilers on body and relative organs weights (Mean±SE)

Parameters	Group number			
	1	2	3	4
Body weight (kg)	1.50±0.05a	1.34±0.05a	1.22±0.02b	1.11±0.05b
Relative liver weight (g kg ⁻¹)	27.60±1.02a	31.20±0.35b	28.10±0.68a	31.40±1.62b
Relative kidney weight (g kg ⁻¹)	4.30±0.16a	6.58±0.09b	7.86±0.34b	8.72±0.27b

Means not having a common letter within each row differ significantly ($p > 0.01$)

Table 4: Effect of different percentages of *Narbon vetch* in the feed of broilers on some blood constituents (Means±SE)

Parameters	Group number			
	1	2	3	4
Hemoglobin (g dL ⁻¹)	7.75±0.08a	6.11±0.27b	5.94±0.21b	6.49±0.49b
Packed cell volume (%)	32.30±0.43a	26.10±0.80b	25.30±0.48b	26.10±1.39b
Glucose (mg dL ⁻¹)	153.50±6.20a	179.20±8.30a	159.30±10.7a	156.20±9.80a

Means not having a common letter within each row differ significantly ($p > 0.01$)

Table 5: Effect of different percentages of *Narbon vetch* in the feed of broilers on total protein, cholesterol and some semm enzymes activities

Parameters	Group number			
	1	2	3	4
Total protein (g dL ⁻¹)	2.65±0.01a	3.03±0.06b	2.53±0.90a	2.35±0.09b
Cholesterol (g dL ⁻¹)	0.293±40.1a	0.238±11.5a	0.224±15.3a	0.214±8.6a
Alkaline phosphatase (K.A.U. dL ⁻¹)	57.60±11.9a	39.40±9.38b	37.80±8.68b	36.50±2.15b
Glutamic oxaloacetic transaminase (U L ⁻¹)	76.30±8.38a	53.70±7.71a	54.30±7.51a	50.70±7.88a

Means not having a common letter within each row differ significantly ($p > 0.01$)

pronounced but we have to bare in mind that these effects were in six week duration, the effect can be more pronounced if used for longer periods as would be the case if used for layers.

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