Early reproductive characteristics of Leghorn pullets reared on diets containing sorghum gluten feed.

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SUMMARY

A total of three hundred and sixty commercial strain Leghorn chicks were used to' study the feasibility of using sorghum gluten feed (SGF) in starter ad grower Leghorn chicks diets. Feeding increasing levels of SGF had no significant effect on weight gain at 4 week of age, whereas, at 12 and 18 week of age there was a decrease (P<0.01) in weight

Offering diets containing 300g/kg SGF delayed attainment of age at point of lay and age at 25% egg production by 18 and 16 days respectively as compared to e control.

It is concluded that p llets can be reared on diets containing 300g/kg SGF up to 4 week of age and 150g/kg SGF from 4 to 18 week of age.

INTRODUCTION

No adequate data are available in the literature on the nutritional

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value of sorghum gluten feed (SGF) for poultry. El Zubeir Al. (1990) have shown that SGF can be used in broiler chicks diets up to 300g/kg with no deleterious effects on performance. However, inclusion of SGF feed at the same rate in Laying hens diet cause a progressive reduction in weight gain and rate of egg production (Khalifa and El Zubeir 1990). SGF protein can replace 50% soybean meal protein in broiler chicks diet but total substitution of soybean meal protein with SGF protein is not possible (Mustafa and El Zubeir 1991).

The present experiment was conducted to study the chemical composition and nutritional value of SGF included in starter and grower Leghorn chicks diets.

MATERIALS AND METHODS

Proximate analysis of composite samples of sorghum gluten feed (SGF) anct the experimental diets was determined according to AOAC (1975). Three hundred and sixty commercial strain Leghorn chicks were used in this experiment to study the effect of feeding SGF on 0 to 18 week old pullets performance. Chicks were floor-reared up to 12 week of age and then transferred to battery cages. Three experimental starter and grower diets were tested with four replicate groups of 30 birds each. The diets consisted of a control starter diet and two other diets with 150 and 300g/kg SGF (Table 1). The starter diets were offered from 0 to 4 week. A control grower diet and two other diets with 150 and 300g/kg SGF (Table 2) were also formalated and given from 4 to 18 week. From 18 week onwards the brids were given a commercial Laying mash. Each rearing diet was represented by five replicate groups of 20 birds each kept in cage each containing 4 brids.

Table : (1) Composition of starter diet (0-4 week) (g/kg)

Sorghum gluten feed	0	150	300
Sorghum	585.5	515.5	445.5
Wheat bran	150	170	190
Groundnut meal	100	50	
Sesame meal	100	50	
Superconcentratel	50	50	50
Oyster shell	10	10	10
Salt	2.5	2.5	2.5
Vitamin and minerals premix	2	2	2
Total	1000	1000	1000
Calculated composition (g/kg)			
Crude protein	205.8	200.5	195.5
Metabolizable energy (Mj / kg)	12.39	12.41	12.37
Crude fiber	51.2	56.5	62
Calcium	8.1	8.3	8
Phosphorus (available)	4.1	4.5	4.2
Determined composition (g / kg)			
Crude protein (N x 6.25)	198.5	199.2	199.5

1 Supplied the following (as%)

Crude protein	56	Calcium	5
Lysine	12	Phosphorus	2.5
Methionine	2.5	Metabolizable energy	9.20 (MJ / kg)

Table (2) : Composition of grower diet (4-week) (g/ kg)

Sorghum gluten feed	0	150	300
Sorghum	640	555.5	535.5
Wheat bran	200	200	100
Groundnut meal	45.5		
Sesame meal	50	30	
Superconcentrate	50	50	50
Oyster shell	10	10	10
Salt	2.5	2.5	2.5
Minerals and vitamin premix	2	2	2
	1000	1000	1000
Calculated composition (g/kg)			
Crude protein	148.5	151.5	150
Metabolizable energy (Mj / kg)	12.37	12.43	12.36
Calcium	7	7	7.2
Phosphorus (available)	4.1	4.1	4.1
Determined composition (g / kg)			
Crude protein	150	150.2	150

All diets were calculated to meet nutrients requirement recommended by NRC (1984).

Pullets were group weighed at 4,12 and 18 week of age with feed intake recorded over the same periods. Mortality and egg produced were recorded daily.

Age at the point of lay and 25% egg production; based on the first two Consecutive days that 5% and 25% rate of egg production was achieved respectively.

Data were subjected to analysis of variance and regression analysis (Steel and Torrie 1960).

RESULTS AND DISCUSSION

Proximate analysis of sorghum gluten feed (SGF) is shown in (Table 3). Feeding increasing levels (0,150, and 300g/kg) of sorghum gluten feed to commercial strain Leghorn chicks had no significant ($P>0.05$) effect on weight gain at 4 week of age, whereas, at 12 and 18 week of age there was a consistent progressive decrease ($P<0.01$) in weight gain of pullets offered SGF based diets (Table 4). Feed intake data were not presented because of the variation between treatments and between replicates of the same treatment due to feed spilling.

Table : 3 Chemical analysis of Sorghum ghuten feed on air-dry basis[1]

Composition	(70
Dry matter	95
Crude protein	26.7
calcium	0.029
Total phosphorus	0.17

1 Means of four samples tested

Age at point of Lay and 25% egg production was delayed ($P<0.01$) by increasing the dietary level of SGF (Table 4). No significant difference was observed between the birds given the control diet and those given 150g/kg SGF, whereas 300g/kg SGF diet delayed at-` tainment of age at point of lay and age at 25% egg production by 18

and 16 days respectively as compared to the control (Table 4). Mortality rate was low (2%) and not related to the dietary treatment. The decrease in weight gain associated with feeding high levels (up to 300 k/g) of SGF is in line with the findings of Khalifa and El Zubeir (1990) which indicates that SGF contains a factor and/or deficient in a nutrient that induces it's adverse effects through feeding SGF based diets for more than 8 weeks. This is supported by the fact that the dietary treatment had no effect on weight gain at 4 week of age. In addition feeding SGF up to 300g/kg to broiler chicks was reported to cause no deleterious effects on performance (El Zubeir et al. 1990).

Table : (4) Effect of feeding increasing levels of sorghum gluten feed on performance of Leghorn pullets.

Level of SGF (g/kg)	Body weight gain (g/bird)			Age at the point of Lay (days)	age at 25% egg production (days)
	4 wk[1]	12wk[2]	18wk[3]		
0	171.8	641.	1059.3	154	160
150	178.5	653.7	962.7	158	163
300	158.3	516.4	795.6	172	176
+ SE	20.2	36.1	38.7	3	4
Linear effect (t-value for significancy)	_0.95Ns	..5.9***	..9.8***	9***	6***

1,2 average of 30 chicks / treatment ± standard error of the mean

3 average of 20 birds /treatment ± standard error of the mean

*** significant at 0.1%

NS not significant at 5%

It is concluded that commercial leghorn chicks can be reared on diets containing 300g/kg SGF up to 4 week of age and 150g/kg SGF from 4 to 18 week of age. Althrough there was an indication of reduced growth rate at 18 week with inclusion of SGF at 150g/kg but this seems to have no adverse effect on age at the point of Lay and age at 25% egg production.

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