EFFECT OF DIFFERENT LEVELS OF *TRIDAX PROCUMBENS* ON PERFORMANCE OF LAYERS

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ABSTRACT

Two experiments were conducted concurrently to assess the effect of different levels of fresh and dry *Tridax procumbens* on performance of layers. 720 Hubbard layers were grouped into 6 treatments of 60 birds per treatment in each experiment. The treatments consisted of 0, 2, 4, 6, 8 and 10% inclusion rates of fresh and dry *Tridax procumbens* in first and second experiments, respectively. *Tridax* leaves, irrespective of the form and level had no significant (P>0.05) effect on egg production, egg weight and feed intake. Inclusion of *Tridax* either in fresh or dry form increased (P<0.05) yolk colour, while the yolk colour intensity was more pronounced (P<0.05) in the dry *Tridax* than the fresh *Tridax* experiment.

Key words: *Tridax procumbens*, Layers' performance

INTRODUCTION

Unavailability and steep rises in the prices of feed ingredient in recent years have been major problems confronting feed millers and livestock farmers in the tropics. This has encouraged a search for alternative sources of these ingredients. Scott (1974) reported that the leaves of tropical grasses and forage legumes are excellent sources of protein, vitamin and xanthophyll. Green plants are main nutritional sources of vitamin, accessory food substances and also provide a large portion of minerals required by animals during normal growth and development (Hafez and Dyer, 1969: Akinyosoye, 1978). In battery cage system, addition of fresh greens, especially *Talinum triangulare* up to 30 grammes per layer per day was found to induce good yolk colour (Adegbogun, 1962).

Tridax species which are annual herbs commonly found and consumed by animals in the tropics, have been claimed to have laxative effect on rabbits (Akinyosoye, 1978). So far, no experiments have been reported showing nutrient composition of Tridax species and how these plants can be used in compounding livestock feeds and its effects on livestock production. An experiment was therefore conducted to assess the effect of varying dietary levels of *Tridax procumbens* on layer performance and the egg quality.

MATERIALS AND METHODS

Two experiments were conducted concurrently. Seven hundred and twenty (720) Hubbard layers already 14 months in lay were randomly grouped into 6 treatments of 60 birds per treatment in each experiment and arranged linearly at 2 birds per cell. The treatments consisted of 0,2,4,6,8, and 10% inclusion rates of fresh and dry *Tridax procumbens* in first and second experiments, respectively. The leaves of the *Tridax* were not harvested before emergence of floral buds.

Birds were fed between 0700 and 0800 once daily at the rate of 130 gm per fowl per day. The fresh *Tridax* leaves were chopped manually while the leaves were sundried for the dry *Tridax* experiment respectively. Each experiment lasted for 8 weeks.

All the eggs collected on the last day of each experimental week were individaully weighed and the average of each replicate recorded. The eggs were analysed for shell thickness, yolk colour, albumen height and

TABLE 1: COMPOSITION OF THE EXPERIMENTAL DIETS (%)

Tridax	0.0	2.0	4.0	6.0	8.0	10.0
Maize	40.6	40.6	40.0	39.5	39.0	38.5
Groundnut cake	14.0	14.0	14.0	14.0	14.0	14.0
Wheat offal	29.55	27.55	26.15	24.65	23.15	21.65
Meat meal	5.0	5.0	5.0	5.0	5.0	5.0
Bone meal	2.4	2.4	2.4	2.4	2.4	2.4
Oyster shell	7.2	7.2	7.2	7.2	7.2	7.2
Premix	1.0	1.0	1.0	1.0	1.0	1.0
Salt	0.25	0.25	0.25	0.25	0.25	0.25
Determined Analysis						
Crude protein	17.48	17.27	17.12	16.95	16.79	16.62
Metabolizable energy (Kcal/g)	2.47	2.43	2.40	2.38	2.34	2.31

yolk width. Shell thickness was measured with a micrometer screw gauge while albumen quality was measured in haugh units by determining the albumen height with a tripod spherometer. Haugh units were later calculated using the formular of Haugh (1937) as cited by Stadelman (1977). The yolk colour was determined with the aid of the Munsell yolk colour fan, and then subjected to regression analysis (Little and Hills, 1978) while yolk width was measured with a vernier caliper.

In both trials, daily data collection were in respect of egg size (oblong and horizontal circumference), total number of eggs produced, total weight of eggs and feed consumption. The circumference of the oblong vertical and horizontal lenghts of each egg were measured daily using a thin thread and thereafter measuring such lengths along a graduated ruler in centimeters.

The results of the trials were subjected to statistical analysis using Complete Randomised Design as described by Little and Hills (1978). Chemical analyses of *Tridax procumbens* was by the method of A.O.A.C. (1990).

RESULTS

Proximate composition of *Tridax*

The nutrient composition of the compounded ration and that of *Tridax* leaves are shown in Tables 1and 2 recpectively. *Tridax* leaf appears to be rich in ash content and moderate in crude fibre and Nitrogenfree extracts (NFE) while it has high levels of Ca, Mg, k, Mn, Fe, Cu and Zn.

TABLE 2: NUTRIENT COMPOSITION OF THE *TRIDAX PROCUMBENS*

Component	*Tridax procumbens*
Average moisture content (%)	90.86
Average dry matter (%)	9.14
Protein (%)	6.80
Ether Extract (%)	1.15
Crude Fibre (%)	36.40
Nitrogen Free Extract (%)	37.18
Total Nitrogen (%)	3.44
Total Phosphorus (%)	0.20
Calcium (%)	3.43
Manganese (ppm)	0.88
Potassium (%)	3.45
Manganese (ppm)	159.90
Iron (ppm)	1965.60
Copper (ppm)	14.70
Zinc (ppm)	126.10
Total Ash (%)	14.07

Egg Production and Egg Quality

The effects of fresh and dry Tridax leaves on egg production and egg quality are presented in Tables 3 and 4. Addition of *Tridax* leaves to poultry feed, irrespective of

TABLE 3: PERFORMANCE AND EGG QUALITY CHARACTERISTICS OF BIRDS ON EXPERIMENT 1.

	Inclusion rate of *Tridax* (wet)						
	0	2	4	6	8	10	SEM
Hen-day Production(%)	71.03	67.06	65.89	65.49	67.46	67.85	1.37
Average egg weight(gm)	60.03	62.69	58.36	59.75	62.06	67.79	0.98
Average feed intake(gm)	127.15	125.95	125.61	124.19	126.36	126.27	0.54
Yolk Colour intensity	1.00[b]	2.83[a]	2.50[a]	2.67[a]	2.67[a]	3.16[a]	0.54
Shell thickness(mm)	0.36	0.36	0.37	0.36	0.35	0.36	0.01
Oblong egg circumference (cm)	16.80	16.09	15.82	15.90	15.75	15.93	0.11
Haugh units	70.15	73.23	70.02	68.91	68.15	73.63	0.32
Horizontal egg circumference(cm)	13.68	14.02	13.67	13.70	13.70	13.68	0.10
Feed/kg egg(kg)	2.12	2.01	2.15	2.08	2.04	1.86	0.11

SEM = Standard error of mean

a,b: Means on the same horizontal row without common superscripts differ significantly (P<0.05).

TABLE 4: PERFORMANCE AND EGG QUALITY CHARACTERISTICS OF BIRDS ON EXPERIMENT 2.

	Inclusion rate of Tridax (dry)						
	0	2	4	6	8	10	SEM
Hen-day production (%)	71.63	64.11	67.94	68.65	63.71	63.10	2.18
Average egg weight(gm)	60.74	60.14	57.73	58.49	65.06	61.86	0.76
Average feed intake(gm)	125.08	124.24	121.94	122.02	122.38	122.25	0.15
Yolk colour intensity	1.33[b]	3.00[a]	3.17[a]	3.00[a]	3.17[a]	3.50[a]	0.34
Shell thickness(mm)	15.77	15.87	16.08	1593	15.95	1603	0.13
Haugh units	70.59	69.62	69.9	70.31	70.25	71.1	0.21
Horizontal egg circumference(cm)	13.68	14.02	13.67	13.70	13.70	13.68	0.10
Feed/kg egg (kg)	2.06	2.07	2.11	2.09	2.88	1.98	0.04

SEM - Standard error of Mean

a,b, Means on the same horizontal row without common superscripts differ significantly (P<0.05)

the form and level did not statistically (P>0.05) affect egg production, egg weight and feed intake of the layers. Inclusion of *Tridax* either fresh or dry increased significantly (P<0.05) yolk colour, while the yolk colour intensity was more pronouced (P<0.05) in the dry *Tridax* than the fresh Tridax experiment. The egg size, shell thickness and haugh units appears to be similar in the two experiments.

DISCUSSION

From the nutrient composition, it appears that *Tridax* could supply adequate amounts of many minerals including Ca, P, Mn, Fe and Mg that are needed for proper growth and development, blood, shell and bone formation as well as for egg production (Ademosun and Kalango, 1973, Coates, 1977; Fox and Feltwell, 1980). The relative abundance of these minerals in the *Tridax* leaf suggests that a substantial amount of the minerals can be supplied by the plant thus reducing the cost of purchasing the synthetic minerals.

The addition of fresh and dry *Tridax* leaves had little influence on the hen-day egg production. Also there was no significant (P>0.05) difference between egg sizes of control and *Tridax* fed hens. This indicated

that addition of the *Tridax* leaves to poultry feed would not lead to economic loss in terms of egg size which is a major determinant of egg price.

The economic values of egg depend largely on size and quality. The hens fed Tridax irrespective of the form had significantly ($P<0.05$) higher yolk colour intensity than control.

However, the intensity was more marked ($P<0.05$) in birds given dry than fresh *Tridax* leaves. The higher yolk colour intensity in the dry *Tridax* fed eggs than the fresh *Tridax* fed eggs can be attributed to lower moisture content in the dry than in the fresh *Tridax*. Adegbogun (1962) observed that a good yolk colour of battery cage produced eggs can be obtained by adding green plants to layers feed.

Inclusion of 2,4,6,8, and 10% *Tridax* leaves in the ration only amounted to a reduction of 0.21, 0.36, 0.69 and 0.86 gm of protein per kg ratio and 0.04, 0.07, 0.09, 0.13 and 0.16 kcal/g metabolizable energy respectively. Calet (1958) had observed that laying hens are not sensitive to changes of the protein content of the diet within certain limits and that a ration of 11-16% protein may be sufficient for egg productio as long as amino acids are balanced. This means that the slight reduction in the protein content of the rations in this trial did not adversely affect the performance of the layers.

The results of this study showed that the birds responded in the same way to fresh and dry *Tridax* leaves. The slight but non significant differences which however, exist between the two trials may be attributed apparently to the differences between fresh and dry *Tridax* leaves in terms of water content and resultant digestibility.

Generally, addition of *Tridax* up to 10% reduced the cost of feed per egg. Unlike water leaf which is a popular vegetable in the diet of man, *Tridax* is not an item of human diets. It would appear from this study that *Tridax* leaves can be used to reduce the costs of egg production and inprove the yolk colouration in the humid tropical countries, without adverse effects on layer performance.

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