



ANIMAL SCIENCE ASSOCIATION OF NIGERIA

(ASAN)

P. 4

Proceedings
Of **15th** ANNUAL
Conference
(ASANUYO 2010)

theme

**DIVERSIFYING NIGERIA'S ECONOMY:
Animal Production Option**

DATE

13th - 16th September, 2010

HELD AT

UNIVERSITY OF UYO, NIGERIA

Edited By:

O. J. Ifut
U. A. Inyang

I. P. Akpan
I. E. Ebeso

ISSN: 978 34777 22

(Colocasia esculenta) corm.			
Response of hybro broiler chicks fed graded levels of sundried raw and soaked wild cocoyam (Colocasia esculenta) corm- based diets	Olajide, R.* ¹ ; Akinsoyinu, A. O. ² ; Adene, I. C. ¹ and Afolabi, K. D. ²	¹ Department of Animal *Science and Production, Joseph Ayo Babalola University, Ikeji-Arakeji. ² Department of Animal Science, University of Ibadan, Ibadan, Nigeria	439-442
Nutritional value of dry elephant grass as source of fibre in the diet of growing grass-cutter.	Omole ¹ , A. J., Obi ¹ , O. O., Odejide ¹ , J. O., Sodamola ¹ , M. O., Popoola ¹ , Y. A.	¹ Obafemi Awolowo University, Ile Ife, Nigeria. Institute Of Agricultural Research and Training Moor Plantation, Ibadan, Nigeria ² Federal College of Agriculture, I.A.R.&T., Ibadan, Nigeria.	443-445
Performance characteristics of indigenous turkeys fed macaroni waste-based diets	Lala Adebukunola, Bamgbose, A. M, Eruvbetine Daisy, Bemji Martha, Oso, A. O, ¹ Omoikhodje, S. O, ² Olayemi, W. A	University of Agriculture, Abeokuta, Ogun State Nigeria. ¹ Ambrose Alli University, Ekpoma, Edo State, Nigeria. ² Yaba College of Technology, Yaba, Lagos State Nigeria	446-447
Effect of microbial phytase supplementation on performance, phosphorus digestibility and tibia bone-ash in broilers fed corn-cowpea-soyabean meal based diets.	Paschal C. Aguihe ¹ and Eustace A. Iyayi ²	¹ Department of Animal Production and Technology, Federal College of Wildlife and Management, New Bussa, Niger State, Nigeria. Email: aguihepaschal@yahoo.com or aguihepaschal@fcwm.edu ² Department of Animal Science, University of Ibadan, Ibadan, Oyo State, Nigeria.	448-452
Growth performance of broiler starter birds fed graded levels of raw Allamanda cathartica (l) seed meal	Malik,A.A., Aremu, A., Dikko, A. H., Ibrahim,I M. J. and Adelowo, A. A.	Department of Animal Production, Federal University of Technology, Minna, Niger State	453-455
Effect of diets treated with organic acids on the performance of starter broiler chicks	Ndelekwute ¹ , E. K., Amaefule ^{2*} , K. U., Onen ² ,G. E., Anigbogu ² , N. M. and Opara ² , J. U.	¹ Department of Animal Science, University of Uyo, Uyo Nigeria. ² Department of Animal Nutrition and Forage Science, Michael Okpara University of Agriculture, Umudike, Nigeria.	456-458
A comparative performance of broiler fed different finishers commercial feeds	Ehebha, E. T. E ¹ , Omoikhoje, S. O ¹ , Oboh, S. O ¹ , Igene, F. U ¹ . and Bamgbose, A. M ² .	Department of Animal Science, Ambrose Alli University, Ekpoma. Edo state. Department of Animal Nutrition, University of Agriculture, Abeokuta. Ogun state	459-461
Nutrient utilization and carcass value of broilers fed palm kernel cake and cassava rations supplemented with β -mannanase	Adetunji*, V. A, Abu, O. A. and Tewe, O. O.	Department of Animal Science, University of Ibadan, Nigeria	462-465
Performance of finisher broilers served Gongronema latifolia Benth. leaf extracts (GLLE) as supplementary source of vitamins and minerals	¹ Machebe, N. S*, ² Agbo, C. U. and ¹ Onuaguluchi, C. C.	¹ Department of Animal Science, University of Nigeria, Nsukka ² Department of Crop Science, University of Nigeria, Nsukka	466-469
effect of enzyme supplementation of heat treated sheep manure diets on nutrient digestibility of finisher broilers	Ekenyem, B. U. ² and Ahaotu, E O. ³ ¹ Department of Animal Production and	Onu, P. N ¹ , Madubuike, F. N ² , Fisheries Management, Ebonyi State University P.M.B. 053, Abakaliki, Ebonyi State.Nigeria. E-mail: nnenwamazi@yahoo.com ² Department of Animal Science, Imo State University, P.M.B. 2000, Owerri, Imo State, Nigeria.	470-473

GROWTH PERFORMANCE OF BROILER STARTER BIRDS FED GRADED LEVELS OF RAW *ALLAMANDA CATHARTICA* (L) SEED MEAL

Malik, A. A., Aremu, A., Dikko, A. H., Ibrahim, I. M. J. and Adelowo, A. A.

Department of Animal Production, Federal University of Technology, Minna, Niger State.

Corresponding Author: delemalik@yahoo.com

ABSTRACT

The response of 120 day-old broiler starter birds to dietary inclusion levels of 0.0%, 2.5%, 5.0%, 7.5% and 10% raw *Allamanda cathartica* (L) seed meals was investigated. The experiment lasted for 4 weeks, made up of 5 dietary treatments with 2 replicates per treatment and 12 birds per replicate. Feed intake and weight gain decreased progressively as the dietary inclusion level of *A. cathartica* seed meal increased from 0.0 to 10.0%, while feed conversion ratio decreased ($p < 0.05$). No mortality was recorded for the control diet (with 0.0% dietary inclusion level of *A. cathartica* seed meal), while mortality increased progressively as the dietary *A. cathartica* seed meal level increased ($p < 0.05$), with 100% mortality being recorded at 10.0% dietary inclusion level. Hence, *A. cathartica* is extremely toxic to broiler starter birds at whatever inclusion level. So, there is the need to detoxify the raw seed meal before it can be effectively incorporated into broiler starter diets.

INTRODUCTION

Cost of feed in developing countries is about 60-80% of the total cost of production (Oruwani *et al.*, 1995); it accounts for about 65-75% of the cost of production in monogastric animals (Esonu, 2002). This high cost of feed is due to the cost of conventional energy and protein sources such as groundnut cake, soya bean meal and fish meal and have been the most important factors militating against increased commercial poultry production in developing countries. Hence, there is the intensive search by nutritionists for alternative feed ingredients with comparative nutritive value; with less competition between man and animal, and possibly cheaper than the conventional protein sources.

One of such potential plant protein sources that may be used as a replacement for soya bean meal or groundnut cake in poultry diets is *Allamanda cathartica* (L) seed meal. The plant is also called Golden Trumpet, Yellow Bell or Butter Cup and is used as a common ornamental plant. It belongs to the Dogbane family (*Apocynaceae*). It is a woody, evergreen shrub with vigorous growth and may reach a free standing height of two metres or more. The leathery leaves are lance-like, pointed and may either be opposite or in whorls of three or four, producing blooms which are orange in colour; the seed capsules are oval in shape (Dalziel, 1966). *Allamanda cathartica* (L) has long been used in traditional medicine for different purposes, including, for example, the treatment of liver tumours (Mors *et al.*, 2000). Also, leaf extracts of *A. cathartica* (L) has been found to be an excellent potential fungicide for control of nursery diseases of eggplant such as damping off and seedling blight caused by *Phomopsis vexans*, *Fusarium* sp., *Rhizoctinia solani*, *Scelotium rolfsii* and *Phytophthora capsici*, that cause crop loss up to 30-50% in Bangladesh, affecting 8 million farm families involved in eggplant cultivation (Anon., 2004). But the nutritional value of the seeds of *A. cathartica* in the diets of broilers has not been explored before, hence this study was undertaken to

investigate the growth performance of broiler starter birds fed graded levels of raw *Allamanda cathartica* (L) seed meal.

MATERIALS AND METHODS

120 Anak 2000 day-old broiler birds obtained from Minna branch office of Avian Specialities Limited, Ibadan, were used for this study. They were randomly allotted to five dietary treatments consisting of 0.0%, 2.5%, 5.0%, 7.5% and 10.0% inclusion levels of *Allamanda cathartica* (L) seed meal (Table 3). It was a completely randomized design experiment made up of 2 replicates per treatment and 12 birds per replicate. The seed meal was obtained by stripping the matured and dried *Allamanda* fruit of its mesocarp and then cracking the stony endocarp to obtain the seeds; this were then incorporated into the experimental diets at different inclusion levels. The experiment lasted for four weeks during which time feed and water were supplied to the birds *ad libitum*. The birds were subjected to a standard vaccination regime recommended for broilers, and records of feed intake, weight gain and mortality were taken.

RESULTS AND DISCUSSION

The proximate composition of *Allamanda cathartica* (L) seed meal is shown in Table 1 while its phytochemical composition is shown in Table 2. *A. cathartica* (L) seed, like most legume seeds, is rarely utilized either in human diets or livestock feeds despite its appreciable crude protein content (about 19%) because of the presence of anti-nutritional toxic components of the seeds such as cardiac glycosides, phenols, terpinoids, oxalates, phytic acids and saponins (Oji and Okafor, 2000). Feed intake and weight gain decreased progressively as the dietary inclusion level of *Allamanda* seed meal increased from 0.0 to 10.0% while feed conversion ratio decreased ($p < 0.05$, Table 4). This result is similar to the findings of Atteh *et al.* (1995) when he fed increasing levels of raw *Thevetia peruviana* (Dutta, 1964) cake to broiler starter and finisher birds. Due to the bitter taste and low palatability of the diets, there was reduced feed intake as dietary *Thevetia* cake (called Yellow

Oleander) increased, leading to reduced weight gain. Besides, raw *Allamanda* seed meal is extremely toxic to chicken as demonstrated by the high mortality rate observed during the starter phase. Previous work has demonstrated the presence of the bioactive iridoid lactones plumericin, isoplumericin, allamandin, plumieride, plumieride coumarate and plumieride coumarate glucoside in *A. cathartica* seed (Schaab *et al.*, 2006). Birds used in this study reacted to *Allamanda*-based diets within 48 hours after feeding. Post-mortem examination showed that affected birds died of poisoning. There was gastro-intestinal tract irritation, rapid fluid loss, diarrhoea and dehydration. At a later stage, birds showed dullness, anorexia, wobbling gait and loss of condition which made the birds to stagger about in a drunken fashion and fall over, with the toes flexed and legs outstretched. There was twisting of the neck and twitching of the legs leading to paralysis of the legs and eventual death. The birds died in an extended supine position and not in crouched prone position, with the sciatic nerves of the thigh muscle unaffected. This ruled out the possibility of Marek's disease attack.

At times, the birds will remain immobile in the same position for several minutes in a crouching posture. When forced to move, they move in a zigzag, jerky manner. The anti nutritional factor present in the seed meal is believed to have a neuromuscular effect on the birds. Also, the eyes were affected as they were droopy and cloudy in appearance, producing a clear watery exudate oozing out of the eyes. It was also observed in about 50% of the mortalities that the birds were already blind before they finally died. This is similar to the findings of Taiwo *et al.* (2004) when he fed diets containing 10% and 15% raw *Thevetia peruviana* seed cake to rabbits. He observed diarrhoea, rough dry coat, mydriasis and hyperaesthesia in survivors; with muscle spasm, ataxia, paralysis of hind limbs and severe convulsions preceding death occurred in the mortalities.

In this research study, no mortality was recorded for the control diet with 0.0% dietary inclusion level of *A. cathartica* seed meal, while mortality increased progressively as the *A. cathartica* seed meal level increased ($p < 0.05$), with 100% mortality recorded at 10.0% dietary inclusion level.

CONCLUSION

It is therefore concluded that *Allamanda cathartica* (L) seed meal at whatever inclusion level in broiler starter diets is extremely toxic to broiler birds. It contains powerful and potent non-thermolabile

toxins and not just mere anti-nutritional factors. Hence, there is the need to detoxify the raw seed meal using methods such as anaerobic and microbial fermentation or chemical methods before it can be effectively used in broiler starter diets.

REFERENCES

- Anonymous (2004). Development of an Integrated Approach for Management of Phomopsis Blight and Fruit Rot of Eggplant in Bangladesh: Annual Research Report (2003-2004), USDA-Bangladesh Collaborative Research Project (No. 99/24/USDA), Department of Plant Pathology, Bangladesh Agricultural University, Mymensingh, pp. 4-27.
- Atteh, J.O., S.A. Ibiyemi and A.O. Ojo (1995). Response of broilers to dietary levels of thevetia cake. *Journal of Agricultural Science, Cambridge* 125: 307-310.
- Dalziel, J. (1981). Useful Plants of West Africa Origin (3rd Edition). Oxford Press, USA, p. 198.
- Dutta, A.C. (1964). Botany for Degree Students (5th Edition). Oxford University Press, Oxford.
- Esonu, B.O., F.C. Iheukwumere, O.O. Emenalom, M.C. Uchegbu and E.B. Etuk (2000). Performance, Nutrient Utilization and Organ characteristics of Broiler Finisher fed *Microdesmis puberula* leaf meal. *Livestock Research for Rural Development* 14(6): 15.
- Mors, W.B., C.T. Rizzini and N.A. Pereira (2000). Medicinal plants of Brazil. Reference Publications, Inc Agonac, Michigan, USA.
- Oji, O. and O.E. Okafor (2000). Toxicological studies on stem, back, leaf and kernel of yellow oleander (*Thevetia peruviana*). *Phytotherapy Research* 14: 133-135.
- Oruwani, B.M., B.T. Sese and O.O. Mgbere (1995). The effect of whole kernel on broiler performance and production cost: energy and protein ratio. *International Journal of Animal Science* 10: 115-120.
- Schmidt, D.F.N., R.A. Yunes, E.H. Schaab, A. Malheiros, V.C. Filho, G.C. Franchi Jr., A.E. Nowill, A.A. Cardoso and J.A. Yunes (2006). Evaluation of the anti-proliferative effect of the extracts of *Allamanda blanchetti* and *A. schottii* on the growth of leukemic and endothelial cells. *Journal of Pharmacy and Pharmaceutical Science* 9 (2): 200-208.
- Taiwo, V.O., O.O. Afolabi and O.A. Adegbuyi (2004). Effect of *Thevetia peruviana* seed cake-based meal on the growth, haematology and tissues of rabbits. *Tropical and Subtropical Agroecosystems* 4: 7-14.

Table 1: Proximate Composition of raw *Allamanda cathartica* (L) seed meal

Nutrient	% Composition
Dry Matter	91.70
Crude protein	18.55
Ether extract	36.50
Ash	2.50
Crude fibre	13.51
Nitrogen-free extract	20.64
Metabolizable Energy {Kcal/kg}	4404.77

Table 2: Phytochemical composition of raw *Allamanda cathartica* (L) seed meal

Antinutritional factor	Composition (mg/100gm)
Saponin	0.092
Oxalate	1.38
Phytate	1.12
Tannin	0.057
Unknown alkaloid	2.81

Table 3: Percentage composition of the experimental diets for broiler starter birds

Ingredients	Diets				
	1	2	3	4	5
Maize	50.00	48.00	48.00	47.00	46.00
Groundnut Cake	30.00	32.00	32.00	31.00	30.00
Maize Offal	5.25	3.05	3.55	2.55	2.55
Fish Meal	4.00	3.00	3.00	3.00	3.00
Bone Meal	5.50	5.50	5.50	5.50	5.50
Palm Oil	3.00	3.00	0.00	0.00	0.00
Salt	0.30	1.00	1.00	1.00	1.00
Limestone	1.20	1.20	1.20	1.20	1.20
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25	0.25
<i>A. cathartica</i> meal	0.00	2.50	5.00	7.50	10.00
Analysed Composition (%)					
Dry matter	90.19	89.47	89.27	89.16	88.84
Crude protein	23.17	22.68	22.43	22.41	22.28
Ether extract	3.63	3.89	3.93	4.08	4.13
Crude fibre	3.63	3.79	3.83	3.88	3.96
Ash	5.07	5.23	5.36	5.61	5.89

Table 4: Performance of broiler starter birds fed graded levels of *Allamanda cathartica* (L) seed meal (0-4 weeks)

Parameter	Inclusion level of <i>Allamanda cathartica</i> (L) seed meal (%)					SEM
	0.0	2.5	5.0	7.5	10.0	
Av. feed intake (g/bird/week)	280.52 ^a	160.20 ^b	90.41 ^c	70.10 ^d	41.30 ^d	31.51
Av. weight gain (g/bird/week)	209.34 ^a	99.50 ^b	53.18 ^{bc}	38.73 ^c	21.51 ^c	23.59
Feed: Gain	1.34 ^c	1.61 ^b	1.70 ^b	1.81 ^{ab}	1.92 ^a	0.14
Mortality	0.0 ^c	33.3 ^{bc}	43.8 ^b	91.7 ^a	100.0 ^a	23.56

Means with different superscripts were significantly different (p < 0.05)