



GLOBAL JOURNAL OF SCIENCE FRONTIER RESEARCH: D
AGRICULTURE AND VETERINARY
Volume 20 Issue 8 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Digestibility of Broiler Birds Fed Degraded and Detoxified Delonix Regia

By Aiyelabegan A. B, Lawal W. S, Balogun, A & Salami, M.O

Institute of Applied Sciences

Abstract- In an experiment to study the digestibility of broiler birds fed degraded and detoxified Delonix regia (DDD), 180 broiler birds fed DDD for eight (8) weeks and at the end of the experiment, it was found that dry matter, protein, ether extract and crude fibre decreases with increase in DDD.

GJSFR-D Classification: FOR Code: 070299



Strictly as per the compliance and regulations of:



RESEARCH | DIVERSITY | ETHICS

Digestibility of Broiler Birds Fed Degraded and Detoxified Delonix Regia

Aiyelabegan A. B ^α, Lawal W. S ^σ, Balogun, A ^ρ & Salami, M.O ^ω

Abstract- In an experiment to study the digestibility of broiler birds fed degraded and detoxified Delonix regia (DDD), 180 broiler birds fed DDD for eight (8) weeks and at the end of the experiment, it was found that dry matter, protein, ether extract and crude fibre decreases with increase in DDD.

I. INTRODUCTION

The whole of Africa and some third world countries in Asian continent are still lacking behind in production of poultry meat and products, this is because there is serious competition between human being and these birds for major feed ingredients used in making poultry feed like maize, soyabean, palm kernel cake and groundnut. This competition has caused high cost of these ingredients and hence in turn high selling price of poultry meat and products.

It is therefore high time we find solution to this problem, as it is capable of causing malnutrition disease and food insecurity.

Animal nutritionist should therefore swing into action to find an alternative feed ingredients that can serve as good source for both protein and carbohydrates, as it may be very difficult for human being to abandon these stated feed ingredient for poultry birds.

In this experiment, insects like Delonix regia will be degraded and detoxified and make meal out of it to study the effect on broiler birds. The outcome of the experiment will afford the birds to abandon ingredients like maize, soybean, palmkernel and groundnut to human being for consumption, this will make surplus food for human being and also reduce cost of production of feed and hence reducing the selling price of poultry meat and products and so everyone will be able to afford poultry meat and products and then malnutrition will not occur and there will be food security.

a) Objectives of the experiments

- i. Source Delonix regia from school environment
- ii. Degrade and detoxified Delonix regia

Author α: Department of statistics, Institute of Applied Sciences, Kwara State, Polytechnic, Ilorin.

Author σ: Department of Agriculture Technology, Institute of Applied Sciences, Kwara State Polytechnic, Ilorin.

Author ρ: Department of Agric Engineering, Institute of Technology, Kwara State Polytechnic, Ilorin.

Author ω: Department of Science Laboratory Technology, Institute of Applied Sciences, Kwara State Polytechnic.

e-mail: awsl2004@gmail.com.

- iii. Prepare Delonix regia meal and feed to broiler birds.
- iv. study and take data on feed intake, weight gain and feed to weight gain
- v. Take to metabolic cage for faeces collection for digestibility

b) Justification

- i. Availability of Delonix regia throughout the year
- ii. Delonix regia is nutritious
- iii. It is not consumable to animals, so no competition

II. MATERIAL AND METHODS

- a) *Site of the Experiment:* The experiment was carried out in the Agricultural garden of Kwara State Polytechnic, Ilorin
- b) *Repair of Poultry Pen:* The pen were repaired by flouring, putting new poultry net to screen away predators and the pens were again divided based on the experimental design.
- c) *Source of Jatropa Seed:* All the Delonix regia were obtained from Polytechnic campus from the beginning till the end of the experiment.
- d) *Source of feed Stuff:* Other feed ingredients are obtained in whole sales (50kg bags and above) from feed mill shops, each of these ingredients was milled separately in their bags for easy mixing and it is manually mixed in the project site based on the feed formulations and percentage of Delonix regia intended in the feed.
- e) *Inoculation and Preparation of Microorganisms*
The *Aspergillus niger* and *Bacillus lichiformis* used in the experiment were prepared at the microbiology laboratory of Kwara state Polytechnic, Ilorin
- f) *Degradation of Delonix Regia:* The seeds is degraded in a hammer mill to increase the surface area of the seed, so that the detoxification effect can be effective.

- g) *Detoxification of Delonix regia:* The seeds were detoxified using four (4) different methods, the first was Physical method this is done by slight toasting of the seeds before grinding and then soak in water for two (2) days to ferment and after which it is then sundry for easy inclusion into the feed. The chemical method include soaking the granulated

seeds in n- Buthanol for two days in ratio 1:4 after the two days it was rinsed thoroughly before soaking in Acethone for another two days in ration 1:4 and it was then rinsed again before final soaking in Methanol also in ratio 1:4 for next two days before rinsing and then sundrying for easy inclusion into feed. The Bilogical method is done by making the granulated seed into past by distilled water and Aspergillus niger is added and sealed for seven (7) days after which the it is rinsed and sundried and then Bacellus lichiformis is added and then sealed for another seven (7) days, it is then washed and

sundried for inclusion into feed. The combined method is the repetition of all this process on a particular quantity of granulated seeds.

- h) *Chicken Feed*: The composition of the experimental diet is shown below in below, the birds were fed five (5) experimental diet for physical method of detoxification, this is repeated for biological, chemical and combined methods of detoxification. The diet had treated Delonixregia meal at 1%, 2%, 3%, 4% and 5%.

Table 2.1: Experimental Diet for Broilers Birds with Graded Level of Dddrm (Degraded, Detoxified Delonix Regia Meal)

Level of inclusion of DDDRM						
Ingridients(%) (control)	0% (Diet 1)	1% (Diet 2)	2% (Diet 3)	3% (diet 4)	4% (Die t 5)	5%
Maize	50.0	49.0	48.0	47.0	46.0	45.0
Soyabean	18.0	18.0	18.0	18.0	18.0	18.0
Groundnut cake	13.0	13.0	13.0	13.0	13.0	13.0
Fishmeal	3.0	3.0	3.0	3.0	3.0	3.0
DDDRM	0.0	1.0	2.0	3.0	4.0	5.0
Palm kernel cake	6.0	6.0	6.0	6.0	6.0	6.0
Wheat offals	7.0	7.0	7.0	7.0	7.0	7.0
Oystal shell	2.0	2.0	2.0	2.0	2.0	2.0
Salt	0.25	0.25	0.25	0.25	0.25	0.25
Broiler Premix	0.25	0.25	0.25	0.25	0.25	0.25
Lysin	0.25	0.25	0.25	0.25	0.25	0.25
Methaonine	0.25	0.25	0.25	0.25	0.25	0.25
Total						
100	100	100	100	100	100	100
Calculated analysis CP(%)	22.30	22.40	22.49	22.49	22.6	22.6
M.E(kcal/kg) cal.	2920	2918	2915	2915	2918	2918
Lysin (%)	1.10	1.02	1.04	1.04	1.00	1.00
Methionine	77	75	75	75	75	75

2.5 premix supplied per kilogram of diet; vit A12,000,000i u vit D3 2,750,000 I vit E 20,000mg, vit k 3,2000mg. Thiamine B1 1,500mg,Riboflavin B2 4,000mg,Niacin 18,000mg,Panththenic Acid 7,000mg,vit B6 2,000mg vitB1212mcg,Folic Acid 1,000mg Biotin 15meg,Chline chloride 150,000mg,Cobalt 500mg,Copper 600mg,Iodine 1,100mg,Iron 20,000mg,Menganese 80,000mg,Selenium 200mg,Zinc 50,000mg and Antioxidand 125,000mg. CP = Crude protein; ME= Metabolic Energy. DDDRM (Degraded Detoxified Delonixregia meal).

i) Source of Birds

Ross boilers birds used in the experiment was purchased from Affcom Nigeria Limited in Kulende old Jebba Road, Ilorin, Kwara State Nigeria.

i. Management of Birds

Washing of drinkers and cleaning of feeding trough were done on daily basis. Litter material was usually turned at least once a week. Clean water and feed were served on daily basis ad-libitum and the left over feed were weighed to know feed intake. Litter was turned once a week and their health status is monitored throughout the period of experiment. Vaccine and drug administration program was carried out according to recommendation for derived savannah zone of Nigeria shown in table 2.2

III. RESULT AND DISCUSSIONS

Significant difference occurred ($P < 0.05$) in dry matter in all the inclusion levels, with 2ml inclusion level (78) being the highest and 4ml (42) the lowest, the crude protein shows a different pattern with 0ml control (71.4) being the highest and 3ml given the lowest (43), the crude fibre shows its highest value at 0ml control (64) and the lowest at 4ml (40), ether extract has the 2ml to be highest (70.6) and the control 0ml to be (39.9), the Ash has the control to be the highest with (38) and 5ml inclusion Level to be lowest (10.24).

The significant difference experienced in dry matter, crude protein and crude fibre may be as a result of the rate of inclusion level of Delonixregia that was high in the affected diets, the crude protein noticed may

be because of the quantity that has been made used by the birds while the reverse is experienced in ether extract and Ash content content may be because of difference inclusion levels of Delonixregia.

Table 3.1: Shows data for digestibility of birds fed deloxixregia

Parameter	0ml	1ml	2ml	3ml	4ml	5ml	SEM
Dry matter %	80.80 ^b	78.0 ^a	62.8 ^b	52.4 ^c	52.4 ^c	42.0 ^d	13.7
Crude protein %	71.40 ^c	60.6 ^b	51.0 ^d	43.0 ^e	60.0 ^b	56.2 ^c	12.1
Crude fibre %	64.0 ^d	50.0 ^b	49 ^b	45.0 ^c	40.0 ^c	43.0 ^d	11.9
Ether extract %	89.9 ^a	70.0 ^a	63.6 ^b	63.6 ^b	55.0 ^c	56.5 ^d	10.2
Ash %	3.90 ^a	16.9 ^b	18.02 ^b	10.44 ^d	12.44 ^c	10.24 ^d	4.7

a, b, c, d and e means within the same row with different superscript are significantly different at ($P < 0.05$)

IV. CONCLUSION AND RECOMMENDATION

a) Conclusion

- Delonixregia cannot be used without degradation and detoxification.
- Delonixregia is rich energy can be use to feed birds

b) Recommendation

- Delonixregia should be well detoxified and tried on other livestock

REFERENCES RÉFÉRENCES REFERENCIAS

- Keay P. W, Onochie C. P, Stanfield D. P. (1964) Nigeria trees, federal Dept. of forestry research Ibadan, Nigeria. 1964; 1.
- JC, Telek L, Pusztai A. (1991) A survey of the nutritional and haemag glutination properties of legume seeds generally available. Livestock Res. Rural Dev. 1991; 3: 1-10.
- Oresegun A, Oguntade OR, Ayinla OA. (2007) A review of catfish culture in Nigeria. Nig. J. Fish.; 4(1):27-52.
- Lyon, B. G. and Lyon, C. E. (2001). Meat quality: sensory and instrumental evaluations. In: Sams, A. R., editor. Poultry Meat Processing. CRC Press; New York, USA: 2001. pp. tion
- Lara, L. J. C, Baião, N. C, Rocha, J. S, R, Lana, A. M. Q, Cançado, S. V, Fontes, D. O, (2008).
- Influence of physical form of ration and line on the performanceand yield of broiler cuts. Arquivo Brasileiro de Medicina Veterináriae Zootecnia 2008; 60(4): 970-978.
- Lawrence, J. D., Mintert, J., Anderson, J. D. and Anderson, D. P. (2008). Feed grains and livestock. Impact on meat supplies and prices. Choices Magazine 2nd quarter 23(2): 11-15.
- Lawrie, R. A. (1974). Meat Science. 4th edition. Oxford, Pergamon Press. United Kingdom. Pp 121-129.
- Lawrie, R. A (1998): Lawrie's meat science Pargamon Press Plc, Headington Hill Hall, Oxford England (6th edition) 336 pp.
- Lesiak, M. T., Olson, D. G., Lesiak, C. A. and Ahn, D. U. (1997) Effects of post-mortem time before chilling and chilling temperature on water-holding capacity and texture of turkey breast muscle. Poultry Science, 635KKU Res. J. 2014; 19(5): 76: 552-556.
- Lee, Y. S., Owens, C. M. and Meullenet, J. F. (2009).Changes in tenderness, color, and water holding capacity of broiler breast meat during post deboning aging. Journal Food Science.: 74(8): E449-E454.
- Liang, J., Han, B. Z., Nout, M. J. R. and Hamer, R. J. (2009). Effect of soaking and phytase treatment onphytic acid, calcium, iron and zinc in rice fractions. Food Chemistry: 115,789–794.
- Williams, N.andKierholz E. W (1974); The effect of Chili, Curry and black pepper powder in diets for broiler chicks Poultry Science. 53; 2233-2234.
- Wiesenhütter, J. (2003). Use of the Physic Nut (Jatropha curcas L.) to Combat Desertification and Reduce Poverty. Deutsche Gesellschaftfür Technische Zusammenarbeit (GTZ).
- Wood, J. D. and Warris, P. D (1992). The fluen of manipulation of carcass composition on meat Deposition. Butterworth -heinemann, London, PP.331-334. www. foodafactorflife.org.uab www ,umamiinfo.com and www.ajinomoto.com.
- Yan, X.; Sikora, R. A.; Zheng, J. Potential use of cucumber (Cucumissativus L.) endophytic fungias seed treatment agents against root-knot nematode Meloidogyne incognita. J.
- Yu, L. H, Lee, E. S, Paik, H. D, Choi, J. H and Kim, C.J (2005). Effect of thawing temperature on the physicochemical properties of pre- rigor frozen chicken breast and leg muscle. Mea Sci. 71 (2); 375-382.
- Zayas, J. F and Naewbanij, (1986). The effect of microwave heating on the textural properties of

- meat and collagen solubility. *Journal of Food Process and Preservation*. 10: 203-214.
19. Thawing temperature on the physicochemical properties of pre-rigor frozen chicken breast and leg muscles. *Meat Science*. 71 (2): 375- 382.
 20. Zi-guang Zhao, Jian-hong Li, Xiang Li, and Jun Bao (2014); Effects of Housing Systems on Behaviour, Performance and Welfare of Fast-growing Broilers *Asian-Australas J Anim Sci*. 2014 Jan; 27(1): 140–146. doi: 10.5713/ajas.2013.13167