

EFFECT OF RUCHAMAX ON COCCIDIOSIS AND GROWTH PERFORMANCE OF BROILER CHICKENS

Hassana*M, Abdulkadir, U, Adama, J .N, and Shaibu M.J.

Department Of Animal Production, School Of Agriculture and Agricultural Technology Federal University of Technology, Minna, Niger State, Nigeria

E-mail: hmamatullah@gmail.com

ABSTRACT

This study was under taken to determine the effect of Ruchamax on coccidiosis and growth performance of broiler chickens in Animal production teaching and research farm during the period of March to May 2020. A total of 180 day old broiler chicks were randomly divided in to three treatment, in a completely randomized design with 3 replicates containing 20 birds each. The groups were designated T1, T2, and T3 respectively. Treatment one was administered Ruchamax at the rate of 15g in water, treatment two was given amprolium at 100g and treatment three was served as control. Data collected on weight gain, carcass characteristics, feed intake, feed conversion ratio, nutrient digestibility and hematological parameters were subjected to analysis of variance using SPSS statistical software. The result showed that the carcass characteristics, the nutrient retention and weight gain were not significantly ($p>0.05$) different. While no significant difference was observed in hematological indices between the treatment groups. It was concluded that the weekly coccidiosis result shows the safety and effectiveness of Ruchamax as an anticoccidial agent. The findings of the present study showed that 15g of Ruchamax produced encouraging result in comparison to amprolium in treatment and prevention of coccidiosis in broiler chickens.

Keywords: Ruchamax, coccidiosis, broiler chickens, Amprolium.

INTRODUCTION

Poultry meat and eggs are important foods for fulfilling the dietary needs of the ever-growing human population. Poultry represent nearly 33% of global meat production and is a source of protein that plays an important role in human nutrition (Abbas *et al.*, 2012a). Chicken is the most common type of poultry in the world (Adnan *et al.*, 2018). Besides, chicken meat has high level of essential polyunsaturated fatty acids, like omega (n)-3, which can be easily digested and efficiently absorbed (Allen 2003). Coccidiosis is a major disease problem in the poultry industry. It is a parasitic disease of the intestinal tract of animals caused by single-cell protozoa. Coccidian organisms can infect humans, birds, and livestock, as they are usually species-specific (Tanweer *et al.*, 2014; Chand *et al.*, 2014). Coccidiosis in the poultry industry is caused by any of the species of the genus *Eimeria*, individually or in combination. Outbreaks usually result in enormous economic losses as a result of the associated morbidity and mortality. It leads to the extensive destruction of the intestinal epithelium which results in reduced food efficiency and body weight gain, as well as a temporary reduction in egg production (Mio *et al.*, 2000). Ruchamax is a potent herbal formulation which contain 28 different herbs and some minerals. It is used as an appetizer, restorative, carminative, stomachic, and stimulant. It is also aid optimum absorption and utilization of nutrients and hence improves feed conversion ratio, productivity and weight gain (Rajiv 2011). Ruchamax is mostly used in ruminant and pseudo ruminant to treat poor digestion, impaired ruminal function, debility and dyspepsia but there is very scarce literature on its use on Poultry. Each 15g of Ruchamax contains *Zingibar officianale*, *Allium sativum*, *Curcuma longa*, *Azadirachta indica*, *Terminalia chebula*, *Eclipta alba* and many more. Nowadays, consumers request poultry products that are free from residual antiparasitic drugs. Consequently, the development of alternative, safer and environmentally friendly anticoccidial agents have become priority in most parts of the world. The use of natural products as an alternative to drugs may be the best solution to this consumer demand.

Furthermore natural products are cheaper and more affordable which will help save farmers input cost (Chukwuma *et al.*, 2018).

MATERIALS AND METHODS

The experiment was conducted at the poultry unit of the teaching and research farm of the Department Of Animal Production, Federal University Of Technology Minna, Niger State, Nigeria.

Experimental Animals and Mangement

A total of 180 healthy day old broiler chickens were obtained from a reputable hatchery in Niger state and brooded under standard conditions for eleven days before the commencement of the study. The birds were randomly allotted to three (3) treatment of three replicate each in a completely randomized design giving 20 bird per replicate. Prior to arrival the pen house was thoroughly cleaned and disinfected, cobwebs were removed and brooding devices were put in place. The broilers were fed standard pelletized Commercial broiler starter feed and water offered ad libitum. Wood shavings were spread to a depth of 5cm as bedding material throughout the experiment. Manual feeders and drinkers were used. The diet was provided in two phases consisting of starter phase (0–21days) and *finisher* phase (22–46 days). Birds were vaccinated against Newcastle disease and infectious bursal disease according to the standard schedule. The vaccines were administered in their drinking water after 12 hours of water starvation.

Experimental drugs

Ruchamax herbal formulation was purchased from a reputable veterinary store in Minna. 15 grams of Ruchamax powder was administered in drinking water at the second, fourth and sixth week of the experiment. Amprolium (Water soluble powder) a commercially available anticoccidial drug for the routine treatment of avian coccidiosis due to *Eimeria* species was used to compare the anticoccidial effects of ruchamax powder. Amprolium acts by interfering with thiamine metabolism in the parasite.

Experimental design

The 180 purchased birds was subjected to completely randomized design (CRD) where the birds were randomly assigned to three groups of sixty birds in three replicates with twenty birds in a completely randomized design. Treatment 1 received administration of Ruchamax powder. Treatment 2 received administration of amprolium against coccidiosis and treatment C was served as control.

Parameters Measured

Parameters taken were body weight, feed conversion ratio, feed intake and carcass parameters determined include: live weight, dressed weight, slaughtered weight and dressing percentage.

Feecal sample collection

Feecal samples for coccidiosis detection were collected from the second to the sixth week of the experiment. For each of the birds, feecal samples were collected from droppings where possible or with a spatula for freshly voided feces, Feecal samples were also collected by inserting a syringe in to the anus of the experimental birds. Each Feecal sample was placed in a prelabeled bottle indicating the treatment and was immediately stored in a cooler and was quickly transported to the laboratory where it was transferred to the refrigerator and stored at 4°C until processed.

Statistical Analysis

The data was compiled using Microsoft excel 2016 and analyzed by analysis of variance (ANOVA) with SPSS (statistical package for social sciences) version 15.0. Groups were compared using the least significant difference (LSD) at $P < 0.05$.

RESULT AND DISCUSSION

The effect of Ruchamax on coccidiosis in growth performance of boiler chickens is presented in Table 1. The result showed there was no significant difference ($p > 0.05$) in weight gain and feed conversion ratio between the treatment groups. Due to scarcity of literature on the study of Ruchamax on poultry, the result of the present research is being compared to the constituents of ruchamax. This result is similar

to that of Kim *et al.*, (2013) who reported that the supplementation of active ingredients of garlic (propyl thiosulphinate oxide and propyl thiosulphinate) had decreased faecal oocysts excretion and greater antibody response against *Eimeria acervulina* in broiler chickens, he found that garlic metabolites enhance chickens' production performances and reduce the oocyst output in chickens challenged with *E. acervulina*, due to a direct cytotoxic effect on the coccidian sporozoites. High mortality rate was recorded in the treatment three that was served as the control.

Table 1. Effect of Ruchamax administration on growth performance of broiler chickens

Parameters	1	2	3	SEM	P. value	LOS
Initial weight	413.33	403.33	406.67	3.64	0.59	ns
Final weight	1213.33	1270.00	1236.67	15.55	0.37	ns
average feed intake	107.63	122.19	109.44	7.81	0.76	ns
average weight gain	37.44	40.82	39.69	0.84	0.27	ns
Feed conversion ratio	2.88	2.96	2.75	0.17	0.90	ns
Protein intake	22.60	25.66	22.98	1.64	0.76	ns
Energy intake	305.67	347.01	310.82	22.18	0.76	ns
Protein efficiency ratio	1.69	1.69	1.74	0.10	0.98	ns
Energy efficiency ratio	0.13	0.12	0.13	0.01	0.98	ns
Survival %	100.00	97.78	96.58	0.95	0.38	ns

ns = not significantly ($p > 0.05$) different: SEM – standard error of mean

The findings in this study is in line with that of Biu *et al.* (2006) who reported 100 % survival rates, cessation of oocyst production and an improvement in the body weight of birds following administration of 800 mg/kg *Azadiracta indica* extract. El-Khtam *et al.*, (2014). According to his findings stated that herbal powders induced anticoccidial effect which was concentration dependent and increased by increasing the concentration of the tested powders. There was no significant ($p > 0.05$) difference in feed intake among the treatments. There were no marked ($p > 0.05$) variation in feed conversion energy and protein efficiency among the treatment.

The carcass characteristic is presented in Table 2.

The result revealed no significant ($p > 0.05$) effect of the treatment on the carcass parameters. This result is in line with that of majid *et al.*, (2019) who reported that Garlic and Ginger (*Allium sativum* and *Zingibar officianale*) has no significant effect on carcass characteristics and significantly reduced oocyst count in broiler chickens.

Table 2: Effect of Ruchamax administration on carcass characteristics of broiler chickens

Parameters	T ₁	T ₂	T ₃	SEM	LOS
Live Weight	1899.25	1697.65	1650.10	58.70	Ns
Slaughter Weight	1802.50	1650.00	1625.00	54.68	Ns
Dressed Weight	1775.00	1550.00	1550.00	66.77	Ns
Eviscerated Weight	1550.00	1350.00	1400.00	55.78	Ns
Head	47.05	42.20	43.95	1.38	Ns
Neck	113.70	92.10	93.50	6.69	Ns
Back	211.65	170.75	201.80	10.40	Ns
Breast	410.85	321.80	310.15	26.69	Ns
Thigh	223.65	211.05	214.85	7.94	Ns
Drum Stick	194.65	172.45	171.60	9.30	Ns
Shank	82.15	78.45	75.05	3.66	Ns
Wing	204.60	175.45	183.35	9.25	Ns
Heart	6.90	6.10	5.45	0.31	Ns
Liver	45.95	39.70	30.35	4.65	Ns
Spleen	1.05	1.00	0.70	0.10	Ns
Gizzard	32.15	37.35	38.85	1.81	Ns
Intestine	96.10	115.25	119.40	7.46	Ns
Gall Bladder	1.90	1.60	1.65	0.09	Ns
Lung	10.25	12.40	8.15	0.91	Ns
Trachea	1.90	2.95	1.70	0.39	Ns
Crop	73.85	98.80	113.05	11.04	Ns
Proventriculus	8.85	8.05	8.65	0.28	Ns

ns = not significantly ($P>0.05$) different; SEM = standard error of mean

The weekly coccidiosis result is presented in table 3, the result revealed the effectiveness of Ruchamax as an anticoccidial agent as evidenced by the percentage of negativity recorded in weeks five and six.

Table 3: Weekly result of coccidia among broiler chickens administered with ruchamax

Treatment	Week2	Week3	Week4	Week5	Week6
T1	–	+	++	–	–
T2	+	–	++	+	–
T3	–	+	+++	++++	++++
Chi square	2.00	1.14	3.44	4.60	5.78
P.value	0.37	0.57	0.18	0.1	0.06

– = negative; + = positive

Table 3.1: Weekly percentage of broiler chickens found with Coccidia specie

Weeks	T1	T2	T3
2	0.00	25	0.00
3	25	0.00	25
4	50	50	75
5	0.00	25	100
6	0.00	0.00	100

Four (4) animals examined per treatment

CONCLUSION

From the result it is concluded that supplementation with ruchamax powder exhibits anticoccidial activity which was comparable with that of the anticoccidial drug and evidenced by treatment and prevention or reduction of mortality, and reduced fecal oocyst shedding of the infected chickens as compared to the treatment three that was served as control. More research should be conducted on the anticoccidial effect of Ruchamax to ascertain the findings of the present research, ruchamax should be administered at higher inclusion level to determine its toxicity effect.

REFERENCES

- Abbas, R.Z., Colwell, D.D. and Gilleard, J. (2012a). Botanicals: an alternative approach for the control of avian coccidiosis. *Worlds Poultry Science Journal*, 68(June), 203–215.
- Adnan Yousaf, Rehana Shahnawaz, Tahseen Jamil Aamerzish Mushtaq (2018). Prevalence of coccidiosis in different broiler poultry farms in Potohar region (distract Rawalpindi) of Punjab-Pakistan *Journal of Dairy, Veterinary & Animal Research* Volume 7 Issue 3
- Allen PC, Fetterer RH. (2003). Recent advances in biology and immunobiology of *Eimeria* species and in diagnosis and control of infection with these coccidian parasites of poultry. *Clinical Microbiology Reviews* 15:58-65.
- Biu, A. A., Yusuf, S. D. and Rabo, J. S. (2006). Use of neem (*Azadirachita indica*) aqueous extract as a treatment for poultry coccidiosis in Borno state, Nigeria. *African Scientist*, 7 (3): 147 - 54.
- Chand N., Naz, S., Shah, Z., Khan, S., Shah, A.S. and Khan, R.U., (2014). Growth performance and immune status of broilers fed graded levels of *Albizia lebbek seeds*. *Pakistan J. Zool.*, 46: 574-577.
- Chukwuma P. Eze1, Chukwunonso F. Obi1, Idika K. Idika1, Wilfred S. Ezema, Johnlhedioha and Chukwunyere O. Nwosu (2019). Toxicity and anti-coccidial efficacy of *Azadirachta indica* Aqueous

leaf extract in broiler chickens experimentally infected with mixed *Eimeria tenella* and *E. maxima* sporulated oocysts.

Journal of veterinary and applied sciences VOL. 9 (1): 50 – 59.

El-Khtam A.O. Amara Abd El Latif, M.H. El-Hewaity, (2014). Efficacy of turmeric (*Curcuma longa*) and garlic (*Allium sativum*) on *Eimeria* species in broilers International Journal of Basic and Applied Sciences, 3 (3) 349-356.

Kim, D.K., Lillehoj, H.S., Lee, S.H., Jang, S.I., Lillehoj, E.P. and Bravo, D. (2013). Dietary *Curcuma longa* enhances resistance against *Eimeria maxima* and *Eimeria tenella* infections in chickens. **Poultry Science**, 92(10): 2635–43.

Majid Ali, Naila Chand, Rifat Ullah Khan, Shabana Naz & Sina Gul (2019) Anticoccidial effect of garlic (*Allium sativum*) and ginger (*Zingiber officinale*) against experimentally induced coccidiosis in broiler chickens, *Journal of Applied Animal Research*, 47:1, 79-84,

DOI:10.1080/09712119.2019.1573731.

Rajiv Walia, K.Ravikanth and S. Maini (2011).Veterinary Officer, Veterinary Hospital, Darang, Dist., Kangra(H.P.), India 2. R&D, Team, Ayurved Limited, Baddi,(H.P), *India Veterinary World*, Vol.4(3):126-127.

Tanweer, A.J., Chand, N., Saddique, U., Bailey, C.A. and Khan, R.U., (2014). Antiparasitic effect of wild rue (*Peganum harmala* L.) against experimentally induced coccidiosis in broiler chicks. *Parasitology. Res.*, 113: 2951-2960. <https://doi.org/10.1007/s00436-014-3957-y>