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Original research paper

INFLUENCE OF MISTLETOE *(Viscum album)* LEAF MEAL ON GROWTH PERFORMANCE, CARCASS CHARACTERISTICS AND BIOCHEMICAL PROFILE OF BROILER CHICKENS

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ABSTRACT: The quest for alternatives to antibiotics has resulted in the discovery of prebiotics. The search for the alterative antibiotics is on-going. Therefore, this study was carried out to investigate possible prebiotic potentials inherent in mistletoe (*Viscum album*) leaf meal with the aim of developing prebiotics as an alternative to antibiotics thus optimizing animal performance, carcass characteristics and a healthy blood profile as indicators of systemic conditions. Five experimental diets were formulated and mistletoe leaf meal (AMLM) was incorporated into the diets at different concentrations (0% with 0.05% antibiotics (positive control), 2.5%, 5.0%, 7.5% without antibiotics (negative control)). The values of body weight were not significantly different across the treatments. Live weight, bled weight, wings, drumsticks, thighs, breasts and heads were not significantly different across the treatments. Aspartate aminotransferase, globulin and creatinine contents were not significantly different across the treatments. Meanwhile, birds on AMLM-supplemented diets obtained significantly ($p < 0.05$) higher values of alanine aminotransferase than those on negative control diet (3.75 IU/l). Urea and glucose contents followed a similar pattern. The AMLM could be used as alternative antibiotics in broiler production, although further studies are required to ascertain this.

Key words: *antibiotics, broiler chickens, feeding trial, Viscum album*

INTRODUCTION

With the intensification of the livestock production in Nigeria, came an increase in clinical and sub-clinical enteric diseases, thus animals became vulnerable to harmful bacterial such as *E. coli, Salmonella* and *Clostridium perfringens,* resulting in reduced productivity, increased mortality and the associated contamination of meat, meat products and eggs for human consumption (EFSA BIOHAZ panel, 2013). In response to these problems, antibiotics have been used as a growth promoter (AGP) to promote good health and enhance feed efficiency, growth and production performance in farm animals.

Antibiotics are naturally occurring, semi-synthetic and synthetic compounds with anti-microbial activity that can be administered orally, parentally or topically and also be used as growth promoters at subtherapeutic levels. However, the use of antibiotics has not been without side effects. These include increase in populations of resistant pathogens and commensal bac-

teria in the animal given antibiotics. Leaf meals have been incorporated into poultry diet for several positive reasons. The beneficial effects of leaf meals in poultry production have been reported (Egbenwade and Olorede, 2003; Murthy et al., 2006).

Leaf meals have been reported to provide antioxidants (Cross et al., 2007), antimicrobial (Manzanilla et al., 2004), immunity (Ko et al., 2008) and growth promoting effects (Lee et al., 2009). In the livestock industry, herbs and other plant extracts improve feed intake, digestibility and reinforce immunity (Wenk, 2003).

The search for the alterative antibiotics is on-going. Ologhobo et al. (2017) earlier reported that *Viscum album* did not have any significant on packed cell volume, haemoglobin, red blood cell counts, monocytes, eosinophils, basophils, platelets, MCV, MCH and MCHC of broiler chickens fed with diets supplemented with *Viscum album.* Therefore, this study was carried out to investigate possible prebiotic potentials inherent in mistletoe (*Viscum album*) leaf meal with the aim of developing prebiotics as an alternative to antibiotics thus optimizing animal performance, carcass characteristics and a healthy blood profile as indicators of systemic conditions.

MATERIAL AND METHODS

The study was carried out at the Poultry Unit of the Department of Animal Science, Teaching and Research Farm, University of Ibadan, Nigeria. The experimental pens were thoroughly cleaned, washed and disinfected. Fresh leaves of *Viscum album* from *Citrus* spp. (orange) trees were harvested, washed and air dried for about two weeks.

Table 1.
Gross composition of experimental diets for birds (%) (as fed basis)

Ingredients (%)	**T_1-positive control** (0% AMLM, 0.05% antibiotics)	**T_2** (2.5% AMLM, 0% antibiotics)	**T_3** (5% AMLM, 0% antibiotics)	**T_4** (7.5% AMLM, 0% antibiotics)	**T_5-negative control** (0% AMLM, 0% antibiotics)
Maize	53.30	53.30	53.30	53.30	53.30
Soy bean meal	35.65	34.76	33.87	29.55	35.65
Fish meal	3.00	3.00	3.00	3.00	3.00
Wheat offal	2.85	2.85	2.95	2.95	2.95
Oyster shell	2.00	2.00	2.00	2.00	2.00
DCP*	2.00	2.00	2.00	2.00	2.00
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.35	0.35	0.35	0.35	0.35
Premix**	0.35	0.35	0.35	0.35	0.35
Salt	0.25	0.25	0.25	0.25	0.25
AMLM	0.00	0.95	1.75	2.55	0.00
Antibiotics***	0.05	0.00	0.00	0.00	0.00
Calculated analysis					
Crude protein	23.25	23.11	23.18	23.10	23.24
Crude fibre	3.00	3.34	3.69	3.98	3.00
Ether extract	3.65	3.66	3.64	3.68	3.66
Calcium	1.45	1.47	1.49	1.52	1.45
Phosphorus	0.72	0.74	0.73	0.75	0.72
Lysine	0.93	0.93	0.95	0.97	0.93
Methionine	0.32	0.34	0.34	0.35	0.32
ME (Kcal/kg)	3199.00	3227.00	3263.00	3279.00	3200.00

** DCP – Dicalcium Phosphate*
*** Composition of Vitamin Premix per kg of diet: Vitamin A, 12500 IU; Vitamin D3, 2500 IU; Vitamin E, 40 mg; Vitamin K, 3.2 mg; Vitamin B1, 3 mg; Vitamin B2, 5.5 mg; Calcium pantothenate, 11.5 mg; Vitamin B6, 5 mg; Vitamin B12, 0.025 mg; Choline Chloride, 500 mg; Folic Acid, 1 mg; Biotin, 0.08 mg; Manganese, 120 mg; Iron, 100 mg; Zinc, 80 mg; Copper, 8.5 mg; Iodine, 1.5 mg; Cobalt, 0.3 mg; Selenium, 0.12 mg; Antioxidant, 120 mg.*
**** Antibiotics contained tetracycline hydrochloride 500 mg*
AMLM – African Mistletoe Leaf Meal

The dried leaves were separately micronized with a hammer mill into a fine powder, known as African Mistletoe Leaf Meal (AMLM), weighed and kept in sterile containers for use later.

Experimental diets

A total of five experimental diets were formulated to meet the NRC (1994) nutrient requirements for broilers. Mistletoe leaf meal (AMLM) was incorporated into the diets at different concentrations (0%, 2.5%, 5.0% and 7.5%). Treatments were: T_1 (standard diet + 0.05% antibiotic – positive control), T_2 (standard diet + 2.5% AMLM), T_3 (standard diet + 5.0% AMLM), T_4 (standard diet + 7.5% AMLM) and T_5 (standard diet – negative control). The gross composition of experimental diet is shown in Table 1.

Determination of the chemical composition of the diets

Triplicate samples of mistletoe leaf meal (AMLM) were subjected to chemical analysis according to the method of AOAC (2000). Nitrogen free extract (NFE) was determined by difference between 100 and the sum of moisture, protein, crude fibre, fat and ash values (Table 2).

The spectrophotometric method of Akinmutimi (2006) was used for the determination of saponin, tannin, oxalate and phytates in AMLM. One gram of AMLM was dissolved in 50 ml of butanol in a 25 ml beaker, the mixture was left for 5 h and then shaken to have a homogenous mixture. The mixture was filtered through a Whatman filter paper into a 100 ml beaker and 20 ml of 40% saturated solution of magnesium carbonate ($MgCO_3$) was added to the filtrate. The saturated solution of magnesium carbonate obtained was again filtered using Whatman filtter paper to obtain a clean colourless solution. 1 ml of the colorless solution was pipetted into a 50 ml volumetric flask and 2 ml of 5% $FeCl_3$ solution added. It was made to the mark with distilled water and allowed to stand for 30 min. The absorbance of the solution was read on an Agilent spectrophotometer at a wavelength of 380 nm.

Tannin was quantified by taking 2 g of each of AMLM in a conical flask and 10 ml of distilled water was added. The solution was left to stand for 30 min after which 2.5 ml of the supernatant was taken into a 5 ml volumetric flask and 1 ml of Folin–Denis' reagent was added. This was followed by the addition of 2.5 ml of saturated Na_2CO_3 and diluted to 50 ml in a volumetric flask with distilled water. It was allowed to stay for 90 min after which the absorbance was read at 250 nm on a spectrophotometer.

Oxalate was determined by dissolving 2 g of the AMLM in 100 ml of distilled water in a 500 ml volumetric flask, followed by addition of 10 ml 6 M HCL. It was boiled for 1 h, cooled and filtered. The content was made up to 300 ml with distilled water. Duplicate portions of the filtrate (125 ml) were taken into 5 different beakers and drops of methyl red indicator were added, followed by concentrated NH_4OH solution drop wise until the test solution changed from pink to faint yellow colour.

Phytate was determined by extracting 5 g of AMLM with 0.2 N HCl**;** 0.5 ml of the extract was pipetted into a test tube and heated in boiling water bath for 30 min. The test tube was cooled in ice for 15 min and allowed to reach the room temperature. The content of the tube was mixed and centrifuged for 30 min at 3000 rpm. 1 ml of the supernatant was transferred to another test tube and 1.5 ml of HCl solution was added before the absorbance was read at 514 nm in a spectrophotometer. All determinations were carried out in triplicates.

Management of experimental animals

A total of two hundred unsexed day-old Cobb broiler chicks were used for the study. They were weighed for their initial weights and randomly allotted into five dietary treatments with forty (40) chicks per treatment. Each group had five replicates with eight (8) chicks per replicate in a completely randomized design (CRD). The birds were placed on conventional feeds for the first week after which they were randomly assigned to dietary treatments. The brooding pens were thoroughly cleaned, disinfected and allowed to rest for a period of two weeks before the arrival of the chicks. During this period, the

pens were sealed up with polythene bags and fumigated in preparation for brooding, feeders and drinkers with other brooding materials were thoroughly washed and disinfected. Wood shavings used as litter materials were spread on the floor of the pen and a warm temperature was maintained within the pen with 100 watt electric bulbs before the arrival of the chicks. On arrival, the chicks were carefully unboxed, weighed and brooded for a period of one week before they were randomly allotted into treatments.

Fresh cool water and feed were provided *adlibitum* to the birds throughout the period of the experiment and routine medication (vaccination and drugs) were administered at appropriate times to birds on the positive control only.

Data collection and analyses

Feed consumption for each animal was measured daily as the difference between the daily feed supplied and refusal, and live-weight changes of the animals were taken weekly throughout the experimental period.

Carcass characteristics

The carcass characteristics were determined at the end of the experiment by selecting randomly, three birds from each replicate. The selected birds were starved of feed and water over night. Before slaughtering, the individual weight of the birds was recorded. Thereafter, the birds were slaughtered by cutting the jugular vein around the neck. The birds were immediately scalded in warm water and the feathers were manually removed. Thereafter, the fully dressed weights of the carcasses were taken and recorded. The carcasses were then separated into breast, back, upper back, thigh, shank, neck, arm, wing, drumstick, head and the internal organs (viscera). The parts were individually weighed and the weights were expressed as percentage of the live weight of the carcass. In addition, the length of the intestine of each carcass was taken and recorded. The dressing percentage and percentage weight of body in relation to the live weights of the birds were calculated by this formula:

$$\text{Relative weight} = \frac{\text{Weight}}{\text{Live weight}} \times 100$$

Haematological parameters

At the end of the feeding trial, blood samples were collected from the jugular vein of animals from each group into two sets of Monoject® vacutainers. One set containing ethylenediaminetetraacetic acid vacutainers (EDTA) for haematology, while the other set without EDTA was covered and centrifuged, the serum de-canted and deep-frozen for serum biochemical and enzymological analyses.

Statistical analysis

Data obtained from the experiment were subjected to analysis of variance (ANOVA) (SPSS 17.0). The variations in means were separated using the Duncan's Multiple Range Test (Duncan, 1995).

RESULTS AND DISCUSSION

The result of the proximate composition of the tested ingredient (African mistletoe leaf meal) is shown in Table 2. The leaf was rich in phytates (22.75%) and oxalates (15.80%) while the proximate composition of the feed samples is shown in Table 3.

The growth performance, carcass characteristics, organ weights and serum biochemical profile of broiler chickens fed with AMLM are presented in Tables 4, 5, 6 and 7 respectively. The values of body weight were not significantly different across the treatments. Feed intake was not significant during weeks 4 and 5, while on positive control (T_1) had the highest feed intake during the second week closely followed by those on negative control (T_5). The feed conversion ratios (FCR) were statistically similar across the treatment during weeks 2 and 5, while the values were not significant during weeks 3 and 4. Birds on control diets had the highest rate of mortality when compared with those on 5.00% and 7.50% AMLM supplemented diets. Live weight, bled weight, wings, drumsticks, thighs, breasts and heads were not significantly different across the treatments. Birds on 7.50% AMLM-supplemented diet (930.00 g) obtained higher defeathered weights than those on positive control (834.80 g).

Table 2.
Chemical composition of African mistletoe leaf meal (AMLM)

Parameters	Proportion (%)
Moisture content	7.70
Crude protein*	3.50
Ash*	11.21
Ether extract*	7.11
Crude fibre*	8.90
Saponins*	3.25
Tannins*	9.90
Oxalate*	15.80
Oxalate*	22.75

**Determined on dry matter basis*

Table 3.
Proximate composition of feed samples

Samples (%)	T_1-positive control (0% AMLM, 0.05% antibiotics)	T_2 (2.5% AMLM, 0% antibiotics)	T_3 (5% AMLM, 0% antibiotics)	T_4 (7.5% AMLM, 0% antibiotics)	T_5-negative control (0% AMLM, 0% antibiotics)
Dry matter	92.10	92.18	92.49	92.27	92.40
Crude protein	23.00	23.50	23.13	22.77	24.10
Crude fibre	10.0	9.96	9.61	9.01	9.40
Ether extract	7.12	6.90	7.02	6.80	7.00
Ash	10.89	11.30	11.50	11.30	12.00

AMLM – African mistletoe leaf meal

Table 4.
Growth performance of broiler chickens fed with graded levels of mistletoe leaf meal

Parameters	T_1-positive control (0% AMLM, 0.05% antibiotics)	T_2 (2.5% AMLM, 0% antibiotics)	T_3 (5% AMLM, 0% antibiotics)	T_4 (7.5% AMLM, 0% antibiotics)	T_5-negative control (0% AMLM, 0% antibiotics)	SEM
Body weight gain (g/bird)						
Week 2	2.67^{ns}	2.25^{ns}	2.25^{ns}	2.74^{ns}	2.68^{ns}	0.96
Week 3	3.57^{ns}	2.68^{ns}	2.98^{ns}	2.36^{ns}	3.08^{ns}	4.33
Week 4	6.63^{ns}	7.14^{ns}	7.36^{ns}	8.05^{ns}	9.05^{ns}	0.63
Week 5	2.21^{ns}	2.43^{ns}	1.96^{ns}	3.07^{ns}	2.69^{ns}	4.10
Feed intake (g/bird)						
Week 2	59.64^{a}	52.14^{c}	54.54^{cd}	51.61^{c}	54.54^{ab}	0.85
Week 3	111.00^{bc}	111.61^{bc}	104.82^{b}	118.75^{bc}	123.21^{a}	2.47
Week 4	118.39^{ns}	117.50^{ns}	116.43^{ns}	128.87^{ns}	138.71^{ns}	3.76
Week 5	117.11^{ns}	117.14^{ns}	114.12^{ns}	137.02^{ns}	140.21^{ns}	4.40
FCR						
Week 2	22.63^{ab}	20.21^{ab}	26.33^{a}	18.91^{b}	21.32^{ab}	0.08
Week 3	31.54^{ns}	43.22^{ns}	46.52^{ns}	60.65^{ns}	42.16^{ns}	0.19
Week 4	19.01^{ns}	16.78^{ns}	15.37^{ns}	16.49^{ns}	15.37^{ns}	0.35
Week 5	46.99^{ab}	38.63^{b}	67.83^{a}	47.52^{ab}	59.50^{ab}	0.25
Mortality (%)	1.80^{ab}	0.40^{bc}	0.20^{c}	0.20^{c}	2.80^{a}	0.30

$^{a,b,\ldots}$ Means with different superscripts in the same row differ significantly ($p< 0.05$) different, ns = non-significant, SEM = Standard Error of Mean
AMLM – African mistletoe leaf meal

Dressed weight followed a similar trend. The mean values of whole gizzard were not significantly different across the treatments. However, weights of hearts, empty gizzards and lungs were statistically similar to those of the control diets. Aspartate aminotransferase, globulin and creatinine contents were not significantly different across the treatments.

Table 5.
Carcass characteristics of broiler chickens fed with graded levels of mistletoe leaf meal

Parameters (g)	T_1-positive control (0% AMLM, 0.05% antibiotics)	T_2 (2.5% AMLM, 0% antibiotics)	T_3 (5% AMLM, 0% antibiotics)	T_4 (7.5% AMLM, 0% antibiotics)	T_5-negative control (0% AMLM, 0% antibiotics)	SEM
Live weight	954.00^{ns}	936.00^{ns}	960.00^{ns}	1030.00^{ns}	900.00^{ns}	19.12
Bled weight	867.20^{ns}	913.60^{ns}	908.20^{ns}	962.00^{ns}	879.00^{ns}	14.86
Defeathered weight	834.80^{c}	847.00^{bc}	865.00^{abc}	930.00^{a}	914.80^{ab}	12.33
Dressed weight	631.60^{b}	657.00^{ab}	633.00^{b}	722.00^{a}	666.00^{ab}	11.32
Wings	75.56^{ns}	71.00^{ns}	78.20^{ns}	82.54^{ns}	77.84^{ns}	3.24
Drumstick	76.98^{ns}	85.00^{ns}	77.70^{ns}	74.00^{ns}	83.44^{ns}	1.87
Thigh	88.00^{ns}	88.80^{ns}	92.98^{ns}	95.42^{ns}	94.84^{ns}	1.85
Breast	156.54^{ns}	173.70^{ns}	125.46^{ns}	164.78^{ns}	147.04^{ns}	4.00
Back	102.08^{b}	125.46^{a}	108.26^{b}	126.32^{b}	105.760^{a}	3.12
Neck	40.54^{abc}	38.28^{bc}	36.00^{c}	47.00^{a}	44.00^{ab}	1.18
Shank	37.74^{ab}	35.90^{b}	63.64^{a}	46.32^{ab}	41.10^{ab}	3.93
Head	27.54^{ns}	28.84^{ns}	28.50^{ns}	30.04^{ns}	29.06^{ns}	4.73

$^{a\,b,\ldots}$ Means with different superscripts in the same row differ significantly ($p< 0.05$) different, ns = non-significant
SEM - Standard Error of Mean
AMLM – African mistletoe leaf meal

Table 6.
Organ weight of broiler chickens fed with graded levels of mistletoe leaf meal

Parameters (g)	T_1-positive control (0% AMLM, 0.05% antibiotics)	T_2 (2.5% AMLM, 0% antibiotics)	T_3 (5% AMLM, 0% antibiotics)	T_4 (7.5% AMLM, 0% antibiotics)	T_5-negative control (0% AMLM, 0% antibiotics)	SEM
Heart	4.16^{b}	4.78^{ab}	5.66^{ab}	4.82^{ab}	7.86^{a}	0.50
Liver	34.68^{a}	25.98^{b}	29.18^{ab}	29.32^{ab}	29.08^{ab}	1.11
Empty gizzard	26.28^{ab}	21.52^{b}	29.22^{a}	26.96^{ab}	25.04^{ab}	0.50
Whole gizzard	43.20^{ns}	35.52^{ns}	42.82^{ns}	39.14^{ns}	39.44^{ns}	1.13
Spleen	1.00^{ab}	0.90^{b}	0.68^{b}	1.50^{a}	0.76^{b}	0.98
Lungs	80.30^{b}	92.36^{ab}	87.10^{ab}	84.64^{ab}	100.44^{a}	2.54
Abdominal fat	5.64^{a}	2.34^{b}	0.80^{c}	5.24^{a}	0.90^{c}	0.55

$^{a,b,\ldots}$ Means with different superscripts in the same row differ significantly ($p< 0.05$) different, ns = non-significant.
SEM - Standard Error of Mean
AMLM – African mistletoe leaf meal

Table 7.
Serum profile of broiler chickens fed with graded levels of mistletoe leaf meal

Parameters (g)	T_1-positive control (0% AMLM, 0.05% antibiotics)	T_2 (2.5% AMLM, 0% antibiotics)	T_3 (5% AMLM, 0% antibiotics)	T_4 (7.5% AMLM, 0% antibiotics)	T_5-negative control (0% AMLM, 0% antibiotics)	SEM
AST (IU/l)	197.16^{ns}	213.83^{ns}	191.24^{ns}	192.97^{ns}	198.44^{ns}	285.86
ALT (IU /l)	3.75^{d}	4.87^{c}	8.08^{a}	6.07^{b}	8.30^{a}	0.56
TP (g/dl)	3.75^{b}	4.85^{a}	4.38^{ab}	4.19^{ab}	4.74^{a}	0.29
Globulin (g/dl)	0.76^{ns}	1.04^{ns}	1.00^{ns}	0.75^{ns}	1.18^{ns}	0.28
Creatinine (mg/dl)	0.28^{ns}	0.44^{ns}	0.33^{ns}	0.39^{ns}	0.45^{ns}	0.03
Urea (mg/dl)	6.30^{c}	7.75^{b}	9.83^{a}	10.11^{a}	10.24^{a}	0.30
Glucose (mg/dl)	174.32^{a}	184.51^{b}	192.22^{b}	198.15^{b}	250.00^{b}	795.77

$^{a,b,\ldots}$ Means with different superscripts in the same row differ significantly ($p = 0.05$) different, ns = non-significant. TP-total protein, SEM-Standard Error of Mean, AMLM – African mistletoe leaf meal, AST – Aspartate amino transferase, ALT - Alanine Amino transferase

Meanwhile, birds on AMLM-supplemented diets obtained significantly ($p < 0.05$) higher values of alanine aminotransferase than those on negative control diet (3.75

IU/l). Urea and glucose contents followed a similar pattern.Traditional herbal practice in many parts of the world involves prescribing combinations of herbs with a wide range of actions that concurrently cover several treatment strategies. Rather than focusing on a specific disease pathology, Herbal practitioners treat holistically with individualized herbal formulae (Williamson, 2001). Combinations provide multiple active constituents working together which may produce additive, or synergistic interacttions.

The result of the proximate composition of the test diet showed that the crude protein, metabolizable energy, and ether extract are adequate. Even though, there was variation in the analysed crude protein composition, this did not affect the performance of the birds. The reason would perhaps be due to the fact that all the diets had crude protein that was well above the least recommendation. In this study, feed intake became not significant as the experiment progressed. Also, Mottaghitalab (2000) earlier observed no differrences in body weight gain of broiler chickens given diets supplemented with different natural feed additives as alternatives to antibiotic growth promoters, which is similar to the findings of the present study, although Guo et al. (2004). reported a significant positive effect on broiler body weight gain exposed to herbs and herbal products. Also, Ocak et al. (2008) and Sarker et al. (2010b) reported no significant difference for body weight gain and feed intake. The variations in the results could be explained by the type and dosage of herbs and herbal products used. Plant extracts contain different molecules that have intrinsic bioactivities affecting animal physiology and metabolism. Some of these compounds have been reported to improve animal performance due to their stimulating effect on salivation and pancreatic enzyme secretions or by having a direct bactericidal effect on gut microflora (Hardy, 2002). Previous studies disagree on carcass characteristics of animals. Hassan et al. (2004) reported an increase in dressing and liver percentages for broiler chicks fed the supplemented herbal feed additives while Sarker et al. (2010a) reported that herbal plants had no influence on organ weight. The AMLM did not influence most of carcass parts and such results are not strange since it did not influence body weight gain of the experimental animals.

The non-influence of AMLM on creatinine content of the experimental animals is in harmony with the findings of Hossain et al. (2012) who earlier reported that water plantain, mistletoe and antibiotics had no influence on the creatinine content of birds. The observed ALT content was higher for AMLM-supplemented diets but fell within the range reported by Mitruka and Rawnsley (1977). Elevated serum activities could be an indication of heart, kidney and or liver damage owing to cellular destructions caused by toxins (Ewuola and Egbunike*,* 2008). More studies may be required to ascertain the hematological, immunological, and antimicrobial activities of these plants.

CONCLUSIONS

It is concluded from the results of this study that AMLM did not influence body weight gain, feed intake and some parts of the carcass characteristics of the reported experimental animals. The AMLM did not seem to pose a threat on biochemical profile of the experimental animals. However, further studies may be required to ascertain the effects of AMLM on biochemical profile of animals, antibacterial properties and effects on immune response of animals.

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УТИЦАЈ ХРАНЕ НА БАЗИ ИМЕЛЕ *(Viscum album)* НА ПЕРФОРМАНСЕ РАСТА, КВАЛИТЕТ ТРУПА И БИОХЕМИЈСКИ ПРОФИЛ ПИЛИЋА БРОЈЛЕР

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Сажетак: Истраживање алтернатива за антибиотике је довела до открића пребиотика а потрага за алтернативама је и даље актуелна. У овом раду, испитује се пребиотички потенцијал хране за животиње са додатком лишћа имеле (*Viscum album*) са циљем проналажења пребиотика као замене за антибиотике, а који би могли да се користе за оптимизацију перформанси животиња, побољшање квалитета трупа и здравственог профила крви, као индикатора системског стања животиње. Формулисано је пет експерименталних хранива у којима је додата имела (АМЛМ) у различитим концентрацијама (0% са 0,5% антибиотика (позитивна контрола); 2,5%; 5,0%; 7,5% без антибиотика (негативна контрола)). Маса тела пилића се није значајно мењала у току третмана. Маса живих пилића, пилића после клања, крила, батака, карабатака, груди и главе се нису значајно мењали у току третмана. Вредности аспартат аминотрансферазе, глобулина и креатинина се такође нису значајно мењали у току третмана. Код пилића који су храњени храном са додатком АМЛМ показан је значајан саджај ($p < 0.05$) аланин трансферазе у односу на негативну контролу (3.75 IU/l). Садржаји урее и глукозе су следиле сличан образац. АМЛМ може да се користи као алтернативни антибиотик у производњи бројлера мада су потребна даља, опсежнија истраживања за потврду његовог потенцијала.

Кључне речи: *антибиотици, бројлери, исхрана, Viscum album*

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