Albizia lebbeck stem bark aqueous extract as alternative to antibiotic feed additives in broiler chicks diets: performance and nutrient retention

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ABSTRACT

A study was conducted to examine the effect of *Albizia lebbeck* stem bark aqueous extract (ATSM) as alternative feed additives in broiler chicks diets: performance and nutrient retention. Three hundred and seventy five (350) one -day -old Ross 308 broiler chicks of mixed sex were used for the experiment, the animals were reared in a deep litter poultry house and distributed into five treatment containing 75 birds each, each treatment was further divided into 5 replicates consisting of 15 birds each in a completely randomized design. Birds in treatment 1 (T1) were fed 0 % ATSM, T2 were fed Oxytetracycline at 1.20 g per litre of water, T3, T4 and T5 were given ATSM at 10 ml, 20 ml and 30 ml per litre of water respectively. Clean feed and water were provided *ad libitum* throughout the experiment which lasted for 56 days. The result obtained revealed that there was average daily gain, average daily feed intake and feed: gain was influenced by the dietary treatments (P<0.05). Birds in T5 had the highest weight gain (2424.2 g) followed by T4 (2371.3 g), T3 (2119.4 g), T2 (2053.1 g) and T1 (1686.0 g) respectively. High mortality was recorded in T1 (7.1 %) while T2 had 1.4 %; none was recorded in T3, T4 and T5. Nutrient retention were significantly (P<0.05) different among the treatments. T5 had the highest dry matter (85.66 %) followed by T4 (85.08 %), T3 (77.56 %), T2 (73.40 %) and T1 (72.45 %) respectively. It was concluded that ATSM can be fed to broiler chicks at 30 ml/litre without any deleterious effect on the performance and nutrient retention of birds.

Keywords: *Albizia lebbeck*; broiler chicks; performance; nutrient

1. INTRODUCTION

The huge increase in poultry production to meet the growing demand in the country has led to the rise in antibiotic use, leading to a worrying increase in antibiotic resistance diagnosed in animal and humans via direct contact, environmental contamination and food consumption causing high cases of diseases (Olafadehan *et al*., 2020; Rahimi *et al*., 2011). This prompted a growing interest in the use of organic materials as substitute for antibiotics as feed additives in animal feed (Bozkurt *et al*., 2009). Among the potential alternatives is the use of herbs, spices, probiotics, essential oil and plant extracts (Oluwafemi *et al*., 2020). Plant extracts have also been reported to be relatively safe, effective and cheaper, it is also the most preferred because it contains multiple bioactive chemicals (phytochemicals) such as flavonoids, alkaloids, terpenes, tannins, phenol, glycosides (Dhan *et al*., 2012). According to Abdul *et al*. (2013), phytochemicals comprises of primary (protein, chlorophyll and carbohydrates) and secondary compounds (alkaloids, saponin, phenol, alkaloids etc). WHO (2006) reported that there are over 500, 000 species of plant with high medicinal value. Some of these plants are still underexplored; among the potential plant is *Albizia lebbeck* which is found to be loaded with minerals, vitamins and several bioactive chemicals.

Albizia lebbeck (L) belongs to the family Mimosaceae. It is a native to deciduous and semi deciduous forest in Asia. It is also wide spread in the tropics in countries like Nigeria, Kenya, Etopia, Senegal, Benin republic, Congo, Liberia etc. The plant is mostly propagated via seeds (Adubiaro *et al*., 2016; Labaran *et al*., 2016). The leaves have traditionally been used to treat sores, leprosy, wounds, back ache and rheumatism (Lowry, 1989). The leaves, stems and seeds have been reported to perform multiple biological activities in animals such as antimicrobial, antioxidants, anti-inflammatory, antifungal, antispasmodic, antiviral, hypolipidemic, anti-allergic and neuroprotective properties (Alagbe and grace, 2019; Gupta *et al*., 2004; Mc Donald *et al*., 2001; Obdoni and Ochuko, 2001).

In view of these potentials, the use of *Albizia lebbeck* will help to build the bridge between food safety and livestock. Therefore, this experiment was designed to evaluate the effect of *Albizia lebbeck* stem bark aqueous extract (ATSM) as alternative feed additives in broiler chicks' diets: performance and nutrient retention.

2. MATERIALS AND METHODS

Experimental Site

The experiment was carried out at Division of Animal Nutrition, Sumitra Research Institute, Gujarat, India during the month of December to February, 2019.

Source, processing and chemical analysis of test materials

Fresh and mature stem bark of *Albizia lebbeck* were harvested within the farm in Gujarat, India and authenticated by a botanist Mr. Ram Sharma. The stems were thoroughly washed with running tap water to remove debris, chopped into bits and allowed to dry under shade for 12 days in order to maintain the bioactive chemicals in the sample. After drying the stems bark were grinded into powder using mortar and pestle and stored in an air tight container for further analyisis. 200 grams of the sample was soaked in 1000 ml of water for 72 hours in a refrigerator at 4^{o}C, the mixture was frequently stirred and then sieved. The filterate (*Albizia lebbeck* bark) ATSM was stored in a labelled container.

Proximate compositions of the test material were determined in accordance with the Official Analytical Chemist (AOAC, 2000). Phytochemical evaluation of tannins, alkaloids, saponins, flavonoids, phenols, oxalate, glycosides, steroids and terpenoids were estimated using methods described by Atamgba *et al*. (2015), Harbone (1973), Shabbir et al. (2013), Odebiyi and Sofowora (1978), Boham and Kocipai (1974). Determination of vitamin composition was determined according to the methods outlined by (Ngozi *et al*., 2017). Mineral analyses were carried out using Atomic Absorption Spectrophotometer (AAS) model 12-0TA.

Experimental animals and Management

Three hundred and seventy five (350) one -day -old Ross 308 broiler chicks of mixed sex were used for the experiment. Prior to the commencement of the study, the deep litter pens were thoroughly disinfected, electrical fittings were properly fixed and the foot bath was constructed to ensure bio- security. Birds were weighed on arrival at the research farm and randomly divided into five treatments with five replicates of fifteen (15) birds in a completely randomized design. Wood shavings were used as litter material and the initial brooding temperature is 35 ^{o}C, it was gradually reduced weekly by 2 ^{o}C until a temperature of 22 ^{o}C was maintained. Vaccines were administered according to the prevailing vaccination schedule in the environment and the experiment lasted for 56 days.

Formulation of experimental diets and set-up

Three (3) basal diets were formulated at different stages of production to meet up with the requirements of birds according to NRC (1994). Broiler starter's mash (0-21 days), growers mash (22-35 days) and finishers mash (36-56 days).

Treatment 1 (basal diet + 0 % ATSM), treatment 2 (basal diet +1.2 grams Oxytetracycline per liter of water), treatment 3 (basal diet + 10 ml ATSM per liter of water), treatment 4 (basal diet + 20 ml ATSM per liter of water) and treatment 5 (basal diet + 30 ml ATSM per liter of water).

Measurements

- Daily feed intake (g) was calculated as a difference between feed offered and left-over.
- Weight gain = final weight (g) – initial weight (g)
- Feed conversion ratio (FCR) = $\frac{\text{Daily feed intake (g/d)}}{\text{Daily weight gain (g/d)}}$
- Average daily gain (g/d) = $\frac{\text{Final weight (g) – initial weight (g)}}{\text{Number of experimental days}}$
- Mortality was also recorded as it occurs.
- Recommended daily allowance (RDA) = $\frac{\text{Concentrations of sample (mg)}}{\text{Requirement by animal}} \times 1000$

Nutrient retention trial

A nutrient retention trial was carried out on the 56th day of the experiment; three birds were selected from each replicate. The birds were housed in cages with wire bottoms, trays were placed under each cage for fecal collection. The birds were given a known amount of feed for seven days and clean water was also given throughout the experiment. Feed consumed were measured by weighing the left over feed daily and subtracting from amount of feed provided. Excreta were collected for 7days, dried and mixed thoroughly. Contaminants were carefully removed and the excreta were stored in containers before it was sent to the laboratory for further analysis.

The percentage retention was calculated using the equation below:

$$\text{Nutrient retention} = \frac{\text{Nutrient intake (DM) – Nutrient output (DM) in the excreta}}{\text{Nutrient intake (DM)}} \times 100$$

Statistical analysis

All data were subjected to one -way analysis of variance (ANOVA) using SPSS (18.0) and significant means were separated using Duncan multiple range tests (Duncan, 1955). Significant was declared if P ≤ 0.05.

3. RESULTS & DISCUSSION

Proximate compositions of Albizia lebbeck stem bark

The proximate composition of *Albizia lebbeck* stem bark is presented in Table 2. Dry matter (87.64 %), crude protein (4.65 %), ash (8.73 %), crude fibre (46.40 %), ether extract (0.77 %) and metabolizable energy (1870.7 kcal).

Phytochemical compositions of *Albizia lebbeck* stem bark and *Albizia lebbeck* extract

The phytochemical composition of *Albizia lebbeck* stem bark and *Albizia lebbeck* aqueous extract is presented in Table 3. Result revealed the presence of condensed tannin, hydrolysable tannin, flavonoids, saponin, phenol, oxalate, phytate, alkaloids, terpenoids, glycosides and steroids at 0.51 %, 1.44 %, 6.19 %, 0.23 %, 1.67 %, 1.01 %, 0.15 %, 1.22 %, 0.40 %, 0.02 %, 1.02 % and 0.83 %, 2.31 %, 9.75 %, 0.55 %, 2.74 %, 0.05 %, 0.22 %, 1.78 %, 0.95 %, 0.09 and 1.84 % respectively.

Mineral compositions of *Albizia lebbeck* stem bark

The mineral composition of *Albizia lebbeck* stem bark is presented in Table 4. Result revealed that calcium had the highest concentration of 101. 5 mg/100g followed by phosphorus (67.10 mg/100g), potassium (29.1 mg/100g), magnesium (14.3 mg/100g), sodium (4.67 mg/100g), zinc (1.66 mg/100g), manganese (1.33 mg /100g), iron (0.10 mg/100g) and copper (0.07 mg/100g) respectively.

Vitamin compositions of *Albizia lebbeck* stem bark

Vitamin analysis of *Albizia lebbeck* stem bark revealed the presence of β-carotene (0.56 mg/100g), thiamine (0.19 mg/100g), riboflavin (0.02 mg/100g), niacin (0.33 mg/100g), vitamin E (0.02 mg/100g), vitamin K (0.14 mg/100g) and vitamin D (0.10 mg/100g). The stem bark is abundant in vitamin C as presented in Table 5.

Table 1: Chemical composition of experimental diets

Materials	Starter (1-21 days)	Grower (22-35 days)	Finisher (36-56 days)
Maize	50.00	56.00	60.50
Wheat offal	8.00	7.00	8.05
Soya meal	28.55	22.00	21.00
Groundnut cake	10.00	11.55	6.05
Fish meal	2.00	2.00	2.00
Bone meal	0.35	0.40	0.40
Limestone	0.20	0.20	0.20
Lysine	0.15	0.15	0.15
Methionine	0.20	0.20	0.20
Premix	0.25	0.25	0.25
Salt	0.30	0.30	0.30
TOTAL	100.0	100.0	100.0
Calculated analysis			
Crude protein	23.08	20.11	19.33
Ether extract	5.03	4.87	4.28
Crude fibre	3.06	3.95	3.42
Calcium	0.81	0.96	0.80
Phosphorus	0.47	0.40	0.51
Lysine	1.17	1.29	1.60
Meth +Cyst	0.87	0.82	0.51
ME (Kcal/kg)	2936	3000.8	3100.2

*Premix supplied per kg diet: - vit A, 13,000 I.U; vit E, 5mg; vit D3, 3000I.U, vit K, 3mg; vit B2, 5.5mg; Niacin, 25mg; vit B12, 16mg; choline chloride, 120mg; Mn, 5.2mg; Zn, 25mg; Cu, 2.6g; folic acid, 2mg; Fe, 5g; pantothenic acid, 10mg; biotin, 30.5g; antioxidant, 56mg.

Table 2: Proximate compositions of *Albizia lebbeck* stem bark

Parameters	% Composition
Dry matter	87.64
Crude protein	4.65
Ash	8.73
Crude fibre	46.40
Ether extract	0.77
Energy (Kcal/kg)	1870.7

Table 3: Phytochemical analysis of *Albizia lebbeck* bark and *Albizia lebbeck* extract

Parameters	*Albizia lebbeck* stem bark (%)	*Albizia lebbeck* bark extract (%)	*Permissible range (%)
Condensed tannin	0.51	0.83	1.88
Hydrolysable tannin	1.44	2.31	2.56
Flavonoids	6.19	9.75	12.10

Saponin	0.23	0.55	7.02
Phenols	1.67	2.74	-
Oxalate	1.01	0.05	0.54
Phytate	0.15	0.22	2.30
Alkaloids	1.22	1.78	2.13
Terpenoids	0.40	0.95	-
Glycosides	0.02	0.09	-
Steroids	1.02	1.84	-

Table 4: Mineral compositions of *Albizia lebbeck* stem bark

Parameters	Composition (mg/100g)
Macro elements	
Calcium	101.5
Phosphorus	67.10
Potassium	29.1
Magnesium	14.3
Sodium	4.67
Micro elements	
Iron	0.10
Manganese	1.33
Copper	0.07
Zinc	1.66

Table 5: Vitamin compositions of *Albizia lebbeck* stem bark

Parameters	Composition (mg/100g)	**% RDA
Thiamine (B1)	0.19	31.0
Ascorbic acid (C)	72.45	39.0
Riboflavin (B2)	0.02	34.0
β-carotene	0.56	6.00
Niacin (B3)	0.33	5.00
Vitamin E	0.02	1.19
Vitamin K	0.14	1.63
Vitamin D	0.10	0.08

Table 6: Performance traits of broiler chicks fed different levels of *Albizia lebbeck* stem bark

Parameters (g)	T1	T2	T3	T4	T5	SEM
Breed: Ross 308						
Number of animals	75	75	75	75	75	-
Initial body weight (g)	47.08	46.92	47.00	46.88	47.00	0.54
Final live weight (g)	1733.1^{c}	2100.0^{b}	2166.4^{b}	2418.2^{a}	2471.2^{a}	43.65
Weight gain (g)	1686.0^{c}	2053.1^{b}	2119.4^{b}	2371.3^{a}	2424.2^{a}	96.11
Daily weight gain (g)	30.11^{c}	36.66^{b}	37.85^{b}	42.34^{a}	43.29^{a}	5.09
Feed intake (g)	5187.1^{a}	4880.6^{b}	4840.8^{b}	4810.0^{b}	4800.6^{b}	77.60

Average feed intake (g)	92.63[a]	87.15[b]	86.44[b]	85.89[b]	85.73[b]	10.88
Feed:gain ratio	3.07[a]	2.38[b]	2.28[b]	2.03[b]	1.98[c]	0.44
Mortality (%)	7.1[a]	1.4[b]	-	-	-	0.03

Means in the same row with different superscripts are significantly different (P<0.05)

Table 7: Nutrient retention of broiler chicks fed different levels of *Albizia lebbeck* stem bark

Parameter (%)	T1	T2	T3	T4	T5	SEM
	72.45[c]	73.40[c]	77.56[b]	85.08[a]	85.66[a]	5.22
Dry matter						
Crude protein	73.19[c]	74.60[c]	77.05[b]	79.00[a]	79.10[a]	2.98
Ether extract	59.43[c]	60.88[b]	65.19[b]	67.09[a]	67.45[a]	3.77
Crude fibre	45.16[a]	43.33[b]	43.45[b]	44.08[b]	44.19[b]	4.53
NFE	69.42[b]	80.11[a]	80.32[a]	79.19[a]	80.85[a]	2.10

Means in the same row with same superscripts are significantly different (P<0.05)
NFE, nitrogen free extract; SEM, standard error of mean

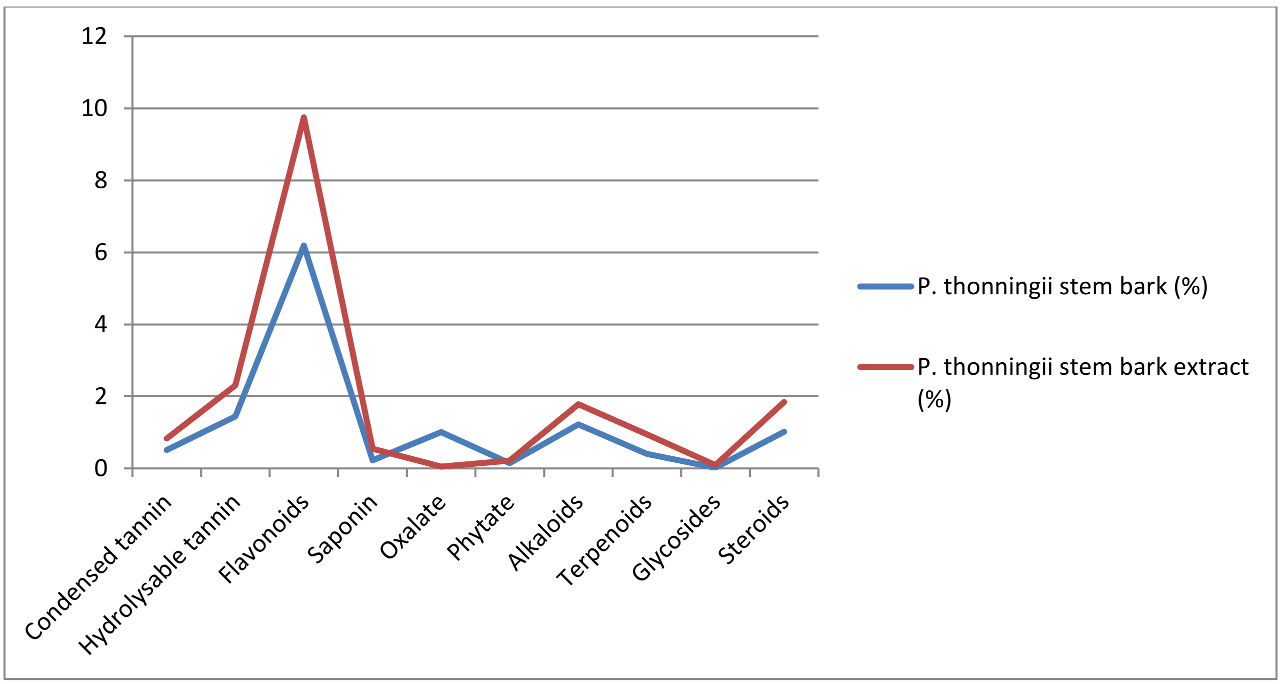

Figure 1. Phytochemical compositions of *Albizia lebbeck* bark and extract

Growth performance of broiler chicks fed different levels of *Albizia lebbeck* stem bark extract

The performance characteristics of broiler chicks given different levels of *Albizia lebbeck* stem bark extract is presented in Table 6. The initial body weight, final live weight, weight gain, average daily gain, average feed intake and feed to gain ratio range between 46.92 – 48.08 g, 1733.1 – 2471.2 g, 1686.0 – 2424.2 g, 30.11 – 43.29 g, 85.73 – 92.63 g and 1.98 – 3.07 respectively. They were highest in T4 and T5, intermediate in T2 and T3 and lowest in T1 (P<0.05). While no mortality was recorded for T3, T4 and T5, mortality was highest in T1 (7.1%), and lowest in T2 (P<0.05).

Nutrient retention of broiler chicks given different levels of *Albizia lebbeck* stem bark extract

Table 7 shows the effect of treatments on nutrient retention of broiler chicks. Dry matter retention was highest for T2 (73.40 %), T3 (77.56 %), T4 (85.05 %) and T5 (85.66 %) and lowest for T1 (72.45 %) (P<0.05). CP retention was higher (P<0.05) for T2 (74.60 %), T3 (77.05 %), T4 (79.00 %) and T5 (79.10 %) than for T1 (73.19 %). Fat retention was lower (P<0.05) for T1 than for other treatments. CF retention was highest (P<0.05) for T2, T3, T4 and T5 and lowest for T1 (45.19 %). NFE retention was highest (P<0.05) for T2 (80.11 %), T3 (80.32 %), T4 (79.19 %) and T5 (80.85 %) and lowest for T1 (69.42 %) (P<0.05).

4. DISCUSSION

The crude protein (CP) of *Albizia lebbeck* stem bark (4.65 %) conforms to the findings of Atamgba *et al*. (2017) who reported 4.70 % CP for *Jatropha curcas* stem bark but slightly lower than those obtained for *Morinda lucida* stem bark (5.70 %). Higher crude fibre was obtained in *Albizia lebbeck* stem bark is in line with the reports of Olanipekun *et al*. (2016). According to Alagbe (2020); Ishida *et al*. (2011) adequate incorporation of dietary fibre improves feed digestion, reduces serum cholesterol and coronary heart diseases. Ash content obtained in this study (8.73 %) is contrary to the report of Uwaya and Igbinaduwa (2017), this could be attributed to the differences in specie and age of plants (Alagbe *et al*., 2020). According to Ojewuyi *et al*. (2014); Onwuka (2005) ash content is an indication of the presence minerals in a sample. A low value was recorded for ether extract (0.77 %) as a result of low level of carotene and pigments in *Albizia lebbeck* stem bark (Gupta *et al*., 2005). The energy content in the sample was determined to be 1870.7 kcal lower than that reported for *Ipomea asarifolia* leaf meal (2760.0 kcal) and *Phyllantus amarus* leaf meal (1967.4 kcal) (Alagbe and grace, 2019). Metabolizable energy is a portion of gross energy that is used by the animal to accomplish work, growth and heat production (Anugwa *et al*., 1989).

Phytochemical analysis of *Albizia lebbeck* bark and *Albizia lebbeck* extract revealed the presence of several bioactive chemicals or secondary metabolites which confers the plant ability to perform multiple biological activities and pharmacological significance (Odeyemi *et al*., 2014). Flavonoids was found to be abundant in the test material indicating that it plays vital as an anti-inflammatory, antiplasmodic, anti-thrombitic, anti-allergic and antioxidant properties (Edeoga *et al*., 2005; Enin *et al*., 2014). Other literatures have also pointed the role of flavonoids as adjuvants in vaccines (Stafford, 1997). Alkaloid performs the role of analgesics and antimicrobial effects (Nwaogu *et al*., 2007). Saponins are generally known for their antibacterial and antifungal properties (Faizi *et al*., 2008). Tannins have been suggested to be involved with antibacterial and anti-viral activity (Adisa *et al*., 2010). Phytate are strong antioxidants and have also been recognized for their ability to bind calcium and other minerals in the small intestine of animals (Graf *et al*., 1990). The presence of steroids is an indication that *Albizia lebbeck* bark could play a major role in fertility of animals (Atamgba *et al*., 2015), The result on the phytochemical composition of the test material conforms to the findings of Labaran (2015); Labaran *et al*. (2016). However, the values were within the lethal levels reported by Alagbe and Oluwafemi (2019). The presence of these phytochemicals reveals the great potentials of the plant as a source of phytomedicines.

The mineral composition of *Albizia lebbeck* stem bark is abundant in calcium (101.5 mg/100g) followed by phosphorus (67.10 mg/100g), iron had the least value (0.01 mg/100g). Calcium plays a vital role in bone formation, rigidity and support to animals (Enin *et al*., 2016; Ibrahim *et al*., 2001). The calcium value obtained is greater than the reports of Akubugwo *et al*. (2007) for Amaranthus hybridus. Phosphorus is an important component of nucleic acids and co-enzymes, deficiency of this mineral causes stunted growth and purplish veins in plant leaves (Simsek and Aykut, 2007). Potassium helps in osmotic pressure balance, activation of intercellular enzymes and regulation of nerves (Tajeda *et al*., 2009). Manganese is essential in the formation of some amino acids, enzyme activation and chlorophyll synthesis (Ozcan, 2003). Sodium is an important intracellular cation responsible for acid-base balance (Akpanyung, 2005). Zinc ensures chlorophyll formation and its deficiency leads to poor root formation (Sidhu *et al*., 2004). Magnesium is key in blood circulation and prevention of heart diseases (Nwauzoma and Dawari, 2013). Copper are important lignin biosynthetic enzymes and its deficiency causes chlorosis, necrosis and stunted growth (Pathak and Kapil, 2004). Manganese is responsible in chlorophyll formation, formation of amino acids and enzyme activation (Eastmond *et al*., 2008). Irons are a component of cytochromes, enzyme activation and make part in blood cells of animals (Kavita *et al*., 2010).The mineral composition of ATSM obtained in this study is contrary to the reports of Ukpabi and Offor (2018); Labaran *et al*. (2016); Ahmed *et al*. (2017), this could be attributed to differences in varieties, age, soil type as well as geographical location (Oluwafemi *et al*., 2020).

Vitamin analysis of *Albizia lebbeck* stem bark shows that the plant is abundant in ascorbic acid (vitamin C) which is a strong antioxidant responsible for strengthening the immune system and cell damage prevention (Jenkins *et al*., 2018). Thiamine (B1) is a component of enzymes needed for energy metabolism and nerve function (Maqbool and Stallings, 2008). Vitamin B2 (riboflavin) is important for normal vision and skin health (Awuchi, 2019). Niacin (B3) is a part of an enzyme needed for energy metabolism; important for nervous system, digestive system, and skin health (Bender, 2003). Vitamin D is needed for proper absorption of calcium; stored in bones as reserve (Berdanier *et al*., 2016). Proper clotting of the blood is the responsibility of vitamin K (Boy *et al*., 2009). Vitamin A plays a key role in proper vision, healthy skin and mucous membranes, bone and tooth growth, immune system health (EFSA, 2006).

Average daily gain, average daily feed intake and feed: gain ratio were influenced by the dietary treatments (P<0.05). These findings are in agreement with the reports of other authors (Oleforuh *et al*., 2014; Olafadehan *et al*., 2020; Alagbe *et al*., 2018). The higher weight gain in T4 and T5 could be attributed to the presence of phytochemicals and other nutrients in ATSM. Phytochemicals have the ability to regulate feed intake, stimulate digestive secretions and maintain interstinal flora (eubiosis) in order to prevent risk of digestive disorders (Hyun et al., 2018; Liu *et al*., 2014; Van *et al*., 2016; Alagbe, 2017). Presence of phenol and flavonoids also confers ATSM the ability to scavenge free radicals and prevents oxidative damage to biomolecules such as lipids, protein and deoxyribonucleic acids (Hollman, 2001). Higher mortality was also reported in T1 and T2 (P<0.05). Synergistic combination of phytochemicals in ATSM exhibits wide range of antibacterial activities against Gram positive and Gram negative bacteria (Lillehoj *et al*., 2016; Guban *et al*., 2006). Plant metabolites are capable of showing strong flavours and thus positively influence the sensory characteristics of feed (Caspar, 2002).

Nutrient retention among the treatments were significantly (P<0.05) influenced by the dietary administration of ATSM. This conforms to earlier findings of Olafadehan *et al*. (2020); Alagbe (2017) but contrary to the reports of Tarek *et al*. (2013) when Olive leaves extract was fed to broiler chickens. Higher nutrient retention in birds fed T4 and T5 indicated that ATSM has the ability to function as laxative, spasmolytic and anti-flatulence in the gastro-intestinal tract due to the presence of bioactive chemicals. Thereby, improving nutrient absorption via secretion of siliva, bile and enzymatic activity (Jang *et al*., 2007; Wenk 2000). This also confirms the earlier reports of Santi and Kim (2017); Yan *et al*. (2012) and Alagbe (2017) when miadiasin was supplemented in the diets of broiler chicken.

5. CONCLUSION

The use of medicinal plants or phytogenics has been adopted as one of the suitable replacement to antibiotics; they are relatively cheap and safe without side effects. Plants are loaded with several phytochemicals and other nutrients that are necessary for animal growth. They can also influence the sensory characteristics of feed, eating pattern, secretion of digestive fluids and feed intake. The use of *Albizia lebbeck* stem bark (ATSM) has greatly justified the outcome of several researchers on phytomedicine, it was concluded from this experiment that the incorporation of ATSM at 30 ml per liter of water significantly influenced the growth of birds without any deleterious effect on their general performance.

Peer-review

External peer-review was done through double-blind method.

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Conflict of Interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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