

**GROWTH PERFORMANCE, NUTRIENT RETENTION, SERUM
BIOCHEMICAL INDICES AND CARCASS CHARACTERISTICS OF
BROILER FINISHER BIRDS SERVED ALOE VERA GEL EXTRACT
SUPPLEMENT**

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ABSTRACT

The use of commercially produced vitamins is costly and tends to increase the cost of poultry production. In view of this, there is increased interest to search for leaves of medicinal plants that can serve as natural sources of vitamins and minerals. The use of *aloe vera* leaf extract is a step in the right direction, since it is a potential source of these essential nutrients. Hence a 4-week study was conducted to investigate the oral supplementation of aloe vera gel extract (AVGE) on growth performance, nutrient retention, serum biochemical indices and carcass characteristics of broiler finisher using one hundred and twenty 4 weeks old broiler birds. The birds were randomly divided into five groups and assigned to five treatments of 24 birds each in a completely randomized design (CRD). Each treatment was replicated three times with 8 birds per replicate. Birds on treatments 1, 2, 3, 4, and 5 received ordinary water, Vitaltye, 10%, 20%, and 30% aqueous AVGE, respectively. Results showed that AVGE had significant ($p < 0.05$) effects on final body weight, feed conversion ratio and cost of feed per kilogram gain. Treatments had significant ($p < 0.05$) effects on all the nutrient retentions parameters determined. The results showed significant ($p < 0.05$) differences in all the serum biochemical indices determined. Finally, there were significant ($p < 0.05$) effect in all the carcass and relative organ weight measured. Based on the results in this study, it was concluded that AVGE supplement to broiler finishers enhanced their growth performance, especially at the 30% inclusion level.

Keywords: aloe vera gel extract, broiler finishers, nutrient retention, growth performance, carcass quality.

INTRODUCTION

Poultry production has been described as one of the fastest means of achieving appreciable improvement in the nutritional standard of the Nigeria populace because of its short generation interval, quick turnover rate and relatively low capital investment (1); (2). However, to achieve maximum health and performance of poultry, birds must be supplied with adequate and nutritionally balanced diets. Besides, one of the common issues with regard to back yard flocks relates to poor or inadequate feeding programs that can lead to vitamin and mineral deficiencies in the birds. Vitamin and mineral deficiencies can produce numerous health problems for chickens including death in some cases. Thus, to prevent nutritional deficiencies, or to correct when deficiency symptoms are noted, feeding a balanced poultry ration with the required vitamins and minerals should be practiced. Moreover, oral administration of vitamins and minerals to birds is inevitable especially in the time of stress and outbreak of diseases. The use of commercially produced vitamins is costly and tends to increase the cost of poultry production. In view of this, there is increased interest by poultry farmers to search for leaves of ethno medicinal plants that can serve as natural sources of vitamins and minerals. The use of various plant extracts in broiler production has been recorded (3); (4); (5); (6). One of such plant extracts is *Aloe vera* (*Aloe barbadensis*) which belongs to the lily family. *Aloe vera* contains numerous vitamins: Vitamin A, C, and D (are crucial antioxidants that combat free radicals in the body); Vitamin B and choline are concerned with the production of energy, amino acid metabolism developing muscle mass. Vitamin B12 (folic acid) is responsible for the production of red blood cells (7). The use of *aloe vera* leaf extract in broiler production is a step in the right direction, since it is a potential source of these essential nutrients that are necessary for normal well being, growth and development of birds (8); (9); (10). This study was therefore conducted to evaluate the growth performance, serum biochemical indices, nutrient retention and carcass characteristics of broiler finisher birds served aloe vera gel extract supplement.

MATERIALS AND METHODS

Ethical Consideration: The experiment was carried out by the provisions of the Ethical Committee on the use of animals and humans for biomedical research of the University of Nigeria, Nsukka.

Study Site: The study was carried out at the Poultry Unit of the Department of Animal Science Teaching and Research Farm, University of Nigeria, Nsukka. Nsukka lies within longitude 6° 45'E and 7°E and latitude 7°12.5' N and on the altitude 447m above sea level. The climate of the study area is typically tropical, with relative humidity ranging from 65 to 80% and mean daily temperature of 26.8°C (11).

The study lasted for a period of four weeks.

Preparation of Aloe Vera Gel Extract

Fresh *aloe vera* leaves were collected from Mbu town in Isi-uzo Local Government Area of Enugu State. The leaves were washed with clean water to remove dirt. *Aloe vera* gel was extracted manually from leaves by making a cut on the leaves with a pocket knife. The gel was scooped out with a small spoon and drained into a beaker. The extract was prepared by pouring 400ml (0.4litre) of fresh gel into a glass bottle containing 1.5 litre of clean tap water. The bottle was agitated for about 2 minutes to ensure thorough mixing, after which it was kept for 30minutes at room temperature prior to use. The homogenized *aloe vera* gel extract (AVGE) was prepared at the interval of two (2) days and served to the animals fresh according to the treatments.

Experimental Birds and Management

One hundred and twenty 4 weeks old male and female broiler birds were used for the study. The birds were randomly allotted to five treatment groups of 24 birds each in a completely randomized design (CRD). The treatments were as follows: T1 = water; T2 = (vitalyte +4liters of water); T3 = (0.4litre of AVGE + 4litres of water); T4 = (0.8litre of AVGE+4 litres of water) and T5 = (1.2litre of AVGE + 4 litres of water). Treatment 1 served as the control while T2 was commercial vitalyte which contained vitamins supplement. Each treatment was replicated three times with 8 birds per replicate placed in a deep litter pen of fresh wood shavings measuring 1.50m x 1.50m. All the groups were fed the same commercial broiler finisher diet containing 2.89Mcal/kg ME, 18.56% crude protein and 5.85 % crude fibre. Routine management practices in terms of medication and vaccination were strictly observed. The test material which was AVGE was added in the drinking water according to the treatments and served *ad libitum* to the birds for the four weeks experimental period.

Data collection

The experimental feed, AVGE, water and vitalyte were given *ad libitum* to the birds for the four weeks experimental period. Birds in each replicate were weighed at the beginning of the experiment and subsequently on weekly basis to determine the weight gain of birds. Feed intake was recorded daily and was determined by the weigh-back technique, and this involved obtaining the difference between quantity of feed offered and the left over the following morning. Feed conversion ratio was calculated from the data on feed intake and weight gain as the number of grams of feed consumed per gram of weight gained over the same period.

Apparent nutrient retention determination.

At week 4 of the experiment, apparent nutrient retention was determined. The birds were housed individually in metabolism cages. Feed was offered at 90% of the average daily feed intake to ensure that it was all consumed and to minimize wastage (12). The birds were allowed for two days to adjust to the cage environment before data collection. Daily feed consumption was recorded as the difference between the quantity offered and the quantity left after 24 hours. Faecal droppings were collected from separate cages in detachable trays placed beneath the wire mesh floor of the cages, oven-dried at 60°C and weighed over a seven day period. At the end of the period, all faecal samples from each bird were bulked and preserved for analysis. The samples were later analyzed for proximate composition according to the methods of AOAC (13).

$$\text{Apparent Nutrient Retention} = \frac{\text{Nutrient intake} - \text{Nutrient in Feases}}{\text{Nutrient intake}} \times 100$$

Serum biochemical analysis

At the 4th week of the experiment, three birds per treatment were randomly selected and blood samples were collected from the wing veins of each bird using sterilized syringe and emptied into sterilized plain bottles. Serum metabolites (total protein (TP), glucose albumin, globulin, creatinine, cholesterol and calcium) were determined according to the methods described by Campbell and Coles (14).

Carcass and organ evaluation

At the end of the four weeks experimental period, three birds per treatment were randomly selected, starved overnight and weighed for carcass and organ evaluation. The birds were slaughtered by severing the jugular vein, scalded in warm water for a minute and de-feathered by manual plucking. The birds were eviscerated and weighed to obtain their dressed carcass weight. The kidneys, liver, gizzard, heart, intestine, lungs, head and legs were removed and weighed using a sensitive scale. The kidneys, liver, heart, intestine and lungs were grossly examined for any pathological lesion. The dressed carcass weight and the organ weights were expressed as percentages of live weight.

Proximate and Statistical Analyses

The aloe vera gel extract was assayed for proximate composition by the method of AOAC (13). Data collected were subjected to analysis of variance (ANOVA) for completely randomized design (CRD) using a statistics package for social sciences (15) Model. Significantly different means were separated using Duncan's New Multiple Range Test (16)

RESULTS AND DISCUSSION

The proximate composition of *Aloe vera* gel is presented in table 1.

Table 1: Proximate composition of *Aloe vera* gel extract

Components	AVGE
Dry matter (%)	44.06
Crude fibre (%)	10.00
Ether extract (%)	4.40
Crude protein (%)	20.02
Ash (%)	8.99
Nitrogen-free extract (%)	0.65

The crude protein value (20.02%) obtained in the present study is higher than the crude protein value of 6.86% reported by (10). However, the crude fibre and ash values (10.00% and 8.99%, respectively) obtained in the present study were lower than crude fibre and ash values (13.35%, and 16.88 %, respectively) reported by (10). The proximate values obtained in the present study were also higher than the values (moisture, 11.7%; ether extract, 2.91%; ash, 2.36%; crude protein, 4.73% and crude fibre, 7.84%) reported by (17). The observed differences, especially in the crude protein and crude fibre contents may be due to differences in geographical locations, age and varieties/cultivars of the leaves evaluated in the different studies. It is well known fact that as leaves advance in age, the crude protein reduces whereas the crude fibre content increases (18).

Effect of aqueous *aloe vera* gel extracts on growth performance of broiler finisher birds

The effect of aqueous *aloe vera* gel extract on growth performance of broiler finishers is presented in Table 2.

There were no significant ($p > 0.05$) differences among treatments in average daily weight gain (ADWG), average daily feed intake, average daily water intake and protein efficiency ratio. There were significant ($p < 0.05$) differences among treatments in final body weight (FBW), feed conversion ratio (FCR), cost of feed per kilogram gain (CFG), and mortality rate. The FBW values of T4 (3.38kg) and T5 (3.41kg) were significantly ($p < 0.05$) higher than the final body weight (FBW) values of T1 (3.15kg) and T2 (3.15kg). T3, T4 and T5 were statistically similar ($p > 0.05$) so also T1, T2 and T3. The feed conversion ratio (FCR) values of T4 (3.28) and T5 (3.26) were significantly ($p > 0.05$) smaller than other treatments. T3 (3.33) had lower FCR than

T1 (3.46) and T2 (3.52). The cost of feed/kg gain values of T1 and T2 were significantly ($p < 0.05$) higher than AVGE groups.

Table 2: Effect of aqueous alovera gel extracts on growth performance of finisher broiler birds:

Parameters	Treatments*					SEM
	T1	T2	T3	T4	T5	
Initial body weight(g)	1268.00	1270.00	1265.00	1267.00	1269.00	2.31
Final Body weight (kg)	3.15 ^b	3.15 ^b	3.28 ^{ab}	3.38 ^a	3.41 ^a	0.04
Daily weight gain(g)/bird	50.00	50.00	51.02	51.70	52.05	0.07
Average daily feed intake(g)/bird	173.00	176.00	170.00	170.00	170.00	0.01
Feed conversion ratio	3.46 ^a	3.52 ^a	3.33 ^b	3.28 ^c	3.26 ^c	0.05
Daily water intake(cl)/bird	70.00	69.70	70.70	70.00	70.60	0.30
Protein efficiency ratio(PER)	1.59	1.59	1.59	1.59	1.59	0.00
Cost of 1kg of feed(₦)	130.00	130.00	130.00	130.00	130.00	0.00
Cost of feed per kg gain(₦)	449.8 ^a	457.6 ^a	432.9 ^b	426.4 ^c	423.8 ^c	4.50

Means on the same row with different superscripts are significantly ($P < 0.05$) different.

SEM= Standard Error of the Mean.

*T1 = water; T2 = vitality; T3 = (0.4litre of AVGE + 4litre of water); T4 = (0.8litre of AVGE+4 litre of water) and T5 = (1.2litre of AVGE + 4 litre of water).

The higher body weight gain and improved FCR values observed in this findings with the birds on *aloe vera* groups, T3, T4 and T5 supports findings done by (19) using 10 ml of aqueous extract of aloe gel per liter of drinking water. (20) also reported that *Aloe vera* gel added to water resulted in significant increase in final body weight gain as well as in weekly body weight gain compared to control group. This could be due to the fact that *aloe vera* possesses diversified antimicrobial nutrients, minerals, vitamins, enzymes and glycoproteins (21) and these might have helped the birds in better digestions and absorptions of nutrients than birds on control group. Vitamins boost immune systems while enzymes help to breakdown food and assist in digestion of food. The result of the present study was also consistent with the findings of (22) who reported that higher body weight were observed in the groups of broilers that received dietary

inclusion of *Aloe vera* and *Curcuma longa*. (9) and (23) found similar result that aloe vera increased body weight of cockrel at 5% and in broiler at 0.5% inclusions level. However, this finding disagrees consistently with (24) who reported that broiler chickens fed with fresh *Aloe vera* gel (0.25 g/kg) and dry *Aloe vera* gel (0.25 and 1.0 g/kg) had no significant effect on body weight. The non significant ($P < 0.05$) effect noticed in total water intake of the birds supports the report of (25) who reported no significant difference in mean water intake among broiler birds. (26) reported similar findings whereas; (27) and (19) reported higher water intake in *aloe vera* groups than antibiotic group. It could also be attributed that the birds got adapted to bitter taste of *aloe vera* gel extracts. The aloe vera groups and T2 were statistically similar with the control group in protein efficiency ratio. This was in contrary with (28); (22) that noticed improved protein efficiency in *aloe vera* powder and gel treated groups as compared to control group.

The significant decrease in feed cost /kg gain in *aloe vera* groups showed that farmers stand better chance of making profit than using the commercial vitality to produce 1kg of a bird. This is in support of (9) that reported higher profit in using *aloe vera* to feed cockerel.

Effect of aqueous *aloe vera* gel extracts on apparent nutrient retention of broiler finisher birds

The effect of aqueous *aloe vera* gel extract on apparent nutrient retention of broiler finisher birds is presented in Table 3. There were significant ($p < 0.05$) differences among treatments in all the parameters determined with the exception of dry matter retained. The values of crude protein retained (CPR) of T2, T3, T4 and T5 were significantly ($p < 0.05$) higher than the (CPR) value of T1. The results of this findings showed that T4 and T5 retained more crude fibre than other groups. T1 and T2 were significantly ($p < 0.05$) lower in ether extract retained than AVGE groups. T3 had lower percentage value of ether extract retained compared to other AVGE groups (T4 and T5). It was observed from this finding that T1 and T2 were significantly ($p < 0.05$) higher than *aloe vera* groups (T3, T4 and T5) in percentage values of ether extract retained (EER).

Table 3: Effect of aqueous aloe vera gel extract on apparent nutrient retention of broiler finisher birds

Parameters	Treatments*					SEM
	T1	T2	T3	T4	T5	
Crude protein retained (%)	80.91 ^b	91.15 ^a	91.20 ^a	91.88 ^a	88.93 ^a	1.26
Crude fibre retained (%)	22.09 ^b	34.65 ^b	32.39 ^b	38.09 ^a	36.70 ^a	2.45
Dry matter retained (%)	63.15	66.10	63.15	65.07	62.01	1.17
Ether extract retained (%)	84.64 ^c	86.94 ^c	92.81 ^b	95.86 ^a	90.29 ^b	1.13
Nitrogen-free extract retained (%)	78.35 ^a	76.72 ^a	63.52 ^b	63.24 ^b	64.25 ^b	2.15

^{a,b,c} Means on the same row with different superscripts are significantly ($P < 0.05$) different. SEM= Standard Error of the Mean.

The improved crude protein (CP) retention of birds on the vitalyte and aloe vera groups could be attributed to the antimicrobial; appetite- and digestion-stimulating properties in some plant extracts, including aloe vera extract (29). This also supports the high crude fibre value of T4 and T5. Although birds on treatments 1 and 2 (water and vitalyte) retained more nitrogen-free extract than other birds, their overall performances were not superior to those of birds on treatments containing aloe vera extract. This tends to suggest that the inclusion of aloe vera extract in the birds' drinking water had a beneficial effect on the birds. This agreed with (30) who reported that herbs can stimulate appetite and endogenous secretions which, in turn, improve performance. He stated that beneficial effects of herbal extracts on farm animals may be as a result of the increase in feed intake and activation of digestive enzymes secretion of the animals, emanating from the immune stimulating, and anti-bacterial, anti-viral and anti-oxidant properties of these extracts.

Effect of aqueous aloe vera gel extract on biochemical parameters of broiler finisher birds

The effect of aqueous aloe vera extract on biochemical parameters of broiler finisher birds is presented in Table 4.

The effects of aloe vera gel extract were noticed in all serum biochemistry indices determined. The total protein (TP) values of T1 (3.67) and T5 (3.77) were significantly ($p < 0.05$) higher than total protein values of T2 and T3 but statistically similar ($p > 0.05$) to TP value of T4. The total protein values of T2, T3 and T4 were statistically similar ($p > 0.05$). Aloe vera gel decreased the

albumin value of T4 (1.53) and this was significantly ($p < 0.05$) lower than the albumin (ALB) value of other treatments. The effect of AVGE on T2 and T3 showed a decrease in globulin (GLB) value than T1, T4 and T5 GLB values. The glucose (GLU) value of T1 (147.33) and T2 (127.30) showed significant ($p > 0.05$) increase compared to AVGE (103.33, 100.67 and 98.67) groups. The results showed that AVGE lowered glucose level. The creatinine value of T5 (0.29) was statistically ($p < 0.05$) higher than creatinine values of other treatments. T2 (74.99) had a lower value of cholesterol than other treatments. The effect of AVGE on T5 (7.53) showed a ($p < 0.05$) higher calcium value than the rest of other treatments.

Table 4: Effects of aqueous alovera gel extract on Serum biochemical indices of broiler finisher birds.

Parameters	Treatments*					SEM
	T1	T2	T3	T4	T5	
Total protein(g/dl)	3.67 ^a	3.03 ^b	3.03 ^b	3.20 ^{ab}	3.77 ^a	0.11
Albumin(g/dl)	1.97 ^a	2.23 ^a	2.23 ^a	1.53 ^b	2.17 ^a	0.14
Globulin(g/dl)	1.70 ^a	0.80 ^b	0.80 ^b	1.67 ^a	1.60 ^a	0.16
Glucose (mg/dl)	147.33 ^a	127.30 ^b	103.33 ^c	100.67 ^c	98.67 ^c	8.03
Creatine(mg/dl)	0.06 ^b	0.06 ^b	0.06 ^b	0.08 ^b	0.29 ^a	0.04
Cholesterol(mg/dl)	109.00 ^a	74.99 ^b	108.33 ^a	117.00 ^a	120.00 ^a	8.10
Calcium(mg/dl)	6.73 ^b	6.90 ^b	6.83 ^b	6.97 ^b	7.53 ^a	0.13

^{a,b,c} Means on the same row with different superscripts are significantly ($P < 0.05$) different.
SEM= Standard Error of the Mean.

This finding did not support (8) who reported that dietary inclusion of *aloe vera* and *curcuma longa* and its combinations in broiler birds has no significant effect on the treated groups. The significant increase in serum creatinine in treatment 5 is in agreement with; (31) and (32) who reported significant increase in serum creatinine and urea levels when aloe vera was added to the diet of broilers. This study revealed that aloe induces a significant rise in serum creatinine when 1.2 liters of AVGE was added in 4 litres of water. This is in consonance with the study of (33) and (34) that reported the cytotoxic effect of aloe and high creatinine in aloe vera treated rat. Reduced protein level in T3 and albumin levels in T4 is in agreement with the report of (22) that reported decreased in albumin value in broiler birds treated with aloe vera and tumeric. It was also observed in this study that AVGE groups had lower glucose values compared to the control groups T1 (water) and T2 (vitalyte). This was in agreement with (35) who stated that the oral administration of *aloe vera* gel extract (300mg/kg body weight per day) to streptozotocin

induced diabetic rats had a significant reduction in fasting glucose. Similar studies indicate that *Aloe vera* extract is effective in increasing insulin sensitivity, reducing fasting blood glucose, and decreasing the level of HbA1C in patients with pre-diabetes during eight weeks (36). Other studies have also shown the effectiveness of *Aloe vera* extract on the regulation of blood glucose levels in diabetic animals (37); (39). According to (38), *aloe vera* decreases blood sugar level in hyperglycemic patients. This study did not support few studies that indicated a rise in blood sugar levels after consumption of *Aloe vera* extract (39). These might be related to the use of different parts of the plant (not the gel) or short duration of administration. (40) and (41) reported that, *Aloe vera* also contains other compounds such as hydrophilic fiber, glucomannan and phytosterol that reduce blood glucose. The effect of AVGE on calcium value in this study supports (42) that recorded up to 9.08 mg/dl in broiler birds treated with aloe vera. The significant increase observed in the calcium level in this study may be attributed to the calcium content of *aloe vera*. It has been reported that among the important minerals found in aloe vera are: calcium, chromium, copper, iron, magnesium, manganese, potassium, phosphorous, sodium, and zinc (7).

Effects of aqueous *aloe vera* gel extract on carcass and relative organ weights of broiler finishers

The Effects of aqueous *aloe vera* gel extract on carcass and relative organ weights of broiler finishers is presented in Table 5

There were significant ($p < 0.05$) differences among treatments in all the parameters. The results showed that T1, T2 and T4 were significantly ($p < 0.05$) higher in live body weight than T3 and T5 live weight. The percentage dressed weight of T3 was significantly ($p < 0.05$) lower than percentage dressed weights of T1, T2 and T4 but statistically similar with T5. *Aloe vera* gel extract (AVGE) had an increase effect on relative head weight than T2 but were statistically similar ($p > 0.05$) in relative head weight value of T1. The finding revealed that the relative gizzard weight and empty gizzard weight of T3 and T4 were significantly ($p < 0.05$) higher than other treatments. The relative shank weight of T2 was smaller than other shank weight while T4 had the highest value for relative shank weight. The percentage heart weight of T4 (0.76%) was statistically ($p < 0.05$) higher than the percentage heart weight of other treatments. There was high value of relative liver weight of T5 (1.90) compared to other group but showed statistical similar value with T1 (1.78). The effect of AVGE on T5 showed a significant ($p < 0.05$) higher weight of kidney than other treatments. The abdominal fat deposition of T2 was significantly ($p < 0.05$) higher than the abdominal value of the control (T1) and that of the AVGE groups. The birds on T4 and T5 had higher values of relative lung weight and relative small intestine weight compared to T1, T2 and T3 respectively. The result of this finding showed that there was

increase in weight of large intestine weight of birds that were administered AVGE than T1 and T2 that received ordinary water and commercial vitalyte.

Table 5: Effects of aqueous alovera gel extract on carcass and relative organ weights of broiler finishers.

Parameters	Treatments*					SEM
	T1	T2	T3	T4	T5	
Live weight(kg)	3.80 ^a	3.73 ^a	3.60 ^a	3.53 ^a	3.27 ^b	0.09
Dressed weight (%)	77.82 ^a	77.10 ^a	68.71 ^b	70.14 ^{ab}	74.13 ^{ab}	1.39
Head weight (%)	1.07 ^{ab}	1.81 ^b	2.36 ^a	2.15 ^a	2.18 ^a	0.07
Gizzard weight (%)	2.30 ^b	2.35 ^b	2.69 ^{ab}	2.88 ^a	2.55 ^b	0.10
Empty gizzard weight (%)	1.72 ^b	1.68 ^b	1.92 ^a	2.06 ^a	1.79 ^b	0.07
Shank weight (%)	3.26 ^b	2.93 ^c	3.33 ^b	3.71 ^a	3.28 ^b	0.12
Heart weight (%)	0.42 ^b	0.42 ^b	0.41 ^b	0.76 ^a	0.41 ^b	0.06
Liver weight (%)	1.78 ^{ab}	1.62 ^b	1.43 ^c	1.61 ^b	1.90 ^a	0.08
Kidney weight (%)	0.32 ^b	0.35 ^b	0.39 ^b	0.39 ^b	0.51 ^a	0.36
Abdominal fat weight (%)	1.22 ^b	2.08 ^a	0.93 ^b	0.78 ^b	1.06 ^b	0.19
Lungs weight (%)	0.49 ^b	0.58 ^b	0.57 ^b	0.64 ^a	0.64 ^a	0.03
Large intestine	1.12 ^b	0.73 ^b	1.06 ^b	1.35 ^a	1.40 ^a	0.13

weight (%)						
Small intestine	42.68 ^b	36.73 ^b	47.72 ^a	47.42 ^a	47.96 ^a	1.45
weight (%)						

^{a,b,c} Means on the same row with different superscripts are significantly (P<0.05) different. SEM= Standard Error of the Mean.

The significance (p<0.05) differences observed in this study on dressed weight was in support with (19) who observed heavier dressing percentage weight in the broilers treated with antibiotic than other groups treated with *aloe vera* gel except for the 2% *Aloe vera* gel group. There is decrease in eviscerated weight by oral supplementation of *aloe vera* gel. The heavier dressing weight value was experienced more in the control and vitality groups. This findings did not favour the earlier reports of (24) who stated that supplementation of fresh *Aloe vera* gel (0.25 g/kg) and dry *Aloe vera* gel (0.25 and 1.0 g/kg) in broiler diet from 1-day old to 5 weeks of age showed no significant effect on carcass yield and internal organs. On the contrary, (25) reported higher (55 percent) dressing percentage, breast, and thigh and giblet weight in broilers fed diet containing 0.5 percent turmeric and *aloe vera*. Abdominal fat deposition showed a reduction in weight as percentage of *aloe vera* gel increases. This was in support of (19) who found the same result on administration of *aloe vera* to broiler chicken and use of antibiotics. Other organs like head, gizzard, and empty gizzards, were found to be heavier in AVGE groups. The significant (p<0.05) difference observed in 20% AVGE group with other groups in shank weight suggest that the absorption of calcium in *aloe vera* may be best in this inclusion.

The heavier heart observed in T4 and heavier liver and kidney weight also observed in T5 respectively in this recent research disagree with (43), who reported that, medicinal plant usage have been associated with tissue damage and serum enzyme alterations. The heavier lung, lengthy and heavier large intestine in T4 and T5 showed that all organs performed well due to anti-microbial nature of *aloe vera* which may have prevented any harmful effect to these organs. An increase in the relative weight of Gizzard and other internal organs of birds on T3, T4 and T5 may be associated with fact that there is always nutrient in balance when plant extracts are fed to animals. Again the internal organs like kidneys and liver are known as the primary recipient of any medicinal herbs or products before it is being absorbed in the body. This finding however did not agree with (44) and (45) who reported no effect of feeding herbal extracts on intestinal weight.

CONCLUSION

The results obtained in the present study showed that oral administration of *aloe vera* gel extract supplement to broiler finishers enhanced their growth performance, especially at the 30%

inclusion level (1.2litre of AVGE + 4 litres of water). The 30% inclusion level had higher value of final body weight (3.41kg), lower value of feed conversion ratio (3.26) and low value of cost per kg gain (₦423.80k).

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CONFLICT OF INTEREST

The authors declare no conflict of interest

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