



## **The influences of aloe vera gel supplementation on growth performance of broilers**

**Noor Agha Nassary<sup>1\*</sup>, M Yunas Waziri<sup>2</sup>**

<sup>1,2</sup> Department of Pre-Clinic, Veterinary Science Faculty, Nangarhar University, GPO, Jalalabad, Nangarhar, Afghanistan

### **Abstract**

Plant products supplementation in poultry feed are gaining a wider application as growth promoter and alternative of medicines, therefore the present study was aimed to assess the influences of Aloe vera gel on growth performance of broilers. A total of 60 one-day Ross 308 broilers were used on a completely randomized design in 4 groups, namely T0, T1, T2 and T3 with 3 replicates. Control group broilers fed a basal diet and three groups basal diet mixed with different levels of Aloe vera gel (0.1%, 0.2% and 0.3%) respectively. The results of obtained data have shown that feed intake were not significantly differ among the groups whereas slightly variation observed with increased aloe vera gel. The daily live body weight gain of T3 and T1 groups broilers were significantly ( $P < 0.05$ ) higher than control and T2 groups in starter period, and T3 group was significantly ( $P < 0.05$ ) higher than T1 group broiler in finisher period. The control group FCR observed significantly ( $P < 0.05$ ) higher compared to T1 and T3 groups in starter period, no significant difference observed in finisher period. In conclusion, the broilers groups treated with aloe vera gel revealed better growth performance and might be recommended as effective additive in the feeding of broilers.

**Keywords:** aloe vera gel, broilers, growth performance

### **1. Introduction**

The most popular and versatile proteinaceous food consumed in large amount relatively to other meats is poultry meat <sup>[1]</sup>. Broiler is well known and efficiently feed converter into poultry meat in almost 35 days, giving a quick return of investment that would allow 5-6 production cycles per year. Broilers clearly dominate the world poultry consumption contributing about 70 % to the world poultry market <sup>[2]</sup>. Well nutrition and management economize productions and reduce expenses for offer higher quality production to consumers especially in semi-arid areas <sup>[3, 4]</sup>. Drugs frequently using as feed additives in poultry ration resulted resistant pathogenic microorganism, adversely affecting growth performance and feed efficiency of poultry, and residues of these substances in poultry products and bacteria resistance against treatments in human body. Because of such threats to human health, antibiotic use is banned in poultry diet <sup>[5]</sup>. Due to concerns of bacterial resistance, the use of antibiotics has been under investigation. Various types of antibiotics may be used according to the need of poultry in diet. Ban the use of antibiotics as growth promoters, leading them to find alternatives in animal feeding <sup>[6, 7]</sup>.

The scholars have been giving their attention on medicinal plants to achieve the targeted nutritional and health status of poultry. Many studies have been carried out on using additives as an alternative to antibiotics including herbs with direct or indirect effects on intestinal microflora in poultry products <sup>[8]</sup>. The consumption and demand for medicinal plants increasing in many countries due to their good characteristic for production in poultry. Aloe vera (Aloe barbadensis) is one of the semi-tropical house plants has a long and illustrious history, it has been mentioned throughout recorded history and given a high ranking as an all-purpose herbal plant <sup>[9]</sup>. There are over 250 species of Aloe vera grown around the world. However, only two species Aloe barbadensis and Aloe arborescens are grown

commercially, with being the most popular. Leaves are the main part, which contains most of these compounds <sup>[10]</sup>.

Previous studies have been reported that the Aloe vera is an effective substance which has been used as an antibiotic <sup>[11]</sup>, anti-inflammatory and anti-coccidial <sup>[12]</sup>, wound healing <sup>[13]</sup>, antifungal and anti-viral <sup>[14]</sup> agent. Several studies have shown antimicrobial properties of herb extract which can improve intestinal micro flora population and enhance health of broilers digestive system through reduction in number of diseases making bacteria <sup>[15]</sup>. Aloe vera gel complex has polysaccharide acemannan – a mannose polymer <sup>[14]</sup> which improve immune response in broilers <sup>[16]</sup> and improve intestinal <sup>[17]</sup>.

Due to results obtained in previous studies regarding the positive effects of Aloe vera gel on different aspects of broiler but a limited researches on production performance; the present study conducted to determine the influences of Aloe vera gel mixed with broiler's feed on growth performance.

### **2. Materials and methods**

The study was carried out in research farm belonging to veterinary science faculty at Nangarhar University situated in Nangarhar province, Afghanistan. This experiment lasted 35 days from mid-February to mid-march of 2019. Prior to trial, poultry facility was carefully cleaned and rinsed in order to make free pathogen vicinity for poultry, and drinkers and feeders were installed before broilers allocation. Drinkers were regularly washed to prevent with faecal and microbial contaminations. Totally 60 day-old Ross 308 chicks of approximately same body weight were purchased from Torghar poultry chicks supplier. All chicks were placed in pen and wood shavings was used as litter of about 5 cm depth.

The chicks were divided on a completely randomized design into four treatment groups with three replicates (fifteen chicks for each treatment). The control group (To) was

treated with basal diet without additive mixed with feed. The next three group’s diets were mixed with 0.1%, 0.2% and 0.3% Aloe vera gel, respectively. Feed and water were provided ad libitum throughout the experimental period. Starter diets were provided from day 1 to 14 days of age and finisher diets from day 15 to 35 days of age. Poultry diets were purchased from Tal Pasily poultry feed mill for farming Ross 308 chicks. Control parameters in experimental period, such as temperature, humidity, light, ventilation and vaccination, were same for all the groups in pens.

Aloe vera plants were purchased from local nursery and extracted gel mixed with feed regularly, then fed to the chickens at each farming period (starter and finisher) with mentioned amount for each groups. Aloe vera chemical analyze was not performed but reported chemical characterization is in Table-2.1 [18].

**Table 2.1:** Chemical composition of Aloe vera

Items	Contents%
Moisture	98.5
pH	4.53
Galactomannan	0.05
Polimannosa	0.72

Chicks were vaccinated following the standard vaccination schedule in order to eliminate the risk of disease occurrence. The body weight and feed intake by replicate were determined weekly for all chicks. Average daily body weight gain, average total feed intake and feed conversion ratio were then calculated. All the values are expressed as

means, One-way ANOVA was applied to determine significant differences of various treatments followed by Tukey HSD test using R x64 3.3.1 for windows. The level of significance was set at ( $P < 0.05$ ).

**3. Results**

In the present study, the data results have shown in table 3.1 for each parameters in both farming (starter and finisher) periods. The total feed intake of experimental period in all treatment groups of both broiler chicken farming periods were not significantly ( $P < 0.05$ ) differ whereas there was a slightly variation in the means of feed intake among the groups and feed intake was gradually increased with increased level of aloe vera gel with feed. However, the broilers of T3 group showed highest feed intake containing 0.3% Aloe vera gel than T0, T1 and T2 treatment groups fed on 0%, 0.1% and 0.3% Aloe vera gel in ration, respectively, and control group feed intake was lowest compared to treatment groups in both farming periods. The mean of daily live weight gain variation observed significantly ( $P < 0.05$ ) differ in starter and finisher groups. In starter period, the daily live body weight gain of T3 and T1 groups broiler fed 0.3% and 0.1% Aloe vera were significantly ( $P < 0.05$ ) higher than control and T2 groups, respectively. In finisher period, the T3 groups broiler chickens was significantly ( $P < 0.05$ ) higher than T1 group whereas the mean value of group T3 live body weight gain was higher compared to all groups. The FCR mean values obtained significantly ( $P < 0.05$ ) differ only in starter period. The control group FCR observed significantly ( $P < 0.05$ ) higher compared to T1 and T3 groups.

**Table. 3.1:** Effects of different levels of Aloe vera gel on broilers growth performance.

Items	Experiment treatments				SEM
	To (0%)	T1 (0.1%)	T2 (0.2%)	T3 (0.3%)	
Total feed intake, g/bird					
Starter (1-16 days)	441.00	465.73	458.67	477.47	13.04
Finisher (17-35 days)	2169.47	2132.73	2183.67	2232.67	21.81
Average daily gain, g/day/bird					
Starter (1-16 days)	31.50 <sup>a</sup>	33.27 <sup>b</sup>	32.76 <sup>a</sup>	34.10 <sup>b</sup>	3.47
Finisher (17-35 days)	103.31 <sup>ab</sup>	101.56 <sup>a</sup>	103.98 <sup>ab</sup>	106.32 <sup>b</sup>	11.62
Feed conversion ratio, g/g					
Starter (1-16 days)	1.36 <sup>c</sup>	1.28 <sup>ab</sup>	1.34 <sup>bc</sup>	1.24 <sup>a</sup>	0.011
Finisher (17-35 days)	1.32	1.35	1.34	1.33	0.006

In spite of it, the T2 was significantly ( $P < 0.05$ ) higher than T3 group. There was no significant difference among the treatments in finisher period of broiler.

**4. Discussion**

According to obtained results on feed intake in different levels, the feed intake has gradually increased with increasing level of aloe vera gel fed in both farming periods, except T1 group in finisher period which has a slightly decreased in feed intake than control group. It has been reported that total feed intake was higher in the broilers treated by Aloe vera gel solved in water [19]. Due to the existence of phytogetic substance in aloe vera that may stimulate appetite, digestive enzymes and nutrient absorption causing improvement of performance [20]. Herbs consuming results to increase appetite and endogenous secretions which, in turn, improve performance [21], therefore the present study results regarding of feed intake is in accordance to other scholar findings.

The live weight gain result obtained in various treatments were significantly ( $P < 0.05$ ) differ in both farming periods. The group T3 treated with 0.3% aloe vera gel revealed high body weight gain than control and T2, whereas the T1 weight gain was higher than control and T2 groups. Previous research has revealed that chickens of T3 group added 15 ml/L aloe vera extract gained significantly ( $P < 0.05$ ) live weight compared to other treatments [9], and also 600 mg of aloe vera gel in drinking water resulted the significant ( $P < 0.05$ ) increased of live weight gain in third and sixth week of broiler farming period [22]. Findings of the present study regarding aloe vera effects on growth performance were in agreement with [23, 18, 24].

At the experimental period, feed conversion ratio overserved significantly ( $P < 0.05$ ) differ in starter period, whereas no significant difference revealed in finisher periods. The broiler of T3 group converted feed to meat most efficiently compared to T2 and control, and T1 group broiler converted feed into meat efficiently than control. It

has been reported that broilers treated with herbs revealed higher feed efficiency <sup>[25]</sup> and stimulating of appetite, digestive enzymes and nutrients absorption are characteristics of aloe vera, which, in turn, results of best performance <sup>[20]</sup>, therefore the high FCR of T3 could be the high concentration of aloe vera and the poorer feed efficiency may be obtained possibly by poorer utilization of ingested energy <sup>[9]</sup>.

## 5. Conclusion

This study was undertaken to investigate the effects of aloe vera gel on broilers growth performance, according to the experiment findings, It can be concluded that broilers groups treated with aloe vera gel revealed better growth performance than broilers treated with basal diet. Therefore we could claim that aloe vera gel is effective additive in the feeding of broilers for best performance. Furthermore studies are required to evaluate its suitability as a feed resource and standard level as growth promoter in poultry.

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## 7. References

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