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Effect of *Aloe vera* powder *(Aloe barbadensis*) on carcass characteristics of Satpuda poultry

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Abstract
The present experiment entitled "Effect of *Aloe vera* powder (*Aloe barbadensis*) on growth performance and meat characteristics of Satpuda poultry" was conducted at Department of Animal Husbandry and Dairy Science, College of Agriculture, Dhule, Maharashtra. One sixty, day old, Satpuda chicks were purchased from Balaji Hatcheries, Pvt. Ltd. Ahmadnagar, Maharashtra. They were randomly distributed into four groups T_0, T_1, T_2 and T_3 with 40 chicks in each group. The experimental broiler chicks were reared on deep litter system in well ventilated shed from 0- 8 weeks. The control group (T_0) was without *Aloe vera* powder, while chicks in treatment group T_1, T_2 and T_3 were fed basal diet with *Aloe vera* powder @ 0.5%, 1.0% and 1.5%, respectively. The carcass characteristics data indicated non-significant differences among all treatments regarding dressing percentage, weight of heart, liver and gizzard and also cut up parts percentage like thigh percentage, drumstick percentage, breast percentage, neck percentage and wings percentage.

Keywords: Satpuda, *Aloe vera* powder, carcass characteristics

Introduction
The intensifying income and changing consumer preferences lead to significant market opportunities for higher-value agricultural products. India today is the one of the world's largest producer of eggs and broiler meat. India rank 3rd in eggs production in the world. The eggs production in the country has increased from 78.48 billion in 2014-15 to 114.38 billion in 2019-20. In eggs production Andra Pradesh is a top most state in the country. Meat production in India is estimated at 6.3 million tons annually and it is ranked 5th in the world and India is responsible for 3% of the total meat production in the world. The largest producer of meat in the country is Utter Pradesh producing 23% of the total meat. Annual growth rate of eggs production was 4.99% during 2014-15 thereafter, there has been a significant improvement in the eggs production with 10.19% growth registered in 2019-20 over the previous year the per capita availability of eggs was 86 eggs per annum in 2019-20. (FAOSTAT-2019) [5].
The production of Satpuda-Desi synthetic hybrid prototypes, which resembles indigenous fowl in body conformation, multi coloured plumage, dull shanks, pink skin and single comb have generated new opportunity for poultry production in rural areas. The Satpuda birds attained 1.0 kg body weight in 8-9 weeks with 2.45 kg feed. Small scale poultry farmers, raising 100-2000 Satpuda-Desi chicken, have been able to capitalize on its acceptance as an indigenous breed in the local markets, which has been apparent from the sale of 0.67 million chicks in last 12 months (Khan, 2008) [8].
In recent years, the usage of herbs as natural supplements in broiler feeds has expanded due to the prohibition of antibiotic growth boosters in broiler chicken diets. *Aloe vera* is also a good substitute for antibiotic growth boosters and anticoccidial medicines. Since, *Aloe vera* comes in a variety of forms, including gel, powder, ethanolic extract, aqueous extract and a polysaccharide found in *Aloe vera* gel (Babak Darabighane *et al.*, 2011) [4]. Major ingredients of *Aloe vera* include anthraquinones, saccharides, vitamins, enzymes and low molecular weight compounds (Choi and Chung, 2003) [2] which give *Aloe vera* its anti-inflammatory, immunomodulatory, wound-healing, anti-viral, anti-fungal, anti-tumor, anti-diabetic, and anti-oxidant effects (Christaki and Florou Paneri, 2010) [3]. Numerous studies suggest that many benefits of *Aloe vera* are attributable to polysaccharides contained in *Aloe vera* gel, which compose a large part of dry matter in this gel (Hamman, 2008) [6]. In other words, almost 60% of dry matter of *Aloe vera* gel is composed of polysaccharides (McAnalley, 1989) [9]. A compound often analysed by researchers is the polysaccharide acemannan which has

immunomodulatory, anti-microbial and anti-tumour effects (Choi and Chung, 2003) [2].

Material and Methods

The present research was conducted at the poultry Unit of the Department of Animal Husbandry and Dairy Science, College of Agriculture Dhule, Maharashtra State, to study the "Effect of *Aloe vera* powder (*Aloe barbadensis*) on growth performance and meat characteristics of Satpuda poultry". The present study was conducted during the 26th April and 20th June of 2021 at Division of Animal Husbandry and Dairy Science, College of Agriculture, Dhule, Maharashtra, India, which is located at 20.90020 N and 74.79880 E at distance 258 meter from mean sea level. Satpuda is a multicoloured feathered bird that looks like a desi fowl, with a maximum average body weight of 1 kg and 200 eggs per year. The bird is resistant to heat stress and possesses all of the necessary qualities for producing poultry in a village setting. It is a mutant multiple cross of desi, Naked Neck, Rhode Island Red (RIR), Kadaknath, and other breeds that's good for farming. The Dhule environment is hot and dry, with summer temperatures reaching 46 ^{0}C and maximum and minimum ambient temperatures ranging from 10 to 15 ^{0}C in winter and 35 to 40 ^{0}C in summer, with an annual rainfall of 612 millimetres. As a result, the birds either do not perform or fall prey to the high environmental temperature. Hence the bird that can survive such high temperatures while still performing well in rural condition was chosen for this research.

Aloe vera powder was purchased at the Gulabchand Ayurvedic shop, Mundada Market, Dhule. After purchasing *Aloe vera* powder was mixed in commercial poultry feed as per various treatment levels.

Selection of Experimental Chicks

Balaji Hatcheries Private Limited, Nagar, Maharashtra, provided 160-day old Satpuda chicks for the current study. When the chicks arrived, they were weighed and randomly distributed to one of four treatment groups: T_0, T_1, T_2 and T_3, with 40 chicks in each treatment, on equal weight basis.

Table 1: Details of Dietary Treatments and Feeding

Treatment	Treatment details
T_0	Basal diet without *Aloe vera* powder
T_1	Basal diet + 0.5% *Aloe vera* powder
T_2	Basal diet + 1.0% *Aloe vera* powder
T_3	Basal diet + 1.5% *Aloe vera* powder

Experimental Details

1. Number of treatments: 4
2. Number of chicks per treatment: 40
3. Total number of Chicks: 160
4. Design of experiment: CRD

Proximate composition of experimental diet

It was observed that, experimental broiler rations involved adequate nutrients for growth was observed as per BIS (1992). The Satpuda starter ration contained crude protein, crude fiber, ether extract, total ash and NFE are 21.28%, 6.65%, 4.26%, 7.15% and 60.66% respectively. The finisher ration contained crude protein, crude fiber, ether extract, total ash and NFE are 19.34%, 5.63%, 4.73%, 6.8% and 63.5% respectively.

Observations Recorded

During the experimental period following observations were recorded:

Body Weight

At weekly intervals, the weight (g) of each of the experimental birds was recorded on an electronic weighing balance. The weight of birds was taken on the 7th day morning before new water and feed was given to the birds, and then every 7th day interval after that. Live weight gains were computed by subtracting the previous week's live weight from the current week's live weight.

Carcass Characteristics

Four birds from each treatment were slaughtered at the end of experiment to study carcass characteristics.

Dressing Percentage

$$\text{Dressing percentage} = \frac{\text{Carcass weight}}{\text{Final body weight}} \times 100$$

Weight of Liver and Other Organs

Different cut up parts of the carcass were weighed, including the neck, breast, thigh, drumstick, heart, gizzard and liver.

Statistical analysis

The data collected throughout the trial will be statistically analyzed by CRD given by Snedecor and Cochran (1994).

Result and Discussion

The present investigation was undertaken to study "Effect of *Aloe vera* powder (*Aloe barbadensis*) on growth performance and meat characteristics of Satpuda Poultry". Table 2 indicate the data on carcass traits due to different dietary treatments of *Aloe vera* powder supplementation during experimental period and graphically shown in fig.1.

The carcass characteristics data indicated non-significant differences in the carcass traits (%) among the treatment groups. The means of dressing (%), weight of heart (g), liver (g) and gizzard (g) for T_0 treatment group was 62.29%, 7.03, 24.77 and 32.17, for T_1 treatment group was 62.03%, 6.65, 24.12 and 31.52, for T_2 treatment group was 62.38%, 6.82, 24.12 and 32.42 and for T_3 treatment group was 62.72%, 7.13, 24.62 and 32.62, respectively. Non-significant effect of feeding of *Aloe vera* powder on dressing percentage, weight of heart, liver and gizzard. However highest dressing (%) was observed in T_3 (62.72%) treatment group followed by T_2, T_0 and T_1. Highest weight of heart was recorded in T_3 (7.3 g) treatment group followed by T_0, T_2 and T_1. Highest weight of liver was recorded in T_0 (24.77 g) treatment group followed by T_3, T_2 and T_1. Highest weight of gizzard was recorded in T_3 (32.62 g) treatment group followed by T_2, T_0 and T_1. Present findings are similar to result obtained by Mehala and Moorthy (2008) [10] who observed that by combination of *Aloe vera* and *Curcuma longa* at different levels had not shown significant difference in abdominal fat weights. Sinurat *et al.* (2002) [12] fed fresh *Aloe vera* gel (0.25 g/kg) and dry *Aloe vera* gel (0.25 and 1.0 g/kg) supplementation in broiler diets from 1-day old to 5 weeks of age had no significant effect on carcass yield and internal organs, according to the study. this result is concurrent with present findings.

Cut Up Parts

Cut up parts data shown in Table 2 revealed that, non-significant effect of feeding *Aloe vera* powder on cut up parts

percentage and graphically represented in fig.2. High thigh percentage was observed in T_1 (16.95%) treatment group followed by T_0, T_2 and T_3. Highest drumstick percentage was observed in T_3 (16.38%) treatment group followed by 15.75, 15.49 and 15.82. Highest breast percentage was observed in T_0 (26.71) followed by T_1, T_3 and T_2. Highest neck percentage was observed in T_0 (4.79%) followed by T_2, T_1 and T_3. Highest wing percentage was observed in T_2 (11.47) followed by T_3, T_0 and T_1. Present findings are similar to the result obtained by Sinurat *et al.* (2002) [12] Fresh *Aloe vera* gel (0.25 g/kg) and dry *Aloe vera* gel (0.25 and 1.0 g/kg) supplementation in broiler diets from 1-day old to 5 weeks of age had no significant effect on carcass yield and internal organs, according to the study. Amaechi *et al.* (2014) [1] found that, in terms of body weight gain and dressing weight, there was no significant difference (P>0.05) between the 1.5 percent *Aloe vera* powder group and the antibiotic group. This finding is more similar to the present findings. Seham M. Mohamed *et al*. (2017) [11] reported all treated groups showed non-significant (P>0.05) effect on internal organ weights and carcass traits. These results are more similar to present findings which make our data much effective. Present findings are similar to the result obtained by Jongpongrenla Jamir *et al.* (2019) [7] found that there were no significant differences in carcass yield irrespective of treatment groups was obsereved in broiler fed with *Aloe vera* at 1.0, 1.5 and 2.0% distributed into four treatments (T_1, T_2, T_3 and T_4).

Table 1: Effect of feeding *Aloe vera* powder on carcass characteristics of satpuda chicken at 8 weeks of age.

Parameter	Groups				SE(m)±	CD
	T_0	T_1	T_2	T_3		
Dressing (%)	62.295	62.03	62.385	62.72	0.534	NS
Heart weight	7.038	6.65	6.825	7.138	0.413	NS
Liver weight	24.775	24.125	24.125	24.625	0.352	NS
Gizzard weight	32.175	31.525	32.425	32.625	0.679	NS

Table 2: Effect of feeding *Aloe vera* powder on cut up parts (% of dressed weight) of Satpuda chicken at 8 weeks of age.

Cut up parts	Groups				SE(m)±	CD
	T_0	T_1	T_2	T_3		
Thigh (%)	16.878	16.958	16.813	16.58	0.199	NS
Drumstick (%)	15.75	15.49	15.82	16.383	0.208	NS
Breast (%)	26.71	26.445	25.74	25.808	0.359	NS
Neck (%)	4.79	4.715	4.615	4.53	0.122	NS
Wings (%)	11.198	11.06	11.47	11.4	0.202	NS

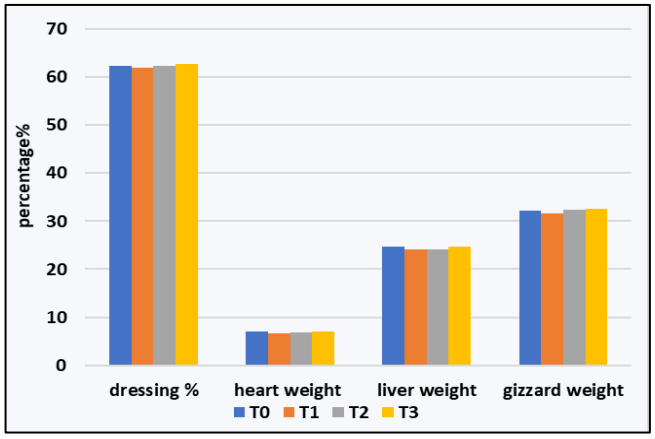

Fig 1: Effect of feeding *Aloe vera* powder on carcass characteristics of satpuda poultry

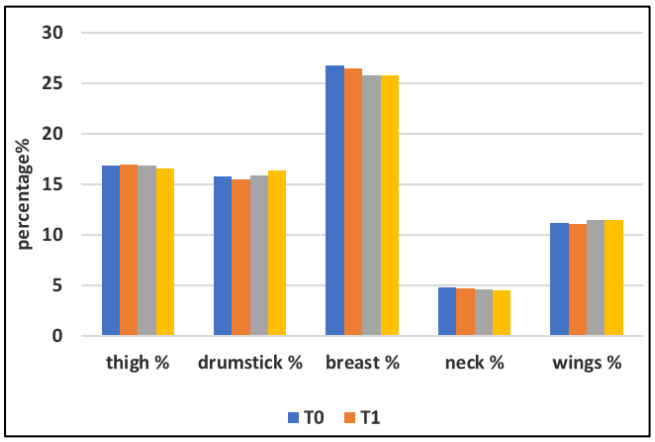

Fig 2: Effect of *Aloe vera* powder on cut up parts (% dressed weight)

Conclusion

Carcass characteristics of Satpuda poultry like dressing %, weight of heart, liver and gizzard, as well as cut up parts percentage, there were statistically non-significant differences among all treatment groups T_0, T_1, T_2 and T_3.

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