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Effect of feeding of powdered coriander seeds (*Coriandrum sativum*) on the meat characteristics of broiler chicken

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Abstract
In the poultry farm of the Animal Husbandry and Dairy Science section of the College of Agriculture, Dhule (Maharashtra), the current study, titled "Effect of feeding Powdered Coriander Seeds (*Coriandrum sativum*) (PCS) on growth performance and meat characteristics of broiler chicken," was carried out from June to August 2023. For forty-five days, 120 broiler chicks were raised in a deep litter system. With four treatment blocks and five replications, thirty chicks per group were randomly assigned to one of four groups. While PCS was added to the experimental meals at doses of 0.5%, 1.0%, and 1.5% for treatments T_1, T_2, and T_3, respectively, the control group (T_0) received any dietary treatment. The outcomes demonstrated that there was a statistically non-significant variation in the proximate composition of thigh meat between the various treatments and the carcass features. Data showed that there were statistically non-significant (p>0.05) differences between the treatments in terms of dressing percentage, percentage of cut-up sections such as breast, giblet, drumstick and thigh, as well as proportion of edible and non-edible components. At 45 days of age, the proximate composition of breast meat revealed non-significant (p>0.05) differences between the treatments for moisture, dry matter, ash, crude protein, crude fat and nitrogen-free extract.

Keywords: Broiler, coriander, PCS, growth performance, meat characteristics

Introduction
One of the most prosperous and quickly expanding industries that offers premium protein at a reasonable cost is poultry. India has one of the biggest and fastest-growing poultry businesses in the world, with 851.81 million birds and an estimated 130 billion eggs produced annually. From 729.21 million to 851.81 million, the total number of chickens in India has grown by about 16.81% (20th Livestock Census, 2019, GOI). Poultry produces 4.06 million tonnes (MT) of meat annually, or about half of all meat produced in the country (BAHS, 2021) [6].

One of the world's most significant developing nations is India. India, a country of 1.30 billion people, places a strong emphasis on "Development," which includes improved living circumstances, wholesome food, and improved health for everybody. People can now afford higher-quality nourishment in the form of chicken meat and eggs thanks to economic growth, and in only 40 years, the poultry business has grown from a modest backyard endeavour to a major commercial enterprise. Poultry is the most prolific animal when it comes to other animals. Protein, vitamins, and minerals like zinc, iron, selenium, and B vitamins are all present in sufficient amounts. It has been determined that chicken flesh is a nutrient-dense meat. India ranks sixth globally in terms of meat output, with the fastest-growing section of the meat business being broiler meat.

This worry has led to ongoing investigation of a variety of feed additives as possible feed antibiotic substitutes in recent years. It has been demonstrated that aromatic herbs enhance feed intake and endogenous digestive enzyme release. It has been demonstrated that adding herbs to a chicken's feed can enhance its health and performance due to the antibacterial properties of their phytochemical components. Over the past few years, phytobiotics have drawn more attention from the broiler production industry as natural feed additives that support growth. Due to their numerous therapeutic advantages and lack of lingering side effects, they are the best substitutes for antibiotic growth promoters (Chaudhary *et al.*, 2018, 2019) [10].

One plant in the parsley family, coriander (*Coriandrum sativum* L.), is native to the Mediterranean region and is grown throughout most of the world.

The relevance of coriander has expanded due to its potential antimicrobial and digestive system-stimulating qualities. *Coriandrum sativum*, also known as Dhania, has long been used for its anti-diabetic, anti-helminthic, analgesic, sedative, anti-parasitic, and antiseptic properties (Samojlik *et al.*, 2010) [16]. It also possesses biological qualities such as antimicrobial activity, hypocholesterolemia, and antioxidants. CSM enhances hens' digestive processes by increasing the production of digestive enzymes and improving the use of digested leftovers. Furthermore, it enhanced liver function (Hernandez *et al.*, 2004) [11].

Materials and Methods

The above study was carried out in the poultry farm of the College of Agriculture, Dhule (MH) India. At the Division of Animal Husbandry and Dairy Science from June 23 to August 6, 2023. For this investigation, 120 day-old broiler chicks (Vencobb-400) were acquired from *Nidhi Poultry Medicare, Dhule*. Each of the thirty experimental chicks in each of the four treatment groups (Table 1) was randomly assigned based on weight after each chick had been individually weighed.

Using the AOAC (1990) [4] and AOAC (2005) [5] standard procedure, proximate analysis of PCS and proximate analysis of meat were conducted over the study period. At the conclusion of their sixth week of life, the birds were slaughtered.

Table 1: Details of Dietary Treatments and Feedings

Treatment	Treatment details
T_0	Basal diet without Coriander seed powder
T_1	Basal diet + Coriander seed powder @ 0.5% each
T_2	Basal diet + Coriander seed Powder @ 1% each
T_3	Basal diet + Coriander seed Powder @ 1.5% each

Carcass Characteristics

Carcass traits were evaluated after slaughtering, dressing and evisceration of birds. Five birds from each treatment were slaughtered at the end of the experiment to study carcass characteristics. Live weight was recorded prior to the slaughter of birds.

Dressing Percentage

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

Weight of Liver and Other Organs & Live Weight

Different cut-up parts of the carcass were weighed, including the breast, thigh, drumstick, heart, gizzard and liver. Birds were weighed before slaughtering using an electronic balance.

Dressed weight

$$\text{Dressed weight (g)} = \frac{\text{Weight of dressed bird (g)}}{\text{Live weight of the bird (g)}}$$

Eviscerated Weight

$$\text{Eviscerated weight (g)} = \frac{\text{Eviscerated weight (g)}}{\text{Live weight of bird (g)}}$$

Edible Weight

$$\text{Edible weight (g)} = \frac{\text{Edible weight (g)}}{\text{Live weight of bird (g)}}$$

Giblet Weight

$$\text{Giblet weight (g)} = \frac{\text{Giblet weight (g)}}{\text{Live weight of bird (g)}}$$

Statistical Analysis

The data collected throughout the trial were statistically analyzed by Completely Randomized Design (CRD) given by Snedecor and Cochran (1994) [18].

Results and Discussion

Proximate Composition of Breast Meat

The impact of adding PCS to the diet on the meat composition of breast muscle is depicted in table no 2. All treatment groups (T_0, T_1, T_2, and T_3) showed statistically non-significant (p>0.05) differences in the proximate composition of breast meat. This suggests that while the addition of varying amounts of PCS to the diet increased feed conversion efficiency, meat quality remained the same. The findings of this investigation were in line with those of Singh *et al.*, (2012) [17], who found that the addition of PCS did not significantly alter the proximate composition of the breast muscle in broiler meat across treatment groups or the control group. The findings of Chandel *et al.*, (2021) [8], who observed a non-significant (p>0.05) influence on the proximate composition of breast meat supplementing PCS in broiler chicks, were consistent with the results.

Proximate Composition of Thigh Meat

It is presented in table no 3, the impact of adding PCS to the diet on the amount of meat in the thigh muscle. According to statistical analysis, there was no difference (p>0.05) in the proximate composition of thigh meat across treatment groups T_0, T_1, T_2, and T_3 in terms of moisture, dry matter, ash, crude protein, fat content, and NFE. The findings of this investigation were in line with those of Singh *et al.*, (2012) [17], who found that the addition of PCS did not significantly alter the proximate composition of the breast muscle in broiler meat across treatment groups or the control group. The findings of Chandel *et al.*, (2021) [8], who observed a non-significant influence on the proximate composition of thigh meat supplementing coriander seed powder in broiler chicks, were consistent with the results.

Carcass Traits

Data on carcass traits (%) due to different dietary treatments of coriander seed powder during the experimental period are represented in Table 4. The carcass characteristics data indicated a statistically non-significant (p>0.05) difference in carcass traits (%) among the different treatment groups. The breast yield was highest in the treatment T_3 group. Giblet (%) was observed higher in treatment T_3. Although, slight variation was observed in drumstick and thigh percent of carcass weights of different treatment groups. However, the difference among all the treatments was non-significant (p>0.05). The results were in line with the reports of Rashid *et al.*, (2014) [14], Sahoo *et al.*, (2008) [15], Aissaoui *et al.*, (2011) [2] reported a non-significant (p>0.05) difference in carcass trait due to feed supplementation with PCS at varying concentrations. The present results were in accordance with the reports of Abou-Elkhair *et al.*, (2014) [1], Naeemasa *et al.*, (2008) [13] reported a non-significant (p>0.05) difference in any carcass characteristics due to herbal plants fed at different levels.

Table 2: Proximate composition of breast meat in different treatments by feeding coriander seed powder

Parameter	Treatments				SE (±)	CD @ 5%
	T_0	T_1	T_2	T_3		
Moisture	71.44	71.39	71.63	71.51	3.09	NS
DM	24.15	24.45	24.76	24.96	1.06	NS
Ash	1.22	1.25	1.27	1.30	0.054	NS
Crude Protein	17.59	18.41	18.68	19.03	20.80	NS
Crude Fat	3.15	3.29	3.56	3.37	0.14	NS
NFE	75.20	75.94	75.72	76.0	3.28	NS

SE: Standard Error; CD: Critical Difference.

Table 3: Proximate composition of thigh meat in different treatments by feeding coriander seed powder

Parameter	Treatments				SE (±)	CD @ 5%
	T_0	T_1	T_2	T_3		
Moisture	68.79	68.75	68.82	68.92	2.98	NS
DM	31.27	31.67	31.45	31.53	1.36	NS
Ash	1.28	1.32	1.21	1.15	0.053	NS
Crude Protein	19.22	19.56	19.82	20.45	0.19	NS
Crude Fat	2.18	2.89	3.14	2.92	0.12	NS
NFE	77.39	75.19	76.82	76.52	3.30	NS

SE: Standard Error; CD: Critical Difference.

Table 4: Effect of feeding different levels of coriander seed powder on carcass traits of broilers

Carcass Traits (%)	Treatments				SE (±)	CD @ 5%
	T_0	T_1	T_2	T_3		
Live body weight	2128.21	2132.85	2145.37	2185.58	93.38	NS
Breast (%)	28.25	28.36	28.52	29.93	1.25	NS
Giblet (%)	4.69	4.76	4.82	4.85	0.20	NS
Drumstick (%)	19.76	19.81	19.89	19.99	0.86	NS
Thigh (%)	17.04	17.24	17.55	17.80	0.75	NS
Edible (%)	64.32	64.68	64.92	65.78	2.82	NS
Non-Edible (%)	35.68	35.32	35.08	34.22	1.51	NS
Dressed Weight	1586.34	1611.52	1620.36	1665.16	70.69	NS
Dressing (%)	74.53	75.55	75.52	76.18	3.28	NS

SE: Standard Error; CD: Critical Difference.

Conclusion

It is concluded that the effect of feeding PCS in the diet at different levels on the proximate composition of thigh meat was found to be statistically non-significant. Also, the carcass characteristics and the proximate composition of breast meat containing moisture, dry matter, ash, crude protein, crude fat and nitrogen-free extract had a non-significant effect in different treatments.

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