Journal of Animal Research: v.15 n.03, p. 107-112. June 2025

DOI: 10.30954/2277-940X.03.2025.5

Effect of Supplementation of Dried Poultry Excreta and Probiotics on the Carcass Characteristics of Broilers

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Received: 20 April, 2025 **Revised:** 16 May, 2025 **Accepted:** 22 May, 2025

ABSTRACT

The objective of this study was to evaluate the influence of dried poultry excreta (DPE) and probiotic on carcass characteristics of commercial broiler chicks. The experiment consisted of the replicates for probiotic and dried poultry excreta groups. The results of the present study were expressed on per cent shrinkage, per cent dressing, percent giblet and on total meat yield. The proximate principles of the meat revealed that there was no effect of the treatments on moisture, fat and ash content. The Coliforms counts and standard plate counts were reduced in probiotics fed groups. The lactobacillus counts were recorded higher in probiotic fed groups than the control. The inclusion of DPE and Probiotics showed highly significant effect on breast Angle at 6th week of age. As well as a highly significant effect on the shank length measurement. Analysis of variance revealed highly significant differences due to DPE on total meat yield per cent. The highest total meat yield was recorded for 5 per cent DPE level of diet followed by 10 per cent DPE level. The higher dressing per cent showed at 5 per cent DPE and 10 per cent DPE level, effect of DPE was found to be highly significant. The Inclusion of Probiotics and DPE in diet was found to have significant effect on keel bone length at 6th weeks of age, The probiotic was found to have significant effect only on per cent wing yield. Numerically higher values were recorded for back with neck per cent yield due to probiotics.

HIGHLIGHTS

- Used 5% and 10% dried poultry excreta (DPE) to study carcass characteristics.
- Probiotics and DPE in diet was found to have significant effect on keel bone length.

Keywords: Probiotic, Cut-Up Parts, Dried Poultry Excreta, Fat, Ash

Probiotics have been introduced as an alternative to antibiotics. The use of antibiotics as routine feed additives has been banned in some countries because of public concern over possible antibiotic residual effects and the development of drug-resistant bacteria. The commercial use of probiotics in poultry industry is relatively new. Probiotic represents a single or mixed culture of live microorganisms which when applied to animals, affects the host beneficially by improving the properties of indigenous microflora. Probiotics come under the category of as generally recognized as safe (GRAS) ingredients classified by Food and Drug Administration (FDA). They have no side and residual effects. Probiotics regulate the microbial environment in the gut, reduce digestive upsets and prevent pathogenic gut bacteria, thereby improve live weight gain, improve feed conversion ratio, reduce mortality, increase feed conversion ratio in layers and increase egg production. Probiotics commercially available contain strains of genera lactobacillus (mainly), *Bifidobacterium, streptococcus, Bacillus, Bacteroides, Pediococcus, Leuconostoc, Propionibacterium, Saccharomyces cerevisiae* and *Aspergillus oryzae*.

Broiler production increased from 14 million in 1971 to about 2000 million in 2005 and total poultry meat

How to cite this article: Bansal, G.R. (2025). Effect of Supplementation of Dried Poultry Excreta and Probiotics on the Carcass Characteristics of Broilers. *J. Anim. Res.,* **15**(03): 107-112.

Source of Support: None; **Conflict of Interest:** None

production increased from 70,000 MT in 1971 to 1900,000 MT in 2005 from 2000 million birds (FAO, 2006). The per capita availability of eggs per year has increased from seven in 1961 to 44 in 2004-05, and poultry meat from 160 g to about 1900 g during the same period. Due to the increase in human population, the production of eggs and poultry meat did not result in similar increases in per caput consumption.

The production level of grains is not increasing proportionally to meet the demand. Hence, the sparing capacity will influence the future growth of the poultry industry which necessitates for the search for alternative feed resources such as crop and industry byproducts, organic waste, aquatic waste, marine waste etc. This huge amount of waste may be recycled to provide nutrients for the growing of crops and keeping environments pollution free. Moreover, these wastes are managed and processed appropriately in relation to the economic viable potency of poultry operation which may be enhanced.

MATERIALS AND METHODS

The experiment was conducted to study the influence of Probiotics and Dried Poultry Excreta (DPE) on the Carcass Characteristics performance of day old four hundred and eighty commercial broiler chicks. The chicks were reared in electric battery brooders under same environmental conditions.

The composition of experimental ration having 0, 5 and 10 per cent Dried Poultry Excreta is given in Table 1.

Table 1: Composition of experimental ration

Ingredients	D0 (0% DPE)	D1 (5% DPE)	D2 (10% DPE)
Maize	56	56	56
DORP	05	02	—
Soya-Cake	15	14	08
GNC	11	12	13
Jawala Fish	10	08	10
Min. Mix.	2.5	2.5	2.5
Vit. Mix.	0.5	0.5	0.5
DPE	—	5	10
Total	100	100	100

The probiotic named "Bioboost – YC" each gram provides Live Yeast Culture (Strain SC-47), will be used as culture containing 20 million CFU kg^{-1}.

Observations

Data pertaining to performance traits such as growth, feed efficiency, and body weights were recorded by weighing individual chicks at weekly interval up to 6^{th} weeks of age. Chicks were fed experimental ration *ad-libitum*. Conformation traits like breast angle, shank length and keel length were measured of all the birds at 4^{th} and 6^{th} week's age. Four broilers of either sex from each replication were picked up randomly and slaughtered at 6^{th} weeks of age to study the carcass characteristics.

Traits measured

The following traits were measured for comparative evaluation and interaction effects of all treatments –

Conformation traits: at 4^{th} and 6^{th} week of age:

1. Breast Angle (^{o})
2. Keel length (cm)
3. Shank length (cm)

Carcass characteristics: 6^{th} week of age:

1. Dressed weight (in per cent)
2. Giblet weight (in per cent)
3. Abdominal fat weight (in per cent)
4. Cut-up parts weight (in per cent)

Carcass characteristics

Four birds selected at random from each group were sacrificed for carcass evaluation at the end of experiment (6 weeks). The birds were kept off fed for overnight prior to slaughter but were allowed to take fresh drinking water *adlibitum* during that period.

Dressed weight

First of all, the live weights of birds were recorded. The birds were slaughtered by 'Modified Kosher' method, i.e., allowing them to bleed completely. The feathers were removed completely with hand picking, leaving the skin intact. The shanks were removed from hock joints and dressed weight recorded. The per cent dressed weight was calculated on the basis of live weight. Dressed wt. =

Live wt. – (blood wt. + skin wt. + Feather wt. + giblets + visceral content)

Eviscerated weight

Evisceration was done by removing crop, gullet, trachea and preens glands. A horizontal cut was made at the rear of the keel bone thereby the breast was a little upturned and pushed forward, exposing the viscera along with the visceral organ which were then removed completely by pulling. The eviscerated weight was recorded as the weight of carcass together with giblets.

Eviscerated weight =

$$\frac{\text{Live wt. - (blood wt. + feather wt. + head + shank)}}{\text{Live weight}} \times 100$$

Giblet weight

The heart, liver and gizzard were weighed jointly. The giblet was expressed as a percentage of live weight.

$$\text{Abdominal fat weight (\%)} = \frac{\text{Abdominal fat weight}}{\text{Starved weight}} \times 100$$

Cut-up parts weight (%) =

$$\frac{\text{Weight of individual cut-up parts}}{\text{Dressed weight}} \times 100$$

Mortality

Daily observations were made to record the occurrence of deaths in different experimental treatments.

Cost of broiler production

The cost of rising 6 weeks broilers under different treatments include the cost of day-old chick, feed, probiotic and cost of labor. The cost of other inputs was not included in this study.

Statistical analysis

The data collected under study were analyzed as 3x2x2 factorial completely randomized design according to Steel and Torrie (1980).

RESULTS AND DISCUSSION

Conformation Traits

The overall means along with its standard error for conformation traits (shank length, keel bone length & breast angle) measured at 4th and 6th week age are scheduled in Table 2 and 3.

Breast Angle

The inclusion of DPE (0-10 per cent) and Probiotics showed highly significant effect on breast at 6th week of age. The widest breast angle with 5 per cent DPE level at 4th week of age, whereas; with 10 per cent DPE level at 6th week of age.

SHANK LENGTH

The Inclusion of Probiotics and DPE in diet was found to have a highly significant effect on the shank length measurement. Trend for effect of DPE was observed at 4th weeks of age. Although at 6th week of age statistically

Table 2: Means for confirmation traits due to the DPE effect at IV and VI weeks

FACTORS	Shank Length		Keel Length(cm)		Breast Angle (‘)	
	IV week	VI week	IV week	VI week	IV week	VI week
DPE D0	5.66^{a}	7.44	6.41	7.71 ^{a}	58.04 ^{a}	66.09 ^{b}
D1	5.91^{b}	7.58	6.51	7.95 ^{b}	61.03 ^{b}	65.32 ^{b}
D2	5.76^{ab}	7.63	6.36	8.03 ^{b}	60.74 ^{b}	64.41 ^{a}
SE Range	0.03-0.08	0.04-0.07	0.05-0.09	0.05-0.07	0.4-0.9	0.35-0.39

*Means having similar super-scripts do not differ significantly.

Table 3: Means for confirmation traits due to the probiotics effect at IVth and VIth weeks

	Shank length(cm)		Keel Length(cm)		Breast Angle (‘)	
FACTORS	**IV week**	**VI week**	**IV week**	**VI week**	**IV week**	**VI week**
Prob. P0	5.69 [a]	7.28 [a]	6.45	7.48 [a]	58.23 [a]	63.57 [a]
P1	5.85 [b]	7.82 [b]	6.41	8.31 [b]	61.63 [b]	66.97 [b]
SE Range	0.02-0.04	0.04-0.07	0.04-0.08	0.04-0.06	0.3-0.7	0.27-0.32

*Means having similar super-scripts do not differ significantly.

nonsignificant but increased shank length measurement with increased DPE level and probiotic in diet was measured.

Keel bone Length

The Inclusion of Probiotics and DPE in diet was found to have significant effect on keel bone length at 6th weeks of age, but the keel bone length was increased when DPE and Probiotics increased in diet. The tendency remains same at 6th week of age for keel bone length measurement.

Some of the carcass parameters studied here (weight after de-feathering, feather weight, eviscerated weight, weight of giblets, weight of shank and dressing percentage) are in line with (Sayed *et al.,* 2000; Banday and Risam, 2001). There are others who have concluded based on their studies that supplementation of probiotics in broilers diet does not affect the carcass characteristics Ahmed *et al.* (2017).

Carcass Characteristics

Four broilers from each replication were picked up randomly for slaughter to study the carcass characteristics. The data were analyzed for each characteristic to study DPE and Probiotic effect. Hossain *et al.* (2012) Indicated that it had a positive effect on carcass composition. (Karaoglu and Durdag, 2005; Paryad and Mahmoudi, 2008; Fallah *et al.*, 2013) concluded that supplementation of probiotics improve carcass characteristics of broiler chicks. On a per cent weight basis of different carcass traits at 6th week of age due to DPE and Probiotics effects were tabulated in Table 4&5.

Starved Live Weight

The highly significant effect was exerted due to DPE on starved weight at slaughter age (6th weeks). The starved weight recorded significantly lower at 0 per cent DPE than the 5 per cent and 10 per cent DPE level. The P0 and P recorded overnight fasting weight probiotic dietary groups, and these groups differ highly significantly whether analysis was performed for starved weight.

Percent Shrinkage

The inclusion of Probiotic showed a highly significant effect on shrinkage percentage. The shrinkage percent after overnight fasting to that of live weight, was estimated, which ranged from 3.1 to 3.2 per cent due to inclusion of DPE levels. As indicated in Table 6, the less shrinkage per cent was observed for the diet including the higher DPE level.

Percent Blood Loss and Percent Feather Loss

Inclusion of probiotics in the diet causes higher blood & feather per cent loss. Averaged over all other effects percent blood loss was lower at 5 per cent DPE level whereas per cent loss of feather was less at 10 per cent DPE level.

Dressing Percentage

The higher dressing per cent showed at 5 per cent DPE and 10 per cent DPE level of diet. The effect of DPE was found to be highly significant. The mean values for per cent eviscerated yield ranged from 63 to 65 per cent between three DPE levels.

Percent Giblet Weight

The giblet weight percentage was found higher at 0 per cent DPE level.

Table 4: Means for carcass characteristics due to the DPE effects (6th week)

FACTORS	Starved	Shrinkage	Bleeding	Feather	Dressing	Liver	Heart	Gizzard	Giblets	Abd Fat	TMY.
	Live wt.	%	%	%	%	%	%	%	%	%	%
DPE D0	1121.65	3.33	4.32	4.87	63.27	1.78	0.51	1.69	4.02	0.76	67.95
D1	1137.13	3.23	4.03	4.81	64.40	1.80	0.50	1.68	4.00	0.65	69.16
D2	1155.00	3.19	4.46	4.58	63.76	1.78	0.53	1.63	4.01	0.62	68.42
SE Range	0.00	0.06-0.09	0.16-0.19	0.19-0.21	1.17-1.29	0.05-0.09	0.05-0.07	0.08-0.13	0.07-0.24	0.04-0.08	0.21-1.23

*Means having similar super-scripts do not differ significantly.

Table 5: Means for carcass characteristics due to the probiotic's effects (6th week)

FACTORS	Starved	Shrinkage	Bleeding	Feather	Dressing	Liver	Heart	Gizzard	Giblets	Abd. Fat
	Live wt.	%	%	%	%	%	%	%	%	%
Prob. P0	1063.56^{a}	3.49^{b}	4.27	4.96	64.57^{b}	1.86^{b}	0.53	1.80^{b}	4.20^{b}	0.65
P1	1212.29^{b}	3.01^{a}	4.27	4.76	63.05^{a}	1.72^{a}	0.50	1.54^{a}	3.83^{a}	0.70
SE Range	4.78-5.12	0.05-0.08	0.13-0.17	0.15-0.17	0.95-1.12	0.06-0.1	0.04-0.06	0.05-0.09	0.06-0.16	0.03-0.07

*Means having similar super-scripts do not differ significantly.

Percent Abdominal Fat

The inclusion of DPE showed a highly significant effect on per cent of abdominal fat. The per cent abdominal fat was significantly lower at 10 per cent DPE than 5 and 0 per cent dietary DPE level.

Percent Total Meat Yield

Analysis of variance revealed highly significant differences due to DPE on total meat yield per cent. Highest per cent total meat yield was recorded for 5 per cent DPE level of diet followed by 10 per cent DPE level. The per cent edible meat yield observed in the present experiment for 5 per cent and 10 per cent DPE 1evel was also more or 1ess similar as per the findings of Endo *et al.* (1999).

Means of cut-up parts at 6th week of age due to DPE and Probiotics effects were tabulated in Table 6&7.

Percent Cut-Up Parts Yield

The findings are in close agreement with Brozoska *et al.* (1999a,b). The probiotic was found to have significant effect only on per cent wing yield. Numerically higher values were recorded for back with neck per cent yield due to probiotics. The inclusion of probiotic showed the significant effect. The results of the present study are on per cent shrinkage, per cent dressing, per cent giblet and on total per cent meat yield. A higher per cent yield was estimated for most of the carcass components in the control group than the diet supplemented with probiotics.

Table 6: Means of cut-up parts due to the DPE effects

FACTORS	Leg%	Wings %	Back & Neck %	Breast %
DPE D0	32.27	16.94	24.42	26.4
D1	31.67	16.94	24.75	26.6
D2	32.04	16.92	24.69	26.34
SE Range	0.21-0.28	0.12-0.21	0.17-0.38	0.15-0.31

*Means having similar super-scripts do not differ significantly.

Table 7: Means of cut-up parts due to the probiotic's effects

FACTORS	Leg %	Wings %	Back & Neck %	Breast %
Prob. P0	31.85	16.97	24.64	26.47
P1	32.14	16.9	24.6	26.43
SE Range	0.22-0.34	0.11-0.19	0.15-0.30	0.15-0.27

*Means having similar super-scripts do not differ significantly.

The cut-up parts yield (leg, breast, back with neck & wings) more or less similar in control and probiotic supplemented dietary group and the percentage was lower in probiotic supplemented diet than the control group.

The reports almost similar dressing percent into sexes and the yield of different carcass components did not differ significantly in control and probiotic treated groups. (Endo *et al.* 1999 ; Biswal *et al*., 2000; Sayed *et al.,* 2000; Talukder *et al.*, 2001; Pietras *et al.,* 2001; Hossain *et al.,* 2012 ; Ahmed *et al.,* 2017).

CONCLUSION

The Coliforms counts and standard plate counts were reduced in Probiotic fed groups. The lactobacillus counts were recorded higher in probiotic fed groups than the control.

ACKNOWLEDGMENTS

The author thankful to the University for carrying out this research work as well as mentors for their Valuable support.

REFERENCES

Ahmed M.E., Abdelrahim A.M., Abdelbasit B.H., Egbal S.A., Abubaker A.A., Mohammed F.M., Ghada A.I. and Haytham H.A. 2017. Effect of different Levels of Probiotic, Biogen, on Performance and Carcass Characteristics of Broiler Chickens. *Int. J. Rec. Tr. Eng. Res.,* **7**(3): 82-90.

Banday, M.T. and Risam, K.S. 2001. Growth performance and carcass characteristics of broiler chicken fed with probiotics. *Indian J. Poult. Sci.,* **36**: 252-255.

Biswal, A.K., Mishra, S.C., Dehuri, P.K. and Mishra, P.K. 2000. Study on the combined effect of probiotics and antibiotics on the performance of synthetic broilers. In *proceedings XX Annual conference and symposium of Indian Poultry Science Association Congress*, pp. 89.

Brozoska, F., Grzybowki, R., Stecka, K. and Pieszka, M. 1999a. Effect of probiotic microorganisms vs. antibiotics on chicken broiler body weight, carcass yield and carcass quality. *Roczniki- Naukowe- Zootechniki.,* **26**: 303-315.

Brozoska, F., Grzybowki, R., Stecka, K. and Pieszka, M. 1999b. Nutritive efficiency of selected probiotic microorganisms in chicken broilers. *Roczniki-Naukowe- Zootechniki*, **26**: 291-301.

Endo, T. and Nakano, M. 1999. Influence of a probiotic on productivity, meat components, lipid metabolism, catcall flora and metabolites, and raising environment in broiler production. *J Anim. Sci.,* **70**: 207-218.

Fallah, R., Saghafi, M., Rezaei, H and Parvar, R. 2013. Effect of Bioplus 2B® and Protoxin Probiotics Supplementation on Growth Performance, Small Intestinal Morphology and Carcass Characteristics of Broiler Chickens. *Br. Poult. Sci.,* **2**(2): 11-15.

Hossain, Md. E., Kim, G.M., Lee, K.S. and Yang, J.C. 2012. Growth performance, meat yield, oxidative stability, and fatty acid composition of meat from broilers fed diets supplemented with a medicinal plant and probiotics. *Asian-Austral. J Anim. Sci.,* **25**(8): 1159–1168.

Karaoglu, M. and Durdag, H. 2005. The influence of dietary probiotic (*Saccharomyces cerevisiae*) supplementation and different slaughter age on the performance, slaughter and carcass properties of broilers. *Int. J. Poult. Sci*., **4**(5): 309-316.

Paryad, A. and Mahmoudi, M. 2008. Effect of different levels of supplemental yeast (*Saccharomyces cerevisiae*) on performance, blood constituents and carcass characteristics of broiler chicks. *African J. Agric. Res*., **3**(12): 835-842.

Pietras, M. 2001. The effect of probiotics on selected blood and meat parameters of broiler chickens. *J. Anim. Feed Sci.,* **10**: 297-302.

Sayed, A.H., Ranade, A.S., Desan, D.N. and Patil, M.B. 2000. Effect of live yeast culture on the performance of broilers. *In proceedings XX Annual conference and symposium of Indian Poultry Science Association Congress*, pp. 90.

Steel, R.G.D. and Torrie, J.H. 1980. Principles and procedures of statistics: A biometrical approach. 2nd edn. New York, USA McGraw-Hill Book Co. New York.

Talukder, J.K., Sundararasu, V., Prabakaran, R., Narahari, D. and Mahanta, J.D. 2001. Effect of probiotics on serum cholesterol of broiler chicken. *In proceeding of South Asian regional poultry conference and exhibition held from 24-26 September at Pune, India.*