



Effects of Different Levels of Proease Enzymes on Growth Performance, Nutrient Utilization and Biochemical Status of Poultry

Abstract A study was conducted at **Livestock Scientific Development Association**, in Cobb broiler birds to assess the effect of varying levels of proease enzymes on growth, nutrient digestibility and health parameters of broiler chickens. This trial for a period of 45 days was designed to study following parameters:

1. Production performance
2. Nutrient utilization
3. Biochemical study

Animal and Experimental Design

A trial was conducted in experimental house of LSDA having HVAC facility for a period of 45 days. The experimental design was arranged in a manner of 4 X 5 (4 treatments; 5 replicate/treatment) where 400 birds were randomly & equally divided in each group, 100 birds/treatment. The treatments were: T1 – control fed with maize-soya meal basal diet, Group A fed with basal diet devoid of Proease activity (negative control), Group B & Group C fed with basal diet, supplemented with PROEASE - Cysteine Protease enzyme of DSAND Animal Nutrition @50gms/ton and 75gms/ton respectively.

Control – Maize soya meal basal diet

Group-A – Basal diet devoid of Proease activity

Group-B – Basal diet with Proease @50 gms/ton

Group C – Basal diet with Proease @75 gms/ton

The production performance was evaluated in broilers in terms of average feed intake, body weight gain, average daily gain and FCR. The percent nutrient digestibility of crude protein (CP) was also studied to evaluate effect of supplements in broiler. The health status of birds was evaluated by analyzing serum SGPT level.



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lsdaofindia@gmail.com



Vill. Asrawad Bujurg, Nemawar
Road, Indore. Madhya Pradesh,
India - 452016



Table 1: Feed formulation of Experimental Diet

	CONTROL			GROUP-A			GROUP-B			GROUP-C		
Ingredients	Prestarter	Starter	Finisher	Prestarter	Starter	Finisher	Prestarter	Starter	Finisher	Prestarter	Starter	Finisher
Maize	574.34	588.04	601.39	607.00	620.71	634.05	607.00	620.71	634.05	623.34	637.04	650.39
Soybean meal 48%	365.43	333.11	299.42	340.94	308.62	274.93	340.94	308.62	274.93	328.70	296.37	262.69
DORB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	23.75	43.26	62.61	14.98	34.49	53.83	14.98	34.49	53.83	10.60	30.10	49.45
Calcite /LSP DCP	5.71	5.64	5.57	5.72	5.66	5.58	5.72	5.66	5.58	5.73	5.66	5.59
	15.55	16.04	16.56	15.80	16.30	16.82	15.80	16.30	16.82	15.93	16.42	16.94
Methionine	2.96	2.44	2.45	2.86	2.35	2.36	2.86	2.35	2.36	2.82	2.31	2.31
Lysine	2.63	1.88	1.57	2.94	2.19	1.88	2.94	2.19	1.88	3.09	2.35	2.04
Vitamin premix DSM	0.66	0.60	0.60	0.66	0.60	0.60	0.66	0.60	0.60	0.66	0.60	0.66
Protease	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.075	0.075	0.075

Table 2: Nutrient Specification of Experimental Diet

	CONTROL			GROUP-A			GROUP-B			GROUP-C		
Ingredients	Prestarter	Starter	Finisher	Prestarter	Starter	Finisher	Prestarter	Starter	Finisher	Prestarter	Starter	Finisher
C.Protein	22.5	21	19.5	21.62	20.12	18.62	21.62	20.12	18.62	21.18	19.68	18.18
ME Mcal/Kg	3	3.129	3.2565	2.97	3.1	3.23	2.97	3.1	3.23	2.96	3.09	3.21
Calori protein ratio	133.33	149	167	134.58	154.24	173.57	134.58	154.24	173.57	139.83	157.04	177
Lysine	1.42	1.27	1.15	1.38	1.23	1.11	1.38	1.23	1.11	1.36	1.21	1.09
Methionine	0.68	0.6	0.58	0.66	0.58	0.56	0.66	0.58	0.56	0.65	0.57	0.55
MET+CYS	1.06	0.95	0.91	1.01	0.91	0.87	1.01	0.91	0.87	0.99	0.89	0.85
Dig Lys	1.27	1.13	1.02	1.23	1.09	0.98	1.23	1.09	0.98	1.21	1.27	0.96
Dig Meth	0.62	0.55	0.53	0.59	0.52	0.51	0.59	0.52	0.51	0.58	0.51	0.5



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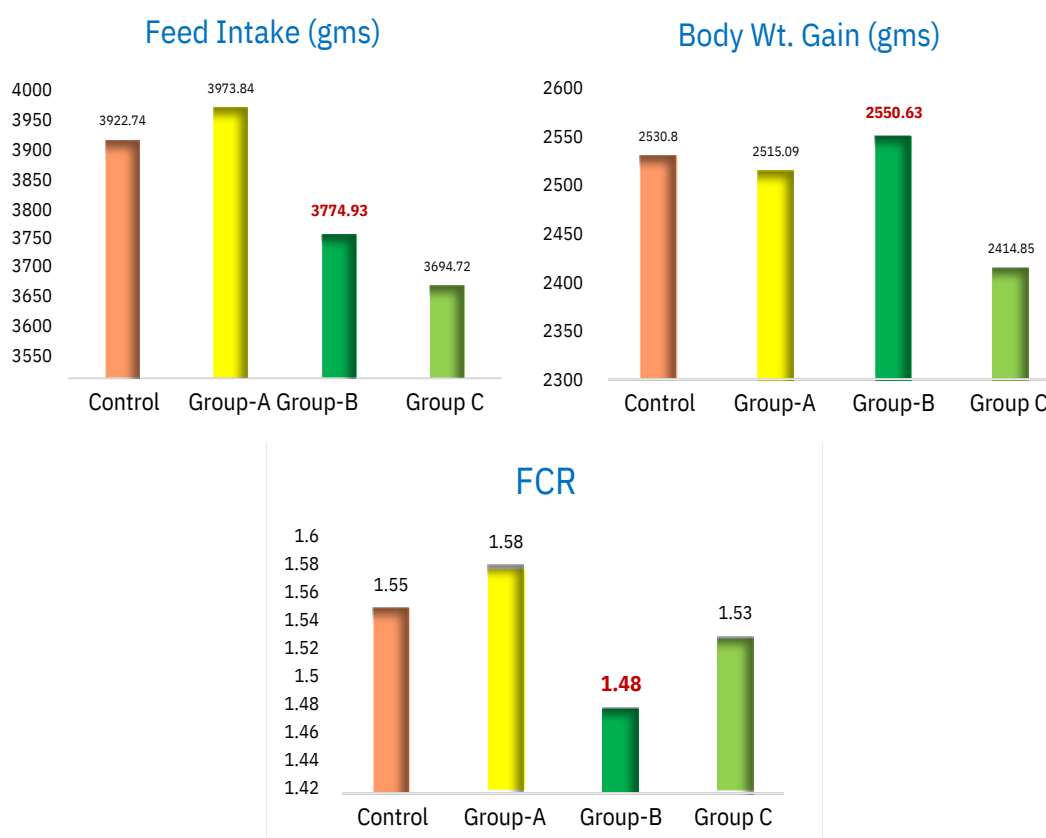
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Results Group C supplemented with Proease @ 75gm per ton of feed has recorded lowest feed intake 3694.72 gm followed by Group B with 3774.93gm, control with 3922.74 and Group A 3973.84gm. The FCR in Group-B was 1.48 which is far excellent compared to other three groups, Group-A, Group C and Control (1.58, 1.53 & 1.55, respectively).

Table 3: Effects of different dietary levels of proease on production performance of poultry birds

Experimental Group	Feed Intake (gms)	Body Wt. Gain (gms)	Avg. Daily Gain	FCR
Control	3922.74	2530.80	59.45	1.55
Group-A	3973.84	2515.09	61.79	1.58
Group-B	3774.93	2550.63	60.73	1.48
Group C	3694.72	2414.85	57.50	1.53

Control- Corn-Soya Meal Basal Diet; Group-A- Basal diet without Proease activity; Group-B – Basal Diet with Proease @ 50gm/ton; Group C – Basal Diet with Proease @ 75gm/ton



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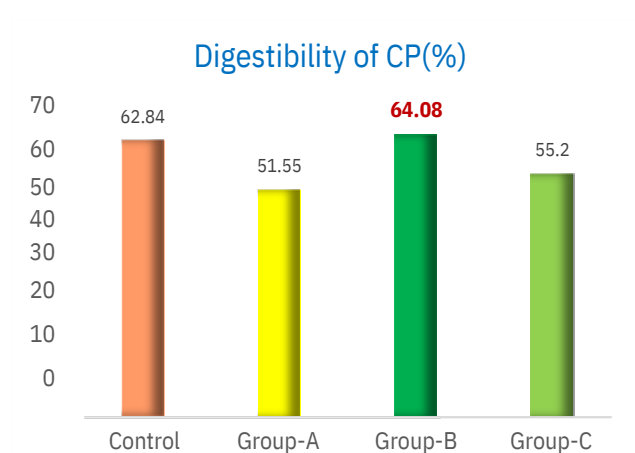
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The group B supplemented with Proease @50 gm per ton of feed showed improved percent crude protein (CP) utilization (64.08) compared to other groups viz., Control, Group A and Group C (62.84, 51.55 & 55.20, respectively).

Table 4: Effects of different dietary levels of Proease on nutrient utilization in broilers

Experimental Group	CP %
Control	62.84
Group-A	51.55
Group-B	64.08
Group-C	55.20

Control- Corn-soya Meal Basal Diet; Group-A- Basal diet without proease activity; Group-B – Basal Diet with Proease @ 50gm/ ton; Group C – Basal Diet with Proease @ 75gm/ ton



The biochemical study revealed that blood SGPT level was found to be lowered (4.50) in Group B and Group C supplemented with Proease @ 50 gm per ton and 100 gm per ton of feed respectively followed by Control (5.50) and Group A (5.25).

Table 5: Effects of different dietary levels of proease on serum biochemical profile in broilers

Experimental Group	SGPT (U/L)
Control	5.50
Group-A	5.25
Group-B	4.50
Group-C	4.50

Control- Corn-soya Meal Basal Diet; Group-A- Basal diet without Proease activity; Group-B – Basal Diet with Proease @ 50gm/ ton; Group C – Basal Diet with Proease @ 75 gm/ ton



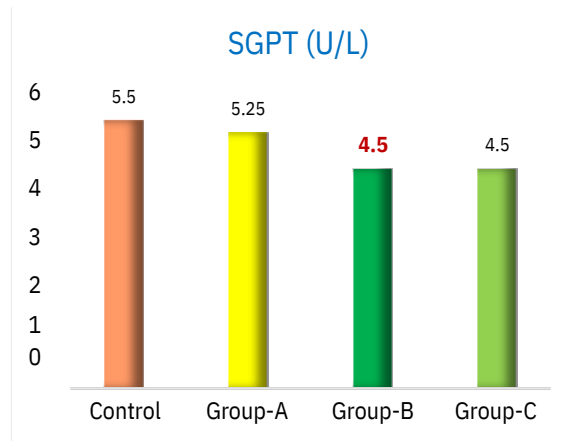
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Conclusion

1. The study reported that Group-B supplemented with Proease @50gm/ton has recorded excellent FCR.
2. The supplementation of protease enzymes showed effect on nutrient utilization as higher percent digestibility of crude protein found in Group B.
3. The Proease supplementation in birds of Group B & C reported lowered level of serum SGPT.
4. Overall study revealed that supplementation of Proease @50 gm/ton showed excellent result in broilers birds by improving CP utilization, excellent FCR, lower serum SGPT level and also helps to reduce the feed cost.



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