PRE DIET'S EFFECTIVENESS ON WHITE LEGHORN LAYERS' PERFORMANCE

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Abstract

The first experiment was carried out on 180 White Leghorn pullets that were 16 weeks old, housed in individual cages of the California type, and randomly assigned to each of the six prelay feeding strategies (kcal ME per kg /%CP /%Ca) during 16-18 weeks of age. These strategies were as follows: T0 (BIS control-2500/16.0/1.0), T1 (2700/16.0/1.0), T2 (2700/16.0/2.0), T3 (2700/16. The second experiment was carried out on 180 White Leghorn pullets that were sixteen weeks old. These pullets were housed in individual cages of the California type and were randomly assigned to each of the six-layer diet feeding strategies (kcal ME per kg /%CP /%Ca) during 19-40 weeks of age. These strategies were designated as follows: T0 (BIS control-2600/18.0/3.0), T1 (2500/18.0/3.0), T2 (2500/18.

Keywords: *Pre diet's, Effectiveness, White Leghorn Layers.*

1. Introduction

When it comes to India's agro-animal economy, the poultry sector is one of the most active and rapidly expanding sectors. Providing nutritious animal food and protein for India's expanding population is the driving force behind the country's widespread chicken farming industry. India produces 3% of the world's eggs and 4% of the world's chicken meat. Out of the overall poultry population of 851.81 million, 534.74 million are raised for meat. India produces 103.32 billion eggs and 4.06 million tonnes of chicken meat annually. Annual egg consumption is 79 eggs, while annual chicken meat consumption is 3.6 kg. The National Institute of Nutrition suggested a yearly consumption of 180 eggs and 11 kg of beef. The difference between the current and suggested per capita intake in India is therefore 101 eggs and 7.4 kg of meat. When compared to the average annual growth rate of the agricultural sector (2.5%), India's poultry industry is now expanding at a pace of 8.51% for egg production and 7.8% for chicken meat output.[1-2]

The commercial egg-laying strains of today are very different from the birds of the 1980s in terms of output and nutrient utilisation. The genetic selection for increased productivity means that today's pullets reach sexual maturity much sooner than the hen of two decades ago. The contemporary pullet has the ability to rapidly reach peak productivity. There are two stages in a hen's life when the physiological and nutritional requirements for producing eggs are different. The first stage, known as prelay, occurs just before the first egg is laid and is characterised by fast maturation of the genitalia. The prelay phase often starts two to three weeks before the first ovulation. The second time is when females are laying eggs. In the time leading up to and soon after the first egg being laid, a number of distinct shifts take place. The pullet's initial quality is a major factor in how lucrative she will be during her laying cycle. To operate well as an egg producer, hens need enough bodily reserves. Pullets that are fed and raised properly should mature into productive layer hens.[3]

1.1 Effectiveness of pre diet

There is ambiguity over the meaning of "pre diet." If, however, you mean whether or not a certain diet should be followed before beginning a weight reduction programme, the answer will vary depending on the diet in question.[4]

The Mediterranean diet is one such eating plan that has been proved to be beneficial for both weight reduction and general health. It has been suggested that persons who follow such a diet prior to beginning a weight reduction programme are better able to build good eating habits and lower their calorie consumption, both of which may aid in weight loss.

It's possible that fad diets, which often include drastic calorie restriction or the elimination of whole food categories, aren't healthy or sustainable in the long run. It's possible that beginning with one of these diets won't help you lose any weight at all, and may even be detrimental.[5]

Weight reduction is a multifaceted process that is heavily influenced by things including genetics, lifestyle, and personal choice. Some people may benefit from commencing their weight reduction programme with a period of strict dietary restriction, but this may not be required or beneficial for everyone.[6]

A balanced and nutritious diet, regular physical exercise, and other long-term lifestyle modifications are the most effective means of achieving and maintaining weight reduction. A consultation with a healthcare provider or qualified nutritionist may aid in the creation of a tailored, healthy weight reduction programme.[7]

2. Literature review

Ding, Y., Bu. & Zou, X. (2020)fed White Leghorn birds a single stage of low protein (14.0%) meals throughout the developing phase and monitored their performance during a 52 week laying period. The Haugh unit, shell deformation, feed intake, egg weight, and production of eggs were all shown to be unaffected. In a second experiment, they compared the birds' reactions to low-protein meals with and without different energy levels by creating the diets to supply either 2610 or 3164 kcal ME/kg and feeding them to the birds.[8]

Altuntas, E., &Sekeroglu, A. (2019) They concluded that the calorie intake of the pullets was unrelated to their growth. Studies comparing the effects of a prelay meal with a protein content of 15.4 vs. 18.1% provided between 134 and 181 days of age on the future performance of broiler breeder chickens found that birds fed the low-energy diet consistently ingested more protein, but the diet did not change body weight at 18 weeks. Birds provided a diet of 18.1% prelay protein produced more eggs (110 vs. 101eggs/bird) and used less feed per egg between 35 and 50 weeks of age compared to birds fed a diet of 15.4% prelay protein. Egg weight was consistent over the whole age range of 35-50 weeks. By feeding the birds a high-protein diet for only 134–181 days of age, he discovered small but significant variations in egg production. It was a really economical choice.[9]

Babatunde, G. M., &Fetuga, B. L. (2018)looked explored how protein consumption at 16 weeks of age affected laying hen productivity. They found no difference in egg weight between pullets given a grower diet with 17.0 or 20.0% CP and those fed a diet with 11.0 or 14.0 CP throughout the same time period. They reasoned that if the organism had more protein stores throughout growth, the resulting eggs would be larger.[10]

Duman, M., &Camci, O. (2017) Isa-Brown pullets were used in an experiment when they were 15 weeks old. The pullets were first given either a grower or prelay diet (consisting of a grower diet with extra Ca from 15-18 weeks of age) and then were kept on diets containing either 16.0 or 18.0% CP during lay and until 56 weeks of age. Both dietary CP levels resulted in equivalent feed intake and egg production in laying hens. Aying chickens given a feed containing 18.0% CP during lay produced heavier eggs and more eggs overall. There was also no discernible influence of the food supplied before to lay on subsequent output.[11]

Farooq, M., &Muqarrab, A. K. (2016)studied the effect of protein consumption on breeder females' skeletal and body components and subsequent egg production for up to 33 weeks of age. Baby chicks were fed a diet with either 12.0% (low), 16.0% (middle), or 20.0% (high) CP that was isocaloric (2865 kcal ME/kg). Greater early CP consumption was only observed to boost growth rate and skeletal development in the young. Protein-related stress or insufficient energy reserves may have an adverse effect on body weight, uniformity, and bone development when transitioning from a high CP beginning diet to a regular CP grower diet. They found that early supplementation with more CP had a positive effect on later egg production.[12]

3. Methodology

3.1. Location and period of study

White Leghorn layers were used as a random bred control population for this study of the effects of prelay diet nutrient density on future egg production performance during lying and the regulation of layer diet nutrient density through prelay diet. This research was carried out in the climate of central Gujarat at the Poultry Research Station of the College of Veterinary Science and Animal Husbandry at Anand Agricultural University (AAU), Anand, Gujarat.

Twenty-five (16-40) weeks were devoted to two separate trials (I and II). The first experiment ran from June 26, 2019, to December 16, 2019, while the second ran from May 24, 2020, to November 14, 2020.

3.2. Hypothesis of research work

How conventionally-fed layers could benefit from a high-density prelay diet before the start of egg production.

Table 3.1: Research using a hypothetical framework

Experiment	Prelayperiod (16^{th}-18^{th}week)	Layingperiod (19^{th}-40^{th}week)
ExperimentI	Differentprelaydiets	Singlelayerdiet
ExperimentII	Singleprelaydiet(Bestprelaydietchosen fromexperimentI)	Differentlayerdiets

3.3. Housing and management of birds

At the Poultry Research Station, AAU, Anand, 406 and 447 female chicks from a White Leghorn random-bred control population were produced for the first and second tests, respectively. There were wing bands on all the baby birds. Standard management practices were used during the 0-8 week brooding period in an open-sided deep litter housing system and the 9-15 week grower cage housing period. Both studies began at 16 weeks of age and lasted until the animals were 40 weeks old. In all studies, the Prelayphase lasted for three weeks, from weeks 16 to 18. From 16-18 weeks of age, the experimental prelay diet was provided, and from 19-40 weeks of age, the layer diet was supplied. All of the birds used in the experiments were raised with the same care and attention.

3.4. Experimental birds and design

3.4.1. Experiment I

180 White Leghorn pullets were split into six groups (T0, T1, T2, T3, T4, and T5) at 16 weeks old. There were a total of 30 pullets across all treatments, with 5 replicates of 6 used in each.

3.4.2 Experiment II

180 White Leghorn pullets were split into six groups (T0, T1, T2, T3, T4, and T5) at 16 weeks old. Thirty individual hens were used across five repetitions of each treatment.

3.5 Statistical analysis

- Analysis of Variance (ANOVA)

4. Results

The outcomes of two experiments comparing the performance of White Leghorn layers fed either the best prelay diet followed by the same layer diet (experiment-I) or the best prelay diet fed with different nutrient densities of layer diets (experiment-II) are presented..

Table 4.1 Macroclimatic averages of temperature and humidity during experiments

Period inweeks	**Experiment I (26.06.2019to16.12.2019)**					
	Temperature(^{0}C)			Relative Humidity(%)		
	Maximum	Minimum	Mean	Maximum	Minimum	Mean
16-20	34.40	26.28	30.34	87.35	64.81	76.08
21-24	30.53	24.74	27.63	92.91	78.01	85.46
25-28	31.80	25.62	28.71	94.81	78.54	86.67

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29-32	33.17	23.72	28.45	89.96	57.43	73.70
33-36	32.07	21.89	26.98	88.14	57.50	72.82
37-40	29.75	17.27	23.51	85.57	49.21	67.39
16-40	31.95	23.25	27.60	89.79	64.25	77.02
ExperimentII (24.05.2020to 14.11.2020)						
16-20	37.26	27.03	32.14	81.49	52.75	67.12
21-24	35.20	27.26	31.23	86.73	60.97	73.85
25-28	32.23	26.23	29.23	93.63	77.52	85.58
29-32	32.38	26.20	29.29	91.18	70.54	80.86
33-36	34.25	24.86	29.55	85.14	55.04	70.09
37-40	33.96	18.98	26.47	82.12	35.43	58.78
16-40	34.21	25.09	29.65	86.72	58.71	72.71

4.1. EXPERIMENT I

Table 4.2 shows the analysis of variance for the body weights (BW) measured at the end of the 16th, 20th, 28th, and 40th weeks of age. There was no statistically significant difference in BW between the T0 and T5 groups, which were fed prelay diets of varying nutritional densities at 16, 18, 20, 28, and 40 weeks of age. Consistent with the current results, Keshavarz (1984) found no significant difference in BW between 28-week-old White Leghorn pullets fed varying rearing protein levels (18.0, 15.0, and 12.0%). Increasing the prelay CP from 14.0 to 18.0% did not affect BW, as reported by Joseph et al. (2000). While pullets given 16.0% prelay CP (T0, T1, T2, and T3) had lower BW, those fed 18.0% prelay CP (T4 and T5) had greater BW. BW was found to be lowest in the control (T0) group that was fed in accordance with BIS (2007) guidelines.

Overall, there was no significant difference in body weight (BW) at the end of the 16th, 18th, 20th, 28th, or 40th week of age or in BWG during the 16th, 18th, 20th, 28th, or 40th week of age when the prelay diet included 16.0 or 18.0% CP, 2500 or 2700 kcal ME/kg, and Ca varying from 1.0-2.5%. However, a favourable labile development surge was achieved with the administration of a high nutritional density prelay meal providing 2700 kcal ME/kg, 18.0% CP, and 2.0 or 2.5% Ca.

Table 4.2 Comparison of prelay and single layer diets on layers' mean body weights (g) using ANOVA

Sourceof variation	Degreeof freedom	Meansquareof				
		BW_{16}	BW_{18}	BW_{20}	BW_{28}	BW_{40}
Between treatments	5	264.883	397.085	666.543	786.222	1566.646
Error	24	567.246	678.582	689.788	1703.309	2103.291
Total	29	-	-	-	-	-

Table 4.3 Layers' Mean Body Weights (g) After Consuming Various Prelay and Layer Diets

Treatment	BW_{16}	BW_{18}	BW_{20}	BW_{28}	BW_{40}
T0	1118.40 ± 13.30	1220.60 ± 14.76	1322.47 ± 15.23	1524.27 ± 16.80	1745.23 ± 30.44
T1	1123.37 ± 10.76	1235.50 ± 9.97	1338.53 ± 9.31	1543.83 ± 8.17	1748.67 ± 15.13
T2	1124.67 ± 7.82	1238.83 ± 10.32	1348.30 ± 13.12	1541.53 ± 16.67	1746.38 ± 15.32
T3	1124.87 ± 9.28	1235.40 ± 8.93	1343.67 ± 9.61	1551.77 ± 25.65	1783.43 ± 20.40
T4	1134.17 ± 6.55	1243.80 ± 10.89	1350.46 ± 9.31	1555.47 ± 7.93	1730.37 ± 17.21
T5	1137.80 ± 14.05	1245.63 ± 13.84	1354.87 ± 12.54	1558.90 ± 26.38	1744.90 ± 20.51
SEm	4.143	13.848	4.781	7.176	8.186
CV%	2.113	2.107	1.956	2.670	2.621
p-value	0.797	0.711	0.458	0.801	0.598

Table 4.5 displays the results of an analysis of variance (ANOVA) on the feed consumption (FC) per bird (g) at the end of the 16th, 17th, 18th, 19th, and 20th weeks of age. There was no significant difference in the daily FC per bird throughout the prelay phase (16th, 17th, and

18th weeks). Between the ages of 16 and 20, the average daily FC per bird was 91.85 0.33, 91.24 0.16, 90.80 0.53, 90.29 0.34, 90.84 0.43, and 90.81 0.26 g in Treatments T1, T2, T3, T4, and T5. There were no statistically significant changes in the mean daily FC between the groups after 16-20 weeks. There was little difference in daily FC between the 19th and 20th week's end.

In general, the FC of pullets was not affected by the amount of dietary Ca or protein if the energy level was sufficient. Energy is a crucial component for pullets since it directly affects their FC. White Leghorn layers' daily FC was not affected by the levels of CP (16.0 or 18.0%), ME (2500 or 2700 kcal/kg), or Ca (1.0 - 2.5%) fed to them throughout the prelay stage (from 16-18 weeks).

Table 4.4: Feed intake (in g) of laying hens (16-20 weeks old) on several prelay and single layer diets: an analysis of variance

Sourceofvariation	Degreeoffreedom	Meansquareof					
		FC_{16}	FC_{17}	FC_{18}	FC_{19}	FC_{20}	FC_{16-20}
Betweentreatments	5	3.075	4.555	5.972	0.601	1.960	1.385
Error	24	1.748	2.123	3.898	3.236	2.430	0.671
Total	29	-	-	-	-	-	-

Table 4.5: Feed intake (in g) for various prelay and single layer diets, per hen (16-20 weeks old).

Treatment	FC_{16}	FC_{17}	FC_{18}	FC_{19}	FC_{20}	FC_{16-20}
T0	86.93 ± 0.48	89.04 ± 1.37	91.92 ± 1.36	94.79 ± 0.20	96.58 ± 0.33	91.85 ± 0.33
T1	85.60 ± 0.69	87.59 ± 0.11	90.27 ± 0.49	94.69 ± 1.04	98.05 ± 0.78	91.24 ± 0.16
T2	85.27 ± 0.73	87.09 ± 0.37	89.75 ± 1.03	94.35 ± 0.76	97.54 ± 0.75	90.80 ± 0.53
T3	84.69 ± 0.77	86.54 ± 0.60	88.85 ± 0.36	94.74 ± 0.28	96.65 ± 1.08	90.29 ± 0.34
T4	85.23 ± 0.41	86.74 ± 0.37	89.59 ± 0.47	94.95 ± 1.28	97.66 ± 0.51	90.84 ± 0.43
T5	85.02 ± 0.23	86.59 ± 0.05	89.17 ± 0.72	95.40 ± 0.67	97.86 ± 0.42	90.81 ± 0.26
SEm	0.256	0.291	0.376	0.304	0.279	0.162
CV%	1.547	1.670	2.196	1.897	1.601	0.901
p-value	0.159	0.094	0.217	0.965	0.556	0.106

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Table 4.7 displays the 40-week experiment's determined egg feed price ratio (EFPR), whereas Table 4.6 displays the results of the analysis of variance. The average selling price of an egg was Rs 4.22, while the cost of layer feed was Rs 27.15 per kilogramme. Eggs produced per hen and feed eaten per hen were added together to get the EFPR for each group. Group T0 had an EFPR of 0.940.03, Group T1 of 0.990.04, Group T2 of 1.010.18, Group T3 of 1.020.04, and Group T4 and T5 of 1.020.04, respectively.

Table 4.6: Layers fed a variety of prelay and single-layer diets were subjected to an analysis of variance (ANOVA) of their performance efficiency index (PEI) and egg feed price ratio (EFPR).

Sourceofvariation	Degreeoffreedom	Meansquareof		
		PEI_{28}	PEI_{40}	$EFPR_{40}$
Betweentreatments	5	21.372	28.055*	0.006
Error	24	16.517	8.954	0.004
Total	29	-	-	-

Table 4.7Evaluating the PEI and EFPR of layers on various combinations of prelay and single-layer diets

Treatment	PEI_{28}	PEI_{40}	$EFPR_{40}$
T0	23.16 ± 1.93	32.71^{c}± 1.45	0.94 ± 0.03
T1	26.64 ± 1.54	34.78^{bc}± 0.48	0.99 ± 0.11
T2	27.77 ± 2.79	33.33^{bc}± 1.45	1.01 ± 0.18
T3	24.42 ± 1.04	35.20^{bc}± 0.70	0.98 ± 0.02
T4	27.47 ± 1.09	36.77^{ab}± 1.44	1.02 ± 0.02
T5	28.38 ± 1.90	39.17^{a}± 1.92	1.02 ± 0.04
SEm	0.760	0.639	0.012
CDat5%	NS	3.906	NS
CV%	15.448	0.470	6.680
p-value	0.299	0.026	0.266

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From June 26, 2019, until December 16, 2019, we ran experiment-I. Table 4.8 displays the livability rating as a percentage. Experiment-I's standard management resulted in 100% bird survival at T0, 100% at T1, 100% at T2, 100% at T3, 100% at T4, and 100% at T5, respectively. Between weeks 21 and 24, group T2 had one death. In the T0, T1, T3, T4, and T5 groups, nobody died. Prelay nutrition and its impact on bird viability has received little attention in the literature.

Table 4.8: Percentage of laying hens who survive when given a variety of prelay and single layer diets

Particular	Treatments					
	T0	T1	T2	T3	T4	T5
No.ofbirdsat startofexperiment	30	30	30	30	30	30
No. ofbirds died	00	00	01	00	00	00
No.ofbirdsat theendofexperiment	30	30	29	30	30	30
Livability(%)	100	100	96.67	100	100	100

4.2. EXPERIMENT II

Table 4.9 shows the average body weight of pullets fed the best prelay diet from weeks 16-18, and the average BW of pullets fed the various layer diets from weeks 19-40, with an analysis of variance shown in Table 4.9. When comparing the body weight of pullets at the end of 16 and 18 weeks of age, we found no significant differences between the groups. All of the groups' prelay diets consisted of 2700 kcal ME/kg, 18.0% CP, and 2.5% Ca, and the pullets were slaughtered at T5. The body weight of pullets between the ages of 16 and 18 weeks was not affected by feeding any of the groups a high nutrient density prelay meal.

Since the prelay diet included 2700 kcal ME/kg, 18.0% CP, it can be deduced that laying hens may be given a diet comprising 2500 or 2600 kcal ME/kg diet with 18.0 or 17.0% CP between 19 and 40 weeks of age without affecting their body weight or egg production. Layers given a high nutritional density prelay meal were unable to gain body weight when switched to a low CP (16 or 15%) diet.

Table 4.9: Statistical analysis of variance of layer average body weights (g) fed best prelay vs other layer diets

Sourceof variation	Degreeof freedom	Meansquareof				
		BW_{16}	BW_{18}	BW_{20}	BW_{28}	BW_{40}
Between treatments	5	97.626	76.935	27.079	856.228	7505.423*
Error	24	459.838	286.713	636.128	1765.185	2123.986
Total	29	-	-	-	-	-

Table 4.10: Comparison of the mean body weights (g) of layer chickens given the best prelay diet with the other layer diets.

Treatment	BW_{16}	BW_{18}	BW_{20}	BW_{28}	BW_{40}
T0	1057.73 ± 8.19	1161.73 ± 7.57	1288.73 ± 14.51	1574.50 ± 12.59	1715.27^{a} 11.18
T1	1067.73 ± 7.98	1168.20 ± 8.25	1286.23 ± 18.34	1576.13 ±27.47	1702.60^{a} ± 32.64
T2	1066.87 ± 12.28	1168.67 ± 7.37	1289.18 ± 10.81	1569.30 ± 16.63	1717.24^{a} ± 12.87
T3	1068.13 ±7.20	1169.77 ± 6.31	1289.80 ± 3.64	1554.80 ± 7.60	1679.77^{ab} ± 16.93
T4	1060.87 ± 8.72	1161.90 ± 9.77	1289.07 ± 6.89	1552.51 ± 27.17	1629.80^{b} ± 23.16
T5	1060.86 ±11.95	1161.70 ± 5.39	1293.44 6.28	1544.53 ± 11.50	1637.06^{b} ± 19.60
SEm	3.639	2.890	4.208	7.322	10.086
CDat 5%	NS	NS	NS	NS	60.161
CV%	2.016	1.453	1.956	2.690	2.743
p-value	0.954	0.926	0.999	0.784	0.016

Table 4.12 displays the average daily feed intake (FC) per bird (g) at the end of weeks 16, 17, 18, 19, and 20; Table 4.11 displays the ANOVA results. There was no significant difference in daily FC across groups at 16 weeks, 17 weeks, or 18 weeks of age. This showed that throughout the 16-18 week prelay stage, there was no difference in the daily FC pullets consumed when both groups were fed the same nutritional density prelay diet (2700 kcal ME/kg diet, 18.0% CP and 2.5% Ca). Laying hens were given a variety of layer diets with

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varying nutritional densities between the ages of 19 and 40 weeks. At 19 weeks of age, the daily FC of T3, T4, and T5 laying hens was statistically (p0.05) greater than that of TO, T1, and T2. At 20 weeks of age, there was little variation in the average FC of laying chickens among treatments.

Table 4.11: Feed intake (g) per hen (16-20 weeks) given the best prelay and various layer diets, compared using analysis of variance

Sourceofvariation	Degreeoffreedom	Meansquareof					
		FC_{16}	FC_{17}	FC_{18}	FC_{19}	FC_{20}	FC_{16-20}
Betweentreatments	5	0.148	0.473	0.073	2.237*	1.180	0.143
Error	24	0.640	0.610	0.492	0.757	1.397	0.233
Total	29	-	-	-	-	-	-

Table 4.12: Hens (16-20 weeks old) on the best prelay and various layer diets had an average daily feed intake (in grammes) of

Treatment	FC_{16}	FC_{17}	FC_{18}	FC_{19}	FC_{20}	FC_{16-20}
T0	84.89 ± 0.18	87.21 ± 0.37	89.61 ± 0.22	94.38^{bc}± 0.24	97.46 ± 0.60	90.71 ± 0.13
T1	84.95 ± 0.38	86.97 ± 0.28	89.45 ± 0.33	94.33^{c}± 0.45	96.98 ± 0.79	90.54 ± 0.22
T2	85.00 ± 0.40	87.44 ± 0.42	89.41 ± 0.30	94.53^{bc}± 0.31	96.12 ± 0.29	90.50 ± 0.11
T3	84.79 ± 0.43	87.84 ± 0.21	89.41 ± 0.42	95.26^{abc}±0.17	96.72 ± 0.22	90.80 ± 0.13
T4	84.52 ± 0.37	87.19 ± 0.40	89.63 ± 0.36	95.93^{a}± 0.69	97.36 ± 0.64	90.92 ± 0.42
T5	84.82 ± 0.33	87.11 ± 0.37	89.68 ± 0.18	95.51^{ab}± 0.21	97.08 ± 0.27	90.84 ± 0.09
SEm	0.136	0.139	0.118	0.183	0.212	0.085
CDat 5%	NS	NS	NS	1.136	NS	NS
CV%	0.943	0.895	0.784	0.916	1.219	0.532
p-value	0.945	0.577	0.976	0.032	0.532	0.689

Table 4.13 displays the final (40th week) EFPR for each therapy, whereas Table 4.13 displays the ANOVA results. At an average of Rs 4.40 per egg, the cost of layer feed increased from T0 to T5 by Rs 29.78 to Rs 29.41 to Rs 29.46 to Rs 28.97 to Rs 27.86. Eggs produced per hen and feed eaten per hen were added together to get the EFPR for each group.

Group T0 had an EFPR of 0.930.02; Group T1 had an EFPR of 0.890.03; Group T2 had an EFPR of 0.900.01; Group T3 had an EFPR of 0.830.03; Group T4 had an EFPR of 0.840.03; and Group T5 had an EFPR of 0.840.03. When comparing EFPR scores between groups, there were no discernible deviations. In terms of raw numbers, however, group T0 had the greatest EFPR, while groups T4 and T5 showed the lowest. Group T0's enhanced egg production and decreased feed consumption led to a higher egg feed price ratio. When the EFPR is high, profits are high.

Table 4.13: Comparison of best prelay and other layer diets on layers' performance efficiency index (PEI) and egg feed price ratio (EFPR)

Sourceofvariation	Degreeoffreedom	Meansquareof		
		PEI_{28}	PEI_{40}	$EFPR_{40}$
Betweentreatments	5	5.711	43.973 **	0.007
Error	24	7.386	8.402	0.003
Total	29	-	-	-

5. Conclusion

The combination of feeding a high nutrient density prelay diet (2700 kcal ME/kg, 18.0% CP and 2.5% Ca) three weeks prior to the onset of egg production (16-18 weeks of age) and then feeding a layer diet according to BIS (2007) specifications (2600 kcal ME/kg, 18.0% CP, 3.0% Ca) during the first phase of production (19-40 weeks of age) is the best combination for improving production performance in terms of egg number and hen day egg production, feed.

6. References

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