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Effect of Herbal Liver Stimulants on the Performance of Hy-line Commercial Layer

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Abstract

An investigation was undertaken on 180 day-old Hy-line layer chicks to assess the effect of herbal products on feed consumption, egg production and profitability. The experimental chicks were randomly divided in three groups with three replicates in each and were housed in identical management and environmental conditions. Dietary treatments were prepared by addition of herbal liver stimulants such as Livoliv 250 @500 g/ton (D2) and Superliv @500g/ton (D3) in the basal diet (D1). Feed intake, egg production and mortality were recorded throughout the observation period of 50 weeks. Feed per unit of egg production, hen day percentage, additional income of supplemented diet over the basal diet were calculated. Average daily intake (g) of the diets per bird were observed as 59.19±1.05 g, 58.31±0.337 g and 57.67±0.163 g up to 20 weeks and 108.94±0.06 g, 109.01±0.05 g and 108.26±0.41 g during the laying period fed with D3, D1 and D2 diets respectively. Similarly, higher hen day egg % (76.9%) was recorded in the birds fed with Superliv supplemented diet (D3), followed by Livoliv supplemented diet (D2) (73.4%) and Basal diet (D1) (72.1%) with feed intake per unit egg production of 179.3 g, 178.1 g and 193.0 g, respectively. Total egg production was found higher with D3 (161.49 egg), followed by D2 (154.15 egg) and basal diet (151.45 egg) with layer house cumulative mortality only in D3 (3.75%). Additional profits of Rs. 35.18 and Rs. 12.86 in terms of egg selling over feed cost per layer were calculated for the bird fed with Superliv supplemented diet (D3) and Liveloliv supplemented diet (D2) than that of the basal diet.

Key words: layer, herbal products, liver stimulant, feed efficiency, profit

Introduction

Poultry keeping is important in Nepalese farming system from ancient times till today. Chicken is one of the most important poultry species that has played a major role in the livelihood of Nepalese, not only as a nutritional source of food but also for its economic and religious role. The present production of chicken egg in Nepal is around 600.96 million, between 1995/96 and 2006/07, the egg production in the country has been found to be increased by 157.98% (MOAC 2007). Similarly, during the past three decades global egg production has also shown a remarkable increase (FAOSTAT 2006). It is encouraging to see that an increasing demand for eggs because of the higher buying capacity of the population as well as their changing dietary habit clearly indicates favorable prospects and potential of egg production in the country. In the mean time, industrialization of the chicken production is occurring rapidly in the country which inevitably leads chicken egg production to competitive market oriented enterprises accompanied with some constraints. Expensive and substandard quality of feed is commonly a major constraint to secure profitability in the competitive edge in the market along with consumers' awareness towards quality products. It is obvious that feed cost constitute about 70% of production cost in poultry production. So lowest possible feed price is essential for profitable production. Eggs are the major bussiness outputs in commercial table egg production and the higher the egg production the better will be the profit. In general, in chicken egg laying starts at 20-22 weeks of age and individual bird is expected to lay 270 eggs by the age of 75 weeks with consumption of 1.8 kg of feed for each dozen of eggs (Parkhurst & Mountney 2004). Verma and Singh (1997) have reported 87.3% contribution of egg to the total returns of poultry industry.

Some early studies showed that continuous feeding of antibiotics as growth stimulants to chicken resulted in a decreased growth response (Guo *et al.* 2004). Importantly, some countries have already bans on use of antibiotics in chicken production due to growing concern of antibiotics residues in the meat and eggs and on possibly increasing bacterial resistant and their potential transfer from birds to man via the food chain (Casewell *et al.* 2003, Cunha 2007).

Therefore there is a need to explore possible alternatives to ensure sustainable productivity and profitable egg production in the country. Herbal products have been reported to be effective growth promoters in chicken production (Guo *et al.* 2004, Islam *et al*. 2005).

Work carried out in others countries have shown positive effect of herbal liver stimulants on performance of chicken (Chatterjee & Agrawala 2002, Singh *et al*. 2002, Mishra *et al*. 2004). Chatterjee and Agrawala (2002) further reported that supplementation of herbal liver stimulants improved gastro-intestinal microenvironment of the birds and thereby enhanced utilization of nutrients and ultimately increased in productivity without possing any adverse effect on animal systems. Roy *et al.* (1994) reported better quality eggs in addition of 3.08% higher number with Livoliv supplemented diet compared to control. Neupane and Karki (2008) found positive effect of Livoliv on body weight, dressing percentage and profitability of broiler under Nepalese condition. However, the effect of herbal liver stimulants on performance in egg production of layer is not yet investigated in Nepal. Therefore, this trial was designed to assess the effects of Livoliv and Superliv on feed consumption, egg production and economics of layers under Nepalese condition.

Materials and Methods

The present investigation was undertaken on 180 day-old Hy-line layer chicks to assess the effect of herbal products on feed consumption, egg production and profitability. The experimental chicks were randomly divided in three groups with three replicates in each and were housed in identical management and environmental conditions. Dietary treatments were prepared by addition of herbal liver stimulants Livoliv 250 @500 g/ton (D2) and Superliv @500g/ton (D3) in the basal diet (D1). The commercially available layer starter/finisher diet that most commonly used by farmers in the country was used as basal diet. Feed intake, egg production and mortality were recorded throughout the observation period of 50 weeks and feed per unit of egg production, hen day percentage and economics in terms of egg selling income over feed cost per layer was calculated including the extra supplemented charge. The data collected from the experiment were analyzed using MINITAB statistical package.

Results and Discussion

The average value (±SE) of feed intake, egg production, mortality and economics in terms of egg selling over feed cost are given in Table 1. No remarkable difference was observed on daily feed intake of birds between the dietary treatments during both growing and laying period. Including the supplemented charge, slightly higher feed cost per bird was calculated for Superliv supplemented diet (Rs 574) as compared to control (Rs 569). Though, initial days of laying was slightly delayed for supplemented diet compared to control, the difference was non-significant. Lower chicks mortality (1.67%) was observed in Superliv supplemented bird during the growing periods where as layer house mortality was found only in Livoliv supplemented diet. Irrespective of dietary treatments, the overall mortality recorded in this experiemnt was very low than reported by Bhurtel and Shaha (2000) under the Nepalese layer farms condition.

Table 1. Effect of herbal supplemented diet on feed intake, egg laying and economics of layers production

Particulars	Non-supplemented	Supplemented	
		Livoliv (500g/t)	Superliv (500g/t)
Feed intake (g/day) up to growing (0-20 weeks)	58.31 ±0.337	57.67±0.163	59.19±1.05
Feed intake (g/day) during laying (21-50)	109.01 ±0.05	108.26±0.41	108.94±0.06
Total feed cost (0-50) weeks per bird	**Rs 569.11**	**Rs 567.05**	**Rs 574.08**
Initial days of laying (10%)	144.67 ±1.76	147.67 ±3.18	147.33 ±1.76
Mortality up to 20 weeks	5%	5%	1.67%
Mortality during laying (21-50 week)	-	3.75	-
Hen day egg %	72.1	73.4	76.9
Feed intake /unit of egg	193.0 ±8.41 gm	178.1 ±3.87 gm(-7.72%)	179.3 ±9.24 gm(-7.09%)
Feed intake per dozen of eggs	2.316 ±0.101 kg	2.138 ± 0.046 kg	2.151 ± 0.111 kg
Egg/hen/day	0.721 ±0.012	0.734 ±0.006	0.769 ±0.027
Total egg up to 50 weeks	151.45 ±2.60 egg	154.15 ±1.33 egg	161.49 ±5.81 egg
Income selling egg (Rs 4 per egg)	Rs 605.8	Rs 616.6	Rs 645.96
Saving over feed cost	**Rs 36.69**	**Rs 49.55**	**Rs 71.87**
Additional profit per bird		**Rs. 12.86**	**Rs. 35.18**

Hen day egg % was recorded higher (76.9%) in the birds fed with Superliv supplemented diet (D3), followed by Livoliv supplemented diet (D2) 73.4% and Basal diet (D1) 72.1% with consuming 179.3±9.24 g, 178.1±3.87 g and 193.0±8.41 g of feed per each unit of egg production, respectively. Similarly, total egg production was found higher with D3 (161.49 eggs), followed by D2 (154.15 eggs) and basal diet (151.45 eggs). Data revealed that birds fed with supplemented diet consumed about 7% less feed for each unit of egg production as compared to the control group, however, not efficient than quoted by Parkhurst and Mountney (2004). The egg production trends of laying period are given in Table 2. It is fact that irrespective of dietary treatment, the egg production was observed lower at initial period of laying and remained peak duing the periods of 25-32 weeks, then slightly declined. The laying periods of 25-32 weeks was found very efficient and economical.

Saving in terms of income from selling eggs over feed cost was found higher in Superliv supplemented diet (Rs 71.87), followed by Livoliv supplemented diet (Rs 49.55). Additional profits of Rs. 35.18 and Rs. 12.86 in terms of egg selling over feed cost per layer were calculated for the birds fed with Superliv supplemented diet (D3) and Livoliv supplemented diet (D2) than that of the basal diet. Based on this observation, it can be concluded that supplementation of herbal liver stimulants (Livoliv and Superliv) are beneficial for improving laying performance as well as profitability of layer. However, further research needs to be conducted in future with emphasizing utilization of different domestic herbs of the country and their appropriate concentration.

Table 2. Hen day % and feed consumption per unit of egg production at different periods of laying

Age (week)	Hen day percentage			Feed per unit of egg production (g)		
	D1	D2	D3	D1	D2	D3
21-24	39.8 ±0.94	29.1 ±2.20	34.0 ±3.92	489.0 ±45.5	403.0 ±42.5	464.0 ±44.2
25-28	82.4 ±2.21	84.3 ±2.40	85.2 ±3.66	128.5 ±3.25	125.5 ±2.82	125.1 ±5.13
29-32	83.2 ±0.72	86.4 ±0.95	88.3 ±2.95	130.8 ±2.87	127.2 ±1.54	124.7 ±2.73
33-36	77.0 ±0.45	75.3 ±1.25	85.4 ±2.56*	144.6 0.70	146.2 ±3.45	129.7 ±3.83*
37-40	76.4 ±2.79	77.1 ±0.59	82.7 ±3.22	149.8 5.26	146.7 ±1.76	137.2 ±5.49
41-44	76.0 ±1.86	82.5 ±1.88	81.4 ±2.19	153.6 ±4.38	140.9 ±3.89	142.3 ±3.75
45-48	71.8 ±2.75	75.3 ±1.69	78.9 ±2.66	163.0 ±6.57	172.0 ±14.5	148.0 ±5.10

Means bearing * in a row of same parameter differ significantly (P<0.05), D1: Control, D2: D1+ Livoliv @500g/ton and D3: D1 + Superliv@500g/ton

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