Research Paper

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Effect of Synthetic Vitamin C Vis – A –Vis Herbal Vitamin C on Economy of Giriraja (Cross bred chick) Farming

Veterinary

KEYWORDS : Giriraja, Synthetic Vitamin C, Ayucee.

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ABSTRACT

The present study was carried out for six weeks, from November 21st, 2013 to January 03rd, 2014 at Government poultry farm, Khatipura, Jaipur. A total of 135 day- old Giriraja chicks were divided into three treatment groups of 45 chicks which were further subdivided into three equal replicates of 15 chicks each. The synthetic and herbal vitamin C were supplemented through drinking water at the rate of 2ml./l. for starter , 3ml. / l. for finisher. Ayucee and 250 mg/ l synthetic vitamin C various treatment groups and their designation used in this study are T1 control group, Vitamin C incorporated T2 and Ayucee incorporated T3 groups. Profit over control per chick revealed a loss of Rs. 23.28 and 21.42 in T2 and T3 groups, respectively. But Feed cost (Rs.) per unit live weight gain revealed that there was a percentage reduction of 10.34 and 06.59 in T2 and T3 groups, respectively, in comparison to control.

INTRODUCTION

During last 4-5 decades, broiler farming in the country has been growing rapidly because of its early assured return, rapid turnover and limited land requirements. Today it has transformed into a specialized complex competitive industry.

The production of agricultural crop has been rising at the rate of 1.5 to 2.0 per cent per annum, while eggs and broilers have been rising at the rate of 5 and 12 per cent per annum, respectively. As a result, India became the world's third ranked country in egg production and sixth largest broiler meat producer (FAOSTAT, USDA / FAS, 2011) with poultry meat production amounting to 3.4 million tonnes (ICRA rating, 2013).

The respective annual per capita consumption of poultry egg and meat in India is only 55 and 2.8 kg. Which is much less than the W.H.O. / I.C.M.R. recommendation of 180 eggs and 11 kg? It indicates that eggs and broiler production in India is yet very low and has vast scope to grow. The low productivity is mainly due to poor nutrition, management and poor health coverage. The low productivity may be augmented through backyard poultry production, as in case of China whose major proportion of total egg and poultry meat produced is through backyard farming as compared to the organized sector. The need for development of varieties suitable for back yard production in India was visualized by poultry breeders during nineties and the research in this field has been made for production of the improved varieties suitable for rural areas under backyard environment.

The importance of backyard poultry is well recognized by Government of India and special programmes are formulated for its promotion. Hence, efforts have been diverted into producing dual purpose native hybrids with improved production profiles. These hybrids are readily accepted by the rural farmers owing to their phenotypic appearance of the local birds. Hence, the introduction of different exotic crossbreds like Vanraja, Giriraja, Nadanam, Grampriya, Hitcari, Upcari etc. have generated new opportunities for poultry production in rural areas. These grow fast and produce more number of eggs, require low input (like feed, management , health care, housing etc.) and sustain different vagaries of climatic and environmental changes (Singh *et al.*;2002 Khan and Sardar 2005; Siyag, 2010, Thiruvenkadan *et al.* 2010).

Rajasthan, inspite of all infrastructures for poultry development, has not been able to keep pace with the neighboring states like Punjab and Haryana because of extreme climatic / environmental conditions which results into stress on the birds. Stress invariably causes high production of free radicals which are proven to be involved in the etiopathology of many diseases and loss of production. During stress severe depletion of vitamin C takes place (Daghir, 1996). To prevent this, antioxidants have been used to control the production of free radicals and prevent the deleterious effect of free radicals.

Among the antioxidants, ascorbic acid (Vitamin C) is most popular and commonly used. Vitamin C exerts a stimulant action on the phagocytic activity of leukocytes, reticuloendothelial system and formation of antibodies.

As the new catchword the world over is herbal therapy or herbal treatment, the application of the knowledge of herbs and their medicinal properties have made forays into the poultry industry in India. As herbal preparations pose no danger of side effects, residual effects and resistance development and they are personnel and environment friendly. Various herbal products of Vitamin C are commercially marketed with slight variation in composition having AmlaPowder(Emblicaofficinal) is as the major constituent e.g. Stresroak, Ayucee (Dabur Ayurvet Ltd.), POL-C (POLCHEM Nobel Agrovet Pvt. Ltd.) etc., alongwith other herbal sources of Vitamin C.

Keeping in the view the above facts, the present study was undertaken to investigate the comparative effect of synthetic Vitamin C vis-à-vis herbal Vitamin C (Ayucee) on Giriraja(A cross of native with exotic breed) farming with the objective to study the comparative economics of different treatment groups.

REVIEW OF LITERATURE

Several stressors like heat, cold, rain, humidity, transportation, overcrowding, housing, adultrated feed, chemical, infection, vaccination, debeaking, deworming, production, pollution in air, water, litter, noise etc. may lead to stress in birds causing adverse production effects and economic losses

Out of 75 reviews few most relevant previous studies are as follows –

Ajakaiye *et al.* (2011) conducted an experiment to investigate the effects of vitamins C and E on live weight and egg quality profile of layer hens subjected *in situ* to heat stress. They concluded that both antioxidants offered protective effect against the thermally stressful hot-humid conditions.

Siyag (2010) carried out an experiment on 240 day-old broilers fed ascorbic acid, stresroak and amla powder in all possible combinations. The average body weight, weight gain and FCR were significantly affected by antistress supplementation. Feed intake, mortality and carcass traits were found to be non- significant. The feed cost per Kg. live body weight gain was significantly reduced.

Jadhav *et al.* (2013) conducted an experiment to determine the effects of synthetic vitamin C and herbal vitamin C (Ayucee) on production performance in layer chickens. Better growth and performance in terms of higher body weight, egg production,

egg weight resulted in groups fed Ayucee. Thus considering the cost benefit ratio herbal product Ayucee premix can replace synthetic vitamin C.

Research Methodology :-

1. Materials

The present study was conducted at the Government Poultry Farm , Khatipura, Jaipur. For the present study freshly hatched, apparently healthy day – old unsexed 135 Giriraja (cross bred) chicks were procured from hatchery at Jaipur. The chicks were vaccinated against Marek's disease at the hatchery itself.

On 3rd day these 135 chicks were randomly distributed in 3 experimental groups with 45 chicks in each group. These were further sub divided into 3 replicates for each treatment consisting of 15 chicks in each replicate and vaccinated for Ranikhet disease, wing banded and body weight recorded individually. This weight was considered as zero day of the experiment. On 14th day all the chicks were vaccinated against IBD also.

Each replicate of 15 chicks was reared in 9 separate, clean and disinfected floor pens allotted randomly. Fresh and dry wheat straw was used a litter. In each pen one 250 watt infrared bulb was placed, and ½ feet above the level of the litter for brooding purpose. The temperature for brooding was controlled by increasing or decreasing the height of bulb. A photo period of 24 hours duration was provided through out the experimental period for all 3 groups. All the chicks was reared under almost identical standard managemental practice like brooding, lighting, watering, and health care during the entire course of study.

Adequate and identical floor, feeding and watering space was provided to chicks of the 3 groups throughout the experiment. Standard (BIS) starter and finisher ration was fed to the chicks, upto three weeks and thereafter, respectively.

2. Method:-

Experimental Groups

Table 1 :The different experimental groups will be formulated as follows:-

Treatments I		Replicates II	III		Total Chicks
T1	Basal diet (Control)	15	15	15	45
T2	Basal diet + Ascorbic acid	15	15	15	45
T3	Basal diet + Herbal Vitamin C	15	15	15	45

Note: The quantity of Synthetic Vitamin C and Herbal Vitamin C were given in drinking water as follows:

a) Synthetic Vitamin C (Ascorbic acid) : 250 mg / l. of water

b)Herbal vitamin C (Ayucee) : 2 ml. /l. water (For starter)

3 ml. / l. water (For finisher)

The first feeding group (T1) was kept as the control and no antistress agent was supplemented to the starter and the finisher basal ration.

In the second feeding group (T2) synthetic vitamin 'C' provided through drinking water @ 250 mg / ltr. of water

.In the third feeding group (T3) herbal vitamin 'C' (Ayucee) provided through drinking water @ 2ml / ltr for starter and 3ml/ ltr for finisher.

Table 2 :The starter and finisher ration purchased from the market had the following approximate ingredients:

Ingredient	Starter Ration (Parts per 100)	Finisher Ration (Parts per 100)
Maize	40	52
Wheat bran	10	8
Rice polish	8	6
Ground nut cake	30	26
Fish Meal	10	6
Mineral Mixture	2	2
Total	100	100
Calculated Composition C P Energy (Kcal/Kg)	23.1046 2905.56	20.1532 3120.02

Observations:-

Comparative economics:

While calculating the economy, the cost of chicks, brooding, labour etc. were taken identical for all the groups and therefore, ignored and returns over feed cost and cost of feed additives under different feeding groups were taken into account.

Cost of feed was calculated on the basis of rate quoted in local market of Jaipur and the cost of antistress agents (synthetic vitamin C and Ayucee) were calculated on the basis of prevailing market rates.

Cost of feed (i) Starter Rs 32.80 per kg

(ii) Finisher Rs. 32.40 per kg

Cost of synthetic Vitamin C Rs. 1.70 per g

Cost of Ayucee Rs. 0.31 per ml

The rate of sale of live chicks @ Rs. 73.00 per kg as prevailing in the local market. The return over feed cost and the cost of synthetic vitamin C and Ayucee per chick were calculated.

RESULTS AND DISCUSSION

The objectives of this experiment were to compare the effect of synthetic vitamin C vis-à-vis herbal vitamin C (Ayucee) on economy of Giriraja farming. An experiment was conducted on 135 day-old straight run commercial chicks of Giriraja strain at Government Poultry Farm, Khatipura, Jaipur. The experiment was conducted for a period of 6 weeks, on day old chicks, beginning at 3 days of age. The experiment was carried out from November 21, 2013 to January 3, 2014.

Various treatment groups and their designation used in the presentation and discussion are as follows.

1.	T_1	-	Control
2.	T_0	-	Synthetic Vitamin C
3.	T_2	-	Ayucee (Herbal Vitamin C)

The results obtained in the present investigation along with their discussions are presented as comparative economy.

COMPARATIVE ECONOMY

The ultimate goal of poultry raising is to get profits in terms of economy. Thus various practices are being adopted to rear the poultry to increase profits by overcoming the stress which adversely affects the profitability of poultry enterprise. The present study is one of such effort to evaluate the effect of synthetic vis-à-vis herbal source of vitamin C on giriraja chicks in such a condition in order to ensure increased returns.

Assuming the cost of chicks, brooding, labour etc. to be similar under different treatments, the return on the sale of broiler chicks over cost of feed and antistress agents were calculated.

Feed cost was calculated on the basis of cost of different feed ingredients purchased from the local market of Jaipur and the cost

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of synthetic vitamin C and Ayucee at market rates. The net profit was calculated taking into account the average price of live body weight prevailing in the market of Jaipur to be Rs. 73 per kg.

Table 3 gives an overall estimate of returns over cost of feed and both sources of vitamin C per live chicks under different treatments during entire experimental period of six weeks.

Evaluation of comparative economy of feeding different treatment groups revealed that total returns over feed cost was highest in group T2 (Rs. -544.57) followed by T3 (Rs. -640.64) and control group T1 (Rs. -1591.30). The total return over feed cost revealed a loss in all three treatment groups. This is due to the fact that the weight gain in giriraja chicks was very low coupled with high feed cost. Hence, it is concluded that this native hybrid is not economical to be reared in an organized farm, and should be propogated in backyard poultry farming onlyl, which has almost zero input on feed cost.

Increased return from feed cost over control was best obtained with ascorbic acid supplemented group T2, followed by herbal vitamin C supplemented group T3.

Table 3 : Returns over feed cost per chick as influenced by feeding different antistress agents.

Item	T_1	T_2	T_3
No. of birds in beginning	45	45	45
No. of birds died	7	4	6
No. of birds in end	38	41	39
Average Live weight per bird (kg)	0.99	1.04	.997
Total live wt. Kg.	37.62	42.59	38.88
Amount Sale @ 73/- per kg	2746.26	3109.07	2838.24
Total feed consumed (kg), Starter	46.62	42.10	35.35
Finisher	86.68	68.24	70.52
Cost of ration (Rs/kg) , Starter	32.80	33.36	32.86
Finisher	32.40	32.96	32.46
Total cost of feeding (Rs.)	4337.56	3653.64	3478.88
Total return over feed cost (Rs.)	-1591.30	-544.57	-640.64
Profit over control (Rs.)	-	1046.43	950.66
Profit over control per chick (Rs.)	-	23.28	21.42
Benefit : cost ratio (over feed cost)	-0.36	-0.14	-0.18

On evaluation of comparative economy of feeding different treatment groups, The Benefit : cost ratio was observed to be -0.14 in treatment group T2 followed by -0.18 in T3 and -0.36 in control group T1 .

The return over control was obtained in two different source of vitamin C supplemented group. This was due to cumulative effect of higher average live weight / weight gain and improved feed conversion efficiency due to supplementation of the synthetic and natural source of vitamin C as compared to control.

Comparative economics of feeding per unit gain

Profitable poultry production depends upon a number of factors such as proper management, strain of chicks, balanced feed, marketing etc.

Out of these factors, feed cost constitutes a major deciding factor in profitability, since the cost of feeding alone accounts 70 to 75 per cent of the total poultry production. In order to achieve the goal of maximum profitability, the feed should not only be balanced nutritionally but also be economical. The economy of the feed in not determined by the apparent cost per kilogram of feed but by the cost of feed to produce a kilogram of broiler weight. Hence, in present study the comparative economics of various antistress agents supplementation was calculated in terms of feed cost per unit gain.

Table 4: Feed cost (Rs.) per unit live weight gain.

Treatment	Starter rate per kg	Finisher rate per kg	Feed cost per kg gain	Percentage reduction per kg gain
T_1	32.80	32.40	70.06	-
T_2	33.36	32.96	62.71	10.34
T_3	32.86	32.46	58.83	6.59

Feed cost per kilogram live weight gain

The cost of starter ration and finisher ration in rupees per kilogram are presented in Table 4. The table revealed that cost of both the ration was increased by incorporation of antistress agents (vitamin C and ayucee) as compared to standard diet (control).

The feed cost per kilogram live weight gain by Giriraja chicks indicated that cost of feed was reduced as compared to control. The lowest feed cost per kilogram gain was found in T3 (Rs. 58.83), followed by T2 (Rs. 62.71) groups as compared to control group T1 (Rs. 70.06) which was the highest.

The per cent reduction in feed cost per kilogram gain was observed to be 10.34 per cent in T2 group and 6.59 per cent in T3 group as compared to control group T1.

The results suggested that feed cost per kilogram weight gain was reduced by supplementation of both sources of vitamin C viz. synthetic vitamin C and Ayucee. Hence, incorporation of synthetic and natural vitamin C in drinking water of chicks is economical in terms of feed cost (Rs.) per unit weight gain.

The results of feeding herbal vitamin C on overall profitability were in accordance with Prajapati (1997) who recorded net additional gain of Rs. 1.84 per bird, Ather (1998) reported highly favourable cost economics of Rs. 2.01 net extra profit per bird due to Stresroak. Sharma (1999) observed optimal economic benefit (cost benefit ratio of 1:8.78), Baruah and Bhatt (2006) reported decreased cost of production per kg feed in additive group as compared to control and per cent improvement in cost of production per kg live broiler was 6.69 due to Stresroak supplementation.

Similarly, Siyag (2010) observed net profit over control per chick to be Rs. 07.45 in ascorbic acid and Rs. 09.48 in herbal vitamin C (Stresroak) supplemented group. The benefit cost ratio over feed cost in this study was found to be 0.49 in control group followed by 0.65 in ascorbic acid and 0.66 in stresroak supplemented groups.

The results of feeding vitamin C on overall profitability were in concurrence to the reports of Sayed and Shoeib (1996), Gundna (1997), Bishnoi (2004), Siyag (2010) and Eevuri and Putturu (2013) who found favorable cost economics of broilers when supplemented with vitamin C. But the results are not in accordance with Abou-El-Ella and Ismail (1999) who observed that ascorbic acid supplementation was not economically efficient.

CONCLUSION

The total return over feed cost was found to be negative in all three groups. Hence, it is concluded this native hybrid is not economical to be reared in an organized farm, and should be propagated in backyard poultry farming only, which has almost zero input on feed cost.

Economy calculated in terms of returns over feed cost revealed profit per chick over control was negative in both treatment groups and was observed to be Rs. 23.28 in T2 group and Rs. 21.42 in T3 group. The feed cost (Rs.) per unit weight gain was reduced in both treatment groups as compared to control. The percentage reduction ranged from 10.34 in T2 group to 06.59 in T3 group.

RECOMANDATION

1 This native hybrid (Giriraja) is not economical to be reared in an organized farm, and should be propagated in backyard poultry farming only.

2 Incorporation of synthetic and natural vitamin C in drinking water of chicks is economical in terms of feed cost (Rs.) per unit weight gain.

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