ISSN 1682-8356
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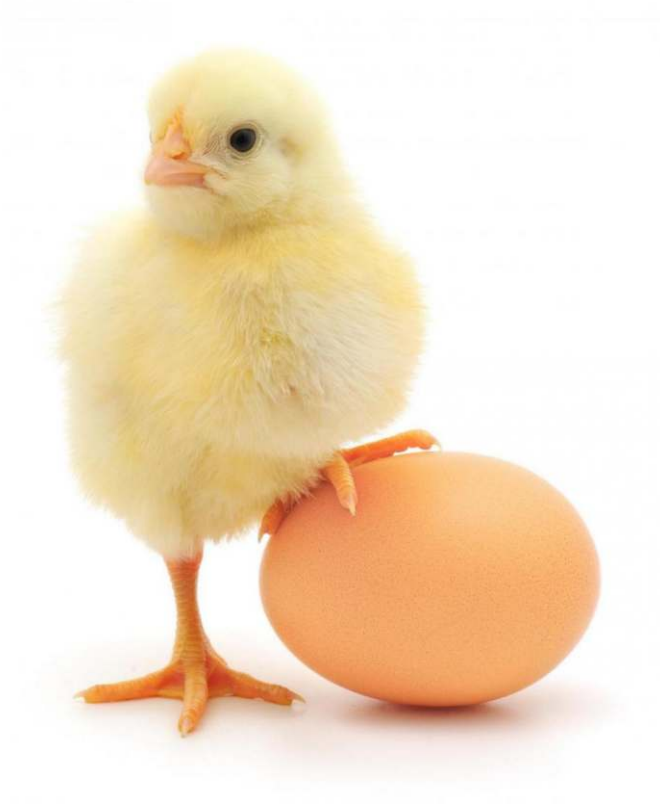

INTERNATIONAL JOURNAL OF

POULTRY SCIENCE

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International Journal of Poultry Science 3 (12): 773-778, 2004

Effect of a Poly Herbal Ingredient on Day Old Chick Quality by Feeding in Parent Flocks

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Abstract: A trial was undertaken in 99 numbers of white leghorn layer parent stock to study the indirect effect of stresroak (a poly herbal feed additive) on overall chick quality improvement, seven day mortality and maternal antibody transfer to chicks. The stresroak feed mix was given @ 2kg per ton of feed and water supplement @ 20ml / day for 100 birds for one month period. The chicks were received two weeks after supplementation at weekly interval for 5 weeks period to assess the chick quality. The results showed that the chick quality scores of the stresroak supplemented groups were highly significantly different from control group ($P<0.01$). The first week mortality recorded for the three treatment groups revealed a highly significant difference ($P<0.01$) upon comparison with control group. The maternal antibody against Ranikhet disease in the stresroak supplemented groups showed a highly significant difference ($P<0.01$) in the transfer of maternal antibody when compared to control group.

Key words: Stresroak, chick quality, seven day mortality, maternal antibody, Ranikhet disease

Introduction

The poultry farming plays a major role in Indian economy. To succeed in poultry farming chick quality assessment is most important for the poultry farmers as that of seed quality in agriculture before starting a broiler or layer farm. But there is no standard system is available to assess the chick quality. Cervantes (1993) proposed a national numerical standard for chick quality. In this, chick quality has been defined with three specifications viz., physical, microbiological and serological specifications to derive a numerical score for chick quality grading. Though this system was proposed only for broiler chicks, it has been applied very well for both layer and broiler chicks in this center (Koteeswaran *et al*., 2004).

Stresroak-a commercial product of Ayurvet limited, India which contains herbal ingredients (*Withania somnifera, Ocimum sanctum, Phyllanthus emblica, Mangifera indica* and *Shilajit*) that effectively fights stress through better adaptation thus restoring normal immune functions and was found to be effective against vertical transmission of Infectious bursal disease (Mujeeb Ather, 2000). The company claims that it possess adaptogenic, immuno modulating, free radical scavenging, antioxidant and rejuvenating actions. This study was carried out to find out the indirect effect of the stresroak feed and water supplements by feeding in the parent flocks.

Materials and Methods

Ninety nine numbers of White Leghorn layers of 54 weeks of age were selected for this experiment at Poultry Research Station, Tamil Nadu Veterinary and Animal Sciences University, Nandanam, Chennai - 600 035. The birds were grouped randomly as given below based upon body weight, previous egg production and phenotypic appearance.

	Male:Females	
Treatment 1		
Replicate 1	1 : 10	Standard breeder mash (control)
Replicate 2	1 : 10	
Replicate 3	1 : 10	
Treatment 2		
Replicate 1	1 : 10	Standard breeder mash
Replicate 2	1 : 10	supplemented with Stresroak
Replicate 3	1 : 10	@ 2kg/ton of feed as a feed premix for four weeks
Treatment 3		
Replicate 1	1 : 10	Standard breeder mash
Replicate 2	1 : 10	supplemented with Stresroak
Replicate 3	1 : 10	liquid @ 20ml/day/100 birds in drinking water for four weeks

The feeding trial with stresroak supplements was conducted in two phases. In phase I stresroak supplements were given with the regular feed for 4 weeks period starting from 28.7.2003 to 24.8.2003 and in phase II, regular feed alone was given to all the treatment groups starting from 25.8.2003 to 21.9.2003. The managemental conditions were kept identical throughout the experimental period.

Chick quality assessment: In the stresroak feeding

Table 1: Physical Exam Score Vaccine Research Centre (Viral Vaccine), Centre for Animal Health Studies, Madhavaram Milk Colony, Chennai - 600 051

Case			Breeder ID.						Breeder Age				
Hatchery			Date Submitted						Date Completed				
Chick	1	2	3	4	5	6	7	8	9	10	Total	Factor	Score
								Ave chick wt.					
Weight													
Appearance													
Listless													
Normal												X	1.77
Legs													
Twisted													
Normal												X	1.17
Hocks													
Red													
Normal												X	1.17
Toes													
Crooked													
Curled													
Normal												X	0.59
Eyes													
Abnormal													
Normal												X	0.59
Vent													
Pasted													
Normal												X	0.59
Navel													
Abnormal													
Normal												X	2.35
Hydration													
Dehydrated													
Normal												X	1.77
Subtract 10 Points From Physical Score if Average Weight is Below Minimum Required												Physical Score	

Table 2: Micro Score Vaccine Research Centre (Viral Vaccine), Centre for Animal Health Studies, Madhavaram Milk Colony, Chennai - 600 051

Case			Breeder ID.						Breeder Age				
Hatchery			Date Submitted						Date Completed				
Chick	1	2	3	4	5	6	7	8	9	10	Total	Factor	Score
Total count													
NG												X 10	
1+												X 8	
2+												X 6	
3+												X 4	
4+												X 0	
										Total count score			
Coliforms													
NG													
1+													
2+													
3+													
4+													
Staph													
NG													
1+													
2+													
3+													
4+													
Salmonella													
Negative													
Positive												X 20	A
Asperaillus													
Negative													
Positive												S 2	B
Micro Score=The Sum of (A) and (B) Subtracted from Total Count Score=(1+)=0-5 (2+)=6-25, (3+) = 26-50,Micro Score (4+) = > 50 C.F.U.													

Table 3: Numerical scores from chick quality assessment of the chicks derived from parent stock with three treatment groups

	T1				T2				T3			
	R1	R2	R3	Ave	R1	R2	R3	Ave	R1	R2	R3	Ave
Ave wt.	35.8	36.30	36.50	36.20	37.04	36.68	35.73	36.48	37.54	35.35	36.39	36.43
PS	92.93	94.11	97.35	94.78	94.69	96.46	96.47	95.87	97.65	97.65	94.7	67.67
MS	86	86	84	85.33	94	94	94	94	92	90	92	91.33
CS	89.46	90.06	90.68	90.06	94.35	95.23	95.24	94.94	94.83	94.83	93.35	94
Ave wt.	36.16	35.1	37.93	36.40	36.87	35.47	38.54	36.96	38.15	37.46	37.13	37.58
PS	97.64	91.18	91.76	93.53	94.11	93.52	92.95	93.53	97.64	92.70	93.53	94.62
MS	82	88	84	84.66	92	96	92	93.33	94	94	94	94
CS	89.82	89.59	87.88	89.09	93.06	94.76	92.48	93.43	95.82	93.35	93.77	94.31
Ave wt.	36.02	33.43	37.24	35.56	36.59	35.72	38.53	36.95	37.20	35.58	39.65	37.48
PS	91.16	89.39	96.16	92.24	93.52	97.06	96.47	95.68	94.7	95.29	94.12	94.7
MS	88	82	86	85.33	94	92	92	92.67	98	94	96	96
CS	89.58	85.70	91.08	88.79	93.76	94.53	94.24	94.18	96.35	94.65	95.06	95.35
Ave wt.	38.62	35.25	37.28	37.38	36.42	38.02	36.98	37.14	39.26	36.63	36.36	37.42
PS	94.70	89.40	97.40	93.83	94.70	91.76	94.7	93.72	95.29	96.46	99.7	97.15
MS	84	88	82	84.67	92	94	94	93.33	96	96	98	96.67
CS	89.35	88.70	89.70	89.25	93.35	92.88	94.35	93.53	95.65	96.23	96.35	96.08
Ave wt.	32.41	35.75	35.14	34.43	36.08	35.81	35.78	35.89	35.31	36.44	37.32	36.36
PS	87.26	93.52	95.16	91.98	94.70	92.06	94.12	95.29	97.06	91.75	94.71	94.51
MS	92	72	90	85.33	90	92	94	92	96	98	96	96.67
CS	89.63	83.76	92.58	88.66	92.35	94.53	94.06	93.65	96.53	94.86	95.36	95.58

Ave Wt.	Average Weight of day old chicks	T1 - Control group	R1 - Replicate 1
PS	Physical Score	T2 - Stresroak feed supplement group	R2 - Replicate 2
MS	Microbiological Score	T3 - Stresroak water supplement group	R3 - Replicate 3
CS	Chick quality score		

trial, the day old chicks hatched from eggs laid by hens that received stresroak and also from hens that did not get any stresroak supplementation, were obtained from Poultry Research Station, Nandanam 2 weeks after stresroak supplementation at weekly interval for 5 weeks. At every week 9 batches of chicks were tested (10 chicks per batch) for the chick quality study.

This chick quality study was carried out at Vaccine Research Centre-Viral Vaccines, Centre for Animal Health Studies, as per Cervantes (1993) who proposed a numerical standard for chick quality. In the present trial, it was adopted to find out the effect of stresroak on the quality of day old chick. In this, chick quality has been defined with three specifications viz., physical, microbiological and serological specifications. Physical quality requires the chicks to meet a minimum average body weight, free of deformities and properly hydrated etc. Microbiological quality pertains to the fact that the chicks must be free of pathogenic bacteria and fungus. The physical quality of chicks was assessed by the physical examination of day old chicks immediately after hatch to derive the physical score. Each chick was individually weighed and examined for overall appearance, conformation of legs, hocks and toes, soundness of eyes, vent, navel and hydration status. The results for each chick on all of these parameters were recorded in the given format (Table 1) to derive the physical score. The total number of normal chicks within each parameter evaluated was added and then multiplied by a factor, which has a different numerical value according to its overall impact on chick quality. Any abnormality detected in any chick reduces the score. The reduction was in direct proportion to the parameter's importance to total chick quality and the number of affected chicks. Thus a physical score was evolved for each batch.

The microbiological examination was carried out to the fact that the chicks must be free of pathogenic microorganisms. Samples were collected form each chick three days after hatch and the bacterial count in different selective media were assessed. Briefly, yolk sac swab was aseptically collected from each chick and streaked out in Tryptic soy agar, Mannitol salt agar for *Staphylococci* sp. and MacConkey agar for coli forms. In calculating the microbiological score the results from the yolk sac swabs plated on to the Tryptic soy agar were entered under the total count (Table 2). Additionally yolk sac swab, ileo-caeco-colic junction materials were saved in tetrathionate brilliant green broth for *Salmonella* sp. culture. Finally the right lung from each chick was removed and deposited in fungal medium plate such as Saubouraud's dextrose agar. In case of any chick is positive for *Salmonella* sp. and *Aspergillus* sp. an additional 20 and 2 points have be subtracted from the total count micro score respectively. The results were recorded in the given format (Table 2) and the micro score was calculated.

Equal importance was given for the physical and

Table 4: Seven day mortality percentage of chicks derived from three treatment groups parent stock in the stresroak trial

Groups		Hatches					Weighted average
		I	II	III	IV	V	
T1	R1	Nil	Nil	3.23	2.7	3.45	1.88
	R2	2.77	3.22	Nil	2.63	Nil	1.72
	R3	3.57	3.33	2.86	Nil	4.76	2.90
	Average	2.11	2.18	2.03	1.78	2.74	2.17
T2	R1	Nil	Nil	Nil	Nil	2.38	0.48
	R2	Nil	1.61	Nil	1.67	Nil	0.66
	R3	2.5	Nil	2.08	Nil	Nil	0.92
	Average	0.83	0.54	0.69	0.56	0.79	0.68
T3	R1	Nil	Nil	Nil	Nil	2.5	0.50
	R2	2.63	1.79	Nil	Nil	Nil	0.88
	R3	2.27	Nil	Nil	Nil	2.17	0.89
	Average	1.63	0.60	0	0	1.56	0.76

T1 - Control group
T2 - Stresroak feed supplement group
T3 - Stresroak water supplement group
R1 - Replicate 1
R2 - Replicate 2
R3 - Replicate 3

Table 5: Maternal antibody level in chicks derived from the three treatment groups parent stock against Ranikhet disease

	Groups	GMHI titre (log2) of different hatches				
		I	II	III	IV	V
T1	R1	5.10	5.00	4.90	4.80	4.50
	R2	4.90	4.80	5.10	4.90	4.60
	R3	5.00	5.00	5.00	4.70	4.50
	Average	5.00	4.93	5.00	4.80	4.53
T2	R1	5.90	6.60	6.60	6.60	6.40
	R2	6.10	6.60	6.70	6.70	6.50
	R3	6.00	6.40	6.70	6.70	6.50
	Average	6.00	6.53	6.67	6.67	6.47
T3	R1	6.50	6.90	6.90	6.70	6.60
	R2	6.70	6.60	6.90	6.80	6.50
	R3	6.10	6.90	6.80	6.90	6.70
	Average	6.43	6.80	6.87	6.80	6.60

T1 - Control group
T2 - Stresroak feed supplement group
T3 - Stresroak water supplement group
R1 - Replicate 1
R2 - Replicate 2
R3 - Replicate 3

microbiological specifications. Hence the final chick quality score is the average of physical and microbiological scores. The chicks were maintained in a healthy environment for calculating the seven-day mortality.

The maternal antibody status for RD and IBD were assessed by haemagglutination inhibition (HI) test (Alexander, 1988) and quantitative agar gel immunodiffusion (QAGID) test (Cullen and Wyeth, 1975) respectively.

The final chick scores have been interpreted as given below:

100	=	Excellent	99-95	=	Very Good
94-90	=	Good	89-80	=	Fair
79-70	=	Poor	<70	=	Unacceptable

Statistical analysis: The statistical analysis of the data was done by using 't' test

Results and Discussion

The chick quality parameters assessed for the 5 batches of chicks from 3 treatment groups with 3 replicates are presented in Table 3. The seven day mortality of the chicks recorded for the three treatment groups and their maternal antibody titre values are presented in Table 4 and 5 respectively.

The chick quality testing system established by Cervantes (1993) was very well used for this study. The importance of this system was understood by many poultry breeders. Later the chick quality testing system was studied upon its applicability in Indian conditions

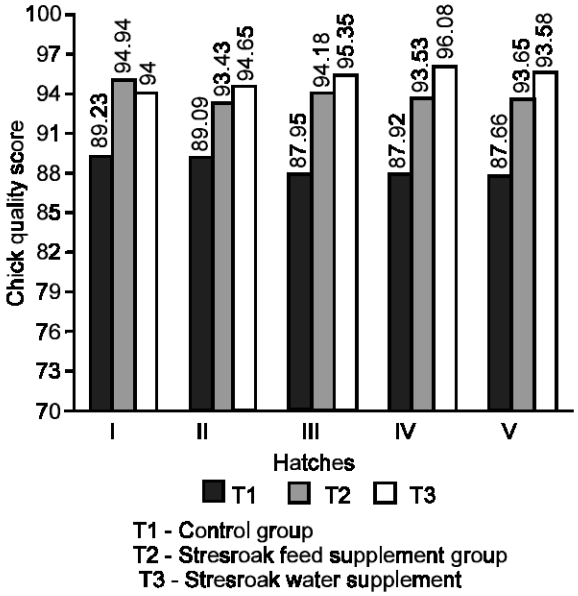

Fig. 1: Comparison of chick quality scores of different hatches of chicks derived from three treatment groups parent stock

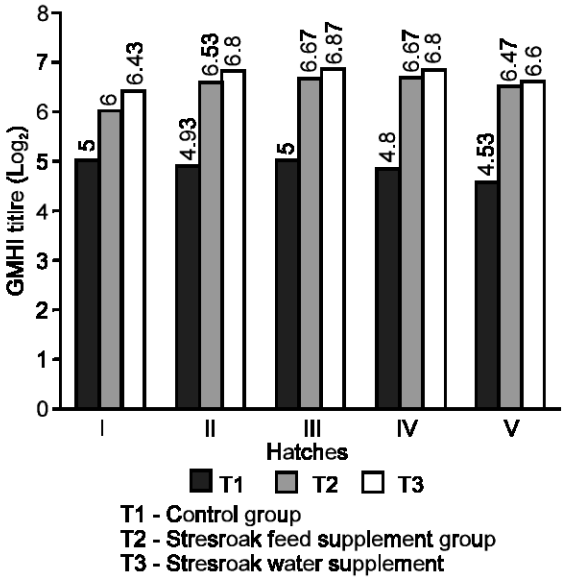

Fig. 2: Maternal antibody level of the chicks obtained from three treatment groups parent stock against Ranikhet disease

and was found to be good (Koteeswaran *et al.*, 2004). In the present study, the indirect effect of stresroak feed and water supplements in parent flocks upon day old chick quality was analysed. The parameters such as day old body weight, physical score, microbiological score, seven day mortality and maternal antibody transfer were studied in this trial.

Day old body weight of chicks: In the stresroak feeding trial, day old chicks were received from Poultry Research Station, Nandanam 2 weeks after stresroak supplementation at weekly interval for 5 weeks. At every week 9 batches of chicks were subjected to chick quality studies. The average day old body weight of the chicks recorded for the different trials group for 5 hatches of chicks are given in the Table 3. In this study, the stresroak was supplemented for 4 weeks period (phase I) and subsequently regular feed was given for 4 weeks (phase II). In both phases day old body weight of the chicks showed statistically insignificant weight gain between the groups.

Physical quality: In this study, the average physical score evolved by examining 10 chicks per batch for the three treatment groups of 5 hatches of chicks are presented in Table 3. The range of physical score of the control (T1) chicks was from 91.98 to 94.78, in the T2 group the score ranged between 93.33 and 95.87 and for T3 group the range was from 94.62 to 97.15. The results were not statistically significant indicating that the physical specifications prescribed for the chick quality were not influenced much by the stresroak supplementation.

Microbiological quality: This represents the microbial load of the day old chicks. The microbiological scores derived by testing 10 chicks per batch based on the growth in different microbiological media are presented in Table 3. The range of microbiological scores in the control chicks (T1 group) was from 84.66 to 85.33. In the stresroak supplemented group the range for the T2 group was from 92 to 94 and for T3 group it ranged between 91.33 and 96.67. The 't' test analysis of the results showed a highly significant difference ($P<0.01$) when comparing the control group with the stresroak supplemented groups.

Chick quality score: The final chick quality which is the average of physical and microbilogical scores and the results are presented in Table 3 and Fig.1. The average chick quality scores of the control group (T1) ranged between 88.66 and 90.06. In the stresroak-supplemented groups the range for T2 group was from 93.43 to 94.94 and in T3 group the range was from 94 to 96.08. The chick quality score results of the stresroak supplemented groups were highly significant ($P<0.01$) when compared to control group.

Seven-day mortality: The chicks from the three treatment groups for 5 hatches of various size were maintained in a healthy environment for seven days to record the 1st week mortality and the results are

presented in the table 4. In the treatment I (T1) group, the mortality range for the five hatches of chicks varied from nil to 4.76% whereas the range for T2 and T3 group chicks varied from nil to 2.5% and nil to 2.63 respectively and the weighted average were 2.17%, 0.68% and 0.76% respectively. A highly significant difference ($P<0.01$) was noticed in the mortality percentage between control and stresroak supplemented groups and no variation found among the two stresroak supplemented groups.

Maternal antibody transfer: Serum samples collected from the three treatment groups of 5 hatches of chicks were tested for presence of maternal antibody against Ranikhet Disease by RDHI test and for Infectious Bursal Disease by IBD-QAGID test. There was no antibody against IBDV in any of the chicks as the parent flocks were not vaccinated against IBD. Regarding the level of maternal antibody against RD (Table 5 and Fig. 2) a highly significant difference in the maternal antibody transfer ($P<0.01$) between control and stresroak supplemented groups was found. The increased maternal antibody transfer due to the strsroak supplement was already proved by Mujeeb Ather (2000) by controlling vertical transmission of IBD in birds.

Overall the stresroak feed and water supplement not only enhanced the day old chick quality but also reduced the first week mortality by improving the maternal antibody transfer.

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