EFFECT OF DIETARY SUPPLEMENTATION OF SODIUM BENTONITE ON LAYING PERFORMANCE OF WHITE LEGHORN, FAYOUMI AND RHODE ISLAND RED BREEDS OF CHICKENS

Bashir Mahmood Bhatti and Abdul Waheed Sahota
Poultry Research Institute, Rawalpindi, Pakistan

INTRODUCTION

For many years nutritionists have recognized that certain non-nutritive materials affect the nutritive efficiency of diets and that some nutrient containing materials posses dietary effect beyond that which might be expected from their nutrient contents (Olver, 1988). Beneficial effect of sodium bentonite (SB) as a growth promoter in broilers (Petkova and Ivanov, 1982) and as binding and lubricating agents in the production of pelleted feeds (Salmon, 1985) has been indicated. It has been reported that SB decreased ammonia contents and reduced bacterial, yeast and fungal populations of bedding when mixed in broiler house litter (Majewski and Tymczyna, 1988). However, very little information is available on the effect of SB on laying performance of chicken. This paper describes results of a study conducted to examine effect of dietary SB supplementation on the laying behaviour of White Leghorn (WLH), Fayoumi (FY) and Rhode Island Red (RIR) breeds of chickens.

MATERIALS AND METHODS

A study involving 540 adult laying hens (40 weeks-old), 180 each of the three breeds namely, White Leghorn (WLH-Commercial Babcock strain), Fayoumi (FY) and Rhode Island Red (RIR) was conducted at Poultry Research Institute, Rawalpindi. The birds of each breed were divided into 3 equal groups (each group having 3 replicates) and they were maintained on littered floor in 9 separate pens under optimal managemental conditions. The birds were given a balanced commercial layer's mash *ad libitum*. The birds of each breed in group B and C were given feed supplemented either with each 1.0 or 1.5 percent sodium bentonite (SB) or maintained without SB supplementation as control (group A). The birds had free access to clean and fresh drinking water and 16 hours light per day was provided. The data on egg production, feed intake and mortality rate were collected for a period of 8 weeks. Feed conversion efficiency (feed/dozen eggs) was calculated. The data thus collected were analysed using analysis of variance technique (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

The results are given in Table 1. The improvement in egg production of WLH chickens with 1.0 and 1.5 percent SB was 10.21 and 17.72 percent, respectively, in comparison to the control. A similar improvement in egg production of FY birds was found to be 9.36 and 10.49 percent and that in RIR hens was 13.20 and 20.00 percent with 1.0 and 1.5 percent SB, respectively, in comparison to the control. The improvement in egg production of SB supplemented birds was found to be significant. A higher improvement in egg yield was recorded in RIR as compared to FY and WLH chickens. The results indicate that birds fed diets supplemented with SB consumed significantly more feed as compared to that of the control birds. The chickens supplemented with 1.5 percent level of SB had higher feed intake than those supplemented with lower level (1.0 percent). The increase in feed intake was found to be higher in WLH as compared to that of FY and RIR breeds. The results indicated similar improvement in feed conversion ratio (feed/dozen eggs) of SB supplemented birds in comparison to the control (Table 1). A non-significant effect of SB on mortality rate was noticed in all the three breeds.

The results of the present study indicating improvement in egg production and feed intake of birds are in agreement with the findings of Olver (1988) who reported beneficial effect of SB (2 percent level) on egg production and feed consumption in laying chicken. Vaslvev and Mirzaliev (1989) reported 7.1 and 13.0 percent improvement in egg production and feed conversion efficiency of SB supplemented (2.5 percent) hens, respectively, in comparison to the un-supplemented control. Improvement in egg production of the supplemented birds has been suggested to be due to better energy and protein utilization brought about by SB feeding through prolonged feed passage time in the intestinal tract of chickens (Anonymous, 1992). Monks (1992) stated that SB absorbed fluid in the digestive tract of animals thereby making the contents thickened

Table 1: Average egg production, feed intake, FCR and percent mortality of hens fed diet without or with sodium bentonite

Particulars	Breeds	Groups		
		A (Control)	B (1% SB)	C (1.5% SB)
Average egg production (dozen)	WLH	3.33a	3.67b	3.92c
	FY	2.67a	2.92b	3.95c
	RIR	2.50a	2.83b	3.00c
Average feed intake (kg)	WLH	5.88a	6.20b	6.30c
	FY	6.05a	6.06b	6.30c
	RIR	6.44a	6.61b	6.70c
Average feed conversion ratio (Feed/dozen eggs)	WLH	1.77a	1.69b	1.61c
	FY	2.26a	2.08b	2.13c
	RIR	2.57a	2.34b	2.23c
Percent mortality	WLH	2.00a	2.67a	2.67a
	FY	2.00a	2.00a	2.00a
	RIR	1.33a	2.67a	2.00a

Mean with different letters in a row indicate significant difference ($P<0.05$) (values under each group are average of 3 replicates). WLH = White Leghorn; FY = Fayoumi; RIR = Rhode Island Red

and their movement slower in the gut. This allowed more time for the animal to extract the maximum nutrients from the feed. The binding action of SB enabled it to tie up harmful by-products of digestion; heavy metals and mycotoxins were bound irreversibly to it and were not absorbed by the birds. Based on the findings of the present study it may be stated supplementation of poultry rations with 1.5 percent sodium bentonite may improve performance of laying chickens.

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