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해바라기씨앗으로 사육된 병아리의 성장 및 산란계로서의 생산능력에 관한 연구

남기홍
대구대학교 농과대학

A Study on the Performances of Pullets and Subsequent Egg Production with the Substitution of Ground Sunflower Seeds

K.H. Nahm
College of Agriculture, Taegu University

적 요

10주령 병아리를 이용하여 Cage당 10수로 하여 15반복의 시험구를 배치하였다. 10주령까지는 19%의 단백질사료로 사육되었으며 그 후에는 12%의 단백질사료를 이용하여 사육하였다. 대조구는 옥수수와 대두박구로 하고 시험구는 대조구의 대두박 대신 해바라기 씨앗으로 일부(19%) 또는 전부(38%)를 대치하여 19주령까지 사육하였다. 19주령에서 산란계용 cage로 옮긴후 13.5%의 단백질 수준을 유지시켰다.

시험결과에 의하면 해바라기씨앗 첨가구는 19% 대치한 구에서는 전 산란기간을 통하여 난 생산 및 능력이 대조구에 비하여 아무 차이가 없었다. 그러나 38% 대치구에서는 약간의 성성숙 지연이 있었지만 전 산란기간을 통하여 얻어진 시험결과에 의하면 오히려 경제적으로 이익이었다.

I. Introduction

Sunflower production has increased in recent years. Although the main use of this crop is extraction of oil, it's usage is especially important when low protein diets and high fiber contents are desitable. It does not give an adverse effect on later performance of chicks such as commercial laying hens, commercial egg type pullets(10 to 20 weeks of age) and broiler and turkey breeders. Morrison et al.(1953) reported that sunflower seed meal was satisfactory in a chick starter diet if it replaced no more than onethird of the total animal protein mixture. Waldroup et al.(1970) and Chung et al.(1976) indicated that the maximum amount of sunflower meal tolerated by broiler chicks was 12~20% in all mash diets and 30% in pelleted feeds. The use of sunflower meal is the most promising protein diet in laying hens and breading protein diet in laying hens and breading hens. Rose et al.(1972) concluded that sunflower meal protein without adversely affecting laying hen performances. However, 100% replacement resulted in decreased egg production and feed efficiency. The present studies were conducted to compare ground full-fat sunflower seed with soybean meal as dietary protein sources for growing pullets and the effect on subsequent egg production.

II. Materials and Methods

Ground whole sunflower seed(SFS) replaced either

some or all of the soybean meal in the control diet with a 12% protein level. Composition of grower diets and calculated analysis values are shown in Table 1.

Table 1. Composition of grower diets

Ingredients	Treatmet		
	1	2	3
	% of diet		
Yellow corn	80.0	67.0	52.0
Soybean meal	8.0	4.0	—
Ground whole sunflower seeds	—	19.6	38.0
Grease	2.0	—	—
Dehydrated alfalfa	6.0	6.0	6.0
Dicalcium phosphate	2.0	2.0	2.0
Limestone	1.0	1.0	1.0
Salt premix	0.5	0.5	0.5
Vitamin premix	0.5	0.5	0.5
Total	100.0	100.0	100.0
Calculated analysis :			
Cruide protein(%)	12.0	12.0	12.0
M.E.(Kcal/kg)	3153.0	3214.0	3367.0
Ether extract(%)	3.9	9.6	17.2
Crude fiber(%)	3.5	5.8	8.1
Calcium(%)	0.98	0.94	0.96

Young chicken were ged a 19% diet up to 10 weeks og age, and were housed 10 birds per cage(61×41cm) with 15 replications and fed one of the above diets for 9 weeks. At 19 weeks of age the level of protein in the diet was changed to a 13.5% protein layer diet containing mainly oats and a small portion of corn and soybean meal. During the egg production phase of the study an experimental unit consisted of 36 birds replicated six times.

The data was examined using analysis of variance and multiple linear regression by LSD (Steel and Torrie, 1980).

III. Results and Discussion

The complete replacement of soybean meal with SFS resulted in lower weight gain than the control diet or the 19% SFS replacement diet.(Table 2).

Table 2. Effect of ground whole sunflower seeds on weight gain and feed conversion

Varable	Treatment		
	1	2	3
Weight gain(g)	646	639	659*
Feed : gain(ratio)	7.46	7.56	7.70
Body weight(kg)			
19 weeks	1.26	1.25	1.18*
26 weeks	1.55	1.55	1.51
44 weks	1.71	1.71	1.70

* Values different from the corresponding control ($P<0.05$).

However, the 19% replacement of corn-soy by SFS did not affect the weight gain. The results of this study agreeded with those of Klain et al.(1985) and Michel and Sunde(1985). They said a complete replacement of soybean meal with expeller SFM caused a significant decrease in chick performance.

The rate of egg production shown in Table 3 was not affected during the production phase from 26 weeks of age to 53 weeks of age. The other performance of the birds during the egg production phase did not show any significant differences among treatments.

Table 3. Effect of grower diet on performance

Variable	Means of seven 28-day periods		
	Treatments		
	1	2	3
Egg production/day.(g)	50.6	51.1	50.0
Egg weight, (g)	63.2	63.1	63.6
Haugh units	84.4	85.4	86.0
Feed/day, (g)	126	127	128
Feed/dozen, (kg)	1.85	1.84	1.91
Average body wt.,(kg)	1.71	1.71	1.70
Mortality, (%)	4.3	4.9	4.3

From the view of the birds production during its life cycle from 10 weeks of age till 53 weeks of age, there was no adverse effect from the complete replacement of soybean meal with SFM, but it was quite possible beneficial. Deaton et al.(1979) reported that neither body weight change, egg prodcution, egg weight, nor eggshell breaking strength was affected by the 100% replacement of soybean meal with SFM without adversely affecting laying hen performance.

In contrast Rost et. al.(1972) found that 100% replacement of soybean meal with SFM resulted in decreased egg production and feed efficiency.

Ⅳ. SUMMARY

Ten-week-old layer type pullets were used in this study, housed 10 birds per cage(61×41cm) and were replicated 15 times.

After raising them on a 19% protein diet up to ten weeks of age they were fed a 12% protein corn-soy control diet or one with half or all of the soybean meal replaced with ground full-fat sunflower seeds. At 19 weeks of age, pulltes were transferred to a layer house and their respective diet was gradually changed to a 13.5% layer diet containing 63.5% oats.

The 19% protein SFS diet in treatment 2 did not show any, adverse effect on body weight or subsequent egg production. The higher level of SFS(38%) appeared to delay sexual maturity somewhat as was indicated by body weight and egg production data. However, the higher replacemet of soybean with SFS(38%) in the pullet ration may not be critical for sexual maturity, but beneficial in a full laying cycle. There were no adverse effects on later stages of production.

Ⅴ.References

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