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1982

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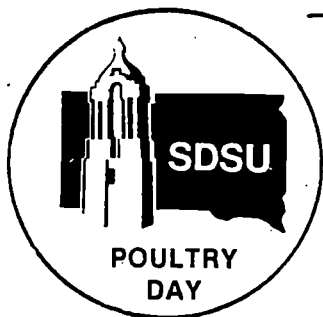
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Kashani, Ali B. and Carlson, C. Wendell, "Sunflowers For Growing Pullets" (1982). *South Dakota Poultry Field Day Proceedings and Research Reports, 1982*. Paper 2.
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SUNFLOWERS FOR GROWING PULLETS

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POULTRY 82-1

South Dakota is the third leading state in the production of sunflowers. Although the primary use of this crop is for extraction of oil, its protein and other nutrient contents make it a suitable ingredient in poultry feed formulation. Growing pullets have been shown (A.S. Series 78-2, POULTRY 80-7) to have relatively low requirements for protein (12% of diet) and also to withstand relatively high fiber contents with no adverse effect on later performance. These characteristics make pullets (10 to 20 weeks of age) appropriate subjects for feeding high levels of full-fat sunflower seeds in their diets.

Ground sunflower seed (containing 16.9% protein, 42% ether extract and 14.6% crude fiber) replaced either half or all of the soybean meal in a 12% corn-soy control diet. A fourth diet of mostly oats was also included as a separate treatment for comparison (Table 1). Ten-week-old layer type pullets previously fed a 19% protein diet were housed 10 birds per cage (61 x 41 cm) and fed one of the above diets for the following nine weeks. Each treatment was replicated 15 times.

As shown in Table 2, pullets fed the diet containing 38% sunflower seeds weighed 77 grams lighter at 19 weeks of age than the controls. This difference proved to be highly significant. Body weights of birds on the 19% sunflower seed or oats diets were comparable to those on the control diet. Feed conversion data showed that the pullets on the high oats diet consumed significantly more feed per unit of gain than those on the control diet, while there was no significant influence from sunflower seeds.

At 19 weeks of age, pullets were transferred to a layer house and their respective diet was gradually changed to a 13.5% protein layer diet containing 63.5% oats. During the egg production phase of the study, an experimental unit consisted of 36 birds replicated six times. Table 3 shows the egg production data by individual periods as well as the overall means. During the 26 to 30 weeks of age period, the pullets that were reared on 38% sunflower seeds produced eggs at 69.9% as compared with 76.6% by pullets reared on the corn-soy diet. However, following the initial 4-week period, the pullets from the different growing treatments showed similar laying performances. Other parameters were not affected by the grower diets (Table 4).

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Therefore, sunflower seeds can constitute 19% of a corn-soy grower diet for pullets with no adverse effect on body weight gain or subsequent egg production. The higher level (38%), however, appeared to delay sexual maturity somewhat as was indicated by body weight and egg production data. This delay in sexual maturity may not be detrimental but quite possibly beneficial in a full laying cycle. There was no adverse effect on later stages of production.

Table 1. Composition of Grower Diets

Ingredient	Treatments			
	1	2	3	4
	(% of Diet)			
Yellow corn	80.0	--	67.0	52.0
Oats	--	87.0	--	--
Soybean meal	8.0	1.0	4.0	--
Ground whole sunflower seeds	--	--	19.0	38.0
Grease	2.0	2.0	--	--
Dehydrated alfalfa	6.0	6.0	6.0	6.0
Dicalcium phosphate	2.0	2.0	2.0	2.0
Limestone	1.0	1.0	1.0	1.0
Salt premix	.5	.5	.5	.5
Vitamin premix	.5	.5	.5	.5
Total	100.0	100.0	100.0	100.0
<u>Calculated analysis</u>				
Crude protein (%)	12.0	12.0	12.0	12.0
M.E. (kcal/kg)	3153.0	2560.0	3214.0	3367.0
Ether extract (%)	3.9	5.9	9.6	17.2
Crude fiber (%)	3.5	10.9	5.8	8.1
Calcium (%)	.98	.94	.94	.96

Table 2. Effects of Sunflower Seeds on Weight Gain and Feed Conversion

	Treatments			
	1	2	3	4
Weight gain (g)	646	656	639	569*
Feed:gain (ratio)	7.46	8.34*	7.56	7.70
Body weight (kg)				
19 weeks	1.26	1.27	1.25	1.18*
26 weeks	1.55	1.58	1.55	1.51
44 weeks	1.71	1.74	1.71	1.70

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

Table 3. Egg Production of Laying Hens as Affected by Previous Grower Diets

Age (weeks)	% Hen-Day Production			
	Treatments			
	1	2	3	4
26-29	76.6	79.9	74.9	69.8**
30-33	83.5	82.6	84.3	82.6
34-37	83.6	84.9	86.6	84.9
38-41	82.9	82.3	83.9	81.9
42-45	81.5	80.9	82.5	79.3
46-49	73.5	74.5	75.2	72.9
50-53	77.8	76.7	77.4	78.8
Means of 7 periods	79.9	80.2	80.9	78.3

** Value different from the corresponding control ($P < 0.01$).

Table 4. Effect of Grower Diet on Performance

	Means of Seven 28-day Periods			
	Treatments			
	1	2	3	4
Egg production/day, g	50.6	50.5	51.1	50.0
Egg weight, g	63.2	63.0	63.1	63.6
Haugh units	84.4	84.9	85.4	86.0
Feed/day, g	126	127	127	128
Feed/dozen, kg	1.85	1.85	1.84	1.91
G egg/100 g feed	40.4	40.2	40.6	39.3
Average body wt., kg	1.71	1.74	1.71	1.70
Mortality, %	4.3	6.5	4.9	4.3