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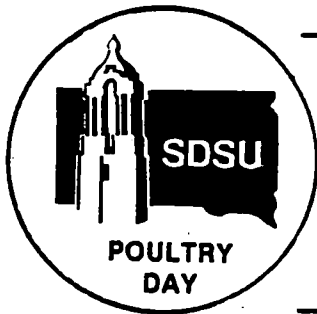
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MEAT AND BONEMEAL WITH VARIOUS
GRAINS FOR EGG PRODUCTION

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A preliminary study with limited numbers of hens indicated that meat and bonemeal provided a better protein supplement for wheat, or equal combinations of corn-oats or corn-oats-wheat than corn or oats alone for egg production. The study presently in progress is a repeat of the previous study with larger numbers of pullets at peak production.

A total of eighty-four 25-week old pullets of a commercial strain were fed one of the six diets shown in Table 1, in an attempt to compare various grains when meat and bonemeal is used as the only protein source. Each treatment was replicated seven times using 12 birds per replicate. The data for the first two 28-day periods are averaged and presented in Table 2.

Similar egg production rates, but significantly lower than that for the control corn-soy diet, were maintained when oats, oats-corn or wheat were used as the cereal grain. Using corn alone with meat and bonemeal further depressed production significantly. The combination of the three grains with meat and bonemeal was similar to the corn-soy diet. Feed consumption was significantly reduced when corn was used with meat and bonemeal. In spite of large mortality variations, differences were not significantly related to treatments.

With the exception of the data for pullets on the oats diet, the early results appear to be quite consistent with the previous experiment. The variation in response to oats relative to that for other treatments could be, in part, related to the adaptability of the younger pullets to the change in fiber and energy contents in their feed. A marked depression in consumption of the oats ration was observed in the first period of the current study which appeared to be adjusted during the second period. Intake of the oats diet in the earlier study did not improve until the fourth period. Whether the improved egg production rate from the oats or wheat based diets relative to that from corn, is related to protein contents of the grains, which resulted in slightly lower requirements for the meat and bonemeal supplement, or to their amino acid profile, remains to be determined. Sulfur amino acids may be borderline.

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Table 1. Composition of Experimental Diets

Ingredient	Treatments					
	1	2	3	4	5	6
	%					
Ground corn	72.0	78.7	--	--	40.0	27.5
Oats	--	--	81.5	--	40.0	27.5
Wheat	--	--	--	84.0	--	27.5
Soybean meal (47% protein)	15.5	--	--	--	--	--
Meat and bonemeal (50% protein)	--	13.3	9.0	6.0	11.0	8.0
Alfalfa meal	2.0	2.0	2.0	2.0	2.0	2.0
Dicalcium phosphate	3.0	.5	1.0	2.0	1.0	1.5
Limestone	6.5	4.5	5.5	5.0	5.5	5.5
Vitamin premix	.5	.5	.5	.5	.5	.5
Salt premix	.5	.5	.5	.5	.5	.5
DL-methionine	--	.09	.09	.11	.09	.09
Lysine	--	.04	--	--	.14	.15
Calculated analysis						
ME, Cal/kg	2850	2947	2313	2880	2675	2731
Crude protein, %	13.8	13.8	13.8	13.8	13.8	13.3
Crude fiber, %	2.4	2.3	9.6	3.1	5.9	5.0
Calcium, %	3.05	3.14	3.22	2.91	3.39	3.19
Phosphorus, %	.86	1.0	.93	1.00	1.00	.97
Lysine, %	.65	.55	.64	.50	.59	.55
Methionine cystine, %	.51	.50	.51	.50	.50	.49
Valine, %	.72	.66	.81	.59	.73	.66
Isoleucine, %	.71	.56	.60	.62	.58	.57
Leucine, %	1.40	1.32	1.05	.89	1.18	1.05
Arginine, %	.96	.87	.98	.73	.92	.82
Tryptophan, %	.18	.12	.16	.11	.14	.13
Threonine, %	.61	.55	.49	.42	.52	.47

Table 2. Effect of Various Grains on Performance of Laying Hens Using Meat and Bonemeal as Protein Supplement

	Treatment					
	1	2	3	4	5	6
Hen-day production, %	87.1 ^a **	63.6	78.2 ^b	80.8 ^b	79.3 ^b	87.2 ^a
Egg wt, g	52.9 ^a **	49.7 ^b	51.6 ^a	49.5 ^b	52.5 ^a	52.6 ^a
Feed/day, g	106 ^{a,b} **	81 ^c	106 ^{a,b}	101 ^{a,b}	100 ^b	110 ^a
G egg/100 g feed	43.7 ^a	39.2 ^{a,b}	38.3 ^b	39.9 ^{a,b}	42.0 ^{a,b}	41.8 ^{a,b}
Mortality	11.9	11.3	--	8.9	1.8	1.8

a,b,c
 Values with different letters in a row differ significantly at P = .10.