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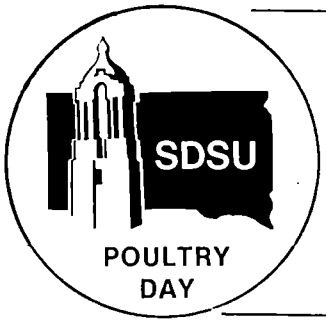

Effect Of Copper And/Or Bacitracin On The Sulphur Amino Acid Requirements Of Turkeys

A. B. Kashani, T. J. DeCock, And C. W. Carlson[1]

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A nonsignificant but consistent depressing effect from additions of combined copper (120 ppm) and zinc bacitracin (50 or 75 g per ton) was observed in a previous study. One of the factors that has been suspected to be affected by copper is the utilization of sulfur containing amino acids. Thus, a factorial experiment was conducted to study the effect of copper (120 ppm) and/or zinc bacitracin (25 g per ton) on the level of sulfur amino acids at 85%, 100% and 115% of NRC (1977) requirements. The low protein density series of Guenthner et al. (1978) was used (23, 20, 18, 16, 14 and 12%). Dietary protein level was reduced at 4-week intervals.

A total of 1200 day-old Nicholas White male poults were randomly distributed into 24 pens initially. The number of turkeys per pen was reduced to 20 birds at 8 weeks of age to allow an additional replicate. Individual weights and group feed consumption data were obtained at 4-week intervals corresponding to changes in the diets.

Table 1 shows the experimental design and average body weight and feed conversions at 8 weeks of age. Slight growth responses from copper or bacitracin were observed. However, the combination of the two feed additives did not produce a response greater than that obtained from either copper or bacitracin alone. The same general trends were observed when 24-week body weight data were examined, although none of the differences were significant (Table 1). Turkeys fed the diet containing 85% of the NRC sulfur amino acid requirements grew as well as those on 100 or 115% levels. Feed conversion ratios were not significantly affected by any of the factors studied.

A current study is in progress to investigate the effect of copper (120 ppm) on lower levels of sulfur amino acids (75, 85 and 100% of NRC requirements). The 8-week body weight data showed a significant depression effect from the copper addition, while the additions of methionine significantly improved body weight (Table 2). The interactions between levels of methionine and copper were not significant.

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Table 1. Effect of copper and/or bacitracin on the sulfur amino acid requirements of turkeys
Experiment 1

	Sulfur amino acid content as percent of NRC			
	85	100	115	Average
	Body Weight at 8 Weeks, Kg			
Control	2.9	2.9	3.0	2.9
Copper (120 ppm)	3.0	3.0	3.0	3.0
Bacitracin (25 g/ton)	3.1	3.2	3.3	3.2
Copper + bacitracin	3.0	3.0	3.0	3.0
Average	3.0	3.0	3.1	3.0
	Cumulative Feed:Gain Ratio (0-8 Weeks)			
Control	1.82	1.85	1.79	1.82
Copper (120 ppm)	1.79	1.83	1.80	1.81
Bacitracin (25 g/ton)	1.80	1.76	1.77	1.78
Copper + bacitracin	1.80	1.80	1.78	1.79
Average	1.80	1.81	1.78	1.80
	Body Weight at 24 Weeks, Kg			
Control	13.8	14.1	14.1	14.0
Copper (120 ppm)	14.5	14.2	14.1	14.3
Bacitracin (25 g/ton)	14.2	14.1	14.1	14.1
Copper + bacitracin	14.2	14.2	14.1	14.2
Average	14.2	14.1	14.1	14.1
	Cumulative Feed:Gain Ratio (8-24 Weeks)			
Control	3.96	3.87	3.83	3.89
Copper (120 ppm)	3.74	3.77	3.91	3.81
Bacitracin (25 g/ton)	3.88	4.10	3.97	3.98
Copper + bacitracin	3.89	3.97	3.93	3.93
Average	3.87	3.93	3.91	3.90

Table 2. Effect of copper on the sulfur amino acid requirements of turkeys
Experiment 2

	Sulfur amino acid content as percent of NRC			
	75	85	100	Average
	Body Weight at 8 Weeks, Kg			
Control	2.78	2.96	3.02	2.92*
Copper (120 ppm)	2.63	2.83	2.94	2.80
Average	2.70[a]	2.89[b]	2.98[c]	2.86

* $P<0.05$.
[a,b,c] Means with different superscripts are significantly different ($P<0.01$).