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SOME EFFECTS OF COPPER AND HIGH AND LOW PROTEIN DIETS ON

AORTIC RUPTURE AND GROWTH OF TURKEYS

E. Guenther¹ and C. W. Carlson²

In other studies using high and low protein diets for growing turkeys, aortic ruptures frequently caused high death losses, particularly among the large type males. Inadequate elastin formation and the resulting lack of strength and elasticity may be contributing factors in aortic failures. The aortic rupture usually occurs in the lower portion of the artery located between the kidneys. Copper and lysine are both involved in elastin synthesis.

Six hundred large and 300 broiler type poults were grown intermingled on four dietary treatments. The treatments were high and low protein corn-soy diets, with and without added copper. During the growing period, the high protein series was adjusted downward from 30% to 14%; the low protein series from 23% to 12%. Copper was added to half of the diets to a level of 120 ppm. The copper content of the other diets averaged 12 ppm. All of the low protein diets were supplemented with lysine and methionine. The broiler turkeys were marketed at 15 weeks and the large turkeys at 24 weeks of age. Results of the experiment are summarized below and in Table 1.

1. The high protein and the high copper treatments increased weight gains for both types of turkeys.
2. The high copper treatment reduced the incidence of aortic ruptures by one half in the large type turkeys. Only one rupture was observed among the broilers.

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3. The posterior portion of the aortas of the broiler turkeys contained 2 to 3 times more elastin than that of the large turkeys.

TABLE 1. EFFECTS OF PROTEIN AND COPPER LEVELS ON GROWTH, AORTIC RUPTURES, AND ELASTIN CONTENT OF THE POSTERIOR AORTAS OF TURKEYS

<u>MARKET WEIGHTS</u>		
	<u>15 Week broiler turkeys</u>	<u>24 Week large turkeys</u>
	kg	kg
High protein and copper	4.6	11.6
High protein	4.4	11.2
Low protein and copper	4.2	11.3
Low protein	4.0	10.0

<u>AORTIC RUPTURES</u>		
	<u>number</u>	<u>number</u>
High protein and copper	--	7
High protein	1	15
Low protein and copper	--	7
Low protein	--	13

<u>POSTERIOR AORTA ELASTIN</u>		
	%	%
High protein and copper	4.2	1.4
High protein	3.8	1.1
Low protein and copper	4.5	1.8
Low protein	3.5	1.6
