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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

Previous work at this Station has indicated that feed costs of growing turkeys may be reduced by using lower protein diets properly supplemented with amino acids. Aortic ruptures frequently cause high death losses, particularly among the heavy type males. Inelasticity of the arteries, resulting from improper elastin formation, is considered a contributing cause to the ruptures. Both copper and lysine are involved in elastin synthesis.

Six hundred Large White male poults were started and grown on corn-soy diets with 4 treatments: high and low levels of protein, with and without added copper. At 15 weeks the flock size was reduced to 4 pens of 30 poults each which were continued on the original treatments to 24 weeks of age.

The high protein series started at 30% protein and was reduced to 14% in 7 diet changes. The low protein series started at 23% protein and was stepped down to 12% in 6 diet changes. Lysine was added to the low protein series to obtain recommended levels. The copper content of the diets, before supplementation, ranged from 9 to 13 ppm. Sufficient copper was added to half of each series of diets to provide 120 ppm copper.

Both treatments, copper and protein, produced significant effects on growth. At 15 weeks, the high protein, and high copper treatments equally increased gains by .6 kg/bird. At 24 weeks, gains were increased .6 kg by high protein, and 1 kg by the high copper treatments. Feed conversion was

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not influenced by levels of protein, and only slightly improved by the high copper treatment.

Based on prices current at the time of the experiment, the ingredient costs of the 30% starter was \$101 per ton, and the 23% starter was \$85. At 15 weeks of age, the 19% grower cost \$75, and the 16% grower \$65 per ton. The costs of the finishing diets, 14% and 12%, were the same, \$55, mainly due to the cost of the extra lysine and methionine used in the low protein diets.

All of the poults that died during the experiment were autopsied to determine cause of death. At the time of slaughter, arteries were removed and analysed for elastin content. The highest number of aortic ruptures and lowest elastin contents were associated with the high protein treatments. The lowest number of ruptures and the highest elastin content of the arteries was associated with the low protein treatment. The effects of the added copper on elastin content was less pronounced than the effects of protein levels.