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R. L. Arnold
South Dakota State University

C. W. Carlson

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CAN SELENIUM INCREASE EGG PRODUCTION?

R. L. Arnold¹ and C. W. Carlson²

Selenium is a mineral element which is found as a natural substance in soil, plants and animals. Although it occurs in relatively small quantities it has frequently been found in toxic amounts in some parts of South Dakota. Recent studies have shown it to be essential and it is being regarded in animal nutrition as a valuable trace element. Other trace elements such as copper and iodine have been shown to be beneficial in animal diets and are routinely added to feeds. In order to study what effects added selenium would have in chicken diets we conducted the following experiment.

Day-old Leghorn chicks were placed in battery brooders and allowed free access to water and experimental diets. Three types of experimental diets were used. The first was a corn-soybean meal diet with selenium salts added to supply selenium at 0, 2 (parts per million), 8 ppm and 8 ppm + 15 ppm arsenic. Arsenic at this level has previously been shown to overcome toxic effects of high levels of selenium. A second type of diet was based on isolated soy protein and glucose with selenium added at 0, 2 ppm, 8 ppm and 8 ppm + 8 ppm arsenic. The third type of diet was a torula yeast-glucose type with selenium added as 0, 0.2 ppm, 2 ppm, 8 ppm and 8 ppm + 8 ppm arsenic. The chicks were maintained on the above levels of selenium throughout their growing and laying periods with adjustments in formulation to meet protein, energy and calcium changes as needed. Pullets were placed in cages at eight weeks of age and maintained in cages for the entire laying period. Feed

¹Graduate Student

²Professor and Leader, Poultry Research and Extension

consumption, egg production, mortality and body weight changes were recorded. The results of the trial are presented in Table 1.

There was a tendency for selenium added at 2 ppm to lower mortality in both the growing and laying periods. Hen lay egg production was increased by adding selenium at 2 ppm (a highly significant increase in the corn-soybean meal diet). However, egg size was slightly reduced with the selenium added at 2 ppm. Further work is needed to establish the most desirable level of selenium to add to chicken diets.

TABLE 1. EFFECTS OF SELENIUM ADDED TO CHICKEN DIETS DURING
GROWING AND LAYING PERIODS

| Treatment | Body Wt. @ 4 Wks. (gms.) | Body Wt. @ 20 Wks. (kg.) | Mortality | | Hen Day Egg Pro- duction | Kg. Feed/ Doz. Eggs | Egg Size (gms.) |
|-------------------------|--------------------------------|--------------------------------|---------------------|----------------------|--------------------------------|------------------------------|-----------------------|
| | | | 0-24 Wks. (%) | 24-64 Wks. (%) | | | |
| Corn-soybean meal | 259 | 1.48 | 3.6 | 17.8 | 61.2 | 2.69 | 55.6 |
| As 1 + 2 ppm Se | 265 | 1.44 | 1.8 | 15.6 | 69.6 | 2.19 | 54.1 |
| As 1 + 8 ppm Se | 249 | 1.48 | 1.8 | 46.7 | 58.0 | 2.90 | 53.6 |
| As 3 + 8 ppm As | 246 | 1.44 | 8.6 | 28.9 | 61.1 | 2.56 | 54.9 |
| Isolated soy-glucose | 192 | 1.41 | 24.6 | 56.8 | 29.2 | 4.65 | 50.2 |
| As 5 + 2 ppm Se | 202 | 1.42 | 17.9 | 51.1 | 32.0 | 4.33 | 51.0 |
| As 5 + 8 ppm Se | 187 | 1.44 | 28.6 | 60.0 | 25.6 | 5.20 | 49.0 |
| As 7 + 8 ppm As | 191 | 1.44 | 25.0 | 57.1 | 24.5 | 5.05 | 49.5 |
| Torula yeast-glucose | 194 | 1.39 | 29.8 | 25.7 | 24.8 | 7.00 | 50.4 |
| As 9 + 0.2 ppm Se | 189 | 1.39 | 25.4 | 23.3 | 20.4 | 7.87 | 50.4 |
| As 9 + 2 ppm Se | 186 | 1.39 | 25.0 | 20.0 | 23.6 | 7.60 | 49.0 |
| As 9 + 8 ppm Se | 179 | 1.34 | 37.3 | 8.6 | 18.9 | 8.83 | 48.3 |
| As 12 + 8 ppm As | 172 | 1.34 | 32.4 | 28.9 | 18.7 | 8.92 | 48.2 |