common salt than groups I and II, which in turn should have increased their water consumption, resulting in an increase of plasma per unit of live weight. The plasma volume observed in this study is lower than previously reported for cattle by Hansard *et al.* (18) and agreed more closely with the value obtained by Reynolds (31).

Serum Protein and Blood Creatinine.—There was essentially no change in serum protein in groups I and II of the yearling heifers, but group III decreased from 7.0 to 6.3 percent, and group IV declined from 6.7 to 5.4 percent (Table 11). Groups III and IV had lower ($P<.01$) serum protein content than groups I and II. While there was no difference between groups I and II, group IV was lower ($P<.01$) than group III. There was an overall decrease ($P<.01$) in serum protein during the later periods; this decrease occurred primarily in groups III and IV. In the two-year-old heifers, groups I and II had higher ($P<.01$) values than groups III and IV.

A prolonged protein deficiency in other species has been shown to induce anemia and leukopenia because the hemopoietic organs are deprived of the amino acids necessary for cell formation and hemoglobin production (Yamamoto, 37, and Whipple and Madden, 35). The yearling heifers in this study showed a decrease of 30 percent in hemoglobin concentration and only 20 percent in serum protein.

Blood creatinine values were determined on the yearling heifers at each bleeding. The average values at slaughter of all heifers varied from 1.4 to 1.6 mg per 100 ml of whole blood, and they were not influenced by protein intake or periods. In these studies a marked decline in the serum protein concentration occurred without an increase in the creatinine level of whole blood.

Serum Albumin and Globulin.—The yearling heifers in group IV had less ($P<.01$) albumin in the serum than heifers in the other three dietary groups. The initial concentration of 3.2 percent in group IV decreased to 2.3 and 2.9 percent at the fifth and final periods, respectively (Table 11). For some unexplained reason, the overall values for the first and second periods were higher ($P<.01$) than those for the initial, third, and subsequent periods. Likewise, the concentrations of serum albumin observed in groups I and II of the two-year-old heifers were higher ($P<.01$) than those observed in group IV. There were no significant differences among the albumin concentrations of