
Abstract
1. The synthesis, both in vivo and in vitro, of various steroid hormones in the adrenals, testes and ovaries of rats was compared at various stages of vitamin A deficiency with the corresponding pair-fed controls.
2. The enzymic conversion of the Delta(5)-3beta-hydroxy steroids into the corresponding Delta(4)-3-oxo steroids was significantly decreased in these tissues even at the mild-deficiency stage, further loss taking place on prolonging the deficiency. 3. In all three tissues the loss in the production of androstenedione from dehydroepiandrosterone could be reactivated in vitro by retinol or retinoic acid, but only at the mild stage of the deficiency. 4. Of the various lipoidal materials tried, retinal, retinol, retinoic acid, alpha-tocopherol acetate, menadione, calciferol, lecithin, palmitic acid and cholesterol, only retinol and retinoic acid restored the lost activity. 5. Intraperitoneal injection of retinal, retinol or retinoic acid into the deficient rats, 24hr. before they were killed, corrected the effect of the deficiency on this reaction. 6. Vitamin A deficiency markedly affected the synthesis of deoxycorticosterone and corticosterone from pregnenolone in the adrenals of rats, even at the mildly deficient stage, with further loss taking place at the acute stage; in vitro, retinol or retinoic acid could restore the loss at the mild-deficiency but not at the acute-deficiency stage. 7. The deficiency had no such effect on the synthesis of deoxycorticosterone from progesterone or of corticosterone from progesterone or deoxycorticosterone. 8. Compared with the pair-fed normals, the adrenals of deficient rats contained smaller amounts of deoxycorticosterone and corticosterone.