ABSTRACT

(1) The effect of feeding a relatively low-protein diet containing 0.06 % DAB for 29 weeks on the activity of DAB-azoreductase, nitroreductase (p-nitrobenzoic acid), N-oxidase (N,N-dimethylaniline), N-demethylase (DAB), cytochrome P-450, NADPH-cytochrome c reductase, β-glucuronidase and arylsulphatase A were studied. Rapid decreases occurred in the activities of the first six enzymes, reaching minimal values at between 4 and 8 weeks. Activities then increased in all cases to control or nearly control levels. This rate of increase was least for cytochrome P-450. At 4 weeks azoreductase activity with the chemotherapeutic agent CB10-252 (I) as substrate was significantly higher than in control rats. Early increases occurred in the activities of β-glucuronidase and arylsulphatase A and the activity of the latter never dropped below the control level.

(2) An investigation was made of the differential effects of dye feeding on some of the enzyme activities in the two major liver lobes and differences were found.

(3) The effect of phenobarbital (PB) pretreatment on the DAB-fed rats was studied at 4-week intervals. The activities of DAB-azoreductase and of nitroreductase increased throughout the whole period, while the activities of the lysosomal enzymes were decreased.

(4) After feeding DAB for 4 weeks the effect of PB and 3-methylcholanthrene (MC) on the activities of DAB-azoreductase, CB1O-252-azoreductase and components of the azoreductases δ cytochrome P-450, NADPH-cytochrome c reductase, the CO-sensitive pathway and the NADH-dependent pathway were studied. The activity of CB1O-252-azoreductase was not induced by PB or MC, and CO did not inhibit its reduction. Its reduction depended only slightly on NADH. CO caused a greater relative decrease in the activity of DAB-azoreductase in dye-fed animals and also in animals following PB and MC pretreatment, implying a greater role of cytochrome P-450 in dye-fed animals.