

## HEPATIC REDOX STATE IN THE CAT

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Cats have relatively little ability to alter the activities of liver enzymes which regulate nitrogen metabolism, gluconeogenesis and lipogenesis (Rogers et al. 1977). Since the main consideration in controlling gluconeogenesis is the balance between the concentrations of metabolites of non-equilibrium reactions and of the redox state of the cellular compartments, we investigated the influence of low protein/high carbohydrate and high protein/carbohydrate-free diets on the hepatic redox state in the cat.

Two groups of cats (1250 g body weight) were fed either a 17.5% soy-protein (51% carbohydrate) or a 70% soy-protein (carbohydrate-free) diet (Rogers et al. 1977). Animals were fasted 16 h prior to "Saffan" anaesthesia after which the liver was perfused for 1 min with 0.15 M ice cold NaCl and then a portion rapidly removed and freeze clamped in liquid nitrogen. The perchloric acid extract was neutralised with 0.5 M triethanolamine-HCl containing 2 M KOH and assays for lactate, pyruvate, malate,  $\beta$ -OH butyrate and acetoacetate conducted. The oxaloacetate concentration and  $[NAD^+]/[NADH]$  ratios were calculated (Hohorst et al. 1959; Williamson et al. 1962).

Each value is the mean of four cats (except for malate and oxaloacetate which are mean values from three cats) and the results are shown in the table below. Concentrations are expressed as  $\mu\text{mol/g}$  fresh wt of liver.

	Lact- ate	Pyr- uvate	$\beta$ -OH- butyrate	Aceto- acetate	Mal- ate	Oxalo- acetate	$[NAD^+]/[NADH]$ cyto- mito- plasm chondria	
Low Protein	0.50	0.09	0.11	0.06	0.41	0.02	1683	10.8
High Protein	0.64	0.10	0.11	0.07	0.54	0.02	1578	13.0
SE	0.12	0.02	0.02	0.02	0.07	-	327	2.6

Neither metabolite concentration nor redox state differed significantly between the two diets. However, when compared to either rat or guinea pig, the cat showed a higher concentration of oxaloacetate and a more oxidised cytoplasmic  $[NAD^+]/[NADH]$  ratio, the latter of which favours phosphoenolpyruvate formation. These features would be of advantage to the cat since it is dependent on gluconeogenesis from amino acids to meet its glucose needs.

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