Metabolism of Ammonium Acetate In Various Animals

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Nitrogenous wastes are handled differently among animals. The major portion is excreted as urea in mammals, and the products of purine catabolism are excreted as uric acid in man and allantoin in most mammals. Birds excrete most of their nitrogenous wastes as uric acid.

We have explored the ammonium acetate tolerance of the chicken, cormorant (with the cooperation of Dr. Schmidt-Neilsen), the rabbit, and the dog-fish (with the cooperation of Dr. Burger). The dosage producing death in about 30 minutes by the intravenous route is surprisingly similar for these animals, ranging from 0.08 meq/kg/minute for the rabbit, 0.20 meq/kg/minute for the chicken, 0.30 for the cormorant and 0.40 for the dog-fish. These animals all convulsed before dying. By infusion into the hepatic portal, the rabbit and the cormorant tolerated about twice the intravenous rate of infusion for 30 minutes. The relationship of the rate of infusion of ammonium acetate to tolerance by various routes of administration will be worked out in more detail.

Another aspect of this study is based on the fact that the bird presumably converts its excess ammonia largely into uric acid, and it may be possible to markedly increase purine synthesis by infusing or feeding the ammonium acetate. This may provide an important system for study, since antimetabolites which interfere with the *de novo* purine synthesis, such as DON, azaserine, or the folic acid antagonists, may cause blocks in the pathways of uric acid synthesis with the appearance of abnormal metabolites in the urine. The young cormorant produces about 7,000 mg. of uric acid/kg/day which is about 10 times that produced by man (the actual production in man is in the range of 10 to 20 mg/kg/day). The effect of feeding or infusing ammonia or glycine on uric acid production will be studied.

Studies of Trimethylamine Oxide Excretion In The Dogfish. II. The Maintenance of Trimethylamine Oxide (TMAO) Plasma Levels In Dogfish (*Squalus acanthias*) in Captivity.

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Little is known about the origin of TMAO in the dogfish. Elasmobranchs in general have relatively high plasma and tissue con-

centrations of this nitrogenous compound. Teleosts, on the other hand, have very low plasma and tissue concentrations of TMAO. In a teleost (the salmon) Benoit (1945) has shown that TMAO is exogenous in origin: TMAO was found in tissue only after food containing TMAO was fed. No data are available for the origin of TMAO in elasmobranchs.

A preliminary experiment was done to determine the constancy of the TMAO in the dogfish plasma. Five freshly caught dogfish in good condition were placed in a live car. Small blood samples were drawn at weekly intervals. It is presumed that no food was available to these fish in captivity. Of the 5 dogfish, one survived 14 days; one, 28 days; two, 34 days; and one was still alive at the end of the summer, 41 days after capture. All fish showed gross evidence of weight loss, but no accurate measurements of weight changes were made. There was no marked change in the plasma (TMAO) during captivity. The surviving fish maintained a mean plasma concentration of 76 ± 4 μMol/ml. This compares well with a mean plasma (TMAO) of 74 ± 2 μMol/ml. in 23 freshly caught dogfish.

It should be noted that if the kidney is the only route of TMAO excretion in the dogfish, and assuming a maximum loss of 10% of the total amount of TMAO filtered, a maximum of 20-25% of the estimated total TMAO in the dogfish could have been lost. The muscle of dogfish has been reported (Benoit) to contain 140 μMol. TMAO/Gm. and thus might serve as a reservoir for TMAO lost from the plasma during this period of starvation.

This study was carried out in a laboratory maintained by the New York University College of Medicine.

The Effect of Phlorozin on the Oxidative Metabolism of Certain Fish Kidneys

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Studies have previously shown that phlorizin profoundly depresses the oxidative metabolism of rat and guinea pig homogenates. This compound, however, did not effect oxidative metabolism of kidney homogenates of flounder, goosefish and dogfish.

The Secretion of Hypertonic Salt Solutions In Marine Birds

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It has often been suggested that marine birds must drink sea water in order to cover their normal needs for water. This problem was investigated, using young cormorants as experimental animals.