A COMPARATIVE NUTRIENT ANALYSIS OF FISH SPECIES CONSUMED BY MANAGED AND FREE-RANGING COMMON BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATES*) WITH RESPECT TO AMMONIUM URATE NEPHROLITHIASIS

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Abstract
Ammonium urate nephroliths develop in common bottlenose dolphins (*Tursiops truncatus*) managed under human care, but do not occur in free-ranging dolphins (Smith et al., 2013). In mammals, urate urolith development has been attributed partly to the effect of diet on urine saturation and pH. Free-ranging and collection dolphins consume diets that differ in fish species variety, location, and fresh versus processed states. The proximate analysis and mineral content were measured in eight fresh frozen fish species (n=5) commonly consumed by free-ranging dolphins and seven stored frozen species commonly fed to collection dolphins. Metabolizable energy (ME) was calculated using Atwater factors. The dietary cation-anion difference (DCAD) was calculated as $(Na^{+} + K^{+} + Ca^{2+} + Mg^{2+}) - (Cl^{-} + P^{1.8-} + S^{2-}$;Frassetto et al., 1998). Nutrient concentrations relative to ME were compared among all fish species and between free-ranging and collection diet species. All nutrient concentrations differed ($P < 0.0001$) among all fish species. Concentrations of calcium, phosphorous, and DCAD were higher and chloride was lower in the free-ranging species ($P < 0.05$). The free-ranging species DCAD was positive (94 mEq/Mcal), whereas the collection species DCAD was negative (-70 mEq/Mcal). Thus, collection dolphins may have to excrete more anions, resulting in a more acidic urine. These nutrient differences may increase ammonia excretion in the urine and contribute to ammonium urate nephrolith formation in dolphins managed under human care.

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Literature Cited
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