
NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY METABOLIC PROFILES TO DISTINGUISH GEOGRAPHICALLY ISOLATED POPULATIONS OF MOUNTAIN GOATS

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Basic physiological studies on mountain goats (*Oreamnos americanus*) are conspicuously lacking in the literature, and the physiology of this species is perhaps the least known of the high mountain ungulates. The objective of this study was to evaluate metabolic profiles of female mountain goats from five geographically distinct populations using Nuclear Magnetic Resonance (NMR) spectroscopy. Serum samples were collected from nannies located in Alaska in September (AK) from Glacier in August (GMT), from the Grand Tetons in November-December (GT), from NE Yellowstone in December (NEY) and from Absaroka in March (AB). Serum was extracted with acetone, dried and re-suspended in a standard NMR buffer. NMR spectra were analyzed with Chenomix™ software. Metabolites were identified and concentrations determined using the Chenomix™ database and the Human Metabolome Database. We identified 55 metabolites in the serum of mountain goats using this emerging technology. Of these 42 metabolites differed among the herds ($P < 0.05$). Of these 42 metabolites; creatinine, lactate and pyruvate distinguished ($P < 0.05$) each herd from another. Furthermore, using Principal Component Analyses of these metabolites allowed us to clearly differentiate metabolic profiles in carbohydrate, protein and lipid metabolism in nannies from these five populations. This study has the potential to enhance our understanding of how changes in nutrition, reproduction, susceptibility to disease, and survival rates drive population dynamics.