NUTRITIONAL ECOLOGY OF NORTH AMERICAN BEARS

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North American brown (*Ursus arctos*) and black bears (*U. americanus*) are well known for undergoing major seasonal physiological and nutritional cycles. These cycles can include switching from herbivory to carnivory, from ingesting diets with minimal protein (e.g., fruit) to diets that are primarily protein (e.g., meat), from fasting during the 5 or 6 months of hibernation to daily food intakes as high as 40% of body weight, and therefore from losing as much as one-third of their body weight during hibernation to gaining more than 5 kg/day during fall hyperphagia. Understanding this physiological flexibility has broad implications for captive and wild bear management. The size of either sex of wild adult brown bears can vary at least 2-fold depending on the energy content and rate of intake of the available foods. Wild berries and vegetation will virtually always produce small bears because of either their low digestibility or small, dispersed bite size. Abundant salmon, garbage, nuts, or other high energy, readily available foods (i.e., the diets fed in captivity) can produce very large, fat bears. Fat accumulation and energy expenditure in bears are flexible and sensitive to both diet composition and level of intake. Bear weights and fat content are difficult to control in captivity as natural selection has long favored large size and fatness and keepers have minimal incentive to restrict intake. For example, cubs produced in the wild by fat mothers are born earlier, grow faster, and survive better once they exit the den than those produced by lean mothers. While many zoos choose not to hibernate their bears, hibernation in bears is a natural phenomena and once understood can be utilized by zoos to instill natural, annual weight cycles in their bears.

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