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EFFECTS OF FEED RESTRICTION ON LIPID DYNAMICS AND REPRODUCTION IN NORTHERN BOBWHITES

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ABSTRACT

High annual and prenesting mortality rates (0.46–0.95) in northern bobwhites (*Colinus virginianus*) compel these birds to devote extraordinary effort and resources to reproduction. Bobwhites exhibit reproductive behavior characteristic of rapid multi-clutch and ambisexual polygamous mating systems. To better understand the physiological basis of the bobwhite's high reproductive capacity, we studied effects of restricted food intake on lean mass, lipids, and egg laying. We fed 48 bobwhites 3 levels of food intake including ad libitum (100%), and 60% and 80% of ad libitum. After 15 weeks of this protocol, we switched treatments for 50% of the birds in each treatment.

Lipid levels were similar for 60% and 80% groups, but significantly greater for the 100% group. Egg laying was markedly depressed and delayed in food-restricted groups. Comparing quail in the 60% and 80% groups, the latter appeared to catabolize body lipids in order to lay eggs. Egg production rates (eggs bird⁻¹ day⁻¹) were 0.7 for 100% quail, 0.18 for 80% quail, and 0.03 for 60% quail. After switching treatments, subgroups allotted ad libitum food quickly recovered. The 60% and 80% subgroups reached constant egg production (0.6–0.7 eggs bird⁻¹ day⁻¹), and with lean mass and lipid levels (9.8%–13.9% of wet body mass) within 10 days of ad libitum feeding. We discuss partitioning of endogenous reserves for reproduction and importance of exogenous energy in quail ecology.

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