

FEATURE ARTICLES

NUTRITIONAL CONDITION OF PACIFIC BLACK BRANT WINTERING AT THE EXTREMES OF THEIR RANGE

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Abstract. Endogenous stores of energy allow birds to survive periods of severe weather and food shortage during winter. We documented changes in lipid, protein, moisture, and ash in body tissues of adult female Pacific Black Brant (*Branta bernicla nigricans*) and modeled the energetic costs of wintering. Birds were collected at the extremes of their winter range, in Alaska and Baja California, Mexico. Body lipids decreased over winter for birds in Alaska but increased for those in Baja California. Conversely, body protein increased over winter for Brant in Alaska and remained stable for birds in Baja California. Lipid stores likely fuel migration for Brant wintering in Baja California and ensure winter survival for those in Alaska. Increases in body protein may support earlier reproduction for Brant in Alaska. Predicted energy demands were similar between sites during late winter but avenues of expenditure were different. Birds in Baja California spent more energy on lipid synthesis while those in Alaska incurred higher thermoregulatory costs. Estimated daily intake rates of eelgrass were similar between sites in early winter; however, feeding time was more constrained in Alaska because of high tides and short photoperiods. Despite differences in energetic costs and foraging time, Brant wintering at both sites appeared to be in good condition. We suggest that wintering in Alaska may be more advantageous than long-distance migration if winter survival is similar between sites and constraints on foraging time do not impair body condition.

Key words: body composition, energy storage, geese, lipid, protein, winter.