

Abstract

Doubly labelled water method is used to estimate CO₂ production and energy expenditure. The method is based on the application of water containing rare hydrogen and oxygen isotopes, and estimation of the difference in elimination of these isotopes from the body (used as an indirect estimate of CO₂ production), which is measured mostly from two blood samples taken over a defined time interval (usually 24 hours). Here I summarize the assumptions and methodological approaches associated with the use of the doubly labelled water method in bird studies. Studies on birds typically evaluate energy expenditure associated with parasitic infections and immune response, ageing, investments into the reproduction, flight and migration, ornamentation. In comparison with other methods doubly labelled water is appropriate for measurement of energy expenditure associated with various aspects of biology in targeted individuals.

Key words: Doubly labelled water, energy expenditure, metabolism, birds, reproductive investments, flight costs