



Effect Of Egg Size On Heat Production And The Transition Of Energy From Egg To Hatchling

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Abstract

An experiment was conducted to study the effect of egg size on embryo development, heat production, and energy partitioning between egg and hatchling. Small (56.1 +/- 0.12 g SEM) and large (70.0 +/- 0.11 g SEM) hatching eggs were incubated in climate respiration chambers, and eggshell temperature was maintained constant at 37.8 degrees °C in both egg weight classes by adjusting machine temperature. Dry matter, ash, protein, and fat contents were determined in albumen, yolk, yolk-free body (YFB), and residual yolk (RY), and carbohydrate contents and caloric values were calculated. To achieve a constant eggshell temperature, machine temperature needed to be set lower from d 15 onward, coinciding with increased heat production in large eggs compared with small eggs. Selective nutrient uptake resulted in higher fat content and lower protein content in RY in chicks that hatched from small eggs compared with large eggs. The respiration quotient in small and large eggs was the same, and embryos in small and large eggs were equally efficient in the transfer of energy from egg to YFB. The surplus availability of nutrients in large eggs was therefore held responsible for the absolute and relative higher weight of RY in chicks that hatched from large eggs compared with small eggs.

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