

ONTOGENY OF THERMOREGULATION AND ENERGY METABOLISM  
IN PENGUIN CHICKS

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The ontogeny of thermoregulation, energy metabolism, and body insulation of chinstrap (*Pygoscelis antarctica*) and gentoo (*P. papua*) penguins were studied in Antarctica.

The chicks of both species hatched completely poikilothermic, due to their poor heat production ability at low ambient temperatures. Newly hatched chinstrap chicks had, at a specified ambient temperature, significantly higher metabolic rates and higher body temperature than newly hatched gentoos. It is suggested that this is a non-acclimatory metabolic adaptation of chinstrap penguin chicks to the lower mean temperatures of their breeding areas. The chicks achieved homeothermy on 10—15th day after hatching, but, in spite of their high thermogenic capacity at that time, they were not capable of controlling heat dissipation, and were still dependent on their parents' brooding. Older homeothermic chicks were very cold-resistant; they had their thermoneutral zones up to 25°C wide, with lower critical temperature as low as -15°C. The down of the chicks provided good insulation even in wind and the insulation of feathers increased in wind. In spite of harsh climate these chicks live in thermoneutrality.