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### UPPER THERMAL LIMITS OF CARDIAC FUNCTION FOR ARCTIC COD BOREOGADUS SAIDA - A KEY FOOD WEB FISH SPECIES IN THE ARCTIC OCEAN

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The objective of this study was to determine the upper thermal limits of Arctic cod *Boreogadus saida* by measuring the response of maximum heart rate ( $f_{Hmax}$ ) to acute warming. One set of fish were tested in a field laboratory in Cambridge Bay (CB), Nunavut (north of the Arctic Circle) and a second set were tested after air transport to and 6 month temperature acclimation at the Vancouver Aquarium (VA) laboratory. In both sets of tests, with 0°C-acclimated *B. saida*,  $f_{Hmax}$  increased during acute warming up to temperatures considerably higher than the acclimation temperature and the near-freezing Arctic temperatures in which they are routinely found. These results suggest that factors, other than thermal tolerance and associated cardiac performance may influence the realized distribution of *B. saida* within the Arctic Circle.

This study demonstrated the practicality of using a relatively fast, field-friendly experimental technique for the first time in an Arctic field location to provide novel data on the optimum temperature of a key food web fish species, *B. saida*. This technique provided information on transition temperature that may have biological relevance and that preceded the collapse of the cardiac life support system at the point when the heart becomes arrhythmic ( $T_{arr}$ ). The relatively high temperature tolerance was a surprising discovery for *B. saida*, a species that inhabits cold, near-freezing waters.

Data will also be presented to address the question of whether or not *B. saida* can thermally acclimate to warmer temperatures.