Scientific Paper:

Polar Biol 30, 95-107, 2006

Temperature-dependent energy allocation to growth in Antarctic and boreal eelpout (Zoarcidae)

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Abstract:

Antarctic fishes display slower annual growth rates than congeneric species from temperate zones. For an analysis of growth in relation to energy turnover, body composition was analysed in two benthic fish species to establish a whole animal energy budget. The Antarctic eelpout, *Pachycara brachycephalum*, was maintained at 0, 2, 4 and 6°C and the boreal eelpout, *Zoarces viviparus* at 4, 6, 12 and 18°C. At maximum food supply the weight gain was highest for *P. brachycephalum* at 4°C. Routine metabolic rate in acclimated Antarctic eelpouts did not differ between temperatures, whereas in *Z. viviparus* maximized growth benefited from a reduction of metabolic energy demands at 12°C. The lipid content of liver declined with increasing temperature in both species. The thermal window for growth is based on food conversion efficiency and the level of metabolic energy demand and is limited according to the level of aerobic scope available between pejus temperatures.