EFFECTS OF TEMPERATURE ON REARING JUVENILE SALTWATER CROCODILES

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Rearing hatchling saltwater crocodiles *(Crocodylus porosus)* under controlled environmental conditions can result in very rapid growth rates, with healthy animals doubling in bodyweight approximately every 3 months. Thus, an animal which hatches at 60 g generally grows to over 1 kg within a year. Rapid early growth generally predisposes an animal to good health and continued high growth rates in subsequent years, so it is important for crocodile farmers to devote special care and resources to their juvenile stock. Temperature is regarded as an important environmental variable affecting growth. A study on the effects of temperatures between 30 and 34°C (Webb *et al.* 1990) on growth of crocodiles between hatching and 1 month of age indicated that 32°C was optimal at each of 2 feeding regimens.

An experiment was set up in a specially built crocodile research facility in Townsville to measure the effects of a range of air and water temperatures on growth of *C. porosus* in the age period 2 to 3.5 months.

The research facility consisted of 6 fully insulated rooms, each containing 2 crocodile rearing tanks (3m by 1.3m floor area), the floors being equally divided into water and land areas. Air temperatures could be maintained within 1°C of pre-set levels by means of air-conditioning units in each room, and water temperatures could be varied independently in the 12 research tanks. Different light regimens (intensity, cycles) could be imposed in the separate rooms, and radio speakers (connected to a single radio unit) were set up in each room to condition the animals to a constant level of noise.

Temperature treatments consisted of 6 air/water combinations (28/26, 28/30, 30/28, 30/32, 32/30, 32/34°C). A randomised block design was used with 3 clutches of crocodiles constituting each replicate. Within a block there was balanced representation in each tank from the 3 clutches (since clutches can vary considerably in response). In order to accommodate such balance, -1 tank was reserved for 'left-over' animals. Hence, treatment 32/34°C was replicated only once. Animals were fed 5 days a week on a diet consisting of equal proportions of minced chicken heads, kangaroo and beef, fortified with a special vitamin/mineral supplement for crocodiles, with a fasting period over 2 consecutive days. Average initial liveweight per animal in the tanks ranged from 111 g to 121 g.

Regression analysis of percentage weight change over a 6 week period showed no response to air temperature variation (around each water temperature) but a clear response to water temperature. Final average liveweights ranged from 147g (26°C water) to 210g (34°C water). The graph shows the response, with points representing average tank values.

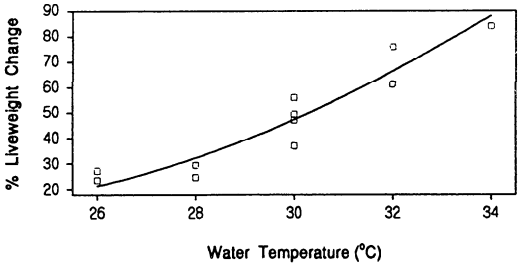

Figure 1. Liveweight changes in tanks held at different water temperatures

Feed conversion ratios (liveweight gain as a percentage of food eaten, on a wet weight basis) were estimated for each tank and ranged from 10% at the lower water temperatures to over 20% at 34°C.

These results demonstrate that growth and food conversion of juvenile crocodiles improved as water temperature increased from 26 to 34°C. More research needs to be done at higher temperatures and at different animal ages.

WEBB, G.J.W., MANOLIS, S.C., and COOPER-PRESTON, H. (1990). Proceedings of the tenth working meeting of the IUCN Crocodile Specialist Group, Florida, pp. 254-73.