

ENERGETIC REQUIREMENTS FOR MAINTENANCE OF A CAPTIVE JUVENILE
GREAT WHITE PELICAN *PELECANUS ONOCROTALUS*

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INTRODUCTION

Energetic requirements for maintenance have not been published for any species of pelican and for only one member of the order Pelecaniformes : the Cape Gannet *Sula capensis* (Cooper 1978). This note describes energetic requirements for maintenance of the Great White Pelican *Pelecanus onocrotalus*.

METHODS

A handreared juvenile Great White Pelican aged approximately six months (C.J. Clinning *in litt.*) was used in the experiment. The bird was fed exclusively on a diet of rockfish *Clinus superciliosus*, with a multivitamin and mineral supplement, at a level to maintain constant mass for a period of six days during July 1977. The pelican was weighed each day before being fed and was fed twice daily : at *ca.* 11h00 and *ca.* 17h30, times similar to peak foraging times in the wild in the southwestern Cape, South Africa (pers.obs.). Mass of each meal was recorded. The pelican varied little in mass during the period July - August 1977 and it is thus considered that the six day experiment is representative of the bird's energy requirements during that period.

The bird was kept out-of-doors but protected from wind, rain and direct insolation. During the experiment the bird was confined to a small cage which allowed standing or sitting only. The cage, fitted with a wire mesh floor, was suspended over a weighed aluminium foil tray which was changed daily. The dry mass of guano produced each day was obtained by drying the foil trays and their contents to constant mass in a forced-draught oven set at 50°C. Samples of the fish were analysed for water content using the same drying regime. Portions of oven-dried food and guano were analysed for energy content using a Gallenkamp ballistic bomb calorimeter. The technique is similar to that used previously (Cooper 1977, 1978).

RESULTS

Results obtained are given in Table 1. The juvenile Great White Pelican was maintained at a constant mass when fed an average of 1 258 g of fish per day or 14,1 % of body mass. Day-to-day fluctuations in food intake are a well known characteristic of carnivorous birds (e.g. Siegfried 1969), accounting for the large range observed. Mean assimilation efficiency was 73,0 %. These figures are similar to those obtained for the Cape Gannet (food intake 12,4 % of body mass with an assimilation efficiency of 72,4 %), and for several other piscivores (Cooper 1978).

DISCUSSION

There are a few published estimates for food intakes of Pelicans. Berry *et al.* (1973) fed a captive Great White Pelican weighing

10 kg, 1 000 g of Pilchards *Sardinops ocellata* or 10 % of body mass. Pilchards are oily fish and have a higher energy content than the fish used in this study. Brown & Urban (1969) cite a food intake of 11 % of body mass for the Dalmation Pelican *P. crispus*, and 5 - 22 % for Great White Pelicans in captivity. A captive adult Brown Pelican *P. occidentalis* consumed 17,5 % of body mass during a period when it undertook a complete moult (Schreiber 1976). Juvenile handreared Brown Pelicans were maintained at 16,1 - 17,3 % of body mass (Schreiber 1976). These birds were allowed to walk about in cages, perhaps explaining the slightly higher figures obtained when compared with that for the juvenile Great White Pelican.

The calculated standard metabolic rate (SMR) of a Great White Pelican weighing 8,9 kg is 1 592 kJ/day (Lasiewski & Dawson 1967). The captive pelican metabolized energy at a mean rate of 3 143 kJ/day (Table 1) or 2,0 x SMR. Captive juvenile Cape Gannets metabolized energy at 2,4 x SMR (Cooper 1978). It is considered that the figure obtained (2,4 x SMR) can be equated to that for roosting in the wild when pelicans either sit or stand (pers.obs.) - the two activities allowed the captive bird.

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TABLE 1
 MASS, FOOD AND ENERGY INTAKE, GUANO AND ENERGY EXCRETED, METABOLIZED ENERGY AND ASSIMILATION
 EFFICIENCY OF A CAPTIVE JUVENILE GREAT WHITE PELICAN

	Mass (g)	Food intake wet mass (g/day)	Estimated energy intake (kJ/day)	Guano excreted dry mass (g/day)	Energy excreted (kJ/day)	Metabolized energy (kJ/day)	Assimilation efficiency (%)
Mean	8 900	1 258	4 278	162	1 136	3 143	73,0
Standard deviation	100	244	827	22	191	747	4,7
Range	8 800 - 9 000	860 - 1 520	2 924 - 5 168	131 - 189	872 - 1 372		
No. of observations	5	6	6	6	6	6	6