

Marine Turtle Research

at the Hawaii Institute of Marine Biology

by

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Marine turtles are air breathing reptiles which spend their entire life in the ocean except for several hours at nesting time. Once every 2 to 4 years mature adults migrate to nesting beaches where the female leaves the water to deposit and bury a clutch of 100 or more soft shelled eggs in the sand, not only at one but on as many as 4 recurring times within the same season. Because marine turtles have many valuable products (e.g. meat, shell, "calipee" for soup, oil and leather) and because these animals are extremely susceptible to capture and predation while on the nesting beaches, they have been over-exploited in most areas of the world. In addition, harvesting on the grazing pastures where the animals spend the greater part of their life has also helped to reduce populations.

The resurgence of a demand for turtle products in recent years, particularly turtle soup, has increased the fears of concerned scientists and citizens about the continued existence of these animals. Of the five kinds of turtles, two (Hawksbill and Leatherback) are now officially recognized as endangered species and the other three (Green, Loggerhead and Ridley) are considered to be threatened. Dr. Archie Carr, the world's foremost authority on marine turtles, has stated "If things are left as they are, the commercial sea turtle industry seems certain to go on cynically mining to exhaustion its sources of supply".

Farming or culture of marine turtles has been suggested as a means of meeting the commercial demands and at the same time preserving the species in its natural environment. As an aquaculture organism, marine turtles offer several advantages. In addition to having a high dressing percentage of useable products, the eggs are quite large and the young are hatched fully developed and ready to accept food. This is in contrast to most fish and crustacea which pass through a number of complex larval stages before reaching adult form. Turtle farm projects presently underway include a large privately owned endeavor in the Caribbean and a native operated village project in Australia.

Superficially the immediate implementation of commercial turtle farming seems logical, however, many basic problems need to be solved before such plans will do anything but further endanger the animal's already precarious position. The new markets for turtle products that such farms spawn will be difficult if not impossible to satisfy and the greater demand would further increase the pressure on natural stocks. As it was for many fishes just a few years ago, not even laboratory expertise exists at present for inducing turtles to complete their entire life cycle in captivity, thus no laboratory, let alone farm, can as yet produce all of their own young. Eggs must therefore be removed from natural nesting sites and hatched in captivity.

Besides the difficulties of controlled reproduction, other basic biological problems which will need to be solved before turtle farming can be feasible include the study of adequate captive environments and the determination of the animal's nutritional requirements at various life stages. The latter problem has aroused our interests at the Hawaii Institute of Marine Biology. The immediate objectives of our work here at Coconut Island are the determination of the nutritive requirements of juvenile and baby green turtles and the formulation of inexpensive diets from common feedstuffs. In addition growth curves, feed efficiencies and digestibility values of various diets are being determined. Such information, virtually non-existent in the literature, is an essential basis for marine turtle culture.

Although large commercial turtle farming best not yet be attempted, small pilot projects at research stations should be encouraged. Nutritional data from our studies will be basic to this work.