# DIGESTIBILITY & GROWTH STUDIES ON THE GREEN TURTLE (*Chelonia mydas*)

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BY

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Apple
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## ABSTRACT

This study was conducted to identify high protein ingredients that can be used as green hatchling feeds and to further understand the digestibility of these ingredients in the hatchlings. The nutritional content, hatchlings' digestibility and growth response from these ingredients were determined.

Five types of ingredients (chicken egg, turtle egg, fish, soybean refuse and terrapin pellet) were used to form the agar test diets in this project. All the test diets have different nutritional composition. Water content was above 80% for the pellet test diet and above 90% for the other test diets. Ash content ranged from 2.25 ± 0.15% in the soybean refuse to 18.53 ± 0.01% in the fish test diet. Protein in these test diets ranged from 30.93 ± 1.82% in the chicken egg test diet to 45.39 ± 2.70% in the fish test diet. The highest fat content was found in the chicken egg test diet (60.49 ± 1.06%) and the turtle egg test diet (58.98 ± 0.75%) while the pellet test diet contained the least fat (10.67 ± 0.73%). Fibre was extremely low for all test diets, less than 2% in the nutritional composition.

The most digestible test diet the turtle egg test diet followed by the pellet test diet with their dry matter digestibility values at 3.39% and 3.25% respectively. The least digestible test diet was the fish test diet with a dry matter digestibility value of 2.12%. The dry matter digestibility coefficient for the soybean refuse test diet could not be determined due to the hatchlings' low acceptance towards this test diet which did not produce enough faecal matter.

Protein and fat were the most digestible nutrient in all the test diets with an apparent digestibility coefficient (ADC) of about 95%. The least digestible nutrient in

the test diets was carbohydrate with an ADC ranging from 0.41% in the pellet test diet to 7.55% in the turtle egg test diet.

Best growth was achieved by the pellet test diet, which produced a 329% gain in weight and a 73% increase in straight carapace measurements in the experimental duration of twelve weeks. The soybean refuse test diet gave the least growth with an increase of only 60% for body weight and 18% for carapace measurements. The growth rates for the chicken egg test diet, turtle egg test diet and the fish test diet were found to be similar statistically.

The best food conversion ratio (FCR) was obtained by the pellet test diet at 6.79 followed by the soybean refuse test diet with a value of 7.79. The poorest FCR value was obtained from the fish test diet with a value of 26.15.

Mortality rates of the hatchlings in this study were the lowest in the pellet test diet treatment. At the end of the experimental duration of 12 weeks, the cumulative mortality percentage was 55.56%. Mortality rates were highest in the chicken egg and soybean refuse test diet. Both of these test diets reached the cumulative mortality percentage of 80% at the seventh week, terminating these treatments ahead of time.

In conclusion, it is recommended that green turtle hatchlings are fed with terrapin pellet as its main diet while the chicken egg, turtle egg and fish can serve as supplements in the hatchlings' dietary intake.

## ABSTRAK

Kajian ini telah dijalankan untuk mengenalpasti bahan-bahan berprotein tinggi yang boleh digunakan sebagai makanan anak-anak penyu agar dan untuk lebih memahami pencernaan bahan-bahan ini oleh anak penyu. Kandungan zat, pencernaan dan kadar tumbesaran anak-anak penyu daripada bahan-bahan ini ditentukan.

Lima jenis bahan (telur ayam, telur penyu, ikan, sisa kacang soya dan pellet) telah digunakan untuk menghasilkan makanan ujian berbentuk agar untuk projek ini. Kesemua makanan ujian ini mempunyai komposisi zat yang berlainan. Kandungan air melebihi 80% untuk makanan ujian pellet dan melebihi 90% untuk makanan ujian yang lain. Kandungan abu berjulat antara 2.25 ± 0.15% dalam makanan ujian sisa kacang soya dan 18.53 ± 0.01% dalam makanan ujian ikan. Kandungan protein makanan ujian pula berjulat antara 30.93 ± 1.82% dalam makanan ujian telur ayam dan 45.39 ± 2.70% dalam makanan ujian ikan. Makanan ujian telur ayan dan telur penyu mengandungi peratusan lemak yang tertinggi sekali dengan nilai 60.49 ± 1.06% dan 58.98 ± 0.75% masing-masing. Makanan ujian pellet pula mengandungi peratusan lemak yang terendah sekali (10.67 ± 0.73%). Kandungan serabut pula adalah kurang daripada 2% untuk semua makanan ujian.

Makanan ujian telur penyu merupakan makanan ujian yang paling mudah dihadam oleh anak-anak penyu diikuti oleh makanan ujian pellet. Nilai pencernaan untuk makanan ujian ini adalah 3.39% dan 3.25% masing-masing. Makanan ujian yang paling kurang dihadam adalah makanan ujian ikan dengan nilai pencernaan sebanyak 2.12%. Kadar pencernaan bahan kering untuk makanan ujian sisa kacang soya tidak dapat ditentukan.

Protein and lemak merupakan zat yang paling dihadam dalam semua makanan ujian dengan nilai pencernaan sebanyak 95%. Zat yang paling kurang dihadam adalah karbohidrat dengan nilai pencernaan berjulat antara 0.41% dalam makanan ujian pellet dan 7.55% dalam makanan ujian telur penyu.

Makanan ujian pellet menghasilkan kadar pertumbuhan yang paling baik sekali dengan pertambahan sebanyak 329% bagi berat badan anak-anak penyu dan sebanyak 73% bagi ukuran karapas untuk tempoh ujian selama 12 minggu. Makanan ujian sisa kacang soya pula member pertambahan yang paling kurang, hanya 60% untuk berat badan dan 18% bagi ukuran karapas. Kadar pertumbuhan hasil daripada makanan ujian telur ayam telur penyu dan ikan adalah sama secara statistikal.

Nisbah penukaran makanan (FCR) adalah terbaik bagi makanan ujian pellet dengan nilai 6.79 diikuti oleh makanan ujian sisa kacang soya dengan nilai 7.79. Nilai FCR adalah tertinggi bagi makanan ujian ikan masing-masing dengan nilai 26.15.

Kadar kematian anak-anak penyu dalam kajian ini adalah terendah bagi makanan ujian pellet. Di akhir tempoh kajian selama 12 minggu, peratusan mortaliti kumulatif bagi makanan ujian ini adalah 55.56%. Kadar kematian yang tertinggi diperhati dalam kumpulan anak penyu yang diberi makan makanan ujian telur ayam dan sisa kacang soya. Kedua-dua makanan ujian ini mencapai peratusan mortaliti kumulatif (80%) pada minggu ketujuh, menghentikan ujian terhadap makanan ujian ini lebih awal daripada yang dijangka.

Sebagai kesimpulan, adalah dicadangkan bahawa anak penyu agar yang baru tetas diberi makanan pellet sebagai makanan utamanya manakala telur ayam, telur penyu dan ikan boleh diberi sebagai makanan tambahan.