Puerto Rican Plain Pigeon Food Intake in a Captive Breeding Program

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Puerto Rican Plain Pigeon at the aviary of the Puerto Rican Plain Pigeon Project, Humacao Campus of the University of Puerto Rico. Photo courtesy of Fr. Alejandro J. Sánchez Muñoz, Puerto Rico.
The Puerto Rican Plain Pigeon (*Columba inornata wetmorei*) is one of the endangered species in the island of Puerto Rico. A captive breeding program was established from 1984 to 2001 at the University of Puerto Rico (UPR) Humacao Campus as a way of combating the decline of this species. The captive breeding program in UPR Humacao had the objective of establishing appropriate techniques for reproducing the species and produce individuals to be freed in the state forests. The captive program has been successful in its use of pigeon milk to feed the hatchlings by a surrogate mother or by hand. This led to the successful breeding of 44 pigeons in 1989, a record in captive breeding programs (Perez 2004). Despite the longevity and successes of the program, specifics for this particular race of plain pigeon are not well known. For the first time in this study we measured the amount of feed that the pigeons consume in captivity to determine their caloric intake and needs in case daily feeds are not available or illness arises in an individual.

The plain pigeon is the size of a domestic pigeon with a pale blue-gray color, and dark red beak and legs. Historically, it was widespread in the western foothills and valleys of Puerto Rico. General habitat types used include lowland swamps and woodland, open woodland and cultivated land in the mountains, limestone karst, and coffee plantations in upland hills. The main source of food for the Plain Pigeon are day jasmine seeds (*Cestrum diurnum*), but they also feed on royal palm (*Roystonea borinquena*), mountain immortelle (*Erythrina poeppigiana*), West Indies trema (*Trema lamarckiana*), and white prickle (*Zanthoxylum martinicense*). (USFWS 2004)

Extensive destruction of natural forest habitat and overhunting are given as causes for the decline of the species. We can see this pattern manifested in the development history of Puerto Rico. By 1912, Puerto Rico had been largely cleared for agriculture and other purposes with one estimate placing the amount of remaining forest at no more than 5,000 acres of virgin or slightly-culled timber. By the middle 1930s the plain pigeon population was considered to be extinct, until, in 1963, a population was rediscovered in the town of Cidra, also following the pattern of forest regrowth in the island. Studies of that population between December 1973 and September 1975 attributed the majority of nest failures observed to human-caused disturbances. Habitat loss due to the rapid development of the Cidra area is the most serious threat to the species’ existence. Though breeding occurs throughout the year, this species only lays one egg, and a maximum of 3 broods has been recorded. This contributes to decreased population growth when its nesting areas are reduced every year. Furthermore, it is thought that establishment of new populations has been limited by the bird’s reluctance to colonize new areas. (USFWS 2004)

For this study, the diet for the captive individuals usually consisted of grains, supplemented with day jasmine (*Cestrum diurnum*) seeds, when in season. For the captive program, the amount of feed was determined based on the estimated protein and fat requirements of the family *Columbidae* (Baer 1984). However, such estimates are not precise and despite of the lon-
gevity of the captive program, the
exact dietary requirements of the
plain pigeon and the effects of cap-
tivity on its feeding behaviors are
largely unknown. As the nature of
captive programs make daily
feedings difficult, insights into di-
etary requirements of the plain pi-
geon are critical, not only to evalu-
ate the health of captive individu-
als, but also to make necessary ad-
justments to avoid food deficits.

Our objective was to determine
the average caloric intake of the
Puerto Rican plain pigeon in cap-
tivity. Each pigeon was kept in in-
dividual cages, and we chose 8 in-
dividuals for this study from the
smallest cages in the captive breed-
ing project, due to ease of handling.
The daily feed for the captive plain
pigeons consisted of grains, con-
taining 15% protein, 2.5% fat, and
10.5% fiber, well within the range
of proteins (12-28%), and fat
(1%) suggested by Dierenfeld
(Dierenfeld and Kreger 1992). Each
bird was given 45-55g of feed each
morning in a marked cup. A small
carton box was placed under each
cage to collect the feed spilled dur-
ing the day. Unconsumed feed was
collected from the cup and the car-
ton box and weighed each day be-
tween 6 and 7pm to determine the
daily consumption of each of the
birds (the original weight of feed
minus the weight of unconsumed
feed). To determine the daily ca-
loric intake the weight of feed con-
sumed was then converted to a ca-
loric equivalent. This procedure
was repeated each day of every
other week from February through
April in 2001.

We found that the captive
Puerto Rican plain pigeon con-
sumes an average of 11.425 grams
of feed daily or 54.383 cal. This av-
erage daily caloric intake is consid-

erably smaller than the average for
the \textit{Columbidae} family (Perez 2004).

Some possible reasons for these
results are 1. Plain pigeons in cap-
tivity eat less than pigeons in the
wild because they don’t have to
spend energy on flying, looking for
food, and/or mating rituals 2. Food
consumption of the pigeons de-
creases with age, and this was a
likely factor in this study (pigeons
on average were 10 years old). Fur-
ther studies are needed to deter-
mine if the effect of captivity, age,
or an interaction of these two fac-
tors caused the decrease in food in-
take of the captive individuals. Po-
tential future research may include
monitoring of wild individuals par-
allel to a similar set-up of this study
with younger actively breeding cap-
tive individuals. Further research
may help us to better understand
and improve the health of the cap-
tive individuals and the success of
the captive breeding program.

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