

# FOOD CONSUMPTION AND PELLET FORMATION RATES IN FOUR OWL SPECIES

CARL D. MARTI

QUALITATIVE food habits of Great Horned (*Bubo virginianus*), Long-eared (*Asio otus*), Burrowing (*Speotyto cunicularia*), and Barn Owls (*Tyto alba*) are generally well known from analysis of their regurgitated pellets (see Earhart and Johnson, 1970). Data on quantitative food intake, however, are lacking. A few investigators have estimated food consumption from remains in pellets of wild owls (Evans and Emlen, 1947; Fitch, 1947; Graber, 1962; Hagan, 1965; Marti, 1970). Graber (1962) measured food intake with captive Long-eared Owls caged indoors and Craighead and Craighead (1956) did so with Great Horned Owls tethered outdoors.

The purpose of this study was to measure daily food intake rates of the four species over an extended period and to measure the daily pellet formation rates.

## METHODS AND MATERIALS

A downy young of each of the four owl species was obtained from nests in Larimer County, Colorado, raised and later tested in outdoor cages. The size of the cage housing the Great Horned Owl was  $2 \times 2 \times 2.5$  m; for the Barn Owl,  $1.3 \times 1.6 \times 1.6$  m; and for both the Long-eared and Burrowing Owls,  $1 \times 1.6 \times 1.6$  m. These cages allowed only limited activity.

When the owls were almost one year old, I began six test periods of 4 weeks each which were evenly spaced over one year. The owls were offered a known weight of whole laboratory mice (*Mus musculus*) each day which exceeded their daily intake. Food that remained by morning (not over 12 hours) was retrieved and weighed to determine the amount consumed. To minimize disturbance, the birds were weighed only three times during each test to obtain an average body weight for the period. Regurgitated pellets were collected and recorded daily, air dried for one week, and weighed.

## RESULTS AND DISCUSSION

The Great Horned Owl (male) consumed an average of 62.6 g of whole mice per day over the year which amounted to 4.7 percent of its body weight; the Long-eared Owl (female) ate 37.5 g or 12.7 percent of its weight; and the Burrowing Owl (male) ate 26.4 g or 15.9 percent of its weight. The Barn Owl (female) ate 60.5 g daily, 10.1 percent of its weight. Although the Barn Owl was only about half the weight of the Great Horned Owl, it consumed almost as much food per day over the year and ate more than the Great Horned Owl during the colder test periods. In view of this, investigation of the metabolic rate of the Barn Owl for comparison with mea-

TABLE I  
FOOD CONSUMPTION AND PELLET FORMATION RATES IN CAPTIVE OWLS

Test* Period	Mean Food Eaten/day g	Mean Owl Weight g	Percent of Body Weight Eaten	Mean Number Pellets/day	Mean air Temperature °C
Great Horned Owl					
1	69.7	1,409.8	4.9	1.1	-1
2	58.8	1,376.1	4.3	1.1	-2
3	60.6	1,311.1	4.6	1.0	13
4	58.3	1,363.3	4.3	1.2	21
5	57.5	1,265.0	4.6	1.3	19
6	70.4	1,287.6	5.5	1.2	4
Long-eared Owl					
1	42.8	304.3	14.0	1.6	-1
2	41.6	301.2	13.8	1.5	-2
3	25.4	265.5	9.6	1.0	13
4	36.9	285.2	12.9	1.2	21
5	35.5	303.1	11.7	1.3	19
6	41.1	287.6	14.3	1.7	4
Burrowing Owl					
1	29.1	177.0	16.5	1.3	-1
2	—**	—	—	—	-2
3	19.9	167.4	11.9	1.4	13
4	26.4	156.6	16.9	1.4	21
5	22.6	160.0	14.1	1.4	19
6	33.7	169.8	19.9	1.9	4
Barn Owl					
1	72.9	661.0	11.0	2.4	-1
2	64.9	639.5	10.1	1.2	-2
3	46.4	542.6	8.6	1.7	13
4	56.7	576.7	9.8	1.6	21
5	47.3	584.5	8.1	1.3	19
6	74.0	614.5	12.0	1.8	4

\* Dates: 1, 24 December to 21 January; 2, 18 February to 17 March; 3, 20 April to 21 May; 4, 19 June to 16 July; 5, 19 August to 15 September; 6, 14 October to 11 November.

\*\* Burrowing Owl unavailable for this period.

surements done by Graber (1962), Collins (1963) and Gatehouse and Markham (1970) on other species of owls should be an interesting area for research. Results of food consumption by each test period are given in Table I.

Wild owls actively searching for prey and carrying out other activities undoubtedly consume food at a greater rate than do sedentary captives. This is supported and the extent of the increase in consumption is indicated in

TABLE 2  
PELLET CHARACTERISTICS OF CAPTIVE OWLS WITH RESPECT TO FOOD CONSUMPTION

Owl	Mean weight Eaten/day g	Mean Pellets/day	Mean weight Eaten/pellet Produced g	Mean pellet Weight/day g
Great Horned	62.6 ± 1.8*	1.2 ± 0.04*	54.5	2.6 ± 0.1*
Long-eared	37.5 ± 1.1	1.4 ± 0.1	26.7	1.4 ± 0.1
Burrowing	26.4 ± 0.9	1.5 ± 0.1	18.1	1.0 ± 0.1
Barn	60.5 ± 1.7	1.7 ± 0.1	41.1	3.2 ± 0.1

\* Mean ± SE. All N > 100.

estimates made by a number of investigators from remains found in pellets. Graber (1962) estimated that wild Long-eared Owls in Illinois in winter consumed from 47 to 53 g of food per pellet produced. However, in Norway they were thought to eat about 43 g per day (Hagan, 1965). According to Fitch (1947), Great Horned Owls in California averaged 120 g of food each day. Evans and Emlen (1947) estimated that a Barn Owl in California ate 150 g per day. This may be too high as it was based on two pellets per day and available evidence indicates that American Barn Owls average less than that per day (Wallace, 1948 and this paper). Estimates of daily food consumption during summer in Colorado for wild owls were 119 g for the Great Horned Owl, 60 g for the Long-eared Owl and 110 g for the Barn Owl (Marti, 1970). These estimates give a rough indication of how much more wild owls consume on a daily basis than confined ones do, but they lack consideration of such data as how intake might be affected by size of the owl and time of year.

Table 2 summarizes pellet formation data collected during this study. A greater average daily pellet weight was found for the Barn Owl than for the Great Horned Owl. This is probably because the pellets were not equally dry when weighed. Barn Owl pellets are much more compact than those of the other species and may dry more slowly. None of the pellets contained undigested material other than bone and hair.

#### SUMMARY

Food consumption and pellet formation rates were studied for one year in captive Great Horned, Long-eared, Burrowing and Barn Owls. Mean food consumption for the whole year in the Great Horned Owl was 4.7 percent of its body weight per day; in the Long-eared Owl, 12.7 percent; in the Burrowing Owl 15.9 percent; and in the Barn Owl, 10.1 percent. Average pellet rates per day for the year were 1.2 for the Great Horned Owl, 1.4 for the Long-eared Owl, 1.5 for the Burrowing Owl and 1.7 for the Barn Owl.

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DEPARTMENT OF ZOOLOGY, WEBER STATE COLLEGE, OGDEN, UTAH 84403, 16  
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#### LATE NEWS FROM THE CHAPEL HILL MEETING

On 19 May at the 54th Annual Meeting of the Wilson Ornithological Society in Chapel Hill, North Carolina the following were elected to office: *President*, Kenneth C. Parkes; *First Vice-President*, Andrew J. Berger; *Second Vice-President*, Douglas A. James; *Secretary*, James Tate, Jr.; *Treasurer*, Jerome A. Jackson; *Editor*, John P. Hubbard; *Elective Member of Council*, George A. Hall. Full details of the meeting will appear in the September issue.