# **Barn Owl Pellet Lab** *Tytonidae tyto alba*

**Pre-Lab Discussion**

Owls are Birds of Prey, which means that they must kill other animals to survive. Their diet includes invertebrates (such as insects, spiders, earthworms, snails and crabs), fish, reptiles, amphibians, birds and small mammals. The main food largely depends on the species of Owl. For example, Scops and Screech Owls feed on insects mostly, while Barn Owls eat mainly mice, shrews and voles. Larger Owls such as the Eagle Owl will prey upon hares, young foxes and birds up to the size of ducks and game birds. Some species have specialized in fishing, such as the Asian Fish Owls (*Ketupa*) and African Fishing Owls (*Scotopelia*). Although certain species have these preferences for food type, most owls are opportunistic, and will take whatever prey is available in the area.

Owl pellets are masses of bones, teeth, hair, feathers, scales, and insect skeletons. These materials are blocked from reaching the intestines by the *pyloric opening*. They are produced and regurgitated, not only by owls, but also by hawks, eagles, and other predatory birds that swallow their prey whole or in large pieces. Because owls swallow their prey whole, each pellet contains virtually complete skeletons of the animals the owl ate the day before the pellet was formed. By examining the bones of the animals eaten, the types of animals eaten, and the number of each species, the varied diet of an owl and the type of ecosystem in which it came from can be determined.

**Safety**
*The owl pellet you will dissect has been dried and fumigated***.** It has been sterilized and does not contain any harmful or disease-carrying organisms.

**Materials**

| | |
|---|---|
| Owl Pellet | Glue (part 2) |
| Magnifying glass or dissecting microscope | Graph paper |
| Dissecting tools (pick, tweezers, etc.) | Tooth picks |
| Bone Chart | Lab Manual |

**Procedure**
*Use the bone charts provided*

You will discover what the owl has eaten by carefully picking apart the pellet and dissecting out the skulls and bones of the prey animals. You will need to analyze the tiny bones, taking careful count of the major bones in the body, which will tell you the number of animals in your pellet. You will identify the animals mainly by the skulls, mandibles, and teeth, so be especially careful when dissecting. Use the field guides and the dichotomous key to identify the skulls found in each owl pellet.

A. Measure the length and width of your owl pellet with a metric ruler. Record information.
Length ____________________ (cm) Width ________________ (cm)
B. Place the pellet in the dissecting tray.
C. Using dissecting tools, separate the bones of the animals in the pellets from the fur and feathers.
D. Remove all fur and debris from the bones and sort them according to their types (i.e. skulls, vertebrae, femurs, etc.) Make sure to remove as much debris as possible from the skull.
E. Group all similar bones into piles. Try to fit bones from different piles together by matching each skull with the rest of the animal's skeleton. Examine the teeth, especially the incisors and molars to assist you in the identification. Use the field guide.

F. Identify the different animals in your owl pellet. Record data for your group on a chart. Include the number and species of the animals identified in the pellets.
G. Calculate percentage present. Add the number of each species found, and then divide by the total of all the animals found in all of the pellets for the class. Graph results.

- Percent (P) for one species = $\frac{\text{Total of one species}}{\text{Total of all species}}$

- Record the percentages on your lab report

H. Compare the owl pellet bones to the human skeleton. Tell how they are similar and different.

I. Assemble one set of bones into a complete skeleton from the owl pellet remains.

J. Design a model ecosystem in which the owl whose pellet you dissected probably lived. Include characteristic plant and animal species.

K. Dichotomous Key:

| Does the animal have... | Then... |
|---|---|
| 1. a) 3 or fewer teeth on each side of its upper jaw? | go to 2. |
| b) at least 9 teeth on each side of its upper jaw? | go to 3. |
| 2. a) 2 biting teeth on its upper jaw? | go to 4. |
| b) 4 biting teeth on its upper jaw? | it's a rabbit. |
| 3. a) a skull length of 23 mm or less and brown teeth? | it's a shrew. |
| b) a skull length of more than 23 mm and 44 teeth? | it's a mole. |
| 4. a) the roof of its mouth extending past the last molar? | go to 5. |
| b) the roof of its mouth not extending past the last molar? | go to 6. |
| 5. a) a skull length of 22 mm or less? | it's a house mouse. |
| b) a skull length of more than 22 mm? | it's a rat. |
| 6. a) flat molars? | it's a meadow vole. |
| b) rounded molars? | it's a deer mouse. |

**Observations**

| **Prey Animals** | **Numbers** | **Percent of Total Prey** |
|---|---|---|
| Deer Mouse/Rodent (*Peromyscus*) | | |
| Shrew (*Sorex)* | | |
| Mole/ Vole (*Microtus)* | | |
| Rat (*Rattus)* | | |
| Bird | | |
| Other: | | |
| **Total** | | |

**Post Lab Analysis**

1. What types of animals do Barn Owls eat?
2. What ecosystem did those animals most likely come from?
3. How do animal skeletons compare to human skeletons?
4. What animals are represented most often in the diet of the owls your group studied?
5. What are the common characteristics of these animals?

6. What type of biotic relationship do the owl pellets provide evidence for?
7. If all the owls whose pellets your class studied lived in the same ecosystem, what generalization could you make about the population size of the most common prey?
8. Other birds also form pellets. What would you expect to find in the pellet of a sea gull?

**Building Models**

Reconstruct and mount a complete skeleton of an animal found in the owl pellet. Compare its anatomy to a human skeleton (*Use your skeletal chart from chapter 15 and animal bone charts provided*).

1. Reassemble the bones using white glue and affix them to a 5 x 7 index card. Make sure your name, lab station number, and period are on the card prior to gluing anything.
2. State what type of animal this skeleton belongs to.
3. On a separate sheet of paper, record the names of bones that are similar to human bones.