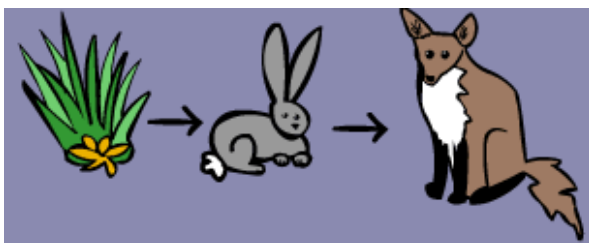


What Mammals Eat By Corinne Ogle

Food Chains/Food Webs

Food chains and webs show the flow of energy from one living organism to another. Energy is essential to all actions of life, meaning everything has to eat to obtain that energy. Food chains and webs accurately represent what organisms consume what. A food chain is a diagram showing what one animal eats after another; it is a very linear model involving just a few organisms. A food web is a diagram showing what all animals in the given environment eat and how they all relate to each other. Food webs are many food chains compiled into one diagram.

All food chains begin with producers. Producers are the plants that get their energy from the sun. Through photosynthesis, they are able to create their own food and start the food chain. Next on the food chain are the primary consumers. These animals are the ones that eat the plants (herbivores). The following animals in the food chain are secondary consumers. These are the animals that eat other animals (carnivores). Omnivores eat both plants and animals and can be the primary or secondary consumer.



Producer

**Primary
Consumer**

**Primary
Consumer**

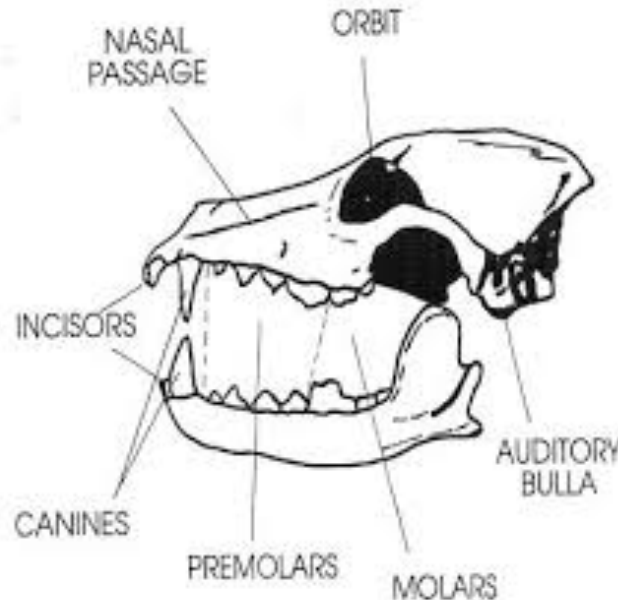
Expect the producer, any of these roles can be a mammal. Mammal skulls help us know what mammals eat, showing where they lie on the food chain.

Skull Features – What Does This Animal Eat?

Teeth

There are many things about teeth that help you identify what animal the skull came from (carnivore, herbivore, or omnivore) and, therefore, what it eats.

Herbivores primarily use their premolars and molars for chewing and grinding plants. They use their incisors to strip a plant of its leaves and other essential foods. Although some herbivores have canines for display, they are typically absent or very small.



Carnivores need teeth that can easily cut and tear meat. This causes carnivores to have canines. These are long and sharply pointed teeth designed to make hunting and eating easier.

Omnivores have a combination of all these types of teeth. They need them all in order to properly eat meats and vegetables. While they do have canines, they are typically not as large as a carnivore's and while they do have molars, they are typically not as flat as a herbivore's.

Jaws (Mandible)

The jaws of carnivores and herbivores are variable to each other. The bone of a carnivore is usually long and curved along the bottom jaw. The purpose of the curve and length is to increase force when closing the jaw.

Herbivore jaws are often long but do not have the curve along the bottom jaw like the carnivore. This allows for strength to be applied to more the middle and back teeth where all the chewing occurs rather than applying force to the front teeth. Their jaw bones also attached in a way that allows forward, backward, and side-to-side movement that carnivores cannot experience.

Omnivore jaws are not distinctive from carnivore and herbivore jaws. They can either display likeness to one or show similarities to both.

Nasal Area (Rostrum)

The size of the nasal area shows the importance sense of smell has to the animal. Both carnivores and herbivores can have long or short noses. Omnivores are also variable in their nasal sizes. Animals with long noses may highly rely on their sense of smell to either sense approaching predators or prey. Animals with shorter noses do not have as good of a sense of smell, meaning they rely more on their other senses. An example is a bear.

Ears (Auditory Bullae)

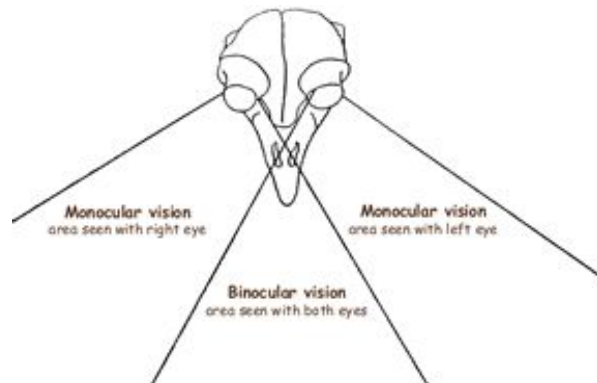
Hearing is similar to the nasal area. Every animal (whether carnivore, herbivore, or omnivore) relies on their sense of hearing differently. Animals who rely greatest on their sense of hearing, such as a bat, have large ears for hearing surrounding predators or prey. Animals also may have large ears because of the value of communication through sound. Particularly for animals that live and hunt in groups, hearing would be important for communication. Animals who have smaller ears may rely on their other senses more, causing them to have small ears.

On the skull, there is an area called the auditory bullae. This area generally lets us know the value of the sense of hearing for that particular animal. The larger and more inflated the auditory bullae, the more valuable hearing is to that animal, indicating it probably has larger ears. The smaller and flatter the auditory bullae, the less valuable hearing is to that animal, indicating it probably has small ears.

Eyes (Orbits)

The size of the orbits indicates the importance of sight for that particular animal. Animals with poor hearing or sense of smell may have larger eyes like a cat. Also opposite, an animal with good hearing and sense of smell may have smaller eyes and poorer vision like a possum. This is determined independent of the animal being a carnivore, herbivore, or omnivore.

Carnivore orbits tend to face more directly forward. This gives them binocular vision, meaning the carnivore sees objects with both eyes at the same time, looking directly in front of them. This allows the animal to have great depth perception, important for hunting and spotting prey.



Herbivores most often have orbits more on the sides of the head looking in different directions. This gives them monocular vision, meaning the herbivore sees objects with only one eye, looking on either side of their head. This allows them to see a larger peripheral area to scan for predators.

Omnivores typically have some monocular vision, but primarily eyes toward the front of the head to result in dominantly binocular vision. This allows for the depth perception needed to find the wide variety of foods consumed in an omnivore diet.

Conclusion

All of these features of a skull help to show what the animal eats. We can draw conclusions based on their features about what kind of animal it is and where it lies in the food chain.



Additional Resources

<http://www.skullsunlimited.com> – This resource is a catalog to help you stock up your skull collection for student understanding and demonstrations.

<http://www.eskeletons.org/comparative.html> – This interactive website allows you to compare the skeletal features of humans to chimpanzees, gorillas, orangutans, and more.

http://www.brandywinezoo.org/games/teeth_bones.pdf – Going further in depth about teeth, this resource talks about what animals have what teeth and has accompanying practice questions.

<http://ethemes.missouri.edu/themes/1444> – If you're looking for a variety of options, this site provides links to many other sites exploring skeletons and the associated standards.

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