

Home Education Lesson 6: Food & Feeding slides and notes



Slide 1



Welcome back for lesson six: Food & Feeding

In today's lesson we will be investigating:

- The different diets eaten by primates
- How primates are adapted for feeding

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All living things need food to survive. Food gives us energy (in the form of calories) that allows us move, eat, grow, breathe... etc. Different animals need different amounts of food to survive; an animal's **basal metabolic rate** is how quickly an animal spends energy just to stay alive. Generally, larger animals require more energy to keep their bodies working than smaller animals. This means larger animals generally need to consume more calories than smaller animals.

If they were able to, all animals would just eat high-calorie foods but there simply aren't enough of them around, or they come in small packages (i.e. insects) and they aren't enough to sustain a larger animal. Therefore, large animals tend to eat lots of lower-calorie food that is widely available. Smaller animals only have small stomachs, so they physically can't eat lots of food, so will eat small pieces of food. For example, an elephant needs to eat lots of low-energy grass & leaves to survive, whereas a mouse only needs small energy-rich grains to survive.

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Although we need to consume calories to survive, we must also have a **balanced diet**. The foods that give us the most energy are **carbohydrates, fats and oils**, but in order to have a balanced diet we also need to eat protein, vitamins and minerals. In addition to eating, most mammals need to drink water *at least* once a day. In the short-term, fluids are more important for survival than food. The picture of the different types of food represents a balanced diet for humans. We are classified as **omnivores** as we generally eat a mixture of both plant and animal products, although there are many different dietary choices made by humans. A good balanced diet for a human is made up of the five food groups: **Fruits and vegetables, starchy foods** such as potatoes, rice and pasta, **dairy products** (or alternatives) like milk, yoghurt and cheese, **protein** such as meat, eggs, fish and beans, and **fats** such as oils and spreads. We cannot eat all of these foods in equal quantities and still have a balanced diet. Fats and sugary food must be eaten in moderation, but we should try and eat at least five portions of fruits and vegetables every day.

There are lots of different dietary choices which humans make; this is part of our culture, as discussed in our last lesson. Most primates primarily eat one type of food more than others; let's explore their main diet categories, starting with fruit-eaters.

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Mammals that eat fruit as their primary food/energy source are classified as **frugivores**. Fruit is more calorific than leaves, is widely available and can be found in greater quantities than insects or gum. Although there isn't very much protein in fruit, so smaller frugivores will tend to eat insects to top up their protein requirement, and larger frugivorous primates will eat leaves for the same reason. Many of the primates at Monkey World are frugivores, including the woolly monkeys, gibbons, and orang-utans. Some of the most popular fruits amongst our frugivores are juicy, tropical fruits such as melons and mangoes.

Although woolly monkeys do primarily eat fruit in the wild, they are very susceptible to diabetes in captivity. At Monkey World we have developed a specialised diet for our woolly monkeys that protects their health; it includes insects, leafy browse (branches) and flowers. They are fed less fruit than they would eat in the wild, as fruit is high in sugar. Instead we feed them lots of fibre in the form of leafy vegetables and

plants, which also helps to slow down the rate of sugar absorption.

Frugivores have the following feeding adaptations:

- Wide incisors for scraping the flesh of the fruit off the rind, and low molar cusps for pulverising fruit
- Laterally (sideways) mobile jaws that allow for chewing
- Fairly simple digestive tracts

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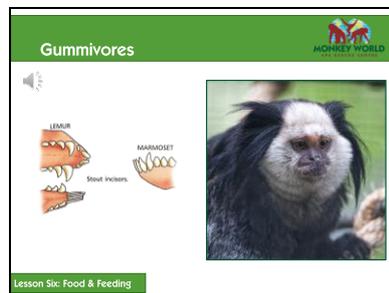
Mammals that rely on insects as their primary food/energy source are called **insectivores**. Insects provide lots of calories but are only small, so are mostly eaten by smaller mammals. Larger animals would struggle to get enough calories from a diet of insects, but there are some – like anteaters – who are specially-adapted to eat a large quantity of insects. Squirrel monkeys are insectivores; their diet consists of around 75% insects, but they also eat other animal prey such as frogs, snails and small lizards, as well as small amounts of fruit and seeds. Tarsiers are the only completely carnivorous primate – their diet is made up mostly of insects, but they also eat small amphibians and reptiles.

Insectivores have the following feeding adaptations:

- Good eyesight and hand-eye coordination
- Sharp, pointy cusps on their teeth to crack through an exoskeleton

- Short and simple digestive tract

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Gummivores are mammals whose diets mostly consist of plant gum and sap; a high-calorie sticky substance that is found in trees and plants. Gummivores are generally small animals because (as with insectivores) it would take a huge amount of gum to sustain a larger animal. Gummivores are adapted to this method of feeding as they have:

- Sturdy, stout incisors, and some have canines that stick forward and are shaped for gouging into bark and scraping off gum
- Claws that enable them to cling to tree trunks like a squirrel.

The marmosets at Monkey World are gummivores; many of them have been rescued from terrible conditions having been bred and sold into the legal British pet trade. Sadly the majority of these primates are sold with misinformation on how to care for them, so their owners will feed them on inappropriate diets which have even included sweets, fizzy drinks and chips. At the park they are fed gum, as well as some insects and fruit, in natural enclosures that allow them to forage

and express their natural feeding behaviours.

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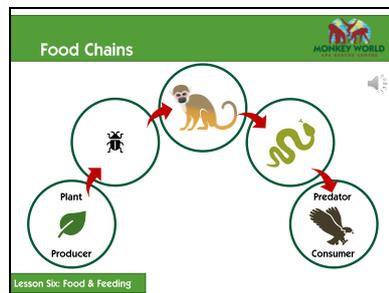


Mammals whose primary food source is leaves (foliage) are called **folivores**. There is less energy per pound of leaves than in insects, gum and fruit, but leaves are plentiful and easy to find. Leaves, particularly young leaves, buds and shoots are fairly high in protein, sugar and starch, however they contain substances that are harder to digest (i.e. cellulose), and so cannot be eaten by all animals. There are quite a few feeding adaptations found in folivores, as leaves are harder to digest; they include:

- Medium – large sized bodies, so they can fit a large amount of leaves in!
- Special microorganisms that help them to break down the cellulose in leaves
- Sharp, rigid molars for tearing leaves into small pieces
- Laterally (sideways) mobile jaws for chewing
- Longer, more specialised digestive tract for processing a lot of leaves
- In terms of their behaviour, they spend a lot of time resting in order to digest large quantities of leaves.

Gorillas, colobus monkeys and langurs are all foliovores, but no foliovores are currently living at Monkey World.

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A **food chain** shows where each living thing gets its food and how it is inter-related to other species in its habitat or ecosystem. Food chains *always* start with a plant and ends with an animal. Plants are **producers** as they make their own food, whereas organisms that must eat animal matter to survive are called **consumers**. A food chain shows how energy is passed from one living thing to another; in the diagram, the red arrows show the movement of energy from each link to the next.

Animals that hunt and eat other animals are called **predators**; animals that are eaten by predators are called **prey**. An animal can be both predator and prey, as seen in our squirrel monkey food chain. A food chain never has more than four or five links in it, as there is not enough energy present to sustain more animals. This food chain, as all do, starts with a plant, which is eaten by an insect that is hunted and eaten by a squirrel monkey. The squirrel monkey is then preyed upon by a snake, who is finally eaten by a hawk. Changes in populations (number of a species in the wild) can affect these food

chains and interdependencies. For example, the consequences of the squirrel monkey population decreasing could be that the insect population increases, but also that the population of snakes and birds of prey could decline.

Food chains seem simple, but in reality are very complicated. All living things in an ecosystem depend on one another for survival, as animals will consume a variety of foods, so they never just appear in one simple food chain like this one. The way that different species interlink looks more like a web than a chain, so they are called **food webs**. For example, marmosets help to control the population of insects and other small prey (i.e. lizards, frogs and snails), as well as being a tasty snack for a predator higher in the food chain. Other animals will also take advantage of the holes marmosets gouge in trees to reach sap, if they are not adapted to do so themselves.

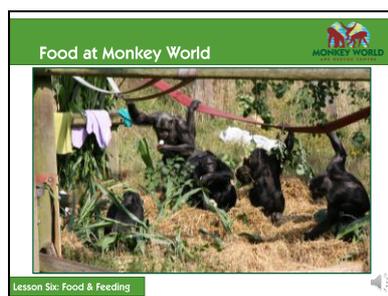
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Many of our primates arrive at Monkey World having been fed unhealthy and inappropriate diets by their human owners. Some arrive malnourished and underweight, while others are overweight due to being fed a diet of sweets and processed foods. Our primates also regularly come to us with dental problems caused by poor diets and, sadly, physical abuse. These issues can range from rotten teeth to our primates arriving with almost no teeth at all.

Oshine is a female orang-utan who was kept as a pet in South Africa for 13 years, before her owner asked Monkey World to give her a home with her own kind. Oshine had been treated as a member of the family and, like many children, was given sugary sweets and snacks. As always happens with pet primates, Oshine became harder to manage as she matured. The family would give her food to placate her and she would help herself to food from the fridge, but no one was strong enough to stop her. Her overeating led to Oshine weighing approximately 100kg when she was rescued by Monkey World. Now having been at the park almost 10 years, Oshine has lost around half of her bodyweight and is now in the healthy weight range for a female orang-utan. She is also encouraged to exercise by the keepers, as they put food high on the climbing frame, also stimulating orang-utans' natural behaviour of feeding in the trees.

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At Monkey World we aim to give our rescued primates the most natural life that we can by encouraging them to live and behave naturally. When it comes to feeding our primates, we try to imitate how they would feed in the wild as well as providing them with a healthy and species appropriate diet. As our primates aren't in their natural habitat and are well-cared for by our Primate Care Staff, we have to ensure that finding food is a challenge, so these intelligent animals don't get bored and understimulated. Our Primate Care Staff will hide food in boxes, baskets, socks, bottles and other

containers to encourage our primates to problem solve and use tools as they would in the wild. In Hananya's house, there is an artificial termite mound where the chimpanzees are able to go "termite fishing" like their wild counterparts. This is called **enrichment** and encompasses every extra item and activity that our keepers provide to keep the primates mentally and physically stimulated. In this picture, Hananya's chimpanzees are foraging through straw, wood wool and browse to find high-calorie apples hidden amongst the straw, as well as inside small containers. The browse (corn stalks and hazel branches) provide fibre for the chimpanzees, as well as the sugary fruit. Feeding our primates like this is far more interesting than if our keepers were to always present food in the same place and in the same way. As well as encouraging natural feeding behaviours, it also encourages natural social behaviours as the group come together to a food source like they would in the wild.

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Recap!

All animals need to consume food to gain the energy needed to survive.

All animals require a balanced diet; they cannot survive on high calorie foods alone.



Lesson Six: Food & Feeding

All animals need to consume food to gain the energy necessary for their survival. They cannot survive just on high calorie, energy rich foods as there are not enough of them to feed everybody. All animals must eat a balanced diet in order to stay healthy.

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Recap!

Primates generally fall into one of four diet categories

- Frugivores - fruit
- Insectivores - insects
- Gummivores - gum/sap
- Folivores - leaves

All species within an ecosystem are interdependent on each other for food and survival.

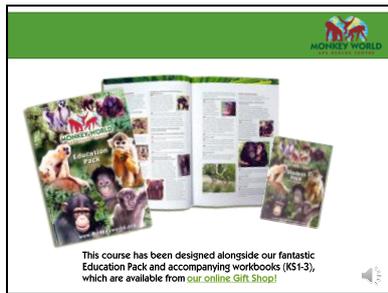
Lesson Six: Food & Feeding

Primates generally fall into one of four diet categories:

- Frugivores - eat fruit
- Insectivores – eat insects
- Gummivores – eat gum/sap
- Folivores – eat leaves

All species within an ecosystem are interdependent on each other for food and survival. These relationships can be tracked and seen using food chains and food webs.

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This course has been designed alongside our fantastic Education Pack and accompanying workbooks (KS1-3), which are available from our [online Gift Shop!](#)

These lessons have been designed alongside our Education Pack which is full of comprehensive information on primate classification, habitats, family groups, diets and more. It is perfect for learning more about primates at home! It is available from our online Gift Shop, along with curriculum-linked workbooks available in Keystages 1, 2 and 3!