



# Jr. Animal Scientist

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# MAMMALS

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# Mammals

There are over six thousand species of mammals—including you! Humans, cows, mice, lions, and whales are all examples of mammals. Mammals are special because they can produce milk using mammary glands to feed their young. Mammals are divided into three different groups based on how their babies develop. These three groups are **monotremes**, **marsupials**, and the largest group, **placental** mammals.

## Monotremes

**Most mammals give birth to live young, but these mammals actually lay eggs!**

There are only two monotremes alive today, the echidna and the platypus. This group of mammals is very different from the others.



Photo: iStock / User10095428\_393

### Echidna

The female echidna lays one leathery-shelled egg directly into the pouch on her belly. The egg hatches after only ten or eleven days and will stay in their mother's pouch for several weeks. Babies are fed by mother's milk that seeps out of pores on her skin.

### Platypus

The platypus lives in the water and lays her eggs in an underground nest. After they hatch, the tiny babies drink milk from their mother's body by lapping up milk that oozes onto the fur.

### Fun Facts:

- The name “monotreme” comes from the fact that they have only one body opening for both waste and eggs to pass through.
- Their body temperature is lower than most warm-blooded animals, a feature that is more common with reptiles.
- The platypus is one of only a few mammals that are venomous.



Photo: iStock / leonello

## Marsupials

**The better-known marsupials include kangaroos, koalas, wallabies and opossums.** When a marsupial gives birth, its young is still not fully developed. At this point, the babies are very small and lack fur to keep warm and proper eyesight. To stay safe, the babies then crawl up the fur of their mother's belly into a pouch on the outside of her abdomen. The babies drink milk from inside the mother's pouch until they are developed enough to explore the world outside.



Photo: Wild at Heart Rescue



### Opossums

The opossum will give birth to as many as twenty-one babies at one time. However, she only has thirteen nipples in her pouch. The first thirteen babies to climb into her pouch and attach to her nipples are the only ones to survive.

### Kangaroo

Kangaroos are baby-making machines. They can support three babies, called joeys, at different stages of development all at once! At the same time, mother kangaroo can have a “yearling” joey that lives outside of her pouch and only returns to nurse, a newborn joey that is nursing and developing inside her pouch, and be pregnant with another.

**Fun Fact:** A kangaroo can supply two different types of milk at the same time to supply to the yearling and newborn joeys.



Photo: iStock / Smileus





## Placental Mammals

**Most mammals are called “placental” mammals.** These mammals develop inside their mothers, where they receive nutrients and oxygen through blood that come from their mother through an organ called a placenta. The baby develops inside the mother’s body until its systems are ready to function on their own. This group of mammals includes humans, dogs, cats, horses, and even bats!

### Bats

Bats are a very unique mammal because they are the only mammal that flies. The heavy load of milk makes flying very hard for a mother bat. In fact, a female bat can produce over half her own body weight in milk every day.



Photo: Shutterstock / CraigRJD

**Fun Fact:** The mother bat is a super strong mom! Bats often fly with their young. The babies can cling to their mother’s underarm nipples with their mouths and hang onto her waist with their toes.



# COLORING

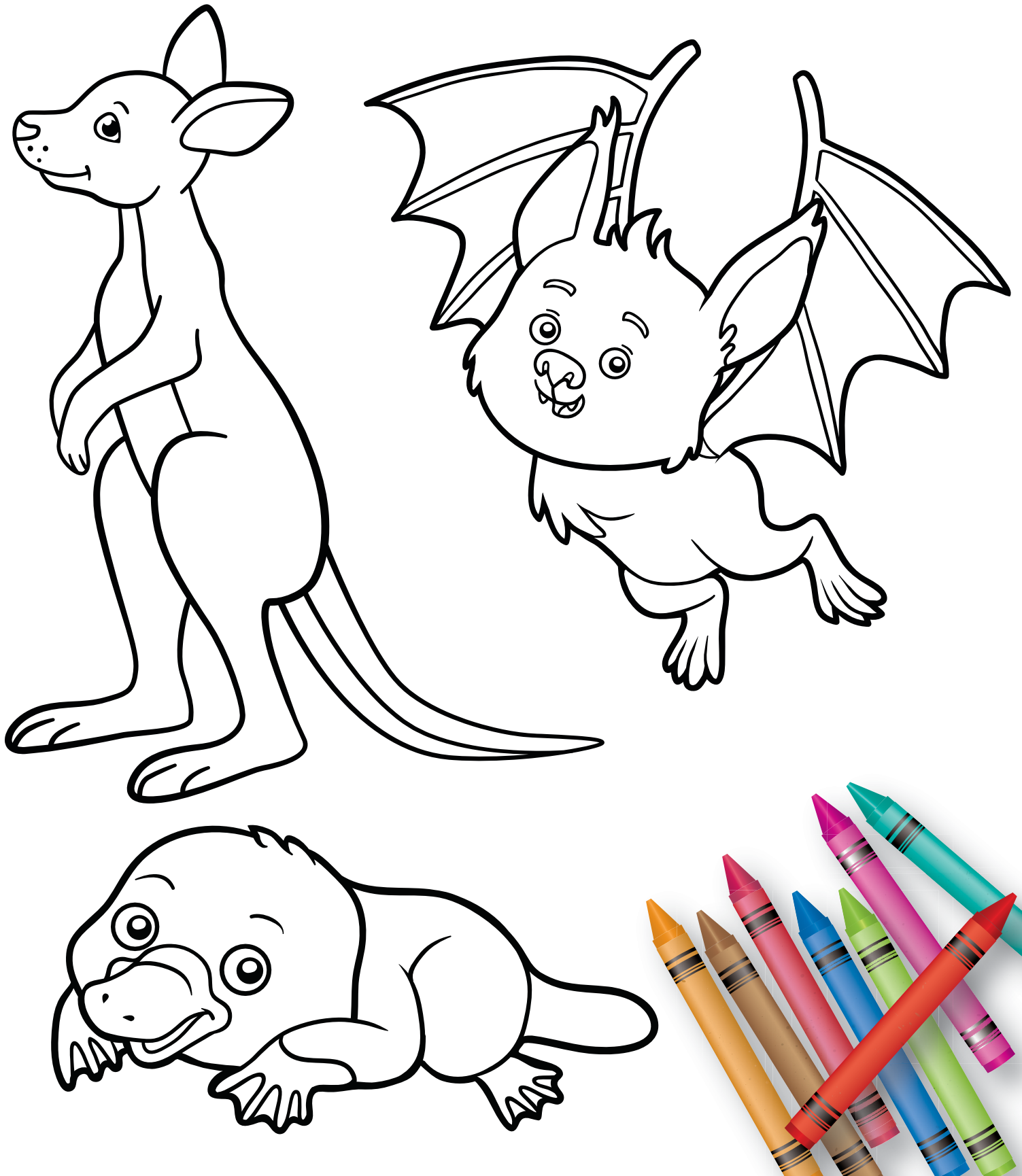


Photo: iStock / ksenya\_savva (bat) / ya\_mayka (kangaroo) / ksenya\_savva (platypus)





# Meet DR. S Mammary Gland

**I am a researcher in the Animal Sciences Department at Purdue University.**

Originally from the Canary Islands (Spain), I grew up in the city without any contact with the rural world or animals. However, life has driven me into having a career working with animals and being passionate about their health and well-being.





# SUAREZ-TRUJILLO

## and Lactation Scientist

I was always interested in nature and animals, so I decided to study Veterinary Sciences in college. I started my classes in vet school at the University of Las Palmas de Gran Canaria (Spain) in 2006. At first, I was expecting to become a vet clinician and work in a vet clinic or hospital “saving pets lives,” but during the first year of vet school, I had my first livestock production class and my interest completely changed. During vet school, I worked mostly with dairy goats and sheep. I also volunteered to help the vet school herd of small ruminants during breeding and birthing seasons. My favorite time was always the “kidding” and “lambing,” when I would help the animals give birth and raise all the goat kids and lambs. I worked in the anatomy lab on the side, where I was first introduced to the field of “mammary gland and lactation” research. My undergraduate research was focused on how goat breeds develop their mammary glands differently to adapt to living in mountains or flat areas.

I decided to keep studying goats and sheep, so I did a graduate program in Animal Health and Food Safety in the same university. My lab mates and I managed the goat and sheep herd and I was in charge of animal reproduction, nutrition, and health. My Ph.D. was focused on the role of a chemical called serotonin (the happy hormone) in the udders of goats and sheep. In 2014, I got the opportunity to spend a year working in the mammary gland laboratory in the Animal Sciences Department at Purdue University in Indiana. During that time, I learned a lot about the basic biology and physiology of the mammary gland across multiple species. That experience helped to increase my interest in lactation research.

I currently work as a researcher in a mammary gland and lactation lab at Purdue. We have numerous research projects with multiple species, dairy cows, mice, pigs and humans. Working with dairy cows and measuring milk production was a huge change for me! I got to work with 1,500 lb dairy cows, compared with the 100 lb goats I was used to. I have to admit, that I was scared on my first day.

Every research project is different. To understand how milk is produced, we use mice with genetic modifications. In order to analyze the milk they produce, we have to milk the mice. This is a little challenging at first, but with patience and a good team of people, anything is possible! We also work to understand how the composition of sow (female pig) milk changes during lactation and how the amount of milk the piglets drink influences their development and health. For these studies, we have to milk the sows and bottle-feed the piglets. It is very fun to work with these animals!

I am dedicated to researching how the mammary gland works, how can we make our animals healthier during lactation, and the best way to improve babies’ health through quality milk.



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