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The Code of Life

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What makes every animal different?

When we study animals, we notice different traits. Traits are things we can notice about an animal, like it's size, color, or shape.

Some dogs are large with long fur. Some are small with short fur. Some cattle have black and white spots. Other cattle are reddish brown.

Traits are fascinating! To understand why animals have different traits, we need to zoom in!

Photo: iStock / Eriklam

Every animal has a different code

All living things are made up of very small parts called cells. Cells are microscopic. They are much smaller than the period at the end of this sentence.

If we look even closer at a cell, we can see that it is made up of building blocks called **molecules**. Cells have special molecules called **DNA** that tell it what to do!

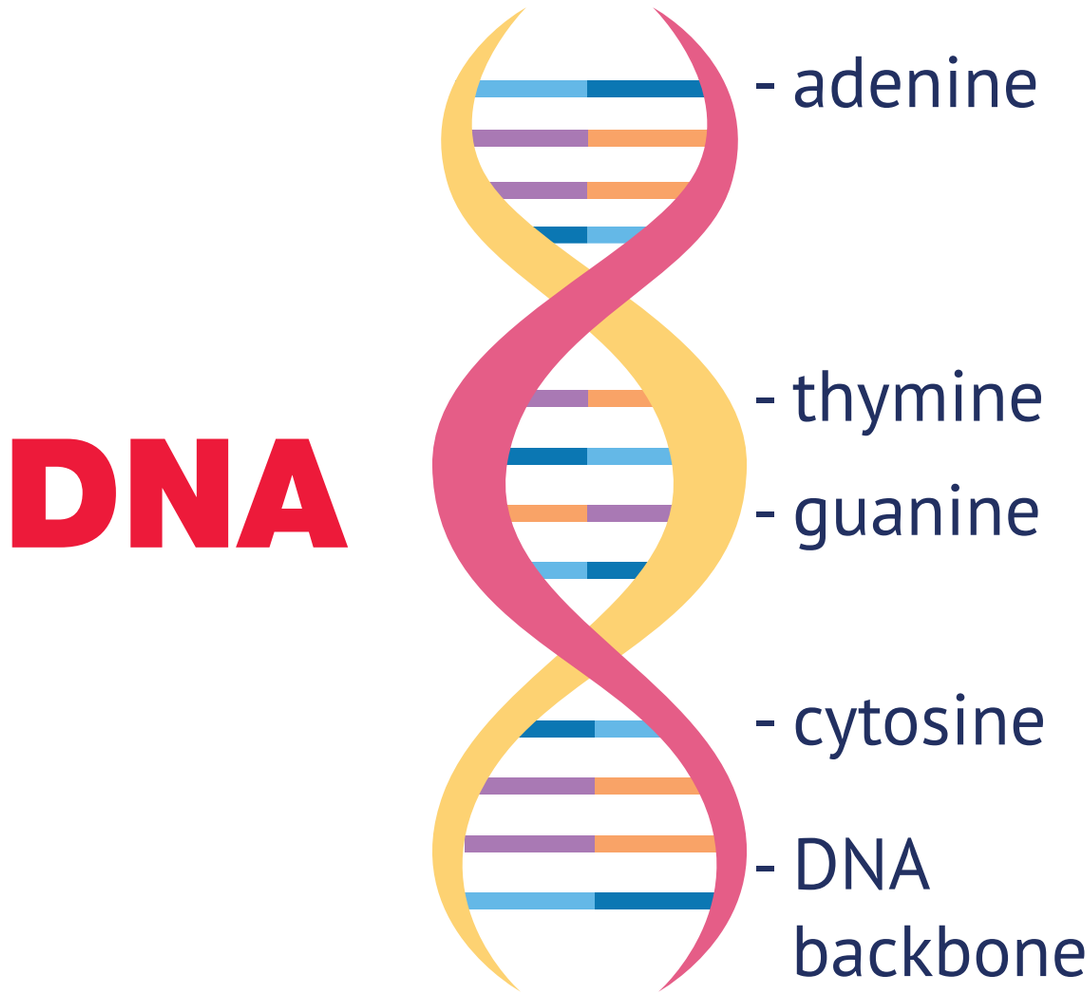
DNA is short for **deoxyribonucleic acid**. This is pronounced dee-ox-ee-rie-bow-new-clay-ic acid. Whew!

When the compounds in DNA are in a certain order, other parts of the cell can "read" a message in the DNA. This is how the DNA code tells cells how to work.

Reading the DNA code tells a cell a lot! DNA controls how an animal looks, and DNA can also control how an animal makes energy, how it fights disease, and even how it acts sometimes.

That's why scientists call DNA the "code of life." In this issue of Jr. Animal Scientist, we'll explore how that code works—and learn more about the importance of studying animal DNA.

Cracking the Code



Even the smallest parts of the body have a shape. DNA has a very special shape. The compounds in DNA form a shape that looks a lot like a ladder!

Scientists call the side of the latter the DNA "backbone." The rungs of the ladder are made up of compounds that scientists call **bases**.

The four types of bases found in a DNA molecule are adenine (A), cytosine (C), guanine (G), and thymine (T). Scientists call this the ACTG code! A is always next to C and G is always next to G. It's like they are best friends!

Every animal, from a horse to a shark, has the same ACTG bases! So how do these animals look so different?

Animals can all have the same kinds of bases in their DNA, but the bases are in a different order in every creature! It's sort of like how we use the same set of letters when writing every sentence—but different sentences have the letters in different orders to say different things!

Photo: iStock / sabelskaya

DNA tells cells what to do

DNA Controls Fur Color

Some animals are born without color in their fur. Their DNA lacks the code to tell the body to make colored pigments. Without this code, the body cannot make the pigments it needs for the animal to grow fur with any sort of color.

We call these rare white animals **albino** animals. This trait, called albinism, shows us how important DNA messages are.

Photo: iStock / CBCK-Christine

DNA controls how animals grow

Eating healthy food can help an animal grow, but DNA controls growth too! The DNA code can tell the body how big it can get.

For example, male and female mountain goats live in the same places and eat the same food. Yet male mountain goats tend to be a lot bigger than female goats. This is due to differences in the male and female DNA code.

Photo: flickr / NPS/ Tim Rains

DNA on the Farm

Many animal scientists study DNA and the messages it holds! This field of research is called genetics. It is very important to understand the DNA code of farm animals.

Studying the DNA code helps us figure out which animals have important traits.

Photo: iStock / AmeliaFox

MILK

Some cows make more milk than other cows. Animal scientists have figured out how to look at the DNA of cows to figure out which ones make the most milk. Farmers can raise these cows to produce more milk. That means more milk, cheese and ice cream for us to enjoy!

Photo: iStock / from_my_point_of_view

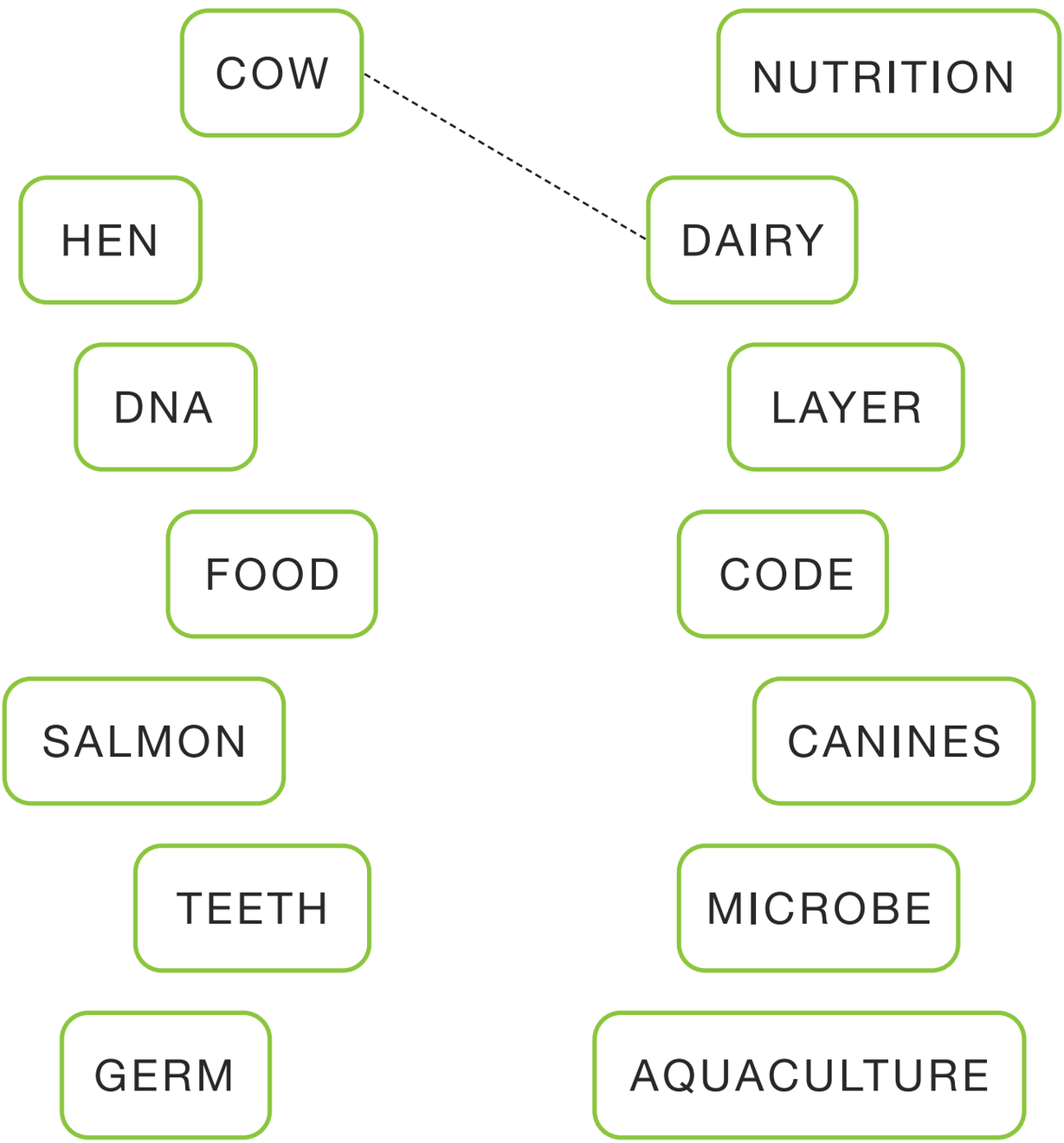
MEAT

The DNA code tells the body how to grow muscles. That means a pig's DNA is part of what determines pork tenderness. Tenderness is a word we use to describe how easy it is to chew meat. Some pigs have meat that is extra tender. That is partly due to messages from the pigs' DNA code.

ACTIVITY:

Word Match

Remember AC and TG?
These best friend DNA base pairs always match up with each other.
Can you match up these animal science terms with their related words?



Answers: Cow—Dairy, Hen—Layer, DNA—Code, Food—Nutrition, Teeth—Canines, Salmon—Aquaculture, Germ—Microbe

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