

# Colorado Reader

AG in the Classroom

Helping the Next Generation Understand Their Connection to Agriculture

Colorado Foundation for Agriculture ~ [www.growingyourfuture.com](http://www.growingyourfuture.com)

## Food, Fiber and Natural Resource Literacy

### Egg Production



Over 4 million hens in Colorado produce more than one billion eggs each year.  
*Learn more on pages 2 & 7.*

### Egg Farm to Table



Six Colorado egg farms provide jobs for more than 250 families and provides over \$100 million annually to the state's economy.

*Learn more on page 4.*

### Egg Farming History



Egg farmers have led in using technology to improve egg production and hen health.  
*Learn more on page 2.*

### Biosecurity



Protecting hens from disease, severe weather and predators is a priority for egg farmers.  
*Learn more on page 6*

### Egg Nutrition



The nutrition label does not show the high quality protein found in eggs. Nor does it mention all the 13 vitamins and minerals found in eggs. Eggs are also one of the few food sources of vitamin D.  
*Learn more on page 5.*

PER EGG
70 CALORIES
1.5g SAT FAT 8% DV
70mg SODIUM 3% DV
0g SUGARS 0% DV
6g PROTEIN 12% DV

### Egg Safety



All commercially produced eggs in Colorado meet USDA grading guidelines.  
*Learn more on page 6.*

### Egg Types/Labels



Eggs are produced based on what consumers choose to buy.

*Learn more on page 3*

**Exploring  
Eggs**



### Eggbert's Corner



Eggbert is the new mascot for the Colorado Egg Producers. Look for him at events around the state. Find out how you can be a "Good Egg."  
*Learn more on page 8*

# Egg Farming History

During the 1940s, most people kept small flocks of hens in their backyards for eggs and meat. The hens were exposed to cold and freezing temperatures, diseases spread by contact with other birds and contamination of their feed. These problems caused as many as 40 out of 100 chickens to die. The strongest hens were only able to lay 112 eggs per year. These eggs were unwashed and kept at warm temperatures. These hens needed eight pounds of feed to produce one dozen eggs.

As more and more people moved to the cities, fewer people raised their own chickens. There were not enough eggs to meet the demand. Egg farmers looked for ways to enlarge their flocks to provide more eggs.

By the early 1960s, improved technology and use of mechanical equipment resulted in a shift from small farm flocks to larger commercial operations. Flocks of 100,000 laying hens are not uncommon and some flocks number more than 1 million!

The egg industry and farmers pioneered many improvements in layer hen flocks. Today, many egg producers keep their hens in clean, dry laying houses. Temperature, humidity and light are controlled and the air is kept

**Colorado egg farmers believe the hen always comes first . . .  
by providing a healthy diet, fresh water and shelter, she will  
produce an abundance of wholesome and safe eggs.**

circulating. Birds are either given the run of the floor area or are housed in cages. Automatic feeders move food through troughs for the hens to eat. Along with the food, clean water is always available to the hens.

Chickens are fed a balanced diet of corn, wheat or milo grains and soybean meal. Vitamins and minerals are added to their food. Limestone is used in the diet to build strong shells. Today's hens eat a diet that is better balanced nutritionally than the diet of most people!

How much a hen eats depends upon the hen's size, rate of egg production, temperature and the energy level of the feed. It takes about four pounds of feed to produce one dozen eggs.

High-quality egg production begins with using the right breed of chicken. Most commercial egg farms use the Single Comb White Leghorn breed. This breed reaches maturity early, utilizes feed well, and produces a large number of white-shelled eggs.

Today, chickens are more than twice as productive as their ancestors thanks to better genetics, nutrition and care. Each of the 285 million hens in the U.S. produces 250-265 eggs per year.



In the second paragraph it says:  
“The hens were exposed to cold and freezing temperatures, diseases . . .” Circle the best meaning for the word “exposed” as used in this sentence.

- a. laid open to view; unconcealed
- b. left or being without shelter or protection
- c. susceptible to attack; vulnerable

In the second column, second paragraph it says: “Chickens are fed a balanced diet of corn, wheat or milo grains and soybean meal.” What is the best meaning for the word “balanced” as used in this sentence?

- a. diet that is weighed out using a balance
- b. diet that provides the same amount of each nutrient
- c. diet that contains all nutrients the body needs

In the last paragraph of this article it says: “Today, chickens are more than twice as productive as their ancestors thanks to better genetics, nutrition and care.” Circle the best meaning for the word “genetics” as used in this sentence.

- a. selecting and breeding animals for improved performance
- b. science that studies genes
- c. studying the heredity of an animal



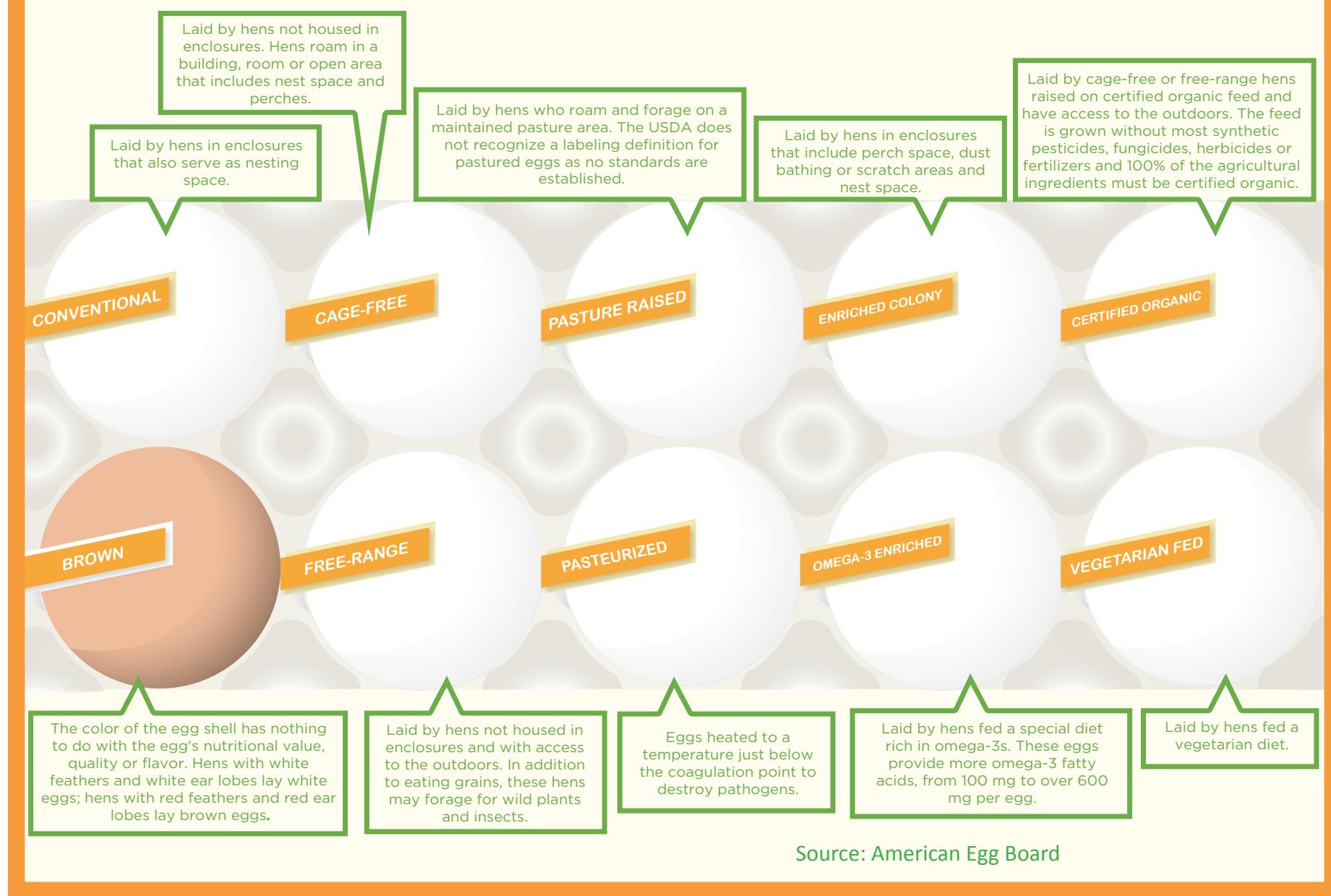
# Giving You A Choice

There are many choices when it comes to buying eggs. You can buy white eggs, brown ones, and many other colors. You can buy eggs from hens fed a special diet.

You can make your selection of eggs based on how the hens are raised. For example, hens are kept in many different housing systems. You can choose eggs raised

in cage-free housing, enriched colony systems, conventional cages or pasture raised. The choice is yours. Egg farmers will produce what you want to buy.

## CRACKING THE EGG CODE



# From the Farm to your Table

From the moment the egg is laid, physical and chemical changes begin. Freshly laid eggs must be gathered frequently and refrigerated quickly. Warm temperatures lower the eggs' freshness and quality.

Some eggs are gathered by hand. Most large laying houses use automated gathering machines to do the job. Eggs that are gathered are moved into refrigerated holding rooms where temperatures are maintained at 45°F or less. Humidity is kept high to keep moisture from being lost from the eggs. Eggs are washed, sanitized, graded for quality and packaged. They are stored in large refrigerated coolers, then transported in refrigerated trucks to grocery stores. Eggs usually arrive at the store within 72 hours of being laid. You can choose any variety of eggs to take home and to prepare your favorite egg dish.

The hens lay their eggs .



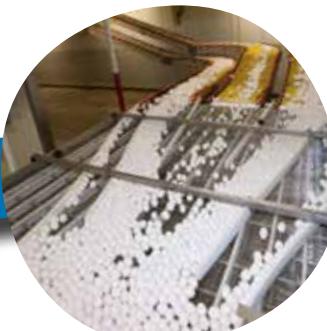
1

You have many egg choices at the grocery store.



7

2 Eggs are brought from the laying houses on conveyor belts for cleaning, grading and packaging. (above)



2

3 Eggs are washed and sanitized,then dried.



3

4 Eggs are inspected for quality using lights and sound.



4



5

The eggs are weighed by electronic scales and packaged by size based on weight.

6 Packaged eggs are put in boxes and moved into a refrigerated room (cooler) for storage until they are shipped by refrigerated trucks to stores.



6



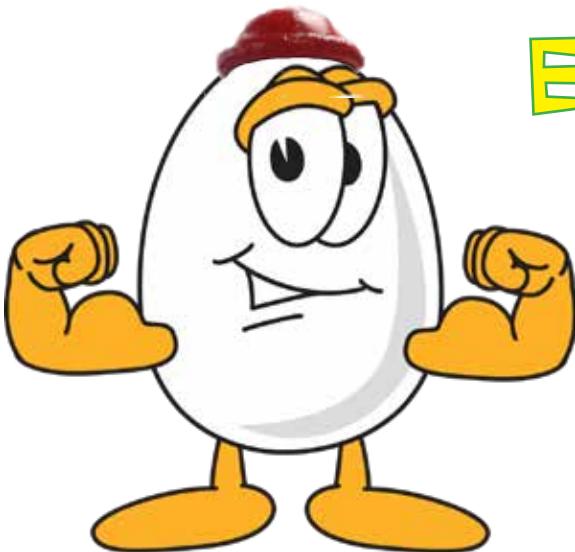
There are hundreds of ways to enjoy eggs - deviled to scrambled, cookies to ice cream.

4

You can see videos of eggs being produced and processed at  
<http://coloradoeggproducers.com>



WWW.GROWINGYOURFUTURE.COM



# Eggceptionally Nutritious

- 1. PROTEIN** If you start your weekday with cereal or toast instead of eggs, here's a wake-up call: Did you know eggs have 6 grams of high-quality protein? And did you know a protein-packed breakfast helps sustain mental and physical energy throughout the day? That's good news, especially if you're a body-building chess champion.
- 2. GOT CHOLINE?** Eggs are rich in choline, which is a weird word but it's a "good weird" because choline promotes normal cell activity, liver function and the transportation of nutrients throughout the body. Think of it as a commuter train for vitamins and minerals.
- 3. ZERO CARBS NO SUGAR** Eggs contain zero carbs and no sugar. That means you can eat a well-rounded breakfast during the

week without feeling round yourself.

- 4. AMINO ACIDS** Eggs have all 9 essential amino acids. Seems like a lot but remember – they ARE essential.
- 5. MORE FOOD FOR THOUGHT** Unlike most cereals and yogurt, eggs don't come with a complicated, jam-packed ingredient list because they only contain one ingredient. It's called "eggs." And at 17¢ a serving, eggs are the least expensive source of high-quality protein. That's right, 17¢.

- 6. NO GLUTEN? NO PROBLEM.** Let's not forget that eggs are naturally gluten-free. Always have been, always will be. And that's awesome because there isn't exactly a glut of gluten-free breakfast options.

**INCREDIBLE, ISN'T IT?** Most cereals and yogurts can't say all this, mainly because they don't have mouths, but also because they don't have the nutrient content eggs do. So next time someone asks how you like your eggs, say you like 'em a whole heck of a lot. Wake Up To Eggs!

Source: American Egg Board

## IT'S IN THE YOLK

The yolk is the yellow part of the egg. It is the major source of vitamins, minerals and fat from the egg. It also contains about half of the protein. Some egg yolks are more yellow than others because... you are what you eat.

Hens that eat feed containing yellow corn and alfalfa meal lay eggs with medium yellow yolks, while those hens eating wheat or barley lay eggs with lighter colored yolks. A diet made up of colorless foods, like white cornmeal, produces almost colorless yolks.

## A LARGE EGG PROVIDES:

### VITAMINS...

vitamin A	niacin
vitamin D	pantothenic acid (B3)
vitamin E	pyridoxine (B6)
vitamin B12	riboflavin (B2)
biotin	thiamin (B1)
choline	
folate	

### and MINERALS...

calcium	phosphorus
copper	potassium
iron	sodium
magnesium	sulfur
manganese	zinc

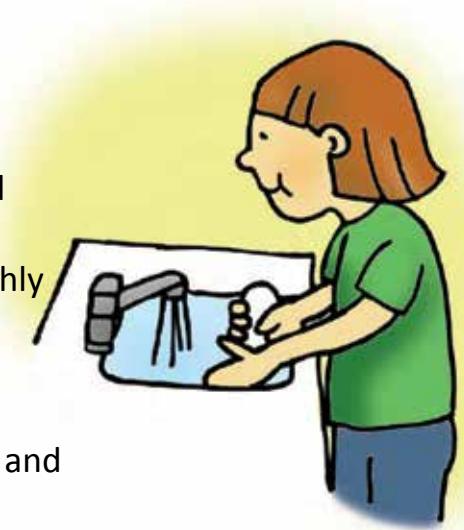
... And all for just  
70 calories

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# Eggsploring Food Safety

## Practice cleanliness . . .

- Wash hands in hot, soapy water before handling food. Wash counter tops, utensils and equipment that have been in contact with raw food before using them again.
- Use separate cutting boards and knives for raw and cooked foods. Wash them thoroughly with hot, soapy water after each use.
- Throw away eggs that are dirty, cracked, broken or leaking. Eggs do not need to be washed – they have been washed and sanitized before they are packed.
- Don't use an egg's shell to separate contents. Use an egg separator to separate whites and yolks. Use a clean utensil to remove any shell from an egg mixture.



Salmonella is a common microbe found around food. In large numbers, it will make people sick. Salmonella will not grow at temperatures below 40°F. This is why refrigeration of eggs and other foods is a very important part of food safety. The danger zone for food is between 40° and 140°F. These temperatures are ideal for rapid Salmonella growth. Freezing does not kill Salmonella but does stop growth.

On average, only one out of 20,000 commercially produced eggs in the U.S. might contain the Salmonella bacteria. Cooking eggs thoroughly where both the yolk and white are firm, not runny, is the best method of preventing bacteria that can make people sick.

## Biosecurity

Biosecurity is the term used in agriculture for steps a farmer or rancher might use to protect their animals and the food supply.

A successful biosecurity program on an egg farm takes steps to ensure that there is no introduction or transfer of diseases into or among poultry houses. Biosecurity measures producers take include:

- Limit visitors on the farm and in the poultry houses;
- Protect against cross contamination when equipment is moved and people travel between and among poultry houses;
- Prevent stray poultry, wild birds, cats, rodents and other animals from entering poultry houses;
- Don't allow employees to keep birds at home.

For more information, go to: [www.eggsafety.org](http://www.eggsafety.org).



*In the spring of 2015 wild birds migrating north carried with them Avian Influenza (AI.) This disease spreads rapidly through birds.*

*Chickens and turkeys along the major migration route contracted the disease. More than 40 million chickens and turkeys died. This caused a temporary shortage of eggs.*

*Working with state and federal governments, farmers have increased biosecurity on their farms and have put into place increased monitoring and systems for handling disease outbreaks.*

*The Center for Disease Control (CDC) considers the risk to people from the virus to be low as AI cannot be transmitted through properly cooked eggs. Additionally, the strains of this disease are not transmissible to humans and no human infection with these viruses have been detected.*

# Egg Production



Most of the eggs we eat come from chickens.

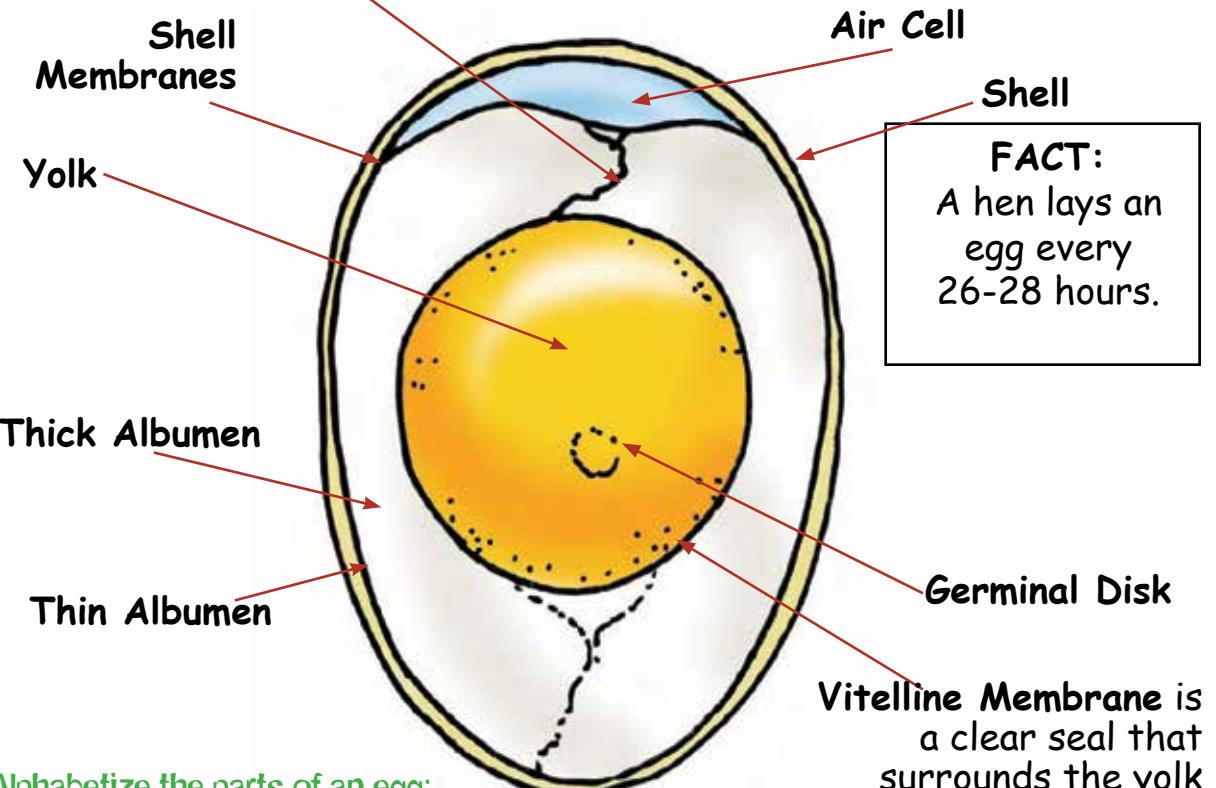
Hens are female chickens. Hens lay eggs. It's an all day event for a chicken to make an egg and lay it.

1. The hen is hatched with many tiny yolks in her body. One at a time, these will grow to full size.
2. When a yolk comes to full size, it is released into a long tube called an oviduct. This release takes about 14 minutes.
3. As the yolk moves, a thick white layer of albumen also known as the egg white, is placed around it. This takes about 3 hours.
4. The next stage takes about 1 hour and 15 minutes. Water is added to the albumen to form a thin layer of white.
5. The formation of the egg shell is the last and longest step. This step can take as long as 20 hours. Pigment is added to the shell at the very end of this step making the egg shell white, cream or brown depending on the breed of the hen.
6. The hen lays the egg and the process starts again.



## Parts of an Egg

**Chalazae** is the twisted white protein that holds yolk in place



Alphabetize the parts of an egg:

*air cell*

# REVIEW

Choose the best answer

1. To change from doing a job by hand to using a machine to do a job. (page 2)

- mechanic
- automation
- machinery
- none of the above

2. The part of an egg that holds the yolk in place. (page 7)

- chalazae
- shell
- thick albumen
- thin albumen

3. A microbe that can make you sick. (page 6)

- molecule
- salmonella
- alga
- all of the above

4. The hard outer layer of an egg. (page 7)

- yolk
- shell membrane
- shell
- air cell

5. A process used to cool foods and keep them out of the danger zone so microbes cannot grow. (page 6)

- freezing
- cooking
- cooling
- refrigeration

6. Eggs have: (page 5)

- no sugar
- no carbohydrates
- no gluten
- all of the above

M  
a  
t  
h

Each of the baskets below contains numbers. Use +, -, ×, or ÷ between each number to get the correct answer.

$$5 \quad 3 \quad 10 = 12$$

$$9 \quad 3 \quad 13 = 14$$

$$8 \quad 2 \quad 1 = 5$$

$$1 \quad 15 \quad 3 = 5$$

$$4 \quad 2 \quad 2 = 0$$

7. To clean thoroughly so that bacteria are destroyed. (page 6)

- sanitize
- eliminate
- polish

8. Chicken houses are called this. (page 4)

- bird houses
- chicken condos
- chicken homes
- laying houses

9. The term used to protect hens from diseases. (page 6)

- biosecurity
- clean
- refrigeration
- none of the above

10. The yellow part of the egg. (page 7)

- yolk
- air sack
- shell
- there is no yellow part of an egg

## Eggbert's Corner



I Pledge to Eat good.  
Do good every day.  
[www.GoodEggProject.org](http://www.GoodEggProject.org)

Colorado egg farmers donate more than 1 million eggs each year to food banks across Colorado as part of their commitment to the Good Egg Project.

### How can you be a Good Egg?

Just like egg farmers support their communities by making regular egg donations to area food banks and homeless shelters, you too can get involved. Volunteer to raise money, start a food drive or help bring awareness to a cause or need in your school or community.

