

# Egg Farming Then and Now

**Grade Level: 4-8**

## Lesson Overview

Eggs show up scrambled on our breakfast plates, hard-boiled in our lunch bags, in fancy frittatas on our supper tables, and baked into countless cookies and cakes. We eat a LOT of eggs, but where do they come from, and how are they produced? Engage students in inquiry, sequencing, comparing, and contrasting as they reflect on eggs as human food and examine egg production over time.

## Student Objectives

1. Compare and contrast historical and modern egg production systems.
2. Explain how technology has changed egg production in the United States.
3. List pros and cons of modern egg production.

## Materials

- ✓ Set of 6 meal photos (cut out in advance)
- ✓ Eating Eggs: An Inquiry worksheet
- ✓ History of Commercial Egg Production information sheet
- ✓ Modern Hen Housing information sheet
- ✓ Unscrambling Egg Production note-taking organizer
- ✓ Egg Farming Then and Now worksheet

## Vocabulary

- **automation** – the technique of making a process or machine work automatically, with minimal human involvement
- **aviary** – a building or structure used to house birds or poultry such as chickens
- **barn** – a farm building used to house livestock, machinery, tools, and/or feed
- **cage-free** – a poultry housing system wherein birds can freely move vertically and horizontally and exhibit natural behaviors such as scratching and roosting on perches; eggs must be collected by hand
- **commercial** – a business operated in commerce with the intent to make a profit
- **conventional cage** – a poultry housing system in which birds are housed in climate-controlled buildings within stacked rows of cages with wire mesh floors, automatic egg collection, and conveyer belts that constantly remove manure

- **enriched colony** – a poultry housing system which combines features of cage-free and conventional systems, allowing space for natural behaviors combined with efficiency measures like an egg-collecting system and conveyor belt which removes manure
- **litter** – the mixture of bedding material, manure, feathers, and spilled feed found wherever poultry are housed
- **manure** – animal waste, especially that of livestock or poultry
- **mortality rate** – death rate, often stated as a percentage of a population; used to measure the overall success of livestock production systems
- **pecking order** – the pattern of social behavior within a flock or group of poultry; stronger or higher-status birds peck weaker or lower-ranking birds which do not fight back.
- **waste** – another term sometimes used to refer to manure; animal waste

## Procedure

1. As an interest approach, show students the six meal photos, one at a time. Discuss each briefly by asking students:
  - a. What do you see?
  - b. What is this dish called?
  - c. Have you ever eaten it?
2. Once you have shown all six photos, ask students what all the dishes have in common. (They are all made with eggs.)
3. Distribute the Eating Eggs: An Inquiry worksheet. Give students time to complete the questions. Invite them to discuss their responses with a partner.
4. Distribute copies of History of Commercial Egg Production, Modern Hen Housing, and Unscrambling Egg Production. Have students work in pairs to read and analyze the information one segment at a time, with segments being determined by headings. They should follow these steps:
  - a. Both students silently read the segment, then stop to discuss.
  - b. One student identifies the main idea, summarizing the section in their own words. The other student agrees or disagrees and gives their reasoning.
  - c. Both students should come to agreement about the segment's main idea.

- d. Partners take turns identifying text details that support the main idea.
  - e. Students then silently read the next segment, switch their previous roles, and repeat steps b-c.
  - f. Students keep track of main ideas and details using the Unscrambling Egg Production note-taking organizer.
5. Conduct a class discussion on key points learned in the informational reading.
  6. As an assessment tool, distribute copies of the Egg Farming Then and Now worksheet for students to complete independently.

### **Extension Activities**

1. This lesson focuses on modern indoor hen housing systems. Learn more about these systems as well as outdoor/free range systems in the Hen House Engineering lesson at <https://agclassroom.org/matrix/lesson/799/>.
2. Follow the path of eggs from farm to fridge with the From Hen to Home at <https://agclassroom.org/matrix/lesson/718/>

### **Additional Resources**

- American Egg Board - [www.IncredibleEgg.org](http://www.IncredibleEgg.org)
- United Egg Producers - <https://unitedegg.com/>

## Standards

### ***Illinois Social Science Standard***

SS.H.3.5: Explain probable causes and effects of events and developments in U.S. history

### ***Illinois English Language Arts Standard***

RI.6. 2: Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

The **M**ultidisciplinary **A**gricultural **I**ntegrated **C**urriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in September 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

Poultry mAGic project update writers/reviewers: Rhodora Collins – Dekalb County; Suzi Myers – Kane County; Connie Niemann – Montgomery County; Debbie Ruff – Livingston County; Jennifer Waters – Sangamon County; and Dawn Weinberg – Hancock County.

**Meal Photos**  
(to be cut out)



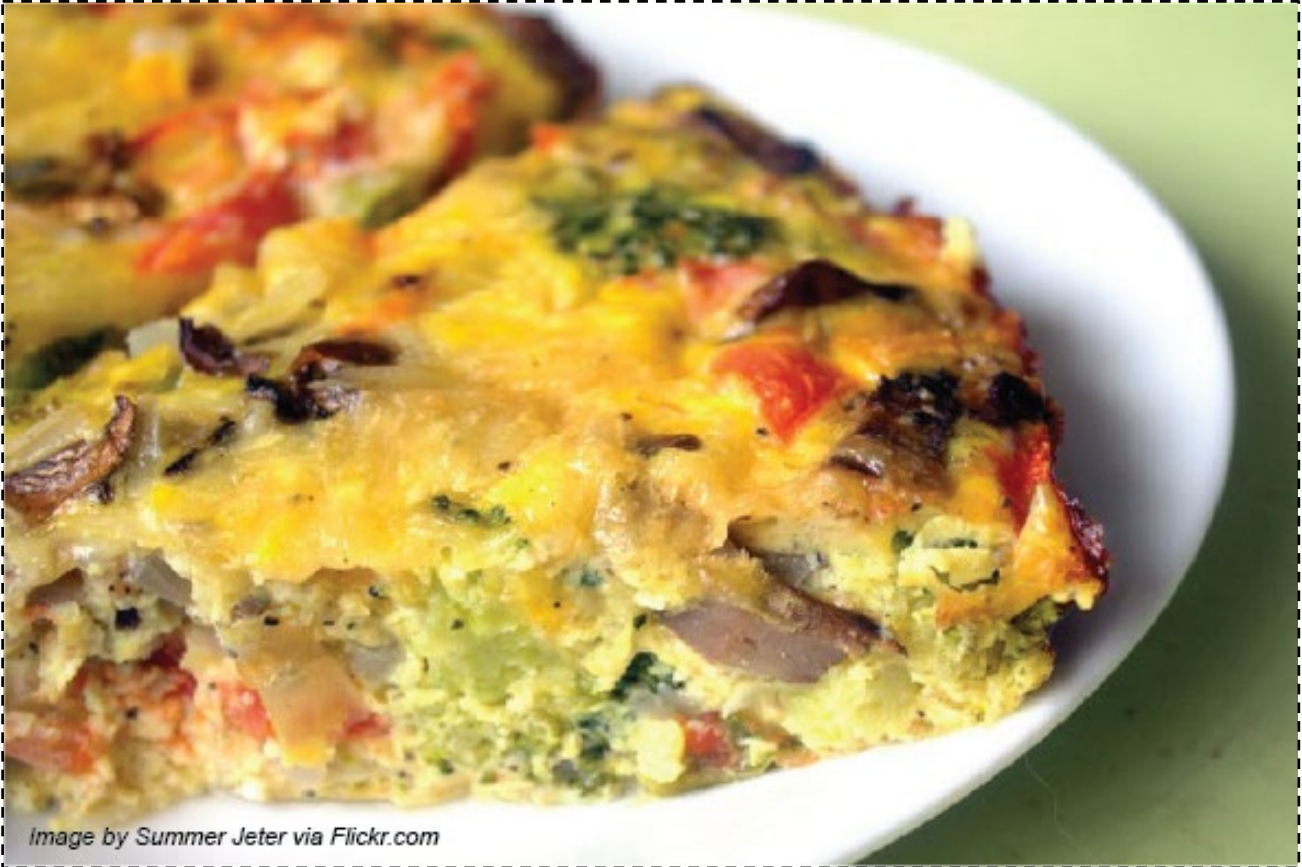


**Meal Photos**  
(to be cut out)





**Meal Photos**  
(to be cut out)



*Image by Summer Jeter via Flickr.com*



*Image by Tamanna Rume via Unsplash.com*

Name \_\_\_\_\_

## **Eating Eggs: An Inquiry**

Read and thoughtfully consider each of the questions below before writing your answers. This is not a test; there are no correct or incorrect answers.

1. Why do you think humans eat eggs?
2. How long do you think humans have been eating eggs?
3. Do you think humans have always eaten eggs from chickens? Why or why not?
4. Describe how you think a farm that raised chickens for eggs looked like 100 years ago. How many hens would there be? How were they cared for and by whom? How do think the eggs were collected?
5. Now describe how you think a farm that raises chickens for their eggs looks today. Does it look the same or different? If it is different, how? Why?



# History of Commercial Egg Production

## From Ancient Times

Since birds and eggs preceded man in the evolutionary chain, they've existed longer than historians. East Indian history indicates that wild fowl were domesticated as early as 3200 B.C. Egyptian and Chinese records show that fowl were laying eggs for humans in 1400 B.C. Europe has had domesticated hens since 600 B.C. There is some evidence of native fowl in the Americas prior to Columbus' arrival.

Nearly 200 breeds and varieties of chickens have been established worldwide. Most U.S. laying hens are Single-Comb White Leghorns.

## The Early 1900s

In the 1920s and 1930s, egg farms were still mostly backyard systems. Many farmers had laying hens to supply their own families with eggs and would sell any extra eggs at local farmers' markets. As selling eggs became profitable, some farms started building up flocks of about 400 hens. The hens roamed around outside with a coop for roosting.



Living outside presented some problems, mainly with weather and predators. Social issues within the flock included the "pecking order" in which bigger and more aggressive birds would eat more of the food, leaving less for the other birds.

Scientifically controlling what the birds ate was another major step forward in maintaining healthy hens and ensuring eggs of consistent quality. While these

advances helped, the hens still had a mortality rate of about 40 percent.

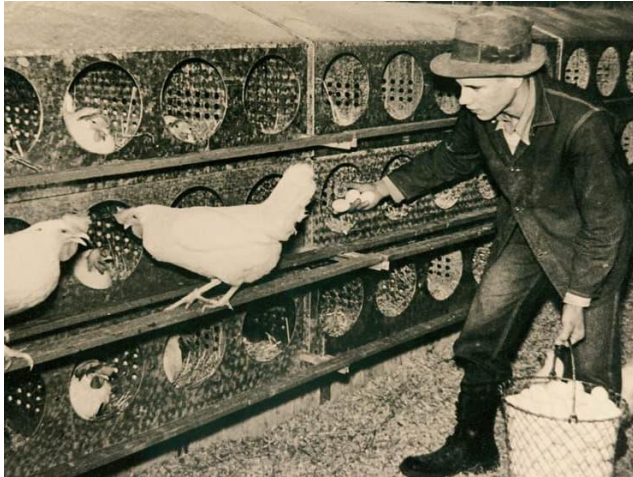
Research on moving hens to indoor living showed many benefits. While expensive, specialized large hen houses resulted in much healthier birds. When living indoors, the hens weren't exposed to predators and the elements, including temperature extremes.

Instead of the hens eating whatever they found outside, feed could be better-controlled indoors, too.

These changes reduced hen mortality to 18 percent a year. But some of the same old problems remained, including sanitation, waste control and the pecking order. The eggs were often dirty and exposed to some of the same waste-related bacteria as the hens.

## The Mid to Late 1900s

Continuing studies began in the late 1920s. In the late 1940s, some poultry researchers had favorable results with raised wire-floor housing for hens.



Sanitation greatly improved when hens were raised off the floor. Neither the hens nor the eggs came into contact with waste, and waste removal was much easier. Feeding became more uniform as the more timid hens were able to eat and drink as much as they wanted. This resulted in more uniform egg-nutrient quality and less feed being needed for the flock.

In colder climates, farmers modified the southern structures by enclosing them and adding fans for ventilation. The hens themselves were a great source of heat for the winter.

Conveyor belts were added to the hen house to collect the eggs as soon as they were laid and carry them to the washers.

By the early 1960s, improved technology and the development of sophisticated mechanical equipment were responsible for a shift from small farm flocks to larger commercial operations.

Improving the health of hens through more protective housing and better feeding facilities led to more eggs which led to increased automation to handle the eggs and lower costs to consumers.

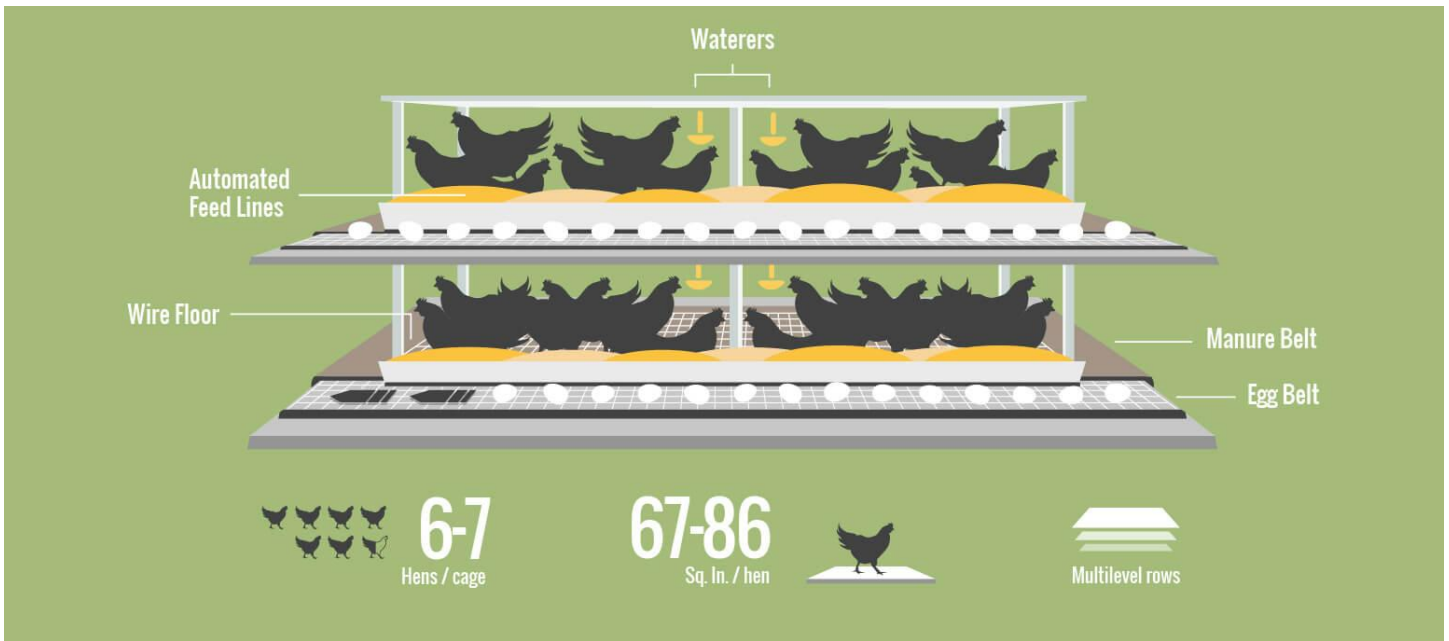


## Today

Annually, about 60 percent of the eggs produced are used by consumers, about 9 percent are used by the foodservice industry and the rest are turned into egg products which are used mostly by foodservice operators to make the meals we eat in restaurants and by food manufacturers to make foods like mayonnaise and cake mixes.

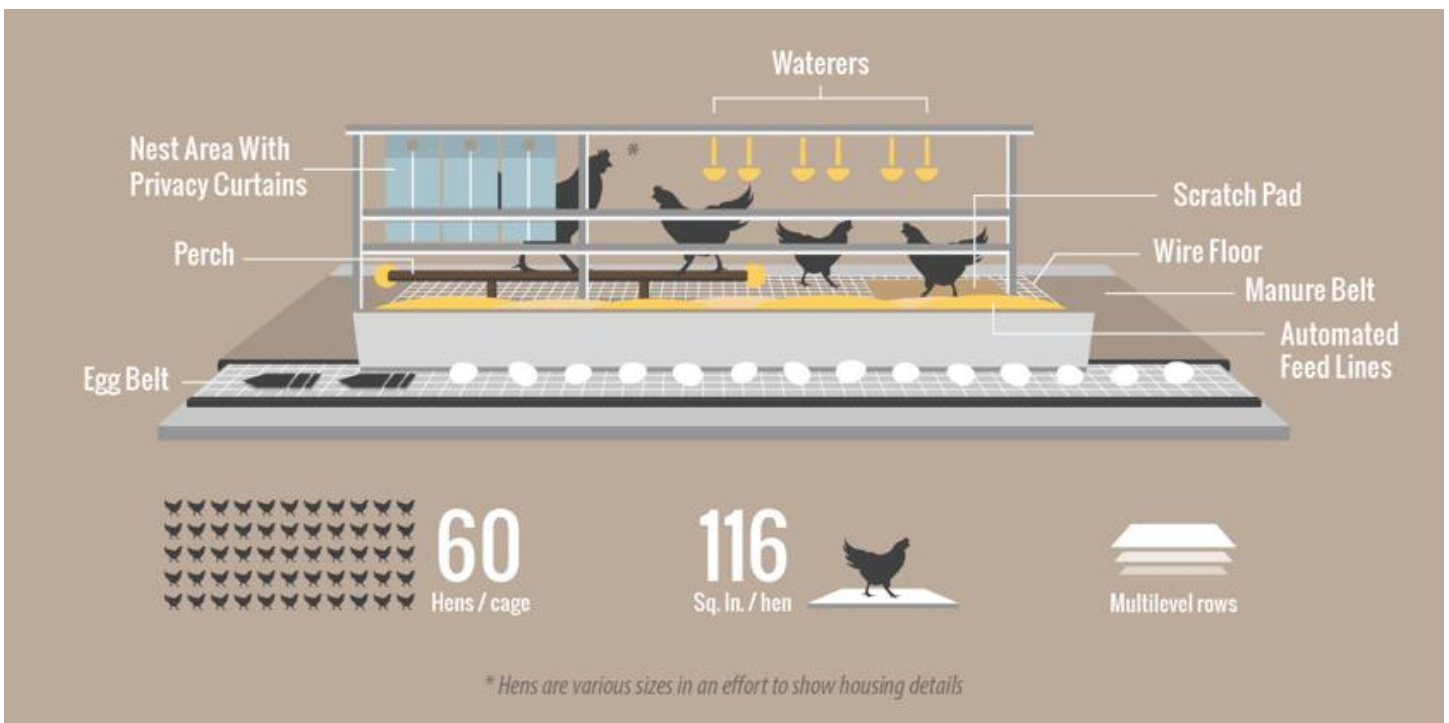
*Text and images retrieved from <https://www.incredibleegg.org/about-us/us-egg-farming-history> on 7-22-21. Used with permission.*

## Hen Housing Today



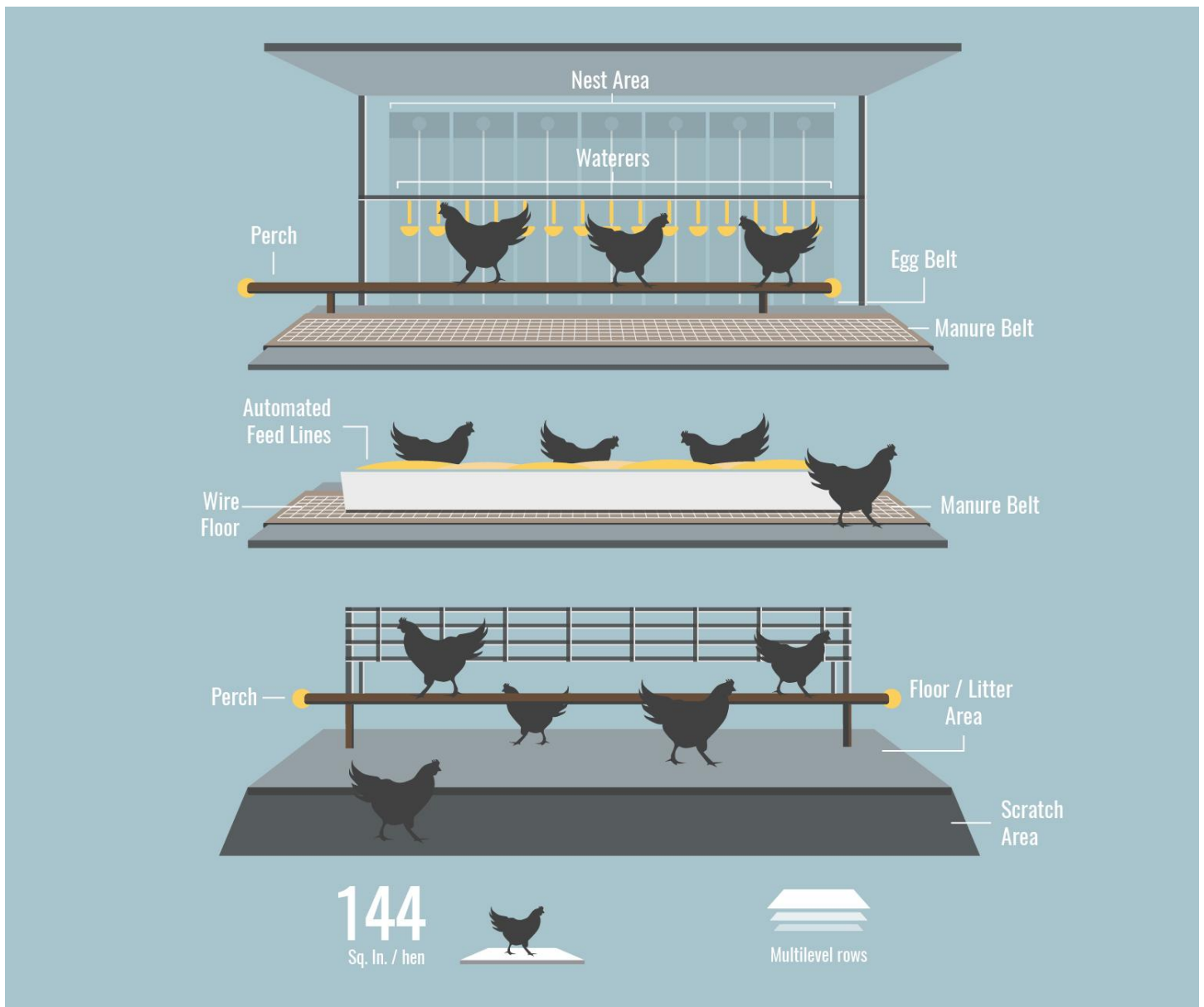
**Conventional Cage** – Hens are housed inside climate-controlled barns in stacked rows of cages. Each cage gives birds continual access to water and food. The cage has wire mesh floors that allow manure to drop through to a belt below, which keeps manure away from the birds, as well as

their eggs, food and water. After a hen lays an egg, it gently rolls off the slightly-sloped mesh flooring onto an egg-collection belt. The belt moves the egg to processing, where it is checked for imperfections, cleaned, and packaged.



**Enriched Colony** – Hens in enriched colony housing live in smaller groups and have space for natural behaviors like perching, scratching and dust bathing. Curtains provide hens with privacy during nesting. Hens are housed inside climate-controlled barns in stacked rows of enclosures, with continual access to water and food. Each enclosure has

wire mesh floors so manure can drop through to a belt below to keep manure away from the birds, eggs, food and water. After a hen lays an egg, it gently rolls off the slightly sloped wire mesh floor onto an egg-collection belt, which moves the egg into the processing area.



**Cage-Free** – Cage-free eggs are laid by hens that are able to roam vertically and horizontally in indoor houses and have access to fresh food and water. Cage-free systems vary from farm-to-farm, and can include multi-tier aviaries. They must allow hens to exhibit natural behaviors and include enrichments such as scratch areas, perches and nests. Hens must have access to litter, protection from predators and be able to move in a barn in a manner that

promotes bird welfare. A cage-free aviary is shown here. Manure belts help keep manure away from birds. Most of the time, hens lay the eggs in the nest box, where the eggs then rolls off the slightly-sloped floor onto a collection belt. The belt moves the egg to processing. Eggs can also be laid in the litter or elsewhere in the barn, and then they must be collected by hand.



Name \_\_\_\_\_

## Unscrambling Egg Production

Use the charts to take notes of the main ideas and details found in each segment of the reading.

History of Commercial Egg Production	
<b>From Ancient Times</b>	
Main Ideas	Details
<b>The Early 1900s</b>	
Main Ideas	Details
<b>The Mid to Late 1900s</b>	
Main Ideas	Details
<b>Today</b>	
Main Ideas	Details

## Hen Housing Today

### Conventional Cage

Main Ideas

Details

### Enriched Colony

Main Ideas

Details

### Cage-Free

Main Ideas

Details

Name \_\_\_\_\_

## Egg Farming Then and Now

Use the information provided on the History of Commercial Egg Production and Hen Housing Today pages to draw a line between each of the date ranges below and the descriptions that match. Some dates will match with multiple descriptions.

1400  
BC

Cage-free eggs are laid by hens that are able to roam vertically and horizontally in indoor houses and have access to fresh food and water.

By this time, improved technology and the development of sophisticated mechanical equipment were responsible for a shift from small farm flocks to larger commercial operations.

1920s  
&  
1930s

Annually, about 60 percent of eggs are used by consumers, 9 percent by the foodservice industry, and the rest are turned into egg products.

As selling eggs became profitable, some farms started building up flocks of about 400 hens. The hens roamed around with a coop for roosting.

Late  
1940s

Hens are housed in climate-controlled barns. Each cage gives birds continual access to water and food and have wire mesh floors that allow manure to drop to a belt below.

Some poultry researchers had favorable results with raised wire-floor housing for hens.

Early  
1960s

Egyptian and Chinese records show that fowl were laying eggs for humans.

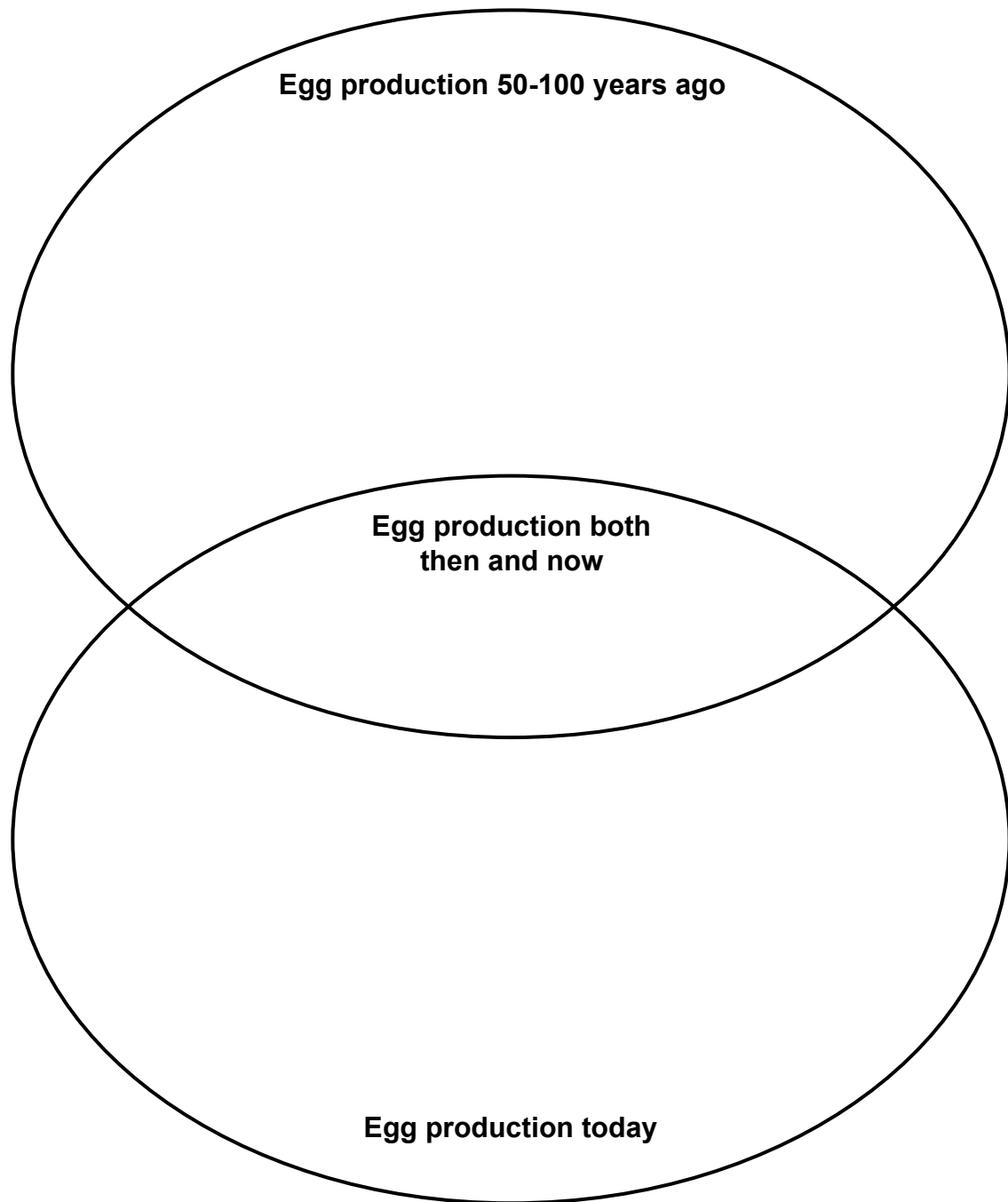
Egg farms were still mostly backyard systems. Many farmers had laying hens to supply their own families with eggs and would sell any extra eggs at local farmer's markets.

Today

Sanitation greatly improved when hens were raised off the floor. Neither the hens nor the eggs came into contact with waste, and waste removal was much easier.

Hens in enriched colony housing live in smaller groups and have space for natural behaviors like perching, scratching, and dust bathing. Curtains provide privacy during nesting.

Use the information you have learned about egg production to write descriptive words or phrases in the Venn diagram below.



Describe ways in which egg production has changed in the past 100 years. In your view, have the changes in egg farming improved the quality of life for laying hens? For humans? Why or why not?



## Egg Farming Then and Now ANSWER KEY

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1400 BC

1920s & 1930s

Late 1940s

Early 1960s

Today

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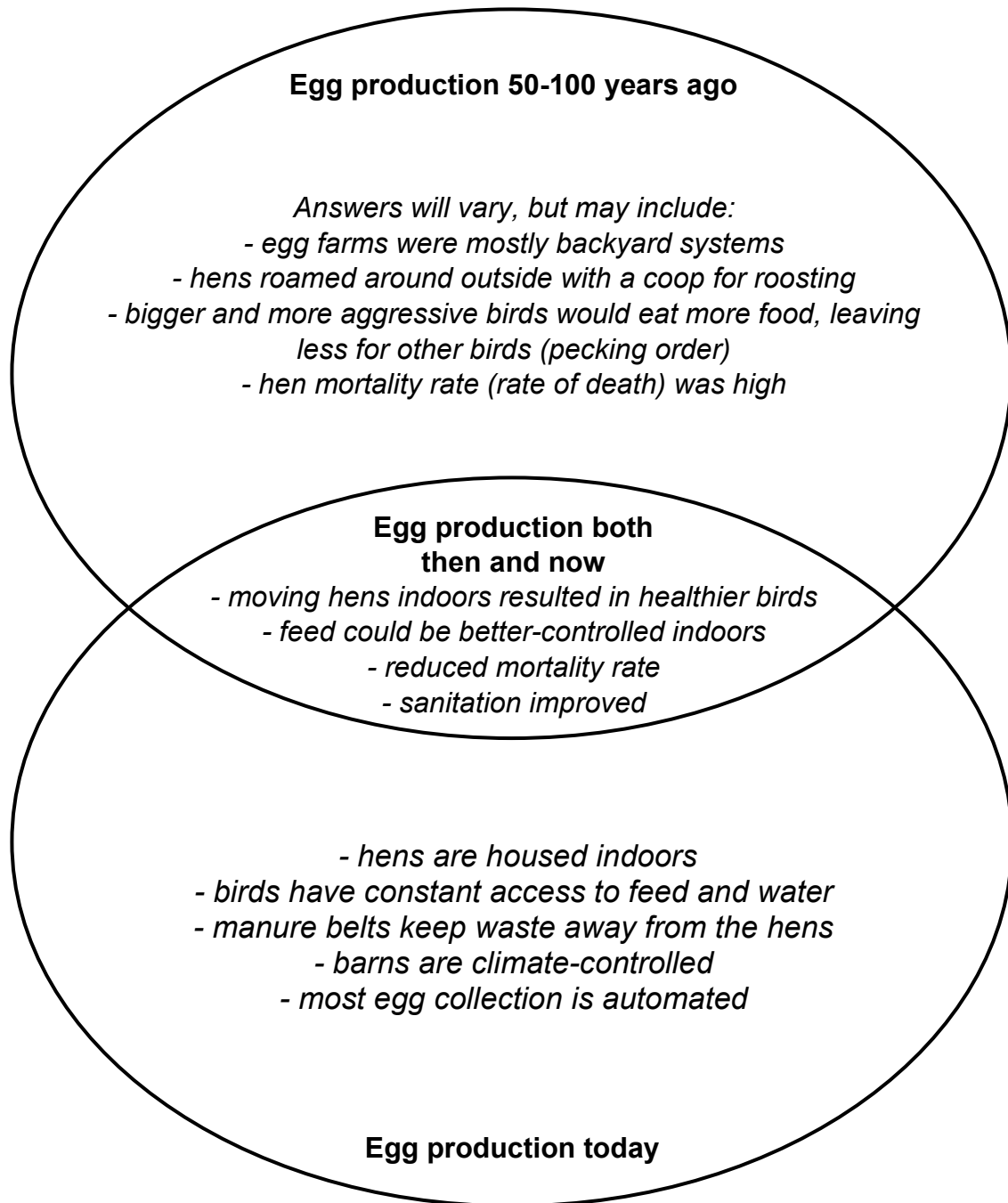
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*(Note: Red lines connect the descriptions to the date ranges as follows: 1400 BC to 'Egyptian and Chinese records...'; 1920s & 1930s to 'As selling eggs became profitable...'; Late 1940s to 'Some poultry researchers...'; Early 1960s to 'Egg farms were still mostly backyard systems...'; Today to 'Sanitation greatly improved...' and 'Hens in enriched colony housing...')'*

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