Illinois Ag Mag

An agricultural magazine for kids

Poultry

What is Poultry?

Poultry is the term used to describe birds that are domestic, not wild, that are raised for their products including meat, eggs, and feathers. Poultry are raised on farms and in backyards across the state providing meat and eggs. The most common types of poultry in Illinois are chickens and turkeys.

CHICKEN & TURKEY

While chickens and turkeys are very similar, they also differ in specific ways. A turkey is larger with a longer neck and bigger body. A chicken has a shorter neck and more compact body. Both are covered with feathers, except for their hard, pointy beak and scaly legs. There are many different breeds of each, and the feathers and features can vary in color.

TURKEY

While turkey was once only thought of as the main dish for Thanksgiving, that has changed and each American now eats over 16 pounds of turkey per year! It is fitting that the turkey is a product of the New World. The turkey is a native of Central America, and was first domesticated in Mexico more than 2000 years ago! As the public has demanded more turkey, production has increased, and it has nearly doubled in the last 50 years. Minnesota, North Carolina, and Arkansas lead the nation in the number of turkeys raised annually. Illinois ranks 18th with just over 730,000 turkeys per year.

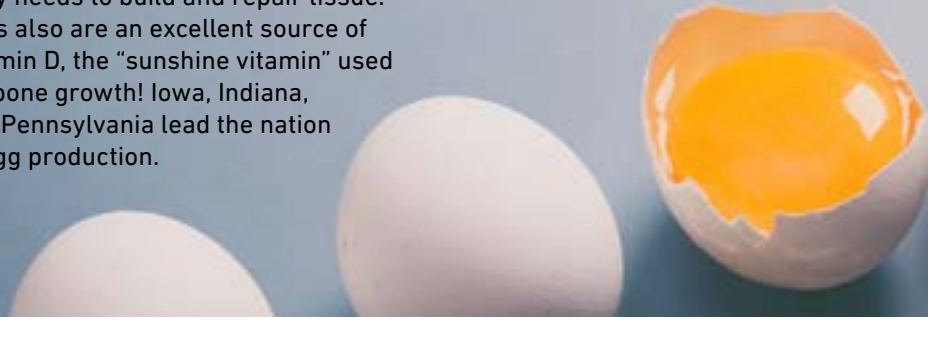
CHICKEN FACT:

Chickens can fly short distances, over a fence or up into a tree to roost.

EGGS

are classified as meat because they are an excellent source of protein that your body needs to build and repair tissue. Eggs also are an excellent source of vitamin D, the "sunshine vitamin" used for bone growth! Iowa, Indiana, and Pennsylvania lead the nation in egg production.

Illinois ranks 20th in egg production.



CHICKENS

The chickens of today can trace their roots back to 2000 BCE to wild jungle fowl of southeastern Asia. Today, chickens are often classified by their purpose. Those that are raised to be used for meat are called broilers, while those that produce eggs are called layers.

Each year, Americans will eat 93 pounds of chicken per person. That is a lot of nuggets! States that lead the way in broiler production include Georgia, Alabama, and Arkansas. Broilers reach market weight in about 5 weeks and provide excellent sources of protein for your diet.

Security at the farm.

Raising poultry on a farm is serious business. Poultry must have consistent temperatures, access to food and water, and a safe environment. That means that poultry farmers are constantly monitoring their flock. Additionally, farmers use biosecurity measures to keep their chickens healthy. This includes wearing protective clothing while visiting or working with the chickens or turkeys. While many towns and cities in Illinois allow chickens to be raised in your backyard, remember this is serious business. Caring for the animals by providing proper shelter, heating and cooling, protection from illness, as well as proper food sources should be considered before bringing home chickens or any other animal!

FUNfact

In a letter to his daughter, Ben Franklin described the turkey as "a true original native of America...." While he wasn't selecting it as our national symbol, he did feel the turkey was a "respectable bird...."

Which Came First?

All poultry are oviparous. This means that their young hatch out of an egg. Mature female chickens, called hens, lay eggs. A hen is born with many tiny yolks in her body. One at a time these grow to full size and become an egg. The egg formation takes around 26 hours. Hens are also sensitive to light, so the time of day impacts when eggs are laid. When raising chickens inside, the light can be adjusted to more closely regulate egg cycles. Eggs that you find at the store are not fertilized.

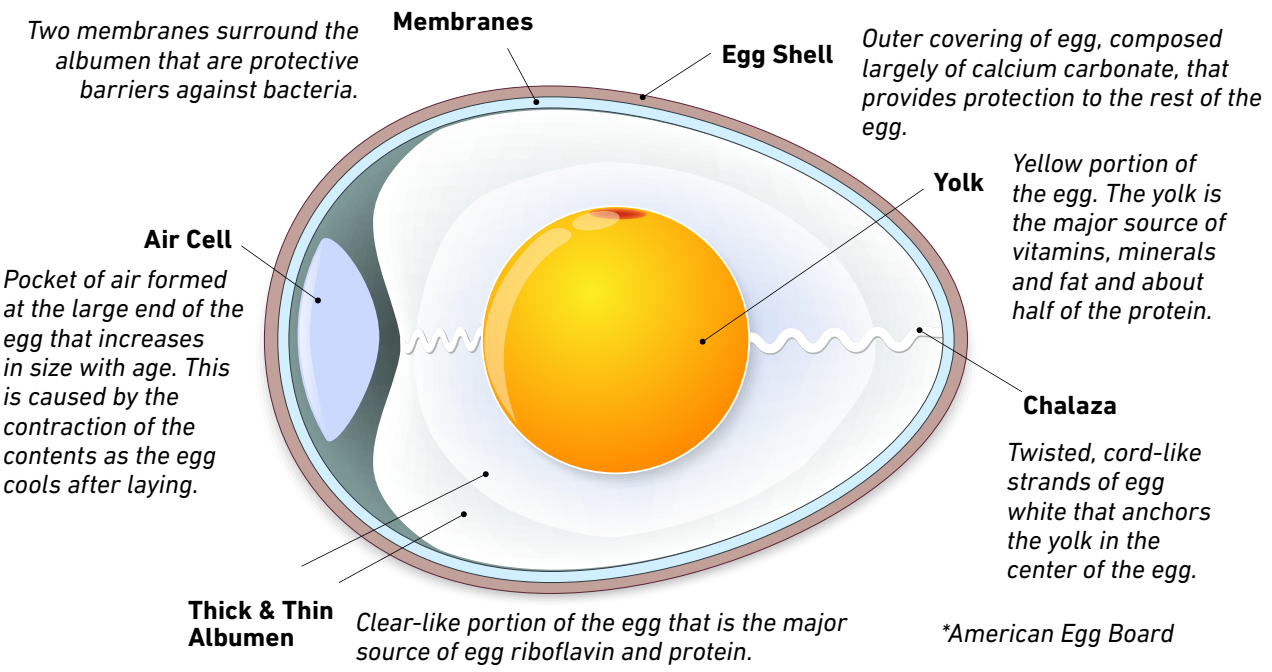
Mature male chickens, called roosters, must be present for an egg to be fertilized. Fertilized eggs become chicks, or baby chickens. When a hen lays her fertilized eggs, she will keep them warm with her body heat and take care of them for around 21 days before they hatch. Taking care of her eggs means that she also turns her eggs on a regular basis to keep the temperature consistent. After about 21 days, the chicks hatch out of the eggs by themselves. While wet and weak when they hatch, after a few hours they have dried off and scurry around looking for food and water.

Take A Closer Look

Have you ever taken a close look at the inside of an egg? The first part you see on an egg is the hard coating, called the shell, which protects the egg. The shell is made of calcium carbonite, the same material that makes up pearls. The shell can be different colors and sizes depending on the breed and age of the hen.

The color of the egg has no effect on quality, cooking properties, or nutrition. If you were to crack the egg open, you would see the chalazae. It is a twisted, cordlike strand of egg white and it anchors the yolk in the center of the egg. The albumen, the clear part, surrounds the yolk.

If you hold an egg in your hand, you will notice that one end is wider than the other. On the wider end is a small air pocket just inside the shell. If the egg were fertilized and a chick developed, the air space would give the chick oxygen when it began to hatch.



*American Egg Board

TIMELINE

3000 B.C.E. — Egyptians domesticated, or tamed, fowl that were laying eggs for man to eat. (a)


(a)

1492 — Historians believe that the first chickens related to today's egg layers were brought to the Americas on Columbus's ships.

1498 — According to William Rubel, the first turkeys arrived in Spain. Turkey was the New World food most easily adopted by Europeans.

1540s — Turkeys were established in England. By the 1570s, they were raised throughout the country.

1620 — The early English settlers brought turkeys with them to what is now New England. Although they encountered wild turkeys in the forests, they wanted domesticated turkeys for their barnyard.

1840 — First National Poultry Census was conducted.

1849 — America's first Poultry Show was held in Boston, Massachusetts.

1911 — Egg carton introduced by Joseph Coyle. (b)

1949 — USDA launched a voluntary program of grading to assure consumers of high quality eggs.


(b)

Image Sources: a) https://www.atlasobscura.com/articles/ancient-foie-gras-debate b) http://inventivekids.com/joseph-coyle-invents-egg-carton-1911/ c) https://www.pinterest.com/pin/199354720976437681/?lp=true d) https://en.wikipedia.org/wiki/McMuffin

Embryonic Development

The embryology of the chicken is the development of the chicken inside the egg. Laying hens (layers) sit on the eggs for 21 days until they hatch. In large commercial chick production, large incubators are used to hatch chicks instead of laying hens. Below you will find the embryonic development of the chicken.

Day 1: Beginning of nervous system, head and eyes

Day 2: Heart beats

Day 3: Beginning of nose, legs and wings

Day 4: Beginning of tongue

Day 5: Formation of reproductive organs

Day 6: Beginning of beak

Day 8: Beginning of feathers

Day 13: Appearance of scales and claws

Day 14: Embryo gets into position suitable for breaking shell

Day 16: Scales, claws and beak become firm

Day 21: Hatching of the chick

Source: http://digitalspace.info/?k=kaz+bad+day

INCUBATORS

Many classrooms experience the wonders of hatching chickens using fertilized eggs and a commercial incubator. The incubation process is relatively simple. Here are five major points to remember during incubation:

1. **Temperature** is the most important factor to consider that influences the developing embryo. The perfect temperature is 100.5 degrees Fahrenheit but should not drop below 99 or go above 103 degrees Fahrenheit.
2. **Humidity** keeps the egg from losing too much or too little moisture during the incubation process. Humidity is achieved by having plenty of water in the small containers in the base of the incubator.
3. **Ventilation** is important to provide air circulation within the incubator. Growing embryos absorb oxygen and release carbon dioxide. Proper ventilation helps with this.
4. **Turning** the eggs is necessary during incubation. This is when the closest observation of the eggs will take place. Keeping good records of the time the eggs were turned is very helpful. Typically, eggs are turned 2-3 times a day from Day 2 until Day 18.
5. **Cleanliness** is critical. Wash your hands before touching the eggs in the incubator. This will help protect the incubator environment from infections.

EGG YOLK

The color of the egg yolk depends on the hen's diet. If she eats yellow corn or alfalfa meal, the yolk is medium yellow. If she eats barley or wheat, the yolk is a lighter yellow. If she eats white corn meal, the yolk is almost colorless.

EGG SHELL

The color of an eggshell depends upon the breed of hen. Hens with white ear lobes lay white eggs. Hens with red ear lobes lay brown eggs. Rhode Island Reds, New Hampshires, and Plymouth Rock chickens lay brown eggs. White Leghorns and Brown Leghorns lay white eggs.

1953 — Swanson invented the TV dinner, featuring turkey and all the fixings. By the end of the first year on the market, Swanson had sold more than 10 million meals.

1959 — Federal inspection of broilers became mandatory.

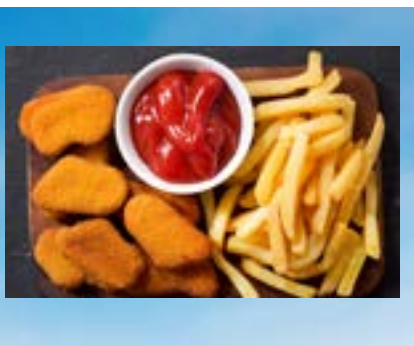
1972 — Egg McMuffin introduced by McDonalds. This is the beginning of fast food breakfast! (c)

1980 — McDonald's Chicken McNuggets were introduced.

(c)

1985 — Chicken consumption surpassed pork consumption in the U.S.

1992 — Chicken consumption surpassed beef consumption in the U.S.



2011 — The average number of egg laying hens in the United States was 281 million!

2017 — Illinois produced nearly $86,000,000 in egg production.

2019 — Americans eat an average of 64.8 pounds of chicken a year.

EGG CANDLING

Did you know that you can see inside of an egg? You can see different stages of chick development over the 21 day incubation process with a fertilized egg.

Candling is when you look at the inside of an egg to determine the stage of development. You only need a few things when candling an egg: a fertilized egg, a flashlight, and an egg candler.

An egg candler is a device used for testing eggs.

To begin, turn the lights off, and carefully place the fertilized egg in the egg candler, with the wide end of the egg down.

Hold the flashlight up to the egg. The light shining through the egg will allow you to determine the stage of chick development throughout the 21 days of incubation.

FACT GRIT

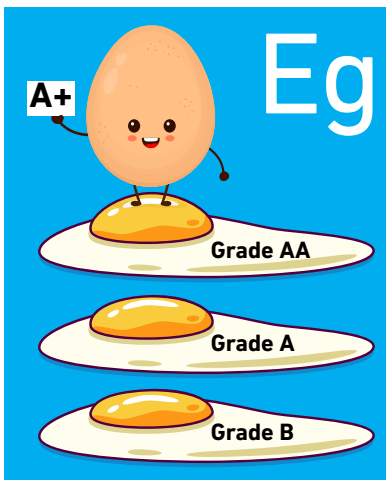
Chickens also eat grit, a mixture of small pebbles or crushed stones to help them digest their food. They need this mixture because chickens do not have teeth and are not able to chew their food to aid digestion. Instead, they pass the food into an organ called the gizzard.

The gizzard is a muscular part of the stomach and uses grit to grind grains and fiber into smaller, more digestible particles.

From Farm to Table!

From the moment eggs are laid, physical and chemical changes begin. Newly laid eggs are refrigerated quickly to maintain freshness and quality. Although eggs can be gathered by hand, many are gathered by automated gathering machines. Gathered eggs are moved into refrigerated holding rooms with high humidity to keep moisture inside the eggs. Eggs are then washed, sanitized, graded, and packaged. The eggs are stored in large coolers and transported to stores in refrigerated trucks.

Egg Grades



Egg quality is measured through a grading system. Egg grades are determined by the inside and outside quality of the egg when packed.

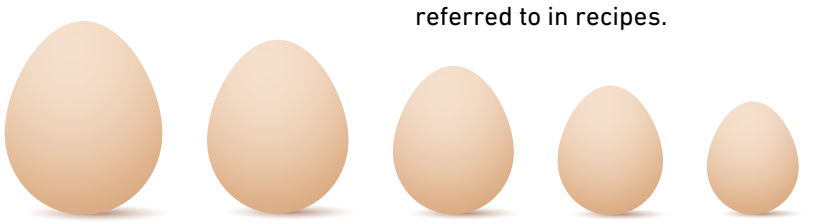
Grade AA: The egg stands up tall, the yolk is firm and the area covered by the white is small. The egg white is thick.

Grade A: The egg covers a small area, and the yolk is round and upstanding. The egg white is thick with some thin areas.

Grade B: The egg spreads out more, and the yolk is flattened. The egg white is much thinner.

EGG SIZES

The size of eggs are determined by an average weight per dozen (12) eggs. You can find a variety of egg sizes in your local supermarket. Large eggs are the most common available size and most commonly referred to in recipes.



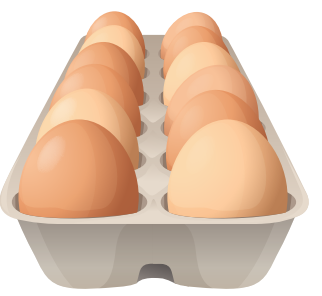
Jumbo
30 ounces per dozen

Extra Large
27 ounces per dozen

Large
24 ounces per dozen

Medium
21 ounces per dozen

Small
18 ounces per dozen



This Ag Mag complements and can be connected to the following common core and Next Generation Science Standards:

Common Core State Standards: ELA-Literacy.RI.4.2; RI.4.3; RI.4.4; RI.4.7; RI.4.10

Next Generation Science Standards: From Molecules to Organisms: K-LS1; 1-LS1; Heredity: 3-LS3

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CAREERS

LINDSEY VOGT

Jasper County Agriculture Education Coordinator

Newton, IL

Describe your background and how did you become interested in poultry?

I grew up on a family farm and was active in FFA and 4-H throughout high school. I earned my associate's degree in Science from Lake Land College and my bachelor's degree from Eastern Illinois University in Biology with a Chemistry specialization and teaching certification. I joined 4-H when I was 8 and began showing chickens. I started small with showing a few meat chickens and selling them at our 4-H auction and soon expanded to showing many breeds of chickens, bantams, turkeys, ducks, and guineas.

What are the major differences between the types of poultry you choose to use in the classroom?

There are many major differences between each type of poultry. Their size, coloring, habitat, dietary needs, flying ability, number of eggs they lay in a year, and weight are just a few examples. However, for hatching eggs in a classroom, the main difference that I am concerned with is how many days it takes the egg to hatch, and the temperature and humidity requirements. For example, most duck, turkey, and guinea eggs take 28 days to hatch out, a chicken or bantam egg needs only 21 days to hatch, and a button quail hatches in just 16 days.

Explain the process from start to finish of hatching eggs in the classroom.

Mother birds will naturally sit on their eggs to hatch them out. We are trying to copy them with the incubator. We run the incubator empty in the classroom for a week to monitor its temperature and humidity to make sure it is working correctly. Humidity and temperature are often adjusted many times before adding the eggs. Everything needs to be just right to get a good hatch. The eggs themselves must be carefully selected, too. The eggs must be fresh, fertile, unwashed, and unrefrigerated. Eggs from the store will not hatch.

To fill my county's incubators, I need over 1,000 fertile eggs at a time.

A mother hen will turn her eggs using her beak several times daily. This helps the chicks to develop and stay at a consistent temperature. To do this inside of an incubator, eggs are placed on a turner that slowly rotates the eggs back and forth.

During the incubation process, teachers and students often candle the eggs to see which ones are developing.

The students carefully monitor the temperature and humidity. Water needs to be added to the incubator about every 3 days.

A week before hatch day, I deliver hatching kits. The hatching kit contains cheese cloth, newspaper, bedding, food, feeder, waterer, heat light, and a large plastic tub. Three days before the chicks hatch, the class takes the eggs out of the turner and places them in the bottom of the incubator on a layer of cheese cloth. The cheese cloth catches the shells when the chicks hatch and makes cleanup easier. They also add extra water to the incubator to increase the humidity in preparation for the hatch.

On hatching day, the class eagerly watches the chicks hatch out of their shells. Once the chick emerges it is very tired from the hard work it went through to get out of the hard shell. It lays still on the cheese cloth and rests until it is dry. When it is dry and up and moving around, it is moved to the tub where it has the heat lamp for warmth and fresh water and food.

The chicks usually stay in the classrooms for around 2 weeks. The students watch the development and growth rate of each type of poultry. They get to see them lose their egg tooth and start getting in their first set of feathers. They also learn the responsibility of cleaning up after the chicks and providing them with plenty of food, water, warmth, and bedding.