The EGG and I

Presented by:
Kentucky Egg Council
&
US Poultry & Egg Association
The average hen lays 257 eggs a year.
It requires 24 to 26 hours to make and lay one egg.
Look at items around you, what shape is an egg?
If you said an oval, you are RIGHT!

But, what is on the inside of the egg - Baby chicken? Yolk?

Do you know?
Shell Color

- Can either be white or brown.
- The breed of the hen determines the outside shell color.
- Has no effect on quality, cooking properties or nutritive value.
Composition of the Egg

Shell
Air Cell
Yolk
Shell Membranes
Latebra
Chalazae
Germinal Disc
Calcariferous Layer
Vitelline (Yolk) Membrane
Thin Albumen (White)
Chalazae
Thick Albumen (White)
Egg Quality

Grade AA

Grade A

Grade B
GRADE AA

- Egg will stand up tall. The yolk is firm and the area covered by the white is small. There is a large proportion of thick white to thin white.
Egg covers a relatively small area. The yolk is round and upstanding. The thick white is large in proportion to the thin white and stands fairly well around the egg.
GRADE B

- Eggs spreads out more. The yolk is flattened and there is about as much (or more) thin white as thick white.
Egg Size

- Jumbo: 30 oz.
- Extra Large: 27 oz.
- Large: 24 oz.
- Medium: 21 oz.
- Small: 18 oz.
- Pee Wee: 16 oz.

Minimum Weight Per Dozen
# Egg Nutrition

## Vitamins
- Vitamin A
- Vitamin B1, B2
- Vitamin D
- Riboflavin
- Nicotinic Acid
- Niacin
- Pantothenic Acid
- Folic Acid
- Biotin
- Pyridoxine
- Chlorine
- Inositol
- Vitamin E
- Vitamin K
- Linolenic Acid
- Linoleic Acid
- Arachidonic Acid

## Minerals
- Calcium
- Phosphorus
- Iron
- Iodine
- Sodium
- Potassium
- Chloride
- Magnesium
- Fluorine
- Copper
- Sulfur
- Manganese
- Zinc

## Biological Value of Protein Quality

<table>
<thead>
<tr>
<th>Food</th>
<th>Biological Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Milk</td>
<td>95</td>
</tr>
<tr>
<td>Eggs</td>
<td>94</td>
</tr>
<tr>
<td>Milk</td>
<td>90</td>
</tr>
<tr>
<td>Liver</td>
<td>77</td>
</tr>
<tr>
<td>Beef</td>
<td>76</td>
</tr>
<tr>
<td>Potatoes</td>
<td>67</td>
</tr>
<tr>
<td>Corn</td>
<td>60</td>
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</tbody>
</table>
Egg White Composition

- Mostly Water
- Approximately 10% protein
- Contains only a trace of fat
- A good source of riboflavin
- Contains most of the protein, niacin, riboflavin, choline, magnesium, potassium, sodium and sulfur found in an egg
- Contains carbohydrates
Egg Yolk Composition

- Approximately 50% water, 17% protein and 33% lipids

- Minerals: iron, phosphorus, calcium, manganese, iodine, copper, and zinc

- Vitamins A and D, B12, E, biotin, choline, folic acid, inositol, pantothenic acid, pyridoxine and thiamin

- Xanthophylls: main yellow pigment
**Eggs May Be Used To . . .**

<table>
<thead>
<tr>
<th>Uses</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thicken</td>
<td>Sauces, Puddings, Cream Fillings, Soft and Baked Custards</td>
</tr>
<tr>
<td>Leavening</td>
<td>Sponge Cakes, Butter Cakes, Quick Breads, Soufflés, Puffy Omelets</td>
</tr>
<tr>
<td>Coating</td>
<td>Breaded Meats, Vegetables, Croquettes, Breads, Rolls, Cakes and Cookies</td>
</tr>
<tr>
<td>Binding</td>
<td>Croquettes, Meat Fish and Egg Loaves, Vegetable Casseroles</td>
</tr>
<tr>
<td>Emulsifying</td>
<td>Cream Puffs, Mayonnaise, and Salad Dressing</td>
</tr>
<tr>
<td>Clarifying</td>
<td>Soup Stocks</td>
</tr>
<tr>
<td>Garnishing</td>
<td>Canapés, Soup, Salads, Dessert and Main Dishes</td>
</tr>
<tr>
<td>Retarding/</td>
<td>Certain Cake Icings, Candies and Crystallization</td>
</tr>
<tr>
<td>Crystallization</td>
<td>Ice Cream</td>
</tr>
</tbody>
</table>
Eggs Add Flavor and Color

- Eggs contain fats which carry and meld flavors in food products
- Eggs add flavor and enhance other flavors
- Egg yolks impart rich color and are used to fortify whole egg blends for a deeper color in baked products
- The pleasing color of eggs is a sign of excellent quality in baked products
Can you think of 101 ways to prepare eggs?

Have you ever seen a chef’s hat? It’s called a *toque*. A toque is white, stands up tall and has 101 pleats. Chefs say that the pleats stand for 101 ways you can cook an egg.
Major Methods of Egg Preparation

- Fried
- Scrambled
- Hard Cooked
- Poached
- Baked
- Omelets
Basic Principle of Egg Cooking

WHAT
Use a moderate to low temperature with exact timing.

WHY
When eggs are cooked at too high a temperature or for too long at a low temperature, egg whites shrink and become tough or rubbery -- yolks toughen and their surface may turn gray-green.
Egg Safety

- *Salmonella* Enteritidis (SE) has been found inside a very small number of eggs: about 1 out of every 20,000 eggs (.005%)
- SE will not grow at temperatures below 40°F and is destroyed when heated to 160°F during thorough cooking, or in acid media with a pH lower than 4.0
- Pasteurization was federally mandated in 1966 to protect against *Salmonella* organisms, at highest possible safe temperatures:
  - Whole Eggs: 140°F, 3-5 minutes
  - Whites: 143°F, 4 minutes
  - 125 °F, 3.5 minutes with addition of hydrogen peroxide
- The main concern is exterior *Salmonella* contamination; care must be taken to limit contact between shell exterior and the egg
Egg Industry Structure

Producers

Shell Egg Grading

Further Processors

Food Manufacturers

Bakery Supply

End Users

Food Brokers
10 Steps on the Journey From Hen to Home

It takes a hen about 24 to 26 hours to form and lay an egg.

Step 1: Laying

Step 2: Collecting
Journey from Hen to Home

Step 3: Washing

Step 4: Oiling
Journey from Hen to Home

Step 5:
Candling and Grading
Journey from Hen to Home

Step 6: Sizing

Step 7: Packing
Journey from Hen to Home

Step 8: Cooling

Step 9: Shipping

Step 10: Selling
Journey from Hen to Home

- Bring your eggs home and store them in their ORIGINAL carton on an inside refrigerator shelf.
- Cook eggs within 4 to 5 weeks of the Julian Date (pack date) or 3 to 4 weeks of buying them.
- Use hard-cooked eggs within 1 week of cooking.