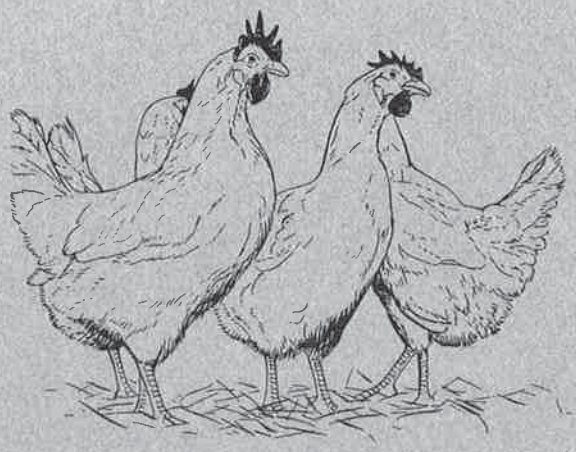
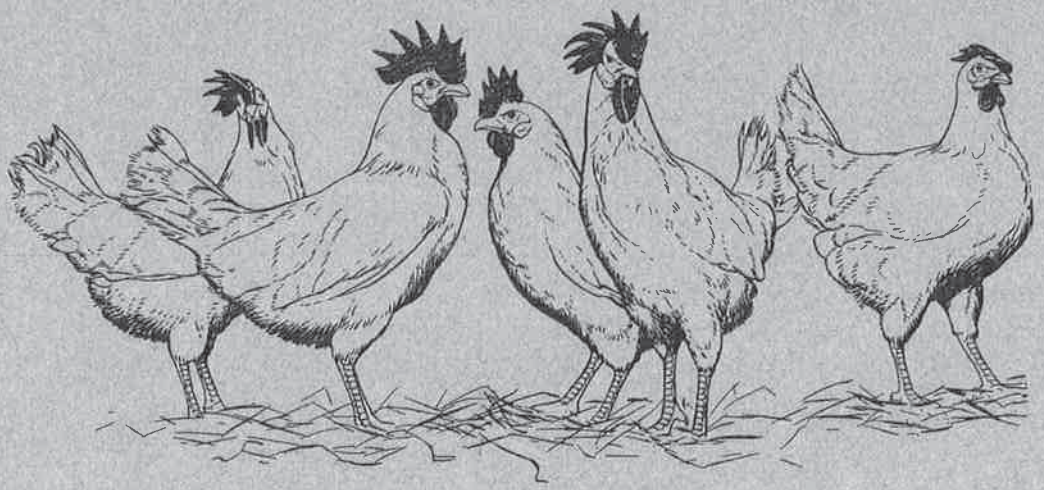


Eggcyclopedia



EGGCYCLOPEDIA

Eggs from A to Z

Exquisitely simple, yet enormously complex, the egg is one of nature's marvels. Within this section are facts and figures, definitions and diagrams, graphs and even a few giggles—all related to various aspects of the egg. From air cell to yolk with such diverse topics as games and mythology, cooking tips and nutrient content tucked in between, the information is arranged alphabetically by subject for ease of reference. We hope it adds to your understanding and enjoyment of the incredible edible egg.

Nutrient Density of the Egg

Percentage of Reference Daily Intake (RDI)*
Provided by One Large Egg

Vitamin A	6%
Thiamin	2%
Riboflavin	15%
Calcium	3%
Iron	4%
Vitamin D	6%
Vitamin E	3%
Vitamin B_6	4%
Folic Acid	6%
Vitamin B_{12}	8%
Sodium	3%
Potassium	2%
Phosphorus	9%
Magnesium	1%
Zinc	4%
Biotin	3%
Pantothenic Acid	6%

*Based on a 2,000-calorie diet. You may need more or less depending on your calorie needs.

Air Cell

The empty space between the white and shell at the large end of the egg.

When an egg is first laid, it is warm. As it cools, the contents contract and the inner shell membrane separates from the outer shell membrane to form the air cell.

The candler uses the size of the air cell as one basis for determining grade. In Grade AA eggs, the air cell may **not** exceed 1/8 of an inch in depth and is about the size of a dime. The air cell of Grade A eggs is greater than 1/8 of an inch but may **not** exceed 3/16 of an inch in depth. In Grade B eggs, the air cell is greater than 3/16 of an inch in depth.

As the egg ages, moisture and carbon dioxide leave through the pores of the shell, air enters to replace them, and the air cell becomes larger.

Although the air cell usually forms in the large end of the egg, it occasionally moves freely toward the uppermost point of the egg as the egg is rotated. It is then called a free or floating air cell. If the main air cell ruptures, resulting in one or more small separate air bubbles floating beneath the main air cell, it is known as a bubbly air cell.

You can see the air cell in the flattened end of a peeled, hard-cooked egg. *—see Candling, Composition, Grading, Peeling*

Albumen

Also known as egg white. Albumen accounts for most of an egg's liquid weight, about 67 percent. It contains more than half the egg's total protein, niacin, riboflavin, chlorine, magnesium, potassium, sodium, and sulfur. The albumen consists of four alternating layers of thick and thin consistencies. From the yolk outward, they are designated as the inner thick or chalaziferous white, the inner thin white, the outer thick white, and the outer thin white. Egg white tends to thin out as an egg ages because its protein changes in character. That's why fresh eggs sit up tall and firm in the pan while older ones tend to spread out.

Albumen is more opalescent than truly white. The cloudy appearance comes from carbon dioxide. As the egg ages, carbon dioxide escapes, so the albumen of older eggs is more transparent than that of fresher eggs.

When egg albumen is beaten vigorously, it foams and increases in volume six to eight times. Egg foams are essential for making souffles, meringues, puffy omelets, and angel food and sponge cakes. *—see Breakout; Chalaza; Color, white; Composition; Cooking Functions; Cooking Terms; Foam; Formation; Grading; Nutrient*

American Egg Board

The advertising, research, and promotion organization for the egg industry. The Board is composed of 18 members and 18 alternates. All are egg producers who have been appointed by the Secretary of Agriculture to administer the program on behalf of all egg producers in the 48 contiguous states.

The Board was authorized by the Egg Research and Consumer Information Act passed by the 93rd Congress. The law is "to enable egg producers to establish, finance, and carry out a coordinated program of research, producer and consumer education, and promotion to improve, maintain, and develop markets for eggs, egg products, spent fowl, and products of spent fowl." The activities of the American Egg Board are conducted under the supervision of the United States Department of Agriculture (USDA).

Before establishment of the current American Egg Board in 1976, there was a prior organization also known as the American Egg Board which conducted similar activities but was funded primarily by voluntary contributions from egg producers, egg handlers, and industry suppliers.

That organization had previously been known as the Poultry and Egg National Board. The staff of the American Egg Board implements the programs and policies of the Board. Major programs consist of nutrition activities conducted through the Egg Nutrition Center, a national advertising campaign, strong consumer education and foodservice efforts, and collection and compliance functions.

Angel Food Cake

A white cake, tall and light in texture, leavened only by beaten egg whites. Before the invention of the egg beater, making this heavenly delight required a deep platter, a whisk, and a very strong arm for whipping the egg whites. The electric mixer has simplified the process. (When you make this great cake you'll have leftover egg yolks, so look to *Leftover Egg Parts* for ideas on using them.)

Avidin

A protein found in small amounts (about .05 percent) in egg albumen. Avidin is inactivated by heat. *—see Biotin*

Baked Egg

—see Cooking Methods, baked

Beverages

Many nutritious beverages can be made with eggs. A nog, for example, is a well-known beverage made□from eggs and milk. *—see Eggnog, Raw Egg*

Biological Value

A measurement of protein quality expressing the rate of efficiency with which protein is used for growth. Egg contains the highest quality food protein known. It is so nearly perfect, in fact, that egg protein is often the standard by which all other proteins are judged. Based on the essential amino acids it provides, egg protein is second only to mother's milk for human nutrition. On a scale with 100 representing top efficiency, these are the biological values of proteins in several foods.* *—see Nutrient, Protein*

Whole egg	93.7
Milk	84.5
Fish	76.0
Beef	74.3
Soybeans	72.8
Rice, polished	64.0
Wheat, whole	64.0
Corn	60.0
Beans, dry	58.0

*Food and Agriculture Organization of the United Nations. *The Amino Acid Content of Foods and Biological Data on Proteins*, Nutritional Study #24. Rome (1970). UNIPUB, Inc., 4611□- F Assembly Drive, Lanham, MD 20706

Biotin

One of the B vitamins which plays an important role in cell metabolism and the utilization of fats, proteins, and carbohydrates. Biotin is present in many foods including egg yolk and is synthesized by the body.

Avidin, one of the egg proteins, can combine with biotin and make it unavailable. However, a human would have to eat 24 raw egg whites a day for biotin to be inhibited by avidin. Heat inactivates the avidin and most eggs are served cooked. *—see Avidin*

Blood Spots

Also called meat spots. Occasionally found on an egg yolk. Contrary to popular opinion, these tiny spots do not indicate a fertilized egg. Rather, they are caused by the rupture of a blood vessel on the yolk surface during formation of the egg or by a similar accident in the wall of the oviduct. Less than 1 percent of all eggs produced have blood spots.

Mass candling methods reveal most eggs with blood spots and those eggs are removed but, even with electronic spotters, it is impossible to catch all of them. As an egg ages, the yolk

takes up water from the albumen to dilute the blood spot so, in actuality, a blood spot indicates that the egg is fresh. Both chemically and nutritionally, these eggs are fit to eat. The spot can be removed with the tip of a knife, if you wish. *—see Formation, Grading*

Bloom

The coating or covering on the egg shell that seals its pores. Bloom, also called cuticle, helps to prevent bacteria from getting inside the shell and reduces moisture loss from the egg. Eggs are washed before they are sent to market. This is necessary for cleanliness, but it removes the bloom. To restore the protection, packers give the eggs a light coating of edible mineral oil. *—see Oiling, Processing*

Blown-out Eggshells

Shells from which the edible part of the egg has been emptied. With nothing inside to spoil, empty eggshells can be decorated to keep indefinitely. The contents can be used in any thoroughly cooked recipe which calls for mixed yolks and whites.

It's easy to empty an eggshell. First, wash and dry the egg. Prick with a long needle to make a small hole in the small end of the egg and a large hole in the large end of the egg. Stick the needle into the yolk to break it.

Then, either shake the egg large-end-down over a cup or bowl until the contents come out or use a baster to pull out the contents. Press the bulb of the baster to expel the air it contains, then insert the tip into the egg. Release the bulb to pull out the contents. If the contents don't come out easily, insert the needle again and move it around to be sure both the shell membranes and yolk are broken. Rinse the shell under cool running water and let it dry. Be careful when decorating empty shells—they're quite fragile.

Label containers in which you store the insides of these eggshells with the number of eggs they contain. Use them immediately in a fully cooked dish or freeze them for later use. Most baked dishes such as casseroles, custards, quiches, cakes, or breads are good uses for eggs emptied from their shells. *—see Freezing Eggs*

Boiled Dressing

A cooked salad dressing thickened with egg yolks. A favorite long before the days of bottled dressings, this rich, creamy dressing is good over greens or fruit or in potato salad and is a good way to use leftover egg yolks.

Boiled Eggs

A misnomer for eggs cooked in the shell. Although hard- and soft-boiled are terms often used in conversation, the proper term is hard- or soft-cooked. Eggs should not be boiled because high temperatures make them tough and rubbery. *—see Cooking Methods, cooked in the shell*

Breakers

Processors who convert shell eggs into egg products. Breaking plants are under strict USDA inspection and are as clean as clean can be. They use a fascinating array of modern equipment to break eggs and separate the shell, white, and yolk. *—see Egg Products*

Breakout

A system of quality control. Sample eggs selected at random are broken out onto a level surface and the height of the thick albumen is measured with a micrometer. This measurement is then correlated with the weight of the egg to give a Haugh unit measurement. A high Haugh value means high egg quality. At the same time, the condition of the yolk is observed.

The foodservice industry also uses a breakout test to evaluate the quality of eggs purchased. Simple observation of the condition of albumen and yolk is considered adequate; the Haugh unit system is generally not used. The descriptions that follow indicate the criteria used to judge quality. *—see Grading, Haugh Unit*

Grade AA: A 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.

Grade A: A Grade A 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 yolk.

Grade B: A Grade B egg spreads out more. The yolk is flattened and there is about as much (or more) thin white as thick white.

Buying

Look for shells that are clean and whole. Cracked eggs are always removed from production lines but some may be broken in handling. Do not use an egg if it is cracked or leaking.

Important factors in maintaining egg quality are proper handling and refrigeration. Eggs lose quality very rapidly at room temperature, so buy them only from refrigerated cases, get them home quickly, and refrigerate them immediately. At temperatures of 35 to 45 °F (3 to 7 °C), eggs will maintain high quality for several weeks.

Eggs are marketed according to grade and size standards established by the USDA or by state departments of agriculture. The USDA shield on the egg carton means that the eggs have been federally inspected.

Some egg packers may follow state standards which meet or exceed USDA standards. Some states may have state seal programs which indicate that the eggs are produced within that state and are subject to continuing state quality checks. All eggs sold at the retail level must meet the standards for Grade B or better.

Size and grade are two entirely different factors bearing no relationship to one another. Grade is determined by the interior and exterior quality of the egg at the time the egg is packed. Size is determined by the average weight per dozen.

Grades: Grades are called AA, A, and B. There is no difference in nutritive value between the different grades.

Because production and marketing methods have become very efficient, eggs move so rapidly from laying house to market that you will find very little difference in quality between Grades AA and A. Although grade B eggs are just as wholesome to eat, they rate lower in appearance when broken out. Almost no Grade B's find their way to the retail supermarket. Some go to institutional egg users such as bakeries or foodservice operations, but most go to egg breakers for use in egg products. —*see Breakers, Breakout, Egg Products*

Sizes: Egg sizes are Jumbo, Extra Large, Large, Medium, Small, and Peewee. Medium, Large, and Extra Large are the sizes most commonly available. Sizes are classified according to minimum net weight expressed in ounces per dozen.

Egg Size	*Oz. Per Dozen*
Jumbo	30
Extra Large	27
Large	24
Medium	21
Small	18
Peewee	15

(To substitute one size egg for another in recipes, see *Size Equivalents*.)

Which Size to Buy: Although most of the eggs sold in supermarkets are Large, there are occasionally specials on other sizes, and it helps to have a chart to find which size is the best buy. Refer to the chart on page 108.

To compare the price of Large eggs to the price of Medium eggs for example, run your finger down the columns to the figures closest to the prices per dozen for Large and Medium eggs. Then, go across to the price per pound for each size. The one selling for the lower price per pound is the better buy. Always compare the same grade of eggs for an accurate price comparison.—*see Grading, Size Equivalents*

Price Per Dozen Eggs					¢/Lb. (16 oz.)
Small (18 oz.)	Medium (21 oz.)	Large (24 oz.)	X-Large (27 oz.)	Jumbo (30 oz.)	
$ .41	$ .48	$ .55	$ .62	$ .68	.36 1/2
.45	.53	.60	.68	.75	.40
.48	.56	.65	.73	.81	.43
.52	.61	.70	.78	.87	.46 1/2
.56	.66	.75	.84	.94	.50
.60	.70	.80	.89	.99	.53
.64	.74	.85	.95	1.06	.56 1/2
.68	.79	.90	1.01	1.13	.60
.71	.83	.95	1.06	1.18	.63
.75	.87	1.00	1.12	1.25	.66 1/2
.79	.92	1.05	1.18	1.31	.70
.82	.96	1.10	1.23	1.37	.73
.86	1.00	1.15	1.29	1.43	.76 1/2
.90	1.05	1.20	1.35	1.50	.80
.93	1.09	1.25	1.40	1.56	.83
.97	1.14	1.30	1.46	1.62	.86 1/2
1.01	1.18	1.35	1.52	1.69	.90
1.05	1.22	1.40	1.57	1.74	.93
1.09	1.27	1.45	1.63	1.81	.96 1/2
1.13	1.31	1.50	1.69	1.88	1.00

Inexpensive Egg Protein: Protein is an essential part of a nutritious diet, but for many people, foods that supply protein are some of the most expensive items on their grocery list.

Fortunately, the protein supplied by eggs is both high in quality and low in cost. In a USDA study comparing the cost of different sources of protein, eggs and beef liver were rated as two of the best protein buys.*

It's easy to compare the price of eggs to the price of other protein foods. A dozen Large eggs weighs 1 1/2 pounds, so the price per pound of Large eggs equals two-thirds of the price per dozen. For example, if the Large eggs cost 90 cents per dozen, they would be 60 cents per pound. At $1.20 per dozen, they're only 80 cents per pound.

Another helpful formula is one egg equals 1 ounce of lean meat, fish, or poultry. This means that you can use two eggs as a substitute for other protein foods as your main dish at a meal or you can use eggs to "stretch" more expensive protein foods. For instance, you might use one chopped hard-cooked egg per serving along with half the usual amount per serving of an expensive seafood in a casserole.
—see Meat Replacement, Protein

*USDA, Human Nutrition Information Service. Costs of Meats and Meat Alternates. Washington, D.C. (December, 1984) U.S. Government Printing Office.

Calcium

One Large egg provides 3 percent of the Reference Daily Intake (RDI) for calcium, most of which is contained in the yolk. Calcium's major role is in building and maintaining bones and teeth. It is also essential for many other body functions related to the blood, nerves, and muscles. The eggshell is composed largely of calcium carbonate (about 94 percent) and contains about 2 grams of calcium. It also contains small percentages of magnesium carbonate and calcium phosphate. *—see Nutrient, Reference Daily Intakes (RDIs), Shell*

Calories

The calorie count for eggs varies with size. Here is the calorie score for one egg in different sizes. *—see Nutrient, Reference Daily Intakes (RDIs)*

Egg Size	Calories
Medium	66
Large	75
Extra Large	84
Jumbo	94

Candling

The step in grading that lets the egg grader look inside the egg without breaking it to judge its quality. Long ago this was done by holding the egg up before a candle. Some hand- candling, using electric equipment, of course, is still used for spot-checking or for training egg graders, but today most eggs pass on rollers over high-intensity lights which make the interior of the egg visible. The eggs are rotated so all parts can be seen. The candler checks the size of the air cell and the distinctness of the yolk outline. Imperfections such as blood spots show up in candling. Very large packing plants may also use electronic blood detectors. *—see Air Cell, Blood Spots, Grading*

Carton Dates

Egg cartons from USDA-inspected plants must display a Julian date, the date the eggs were packed. Although not required, they may also carry an expiration date beyond which the eggs should not be sold. In USDA-inspected plants, this date cannot exceed 30 days after the pack date. It may be less through choice of the packer or quantity purchaser such as your local supermarket chain. Plants not under USDA inspection are governed by laws of their states. *—see Expiration Date, Julian Dates*

Cephalin

A phospholipid found in tissues, especially brain and nerve tissues. One Large egg contains .230 gram of cephalin. *—see Nutrient*

Chalaza

Ropy strands of egg white which anchor the yolk in place in the center of the thick white. They are neither imperfections nor beginning embryos.

The more prominent the chalazae, the fresher the egg. Chalazae do not interfere with the cooking or beating of the white and need not be removed, although some cooks like to strain them from stirred custard. *—see Composition*

Cholesterol

One Large egg contains 213 milligrams cholesterol. Cholesterol is a fat-like substance found in every living cell in the body. It is made in necessary amounts by the body and is stored in the body. It is especially concentrated in the liver, kidney, adrenal glands, and brain. Cholesterol is required for the structure of cell walls, must be available for the body to produce vitamin D, is essential to the production of digestive juices, insulates nerve fibers, and is the basic building block for many hormones. In other words, cholesterol is essential for life.

Your body produces all the cholesterol it needs. Most of the cholesterol found in the blood and tissues comes from this internal synthesis. However, dietary excess—too many calories, too much fat and saturated fat, and high intakes of cholesterol—may increase the level in the blood. Saturated fat has the greatest influence on raising blood cholesterol.

Dietary cholesterol, found in all foods from animals, does not automatically raise *blood* cholesterol levels. Generally the body compensates for dietary cholesterol by synthesizing smaller amounts in the liver, by excreting more, or by absorbing less. Elevated blood cholesterol does increase the risk of heart disease.

You should know your blood cholesterol level and follow your doctor's advice if it is elevated. In a blood cholesterol-lowering diet, cutting down on fat and saturated fat is the most important change you can make. Although egg yolks are usually restricted, it is rarely necessary to avoid them completely, and egg whites can be used freely.

Despite rumors to the contrary, eggs laid by Araucana fowl, eggs laid by free-running hens, and fertilized eggs do not contain less cholesterol than regular supermarket eggs. Cooking does not affect the cholesterol content of eggs. —*see Fat*

Cleaning

Washing eggs to remove any dirt or stains. Shortly after eggs are laid in modern laying houses, they are gathered and moved to automated washing equipment. Strict federal regulations specify the procedures and cleaning compounds that may be used. Today most eggs are cleaned in mechanical egg washers employing sprayers, brushes, detergent-sanitizers, rinses, and driers. Only clean eggs go to market.

In washing, the bloom is removed, so a light, tasteless, natural mineral oil may be applied to replace it.—*see Bloom, Oiling, Processing*

Coddled Egg

1. An egg cooked in a coddler. —*see Cooking Equipment, coddler*
2. A less frequently used term for eggs cooked in the shell for a very brief time. —*see Cooking Methods, soft-cooked*

Cold Storage

The practice of holding eggs in refrigerated warehouses. Commercial cold storage of eggs began in the U.S. in 1890. Because egg production was then seasonal, cold storage could hold the spring and summer surplus for release during periods of relative scarcity in autumn and winter, thus avoiding drastic price fluctuations. Modern breeding and flock management have virtually eliminated seasonal differences in egg production so that cold storage is no longer necessary or even practical. Thanks to rapid handling methods and efficient transportation, most eggs reach the supermarket or supermarket warehouse within a few days. —*see Preservation, Storage Eggs*

Color

Egg shell and yolk color may vary, but color has nothing to do with egg quality, flavor, nutritive value, cooking characteristics, or shell thickness.

Shell: The color comes from pigments in the outer layer of the shell and may range in various breeds from white to deep brown. The breed of the hen determines the color of the shell. Breeds with white feathers and ear lobes lay white eggs; breeds with red feathers and ear lobes lay brown eggs. White eggs are most in demand among American buyers. In some parts of the country, however, particularly in New England, brown shells are preferred. The Rhode Island Red, New Hampshire, and Plymouth Rock are breeds that lay brown eggs. Since brown-egg layers are slightly larger birds and require more food, brown eggs are usually more expensive than white.

White: Egg albumen in raw eggs is opalescent and does not appear white until it is beaten or cooked. A yellow or greenish cast in raw white may indicate the presence of riboflavin. Cloudiness of the raw white is due to the presence of carbon dioxide which has not had time to escape through the shell and thus indicates a very fresh egg.

On very rare occasions, a hard-cooked egg white may darken to a caramel shade due to a high amount of iron in the cooking water or to a carbonylamine-type reaction. Using fresh eggs and cooling them quickly after cooking helps to prevent this darkening.

Yolk: Yolk color depends on the diet of the hen. If she gets plenty of yellow-orange plant pigments known as xanthophylls, they will be deposited in the yolk. Hens fed mashes containing yellow corn and alfalfa meal lay eggs with medium-yellow yolks, while those eating wheat or barley yield lighter-colored yolks. A colorless diet, such as white cornmeal, produces almost colorless yolks. Natural yellow-orange substances such as marigold petals may be added to light-colored feeds to enhance yolk color. Artificial color additives are not permitted. Gold or lemon-colored yolks are preferred by most buyers in this country. Yolk pigments are relatively stable and are not lost or changed in cooking.

Sometimes there is a greenish ring around hard-cooked egg yolks. It is the result of sulfur and iron compounds in the egg reacting at the surface of the yolk. It may occur when eggs are overcooked or when there is a high amount of iron in the cooking water. Although the color may be a bit unappealing, the eggs are still wholesome and nutritious and their flavor is unaffected. Greenish yolks can best be avoided by using the proper cooking time and temperature and by rapidly cooling the cooked eggs. *—see Cooking Methods, hard-cooked*

Occasionally several concentric green rings may be seen in hard-cooked egg yolks. A yolk develops within the hen in rings. Iron in the hen's feed or water as the rings are formed may cause this coloring.

Sometimes a large batch of scrambled eggs may turn green. Although not pretty, the color change is harmless. It is due to a chemical change brought on by heat and occurs when eggs are cooked at too high a temperature, held for too long, or both. Using stainless steel equipment and low cooking temperature, cooking in small batches, and serving as soon as possible after cooking will help to prevent this. If it is necessary to hold scrambled eggs for a short time before serving, it helps to avoid direct heat. Place a pan of hot water between the pan of eggs and the heat source.

Composition

Shell

- Outer covering of egg, composed largely of calcium carbonate
- May be white or brown depending on breed of chicken
- Color does not effect egg quality, flavor, cooking characteristics, nutritive value, or shell thickness

Yolk

- Yellow portion of egg
- Color varies with feed of the hen, but doesn't indicate nutritive content
- Major source of egg vitamins, minerals, and fat and about half of the protein
- Germinal Disc

Vitelline (Yolk) Membrane
- Clear seal which holds egg yolk

Chalazae
- Twisted, cord-like strands of egg white
- Anchor yolk in center of egg
- Prominent chalazae indicate freshness

Air Cell
- Pocket of air formed at large end of egg
- Caused by contraction of the contents during cooling after laying
- Increases in size as egg ages

Shell Membranes
- Two membranes—inner and outer shell membranes—surround the albumen.
- Provide protective barrier against bacterial penetration
- Air cell forms between these two membranes

Thin Albumen (White)
- Nearest to the shell
- Spreads around thick white of high-quality egg

Thick Albumen (White)
- Major source of egg riboflavin and protein
- Stands higher and spreads less than thin white in higher-grade eggs
- Thins and becomes indistinguishable from thin white in lower-grade eggs

Cooking Equipment

Some utensils and gadgets are designed especially for preparing eggs, although cooking eggs can be accomplished with the usual pots, pans, beaters, and bowls ordinarily found in most kitchens. Some are limited to egg use only, such as the electric egg cooker, while others such as custard cups, come in handy for a variety of foods.

You may enjoy having a utensil for every use, but if your budget or storage space is limited, don't despair. A straight-sided uncoated saucepan or casserole dish substitutes nicely for a souffle dish. A quiche baked in a pie plate will be quite as successful as one made in a quiche dish. Some cooks find a double boiler indispensable for egg sauces and custards, while others prefer a heavy-gauge saucepan over low heat.

Generally speaking, if you have a choice about top-of-the-range cookware, choose a heavy-gauge pan so that cooking will be more even. For oven cooking, utensils of the proper size are particularly important for items that rise such as cakes, breads, and souffles.

Beaters: In the old days, cooks had to rely on muscle power to whip eggs. They used an assortment of whisks, large and small, flat and balloon-shaped, many of which are still available. A really determined good cook could whip up an angel food cake by separating the egg whites onto a large platter and attacking them vigorously with a hickory rod.

In 1870, the rotary hand beater was invented, beating out all competition along with mountains of meringue. It is still a handy and inexpensive tool.

Most used today are the electric stand mixer or the portable electric mixer. Blenders and some food processors can whip up a whole egg, a yolk, or a mixture, but they will not produce stiffly beaten egg whites.

Bowls: There has long been a great controversy about the merits, if any, of the copper bowl in producing volume in beaten egg whites. The fact is

that the copper in the bowl reacts with the conalbumin of the egg whites much like cream of tartar to stabilize the egg white foam. A stainless steel or glass bowl with the addition of cream of tartar works just as well and is much less expensive.

Plastic and wooden bowls are not suitable for beating egg whites because they tend to absorb fat. Any film or residue will keep the whites from forming a stable foam.

Size and shape of bowls are important. Use the bowl size, large or small, specified in a recipe when using an electric stand mixer. A deep bowl with enough room for expansion is best for a rotary beater or portable electric mixer. For hand whipping with a balloon whisk, the bowl should be rounded at the bottom, at least 10 inches across the top and 5 or 6 inches deep.

Cooking Equipment Especially for Eggs

Egg cooking can be as simple as you want it to be. If you enjoy fancying up things a bit, there are several pieces of equipment and specialty gadgets you may find interesting.

Coddler: A small cup made of porcelain, heat-proof glass, or pottery with a screw-on top. An egg is broken into the cup, the top screwed on, and the cup submerged in simmering water until the egg is cooked. The egg is eaten directly from the coddler.

Cooker: An electric appliance which steam-cooks eggs in the shell. Most egg-cookers also have inserts or cups for steam-poaching. Some also have a flat insert for cooking omelets, fried eggs, or scrambled eggs.

Crepe Pan: A shallow, slope-sided skillet, 6 to 8 inches in diameter. These range from inexpensive, lightweight pans to sophisticated electric models, some of which cook the crepes on what appears to be the outside of the pan. Crepes can be made in almost any small, shallow pan with sloping sides. A small omelet pan will do a nice double-duty job.

Cup: A small container designed to hold a soft-cooked egg upright in its shell for table service.

Custard Cups: Small, deep, individual bowl-shaped dishes designed for oven use. They are useful for cooking or serving other foods as well as custards.

Omelet Pan: A shallow, slope-sided skillet, usually 7 to 10 inches in diameter. A double omelet pan consists of 2 shallow rectangular or semicircular pans attached by hinges. Each pan has a handle. Some purists insist that an omelet pan should be well seasoned, never washed with detergent, and used only for omelets. More practical cooks insist that a slope-sided pan with a nonstick coating is fine for omelets and for sauteeing, frying, and other purposes.

Piercer: A sharp-pointed tool for gently pricking a very small hole in the large end of an eggshell before hard-cooking. A clean, preferably sterilized, thumbtack, pin, or needle can also be used for piercing. Piercing may allow some air to escape and some water to seep into the egg during cooking which may make peeling easier. Piercing also often produces hairline cracks in the shell.

Poacher: A rack that holds one-egg-sized cups over simmering water, or a small colander-like form that holds an egg as it poaches in simmering water.

Quiche Dish: A round, shallow, straight-sided ceramic or porcelain dish, usually with scalloped edges, for use in the oven. Sometimes it is also called a flan or tart dish and is available in several sizes. A pie plate or pan of the same size will substitute nicely.

Ring: A round band, with or without a handle, to hold a fried or poached egg during cooking.

Scissors: A circular gadget for opening soft-cooked eggs. When its scissors-type handle is operated, a series of teeth or a blade clips off the top of the egg.

Separator: A small cup centered in a round frame made of plastic, metal, or ceramic. The cup catches the yolk while slots around the frame let the white slip through to a container beneath.

Slicer: A device which cuts a hard-cooked egg into neat slices with one swift stroke. It has an indented tray in which the egg rests and a cutting mechanism of parallel wires. To chop an egg, carefully reverse the sliced egg in the tray and cut through again.

Souffle Dish: A deep, straight-sided dish designed for oven use. It may also serve as a casserole dish. Souffle dishes are available in different sizes. A straight-sided casserole, uncoated saucepan, or baking dish of the same size can be substituted.

Wedger: Similar to a slicer, it cuts the egg into 6 equal parts rather than into slices. The wedger holds the egg upright as wires are pulled over to cut the wedges. When the wires are drawn down only partway, the egg can be opened to hold a stuffing or to resemble a flower.

Cooking Functions

While eggs are widely known as breakfast entrees, they also perform in many other ways for the knowledgeable cook. Their cooking properties are so varied, in fact, that they have been called "the cement that holds the castle of cuisine together."

Eggs can **bind** ingredients as in meatloaves or croquettes. They can also **leaven** such baked high rises as souffles and sponge cakes. Their **thickening** talent is seen in custards and sauces. They **emulsify** mayonnaise, salad dressings, and hollandaise sauce and are frequently used to **coat** or **glaze** breads and cookies. They **clarify** soups and coffee. In boiled candies and frostings, they **retard crystallization**. As a finishing touch, they can be hard cooked and used as a **garnish**.

Cooking Methods

There are five basic methods for cooking eggs. The basic principle of egg cooking is to use a medium to low temperature and time carefully. When eggs are cooked at too high a temperature or for too long at a low temperature, whites shrink and become tough and rubbery; yolks become tough and their surface may turn gray-green.

Eggs, other than hard-cooked, should be cooked until the whites are completely coagulated and the yolks begin to thicken.

Recipes

Baked (also known as shirred): For each serving, break and slip two eggs into a greased ramekin, shallow baking dish, or 10-ounce custard cup. Spoon 1 tablespoon half and half, light cream, or milk over eggs. Bake in preheated 325 °F oven until whites are completely set and yolks begin to thicken but are not hard, about 12 to 18 minutes, depending on number of servings being baked.

Cooked in the shell (eggs in their shells cooked in water): Place eggs in single layer in a saucepan and add enough water to cover at least 1 inch above eggs. Cover and quickly bring just to boiling. Turn off heat. If necessary, remove the pan from the burner to prevent further boiling. Let the eggs stand, covered, in the hot water, the proper amount of time.

Hard-cooked: Let stand in hot water about 15 minutes for Large eggs. (Adjust the time up or down by about 3 minutes for each size larger or smaller.) To help prevent a dark surface on the yolks, immediately run cold water over the eggs or place them in ice water until completely cooled. (Unfortunately, it is almost impossible to cook eggs to this stage at altitudes above 10,000 feet.) —*see Peeling*

Soft-cooked: Let stand in hot water about 4 to 5 minutes, depending on desired doneness. Immediately run cold water over the eggs or place them in ice water until cool enough to handle. To serve out of the shell, break the shell through the middle with a knife. With a teaspoon, scoop the egg out of each shell half into a serving dish. To serve in an egg cup, place the egg in the cup small-end down, slice off the large end of the egg with a knife or egg scissors, and eat from the shell with a spoon.

Fried (cooked in a small amount of fat in a pan): In a 7- to 8-inch omelet pan or skillet over medium-high heat, heat 1 to 2 tablespoons butter until just hot enough to sizzle a drop of water. (If you use a very large pan, more butter will be needed.) Break and slip two eggs into the pan. Immediately reduce the heat to low. Cook slowly until whites are completely set and yolks begin to thicken but are not hard, covering with lid, spooning butter over the eggs to baste them, or turning the eggs to cook both sides.

Steam-basted variation (a lower-fat version of fried eggs): Use just enough butter to grease a 7- to 8-inch omelet pan or skillet or substitute a light coating of vegetable pan spray and/or a nonstick pan. Over medium-high heat, heat the butter or the coated pan until just hot enough to sizzle a drop of water. Break and slip the eggs into the pan. Immediately reduce the heat to low. Cook until the edges turn white, about 1 minute. Add about 1 teaspoon water for each two eggs. (Decrease the proportion slightly for each additional egg being fried.) Cover the pan tightly to hold in steam. Cook until the whites are completely set and the yolks begin to thicken but are not hard.

Poached (eggs cooked out of the shell in hot water, milk, broth or other liquid): In a saucepan or deep omelet pan, bring 1 to 3 inches of water or other liquid to boiling. Reduce the heat to keep the water gently simmering. Break cold eggs, one at a time, into a custard cup or saucer or break several into a bowl. Holding the dish close to the water's surface, slip the eggs, one by one, into the water. Cook until the whites are completely set and the yolks begin to thicken but are not hard, about 3 to 5 minutes. With a slotted spoon, lift out the eggs. Drain them in a spoon or on paper towels and trim any rough edges, if desired.

Scrambled (yolks and whites beaten together before cooking in a greased pan): For each serving, beat together two eggs, 2 tablespoons milk, and salt and pepper to taste until blended. In a 7- to 8-inch omelet pan or skillet over medium heat, heat 2 teaspoons butter until just hot enough to sizzle a drop of water. Pour in the egg mixture. As the mixture begins to set, gently draw an inverted pancake turner completely across the bottom and sides of the pan, forming large soft curds. Continue until the eggs are thickened and no visible liquid egg remains. Do not stir constantly.

Cooking Terms

Certain terms or phrases occur with regularity in egg recipes. Here are many of them along with an explanation.

Cook until knife inserted near center comes out clean: Baked custard mixtures are done when a metal knife inserted off-center comes out clean. The very center still may not be quite done, but the heat retained in the mixture will continue to cook it after removal from the oven. Cooking longer may result in a curdled and/or weeping custard. Cooking a shorter period may result in a thickened but not set custard.

Cook until just coats a metal spoon: For stirred custard mixtures, the eggs are cooked to the proper doneness when a thin film adheres to a metal spoon dipped into the custard. This point of coating a metal spoon is 20 to 30 degrees below boiling. Stirred custards should not boil. The finished product should be soft and thickened but not set. Stirred custards will thicken slightly after refrigeration.

Slightly beaten: Use a fork or whisk to beat eggs just until the yolks and whites are blended.

Well-beaten: Use a mixer, blender, beater, or whisk to beat eggs until they are light, frothy, and evenly colored.

Thick and lemon-colored: Beat yolks at high speed with an electric mixer until they become a pastel yellow and form ribbons when the beater is lifted or they are dropped from a spoon, about 3 to 5 minutes. Although yolks can't incorporate as much air as whites, this beating does create a foam and is important to airy concoctions such as sponge cakes.

Add a small amount of hot mixture to eggs/egg yolks: When eggs or egg yolks are added to a hot mixture all at once, they may begin to coagulate too rapidly and form lumps. Therefore, stir a small amount of the hot mixture into the yolks to warm them and then stir the warmed egg yolk mixture into the remaining hot mixture. This is called tempering.

Room temperature: Some recipes call for eggs to be at room temperature before eggs are to be combined with a fat and sugar. Cold eggs could harden the fat in such a recipe and the batter might become curdled. This could affect the texture of the finished product. Remove eggs from the refrigerator about 30 minutes before using them or put them in a bowl of warm water while assembling other ingredients. For all other recipes, however, use eggs straight from the refrigerator. *—see Separated*

The following cooking terms apply specifically to egg whites.

Separated: Fat inhibits the foaming of egg whites. Since egg yolks contain fat, they are often separated from the whites and the whites beaten separately to allow them to reach their fullest possible volume. Eggs are easiest to separate when cold, but whites reach their fullest volume if allowed to stand at room temperature for about 30 minutes before beating.

Many inexpensive egg separators are available. To separate, tap the midpoint of the egg sharply against a hard surface. Holding the egg over the bowl in which you want the whites, pull the halves apart gently. Let the yolk nestle into the cuplike center of the separator and the white will drop through the slots into the bowl beneath.

Drop one egg white at a time into a cup or small bowl and then transfer it to the mixing bowl before separating another egg. This avoids the possibility of yolk from the last egg getting into several whites. Drop the yolk into another mixing bowl if needed in the recipe or into a storage container if not.

Add cream of tartar: Egg whites beat to greater volume than most other foods including whipping cream, but the air beaten into them can be lost quite easily. A stabilizing agent such as cream of tartar is added to the whites to make the foam more stable. Lemon juice works much the same way. *—see Cream of Tartar*

Add sugar, 1 to 2 tablespoons at a time: When making meringues and some cakes, sugar is slowly added to beaten egg whites. This serves to increase the stability of the foam. Sugar, however, can retard the foaming of the whites and must be added slowly so as not to decrease the volume. Beat the whites until foamy, then slowly beat in the sugar. *—see Meringue*

Stiff but not dry: Beat whites with a mixer, beater, or whisk just until they no longer slip when the bowl is tilted. (A blender or food processor will not aerate them properly.) If egg whites are underbeaten, the finished product may be heavier and less puffy than desired. If egg whites are overbeaten, they may form clumps which are difficult to blend into other foods in the mixture and the finished product may lack volume.

Stiff peaks form: Stiff but not dry.

Soft peaks or piles softly: Whites that have been beaten until high in volume but not beaten to the stiff peak stage. When beater is lifted, peaks will form and curl over slightly.

Gently folded: When combining beaten egg whites with other heavier mixtures, handle carefully so that the air beaten into the whites is not lost. It's best to pour the heavier mixture onto the beaten egg whites. Then gradually combine the ingredients with a downward stroke into the bowl, across, up and over the mixture motion, using a spoon or rubber spatula. Come up through the center of the mixture about every three strokes and rotate the bowl as you are folding. Fold just until there are no streaks remaining in the mixture. Don't stir because this will force air out of the egg whites. If you have a stand mixer, put the mixing bowl on the turntable for easier turning as you fold.

Copper Bowl

—see Cooking Equipment, bowls

Cream of Tartar

An acid ingredient which stabilizes beaten egg whites. As a rule of thumb, use 1/8 teaspoon cream of tartar per egg white or 1 teaspoon per cup of egg whites. For meringues, use 1/8 teaspoon cream of tartar for each two egg whites. *—see Cooking Terms*

Cream Puff

A light, but rich, hollow pastry puff which may be filled with a sweet filling for dessert or with a savory one such as chicken salad for a main dish.

Called choux pastry after the French word for cabbage, cream puffs do come out of the oven looking like little cabbages.

A high proportion of egg is necessary to form the structure of the cream puff. The egg yolk helps to emulsify the fat.

Crepe

A light, thin, egg-rich pancake. The word is French, but the crepe is so versatile that you'll find it in many other languages. It's a Russian blini, a Jewish blintz, a Chinese egg roll, a Greek krep, or a Hungarian palascinta. Depending on the filling, it can be an appetizer, a main dish, or a dessert. Crepe batter should be the consistency of heavy cream. Letting it rest for an hour or

so after mixing allows the flour to absorb moisture and lets the air bubbles dissipate so that the crepe does not have tiny holes. Crepes can be made in advance, stacked, wrapped, and refrigerated for a few days, then reheated to serve. For longer storage, double wrap and freeze.

Curdling

Also known as syneresis or weeping. When egg mixtures such as custards or sauces are cooked too rapidly, the protein becomes over-coagulated and separates from the liquid leaving a mixture resembling fine curds and whey. If curdling has not progressed too far, it may sometimes be reversed by removing the mixture from the heat and stirring or beating vigorously.

To prevent syneresis or curdling, use a low temperature, stir—if appropriate for the recipe—and cool quickly by setting the pan in a bowl of ice or cold water and stirring for a few minutes.

The term curdling is usually used in connection with a stirred mixture such as custard sauce, while weeping or syneresis are more often used with reference to pie meringues or baked custards. *—see Meringue, soft meringue*

Custard

A cooked mixture of eggs and milk with sugar and flavoring sometimes added. There are two basic kinds of custard—stirred and baked.

Stirred custard, also known as soft custard, custard sauce or, erroneously, boiled custard, is cooked on top of the range to a creamy, but pourable, consistency. Although some cooks like to cook the mixture in a double boiler over hot water, a heavy saucepan over low heat works as well. Stirred custard is eaten as a pudding or served over cake or fruit.

Baked custard is cooked in a water bath in the oven and has a firm, but delicate, gel-like consistency. It is a dessert in itself or it may serve as a base for toppings and sauces. Unsweetened baked custard can become a quiche or timbale.

The usual custard proportions are one egg plus 2 tablespoons sugar for each cup of milk. This is the minimum ratio of eggs to milk which will produce a properly thickened custard, although as many as four eggs may be used and the sugar may be increased to 4 tablespoons. Increasing the sugar makes the custard less firm and lengthens the cooking time. Increasing the egg makes the custard more firm and shortens the cooking time.

Two egg yolks may be substituted for one whole egg. Two egg whites will also thicken the custard as much as one whole egg, but the characteristic color and flavor will be missing.

Recipes

Soft (Stirred) Custard Sauce
(Makes about 3 1/2 cups)

4 eggs OR 8 egg yolks
1/2 cup sugar
1/4 teaspoon salt
2 1/2 cups milk
1 1/2 teaspoons vanilla

In large saucepan, beat together eggs, sugar, and salt. Stir in milk. Cook over low heat, stirring constantly, until mixture is thick enough to coat a metal spoon with a thin film or reaches at least 160 °F, about 15 to 20 minutes. Remove from heat. Stir in vanilla. Cool quickly by setting pan in bowl of ice or cold water and stirring for a few minutes. (Overcooking will cause the custard to curdle.) Cover and chill thoroughly.

Baked Custard
(Makes 6 servings)

4 eggs
1/2 cup sugar
1 1/2 teaspoons vanilla

1/4 teaspoon salt
3 cups milk, heated until very hot
Ground nutmeg or cinnamon, optional

In medium bowl, beat together eggs, sugar, vanilla, and salt until well blended. Stir in milk. Place six (6-ounce) custard cups or 1 1/2-quart casserole in large baking pan. Pour egg mixture into custard cups. Sprinkle with nutmeg, if desired. Place pan on rack in preheated 350 °F oven. Pour very hot water into pan to within 1/2 inch of top of custards. (The water bath, also called a *bain marie*, promotes even cooking.) Bake until knife inserted near center comes out clean, about 25 to 30 minutes for custard cups or about 35 to 40 minutes for casserole. (Time bake carefully. Too long a baking time will curdle the custard. Too short a time will prevent the custard from setting.) Remove promptly from hot water. Cool on wire rack about 5 to 10 minutes. Serve warm or chilled.

Daily Reference Values (DRVs)

A new term similar to RDIs for food components not covered by RDIs. Some DRVs are based on reference calorie intakes of 2,000 (average needed by postmenopausal women, women who exercise moderately, teenage girls, and sedentary men) and 2,500 calories (adequate for young men) and others on dietary recommendations suggested by some health and nutrition groups. Daily Reference Values are intended to serve as a yardstick for food comparisons, not as a strict dietary prescription. Based on your own calorie intake and activity level, your needs may be more or less than the DRVs. There is no DRV for sugars. Other DRVs are:

- *Calorie Intake:* 2,000*; 2,500 calories,
- *Total Fat:* No more than 30 percent of total calories (less than 65; 80 grams),
- *Saturated Fat:* No more than 10 percent of total calories (less than 20; 25 grams),
- *Unsaturated Fat***:* No more than 20 percent of total calories (less than 40; 50 grams),
- *Cholesterol:* Less than 300 milligrams,
- *Total Carbohydrate:* At least 55 percent of total calories (300; 375 grams),
- *Dietary Fiber:* 11.5 grams per 1,000 calories (25; 30 grams),
- *Protein***:* 10 percent of calories for those over 4 (50 grams; 63 grams),
- *Sodium:* Less than 2,400 milligrams, and
- *Potassium***:* 3,500 milligrams.

*Due to space limitations, food labels will show percentages of DRVs based on a 2,000-calorie diet. Some large labels may also show DRVs (but not percentages) for a 2,500-calorie diet.

**Listing percentages of DRVs for this nutrient on food labels is optional. *—see Daily Values (DVs), Reference Daily Intakes (RDIs), Recommended Dietary Allowances (RDAs), U.S. Recommended Daily Allowances (U.S. RDAs)*

Daily Values (DVs)

A term on new food labels that represents age-adjusted average levels of protein, fat, cholesterol, carbohydrate (including dietary fiber and sugars), vitamins, and minerals recommended for various groups of people of different ages and sexes as established by the National Academy of Sciences.

Since they are averages, many Daily Value figures are lower than the familiar U.S. RDAs which represented the highest values for each nutrient. In some cases, DVs are also lower due to new nutritional evidence considered by the National Academy. DVs serve as a yardstick for food comparisons and not as a strict dietary prescription. *—see Daily Reference Values (DRVs), Reference Daily Intakes (RDIs), Recommended Dietary Allowances (RDAs), U.S. Recommended Daily Allowances (U.S. RDAs)*

Decorating Eggs

The egg's shape has often inspired artists. It has been the palette for one of the most intriguing of folk arts in many cultures.

There is literally no end to the creative possibilities for individual expression on an eggshell. Eggs can be painted or colored with crayons or felt-tipped pens, turned into funny faces, topped with fantastic hats, trimmed with feathers or sequins, or simply dyed in an endless variety of hues. However you decide to do it, decorating eggs is fun for grown-ups as well as for kids.

Eggs to be decorated may be either hard-cooked eggs or empty eggshells. The hard-cooked variety is a bit more sturdy for children to use, while empty shells are best if you're making an egg tree or want to keep the eggs on display for a considerable time.

If eggs are to be dyed, washing in a mild detergent solution helps to remove the oil coating so that the color adheres more evenly.

Commercial egg dyes are available, especially at the Easter season. Food coloring works, too, but some craftsmen prefer to experiment with their own colors from nature. Eggs simmered in water to cover for 15 minutes with 1 tablespoon of white vinegar for each cup of water and your choice of one of the materials below will produce a shade of the color shown. You'll have to use your own judgment about quantities. This is an art—not a science!

Material	***Color***
Fresh beets, cranberries, radishes, or frozen raspberries	Pinkish red
Yellow onion skins	Orange
Orange or lemon peels, carrot tops, celery seed, or ground cumin	Delicate yellow
Ground turmeric	Yellow
Spinach leaves	Pale green
Yellow Delicious apple peels	Green-gold
Canned blueberries or red cabbage leaves	Blue
Strong brewed coffee	Beige to brown
Dill seeds	Brown-gold
Chili powder	Brown-orange
Purple or red grape juice or beet juice	Grey

However you decide to color your hard-cooked eggs, follow these tips if you'd like to eat them later: Wash your hands thoroughly before handling the eggs at every step including cooking, cooling, dyeing, and hiding. If you won't be coloring your eggs right after cooking them, store them in their cartons in the refrigerator. Don't color or hide cracked eggs.

When coloring the eggs, use water warmer than the eggs and refrigerate them in their cartons right after coloring them. Refrigerate them again after they've been hidden and found and don't eat cracked eggs or eggs that have been out of refrigeration for more than 2 hours. If you plan to use hard-cooked eggs as a centerpiece or other decoration and they will be out of refrigeration for many hours or several days, cook extra eggs to refrigerate for eating and discard the eggs that have been left out as a decoration. *—see Cooking Methods, hard-cooked; Blown-out Eggshells; Easter Eggs*

Deviled Eggs

Also known as stuffed eggs. Hard-cooked eggs are peeled and cut in half. The yolks are removed, mixed with a moistener such as mayonnaise and seasonings, and then piled back into the whites. The word "devil" originally referred to the combination of spices, including dry mustard, with which the eggs were highly seasoned.

Dried Eggs

—see Egg Products

Easter Eggs

Eggs were colored, blessed, exchanged, and eaten as part of the rites of spring long before Christian times. Even the earliest civilizations held springtime festivals to welcome the sun's rising from its long winter sleep. They thought of the sun's return from darkness as an annual miracle and regarded the egg as a natural wonder and a proof of the renewal of life. As Christianity spread, the egg was adopted as a symbol of Christ's Resurrection from the tomb.

For centuries, eggs were among the foods forbidden by the church during Lent, so it was a special treat to have them again at Easter. In Slavic countries, baskets of food including eggs are traditionally taken to church to be blessed on Holy Saturday or before the Easter midnight Mass, then taken home for a part of Easter breakfast.

People in central European countries have a long tradition of elaborately decorated Easter eggs. Polish, Slavic, and Ukrainian people create amazingly intricate designs on the eggs. They draw lines with a wax pencil or stylus, dip the egg in color and repeat the process many times to make true works of art. Every dot and line in the pattern has a meaning. Yugoslavian Easter eggs bear the initials "XV" for "Christ is Risen," a traditional Easter greeting.

The Russians, during the reign of the tsars, celebrated Easter much more elaborately than Christmas, with Easter breads and other special foods and quantities of decorated eggs given as gifts. The Russian royal family carried the custom to great lengths, giving exquisitely detailed jeweled eggs made by goldsmith Carl Fabergé from the 1880's until 1917.

In Germany and other countries of central Europe, eggs that go into Easter foods are not broken, but emptied out. The empty shells are painted and decorated with bits of lace, cloth, or ribbon, then hung with ribbons on an evergreen or small leafless tree. On the third Sunday before Easter, Moravian village girls used to carry a tree decorated with eggshells and flowers from house to house for good luck. The eggshell tree is one of several Easter traditions carried to America by German settlers especially those who became known as Pennsylvania Dutch. They also brought the fable that the Easter bunny delivered colored eggs for good children.

Easter is an especially happy time for children and many Easter customs are for their enjoyment. Hunting Easter eggs hidden around the house or yard is a universal custom and so are egg-rolling contests. *—see Blown-Out Eggshells, Decorating Eggs, Games*

Egghead

A highbrow or one with intellectual interests or pretensions. The name is probably related to the idea that a high forehead is a sign of intelligence.

Egg Money

Before World War II, most eggs were produced by small flocks that scratched their way around the barnyard. The farmer's wife usually supervised the operation. The money received from the sale of the eggs was considered hers.

Eggnog

A beverage of eggs, milk, sugar, and flavoring. Rich cream may take the place of part or all of the milk. Spirits are often added at holiday time. Eggnog may be served hot or cold, but it should be prepared as a stirred custard. The name may come from the noggin or small cup in which it was served in earlier days. *—see Custard, Raw Egg*

Egg Nutrition Center

The nutrition organization for the egg industry. ENC was created in 1984 to provide scientifically correct information on egg nutrition and accompanying health issues. The Center is a cooperative project of the American Egg Board and the United Egg Producers. Located in Washington, D.C., the Egg Nutrition Center communicates regularly with industry, government, the media, and health and nutrition communities. Since cholesterol is an important public health and nutrition concern, much of the Center's activity focuses on this complicated issue. A panel of independent scientists advises the Egg Nutrition Center and provides interpretation of current scientific literature. The Center is dedicated to providing balanced, accurate information on the complex issues surrounding cholesterol and heart disease.

Egg Products

Processed and convenience forms of eggs for commercial, foodservice, and home use. These are refrigerated liquid, frozen, dried, and specialty products. Many egg products are comparable in flavor, nutritional value, and most functional properties to shell eggs. Convenience foods such as cake and pudding mixes, pasta, ice cream, mayonnaise, candies, and bakery goods utilize egg products. Egg products are frequently preferred to shell eggs by commercial bakers, food manufacturers, and the foodservice industry because they have many advantages including convenience; labor savings; minimal storage requirements; ease of portion control; and product quality, stability, and uniformity.

Surplus shell eggs, as well as those produced particularly for the purpose, are used in making egg products. In 1992, about 20 percent of the total U.S. egg production went into egg products. About 3/4 billion pounds of all types of egg products are produced each year in the U.S.

Since passage of the Egg Product Inspection Act (EPIA) in 1970, all plants that make egg products operate under continuous USDA inspection. Under this Act, pasteurization of all egg products is mandatory.

Shell eggs used for egg products must be clean and of edible interior quality.

Processing egg products: When shell eggs are delivered to the breaking plant, they are put into refrigerated holding rooms. Before breaking, they are washed in water at least 20 degrees warmer than that of the egg and spray-rinsed with a sanitizing agent. They may be moist, but not wet, when they are broken.

Refrigerated liquid products: Eggs are broken and separated, if necessary, by machines and the liquid egg put into covered containers. At this point, they may be shipped to bakeries or other outlets for immediate use or to other plants for further processing. Shipment is in sanitary tank trucks maintaining temperatures low enough to assure that the liquid egg arrives at its destination at 40 °F (4 °C) or less. Wholesale and foodservice refrigerated products are also available in 30-pound cans and 4-, 5-, 8- and 10-pound cartons.

Retail consumer refrigerated products are generally available in one- or two-pack cartons containing 8 to 16 ounces each.

Keep liquid egg products under refrigeration. Shelf life can vary, so check the label of the products you are using. Once opened, use immediately.

Frozen egg products: These include separated whites and yolks; whole eggs; blends of whole eggs and yolks or whole eggs and milk; and these same blends with sugar, corn syrup, or salt added. Salt or carbohydrates are sometimes added to yolks and whole eggs to prevent gelation during freezing. Frozen egg products are generally packed in 30-pound cans and in 4-, 5-, 8- and 10-pound pouches or waxed or plastic cartons. Some retail consumer products are available frozen in one- or two-pack cartons containing 8 to 16 ounces each.

Frozen egg products should be kept frozen or refrigerated until used. They should be thawed under refrigeration or under cold running water in unopened containers. After defrosting, they should be refrigerated and used within 3 days.

Dried or dehydrated egg products: Known also as egg solids, these have been produced in the United States since 1930, but demand was minimal until World War II, when production reached peak levels to meet military and lend-lease requirements. While quality of the early product was poor, it has now been greatly improved. Dried egg products are used in a wide number of convenience foods and in the foodservice industry. With the exception of some camping supply stores, dried eggs are not available at present on the retail market. Dried eggs for foodservice use are sold in 6-ounce pouches, number 10 cans, and 3-pound and 25-pound poly-packs. For commercial use, 25- and 50-pound boxes and 150-, 175-, and 200-pound drums are available.

Unopened dried egg products should be stored in a cool (below 70 °F.), dry place away from light. Opened containers should be tightly sealed and refrigerated.

Specialty egg products: Egg specialties processed for the foodservice industry include wet-pack and dry-pack pre-peeled hard-cooked eggs—either whole, wedged, sliced, chopped or pickled; long rolls of hard-cooked eggs; frozen omelets; egg patties; quiche and quiche mix; frozen French toast; frozen scrambled egg mix in boilable pouches; frozen fried eggs; frozen pre-cooked scrambled eggs; freeze-dried scrambled eggs; and other convenience menu items.

In the near future, innovative egg products such as ultra-pasteurized liquid egg, free-flowing frozen egg pellets, and modified atmosphere packaging for hard-cooked eggs are expected to become available.

Many specialty egg items are reaching the retail market as well, including frozen omelets and mixes; frozen scrambled eggs, French toast, and quiche; and specially coated shelf-stable hard-cooked eggs. *—see Breakers, Egg Products Inspection Act, Egg Roll, Restricted Eggs*

Egg Products Inspection Act

A program to assure wholesome shell eggs and egg products in the marketplace. Passed by Congress in December, 1970, the Egg Products Inspection Act is administered by the USDA and imposes specific inspection requirements for two categories of eggs—egg products and shell eggs. The Act gives enforcement authority to the USDA and to the Food and Drug Administration. Federal agriculture officials or state officials acting on behalf of USDA visit egg packers and hatcheries at least every 3 months to see that they are in compliance with the law. Firms which transport, ship, or receive shell eggs and egg products may also be checked periodically. Under the Egg Products Inspection Act, plants that break, dry, and process shell eggs into liquid, frozen, or dried egg products must operate under the continuous inspection program of the USDA. An official inspector must be present at all times when eggs are being processed. The law applies to all egg-breaking plants, regardless of size, and to those selling products locally, across state lines, and through foreign commerce. Disposition of undesirable shell eggs is controlled to prevent their entering consumer food channels. *—see Egg Products, Grading, Restricted Eggs*

Egg Roll

1. An elongated hard-cooked egg processed for the foodservice industry. When sliced, every piece is a center cut for attractive service.
2. An Asian specialty made by wrapping an egg-rich dough around a savory filling and deep-fat frying. In this country, egg rolls are often served as appetizers.
3. The annual Easter event on the White House lawn.

Egg Salad

A popular combination of chopped hard-cooked eggs, a moistener such as mayonnaise, and seasonings, often served as a sandwich filling or in scooped-out tomatoes or lettuce cups.

Egg Substitutes

Liquid egg products formulated as substitutes for whole eggs. Such products contain egg white. The yolk is replaced with other ingredients such as nonfat milk, tofu, vegetable oils, emulsifiers, stabilizers, antioxidants, gum, artificial color, minerals, and vitamins.

Equinox

Either of the two times each year when the sun crosses the equator and day and night are of equal length everywhere. During the spring (vernal) equinox (about March 21), it is said that an egg will stand on its small end. Although some people have reported success, it is not known whether such results were due to the equinox or to the peculiarities of that particular egg. Others insist that some eggs will stand on their small ends at any time of the year.

Expiration Date

A date on an egg carton beyond which the eggs should not be sold. *—see Carton Dates*

Fat

A concentrated source of food energy containing 9 calories per gram. In addition to supplying energy, fat aids in the absorption of certain vitamins, enhances flavor, aroma, and mouthfeel of food, and adds satiety to the diet.

Fatty acids, the basic chemical units of fat, are either *saturated, monounsaturated,* or *polyunsaturated.*

Saturated fatty acids are found primarily in fats of animal origin (meat and dairy products) and are usually solids at room temperature. Exceptions are some vegetable oils (palm, palm kernel, and coconut) which contain large amounts of saturated fatty acids. Saturated fat increases blood cholesterol.

Monounsaturated fatty acids are found in fats of both plant and animal origin. They tend to decrease blood cholesterol levels. Polyunsaturated fatty acids are found primarily in fats of plant origin and in fats of fatty fish. They also tend to decrease blood cholesterol levels.

An increasing number of nutrition professionals are recommending the reduction of total dietary fat to 30 percent or less of total calories and that dietary fat be distributed equally among saturated, monounsaturated, and polyunsaturated fats.

A Large egg contains only about 5 grams of fat—about 1.5 grams saturated and 2.5 grams unsaturated. Egg recipes which are high in fat and/or saturated fat can often be significantly lowered in fat content by making changes in "traditional" recipe ingredients and cooking methods. *—see Cholesterol*

Fertile Eggs

Eggs which can be incubated and developed into chicks. Fertile eggs are not more nutritious than nonfertile eggs, do not keep as well as nonfertile eggs, and are more expensive to produce. Fertile eggs may contain a small amount of male hormone, but there are no known advantages. *—see Germinal Disc*

Foam

Air bubbles trapped in liquid albumen when egg white is beaten. When egg white is beaten, it becomes foamy, increases six to eight times in volume and stands in peaks. When the foam is heated, the tiny air cells expand, and the egg protein coagulates around them, giving permanence to the foam. Egg white foam is responsible for the structure of souffles, angel food cake, puffy omelets, and meringue.

Egg whites reach their greatest volume if allowed to stand at room temperature for about 30 minutes before beating.

Fat inhibits the foaming of egg whites, so be sure beaters and bowls are clean and that there is no trace of yolk in the whites. Use only metal or glass bowls because plastic bowls tend to absorb fat.

If egg whites are underbeaten, the volume of the finished product will be less than desired. Overbeaten whites form clumps which are difficult to blend with other ingredients, and because overbeaten egg whites lack elasticity, they cannot expand properly when heated. The finished product may be dry, of poor volume, or may even collapse.

The addition of an acid ingredient helps to stabilize the foam. The most commonly used acid ingredient is cream of tartar ($^1/_8$ teaspoon for each one to two whites), although some recipes call for lemon juice or vinegar.

Since salt decreases foam stability, it is best to add it to other recipe ingredients.

Egg white foams should be combined with other ingredients immediately, before they have time to drain or shrink.

Egg yolk and whole egg will also form foams, but the volume is much less than the foam of beaten white. *—see Angel Food Cake, Cooking Terms, Meringue*

Food Guide Pyramid

Based on nutrition research, the USDA has grouped all of the foods we eat according to the nutritional contributions they make. For a balanced diet that includes all the food groups in good proportions, follow these daily recommendations:

Breads, grains, and cereals: 6 to 11 servings
Vegetables: 3 to 5 servings

Fruits: 2 to 4 servings
Meat and meat alternates: 5 to 7 ounces
Milk and milk products: 2 to 3 servings
Fats, oils, and sweets: 53 to 93 grams (4½ to 7½ tablespoons) fat at most; 2 to 6 tablespoons added sugar at most.

Eggs are included in the meat and meat alternates group because, after mother's milk, they provide the highest quality protein available. One egg = 1 ounce of lean meat, fish, or poultry. *—see Biological Value, Daily Reference Values (DRVs), Nutrient, Protein*

Formation

A hen requires about 24 to 26 hours to produce an egg. Thirty minutes later, she starts all over again.

The reproductive system of the hen consists of the ovary, the organ where the yolk develops, and the oviduct, where the egg is completed. The ovary is attached to the back about halfway between the neck and the tail. The oviduct, a tubelike organ approximately 26 inches long, is loosely attached to the backbone between the ovary and the tail. Most female animals have two functioning ovaries, but the hen uses only one, the left. The right ovary and oviduct remain dormant.

Ovary: A female chick is born with a fully formed ovary containing several thousand tiny ova, or future yolks. These begin to develop, one at a time, when the pullet reaches sexual maturity. Each yolk is enclosed in its own sac or *follicle.*

The follicle contains a highly developed system of blood vessels which carry nourishment to the developing yolk. At ovulation, the follicle ruptures to release the yolk into the oviduct. A double-yolked egg is the result of two yolks being released at the same time. Rupture occurs at the *stigma line*, an area of the follicle which has no blood vessels. *—see Blood Spots*

Oviduct: The *infundibulum*, also known as the funnel, captures the ovulated yolk. This is where fertilization, if it occurred, would take place. After about 15 minutes, the yolk passes along to the *magnum.* Here, in approximately 3 hours, the albumen is deposited around the yolk. As the albumen is formed, the yolk rotates, twisting the albuminous fibers to form the chalazae.

The next sight of activity is the *isthmus* where the two shell membranes are formed in about 1¼ hours. The egg has now reached its full size and shape. It next passes into the *shell gland* and after 19 hours, the shell, shell color, and bloom are laid down. The next stop for the egg is the *vagina.* In the vagina, the egg is flipped so the large or round end of the egg enters into the *cloaca* (the junction of the digestive, urinary, and reproductive tracts), and the egg is expelled from the *vent.* Laying of the egg is known as *oviposition.*

During formation, the egg moves through the oviduct small end first. Just before laying, it is rotated and laid large end first. A young hen lays small eggs. The size increases as she gets older. *—see Composition*

Free-range Eggs

True free-range eggs are those produced by hens raised outdoors or that have daily access to the outdoors. Due to seasonal conditions, however, few hens are actually raised outdoors. Some egg farms are indoor floor operations and these are sometimes erroneously referred to as free-range operations. Due to higher production costs and lower volume per farm, free-range eggs are generally more expensive. The nutrient content of eggs is not affected by whether hens are raised free-range or in floor or cage operations. *—see Production*

Freezing Eggs

If you receive a windfall of eggs far beyond your capacity to use within a few weeks, they can be frozen—not in the shell, of course. Freeze only clean, fresh eggs.

Whites: Break and separate the eggs, one at a time, making sure that no yolk gets in the whites. Pour them into freezer containers, seal tightly, label with the number of egg whites and the date, and freeze. For faster thawing and easier measuring, first freeze each white in an ice cube tray and then transfer to a freezer container.

Yolks: Egg yolks require special treatment. The gelation property of yolk causes it to thicken or gel when frozen. If frozen as is, egg yolk will eventually become so gelatinous it will be almost impossible to use in a recipe. To help retard this gelation, beat in either 1/8 teaspoon salt or 1 1/2 teaspoons sugar or corn syrup per 1/4 cup egg yolks (four yolks). Label the container with the number of yolks, the date, and whether you've added salt (for main dishes) or sweetener (for baking or desserts).

Whole eggs: Beat until just blended, pour into freezer containers, seal tightly, label with the number of eggs and the date, and freeze.

Hard-cooked: Hard-cooked yolks can be frozen to use later for toppings or garnishes. Carefully place the yolks in a single layer in a saucepan and add enough water to come at least 1 inch above the yolks. Cover and quickly bring just to boiling. Remove from the heat and let stand, covered, in the hot water about 15 minutes. Remove with a slotted spoon, drain well, and package for freezing. Hard-cooked whole eggs and whites become tough and watery when frozen, so don't freeze them.

To use frozen eggs: Thaw frozen eggs overnight in the refrigerator or under running cold water. Use yolks or whole eggs as soon as they're thawed. Once thawed, whites will beat to better volume if allowed to sit at room temperature for about 30 minutes.
- Substitute 2 tablespoons thawed egg white for one Large fresh white.
- Substitute 1 tablespoon thawed egg yolk for one Large fresh yolk.
- Substitute 3 tablespoons thawed whole egg for one Large fresh egg.

Use thawed frozen eggs only in dishes that are thoroughly cooked.

French Toast

Egg-soaked bread, sauteed in butter. Another name for this breakfast specialty is *pain perdu*, French for lost bread. Thrifty cooks of the 15th century developed this trick for using nearly stale bread which would otherwise be lost.

Freshness

How recently an egg was laid has a bearing on its freshness but is only one of many factors. The temperature at which it is held, the humidity, and the handling all play a part. These variables are so important that an egg one week old, held under ideal conditions, can be fresher than an egg left at room temperature for one day. The ideal conditions are temperatures that don't go above 40 °F (4 °C) and a relative humidity of 70 to 80 percent.

Proper handling means prompt gathering, washing, and oiling of the eggs within a few hours after laying. Most commercially produced eggs reach supermarkets within a few days of leaving the laying house. If the market and the buyer handle them properly, they will still be fresh when they reach the table.

It is not true that freshness can be judged by placing an egg in salt water. A carefully controlled brine test is sometimes used to judge shell thickness of eggs for hatching purposes but has no application to freshness of table eggs.

How important is "freshness"? As an egg ages, the white becomes thinner and the yolk becomes flatter. These changes do not have any great effect on the nutritional quality of the egg or its functional cooking properties in recipes. Appearance may be affected, though. When poached or fried, the fresher the egg, the more it will hold its shape rather than spread out in the pan. On the other hand, if you hard cook eggs that are at least a week old, you'll find them easier to peel after cooking and cooling than fresher eggs. *—see Storing*

Fried Egg

—see Cooking Methods, fried

Frittata

An unfolded Italian version of the omelet. A frittata cooks on top of the stove until almost set. It is finished off under the broiler or turned over or the pan may be removed from the heat, covered and allowed to stand until the top of the omelet is completely cooked.

A frittata may contain any combination of cooked vegetables, seafood, meat, poultry, grain, or cheese you like.

Games

The egg's fragility probably accounts for its popularity in games down through the centuries.

Egg Hunt: Hiding colored or decorated eggs around the house or garden for youngsters to find has long been an Easter morning tradition.

Egg Toss: Whenever groups gather for picnic games, an egg toss is as predictable as a sack race. Partners line up in two rows facing each other. Every member on one side tosses a raw egg across. After each successful catch, the players step backward, adding to the difficulty of the next catch. This is repeated until all but one egg is broken. The couple with the last unbroken egg wins.

Egg Rolling: Many variations of egg rolling contests and games can be played. The egg rolling that takes place on the lawn of the White House or Capitol building has become an American tradition started, according to legend, by Dolley Madison in the early 1800's. Similar events are held in many other locations throughout the country.

The United States, however, can hardly take credit for inventing the custom—egg rolling was mentioned in a Latin treatise in 1684. In England and Scotland, children roll eggs downhill and the last child with an unbroken egg is the winner. In another version of egg rolling, the players push the egg to the finish line using only their noses. Very similar are egg races in which the players try to send emptied eggshells across the finish line by fanning them with a piece of cardboard or by blowing them. Since eggs are not round, winning is not as easy as it might seem!

Egg Tapping: Many countries continue the age-old ritual of egg-tapping or egg-shackling. For example, Greeks form a circle and tap scarlet eggs, one against the other. The one finishing with an unbroken egg may claim all the other eggs. (The trick is protecting as much of the egg as possible with your fingers.)

Pace Egging: In English villages until modern times, children carried on an old sport called pace-egging. The name comes from *Pasch*, the word that means Easter in most European countries. This derives from *Pesach*, the Hebrew Passover, which falls at the same time of the year. Pace-eggers are much like Halloween trick-or-treaters. They go from house to house in costume or with paper streamers and bright ribbons attached to their clothes. Faces blackened or masked, they sing or perform skits and demand pace-eggs, either colored hard-cooked eggs or substitutes such as candy and small coins.

—see Decorating Eggs, Easter Eggs

Germinal Disc

The entrance of the *latebra*, the channel leading to the center of the yolk. The germinal disc is barely noticeable as a slight depression on the surface of the yolk. When the egg is fertilized, sperm enter by way of the germinal disc, travel to the center, and a chick embryo starts to form. *—see Composition, Formation*

Grading

Classification determined by interior and exterior quality and designated by letters: AA, A, and B. In many egg-packing plants, the USDA provides a grading service for shell eggs. Its official grade shield certifies that the eggs have been graded under federal supervision according to USDA standards and regulations. The grading service is not mandatory. Other eggs are packed under state regulations which must meet or exceed federal standards.

In the grading process, eggs are examined for both interior and exterior quality and are sorted according to weight (size). Grade quality and size are not related to one another. In descending order of quality, grades are AA, A, and B.

Exterior: The first step in egg grading is inspection of the shell for cleanliness, soundness, apparent texture, strength, and shape. Shell color is not a factor in judging quality.

To pass grading requirements, all eggs must be clean, but a certain amount of staining is permitted in the lower grade. All eggs must have sound shells. Those with cracks or markedly unsound shells are classified as restricted eggs.

The ideal shell shape is oval with one end larger than the other. Abnormal shells, permitted under B quality, may be decidedly misshapen or faulty in texture with ridges, thin spots, or rough areas.

Interior: Inspection of the interior is the next step in grading. This is accomplished by candling or by the breakout method using the Haugh unit system to evaluate the air cell, the albumen, and the yolk.

Higher grade eggs have a very shallow air cell. In AA quality eggs, the air cell may not exceed $1/8$ of an inch in depth. In eggs of A quality, air cells can be larger than $1/8$ of an inch in depth but less than $3/16$ of an inch. There is no limit on air cell size in Grade B.

Albumen is judged on the basis of clarity and firmness or thickness. A clear albumen is defined as being free from discolorations or from any floating foreign bodies.

Factors determining yolk quality are distinctness of outline; size and shape; and absence of such defects as blemishes or mottling, germ development, or blood spots.

When eggs are twirled before the candling light, the yolk swings toward the shell. The distinctness of the yolk outline depends on how close to the shell the yolk moves, which is, in turn, influenced by the thickness of the surrounding albumen. Thick albumen permits limited yolk movement while thin albumen permits greater movement.

—see Air Cell, Blood Spots, Breakout, Buying, Candling, Egg Products Inspection Act, Formation, Haugh Unit, Restricted Eggs, Shell, Yolk

Greening

—see Color, yolk

Hard-cooked Egg

—see Cooking Equipment, cooker, piercer, slicer, wedger; Cooking Methods, hard-cooked; Decorated Eggs; Peeling; Storing

Haugh Unit

A measurement used in determining albumen quality by the breakout method. The test is named for Raymond Haugh who suggested it in 1937. *—see Breakout*

History

Because birds preceded man in the evolutionary chain, both eggs and birds have been around longer than historians. Nobody really knows when the first fowl was domesticated, although Indian history places the date as early as 3200 B.C. Egyptian and Chinese records show that fowl were laying eggs for man in 1400 B.C. The dependability of the rooster's early morning

call and the regularity with which newly laid eggs appeared probably inspired the Chinese to describe fowl as "the domestic animal who knows time."

It is believed that Columbus' ships carried the first of the chickens related to those now in egg production to this country. These strains originated in Asia.

Hollandaise Sauce

A rich, lemon-flavored butter sauce thickened with egg yolks. The French chef who created this sauce named it for Holland probably because Holland was famous for its butter, a main ingredient in the sauce. Hollandaise sauce is often served over asparagus or poached salmon. Many sauces are based on hollandaise, including bernaise and mousseline. Because hollandaise can curdle if even slightly overcooked, it needs close attention, low heat, and constant stirring.

Julian Dates

Starting with January 1 as number 1 and ending with December 31 as 365, these numbers represent the consecutive days of the year. This numbering system is sometimes used on egg cartons to denote the day the eggs are packed. Fresh shell eggs can be stored in their cartons in the refrigerator for 4 to 5 weeks beyond this date with insignificant quality loss.

Lecithin

One of the factors in egg yolk that helps to stabilize emulsions such as mayonnaise, salad dressings, and Hollandaise sauce. Lecithin contains a phospholipid, acetylcholine, which has been demonstrated to have a profound effect on brain function. *—see Cooking Functions, Hollandaise Sauce, Mayonnaise, Nutrient*

Leftover Egg Parts

Occasionally recipes call for only the yolk or the white of the egg. Many delectable dishes can be made from the other half of the egg.

Whites	***Yolks***
Angel food cake—*see same*	Boiled dressing—*see same*
Boiled frosting—*see Meringue, Italian*	Egg pastry
Macaroons	Hollandaise and variations—*see same*
Meringue—*see same*	Mayonnaise—*see same*
Sherbet	
Snow pudding—*see Souffles, cold*	
White cake	

Remember, you can always add a little of either whites or yolks to whole eggs for scrambled eggs or cook each and then chop for a pretty garnish. In some recipes, either two egg whites or two egg yolks can replace one whole egg. *—see Freezing, Storing*

Legends

Stories about eggs go back to the earliest memories of man. In Sanskrit, the sacred language of the Hindus, it is written that a cosmic egg contained a spirit that would be born, die, and be reborn.

The Egyptians believed that their god Ptah created the egg out of the sun and moon. Phoenicians thought that two halves of a very large egg split open producing heaven and earth.

Because of its connections with new life, the egg has been touted as both an aphrodisiac and fertility insurance. Central European peasants rubbed eggs on their plows hoping to improve the crops. The French bride broke an egg on the doorstep before entering her new home to assure a large family.

Back before Nero practiced fiddle pyrotechnics, his consort Livia was told to warm an egg on her bosom. When it hatched, the sex of the chick would foretell the sex of her unborn child. All went as predicted and the Emperor Tiberius (as well as an old wives' tale) was born. *—see Decorating Eggs, Easter Eggs, Games, Roasted Egg*

Marketing

How eggs get from hen to kitchen. The marketing chain begins at the laying farm where eggs are gathered, packed, and refrigerated. They are picked up several times a week by the grading station's refrigerated trucks. (On some farms, grading and packing is done right at the farm.)

At the grading station, the eggs are washed and oiled, sorted by size, graded for quality, and packed into cartons.

Ideally, eggs move from the grading station to the store or store warehouse three to five times a week, depending on the store's available storage space. The retailer needs both adequate refrigerated space in the back and refrigerated self-service counters out front to merchandise eggs properly. Some large supermarket chains receive all their eggs at warehouses from which the eggs are distributed to individual stores.

Sales techniques depend on the local retailer and, sometimes, the supplier. Attractive cartons and point-of-purchase displays, in addition to advertising and consumer education activities, help to stimulate sales.

Activities of the American Egg Board help to keep consumers aware of the egg as a versatile, nutritious, delicious, economical mealtime staple. State and regional egg promoters inform consumers through lectures, articles, recipes, and demonstrations. Advertising messages help to heighten buyer awareness of the egg and its importance to meal planning. *—see American Egg Board, Grading*

Marshmallow

A soft confection made from sugar, corn syrup, egg white, and gelatin.

Mayonnaise

A salad dressing made of eggs, oil, vinegar or lemon juice, and seasonings. The egg yolk acts as an emulsifying ingredient to keep the oil and the vinegar from separating. In making mayonnaise, remember to add the oil to the egg-liquid mixture very slowly.*—see Raw Egg Yolk*

Meal Planning

Eggs can play a part at any meal. It is said that each of the many pleats around the top of the chef's hat stands for a different way of preparing eggs.

You need many different nutrients for good health. Since no single food can supply all the nutrients you need, meals should contain a wide variety of foods. With the help of the Food Guide Pyramid, you can choose foods each day from the five major food groups to give your meals variety and supply good nutrition. *—see Food Guide Pyramid*

Meat Replacement

One egg = 1 ounce of lean meat, fish, or poultry from the meat, poultry, fish, eggs, legumes, and nuts food category.

One Large egg provides 6.25 grams of protein or 10 to 13 percent of the Daily Reference Value (DRV) for protein. *—see Buying, Daily Reference Values (DRVs), Food Guide Pyramid, Nutrient*

Membranes

Shell Membranes: Just inside the shell are two shell membranes, inner and outer. After the egg is laid and it begins to cool, an air cell forms between these two layers at the large end of the egg.

Vitelline Membrane: This is the covering of the yolk. Its strength protects the yolk from breaking. The vitelline membrane is weakest at the germinal disc and tends to become more fragile as the egg ages. *—see Air Cell, Composition, Formation, Germinal Disc, Grading*

Meringue

A foam of beaten egg white and sugar. Egg foams were used in pastries much earlier, but the name meringue came from a pastry chef named Gasparini in the Swiss town of Merhrinyghen. In 1720, he created a small pastry of dried egg foam and sugar from which the simplified meringue evolved. Its fame spread and Marie Antoinette is said to have prepared the sweet with her own hands at the Trianon in France.

The most critical factor in making meringue is humidity. Because of its high sugar content, meringue can absorb moisture from the air and become limp and sticky. For best results, make meringue on a bright, dry day.

Be sure that beaters and bowls are clean and completely free of fat or oil because the least bit of fat will prevent beaten egg whites from reaching their full volume. Use only metal or glass bowls. Plastic bowls tend to absorb fat.

After separating eggs, allow the whites to stand at room temperature about 30 minutes before beating so they will reach their fullest volume.

Beat the whites with cream of tartar, using 1/8 teaspoon for each two egg whites, until foamy. (Cream of tartar lends stability to egg foams.) When foamy, gradually beat in the sugar, 1 tablespoon at a time. Continue beating until sugar is dissolved and soft peaks form. (If the sugar is not completely dissolved, the meringue will be gritty. Rub just a bit of meringue between thumb and forefinger to feel if the sugar has dissolved.)

There are several kinds of meringues, each suited to a special use. The differences are in the ratio of egg white to sugar, the method of mixing, or the method of cooking. *—see Cooking Terms, Foams*

Soft meringue: Used to top pies and puddings. The usual ratio is 2 tablespoons of sugar to 1 egg white. The meringue is beaten until soft peaks form, then swirled over a hot, precooked pie filling or pudding and baked until peaks are lightly browned. A 3-egg-white meringue will cover a 9-inch pie. Bake it in a preheated 350 °F oven 12 to 15 minutes. For a meringue containing more egg whites, bake at 325 °F for 25 to 30 minutes.

Sometimes liquid accumulates between the meringue and the filling. This weeping can be minimized if the filling is hot when the meringue is put on it. On a pie, the meringue should touch the crust all around the edge or it may shrink during baking.

Hard or Swiss meringue: A confection or a foundation for fillings of fruits or puddings. Hard meringue is produced by increasing the proportion of sugar to 4 tablespoons of sugar per egg white and beating until stiff peaks form.

The meringue may be baked on a baking sheet greased with unsalted shortening (not oil) or on a baking sheet lined with waxed paper, brown paper, or foil. It may be piped through a pastry tube or shaped gently with a spoon or spatula. It may also be baked in a greased pie plate, cake pan, or springform pan depending upon its intended use.

When baked in a pie plate, the meringue forms a delicate crust for such fillings as chocolate or lemon and the result is often known as angel pie. Meringue baked in a cake or springform pan is often served with whipped cream and fruit and is called schaum torte or pavlova.

The texture of the finished meringue can be varied from dry and crisp to chewy depending upon the oven temperature and baking time. Meringue baked or, more properly, dried in a preheated 225 °F oven for 1 to 1½ hours until a cake tester or toothpick inserted in the center comes out clean, will be white, dry, and crisp. The oven should be turned off and the meringue left in the oven for at least an hour longer. A shorter baking time will produce a chewier center. For a light golden hue, bake at 250 °F for less time or until the center is done as desired.

Hard meringues may be stored for several months in a tightly sealed container with waxed paper between the layers.

If meringue should lose its crispness, reheat it in a preheatcd 250 °F oven for 15 to 20 minutes.

Italian meringue: Also known as boiled frosting, this is made by beating hot sugar syrup into beaten egg whites. Italian meringue may be used to frost cakes, as a topping like soft meringue, or as a base for frozen desserts; baked like hard meringue; or poached. When folded into whipped cream, it becomes chantilly meringue which may be combined with fruit as a filling for cream puffs or used as a frosting.

Poached meringues: These are also known as snow eggs or *oeufs a la neige* and are often served with custard or fruit sauce. They are also the islands in floating island pudding. Soft, hard, and italian meringue mixtures may be poached. To poach, drop the meringue mixture by spoonfuls onto simmering milk or water and simmer, uncovered, until firm, about 5 minutes. Smaller spoonfuls will not need to be turned over but large ones may require turning halfway through the cooking time. Remove from the liquid with a slotted spoon and drain on absorbent paper. Chill until used.

Microwave Cooking

Incredible edible eggs and the microwave oven are a great team; one dish after another, they add up to quick and easy meals with a minimum of clean up!

Despite all its attributes, though, the microwave oven doesn't do justice to airy souffles or puffy omelets—they need the dry heat of a conventional oven to puff beautifully.

For successful eggs a la microwave, keep these few points in mind:

• Egg yolk, because it contains fat, tends to cook more quickly than egg white. When you're microcooking unbeaten eggs, use 50 percent or 30 percent power.

• Omelets, scrambled eggs, and poached eggs microcook well on full power (high).

• Even out of the shell, eggs may explode in the microwave because rapid heating causes a buildup of steam. Always use a wooden pick or tip of a knife to break the yolk membrane of an unbeaten egg before microcooking to allow the steam to escape.

• Covering cooking containers with a lid, plastic wrap, or waxed paper encourages more even cooking and—if you forgot to prick the yolk—helps to confine the explosion!

• Eggs microcooked in their shells will explode.

Microwave Recipes

Fried Eggs: Break and slip one egg into each of two lightly greased 10-ounce custard cups or a pie plate. Gently prick yolks with tip of knife or wooden pick. Cover with plastic wrap. Cook on 50 percent power just until eggs are almost desired doneness, about 2 to 3 minutes. Let stand, covered, until whites are completely set and yolks begin to thicken but are not hard.

Hard-cooked Eggs: Separate yolks and whites of eggs into two lightly greased liquid measures or small bowls. Stir yolks with fork. Cover each container with plastic wrap. Cook separately on 50 percent or 30 percent power, stirring once or twice, allowing about 20 to 30 seconds per yolk, about 30 seconds to 1 minute per white. Remove when slightly underdone. Let stand, covered, about 2 minutes. Cool long enough to handle comfortably, then chop or chill until ready to chop.

Poached Eggs: Pour 1/3 cup water into 10-ounce custard cup or small, deep bowl. Break and slip in two eggs. Gently prick yolks with tip of knife or wooden pick. Cover with plastic wrap. Cook on full power about 1 1/2 to 2 minutes. If necessary, let stand, covered, until whites are completely set and yolks begin to thicken but are not hard, about 1 to 2 minutes. Pour off water to serve in custard cup or lift out with slotted spoon. *NOTE: For four eggs, use 2/3 cup water in 1-quart bowl or baking dish. Cook 1 1/2 to 3 minutes and let stand as above.*

Scrambled Eggs: In 10-ounce custard cup, beat together two eggs, and 2 tablespoons milk with salt and pepper to taste, if desired, until blended. Cook on full power, stirring once or twice, until almost set, about 1 to 1 1/2 minutes. Stir. If necessary, cover with plastic wrap and let stand until eggs are thickened and no visible liquid egg

remains, about 1 minute. *NOTE: All microwave cooking times are based on a full power output of 600 to 700 watts. For a lower wattage oven, allow more time.*

Nest Egg

A natural or artificial egg placed in a nest to encourage a hen to lay there rather than in some secluded hiding place. (Done before the days of modern egg production.) The term now means money set aside as a reserve.

In recipe use, nest eggs are piles of stiffly beaten egg whites shaped into nests on toast. Reserved yolks are dropped into the nests and baked.

Nest Run

Ungraded shell eggs. They may be sold to shell egg grading or packing plants or to official egg products plants. They cannot be sold to bakeries, restaurants, food manufacturing plants, retail stores, etc., unless they contain no more restricted eggs than are permitted in U.S. Grade B. *—see Egg Products, Grading, Restricted Eggs*

Nutrient

A nutritious substance, many of which are supplied by the egg. While no one food (other than mother's milk, perhaps) provides everything that humans need, the egg contains a wide array of necessary nutrients. It was, after all, made to supply everything for the creation and nourishment of a baby chick.

Egg protein is of such high quality that it is often used as the standard by which other protein is measured. Egg protein contains all the essential amino acids (building blocks of protein which the body needs but cannot make) in a pattern that matches very closely the pattern the body needs. This is why eggs are classified□with meat in the food groups and why egg protein is called complete protein.

A moderate amount of fat, about 5 grams, is found in a Large egg yolk. About 1.5 grams are saturated and 2.5 grams unsaturated.

An egg contains varying amounts of 13 vitamins (but no vitamin C) plus many minerals. An egg yolk is one of the few foods which contain vitamin D, the sunshine vitamin.

As is true for most foods, some minor nutrient losses do occur in the egg after cooking. Of the nutrients in an egg, riboflavin, thiamin, and folic acid are generally less heat-stable than other nutrients. Normal cooking simply changes the form of egg protein, but it is still just as nutritious. Protein is destroyed only when it is severely overcooked, such as in the brown lacy edges of an overcooked fried egg. You can preserve the highest nutrient content possible by avoiding overcooking. *—see Biological Value, Nutrient Density, Protein, Reference Daily Intakes (RDIs)*

Nutrient Density

The ration of nutrients to calories, sometimes called the nutrient-calorie benefit ratio (NCBR). Foods that supply significant amounts of one or more nutrients compared to the number of calories they supply are called nutrient dense. Eggs have a high nutrient density because they provide excellent protein—per Large egg, 10 to 13 percent of the DRV—and a wide range of vitamins and minerals in proportion to their calorie count—only 75 calories per Large egg. *—see Biological Value, Calories, Nutrient, Protein*

Nutrition Education and Labeling Act

In 1990, Congress passed a Nutrition Education and Labeling Act requiring most foods, including eggs, to carry a nutrition label. Differing from previous label formats, the new labels express nutrients as a percentage of Daily Values (DVs) for a 2,000-calorie diet instead of U.S. Recommended Daily Allowances (U.S. RDAs).

Eggs are produced by nature, not processed according to a man-made formula, and may differ somewhat in nutrient content based on the individual hen and her diet, even within the same size. *—see Daily Reference Values (DRVs), Daily Values (DVs), Nutrient Density, Recommended Dietary Allowances (RDAs), U.S. Recommended Daily Allowances (U.S. RDAs)*

*Assayed Nutrient Values for a Large Raw Egg**

Based on 59 grams shell weight with 50 grams total liquid whole egg, 33.4 grams white and 16.6 grams per yolk.

Nutrient and Unit	*Whole*	*White*	*Yolk*
Proximate			
Water%	37.66	29.33	8.10
Food energy (calories)	75	17	59
Protein (N x 6.25)—g.	6.25	3.52	2.78
Total lipid-g.	5.00	—	5.12
Total carbohydrate—g.	.61	.34	.30
Ash—g.	.47	.21	.29
Lipids			
Fatty acids as triglycerides—g.	4.327	—	4.428
Saturated—total	1.550	—	1.586
8:0 Caprylic	.002	—	.002
10:0 Capric	.002	—	.002
12:0 Lauric	.002	—	.002
14:0 Myristic	.017	—	.017
16:0 Palmitic	1.113	—	1.139
18:0 Stearic	.392	—	.401
20:0 Arachidic**	.020	—	.020
Monounsaturated—total	1.905	—	1.949
14:1 Myristoleic**	.005	—	.005
16:1 Palmitoleic	.149	—	.152
18:1 Oleic	1.736	—	1.776
20:1 Eicosenoic	.014	—	.014
22:1 Erucic	.002	—	.002
Polyunsaturated—total	.682	—	.698
18:2 Linoleic	.574	—	.587
18:3 Linolenic	.017	—	.017
20:4 Arachidonic	.071	—	.073
20:5 Eicosapentaeonic	.002	—	.002
22:6 Docohexaenoic	.018	—	.019
Cholesterol—mg.	213	—	213
Lecithin—g.**	1.15	—	1.11
Cephalin—g.**	.230	—	.219
Vitamins			
A—IU	317	—	323
D—IU**	24.5	—	24.5
E—mg.	.70	—	.70
B_{12}—mcg.	.50	.07	.52
Biotin—mcg.**	9.98	2.34	7.58
Choline—mg.**	215.06	.42	215.97
Folic Acid (Folacin)—mcg.	23	1	24
Inositol—mg.**	5.39	1.38	3.95
Niacin—mg.	.037	.031	.002
Pantothenic acid (B3)—mg.	.627	.040	.632
Pyridoxine (B6)—mg.	.070	.001	.065

Nutrient and Unit	Whole	White	Yolk
Riboflavin (B_2)-mg.	.254	.151	.106
Thiamin (B_1)-mg.	.031	.002	.028
Minerals—mg.			
Calcium	25	2	23
Chlorine**	87.1	60.0	27.1
Copper	.007	.002	.004
Iodine**	.024	.001	.022
Iron	.720	.010	.590
Magnesium	5	4	1
Manganese	.012	.001	.012
Phosphorus	89	4	81
Potassium	60	48	16
Sodium	63	55	7
Sulfur**	82	56	25
Zinc	.55	—	.52
Amino Acids—g.			
Alanine	.348	.203	.143
Arginine	.375	.191	.199
Aspartic acid	.628	.358	.272
Cystine	.145	.091	.050
Glutamic acid	.816	.467	.353
Glycine	.210	.123	.086
Histidine	.148	.079	.072
Isoleucine	.341	.199	.141
Leucine	.534	.296	.244
Lysine	.449	.239	.221
Methionine	.195	.121	.069
Phenylalanine	.332	.205	.119
Proline	.249	.137	.116
Serine	.465	.242	.238
Threonine	.300	.160	.148
Tryptophan	.076	.043	.033
Tyrosine	.255	.137	.124
Valine	.381	.224	.155

*1989 *Supplement-Agriculture Handbook No. 8*, Human Nutrition Information Service, USDA
**1979 *Poultry Science* 58:131-134

Oiling

A thin film of odorless, tasteless mineral oil sprayed on eggs before cartoning. The oil replaces the natural bloom, the protective coating on the outside of the egg, which is removed during washing.

Omelet

Beaten eggs cooked in a pan and rolled or folded. The ancient Romans supposedly made the first omelet and, because it was sweetened with honey, they called it ovemele (eggs and honey). Some insist this was the origin of the word omelet. Others maintain the word was derived from amelette (Fr.), meaning blade, describing the long flat shape of an omelet.

Whatever its origin, an omelet can hold or be topped with any food from caviar to leftover meatloaf. The list of filling and topping possibilities is endless, limited only by your imagination and the contents of your refrigerator.

Omelets take different forms depending on how you cook them. Quick and easy (about a minute or two) on top of the range gives you the French or plain omelet. (Using the microwave adds the convenience of no-stir cooking.) Separately beat the egg yolks and whites and finish the omelet in an oven and you have a puffy or souffle omelet.

Although you may have heard that omelets require special pans and Cordon Bleu skills, it just isn't so. Omelets are easy to make.

Omelets cook so quickly that the filling should be selected and prepared before starting the eggs. —*see Frittata, Omelet Fillings*

Recipes

Basic French (Plain) Omelet
(Makes one serving)

Multiply the recipe by as many servings as you need and use 1/2 cup of the egg mixture for each omelet. For a sweet dessert omelet, substitute a pinch of sugar for the salt and pepper.

2 eggs
2 tablespoons water
1/8 teaspoon salt
Dash pepper
1 teaspoon butter

Beat together eggs, water, salt, and pepper until blended. In 7- to 10-inch omelet pan or skillet over medium-high heat, heat butter until just hot enough to sizzle a drop of water. Pour in egg mixture. (Mixture should set immediately at edges.) With an inverted pancake turner, carefully push cooked portions at edges toward center so uncooked portions can reach hot pan surface, tilting pan and moving cooked portions as necessary. When top is thickened and no visible liquid egg remains, fill, if desired. With pancake turner, fold omelet in half or roll. Invert onto plate with a quick flip of the wrist or slide from pan onto plate.

Basic French (Plain) Microwave Omelet
(Makes one serving)

The secret of a tender, easily rolled microwave French omelet is a tightfitting cover. No stirring is needed since trapped steam helps to cook the omelet evenly.

1 teaspoon butter
2 eggs
2 tablespoons water
1/8 teapoon salt
Dash pepper

In 9-inch pie plate, cook butter on full power until melted, about 45 seconds. Spread to coat bottom of plate. Beat together remaining ingredients until blended. Pour into plate. Cover tightly with plastic wrap. Cook on full power about 2 to 3 minutes, rotating a quarter-turn each 30 seconds. Do not stir. When top is thickened and no visible liquid egg remains, fill, if desired. With pancake turner, fold omelet in half or roll and slide from pie plate onto serving plate. *NOTE: All microwave cooking times are based on a full power output of about 600 to 700 watts. For a lower wattage oven, allow more time.*

Basic Puffy (Souffle) Omelet
(Makes two servings)

To preserve the puff, fold the souffle omelet over its filling or serve it open-faced with the filling on top as soon as you remove it from the oven. Substitute a pinch of sugar for the salt if your filling is sweet.

4 eggs, separated
1/4 cup water
1/2 teaspoon cream of tartar or lemon juice
1/4 teaspoon salt
1 teaspoon butter

In large mixing bowl, beat egg whites with water and cream of tartar at high speed until stiff but not dry, just until whites no longer slip when bowl is tilted. In a small mixing bowl, beat egg yolks with salt at high speed until thick and lemon-colored. Gently, but thoroughly, fold yolks into whites.

In 10-inch omelet pan or skillet with ovenproof handle* over medium-high heat, heat butter until just hot enough to sizzle a drop of water. Pour in egg mixture and gently smooth surface. Reduce heat to medium. Cook until puffed and lightly browned on bottom, about 5 minutes. (Lift omelet at edge to judge color.) Bake in preheated 350 °F oven until knife inserted halfway between center and outer edge comes out clean, about 10 to 12 minutes. Loosen omelet edges with spatula.

To Serve Folded: With sharp knife, cut upper surface down center of omelet but DO NOT cut through to bottom of omelet. Fill, if desired. Tip skillet. With pancake turner, fold omelet in half and invert onto warmed plate or platter with a quick flip of the wrist.

To Serve Open-Faced: Invert pan over warmed plate or platter, or slide omelet from pan onto plate. Spoon or sprinkle filling, if desired, over top. Cut in half or into wedges. Serve immediately.

*To make handle ovenproof, wrap completely with aluminum foil.

Omelet Fillings

Almost any food can fill an omelet. To invent your own filling, use one or more filling ingredients to total about 1/3 to 1/2 cup for each omelet. Flavor the omelet, filling, or both with about 1/8 to 1/4 teaspoon of your favorite herb or spice or a seasoning blend from a salad dressing, soup, or other flavoring mix. Fill an omelet right after you've finished cooking it. At this point, the omelet will be hot enough to melt cheese and warm some filling ingredients such as yogurt, peanut butter, jelly, or diced or sliced fruit. Heat refrigerator-cold fillings to serving temperature or fully cook raw foods before you begin cooking the omelet.

Omelet King

Howard Helmer, Senior National Representative for the American Egg Board and holder of the Guinness World Record for omelet making—427 in 30 minutes!

Howard spreads the good word of the good egg to consumers across the country through appearances on radio and television and through newspapers and magazines.

Organic Eggs

Eggs from hens fed rations having ingredients that were grown without pesticides, fungicides, herbicides, or commercial fertilizers. No commercial laying hen rations ever contain hormones. Due to higher production costs and lower volume per farm, organic eggs are more expensive than eggs from hens fed conventional feed. The nutrient content of eggs is not affected by whether or not the ration is organic. —*see Production*

Ovary

The hen's reproductive organ in which egg yolks develop. —*see Formation*

Oviduct

The organ in the hen which accepts the yolk after ovulation, where the egg is completed. —*see Formation*

Oviposition

Laying of the hen's egg. —*see Formation*

Ovulation

Release of the egg yolk from the hen's ovary. —*see Formation*

Packaging

The most familiar egg package is the pulp or foam carton holding 12 eggs. There are sizes other than dozens available in some regions such as 2½ or 3 dozen small eggs per package or packs of 6, 8, or 18. The sponginess of the carton insulates the eggs from jolts. New package designs are constantly being tested to provide the best protection for the eggs.

Whether foam or pulp, the carton prevents loss of moisture and carbon dioxide and also keeps the eggs from picking up undesirable odors and flavors. Even though your refrigerator may have an egg shelf in the door, it is better to store eggs in the carton on an inside shelf for freshness' sake. Eggs are placed in their cartons large-end-up to keep the air cell in place and the yolk centered. The carton shows brand, grade, egg size, and nutrient content.

Peeling

Removing the shell and membranes from a hard-cooked egg. Opinion among researchers is divided as to whether or not salt in the cooking water helps make hard-cooked eggs easier to peel. Some research indicates that a 1 to 10 percent salt level (2 to 4 tablespoons per gallon of water) makes unoiled eggs easier to peel, but peelability of oiled eggs is not significantly affected. Almost all eggs available on the consumer market are oiled while commercial purchasers may specify unoiled eggs. Most researchers agree that using eggs that are "not too fresh" will help make peeling easier.

A nicely centered yolk makes very attractive deviled eggs and garnishes. However, as an egg ages, the white thins out which gives the yolk more opportunity to move about freely. This can result in a displaced yolk when the egg is hard-cooked. Using the freshest eggs possible will minimize this displacement, but very fresh eggs are more difficult to peel after hard-cooking. The air cell that forms between the shell membranes as the egg ages helps to separate shell from egg, but in very fresh eggs the air cell is still small. The best compromise for attractive eggs with centered yolks that are relatively easy to peel seems to be using eggs that have been refrigerated for about a week to 10 days. Some new research suggests that yolk centering may be better if eggs are stored small-end up for 24 hours before hard-cooking. Piercing the shell before cooking may also make peeling easier.

Thoroughly cool the egg immediately after cooking in a bowl of ice or under running cold water (5 minutes isn't too long). Peel right after cooling for immediate use or refrigerate in the shell in the carton for use within 1 week. Crack the shell all over by tapping gently on a table or counter top. Roll the egg between the hands to loosen the shell. Then peel it off, starting at the large end. Hold the egg under running water or dip it in water to make peeling easier. —*see Air Cell; Composition; Cooking Equipment, piercer; Cooking Methods, hard-cooked*

Pet Food

Eggs are nutritious for many pets as well as humans and are often an important part of prepared pet food formulas.

Pickled Eggs

Marinated hard-cooked eggs. The marinade may be made from vinegar and pickling spices, although spicy cider or pickle juice works well, too. The juice from pickled beets is one of the most popular marinades. When sliced, the lovely red color is a pretty contrast to the yolk and white.

Pickled eggs can be served as a snack or appetizer; cut in wedges and added to tossed green salads; included on cold cut platters; sliced and used as garnish for cooked vegetables and potato salads; or prepared as deviled eggs.

If the container is not opened, pickled eggs will keep several months without refrigeration. Although the acidity of the pickling solution prevents the growth of bacteria, it eventually causes the eggs to disintegrate. Refrigerate opened containers and, to avoid introducing bacteria, use a clean implement to remove eggs from the solution.

Use several small containers, quarts or less, if the pickled eggs are to be consumed intermittently over a period of time. *—see Cooking Methods, hard-cooked; Peeling*

Poached Egg

—see Cooking Methods, poached

Popovers

An egg-rich, hollow bread baked in small cups or pans. A very hot oven creates the steam inside the batter that pops them to magnificent heights.

Preservation

Refrigeration, drying, and freezing are the best ways to preserve egg quality. Fresh eggs are so readily available that long storage periods are rarely necessary. However, centuries before modern methods of egg production, transportation, and refrigeration became known, man did his ingenious best to preserve the egg intact.

The ancient Chinese stored eggs up to several years by immersion in a variety of such imaginative mixtures as salt and wet clay; cooked rice, salt, and lime; or salt and wood ashes mixed with a tea infusion. Although the Chinese ate them with no ill effects of which we are aware, the eggs thus treated bore little similarity to fresh eggs, some exhibiting greenish-gray yolks and albumen resembling brown jelly.

Immersion in different liquids too numerous to mention was explored, lime water being a favorite in the 18th century. During the early 20th century, water glass was used with considerable success. Water glass, a bacteria-resistant solution of sodium silicate, discouraged the entrance of spoilage organisms and evaporation of water from eggs. It did not penetrate the egg shell, imparted no odor or taste to the eggs, and was considered to have somewhat antiseptic properties. However, it did a rather poor job at relatively high storage temperatures. Eggs preserved in a water glass solution and stored in a cool place keep 8 to 9 months.

Dry packing in various substances ranging from bran to wood ashes was used occasionally, but costs of transporting the excess weight of the packing material far exceeded the dubious advantages. In an attempt to seal the shell pores to prevent loss of moisture and carbon dioxide, a great variety of materials including cactus juice, soap, and shellac were investigated with varying degrees of success. The only coating considered fairly efficient was oil which is still used today.

Thermostabilization, immersion of the egg for a short time in boiling water to coagulate a thin film of of albumen immediately beneath the shell membrane was rather extensively practiced by housewives of the late 19th century. Mild heating destroyed spoilage organisms but did not cook the eggs. If kept in a cool place, thermostabilized eggs coated with oil keep several months although some mold growth may take place.

During the first half of the 20th century, storing eggs in refrigerated warehouses was a common practice. Preservation was later improved with the introduction of carbon dioxide into the cold storage atmosphere. Today, very few, if any, cold storage eggs find their way to the retail market. *—see Cold Storage; Oiling*

Price Per Pound

An easy way to compare the price of eggs with other protein foods. —*see Buying*

Production

Prior to World War II, most egg production came from farm flocks of less than 400 hens. By the early 1960's, improved technology and the development of sophisticated mechanical equipment were responsible for a shift from small farm flocks to larger commercial operations. In the major egg producing states, flocks of 100,000 laying hens are not unusual, and some flocks number more than 1 million. Each of the 235 million laying birds in the U.S. produces from 250 to 300 eggs a year.

Factors That Influence Egg Production

Genetic pattern of the breed of hen: Maximum production of top-quality eggs starts with a closely controlled breeding program emphasizing favorable genetic factors. The Single Comb White Leghorn hen dominates today's egg industry. This breed reaches maturity early, utilizes its feed efficiently, has a relatively small body size, adapts well to different climates, and produces a relatively large number of white-shelled eggs, the color preferred by most consumers. Because brown-shelled eggs are favored in the New England region, the Rhode Island Red, New Hampshire, and Plymouth Rock Breeds predominate in that area of the country.—*see Color*

Hen's age at egg-laying maturity: Although early starters lay more eggs, maturity too early results in many small eggs.

Resistance to disease: Selective breeding is reinforced by good sanitation and vaccination.

Light control: Of primary importance both during the growing and laying periods, controlled, low-intensity light can be used to delay sexual maturity until the bird's body is big enough to produce larger eggs. Today's laying hen doesn't need to depend upon the fickle sun to tell her when laying time has arrived. Intensity and duration of light can be adjusted to regulate production.

Quality of feed: Since more is known about the nutritional requirements of the chicken than of any other domestic animal, it is not surprising that rations are scientifically balanced to assure layer health along with optimum quality eggs at least cost.

Temperature: Laying houses maintained between 57 and 79 °F (14 and 26 °C) are desirable.

Humidity: A relative humidity between 40 and 60 percent is best.

Replacing or molting the flock: Molting, or loss of feathers, is a natural occurrence common to all birds regardless of species. As the hen ages, egg quality declines and, at about 18 to 20 months of age, molting occurs and egg production ceases. While some flocks are sold for slaughter at this point, replacement is costly. A fairly common practice is to place the flock into a controlled molt. After a rest period of 4 to 8 weeks, the birds start producing again. Poultrymen have found that with two periods of controlled molting, one at 14 months of age and another at 22 months, egg quality is more consistent than with one molt at 18 or 20 months.

The laying house: In today's egg-laying facilities, temperature, humidity, and light are all controlled, and the air is kept circulated. The building is well-insulated, windowless (to aid light control), and is force-ventilated. Birds are either given the run of the floor area or are housed in cages. Most new construction favors the cage system because of its sanitation and efficiency, but floor operations are also in use.

Feeding: Because care and feeding of hens, maintenance, sanitation, and egg-gathering all require time and money, there is a strong trend toward automation whenever possible.

Automatic feeders, activated by a time clock, move mash through troughs in the floor or past the cages. Birds at floor level drink from troughs. Those in cages may sip from such sophisticated accessories as self-cleaning drinking cups or nipple valves.

Most poultry rations are of the all-mash type. They are made of sorghum grains, corn, cottonseed meal, or soybean oil meal depending upon the part of the country in which the ration is produced and which ingredient is most available. The feed is carefully balanced so that the hen gets just the right amounts of protein, fat, carbohydrates, vitamins, and minerals. Today's hen eats a better balanced diet than many people!

The hen's ration may contain the same types of additives approved for human food. Antioxidants or mold inhibitors (also used in mayonnaise and bread) are added to maintain the quality of the feed. And, like people, chickens occasionally require an antibiotic.

An additive is not approved for use in poultry feed unless adequate research has been undertaken to determine its pharmacological properties and possible toxicity and to discover any potentially harmful effects on animals. Hormones are not fed to poultry in the United States.

How much a hen eats depends upon the hen's size, the rate of egg production, temperature in the laying house, and the energy level of the feed. In general, about 4 pounds of feed are required to produce a dozen eggs. A Leghorn chicken eats about 1/4 pound of feed per day. Brown-egg layers are slightly larger and require more food.

Egg quality is affected by the type of feed. Shell strength, for example, is determined by the presence and amounts of vitamin D, calcium, and other minerals in the feed. Too little vitamin A can result in blood spots. Yolk color is influenced by pigments in the feed. Maximum egg size requires an adequate amount of protein and essential fatty acids.

Handling: The moment an egg is laid, physical and chemical changes begin to conspire against freshness. Warm temperatures encourage those changes, so newly laid eggs must be gathered frequently and refrigerated quickly.

Some eggs are still gathered by hand, but in most production facilities automated gathering belts do the job. Gathered eggs are moved into refrigerated holding rooms where temperatures are maintained between 40 and 45 °F (5 and 7 °C). Humidity is relatively high to minimize moisture loss but should not exceed 80 percent. Sometimes eggs are oiled as they are gathered. *—see Oiling*

Processing and distribution: Some producers sell their eggs nest run (ungraded) to processing firms which clean, grade, size, and carton the eggs and ship them off to retail outlets. Other farms and ranches carry out the entire operation.

—see Egg Products, Egg Products Inspection Act, Grading, Nest Run

Protein

A combination of amino acids, some of which are called essential because the human body needs them but can't synthesize them. The human diet must regularly supply protein which contains all of the essential amino acids. The egg boasts them all: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. They are present in a pattern that matches very closely the pattern the body needs, so the egg is often the measuring stick by which other protein foods are measured.

In addition to the nine essential amino acids, there are nine other amino acids in an egg. Altogether, each Large egg provides a total of 6.25 grams of high quality, complete protein. For this reason, the egg is classified with meat in the food categories. One egg equals 1 ounce of

lean meat, fish, or poultry. A Large egg provides 10 to 13 percent of the Daily Reference Value for protein and varying amounts of many other nutrients, too. *—see Biological Value, Buying, Daily Reference Values (DRVs), Nutrient, Nutrient Density*

Pullet

A young hen, less than 1 year old.

Quiche *(keesh)*

An unsweetened, open-faced custard pie served hot or cold as an entree, appetizer, or snack. It requires only a few ingredients—eggs, milk, seasonings, and whatever else you might wish to add in the way of chopped vegetables, meat, poultry, seafood, or shredded cheese. Quiche can be made in a conventional pie plate or pan or in a special dish called a quiche dish.

Quiches are traditionally made in a pastry crust, but crusts can be made from mashed potatoes, cooked rice, or spinach. Bread crumbs or cereals are also delicious and do not contain the high fat content of pastry. *—see Cooking equipment, quiche dish*

Quiche Lorraine

Frenchmen claim that this savory custard pie originated in the province of Lorraine, but the Germans insist it started in Alsace. The classic version includes bacon and Swiss cheese.

Raw Eggs

There have been warnings against consuming raw or lightly cooked eggs on the grounds that the egg may be contaminated with *Salmonella,* a bacteria responsible for a type of food poisoning.

With eggs and all other raw foods from animals, there is a small possibility of *Salmonella* food poisoning. The risk is greater for those who are pregnant, elderly, or very young, and those with medical problems which have impaired their immume systems. These individuals should avoid raw and undercooked animal foods.

Healthy people need to remember that there is a very small risk and treat eggs and other raw animal foods accordingly. Use only properly refrigerated, clean, sound-shelled, fresh, grade AA or A eggs. Avoid mixing yolks and whites with the shell. Refrigerate broken-out eggs, prepared egg dishes, and other foods if you won't be consuming them within an hour.

For summer outings, use ice or coolant in an insulated bag or cooler to keep cold foods cold (40 °F or lower) and thermal containers to keep hot foods hot (140 °F or higher). When toting raw eggs on outings, leave them in their shells. Immediately consume, refrigerate, or freeze raw or lightly cooked egg dishes. Eggnog and homemade ice cream should be based on a cooked, stirred custard to ensure safety.

The kitchen, too, can be a source of bacteria. Clean hands and equipment, sanitary food handling practices, proper cooking, and adequate refrigeration are essential in safely preparing all foods.

Raw Egg Whites: Although it is possible for *Salmonella* to be in both the white and the yolk of the egg, the white does not readily support bacterial growth. Cold souffles, mousses, and chiffons containing raw beaten whites require refrigeration to maintain their character, an added safety factor. Such dishes might be considered low-risk for healthy individuals.

For further safety, combine the whites with the sugar in the recipe (using a minimum of 2 tablespoons of sugar per white) and beat over hot water or over low heat in a heavy saucepan until the whites stand in soft peaks. Without sugar, the whites will coagulate too rapidly and produce an unsatisfactory meringue. This is the same procedure used in making 7-minute frosting and can be used to make royal icing or other frostings ordinarily containing raw whites. If using an unlined aluminum saucepan, do not add cream of tartar. It will react with the aluminum to produce an unattractive gray product.

Raw Egg Yolks: Raw egg yolks are a fine growth medium for bacteria. It is best to cook yolks for use in such dishes as cold souffles, chiffons, mousses, mayonnaise, and hollandaise sauce.

To cook yolks, the recipe must contain at least 2 tablespoons of liquid per yolk. Less liquid will produce scrambled eggs. Simply combine the yolks with the liquid in the recipe. Cook in a heavy saucepan over very low heat, stirring constantly, until the mixture coats a metal spoon, bubbles at the edges, or reaches 160 °F. Cool quickly and proceed with the recipe. *—see Avidin, Biotin, Custard, Salmonella*

Recommended Dietary Allowances (RDAs)

A term used to denote recommendations for 26 nutrients for 18 different population subgroups. RDAs are based on information on nutrient allowances for healthy people from the National Research Council of the National Academy of Sciences. This information is revised about every 5 years and is used to determine the Daily Value and Reference Daily Intake figures used on food labels. *—see Daily Reference Values (DRVs), Daily Values (DVs), Reference Daily Intakes (RDIs), U.S. Recommended Daily Allowances (U.S. RDAs)*

Reference Daily Intakes (RDIs)

A new term that replaces the familiar U.S. Recommended Daily Allowances (U.S. RDAs). RDIs are based on a population-weighted average of the latest RDAs for vitamins and minerals for healthy Americans over 4 years old. RDIs are not recommended daily intake figures for any particular age group or sex. They are simply average values for the entire U.S. population.

The RDI for protein for everyone over 4 years of age is 50 grams and, for those under 4, is 14 grams. For vitamins and minerals, RDIs are:

Vitamins

A*	5000	IU
C*	60	mg
D	400	IU
E	30	IU
Thiamin (B_1)	1.5	mg
Riboflavin(B_2)	1.7	mg
Niacin	20	mg
B_6	2	mg
Folic Acid	0.4	mg
B_{12}	6	mcg
Biotin	0.3	mg
Pantothenic Acid	10	mg

Minerals

Calcium*	1000	mg
Iron*	18	mg
Phosphorus	1000	mg
Iodine	150	mg
Magnesium	400	mg
Zinc	15	mg
Copper	2	mg

*Listing the percentage of RDI for this nutrient is mandatory on new food labels. Listing the percentage of RDI for other nutrients is optional. *—see Daily Reference Values (DRVs), Daily Values (DVs), Recommended Dietary Allowances (RDAs), U.S. Recommended Daily Allowances (U.S. RDAs)*

Restricted Eggs

Undergrade eggs, specifically checks, dirties, incubator rejects, inedibles, leakers, and loss eggs.

- *Checks* have a broken shell or a crack in the shell, but shell membranes are intact so that the egg contents do not leak.
- *Dirties* may have adhering dirt, prominent or conspicuous stains, or moderate stains covering more than a quarter of the shell surface.

• *Incubator rejects* have been subjected to the incubation process for a period of time.
• *Inedibles* are moldy, musty, or sour; or exhibit rot, blood rings, green whites, stuck yolks, or embryo chicks.
• *Leakers* have a crack or break in both shell and shell membranes so that the contents are leaking.
• *Loss eggs* are leakers, inedibles, and any egg that has been cooked, frozen, or contaminated.

The Egg Products Inspection Act (EPIA) controls the disposition of such eggs to prevent their getting into consumer channels. Checks and dirties are allowed to move to official USDA egg products plants where they can be properly handled and processed. They cannot be sold in the shell to restaurants, bakeries, food manufacturers, or consumers unless such sales are specifically exempted by Section 15 of the Act and not prohibited by state law. All other restricted eggs must be disposed of according to approved procedures.

Roasted Egg

A roasted egg which appears on the Jewish Passover plate as part of the ritual. The egg is hard-cooked then roasted in the oven until the shell becomes brown.

Salmonella

One of several types of bacteria which can cause food poisoning (salmonellosis) if ingested in large numbers. It is found in the intestinal tract of animals, birds, insects, reptiles, seafood, and people. The bacteria can easily be passed from the intestinal tract to the hands and on to food.

Although the inside of the egg was once considered almost sterile, *Salmonella enteritidis (S.e.)* has been found recently inside a small number of eggs (much less than 1 percent). If an egg does contain *S.e.*, the numbers in a freshly laid egg probably will be small and, if the eggs are properly refrigerated, will not multiply enough to cause illness in a healthy person.

The majority of salmonellosis outbreaks have been attributed to foods other than eggs—chicken, beef, and fish—to human carriers, and through them, to utensils and other foods during preparation. Of the outbreaks involving eggs, almost all have occurred in the foodservice sector and have been the result of inadequate refrigeration and insufficient cooking.

S.e. will not grow at temperatures below 40 °F and is killed at 160 °F. Temperatures between 40 °F and 140 °F, known as the danger zone, are ideal for rapid growth.

Illness from *S.e.* can be avoided through adequate refrigeration, proper cooking, and sanitary kitchen and food handling procedures. *—see Buying, Cooking Methods, Raw Eggs, Storing*

Saturated Fat

—see Fat

Sauces

Eggs are a time-honored thickener for sauces, but they fill more than that primary function. Eggs enrich flavor, add color, and increase nutritive value.

Milk or cream sauces thickened with eggs are used to bind casseroles and meat loaves. When sweetened, such sauces are served with desserts.

Eggs are also used in butter sauces which are emulsions of butter and other liquids. On heating, the egg both thickens and strengthens the emulsion. Hollandaise is the best known sauce of this type.

Other egg sauces include those in which chopped hard-cooked eggs are an ingredient, such as polonaise sauce. *—see Custard, stirred; Hollandaise Sauce*

Scrambled Egg

—see Cooking Methods, scrambled

Shell

The egg's outer covering, accounting for about 9 to 12 percent of its total weight, depending on egg size. The shell is the egg's first line of defense against bacterial contamination.

The shell is largely composed of calcium carbonate (about 94 percent) with small amounts of magnesium carbonate, calcium phosphate, and other organic matter including protein.

Shell strength is greatly influenced by the minerals and vitamins in the hen's diet, particularly calcium, phosphorus, manganese, and Vitamin D. If the diet is deficient in calcium, for instance, the hen will produce a thin or soft-shelled egg or possibly an egg with no shell at all. Occasionally an egg may be prematurely expelled from the uterus due to injury or excitement. In this case, the shell has not had time to be completely formed. Shell thickness is also related to egg size which, in turn, is related to the hen's age. As the hen ages, egg size increases. The same amount of shell material which covers a smaller egg must be "stretched" to cover a larger one, hence the shell is thinner.

Seven to 17 thousand tiny pores are distributed over the shell surface, a greater number at the large end. As the egg ages, these tiny holes permit moisture and carbon dioxide to move out and air to move in to form the air cell. The shell is covered with a protective coating called the cuticle or bloom. By blocking the pores, the cuticle helps to preserve freshness and prevent microbial contamination of the contents.

Uses for eggshells vary from the thrifty (compost) to the creative (decorating). *—see Air Cell; Bloom; Color, shell; Composition; Decorating Eggs; Formation; Oiling*

Size

Several factors influence the size of an egg. The major factor is the age of the hen. As the hen ages, her eggs increase in size. The breed of hen from which the egg comes is a second factor. Weight of the bird is another. Pullets significantly underweight at sexual maturity will produce small eggs. Environmental factors that lower egg weights are heat, stress, overcrowding, and poor nutrition.

All of these variables are of great importance to the egg producer. Even a slight shift in egg weight influences size classification and size is one of the factors considered when eggs are priced. Careful flock management benefits both the hens and the producer. *—see Buying, Grading, Production, Treatment of Hens*

Size Equivalents

Although any size egg may be used for frying, scrambling, cooking in the shell, or poaching, most recipes for baked dishes such as custards and cakes are based on the use of Large eggs. To substitute another size, use the following chart.

Large	Jumbo	X-large	Meduim	Small
1	1	1	1	1
2	2	2	2	3
3	2	3	3	4
4	3	4	5	5
5	4	4	6	7
6	5	5	7	8

You can also figure how many of which to use by cup measurement.

To Make 1 Cup:	Egg Size	Whole	Whites	Yolks
	Jumbo	4	5	11
	X-Large	4	6	12
	Large	5	7	14
	Medium	5	8	16
	Small	6	9	18

—see Buying

Soft-cooked Egg

—see Cooking Methods, soft-cooked

Souffle

A puffy, delicate, light-as-air creation. Savory or sweet, hot or cold, souffles are sensational and impressive whether served as a main dish, accompaniment, or dessert.

Strictly speaking, a true souffle consists of a thick white sauce blended with beaten egg yolks and leavened by stiffly beaten whites. It may also contain finely chopped or pureed meats, cheese, seafood, or vegetables and is always served hot. Condensed cream soups or quick-cooking tapioca cooked in milk are sometimes substituted for the white sauce. For sweet or dessert souffles, sugar is added to the sauce.

Like so many skills, making a successful souffle is easy when you know how. A mastery of the following basics will have you turning out souffles with the best of them.

If you don't have a traditional souffle dish, use a straight-sided casserole dish or even a straight-sided uncoated saucepan of the proper size. For individual servings, large custard cups or ovenproof coffee or soup mugs are satisfactory. As it bakes, the souffle will increase in volume two to three times, so container size is important. If the container is too large, the mixture will not rise above the rim and have the lofty look that is part of a souffle's charm. If the container is too small, the mixture may run over. Usually a four-egg souffle will fit a 1 1/2- to 2-quart container. Use a 2- to 2 1/2-quart container for a six-egg souffle. The container may be filled to within half an inch of the top.

A souffle needs to cling to the sides of the container to reach its maximum height, so the container should not be buttered. However, buttering the sides and bottom of the container and then dusting them lightly with grated Parmesan cheese, cornmeal, or very fine crumbs lends flavor and a nice crusty texture. For dessert souffles, dust with sugar.

If you find your technique produces souffle mixtures which are especially light and voluminous, or if you don't have a container of the suggested size, you can keep the souffle in bounds by fitting a collar around the top of the container. Make a 4-inch band of triple thickness aluminum foil long enough to go around the container and overlap 2 inches. Butter and dust the band. Wrap it around the outside of the dish with the buttered side in and fasten with paper clips or string. The collar should extend 2 to 3 inches above the rim of the container.

Recipe

Basic Savory Souffle

(Four side or two main-dish servings)

With this modern, streamlined method, a souffle is not as difficult to make as you might think. This basic formula can be used for almost any savory souffle combination you can imagine! Add up to 1 1/2 cups total of shredded cheese and/or any shredded or finely chopped, well-drained cooked food and a pinch of a complementary seasoning to the sauce.

1/4 cup butter
1/4 cup all-purpose flour
1/2 teaspoon salt
1 cup milk
1 1/2 cups additional ingredients, optional
Seasoning, optional
4 eggs, separated
1/2 teaspoon cream of tartar

In medium saucepan over medium-high heat, melt butter. Stir in flour and salt. Cook, stirring constantly, until smooth and bubbly. Stir in milk all at once. Cook and stir until mixture boils and is smooth and thickened. Stir in cheese and seasoning, if desired, until cheese is melted. Set aside.

In large mixing bowl, beat egg whites with cream of tartar at high speed until stiff but not dry, just until whites no longer slip when bowl is tilted. Stir egg yolks into reserved

sauce until thoroughly blended. Stir in additional ingredients, if desired. Gently but thoroughly, fold yolk mixture into whites. Carefully pour into 1½- to 2-quart souffle dish or straight-sided casserole.

For a "top hat," hold spoon upright and circle mixture to make ring about 1 inch from side of dish and 1 inch deep. Bake in preheated 350 °F oven until puffy and delicately browned, and until souffle shakes slightly when oven rack is moved gently back and forth, about 30 to 40 minutes. Serve immediately.

Some tips:

• An unbaked souffle can wait in its dish in the refrigerator for up to 2 hours before you send it to the oven.

• Don't open the oven door to peek for at least the first 25 minutes of baking time. A cool draft might deflate it.

• Hurry the finished souffle to the table. It is an age-old rule that guests wait for the souffle, not the souffle for the guests!

• Serve by gently breaking the souffle into portions with two back-to-back forks. Spoon out lightly, including some of the top and side crusts and softer center with each serving.

Souffle, Cold

A term loosely applied to a number of airy egg dishes with a texture closely resembling a souffle. For the purist, however, they are more accurately known as snows or sponges, chiffons, or bavarians.

Snows or sponges are clear gels plus egg whites. A basic gelatin mixture is partially set, unbeaten egg whites are added, and the mixture is beaten until soft peaks form and chilled until firm.

Chiffons are custard gels to which beaten egg whites are added. Egg yolks are cooked with gelatin to make a custard base, stiffly beaten egg whites are folded in, and the mixture chilled. Chiffons can be enjoyed as they are or used for pie fillings.

Bavarians are custard gels made with egg yolks to which both beaten egg whites and whipped cream are added.

Although such recipes are usually made with raw whites and/or yolks, some can be cooked. *—see Raw Eggs*

Sponge Cake

An airy foam cake similar to angel food cake except that sponge cake may be made with egg yolks or with whole eggs. True sponge cakes contain neither shortening nor baking powder. *—see Angel Food Cake, Foams*

Storage Eggs

A technical term for eggs held under refrigeration for more than 30 days rather than being sold immediately. Almost no retail eggs today are storage eggs. *—see Cold Storage, Preservation*

Storing

The refrigerator is where you should store your eggs. Unless you seldom open the door, it's best to place the eggs on an inside shelf. Repeated opening and closing of the door causes temperature fluctuations and slamming can result in breakage. The carton in which you purchase them helps keep the eggs from picking up odors and flavors from other foods and helps prevent moisture loss—a particularly important factor if you have a frost-free refrigerator.

Fresh, uncooked eggs in the shell can be kept refrigerated in their cartons for at least 4 to 5 weeks beyond the pack date. Properly handled and stored, eggs rarely "spoil." If you keep them long enough, they are more likely to simply dry up! But don't leave eggs out. They'll age more in 1 day at room temperature than they will in 1 week in the refrigerator.

As soon as you've cooked them, refrigerate hard-cooked eggs in their shells in their cartons and use them within 1 week.

When storing hard-cooked eggs, you may notice a "gassy" odor in your refrigerator. It may be more noticeable when the refrigerator is opened infrequently. The odor is caused by hydrogen sulfide which forms when the eggs are cooked. It is harmless and usually dissipates within a few hours.

For outdoor eating occasions, eggs can be kept refrigerator-cold with ice or commercial coolant in an insulated bag or picnic cooler as long as the ice lasts or the coolant remains almost at freezing. Unless it's quite cold weather, for hiking, backpacking, camping, and boating when refrigeration or cooler facilities aren't available, it's better to use dried eggs. Usually available in sporting goods stores, dried eggs can be reconstituted with purified water and used in most of the ways you would use fresh eggs. Specially coated hard-cooked eggs which keep without refrigeration for a considerable length of time are also available in some areas.

Pickling and other forms of preservation are additional possibilities.

If a recipe calls for only whites or only yolks, refrigerate the leftover whites in a covered container up to 4 days. Store yolks in water in a covered container in the refrigerator and use in a day or two. If you can't use the yolks quickly enough, hard-cook them. Carefully place them in a single layer in a saucepan and add enough water to come at least 1 inch above the yolks. Cover and quickly bring just to boiling. Remove from heat and let stand, covered, in the hot water for about 15 minutes. Remove with a slotted spoon and store in a tightly sealed container in the refrigerator up to 4 or 5 days.

If you find yourself with more eggs than you will use in several weeks, freeze them. *—see Egg Products, Freezing, Leftover Egg Parts, Pickled Eggs, Preservation*

Strata

A custard mixture poured over layers of bread and cheese and baked. The strata was created to use up stale bread and cheese.

Treatment of Hens

Laying hens are an egg producer's living and are treated with care. Like humans, hens seem to be more productive when they're healthy. In 1945, the average hen laid 151 eggs per year. Now, as a result of breeding and better nutrition, housing, and general management of facilities, the average hen lays between 250 and 300 eggs per year.

Although the housing and caging of laying hens may seem to limit their freedom, the system is actually designed for the welfare of the birds as well as for production efficiency. In the hen house, the birds may more readily be protected from the elements, from disease, and from both natural and unnatural predators (such as cars).

Housing the hens also makes it possible to control their diet, which results in better-fed hens and eggs of more uniform quality. Scientifically balanced feed ensures that the birds are protected from improper or inadequate diets—a vast improvement over the days when hens foraged for food in barnyards or ate household scraps.

Chickens, like some other animals, may exhibit cannibalistic tendencies. To protect the birds from each other, part of their upper beaks or both lower and upper beaks are cut off. The beak-trimming process is done by a special machine which cauterizes the beak and may be compared to clipping a dog's claws. Of course, the birds are still able to eat and drink.

Some hens are even treated to piped-in music. *—see Production*

Thickener

—see Cooking Functions, Sauces

Tempering

The technique used to blend uncooked eggs into hot mixtures. Eggs are beaten and a little of the hot mixture is stirred into them to warm (temper) them. The warmed eggs are then stirred into the remaining hot mixture. Tempering helps to prevent the eggs from curdling. *—see Curdling*

Unsaturated Fat

—see Fat

Uses, Other

• **Cosmetic:** Egg white has long been used as a facial. Egg yolk is used in shampoos and conditioners.

• **Animal Feed:** Both shells and interiors of eggs are used.

• **Experimental Uses:** Egg white is used as a protein reference in feeding laboratory animals. Egg yolk and egg products are used in laboratories as a medium for the growth of microorganisms.

• **Medical and Pharmaceutical:** Fertile eggs are used to manufacture many vaccines, as a source of purified proteins, and as an aid in the preservation of bull semen for artificial insemination.

U.S. Recommended Daily Allowances (U.S. RDAs)

A term that once indicated suggested intake levels for nutrients. U.S. RDAs simplified the RDAs of the National Academy of Sciences by providing a single recommended allowance for the general healthy population. With few exceptions, these allowances were based on the highest RDA for each nutrient—the amounts required for young adult males. Since these values were excessively high for children, women, and the elderly, U.S. RDAs have now been replaced by RDIs which represent average RDAs. *—see Daily Values (DVs), Daily Reference Values (DRVs), Recommended Dietary Allowances (RDAs), Reference Daily Intakes (RDIs)*

Vegetarian Diets

Eggs can be an important source of complete protein in diets that omit meats. One egg equals 1 ounce of lean meat, fish, or poultry. *—see Nutrient, Protein, Reference Daily Intakes (RDIs)*

Vitamins

An egg contains varying amounts of 13 vitamins but no vitamin C. *—see Biological Value, Nutrient, Reference Daily Intakes (RDIs)*

Vitelline Membrane (vi-tel'-an)

—see Composition, membranes

Water Bath

Also known as a *bain marie*. Some delicate dishes, such as custard, are cooked in the oven in a water bath. The baking dish or pan is placed in a larger baking pan and very hot water is added to within half an inch of the top of the custard. The water promotes even cooking. *—see Custard, baked*

Water Glass

A solution of sodium silicate formerly used to preserve eggs. *—see Preservation*

Weeping

—see Curdling; Meringue, soft meringue

Weight

—see Buying, Grading, Size

Well-beaten

—see Cooking Terms

White

—see Albumen; Color, white; Composition; Foam

Yolk

The yolk or yellow portion makes up about 33 percent of the liquid weight of the egg. It contains all of the fat in the egg and a little less than half of the protein.

With the exception of riboflavin and niacin, the yolk contains a higher proportion of the egg's vitamins than the white. All of the egg's vitamins A, D, and E are in the yolk. Egg yolks are one of the few foods naturally containing vitamin D.

The yolk also contains more phosphorus, manganese, iron, iodine, copper, and calcium than the white, and it contains all of the zinc. The yolk of a Large egg contains about 59 calories.

Double-yolked eggs are often produced by young hens whose egg production cycles are not yet completely synchronized. They're often produced, too, by hens who are old enough to produce Extra Large eggs. Genetics is also a factor. Occasionally a hen will produce double-yolked eggs throughout her egg-laying career. It is rare, but not unusual, for a young hen to produce an egg with no yolk at all.

In fertilized eggs, the yolk is the site of embryo formation.

It is the yolk which is responsible for the egg's emulsifying properties. *—see Breakout; Color, yolk; Composition; Cooking; Fat; Functions; Fertile Eggs; Formation; Germinal Disc; Grading; Nutrient*