

Fresno County 4-H Poultry Study Guide (Supplemental)



To be used to study for Poultry Achievement Test
Level II in conjunction with Study Guide

Poultry Equipment and Feed Identification Level II

- Net
- Nesting Box
- Electrolytes/Probiotics for Water
- Bulk Feeder
- Toe Punch
- Digital Scale
- Chicken Wire
- Shavings
- Wood Pellets/Equine Bedding
- Heat Plate for Chicks (Example Brinsea Ecoglow)
- Egg Air Cell Gauge
- Wazine
- Fodder
- Fermented Feed
- Whole Corn

Poultry Diseases

Name	Cause	Symptoms	Prevention	Treatment
New Castle Disease	Virus	Respiratory troubles, nervous signs, green diarrhoea, egg drop	Vaccination	None
Infectious bronchitis	Virus	Respiratory troubles, egg drop, misshapen eggs	Vaccination	None
Fowl pox (avian pox)	Virus	Lesions on comb wattle and face, yellow membranes in mouth cavity	Vaccination	None
Chronic Respiratory disease	Mycoplasma (MG)	Respiratory signs	Sanitation, monitoring, use of MG-free flocks	Antibiotics
Avian encephalo myelitis (epidemic tremor)	Virus	Paralysis, nervous tremors	Vaccination	None
Cholera	Bacterium Pasteurella multocoda	Swollen joints and wattles, darkened heads	Sanitation	Antibiotics, sulfa drugs
Fowl Typhoid	Bacterium	Mortality	Sanitation, monitoring	Sulfa drugs, antibiotics
Infectious bursitis (Gumboro disease)	Virus	Watery diarrhoea	Vaccination	None
Coccidiosis	Protozoa (Eimeria)	Diarrhoea	Sanitation, dry litter, anti-coccidial agents	Sulfas
Worm infectious	Various kinds of worms	Diarrhoea	Sanitation, fresh litter, avoid exposure and overcrowding	Various anti-worm drugs
Infectious Coryza	Bacterium Haemophilus paragallinarum	Nasal mucus, swollen wattles, rales and face	Vaccination	Antibiotics like sulphathiazole, streptomycin, tetracyclines

For more information on poultry diseases visit: <http://ucanr.edu/sites/poultry/dz/> and <http://edis.ifas.ufl.edu/ps044>

American Poultry Association (APA) Classes and Breeds

APA Large Fowl Classes and Breeds

AMERICAN CLASS

Plymouth Rocks, Dominiques, Wyandottes, Javas, Rhode Island Reds, Rhode Island Whites, Buckeyes, Chanteclers, Jersey Giants
Lamonas, New Hampshires, Hollands, Delawares

ASIATIC CLASS

Brahmas, Cochins, Langshans

ENGLISH CLASS

Dorkings, RedCaps, Cornish, Orpingtons, Sussex, Australorps

MEDITERRANEAN CLASS

Leghorns, Minorcas, Spanish, Andalusians, Anconas, Sicilian Buttercups, Catalanas

CONTINENTAL CLASS

Continental (North Europe)

Hamburgs, Campines, Lakenvelders, Barnevelder, Welsummers Continental

Continental(Polish)

Polish: Bearded - Non-Bearded

Continental (French)

Houdans, Faverolles, Crevecoeurs, La Fleche, Marans

ALL OTHER STANDARD BREEDS CLASS

Games

Modern - Old English

Oriental

Malays, Sumatras, Aseels, Shamos, Yokohamas, Phoenix, Cubalayays

Miscellaneous

Sultans, Naked Necks, Araucanas , Ameraucanas

APA Bantam Classes and Breeds

GAME BANTAM CLASS

Modern
Old English
American Game Bantams

SINGLE COMB CLEAN LEGGED OTHER THAN GAME BANTAM CLASS

Anconas, Andalusians, Australorps, Catalanas, Campines,
Delawares Dorkings, Dutch, Hollands, Japanese, Javas, Jersey
Giants Lakenvelders, Lamonas, Leghorns, Minorcas, Naked Necks,
Nankins New Hampshires, Orpingtons, Phoenix, Plymouth Rocks,
Rhode Island Reds, Seramas, Spanish, Sussex

ROSE COMB CLEAN LEGGED BANTAM CLASS

Anconas - Belgian Bearded d'Anvers - Dorkings - Dominiques -
Hamburgs Leghorns - Minorcas - Nankins - Red Caps - Rhode
Islands - Rosecombs Sebrights - Wyandottes

ALL OTHER COMBS, CLEAN LEGGED, BANTAM CLASS

Ameraucanas, Araucanas, Buckeyes, Chanteclers, Cornish,
Crevecoeurs, Cubalayas, Houdans, Ko Shamo, La Fleche, Malays,
Polish, Shamos, Sicilian Buttercups, Sumatras, Yokohamas

FEATHER LEGGED BANTAM CLASS

Booted, Brahmas, Belgian Bearded d'Uccles, Cochins, Faverolles, Langshans,
Silkies, Sultans

BANTAM

Call, East Indie, Mallard, Carolina Wood, Mandarin

APA Waterfowl, Turkey, and Guinea Fowl Classes and Breeds

DUCK CLASS

Heavy Weight

Pekin, Aylesbury, Rouen, Muscovy, Saxony, Silver Appleyard

Medium Weight

Cayuga, Crested, Swedish, Buff

Light Weight

Runner, Campbell, Magpie, Welsh Harlequin

GOOSE CLASS

Heavy

Toulouse, Embden (Emden), African

Medium

Sebastopol, Pilgrim, American Buff , Saddleback Pomeranian, Steinbacher

Light

Chinese (China) , Tufted Roman, Canada, Egyptian

TURKEY CLASS

Bronze, Narragansett, White Holland, Black, Slate Bourbon Red,
Beltsville Small White, Royal Palm

GUINEA FOWL CLASS

Examples of Poultry Breeds and Classes

Breed	Class	Comb	Varieties
African (Goose)	Heavy		Brown, White
Belgium D'Uccle	Feather Leg	Single	*Black, Mille Fleur, Mottled, Self Blue, White
Call Duck	Bantam Duck		*White, Pastel, Gray, Chocolate, Buff,
Campbell (Duck)	Light		Khaki
Canadian (Goose)	Light		Eastern
Cochin	Feather Leg	Single	*White, Black, Barred, Birchen, Blue,
Japanese	Single Comb Clean Legged	Single	*Barred, Black, Brown Red, Mottled, Wheaten, White
Leg Horn	Mediterranean	Single and Rose Comb	* Red, Dark Brown, Golden, Silver, White
Modern Game	Modern Game	Single (Dubbed)	* Black, Blue, Birchen, Red Pyle, Splash,
Old English Game Bantams	Game	Single (Dubbed)	* Black, Blue, Crele, Columbian, Silver Duckwing, Spangled, Wheaten, White
Rhode Island Red	American	Single Comb and Rose Comb	
Silkies	Feather Leg	Walnut	*Black, Buff, Gray, Partridge, White
Turkey	Turkey		Bronze
Turkey	Turkey		Bourbon Red

* Breed has more varieties than are listed

For more information on the American Poultry Association (APA) recognized breed and variety information, please visit <http://www.amerpoultryassn.com/Breed%20Variety%20Info.htm>, under Accepted Breeds.

**Please refer to the APA Standard of Perfection for more information on breed/variety details*

Poultry Terms Level II

Air cell - the air space between the two shell membranes, usually at the large end of the egg

Alektorophobia - the fear of chickens

Banding - putting a tag or band with identification on it to the wing or leg of a bird

Barring - alternate markings of two distinct colors on a feather

Bleaching - the disappearance of the color from the vent, face and shanks of yellow-skinned chickens

Bloom - the moist protective coating on a freshly laid eggs that partially seals the pores of the egg shell to prevent penetration by bacteria (also called the cuticle)

Chicken tractor - a portable pen for chickens on pasture

Class - a group of chicken breeds that were originally developed in a particular region of the world (e.g. American, Asiatic, Mediterranean)

Clutch - a group of eggs or chicks

Coop - the house or cage in which poultry are housed

Cull - to remove a bird from the flock because of productivity, age, health or personality issues

Disqualification - a defect or deformity serious enough to bar a bird from a poultry show

Dust bath - the habit of chickens to splash around in soft soil to clean their feathers and discourage external parasites

Embryology - the study of the formation and development of embryos

Frizzle - a feather that curls rather than laying flat

Gander - a male goose

Guinea hen - an adult female guinea fowl

Hatchability - the percentage of fertile eggs that hatch when incubated

Hatchery - a place where eggs are incubated and chicks hatched

Lopped comb - a comb that falls to one side

Molt (Moult) - a part of the hen's reproductive cycle when she stops laying and loses her body feathers

Necropsy - a postmortem (after death) examination of an animal (equivalent to a human autopsy)

NPIP - National Poultry Improvement Plan

Ovum - the female germ cells in the ovary (plural = ova)

Pasting - loose droppings sticking to the vent area

Pecking order - the social rank of individuals within a flock

Perch - the area above the ground where birds will sit, primarily for sleeping at night (also called roosts)

Pip - when a chick breaks through the shell

Pipping - breaking through the shell prior to hatch

Pin feathers - a developing feather on a bird

Poultry - a term for domestic fowl raised for meat, eggs, feathers, work or entertainment

Preening - to straighten and clean feathers, typically with oil

Purebred - offspring from a hen and rooster of the same breed

Scales - small, hard, overlapping plates that cover a chicken's shanks and toes.

Sexed chicks - day-old chicks that are separated into separate groups of male and female chicks

Splayed legs - the legs are positioned such that the bird is unable to stand up (also called 'spraddle legs')

Squirrel tail - tail that has more than a 90 degree angle

Straight-run (chicks) - day-old chicks that have not been sorted by sex (also called unsexed)

Vent - the common outside opening of the cloaca in birds through which the digestive, excretory and reproductive tracts empty

Web - the network of interlocking parts that give a feather its smooth appearance; a part of the feet of waterfowl

Wing clipping - a procedure in which the primary wing feathers of one wing are cut to prevent flight

Yolk - the round yellow mass upon which the genetic material of the female (and male if the egg is fertilized) is located and that provides nutrients for the developing embryo

Yolk sac - the membrane that surrounds the yolk in the incubating egg

For more poultry terms visit: <https://afs.ca.uky.edu/poultry/glossary-poultry-terms>

Poultry Showmanship Scorecard

		Showman Name and Number																		
		1	2	3	4	5	6	7	8	9	10									
Stage I	Procedures	Personal appearance of member (5 pts.)																		
		Carrying bird (5 pts.)																		
		Examining bird (15 pts.)																		
		Posing bird on table (10 pts.)																		
		Quality and condition of bird (10 pts.)																		
		Handling bird in and out of cage (5 pts.)																		
		Posing bird (10 pts.)																		
		Walking bird (15 pts.)																		
		Poise (5 pts.)																		
		Speaking ability (5 pts.)																		
		Knowledge (15 pts.)																		
TOTAL (100 pts.)																				

How to Grade Eggs

COOPERATIVE EXTENSION SERVICE - UNIVERSITY OF KENTUCKY - COLLEGE OF AGRICULTURE - LEXINGTON, KY, 40546

AFS

Grading table eggs

Tony Pescatore, Jacqui Jacob and Austin Cantor



Before selling table eggs it is important that they be evaluated for exterior and interior quality and any below standard eggs removed. USDA has specific standards for Grades AA, A, B or inedible/reject and these standards should be used whether eggs are officially graded by USDA inspectors or on-farm by producers. A complete description of the factors that affect egg graders can be found in the USDA Egg Grading Manual (available through www.ams.usda.gov website).

Commercially eggs are graded simultaneously for exterior and interior quality but here these standards will be discussed separately. Exterior quality standards were developed to reduce the number of eggs with defects that detract from the egg's appearance or that would have a low probability of surviving the typical handling involved in getting eggs from the farm to market.

EXTERIOR EGG QUALITY

The consumer wants a clean egg with an intact shell that looks appealing when it is fried or poached. While the appearance of the egg shell does not have an effect on the quality of its contents, the quality of the shell definitely affects consumer appeal.

Exterior quality evaluation is based on cleanliness, shape, shell texture and shell strength (see Table 1 on the next page). The exterior quality factors for Grades AA and A are the same.

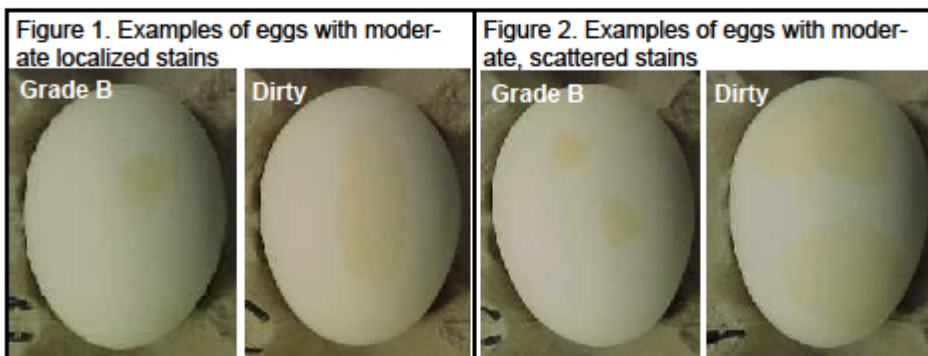
Cleanliness

Grade A eggs must be clean. They may show traces of processing oil which is sometimes used to preserve freshness.

Stains

Eggs with stains can be Grade B or Dirty/Reject depending on the intensity of the stain, the type of stain, as well as the amount of shell covered by the stain.

- **Stain intensity** can be classified as slight, moderate or prominent (see Figures 1 and 2). As a rule of thumb, a slight stain is easily visible from one foot away but difficult to see from about three feet. A moderate stain is easily visible from three feet but difficult to see from about six feet. A prominent stain is easily visible from six feet or more.
- There are two **stain types**, localized and scattered. A localized stain is a single stain where all the stained areas are connected.



Agriculture and Natural Resources - Family and Consumer Sciences - 4-H Youth Development - Community and Economic Development

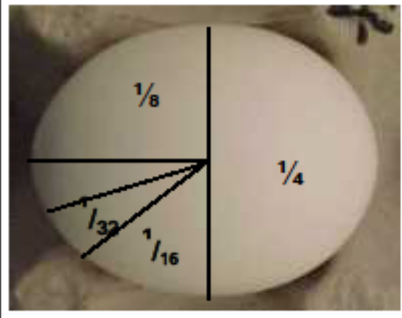
Table 1. Summary of standards for the exterior quality of table eggs

FACTOR	GRADE		
	AA or A	B	Dirty/Reject
Stain	Clean, but - May show small specks, stains or cage marks that do not detract from general clean appearance of the egg - May show traces of processing oil	Slight or moderate localized stains less than 1/32 nd of shell OR Slight or moderate scattered stains less than 1/16 th of shell	Prominent stains OR Slight or moderate stains covering more than 1/32 nd if localized and 1/16 th of the shell if scattered
Adhering dirt or foreign material	None	None	Adhering dirt or foreign material (1.0 mm in area or greater)
Egg shape	Approximately the usual egg shape	Unusually or decidedly misshapen	
Shell texture	May have rough areas and small calcium deposits that do not materially affect shape or strength	Extremely rough areas that may be faulty in soundness or strength. May have large calcium deposits.	
Ridges	Slight ridges that do not materially affect shape or strength	May have pronounced ridges	
Shell thickness	Free of thin spots	May have pronounced thin spots	
Body checks	Absence of body checks	May show pronounced body checks.	

Table 2. Summary of standards for the interior quality of table eggs

FACTOR	GRADE			
	AA	A	B	Inedible
Air cell	1/8 inch or less in depth	3/16 inch or less in depth	More than 3/16 inch in depth	Doesn't apply
White/albumen	Clear Firm	Clear May be reasonably firm	Clear May be weak and watery	Doesn't apply
Yolk	Outline slightly defined	Outline may be fairly well-defined	Outline clearly visible	Doesn't apply
Spots (Blood or meat)	None	None	Blood or meat spots aggregating not more than 1/8 inch in diameter	Blood or meat spots aggregating more than 1/8 inch in diameter

Figure 3. An egg marked to show 1/16th and 1/32nd of its shell surface



A scattered stain is two or more stained areas on the same egg.

- The size of the stained portions must be mentally added together and the total area of shell compared with the amount of stain allowed for a Grade B egg (see Figure 3 above). A Grade B egg can have a moderate localized stain covering less than 1/32nd of the shell. For scattered stains the limitation is 1/16th of the shell. If the stains are larger than those listed above, it is a Dirty/Reject egg.

Adhering material

Eggs with adhering or foreign material larger than a speck (about 1.0 mm) are considered Dirty/Reject eggs. The adhering material can be anything from manure, a piece of shell, yolk or albumen (see Figure 4 below). It can also include a feather. Even though these things can be washed off, the eggs are categorized as Dirty until they are actually cleaned and the adhering material removed.

Shape

There is a considerable range of egg shapes that could be considered 'approximately the usual egg shape' which would all be Grade As. Eggs that are too round or too long to fit in the egg carton are Grade B eggs downgraded because of their shape (see Figure 5). Grade B eggs downgraded for shape will also include those eggs that are clearly misshapen or that have definite flat areas. Any eggs that come in a strange shape are also Grade B (see Figure 5).

Figure 4. Photographs of different 'Dirty' eggs with adhering material



Figure 5. Photographs of Grade B eggs which are downgraded because of shape



Figure 6. Examples of Grade B eggs with calcium deposits.



Figure 7. Example of a Grade A egg with small calcium deposits.



Figure 8. Example of an egg downgraded because of ridges.



Figure 9. Example of a Grade B egg downgraded because of rough shell.



Shell texture

Eggs with faulty texture are much weaker in shell strength and may be broken during distribution. It is primarily for this reason that these eggs are downgraded and do not normally appear in grocery stores.

Shells with large calcium deposits (greater than $1/8^{\text{th}}$ of an inch in diameter) are Grade B (see Figure 6). Grade A eggs are allowed smaller calcium deposits (see Figure 7). A good rule of thumb is that if you were to pull your fingernail across a calcium deposit, and there would be a good size hole if it came off, it would be classified as Grade B. There is no standard for the number of calcium deposits. Therefore, eggs with small calcium deposits over the entire shell may be classified as Grade A if otherwise qualified (see Figure 7).

Ridges

Ridges can result in weakened shells (see Figure 8 on the next page). Many eggs have small ridges and most of these should be classified as Grade A. Those eggs with large ridges, however, are Grade B.

A related condition is shell roughness, without distinct ridges (see Figure 9). It is common, however, to see both conditions on the same egg (see Figure 10).

Body checks

Body checks are another type of faulty shell that results in downgrading of eggs. Body checks are eggs which were cracked when the shell was being formed in the hen's body and then partially calcified over, repairing the damage, before being laid.

Figure 10. Example of an egg with both distinct ridges as well as a rough shell.



Figure 11. Example of a body check egg showing visible cracks.



Figure 12. Example of a body check egg with visible bulge in the shell.

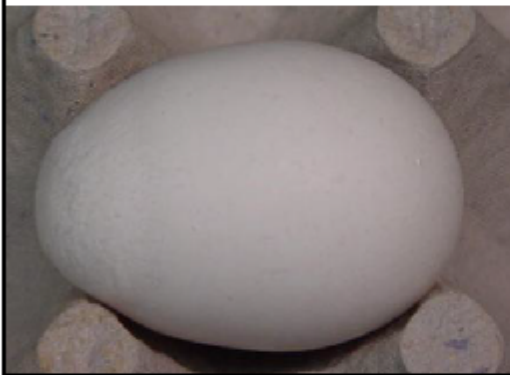


Figure 13. Example of a Grade B egg with a large thin spot in the shell

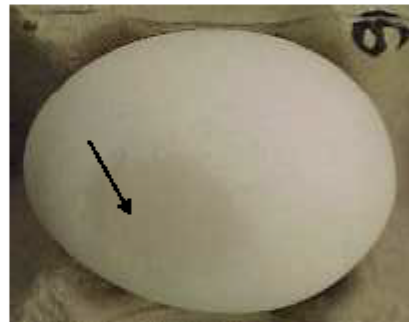
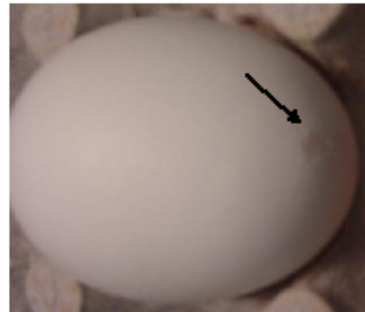


Figure 14. Example of a Grade B egg with a small thin spot, or 'window,' in the large end



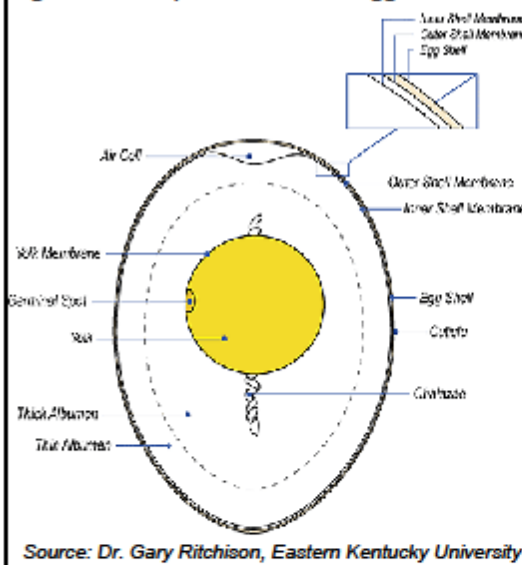
Frequently an egg with a body check looks cracked, but it is actually still intact (see Figure 11). The shell does remain weak, however, so commercially these eggs are removed and not sold as table eggs. With some body check eggs the cracks are not as visible but they can be identified by the bulge in the shell shape (see Figure 12).

Shell thickness

A shell should appear thick enough to withstand reasonable handling without breaking. Grade A eggs must have thick shells with no thin spots. Thin shells or thin spots would result in an egg being downgraded to a B. The egg in Figure 13 has a relatively large weak area. Eggs can also have small, weak shells in

one area of an egg, such as the egg in Figure 14 which has a weak area (or 'window') in the shell at the large end. Both eggs would be Grade B.

Figure 15. The parts of an avian egg.



Source: Dr. Gary Ritchison, Eastern Kentucky University

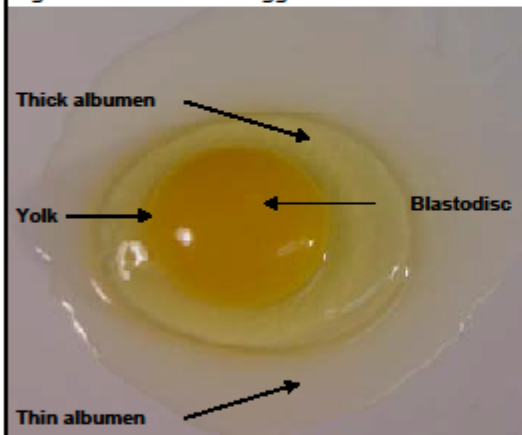
and, of course, the shell. When an egg is first laid these two membranes are closely attached on the inner lining of the shell.

The temperature of the contents of a freshly laid egg is slightly lower than that of the body temperature of the hen (105-107°F) but quickly warms to room temperature. As the egg contents cool they contract, separating the inner and outer shell membranes slightly, typically at the large end of the egg. This is referred to as the air cell.

As an egg ages it loses moisture and the contents contract even more, enlarging the air cell. Air cell size, therefore, is a good indication of egg quality and can be evaluated without breaking the egg open.

When an egg is broken open it is possible to see the parts making up the egg contents (see Figure 16). The yolk is in the center of the egg and is held in position by the chalazae located on the two poles of the yolk (difficult to see in the photo).

Figure 16. Parts of an egg without its shell.



The yolk is surrounded by a layer of thick albumen and finally by the thin albumen. The blastodisc, which contains the genetic material of the female chicken, is located on the surface of the yolk.

As an egg ages the thick albumen breaks down reducing its height and volume. The amount of thin albumen is increased.

Candling

Candling is done in a dark room with the candler light turned on. To candle an egg, hold it up to the candler with the large end against the light (see Figure 17 on the next page). It is best to hold the egg between your thumb and first two fingers. If you feel you may drop the egg, place your other hand underneath to catch any eggs that may drop.

With the egg at a slight angle, turn your wrist first one direction and then the other. This will cause the inside content of the egg to whirl. Repeat the procedure with the small end of the

INTERIOR EGG QUALITY

The grades based on interior egg quality are AA, A, B or inedible (see Table 2 on page 2). To evaluate the egg contents without breaking them out the shell, candling is used. To understand the criteria used in these evaluations it is important to have knowledge of the parts of an egg (see Figures 15 and 16).

The egg contents are surrounded by two membranes—an inner and outer shell membrane—

Figure 17. The use of a candler for determining egg grade based on internal egg quality.



Figure 18. An example of an egg with a blood spot being candled.

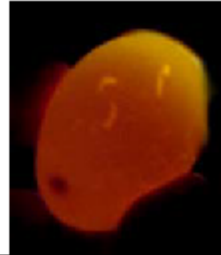
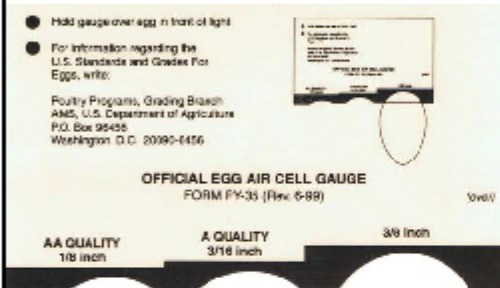


Figure 19. Official egg air cell gauge used in determination of the grade of an egg based on quality of interior contents.



serve the size of the air cell (typically, but not always, found in the large end of the egg). The size of the air cell typically determines the grade as either AA, A, or B according to USDA standards (see Figure 19).

Eggs with air cells less than $\frac{1}{8}$ inch deep are Grade AA. Eggs with an air cell greater than $\frac{1}{8}$ inch but less than $\frac{3}{16}$ inch are Grade A. Anything greater than $\frac{3}{16}$ inch is a Grade B. Examples are shown in Figure 20 below.

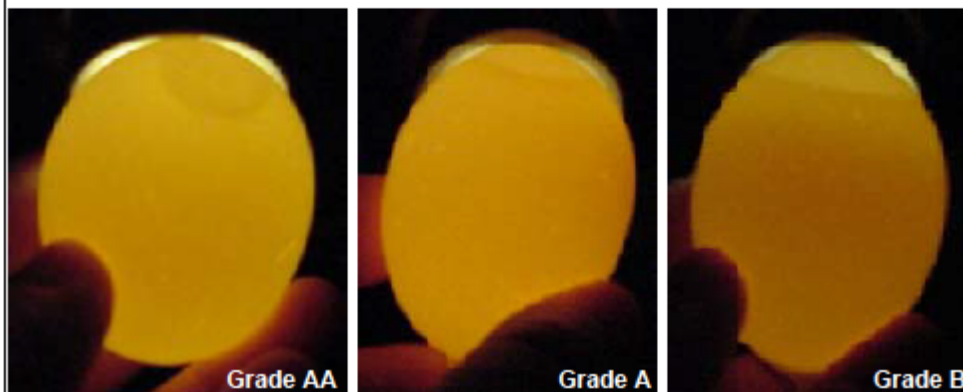
As a rule of thumb, those eggs with an air cell smaller than the size of a dime are Grade AA and those larger than a dime but smaller than a nickel are Grade A. Anything larger than a nickel is a Grade B.

There is a third air cell depth indicator on the card, for an air cell depth of $\frac{3}{8}$ inch. This is no longer used. In the past there was a fourth possible grade for eggs, Grade C. This grade no longer exists but the card has not been changed.

egg against the light. This procedure will allow you to determine if a meat or blood spot is present (see Figure 18 for example of an egg with a blood spot). This will immediately make the egg a 'Reject' egg and no other evaluation is needed.

If no blood or meat spots are detected return the large end of the egg to the light and ob-

Figure 20. Examples of different air cell sizes as seen when candling eggs.



The yolk of a fresh, high quality egg will be surrounded by a rather dense layer of albumen/egg white. When the egg is twirled during candling, the yolk moves only slightly away from the center of the egg. As a result, the yolk outline is only slightly defined or partially visible. As the egg ages and interior quality deteriorates, the albumen becomes thinner and allows the yolk to move more freely. With Grade B eggs the yolk may come close to the shell, if it is not already stuck there. The yolk in Grade B eggs, therefore, becomes very visible when candled. It is important to distinguish between the yolk (with the weakened chalazae which are no longer keeping it in the center of the egg) and blood spots.

U.S. Grade AA and A eggs are good for all purposes, but especially for frying or making deviled eggs where appearance is important. Grade B eggs are fine for general cooking and baking.

EGG SIZES

U.S. egg sizes are defined by the weight of a dozen not on the weight of individual eggs. For example, the minimum weight for a carton of large eggs is 24 ounces. That does not mean each egg must weigh at least 24 ounces/12 eggs or 2 ounces. Many times producers will combine eggs of different sizes but making sure the total weight of the 12 eggs is at least 24 ounces.

Table 3. Minimum weights for different sizes of table eggs.

Size	Weight of a dozen eggs
Jumbo	30 ounces
Extra Large	27 ounces
Large	24 ounces
Medium	21 ounces
Small	18 ounces
Peewee	15 ounces

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The original article "Grading Table Eggs" can be found at:

[https://www.extension.iastate.edu/story/sites/www.extension.iastate.edu/files/story/4-Hbroiects/Poultrv/1%20Grading table eggs.pdf](https://www.extension.iastate.edu/story/sites/www.extension.iastate.edu/files/story/4-Hbroiects/Poultrv/1%20Grading%20table%20eggs.pdf)