

Egg Quality

Interior Quality

Candling is used to judge interior egg quality. Although other factors help determine the grade of an egg, the interior quality is most important. Each egg is graded on its individual merits of quality according to United States Department of Agriculture (USDA) grades. The grades are AA, A, B and Inedible. Knowledge of the parts of the egg is essential to understanding candling and grading (Figure 19).

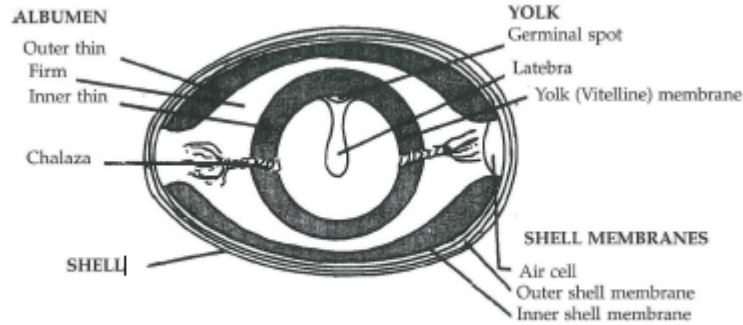


Figure 19. The parts of an egg.

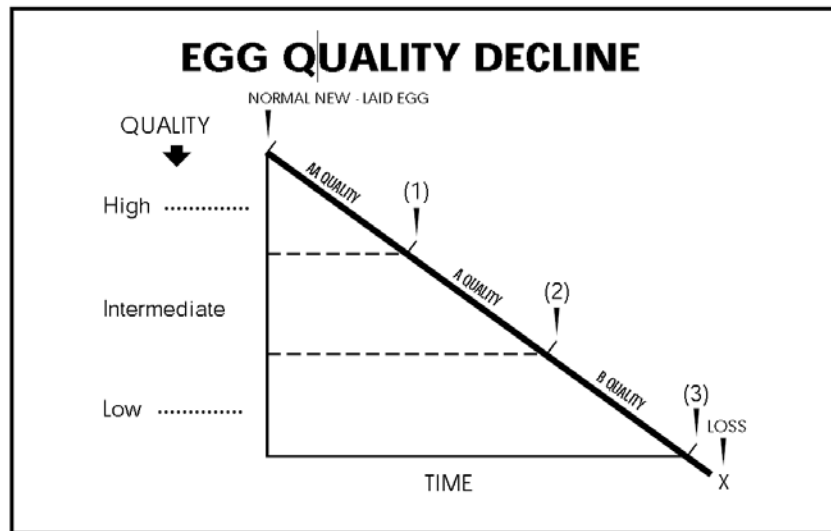


Figure 37. Chart demonstrating range of egg quality decline over time.

How to Candle

Hold the large end of an egg up to the candling light in a slanting position (Figure 20). You can see the air cell, the yolk and the white. The air cell is nearly always in the large end of the egg.

Hold the egg between your thumb and first two fingers. Then, by turning your wrist quickly, you can cause the inside of the egg to whirl. This will tell you a great deal about the yolk and white. When you are learning to candle, you will find it helpful to break and observe any eggs that you doubt.

Figure 19. The parts of an egg.



Figure 20. The way to hold eggs while candling.

Application of Standards

When determining an egg's grade by candling, the lowest factor in the air cell depth, yolk or albumen quality will determine the grade. For example, an egg may have a clearly defined yolk that is flat and at the egg's bottom while the air cell is less than 1/8-inch in depth. This egg would be a B grade.

The following will **not** be considered as quality factors when candling eggs for interior quality:

- Loose, bubbly or out-of-position air cell
- Exterior stains or dirt
- Faulty egg shell shape or texture

Use the specifications given in Table 1 to determine the grade of an egg by candling. Consider air cell depth, yolk outline and albumen quality.

Table 1. Summary of Standards for Interior Quality of Eggs by Candling for 4-H Poultry Judging

Quality Factor	AA Quality	A Quality	B Quality	Inedible
Air Cell	1/8 inch or less in depth	3/16 inch or less in depth	More than 3/16 inch	Doesn't apply
White	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

Air Cell Depth

The depth of the air cell is the distance from its top to its bottom when the egg is held with the air cell up (Figure 21). In a fresh egg, the air cell is small, not more than 1/8-inch deep. As the egg ages, evaporation takes place and the air cell becomes larger and the egg is downgraded.

Measuring Air Cell Depth

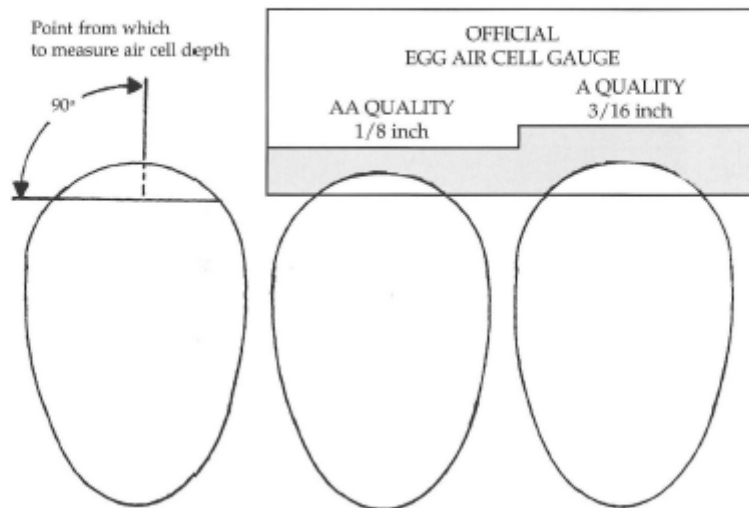


Figure 21. Gauge for measuring depth of air cell.

Yolk

The yolk of a fresh, high quality egg will be surrounded by a rather dense layer of albumen or white. Therefore, it moves only slightly away from the center of the egg when it is twirled before the candler. Because of this, yolk outline is only slightly defined or partially visible. As the egg ages or deteriorates in quality, the albumen thins and the yolk tends to move more freely and approaches the shell more closely. The yolk then becomes more visible when candled.

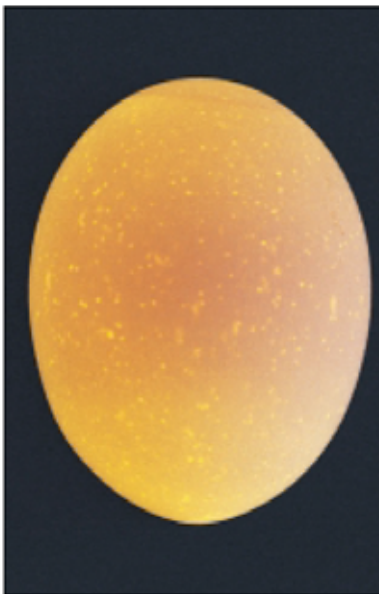


Figure 40. Yolk outline slightly defined.
(99-CS-1610)

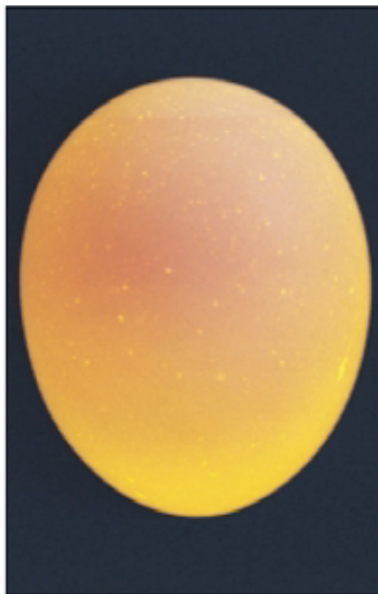


Figure 41. Yolk outline fairly well defined.
(99-CS-1611)



Figure 42. Yolk outline plainly visible.
(99-CS-1612)

White or Albumen

The character and condition of the white or albumen is determined largely by the egg yolk's behavior when the egg is candled. When the egg is twirled, if the yolk retains its position in the center, the white is usually firm and thick.

Spots (Blood or Meat)

Eggs with blood or meat spots more than 1/8-inch in diameter would be classified as inedible. Eggs with small spots less than 1/8-inch in diameter should be classified as Grade B. However, very small pinpoint spots should not be used in judging contests. Contestants should not confuse blood spots with the chalaza. This string of albumen helps hold the yolk in the egg's center and may be prominent in some eggs. The chalaza is distinguished from a blood spot by a bright area of refracted light that accompanies the chalaza's darker shadow.

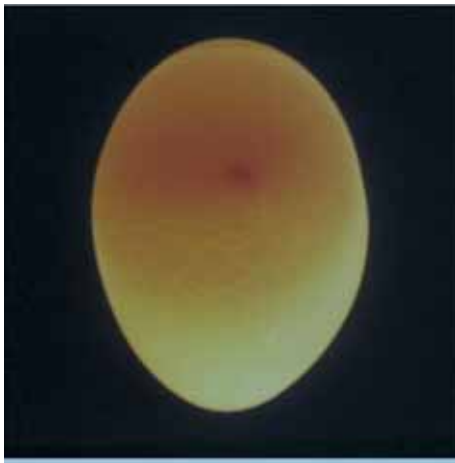
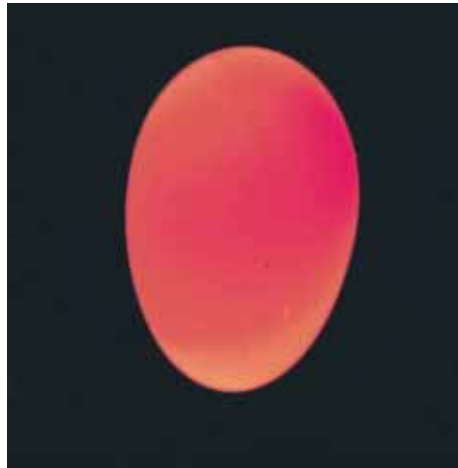


Figure 43. Small blood spot. (99-CS-1613)



Contestant # _____

Class 11: Interior Quality Eggs
National & State 4-H Poultry Judging Card

Egg #	Quality				Score
	AA	A	B	Inedible	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Total Score _____