

Lesson 5: Poultry Products

Even though the poultry industry is a national, ever-growing industry, much of the poultry is produced in the southern Midwest and the Southeast United States. Missouri is a major contributor to poultry and egg production.

Poultry Parts

The common chicken or broiler carcass is cut into several edible parts.

Half - Entire half of a chicken

Breast quarter with or without wing - Similar to the breast with ribs, but it also contains the back

Breast with or without ribs - Breast portion of the bird without any vertebrae, which may or may not have the wing attached

Boneless, skinless breast - Entire chicken breast or one half of the breast without skin or bones, sometimes referred to as the butterfly

Breast tenderloin - Boneless, skinless piece of breast meat

Wishbone - Breast portion containing the wishbone

Leg quarter - Drumstick, thigh, and back portion

Leg - Drumstick and thigh

Drumstick - Portion of the leg of a chicken below the knee joint

Thigh - Thigh of a chicken

Wing - Wing of a chicken

Drumette - Largest portion of the wing

Back - Backbone of a chicken

Liver, gizzard, heart and neck

Poultry Grading

All ready-to-cook poultry must be officially inspected to ensure that it is free from visible signs of disease before it can be quality graded. Ready-to-cook poultry can be graded by USDA graders, but grading is not required. If ready-to-cook poultry is graded by the official U.S. standards and grades, it assures consistency of quality from coast-to-coast and overseas. The standards and grades form a uniform yardstick or measure that describes the commercial quality of various products so their value, usage, and price can be determined.

Chickens, turkeys, ducks, geese, guineas, and pigeons are the classes of poultry covered by the “USDA Standards for Quality of Ready-to-Cook Poultry.” The USDA has established standards for A, B, and C quality grades of poultry carcasses, parts, and individual units of poultry food products. The standards define and measure quality in terms of meat yield (fleshing), fat covering, and freedom from defects such as cuts and tears in the skin, broken bones, and discolorations on the meat and skin. The total area of the defects, their location, and number of defects are all considered in determining the grade. The final quality rating (A, B, or C) is based on the factor with the lowest rating. Carcasses, parts, or poultry food products found to be unsound, unwholesome, or otherwise unfit for human food in whole or in part, shall not be given any of the quality designations.

Ready-to-cook poultry is graded based on the following factors: conformation, fleshing, fat covering, defeathering, exposed flesh, discolorations, broken and disjointed bones, missing parts, and freezing defects. A detailed explanation of the factors for each grade is provided in the *Regulations Governing the Voluntary Grading of Poultry Products and Rabbit Products and U.S. Classes, Standards, and Grades (7 CFR Part 70)*. The “Summary of Specifications for Standards of Quality for Individual Carcasses and Parts” from the USDA regulations for each grade are shown in Figures 5.1, 5.2, and 5.3. The tables are not all inclusive. Refer to the regulations for more details.

Conformation is evaluated by judging the shape and appearance of the part or carcass. To what extent are there deformities, such as a dented, curved or crooked breast, a crooked back, or misshapen legs or wings?

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Figure 5.1 - Ready-to-Cook Poultry - A Quality

Ready-to-Cook Poultry - A Quality

Effective March 6, 1995

Summary of Specifications for Standards of Quality for Individual Carcasses and Parts

(Not All Inclusive) (Minimum Requirements and Maximum Defects Permitted)

		A Quality				
Conformation: Breastbone Back Legs and Wings		Normal Slight curve or dent Slight curve Normal				
Fleshing:		Well fleshed, considering kind and class				
Fat Covering:		Well developed layer -- especially between heavy feather tracts				
Defeathering: Protruding pinfeathers, Diminutive feathers, and Hairs		Free				
Exposed Flesh:¹ Weight Range		Carcass		Large Carcass Parts² (halves, front and rear halves)		Other Parts²
Minimum	Maximum	Breast and Legs	Elsewhere	Breast and Legs	Elsewhere	
None	2 lbs.	1/4 in.	1 in.	1/4 in.	1/2 in.	1/4 in.
Over 2 lbs.	6 lbs.	1/4 in.	1 1/2 in.	1/4 in.	3/4 in.	1/4 in.
Over 6 lbs.	16 lbs.	1/2 in.	2 in.	1/2 in.	1 in.	1/2 in.
Over 16 lbs.	None	1/2 in.	3 in.	1/2 in.	1 1/2 in.	1/2 in.
Discolorations: Carcass		Lightly Shaded			Moderately Shaded³	
		Breast and Legs	Elsewhere on carcass		Hock of leg	Elsewhere on carcass
None	2 lbs.	3/4 in.	1 1/4 in.		1/4 in.	5/8 in.
Over 2 lbs.	6 lbs.	1 in.	2 in.		1/2 in.	1 in.
Over 6 lbs.	16 lbs.	1 1/2 in.	2 1/2 in.		3/4 in.	1 1/4 in.
Over 16 lbs.	None	2 in.	3 in.		1 in.	1 1/2 in.
Discolorations: Large Carcass Parts (halves, front and rear halves)		Lightly Shaded			Moderately Shaded³	
		Breast and Legs	Elsewhere		Hock of leg	Elsewhere
None	2 lbs.	1/2 in.	1 in.		1/4 in.	1/2 in.
Over 2 lbs.	6 lbs.	3/4 in.	1 1/2 in.		3/8 in.	3/4 in.
Over 6 lbs.	16 lbs.	1 in.	2 in.		1/2 in.	1 in.
Over 16 lbs.	None	1 1/4 in.	2 1/2 in.		5/8 in.	1 1/4 in.
Discolorations: Other Parts		Lightly Shaded			Moderately Shaded³	
None	2 lbs.	1/2 in.			1/4 in.	
Over 2 lbs.	6 lbs.	3/4 in.			3/8 in.	
Over 6 lbs.	16 lbs.	1 in.			1/2 in.	
Over 16 lbs.	None	1 1/4 in.			5/8 in.	
Disjointed and Broken Bones:		Carcass--1 disjointed and no broken bones Parts--Thighs with back portion, legs, or leg quarters may have femur disjointed from the hip joint. Other parts--none.				
Missing Parts:		Wing tips and tail. In ducks and geese, the parts of the wing beyond the second joint may be removed if removed at the joint and both wings are so treated. Tail may be removed at base.				
Freezing Defects:		Slight darkening on back and drumstick. Overall bright appearance. Occasional pock marks due to drying. Occasional small areas of clear, pinkish, or reddish colored ice.				
¹ Maximum aggregate area of all exposed flesh. In addition, the carcass or part may have cuts or tears that do not expand or significantly expose flesh, provided the aggregate length of all such cuts does not exceed a length tolerance equal to the permitted dimensions listed above.						
² For all parts, trimming of skin along the edge is allowed, provided at least 75 percent of the normal skin cover associated with the part remains attached, and the remaining skin uniformly covers the outer surface and does not detract from the appearance of part.						
³ Moderately shaded discolorations and discolorations due to flesh bruising are free of clots and limited to areas other than the breast and legs except for the area adjacent to the hock.						

¹Maximum aggregate area of all exposed flesh. In addition, the carcass or part may have cuts or tears that do not expand or significantly expose flesh, provided the aggregate length of all such cuts does not exceed a length tolerance equal to the permitted dimensions listed above.

²For all parts, trimming of skin along the edge is allowed, provided at least 75 percent of the normal skin cover associated with the part remains attached, and the remaining skin uniformly covers the outer surface and does not detract from the appearance of part.

³Moderately shaded discolorations and discolorations due to flesh bruising are free of clots and limited to areas other than the breast and legs except for the area adjacent to the hock.

Credit: United States Department of Agriculture. Agricultural Marketing Services. Poultry Division. *Regulations Governing the Voluntary Grading of Poultry Products and Rabbit Products and U.S. Classes, Standards, and Grades* (7 CFR Part 70). Washington, DC. Effective March 6, 1995.

Figure 5.2 - Ready-to-Cook Poultry - B Quality

Ready-to-Cook Poultry - B Quality

Effective March 6, 1995

Summary of Specifications for Standards of Quality for Individual Carcasses and Parts

(Not All Inclusive) (Minimum Requirements and Maximum Defects Permitted)

		B Quality	
Conformation: Breastbone Back Legs and Wings		Moderate deformities Moderately dented, curved, or crooked Moderately crooked Moderately misshapen	
Fleshing:		Moderately fleshed, considering kind and class	
Fat Covering:		Sufficient fat layer -- especially on breast and legs	
Defeathering: Protruding pinfeathers, Diminutive feathers, and Hairs		Few scattered	
Exposed flesh: Weight Range		Carcass	Parts
Minimum	Maximum		
None Over 2 lbs. Over 6 lbs. Over 16 lbs.	2 lbs. 6 lbs. 16 lbs. None	No part on the carcass (wings, legs, entire back, or entire breast) has more than 1/3 of the flesh exposed	No more than 1/3 of flesh normally covered by skin exposed
Discolorations:¹ Carcass		Carcass Lightly or Moderately Shaded Discolorations	
		Breast and Legs	Elsewhere on Carcass
None Over 2 lbs. Over 6 lbs. Over 16 lbs.	2 lbs. 6 lbs. 16 lbs. None	1 1/4 in. 2 in. 2 1/2 in. 3 in.	2 1/4 in. 3 in. 4 in. 5 in.
Discolorations:¹ Large Carcass Parts (halves, front and rear halves)		Large Carcass Parts	
		Breast and Legs	Elsewhere
None Over 2 lbs. Over 6 lbs. Over 16 lbs.	2 lbs. 6 lbs. 16 lbs. None	1 in. 1 1/2 in. 2 in. 2 1/2 in.	1 1/4 in. 1 3/4 in. 2 1/2 in. 3 in.
Discolorations:¹ Other Parts		Other Parts Lightly or Moderately Shaded Discolorations	
		Breasts, Legs, and Parts	
None Over 2 lbs. Over 6 lbs. Over 16 lbs.	2 lbs. 6 lbs. 16 lbs. None	3/4 in. 1 in. 1 1/2 in. 1 3/4 in.	
Disjointed and Broken Bones:		Carcass--2 disjointed and no broken bones, or 1 disjointed and 1 nonprotruding broken bone Parts--may be disjointed, no broken bones; wing beyond second joint may be removed at a joint	
Missing Parts:		Wing tips, 2nd wing joint and tail.	
Trimming:		Carcass	Parts
		Slight trimming of the carcass is permitted provided the meat yield of any part on the carcass is not appreciably affected. The back may be trimmed in an area not wider than the base of the tail to the area halfway between the base of the tail and the hip joints.	A moderate amount of meat may be trimmed around the edge of a part to remove defects.
Freezing Defects:		May lack brightness. Few pockmarks due to drying. Moderate areas showing a layer of clear, pinkish, or reddish colored ice.	
¹ Discolorations due to flesh bruising shall be free of clots and may not exceed one-half the total aggregate area of permitted discoloration.			

Credit: United States Department of Agriculture. Agricultural Marketing Services. Poultry Division. *Regulations Governing the Voluntary Grading of Poultry Products and Rabbit Products and U.S. Classes, Standards, and Grades* (7 CFR Part 70). Washington, DC. Effective March 6, 1995.

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Figure 5.3 - Ready-to-Cook Poultry - C Quality

Ready-to-Cook Poultry - C Quality

Effective March 6, 1995

Summary of Specifications for Standards of Quality for Individual Carcasses and Parts
(Not All Inclusive) (Minimum Requirements and Maximum Defects Permitted)

			C Quality	
Conformation: Breastbone Back Legs and Wings			Abnormal Seriously curved or crooked Seriously crooked Misshapen	
Fleshing:			Poorly fleshed	
Fat Covering:			Lacking in fat covering over all parts of carcass	
Defeathering: Protruding pinfeathers, Diminutive feathers, and Hairs			Scattering	
Exposed Flesh: Weight Range			Carcass	Parts
Minimum	Maximum			
None Over 2 lbs. Over 6 lbs. Over 16 lbs.	2 lbs. 6 lbs. 16 lbs. None		No limit	
Discolorations: Carcass			Carcass	
			Breast and Legs	Elsewhere on Carcass
None Over 2 lbs. Over 6 lbs. Over 16 lbs.	2 lbs. 6 lbs. 16 lbs. None		No limit on size, number of areas, or intensity of discolorations and flesh bruises if such areas do not render any part of the carcass unfit for food.	
Disjointed and Broken Bones:			No limit	
Missing Parts:			Wing tips, wings, and tails Backs shall include all meat and skin from the pelvic bones, except that the meat contained in the ilium (oyster) may be removed. The vertebral ribs and scapula with meat and skin and the backbone located anterior (forward) of the ilia bones may also be removed (front half of back).	
Trimming:			Carcass	Parts
			Trimming of the breast and legs is permitted, but not to the extent that the normal meat yield is materially affected. The back may be trimmed in an area not wider than the base of the tail to the area between the hip joints.	
Freezing Defects:			Numerous pockmarks and large dried areas	

Credit: United States Department of Agriculture. Agricultural Marketing Services. Poultry Division. *Regulations Governing the Voluntary Grading of Poultry Products and Rabbit Products and U.S. Classes, Standards, and Grades* (7 CFR Part 70). Washington, DC. Effective March 6, 1995.

Fleshing is evaluated by judging the amount of flesh covering the carcass or part. The appropriate amount of flesh is dependent on the kind of poultry you are evaluating.

For fat covering, the grader is evaluating how well the fat is distributed over the carcass or part.

For defeathering, the grader is evaluating the presence of and number of protruding pinfeathers, small (diminutive) feathers, and hairs.

The grader evaluates the amount of exposed flesh (exposed meat) that is the result of cuts, tears, and missing skin. For each grade, the total area (aggregate area) of exposed meat must not equal more than the equivalent area of a circle as indicated by the diameters listed in the tables. Diameters vary depending on the size of the carcass and the part.

Discolorations indicate the amount of bruising of the skin and flesh of poultry with skin and the flesh of skinless poultry. The amount of light to moderate discolorations allowable for the grade are listed in the tables. The total area (aggregate area) of discolorations must not equal more than the equivalent area of a circle as indicated by the diameters listed in the tables.

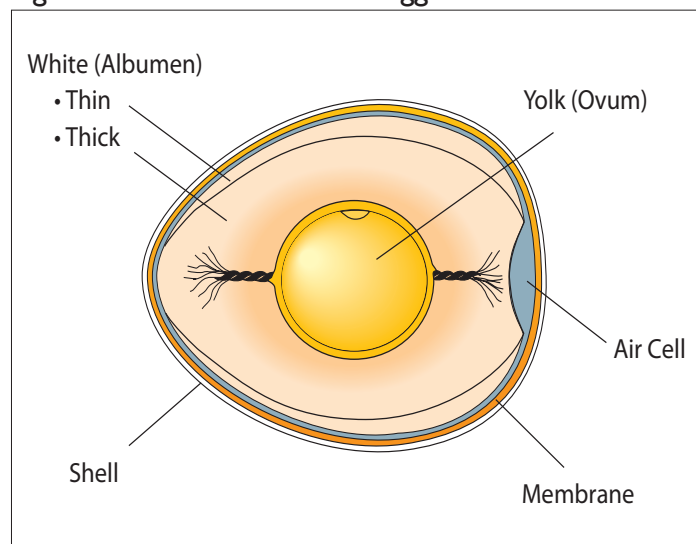
For the disjointed and broken bones and missing parts categories, the grader is evaluating the carcass or part for disjointed bones, broken bones, and missing parts. The criteria for each grade indicates what is the maximum number of defects allowed. For all grades, the wing tips may be removed at the joint, and the tail may be removed at the base. Grades B and C criteria also include the amount of trimming allowed.

Freezing defects indicate the amount of allowable damage from handling or from freezing the packaged poultry, parts, or poultry food products.

Egg Grading

Just like ready-to-cook poultry products, quality grading is not required for individual shell eggs. The “*United States Standards for Quality of Individual Shell Eggs*” provide a consistent way to grade the quality of whole eggs from chickens. It does not apply to eggs

Figure 5.4 - Main Parts of an Egg



from any other type of poultry or to eggs out of the shell. Only a summary of the standards is provided (See Figure 5.5). Refer to the regulations for more details.

The standards spell out the specifications for four quality factors: shell, air cell, white, and yolk. Figure 5.4 shows the main parts of an egg. The interior egg specifications (air cell, white, and yolk) are based on the apparent condition of the interior contents of the egg as it is twirled before a candling light. For candling, the egg should be held between your thumb and first two fingers with the large end up. Turn your hand and wrist quickly in an 180° arc, causing the inside of the egg to whirl. Quickly stop the turning motion and place the side of the egg next to the candling light with the large end up. If not candled this way, the air cell will not be visible. The movement, outline, and shape of the air cell, white, and yolk are evaluated.

An egg is considered inedible if it has any type of rot, is moldy or musty, contains a blood ring or an embryo chick, or is adulterated (altered). An egg that is inedible, cooked, frozen, contaminated, or contains bloody whites, large blood spots, large unsightly meat spots, or other foreign material is considered a “loss.” Eggs that are a loss are not eligible for a quality grade. Most eggs qualify for AA, A, or B qualities. For eggs with dirty or broken shells, the standards of quality provide two additional qualities: dirty and check. Dirty indicates that the unbroken shell has adhering dirt, prominent stains or moderate stains covering more

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Figure 5.5 - Quality Standards for Individual Shell

SUMMARY OF U.S. STANDARDS FOR QUALITY OF INDIVIDUAL SHELL EGGS Specifications for Each Quality Factor			
Quality Factor	AA Quality	A Quality	B Quality
Shell	Clean. Unbroken. Practically normal.	Clean. Unbroken. Practically normal.	Clean to slightly stained.* Unbroken. Abnormal.
Air Cell	1/8 inch or less in depth. Unlimited movement and free or bubbly.	3/16 inch or less in depth. Unlimited movement and free or bubbly.	Over 3/16 inch in depth. Unlimited movement and free or bubbly.
White	Clear. Firm.	Clear. Reasonably firm.	Weak and watery. Small blood and meat spots present.**
Yolk	Outline slightly defined. Practically free from defects.	Outline fairly well defined. Practically free from defects.	Outline plainly visible. Enlarged and flattened. Clearly visible germ development but not blood. Other serious defects.
For eggs with dirty or broken shells, the standards of quality provide two additional qualities. They are:			
Dirty		Check	
Unbroken. Adhering dirt or foreign material, prominent stains, moderate stained areas in excess of B quality.		Broken or cracked shell but membranes intact, not leaking.***	
* Moderately stained areas permitted (1/32 of surface if localized, or 1/16 if scattered). ** If they are small (aggregating not more than 1/8 inch in diameter). ***Leaker has broken or cracked membranes, and contents leaking or free to leak.			

Credit: United States Department of Agriculture. Agricultural Marketing Services. Poultry Division. *Regulations Governing the Grading of Shell Eggs* (7 CFR Part 56) Effective May 1, 1997, and *United States Standards, Grades, and Weight Classes for Shell Eggs* (AMS 56) Effective April 6, 1995. Washington, DC.

than 1/32 of the shell surface if localized, or 1/16 of the shell surface if scattered. Check indicates that an egg has a broken shell or crack, but the shell membranes are intact and do not leak.

The shell is evaluated for its cleanliness, shape, texture, and thickness. A shell is considered clean if it is free from foreign material and stains that are readily visible. It may have small specks, stains, or cage marks if they do not detract from the generally clean appearance of the egg. Practically normal indicates that the shell is basically the usual shape and is sound and free from thin spots. Ridges and rough areas that do not

significantly affect the shape and strength of the shell are permitted. Abnormal indicates that the shell is somewhat unusual or decidedly misshapen or faulty in soundness or strength or that its air cell moves freely toward the uppermost point in the egg as the egg is slowly rotated. A bubbly air cell indicates that the air cell has ruptured resulting in one or more small separate air bubbles.

The white is evaluated for its clarity, firmness, thickness, and presence of blood spots or meats. Clear indicates that the white is free from discolorations or from any foreign bodies floating in it. Firm indicates that

the white is sufficiently thick to prevent the yolk outline from being more than slightly defined when the egg is twirled. Reasonably firm indicates that the white is somewhat less thick than a firm white, which is indicated by the yolk outline being fairly well defined when the egg is twirled. The weak and watery statement indicates that the white is weak, thin, and generally lacking in thickness, which is indicated by the ability of the yolk to come close to the shell when the egg is twirled. Blood spots and meat spots indicate the presence of blood spots or meat spots not more than 1/8 inch in diameter. If they are larger or showing blood in the white, the egg is classified as a loss. An egg with a bloody white has blood diffused through the white and is considered a loss. Eggs with blood spots that show a slight diffusion into the white around the localized spot are not to be classed as bloody whites.

There are eight descriptive terms used when evaluating the yolk.

Outline slightly defined - A yolk outline that is not distinct and appears to blend with the surrounding white as the egg is twirled.

Outline fairly well defined - Indicates that the yolk outline is visible but not clearly outlined when the egg is twirled.

Outline plainly visible - The yolk is clearly visible as a dark shadow when the egg is twirled.

Enlarged and flattened - The yolk membranes and tissues have weakened and/or moisture has been absorbed from the white to such an extent that the yolk appears definitely enlarged and flat.

Practically free from defects - Indicates that the yolk shows no germ development, but there may be slight defects on the yolk's surface.

Serious defects - Indicates that the yolk shows well developed spots or areas and other serious defects that do not render the egg inedible.

Clearly visible germ development - Indicates the development of the germ spot on the yolk of a fertile egg to the point where it is plainly visible as a definite circular area or spot with no blood in evidence.

Blood due to germ development - Indicates that blood lines or a blood ring is present due to germ development. The egg is classified as inedible.

The USDA Marketing Service has summarized the specifications for each quality factor (see Figure 5.5).

Summary

Poultry carcasses are often cut into various parts before sale to consumers. Both carcasses and parts can be graded by the USDA, although grading is not required. When shell eggs are federally graded, the shell, air cell, white, and yolk are evaluated for quality.

Credits

Ermis, Larry. *Poultry Science Manual for National FFA Career Development Events*. College Station, TX: Instructional Materials Service, 1995.

USDA. Agricultural Marketing Service. *Regulations Governing the Grading of Shell Eggs (7 CFR Part 56) Effective May 1, 1997, and United States Standards, Grades, and Weight Classes for Shell Eggs (AMS 56), Effective April 6, 1995*. Washington, DC.

USDA. Agricultural Marketing Service. *Regulations Governing the Voluntary Grading of Poultry Products and Rabbit Products and U.S. Classes, Standards, and Grades (7 CFR Part 70)*. Washington, DC. Effective March 6, 1995.

USDA. Agricultural Marketing Service. "USDA AMS Poultry Grading and Certification." <http://www.ams.usda.gov/poultry/pygrd.htm> (15 September 1997).

USDA. Agricultural Marketing Service. "USDA AMS Shell Egg Grading and Certification." <http://www.ams.usda.gov/poultry/pyshegg.htm> (15 September 1997).

USDA. Agricultural Marketing Service. "USDA AMS Quality Standards." <http://www.ams.usda.gov/poultry/pystand.htm> (15 September 1997).

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