

Poultry and Egg Judging

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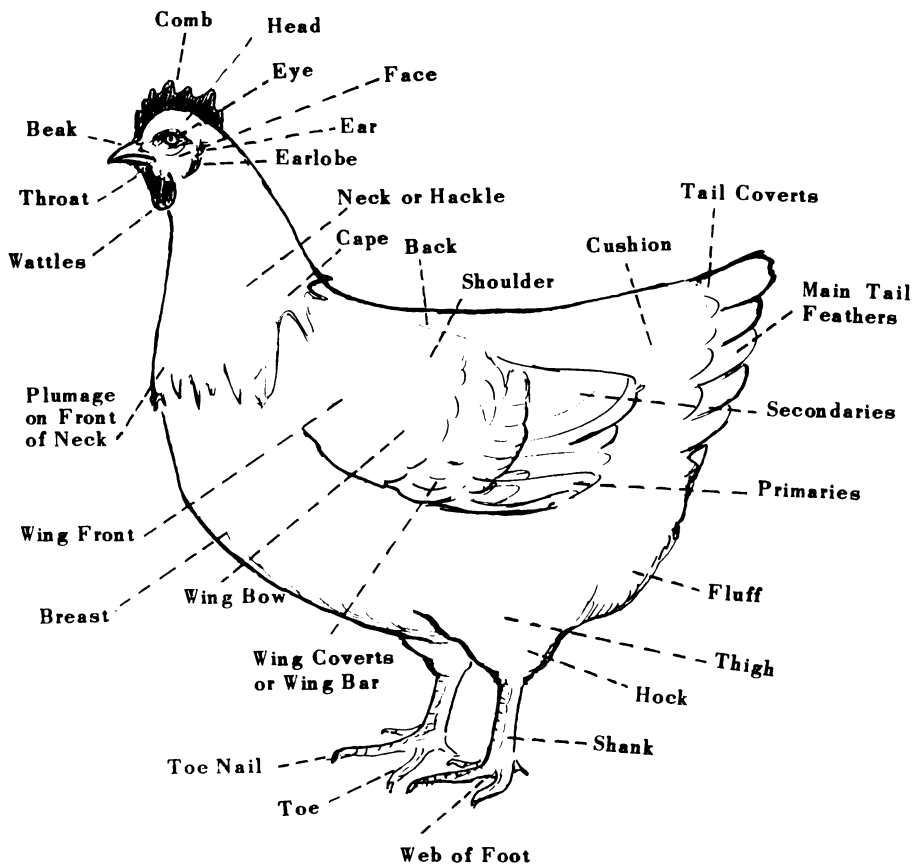
INSTRUCTIONS FOR 4-H CLUB MEMBERS

Publication 47

Reprint September 1975

Extension Division

Virginia Polytechnic Institute and State University



Nomenclature of Female

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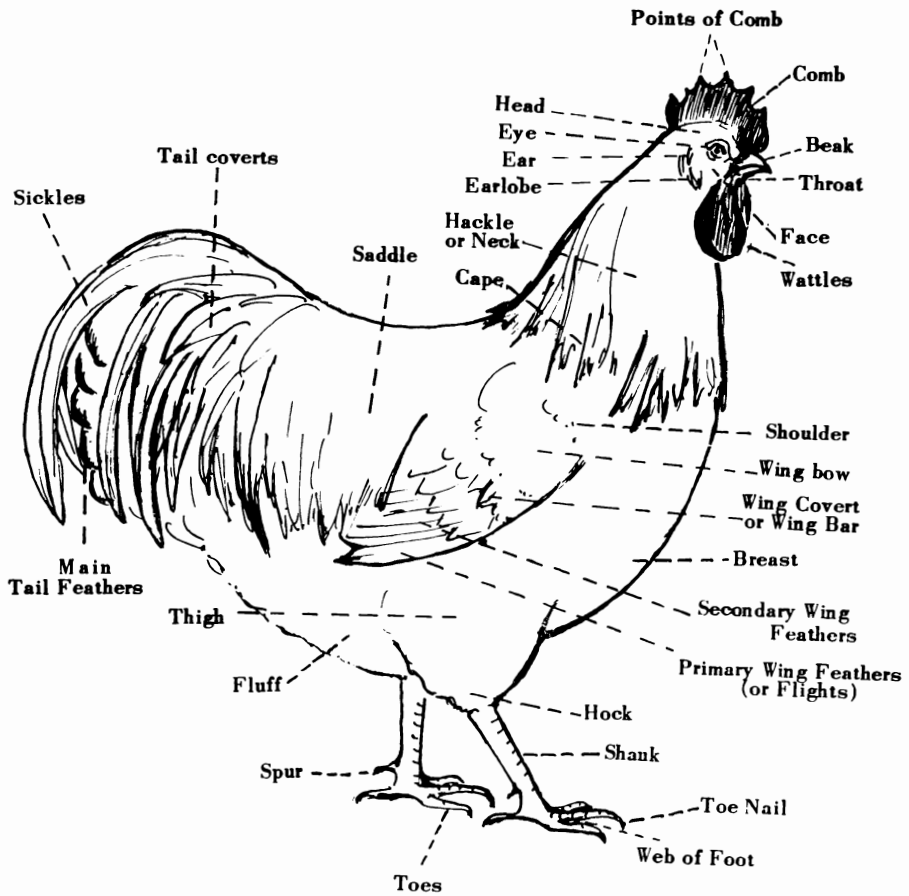
Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture. W. E. Skelton, Dean, Extension Division, Cooperative Extension Service Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

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CONTENTS

Importance of Poultry Judging	5
How to Handle Poultry	5
Using the Placing Cards	7
Judging Hens for Egg Production	9
How to Give Reasons	12
Sample Reasons for Judging Birds	14
Judging Live and Dressed Market Poultry	15
Standards of Quality for Live Market Poultry	16
Standards of Quality for Dressed and Ready-to-cook Poultry	18
Grading and Judging Eggs	22
Interior Quality Factors	23
Exterior Quality Factors	28
Poultry and Egg Judging	34

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Nomenclature of Male

Poultry and Egg Judging Instructions

This bulletin has been prepared primarily for 4-H boys and girls in Virginia to guide and help them with poultry and egg judging work. It may also prove useful to club leaders and others who do not have time to study more technical references.

IMPORTANCE OF POULTRY JUDGING EXPERIENCE

The primary purpose of any type of 4-H Club work is to develop the individual club member. One of the best ways to develop a club member is through judging or demonstration activities. Such activities help develop his initiative and judgment and his ability to think, act, and speak advisedly before an audience. These activities also help to teach approved practices and increase the efficiency of the club member, which in turn helps him to get the most profit from his enterprises.

To know how to tell the difference between good and poor layers, how to determine market quality and the various U. S. grades of live and dressed poultry, and how to determine egg quality and the grades of broken-out and shell eggs, are fundamental and of much economic importance to club members and others working with poultry.

Poultry and egg judging, as well as other judging activities, also help stimulate interest within a club and gives an excellent opportunity for stronger county, district and state-wide programs.

Because of its fundamental and economic importance to the individual club members, and its importance to the club as a whole, poultry and egg judging work should be included as a part of the county 4-H training program in most counties of the state.

HOW TO HANDLE POULTRY

The proper way to handle and hold a bird for examination is one which is comfortable for both the bird and the examiner and lessens the chance of injury.

1. When removing a bird from a coop or crate, always bring the bird out head first. You can do this best by catching the bird by one or both wings, up next to the body, then gently lifting it through the opening.
2. You may use either hand to hold the bird.
 - a. Grasp the legs up close to the body; have at least one finger in between the thighs. (See Figure 1.)
 - b. Let the keel bone of the bird rest upon the palm of your hand, with the head of the bird toward your body.



Figure 1.—Holding the bird.

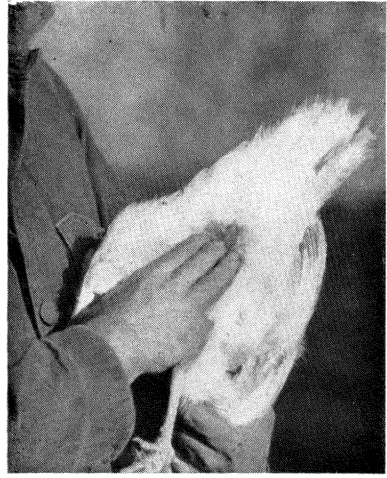


Figure 2.—Examining the bird's abdomen.



Figure 3.—Measuring the distance between pubic bones.



Figure 4.—Examining the bird's keel bone for fleshing.

3. To examine the bird's head, place the free hand under the breast and lift the bird to a plane level with your eyes.
4. To examine the bird's abdomen, maintain a grasp on the legs and let the keel bone rest on the palm of the hand and forearm with the legs drawn forward a little under the bird's body. With the other hand, you can then measure the distance between the pubic bones, and the distance between the ends of the pubic bones and the end of the keel bone, as well as check on the softness and pliability of the abdomen. (See Figures 2 and 3.)
5. To examine the wings, back, and other parts of the bird's body:
 - a. Keep the original hold on the thighs.
 - b. Place one of your feet on an object about 12 inches high.
 - c. Rest the body of the bird on your uplifted knee.
 - d. Use the free hand to examine the various parts of the bird, such as the width of the back, the wing feathers, plumage under color, etc.
6. To examine a market bird for fleshing along the keel bone (breast), maintain your grasp on the bird's legs with the left hand and bend your elbow so as to place the bird's back against your left side and/or upper arm with the bird's legs stretched upward. You can now see the part of the bird you are checking and your right hand is free to feel along the keel bone for fleshing or deformities. (See Figure 4.)
7. When you have to hold the bird for a long time, place its head under your arm, with the body resting on your forearm and keep the original hold on the thighs. Such a position is comfortable for both you and the bird.
8. Return the bird head first to the coop or crate.

USING THE PLACING CARDS

Before judging a class of poultry, you are given placing cards. The type of cards you receive will depend on the classes to be judged. If you are judging a class of 4 production or 4 live market hens, you will receive a card similar to that shown in Figure 5. Judge the class by the comparison method. Then, circle one of the 24 possible placings that you believe is correct. For example, if you wish to place a certain class 2-3-4-1, you find this placing on your card and circle it.

If you are judging dressed market poultry according to the U. S. Grades, you would use a card similar to that shown in Figure 6, and opposite the band or coop number of each bird you would check the grade in which it belongs.

A card similar to Figure 7 is used to record your placings of each egg in a class of eggs judged for exterior quality. You simply check the grade opposite the number that corresponds to the number on the egg.

Placing Card

4-H CLUB JUDGING CONTEST

Contestant's Number _____ Reason Grade _____

Class _____

V.P.I. Agricultural Extension Service

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

(Circle one group of numbers to show how you placed the class)

Figure 5

PLACING CARD FOR MARKET POULTRY

Name of Contestant _____

Class _____ County _____

No.	Grades			Grade
	A	B	C	
1		✓		
2	✓			
3			✓	
4		✓		
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Contestant's Final Score _____

Figure 6

EGG SCORE CARD—EXTERIOR QUALITY
(U.S. Grades for Shell Eggs)

Name or No. _____

Egg No.	AA and A Qual	B Quality		C Quality		Chex	Dirt
		Shape and Shell	Stain	Shape and Shell	Stain		
1				✓			
2		✓					
3	✓						
4	✓						
5							✓
29			✓				
30							✓

Figure 7

EGG SCORE CARD
Interior Quality
(US Grades for Shell Eggs)

Name or No. _____

Egg No.	AA	A	B	C	Ined.	Cut
1	✓					
2		✓				
3		✓				
4			✓			
5				✓		
6					✓	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

MP#82 Final Score _____

Figure 8

Sample Judging Cards

Should you have a class of eggs to be judged for interior quality, according to the U. S. Grades, you would use a card similar to that shown in Figure 8. Here you check in the space provided after the number of each egg that grade in which it belongs.

The officials of the contest will tell you what information they want on the score card, such as your name, the number and/or the name of the class, etc.

Before turning your card in for each class, be sure that it has your name or number and the name of the class on it and that it is marked the way you want it. You may not change it once you turn it in to the judges.

JUDGING HENS FOR EGG PRODUCTION

When judging laying hens to determine their present, past, and rate of production we use the following major factors:

- A. Pigmentation
- B. Handling qualities
- C. Body size and abdominal capacity
- D. Molt

If one were to cull a flock, a fifth factor would be used, namely, general appearance. No weight is given to this factor in judging contests because after several contestants have handled the class, general appearance is difficult to evaluate fairly.

A. Pigmentation: Pigment is the yellow color found in the skin, beak, and shanks of yellow skinned breeds. This is the most important single factor in judging production. As a hen begins to produce eggs, she takes the yellow pigment in her body and uses it in egg yolk production. A heavy producer can not restore this pigment from the feed she consumes fast enough to maintain a deep yellow color. Thus, it is bleached out of the body until none is left in a heavy producer. When the hen stops laying, yolk production has ceased and a surplus of pigment is again stored in the body. Thus, the rate and the completeness of the bleaching of the pigment from the body is highly indicative of a hen's production at any given stage of production.

The pigment bleaches from the body in a definite order. It leaves vent, eyering, earlobe, feet, and shanks in that order and returns in the same order when being retsored in the body (Table 1).

B. Handling Qualities: Handling qualities are defined as being the degree of thinness of the skin over the abdomen, the softness and pliability of the abdomen, and the thinness and flexibility of the pubic bones. A good layer's abdomen will be very soft and pliable and her pubic bones thin and flexible. The skin over the abdomen will be very thin. The spread between

pubic bones and the spread between the pubics and keel bones will, of course, add greatly to the softness and pliability of the abdomen. A poor layer or non-producer's abdomen will be tight and hard to the touch. The pubic bones will be relatively thick and stiff. Space between the pubic bones and the pubics and keel bone will not be great.

TABLE 1.—The following chart shows the approximate number of eggs and the estimated time needed to bleach the various parts of the bird's body. Today's hybrid and strain-cross layers, however, may vary a great deal in their order of bleach.

Order of Bleaching	Approximate Number of Eggs	Estimated Time Required
(a) Vent	0 to 10 eggs	0 to 14 days
(b) Eyering	8-12 eggs	2-2½ weeks
(c) Earlobe	10-15 eggs	2½-3 weeks
(d) Beak		
1/3 bleached	11 eggs	
1/2 bleached	19 eggs	
2/3 bleached	23 eggs	5-8 weeks
4/5 bleached	29 eggs	
All bleached	35 eggs	
(e) Feet and Shanks		
Bottom of feet	68 eggs	
Front of shank	96 eggs	20-30 weeks
Back of shank	159 eggs	
Top of toes and hock	175-180 eggs	

C. Body Size and Abdominal Capacity: Body size and abdominal capacity is the relative width and depth of the body in relation to over-all body size. A good layer will have a deep body and a broad back that carries its width out well to the rear. She will have good spread between the pubic bones and the pubics and keel bone.

A poor producer may have a shallow, narrow body and her width over the back can be tapering in as it extends toward the rear. This is not, however, always the case since many other factors such as health, nutrition, environment, etc. affect layers in a variety of ways.

D. Molt: Molt is the process of shedding of feathers from a bird's body. A hen generally stops laying soon after she starts molting. Spring-hatched birds that molt in July or August of the following year will not have laid as long as those that molt in October. Hens that lay longer also generally molt more rapidly and come back into production sooner than slow molters. Some well-cared-for, high-producing hens may even begin molting before they stop laying and a few may produce some eggs during the molt. It normally takes about 6 weeks for a hen to grow wing feathers to maturity. Heavy producers, therefore, lose 3 to 5 of their wing feathers and much of their body plumage at one time (see Figure 10-A) and require much less time to complete the molt than hens which molt only 1 or 2 feathers at a time (see Figure 10-B).



Figure 9.—Good layer (top), poor layer bottom).

Molting and replacement of wing feathers normally starts with the primary feather next to the axial feather (the short feather separating the primaries and secondaries) and continues outward toward the tip end of the wing. The primaries are the 10 feathers farthest from the bird's body and the secondaries are the feathers, usually 14, closest to the bird's body when the wing is spread. In late summer and early fall, the plumage of the best layers will usually be brittle, rough, broken, and soiled; and the plumage of poor layers will often be new, clean, and more attractive.

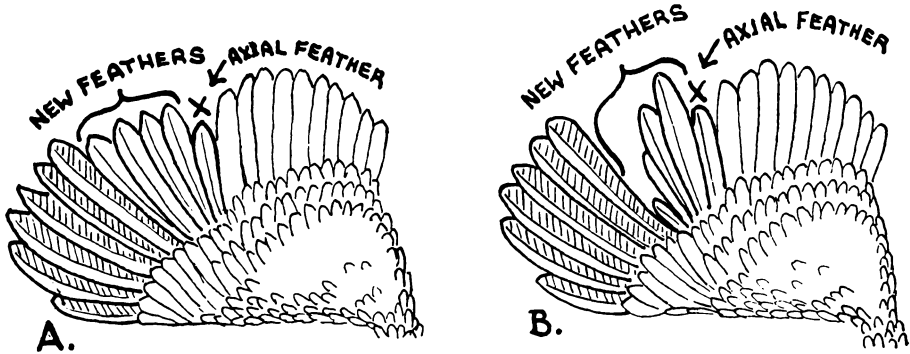


Figure 10.—Wing feathers. A—rapid molter; B—slow molter.

Neck molt in young pullets that have been laying 3 to 6 months should be given more weight than in hens that have laid 10 to 12 months. Wing molt should be given more consideration than neck molt at any stage of lay. Generally, molt is given less weight in placing a class of hens than the other factors. If the other factors are close or equal, molt can be the determining factor.

HOW TO GIVE REASONS

Reasons why you placed the class a certain way are required on one or more classes of production hens in judging contests. The 4 major factors used to place one bird over the other are pigment, handling, qualities, body size and capacity and molt. If the judge has a clear understanding of these factors and how to use them when comparing one bird with another, he will not only usually place the class correctly, but give concise, sound reasons for his placings. It is not enough just to "like" one bird more than another. You must know and be able to tell others why and where the bird you "like" excels the other birds in the class. Try to develop a mental picture of each class you judge. The time allowed to judge a class usually runs from 10 to 15 minutes. In this time, you must make your observations, record your placings, and take any notes you want on the outstanding good and bad points of each bird for study prior to giving reasons. Later on, you are generally allowed 2 minutes to give your oral reasons.

TABLE 2.—A SUMMARY OF THINGS TO CONSIDER WHEN JUDGING BIRDS FOR EGG PRODUCTION

BIRDS FOR EGG PRODUCTION

Physical Character Considered	Good Layer	Poor Layer
Head.....	Well balanced, moderately broad and deep	Long and Shallow
Face.....	Lean, clean-cut, free from wrinkles and coarseness	Puffy, coarse
Beak.....	Medium length, well curved, white—completely bleached	Long, sharp, yellow
Comb and wattles.....	Large, bright red, soft, waxy, and of fine, smooth texture	Small, pale, scaly, sometimes shriveled and of a coarse texture
Eyes.....	Bright, alert, prominent	Dull, listless, sunken
Pubic bones.....	Well spread, thin, and flexible (2 or 3 fingers spread between bones)	Rigid, thick, close together
Vent.....	Moist, bleached, enlarged	Yellow, dry, contracted
Abdomen.....	Deep (4 fingers or more between pubic bones and tip of keel). Soft, pliable	Shallow (only 2 or 3 fingers spread between pubic bones and tip of keel.) Hard, tight, and fatty
Body.....	Deep body, broad back with width carried out well to the rear	Shallow body, narrow, tapering back
Skin.....	Soft, thin, and pliable	Tight, thick, and rather coarse
Feet.....	Bleached or partly bleached, smooth, flat, or wedge shaped	Yellow, round, rather rough
Plumage.....	Brittle, rough, broken, soiled. Late in molting	Smooth, more attractive, possibly new plumage, early in molting

When you are called on to give your reasons:

1. Stand squarely on both feet. Stand 6' to 10' in front of the official judge. Look at him while you talk.
2. Speak clearly, distinctly, and in a conversational tone. Do not make long pauses. Have confidence in what you are saying.
3. Use a definite system in giving reasons. Begin by telling how you placed the class. Compare your first pair, then your second and third pair. Occasionally it will be advantageous to place emphasis on outstanding or poor birds in the class. In most cases, however, you should compare one bird to another.
4. Make sure that you have covered the most important points, such as pigment, handling quality, body size, and capacity, etc. Also, make sure that your statements are accurate.
5. Make sure your reasons are well organized so that they emphasize the big differences. Be fair and impartial. Use more comparative than descriptive terms.
6. Never try to memorize one set of reasons and then attempt to apply it to all classes judged. Use correct terms and be able to define, if necessary, the terms used. Also, try not to use such terms as good, better, or best in describing the birds; instead tell how or why one bird is inferior or superior to another.
7. Don't repeat and back-track. Say everything you have to say about each bird or each pair, and go on to the next.
8. Don't hunt for things to say. If you make up some points, they are sure to be wrong. If you forget, just go on to the next pair and discuss them.
9. Don't use notes when giving reasons. This is against the rules in most contests.
10. Do not discuss your placings with anyone until after the contest is over and everyone has given his reasons.

SAMPLE REASONS FOR JUDGING PRODUCTION BIRDS

I am contestant number

I placed this class of Leghorn Production Hens 2 - 1 - 3 - 4.

I placed 2 at the top of the class and over 1 because of the difference in pigmentation and handling qualities. Two is completely bleached throughout her beak, feet, and shank, while 1 shows decided pigment in her hocks and toes. Pubic bones of 2 are thinner and more flexible than are those of 1. Also, the abdomen of 2 is softer and more pliable to the touch than is 1's.

I placed 1 second and over 3 because of differences in body capacity and molt. The big difference between this pair is in body capacity. One has a very deep

body for her size while 3's body is shallow for her size. One is broader over the back and carries her width out more completely than does 3. Also, 3 is in a neck molt and 1 is not. The bleaching and handling quality were very close between these two birds.

I placed 3 over 4 because of difference in pigmentation, handling qualities, and molt. Number 3 has much less pigment in the front and back of her shanks than 4. The abdomen of 3 is decidedly softer and more pliable than 4's. The 4 bird's pubic bones have started to close, indicating that she is going out of production. The presence of a lot of new feathers on the body and wings of number 4 is evidence that she has been an early and slow molter, while 3 has only a neck molt.

For these reasons I placed this class 2 - 1 - 3 - 4.

JUDGING LIVE AND DRESSED MARKET POULTRY

Market poultry is grouped according to kind and class. Kind refers to whether or not the poultry is chickens, turkeys, ducks, geese, guineas, or pigeons, and class refers to age, tenderness of flesh, and/or sex.

The following are the various classes for market poultry:

Chickens

Rock Cornish Game Hen or Cornish Game Hen. A rock Cornish game hen or Cornish game hen is a young immature chicken (usually 5-7 weeks of age) weighing not more than 2 pounds ready-to-cook weight, which was prepared from a Cornish chicken or the progeny of a Cornish chicken crossed with another breed of chicken.

Broiler or Fryer. A broiler or fryer is a young chicken (usually 8-12 weeks of age), of either sex, that is tender-meated with soft, pliable, smooth-textured skin and flexible breastbone cartilage.

Hen or Stewing Chicken or Fowl. A hen or stewing chicken or fowl is a mature female chicken (usually more than 10 months of age) with meat less tender than younger chickens, and a non-flexible breastbone tip.

Turkeys

Young Hen Turkey. A young hen turkey is a young female turkey (usually 5-7 months of age) that is tender-meated with soft, pliable, smooth-textured skin, and breastbone cartilage that is somewhat less flexible than younger turkeys.

Young Tom Turkey. A young tom turkey is a young male turkey (usually 5-7 months of age) that is tender-meated with soft, pliable, smooth-textured skin, and a breastbone cartilage that is somewhat less flexible than in younger turkeys.

Poultry Grades

There are 3 classifications or grades for live market poultry: U. S. Grade A or No. 1 Quality, U. S. Grade B or No. 2 Quality, and U. S. Grade C or No. 3 Quality; and 3 classifications or grades for dressed and ready-to-cook poultry: U. S. Grade A, U. S. Grade B, and U. S. Grade C. When judging a class of live or dressed market birds, a person generally grades the bird according to the quality standards set up for these U. S. grades. An explanation is given below of the factors that make up these quality standards or the things you must look for when you judge a class of live or dressed market poultry.

STANDARDS OF QUALITY FOR LIVE MARKET POULTRY

Factors or points to consider when judging or grading live poultry according to the U. S. grades:

1. Health and vigor.
2. Feathering.
3. Conformation.
4. Fleshing.
5. Fat covering.
6. Degree of freedom from defects.

A Quality — Bird must be alert, healthy and vigorous, well-fleshed, and well covered with fat. Must be well covered with feathers with not more than a slight scattering of pin feathers. It may have slight defects or deformities, such as a small dent not exceeding $\frac{1}{8}$ " in depth in breastbone, slight skin bruises, scratches, and callouses, and slightly scaly shanks; but it must be free from broken bones, tears, or excessive abdominal fat sometimes found in hens.

B Quality — Bird must be healthy and vigorous, fairly well-fleshed, and fairly well covered with fat. It must be fairly well covered with feathers, but can have a moderate number of pinfeathers. It may have slight to moderate defects or deformities, but must be free of broken bones or tears. Excessive abdominal fat is permitted in hens or fowl.

C Quality — Bird may be lacking in vigor, poorly fleshed, poorly feathered and poorly covered with fat. May have serious defects and rather serious deformities, such as crooked back and/or breast, and bad bruises, scratches, and callouses. However, it must be free from tears and broken bones, external evidence of disease, and any condition that would render it unfit for food.

Rejects — Birds below U. S. Grade C should be called rejects. This includes diseased, emaciated, and severely injured birds, unfit for human consumption.

TABLE 3.—The following chart shows a summary of the preceding specification for U. S. Grades of Live Market Poultry. (Individual bird basis. Minimum requirements and maximum defects permitted.)

Factor	A or No. 1 Quality	B or No. 2 Quality	C or No. 3 Quality
HEALTH and VIGOR	Alert, bright eyes, healthy, vigorous.	Good health and vigor.	Lacking in vigor.
FEATHERING	Well covered with feathers. Slight scattering of pinfeathers.	Fairly well covered with feathers. Moderate number of pinfeathers.	Complete lack of plumage feathers on back. Large number of pinfeathers.
CONFORMATION	Normal.	Practically normal.	Abnormal.
Breastbone	Slight curve, 1/8" dent (chickens), 1/4" dent (turkeys).	Slightly crooked.	Crooked.
Back	Normal (except slight curve).	Moderately crooked.	Crooked or hunched back.
Legs and wings	Normal.	Slightly misshapen.	Misshapen.
FLESHING	Well fleshed, moderately broad and long breast.	Fairly well fleshed.	Poorly developed narrow breast, thin covering of flesh.
FAT COVERING	Well covered, some fat under skin over entire carcass. Chicken fryers and turkey fryers and young toms only moderate covering. No excess abdominal fat.	Enough fat on breast and legs to prevent a distinct appearance of flesh through skin. Hens or fowl may have excessive abdominal fat.	Lacking in fat covering on back and thighs, small amount in feather tracks.
DEFECTS	Slight.	Moderate.	Serious.
Tears and broken bones	Free.	Free.	Free.
Bruises, scratches, and callouses	Slight skin bruises, scratches, and callouses.	Moderate (except only slight flesh bruises).	Unlimited to extent no part unfit for food.
Shanks	Slightly scaly.	Moderately scaly.	Seriously scaly.

STANDARDS OF QUALITY FOR DRESSED AND READY-TO-COOK POULTRY

U. S. Grades for dressed and ready-to-cook poultry are based on the following quality factors:

1. Conformation.
2. Fleshing.
3. Fat covering.
4. Degree of freedom from pinfeathers.
5. Degree of freedom from exposed flesh resulting from cuts and tears.
6. Degree of freedom from discoloration of the skin and flesh.
7. Degree of freedom from broken and disjointed bones and missing parts.
8. Degree of freedom from freezer burn.

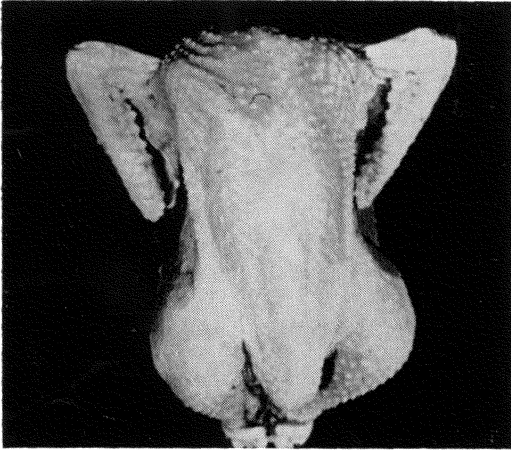
A Quality — The carcass must have normal to almost normal physical conformation, be well fleshed (Figures 11-12) and well covered with fat—except for broilers or fryers which need to be only moderately covered with fat—and it must be free from bad discoloration or freezer burns. It must be free of pinfeathers, free of cuts and tears on breast and legs, practically free of cuts and tears elsewhere. It must also be practically free of deformities, with no broken bones and not more than one disjointed bone.

B Quality — The carcass must be fairly well fleshed (Figures 11-12) with sufficient fat on breast and legs to prevent a distinct appearance of flesh through the skin. It can have slight to moderate deformities and from relatively few to scattering amounts of non-protruding pinfeathers. There can be a limited amount of exposed flesh bruises, discoloration, and freezer burn; and there can be two disjointed and one non-protruding broken bone.

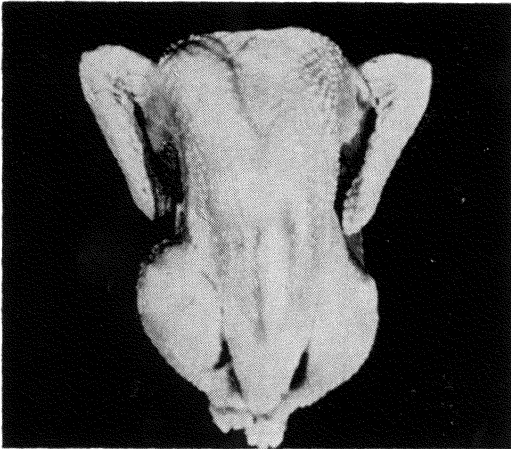
C Quality — The carcass can be poorly fleshed (Figures 11-12) lacking in fat covering. It may have rather serious deformities with scattering to numerous non-protruding pinfeathers, and no limit to the size and number of areas of exposed flesh discoloration and flesh bruises, if such areas do not render part of the carcass unfit for food.

Rejects — Carcasses below U. S. Grade C and unfit for human consumption are called rejects.

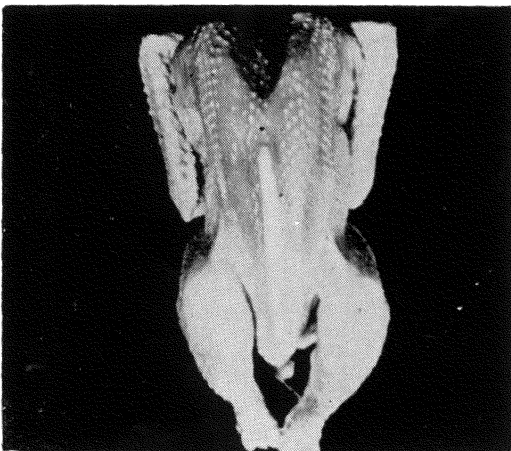
Figure 11.—Minimum Quality Standards for Broilers or Fryers



**A Quality
Broiler or Fryer
Figure 11a**

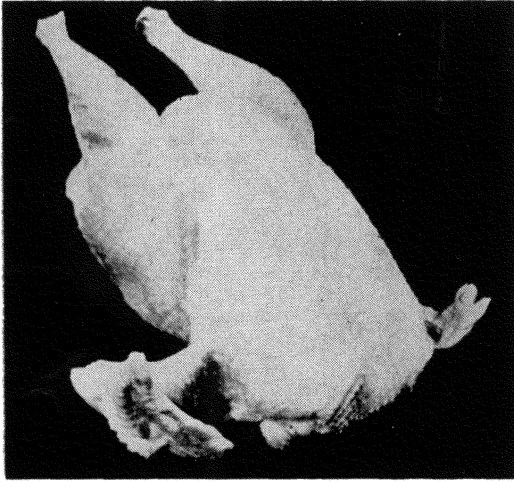


**B Quality
Broiler or Fryer
Figure 11b**

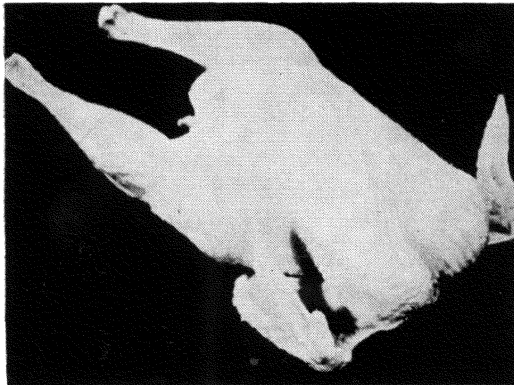


**C Quality
Broiler or Fryer
Figure 11c**

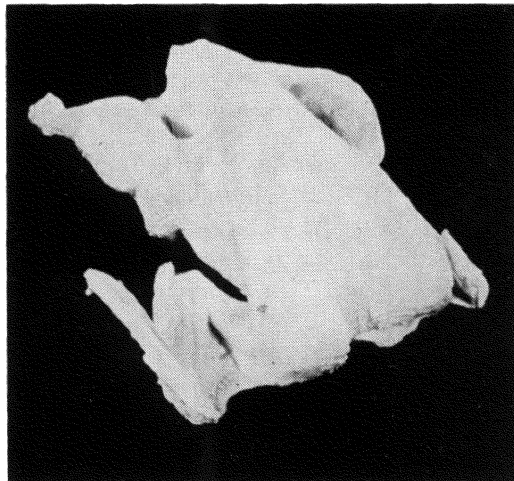
Figure 12.—Minimum Quality Standards for Young Turkey Hens



**A Quality
Young Turkey Hen
Figure 12a**



**B Quality
Young Turkey Hen
Figure 12b**



**C Quality
Young Turkey Hen
Figure 12c**

**TABLE 4.—SUMMARY OF SPECIFIC FOR STANDARDS OF QUALITY
FOR INDIVIDUAL CARCASSES OF READY-TO-COOK POULTRY
(Minimum Requirements and Maximum Defects Permitted)**

Factor	A Quality		B Quality		C Quality
CONFORMATION: Breastbone	Normal Slight curve or dent		Moderate deformities Moderately dented, curved or crooked		Abnormal Seriously curved or crooked
Back Legs and wings	Normal (except slight curve) Normal		Moderately crooked Moderately misshapen		Seriously crooked Misshapen
FLESHING:	Well fleshed, moderately long, deep and rounded breast		Moderately fleshed, considering kind, class and part		Poorly fleshed
FAT COVERING:	Well covered — especially between heavy feather tracts on breast and considering kind, class		Sufficient fat on breast and legs to prevent distinct appearance of flesh through the skin.		Lacking in fat covering over all parts of carcass
PINFEATHERS: Non protruding pins and hair	Free		Few scattered		Scattering
Protruding pins	Free		Free		Free
EXPOSED FLESH: ¹ Carcass Weight	Breast and Legs	Elsewhere	Breast and Legs ²	Elsewhere ²	No limit
1½ to 6 lbs. 6 to 16 lbs.	None None	1½" 2"	1½" 2"	3" 4"	
DISCOLORATIONS: ³ 1½ to 6 lbs. 6 to 16 lbs.	1" 1½"	2" 2½"	2" 2½"	3" 4"	No limit ⁴
OTHER DEFECTS: Disjointed bones	1 None		2 disjointed and no broken or 1 disjointed and 1 non-protruding broken		No limit
Broken bones Missing parts	Wing tips and tail		Wing tips, 2nd wing joint and tail		No limit Wing tips, wings, and tail
FREEZER BURNS: (When consumer packaged)	Slight darkening over the back and drumsticks. Few small ⅛" pockmarks for poultry weighing more than 6 lbs. Occasional small areas showing clear or pinkish ice.		Moderate dried areas not in excess of ½" in diameter. May lack brightness. Moderate areas showing layer of clear, pinkish or reddish colored ice.		Numerous pockmarks and large dried areas

¹ Total aggregate area of flesh exposed by all cuts and tears and missing skin.

² A carcass meeting the requirements of A quality for fleshing may be trimmed to remove skin and flesh defects, provided that no more than one-third of the flesh is exposed on any part and the meat yield is not appreciably affected.

³ Up to one-half of the allowed discolorations may be due to bruises, however, this can be only skin bruises on the breast and legs of "A" quality birds.

⁴ No limit of discoloration as long as it does not render any part unfit for food.

GRADING AND JUDGING EGGS

To better understand the factors considered in grading eggs, you should have some knowledge of the egg's structure. Figure 13 below shows the normal structure of an egg. Table 5 shows the chemical composition of whole eggs

Cross Section of An Egg

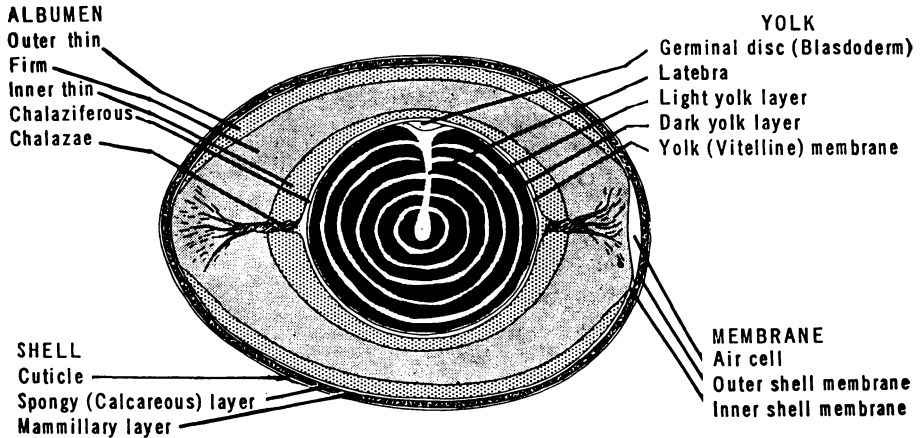


Figure 13.—The Parts of an Egg.

TABLE 5.—CHEMICAL COMPOSITION OF WHOLE EGGS AND OF THE THREE MAJOR PARTS OF EGGS

	Water	Protein	Fat	Ash	
	(Percent)	(Percent)	(Percent)	(Percent)	
Whole egg	100	65.5	11.3	11.7	
White	58	88.0	11.0	0.8	
Yolk	31	48.0	17.5	2.0	
		Calcium Carbonate	Magnesium Carbonate	Calcium Phosphate	Organic Matter
	(Percent)	(Percent)	(Percent)	(Percent)	(Percent)
Shell	11	94.0	1.0	1.0	4.0

and of the 3 major parts of an egg. In addition the USDA weight classifications are shown in Table 6.

Eggs may be scored according to their interior, exterior, or broken-out quality. Interior quality of unbroken eggs is determined by candling*, which involves observing the size and condition of the air cell, the condition of the

yolk, and the condition of the white or albumen. Exterior quality is determined by observing shell shape and texture, soundness of the shell, and cleanliness of the shell.

Broken-out quality can be determined by closely observing or checking the broken-out eggs for: (1) shape and the way the albumen spreads on a flat surface; (2) amount and height of thick albumen; (3) shape and height of yolk; and (4) presence of meat or blood spots.

TABLE 6.—USDA WEIGHT CLASSIFICATIONS FOR CONSUMER GRADES

Size or Weight Class	Minimum	Minimum	Minimum
	Net Weight Per Dozen	Net Weight Per 30 Dozen	Weight for Individual Eggs at Rate Per Dozen
	(Ounces)	(Pounds)	(Ounces)
Jumbo	30	56	29
Extra large	27	50½	26
Large	24	45	23
Medium	21	39½	20
Small	18	34	17
Peewee	15	28	

INTERIOR QUALITY FACTORS

A. Candling

Air Cell— In a strictly fresh egg, the air cell is small, not more than one-eighth of an inch deep, and about the size of a dime. As the egg ages, evaporation takes place and the air cell becomes larger. Keeping eggs in a dry, warm place causes such rapid evaporation that the egg soon loses its good quality. The air cell should not be movable but should remain in the large end of the egg. An air cell that moves more than ¼", or is bubbly, lowers the grade of an egg. Jars or shocks may sometimes loosen the two shell membranes and permit movement of the air cell.

Yolk— The yolk of a strictly fresh, high quality egg will be surrounded by a rather dense layer of albumen or white. It, therefore, moves only slightly away from the center of the egg when it is twirled before the candle. Because of this, the 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 to approach the shell more closely. It, therefore, becomes more visible before the candle.

* Candling—To examine an egg (generally in a dark room) by means of a device known as an egg candler which permits rays of light to pass through the egg as the egg is turned, thus revealing some of its interior characteristics.

In addition to noting the position of the yolk in the egg and its degree of mobility, you also should observe the yolk before the candle to see whether there are evidences of blemishes or damage spots on it. These appear before the candle as areas darker than the rest of the yolk. In this way also the degree of germ development is noted. Very slight germ development will not be apparent before the candle; but as the germ increases in size, evidence of this growth appears at first slightly and later as a distinct area.

A rather common defect found on the yolk of eggs is the presence of blood spots. The blood spots on the surface of the yolk occur in the formation of an egg and have no detrimental effect on its quality. However, since their appearance definitely interferes with saleability, such eggs are placed either in the inedible class or in the one of lowest edibility.

White or Albumen — The character and condition of the white or albumen is determined largely by the behavior of the yolk 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. The chalazas, which are the white, twisted, rope-like masses at each end of the egg, help hold the yolk suspended where it should be in the albumen. When candling, a beginner must watch that he does not confuse the chalaza with blood or meat spots. The chalazas always cast a light diffusing shadow, not a dark one as does blood or meat spots. Occasionally, foreign particles which are discernible before the candle as dark spots are actually seen in the white. The appearance of such foreign matter in the white or albumen will cause an egg to be graded down, as the white of eggs of the higher grades should be clear and firm and free from any foreign particles.

Chalaza that have become broken with small pieces dislodged into the surrounding white should not be confused with foreign material. These pieces are not detrimental to quality.

B. Broken-Out

AA — Egg covers small area. Much thick white surrounds yolk. Egg has minimum amount of thin white. Yolk is round and upstanding.

A — Egg covers moderate area. Egg has considerable thick white and small amount of thin white. Yolk is round and upstanding.

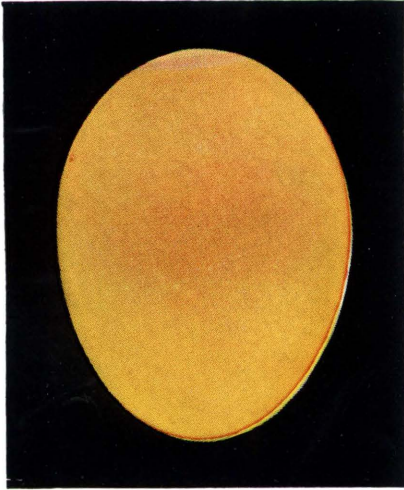
B — Egg covers wide area. Eggs has small amount of thick white much thin white. Yolk is somewhat flattened and enlarged.

C — Egg spreads over wide area. Egg has no thick white and large amount of thin white. Yolk is very flat and enlarged.

Egg quality is determined by the lowest factor found in the egg. For example, an egg may be of AA quality in every respect with the exception of a small blood spot (less than $\frac{1}{8}$ inch in diameter) which makes it C quality.

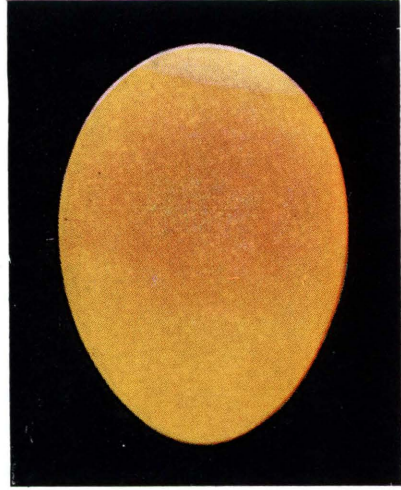
UNITED STATES STANDARDS FOR QUALITY OF INDIVIDUAL SHELL EGGS

Illustrations of candled appearance of white-shelled eggs showing maximum depth of air cell and outline and position of yolk in each quality.



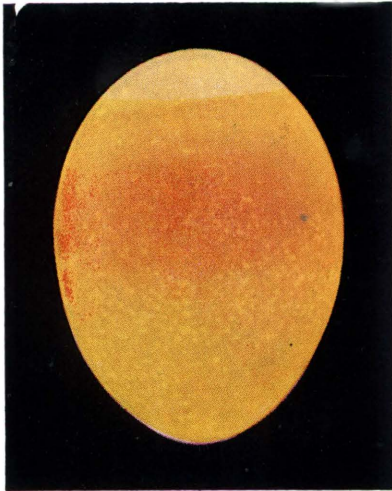
AA Quality

1. Shell—clean; unbroken; practically normal.
2. Air cell— $1/8$ inch or less in depth; practically regular.
3. White—clear; firm.
4. Yolk—outline slightly defined; free from defects.



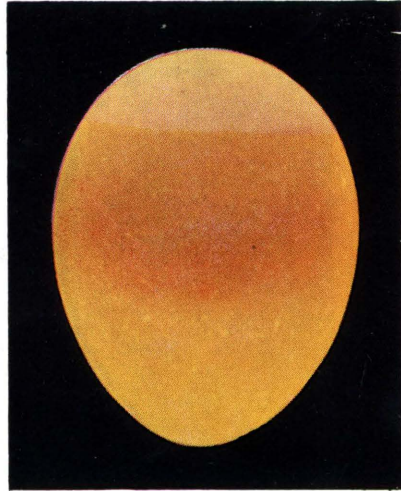
A Quality

1. Shell—clean; unbroken; practically normal.
2. Air cell— $3/16$ inch or less in depth; practically regular.
3. White—clear; may be reasonably firm.
4. Yolk—outline fairly well defined; practically free from defects.



B Quality

1. Shell—clean to slightly stained; unbroken; may be slightly abnormal.
2. Air cell— $3/8$ inch or less in depth; may be free or bubbly.
3. White—clear; may be slightly weak.
4. Yolk—outline well defined; may be slightly enlarged and flattened; may show definite but not serious defects.



C Quality

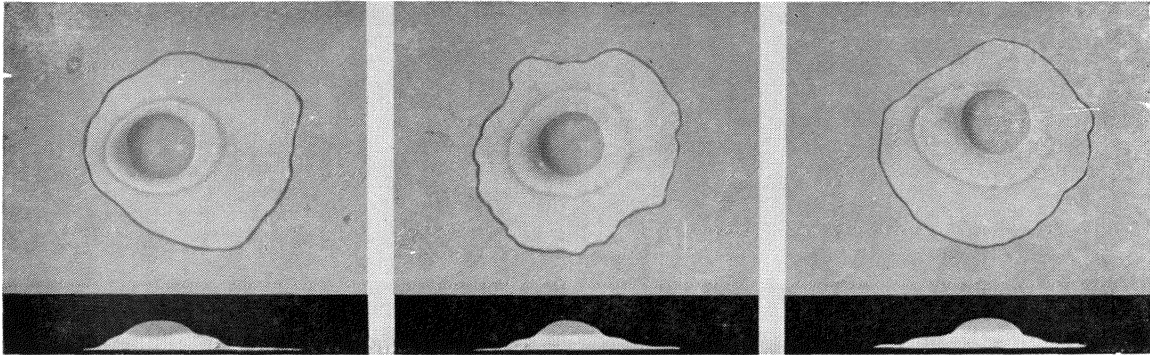
1. Shell—clean to moderately stained; unbroken; may be abnormal.
2. Air cell—may be over $3/8$ inch in depth; may be free or bubbly.
3. White—clear; may be weak and watery; small blood clots or spots may be present.
4. Yolk—enlarged, and flattened; may show clearly visible germ development but no blood; may show other serious defects; outline plainly visible.

Graders should check their work by breaking out an egg occasionally and comparing it with this chart. U. S. Department of Agriculture, Production and Marketing Administration.

* U. S. GOVERNMENT PRINTING OFFICE: Revised 1966.

Figure 14

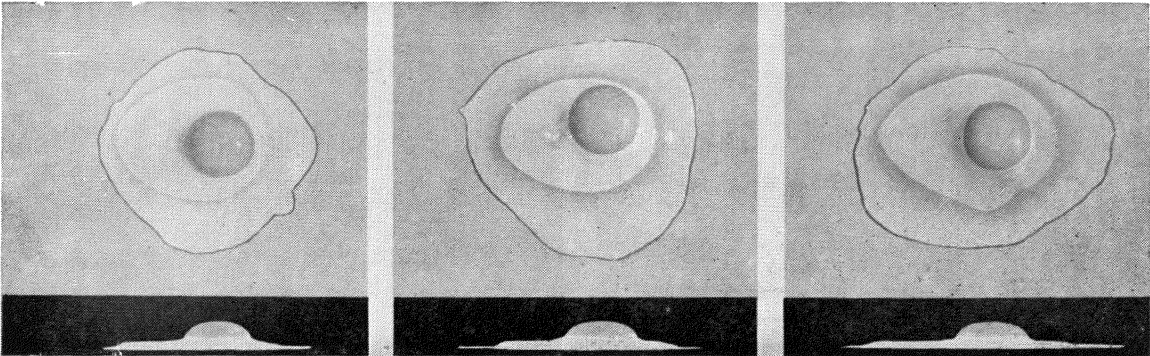
Interior Quality of Eggs



1. High AA

2. Average AA

3. Low AA



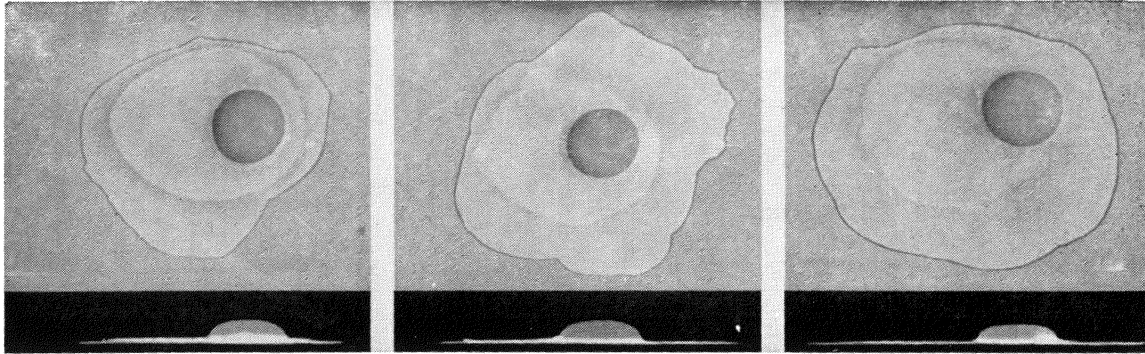
4. High A

5. Average A

6. Low A

Figure 15

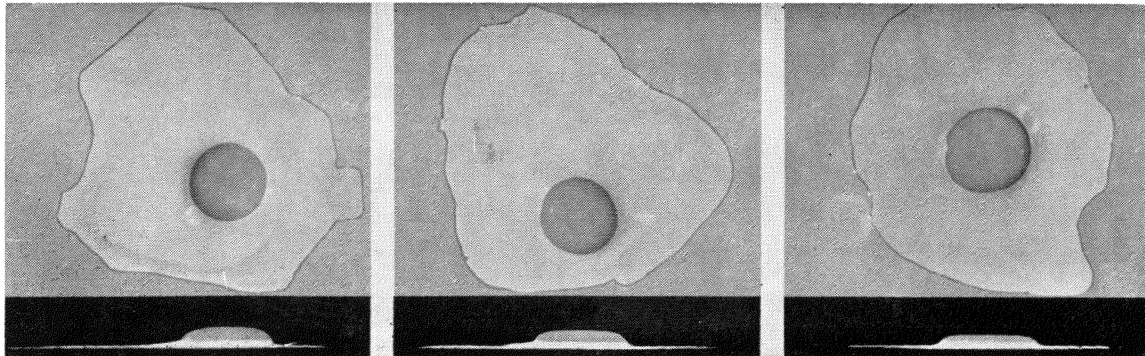
Inteiror Quality of Eggs *



7. High B

8. Average B

9. Low B



10. High C

11. Average C
Figure 16

12. Low C

(27)

The desired shape of a broken-out egg is one that retains the general shape of the unbroken shell egg. The white spreads over a relatively small area on a flat surface, and its outer edge is rather uniform. Illustrations of the different grades of broken-out eggs are shown on pages 26 and 27. High average, and low quality eggs are pictured for Grades AA, A, B, and C. Abnormalities are not considered in these pictures.

EXTERIOR QUALITY FACTORS

Exterior quality factors are: shell shape and texture, soundness of shell, and shell cleanliness. Though these factors can be determined without the use of a candler, in commercial grading, soundness of shell is verified during the candling procedure.

Shell Shape and Texture

Eggs with ridges, rough areas, thin spots, or that are unusual in shape go into the lower grade classifications because they are unappealing and possibly will not withstand normal handling without being broken. The U. S. Standards for shell quality are as follows:

Practically Normal. A shell that approximates the usual shape and that is of good even texture and strength and free from rough areas or thin spots. Slight ridges and rough areas that do not materially affect the shape, texture, and strength of the shell are permitted. (AA and A Quality)

Slightly Abnormal. A shell that is somewhat unusual in shape or that is slightly faulty in texture or strength. It may show definite ridges but no pronounced thin spots or rough areas. (B Quality)

Abnormal. A shell that is decidedly misshapen or faulty in texture or strength or that shows pronounced ridges, thin spots, or rough areas. (C Quality)

Soundness of Shell

The shell of an egg may be sound, checked, or cracked, leaking, or smashed. A *sound* egg is one whose shell is unbroken. A *checked* or *cracked* egg is one whose shell is slightly broken but has its shell membranes intact and whose contents do not leak. A *leaker* is an egg whose shell and shell membranes are broken to the extent that its contents are free to exude through the shell. It should be pointed out that an egg which has a portion of its shell missing in excess of $\frac{1}{4}$ " square is considered a leaker, even though the shell membrane is intact. Checks may range from a very fine, hairline check (blind check) that is discernible only before the candling light, to plain visible cracks.

Shell Cleanliness

Freedom from stains and foreign material on the shell of eggs must be considered in assigning a quality designation to an individual egg. The following are terms provided by the U. S. Standards for shell cleanliness:

Clean. A shell that is free from foreign material and from stains or discolorations that are readily visible. An egg may be considered clean if it has only very small specks or stains, if such specks or stains are not of sufficient number or intensity to detract from the generally clean appearance of the egg. Slight traces of processing oil on the shell are not considered. (AA and A Quality.)

Slightly Stained. A shell that is free from adhering dirt, but which has slight stains which do not appreciably detract from the appearance of the egg. When the stain is localized, approximately $1/32$ of the shell surface may be slightly stained, and when the slightly stained areas are scattered, approximately $1/16$ of the shell surface may be slightly stained. (B Quality.) Eggs having more than $1/16$ of the shell surface slightly stained may be classified as C Quality.

Moderate Stains. A shell that is free from adhering dirt, but which has stains of moderate degree covering not more than $1/4$ of the shell surface. (C Quality.)

Dirty. A shell that has adhering dirt, prominent stains, or moderate stains covering more than $1/4$ of the shell surface.

The color of the shell does not affect the quality of the egg and for this reason it is not considered in the U. S. Standards of quality or grades.

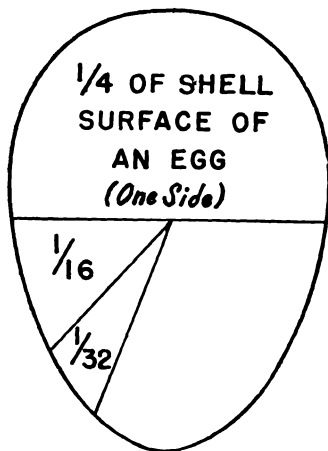


Figure 17.—One thirty-second, one-sixteenth, and one-fourth of shell surface of an egg — actual size.

ILLUSTRATIONS OF TYPES OF SHELL CONDITION AND SHELL CLEANLINESS

**AA, Fresh Fancy &
A Quality**
(Practically Normal)



Figure 18.—Good even texture and strength, free from rough areas or thin spots. Slight ridges and rough areas permitted.

B Quality
(Slightly Abnormal)

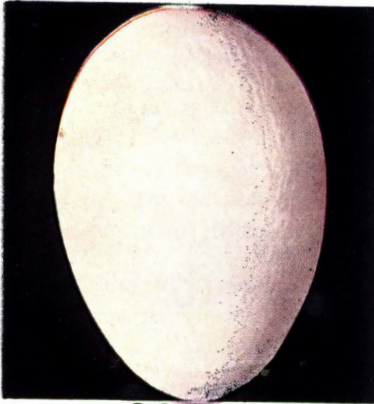


Figure 19.—May be unusual in shape; slightly faulty in texture or strength; definite ridges; no pronounced thin or rough areas.

C Quality
(Abnormal)



Figure 20.—May be decidedly misshapen or faulty in texture or strength. May show pronounced thin, rough or ridged areas.

**AA, Fresh Fancy,
A Quality
(Clean)**

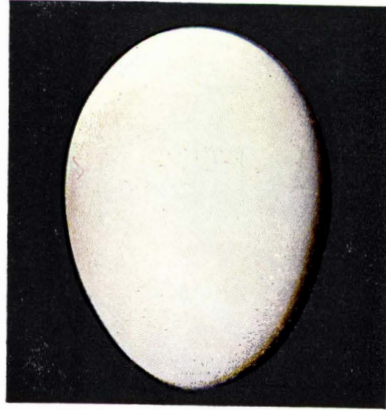


Figure 21.—The shell must be clean and free of stains or discolorations that are readily visible.

**B Quality
(Slight Stains)**



Figure 22.—Localized stain approximately $1/32$ of the shell surface.

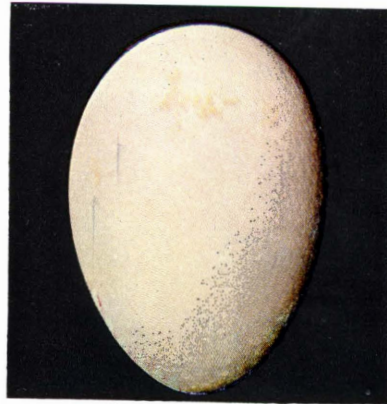


Figure 23.—Scattered stain approximately $1/16$ of the shell surface.

C Quality



Figure 24.—Slight stains covering more than $1/16$ of the shell surface.



Figure 25.—Moderate stains covering less than $1/4$ of the shell surface.



Figure 26.—Moderate stains covering more than $1/4$ of the shell surface.

Figure 27.—Prominent stains.



Figure 28.—Adhering dirt.

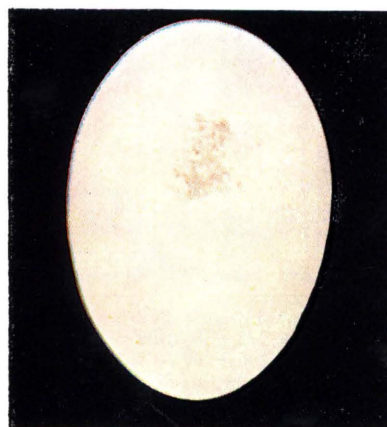


Figure 29.—Shell broken but membrane intact. (candled appearance)

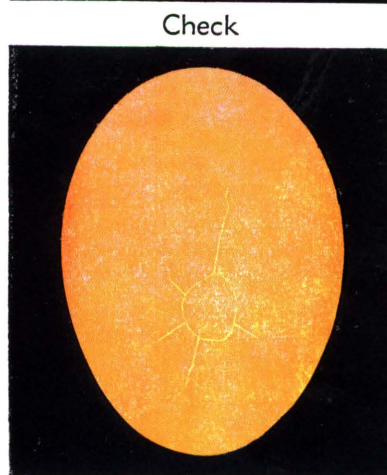


TABLE 7.—POULTRY AND EGG JUDGING

Standard for Grading Placings

Find where the correct placing equals 100. Then compare your placing with those in these columns to find your score on the class judged.

1-2-3-4-100.	1-2-4-3-100.	1-3-2-4-100.	1-3-4-2-100.	1-4-2-3-100.	1-4-3-2-100.
1-2-4-3- 83.3	1-2-3-4- 83.3	1-3-4-2- 83.3	1-3-2-4- 83.3	1-4-3-2- 83.3	1-4-2-3- 83.3
1-3-2-4- 83.3	1-4-2-3- 83.3	1-2-3-4- 83.3	1-4-3-2- 83.3	1-2-4-3- 83.3	1-3-4-2- 83.3
1-3-4-2- 66.7	1-4-3-2- 66.7	1-2-4-3- 66.7	1-4-2-3- 66.7	1-2-3-4- 66.7	1-3-2-4- 66.7
1-4-2-3- 66.7	1-3-2-4- 66.7	1-4-3-2- 66.7	1-2-3-4- 66.7	1-3-4-2- 66.7	1-2-4-3- 66.7
1-4-3-2- 50.	1-3-4-2- 50.	1-4-2-3- 50.	1-2-4-3- 50.	1-3-2-4- 50.	1-2-3-4- 50.
2-1-3-4- 83.3	2-1-4-3- 83.3	3-1-2-4- 83.3	3-1-4-2- 83.3	4-1-2-3- 83.3	4-1-3-2- 83.3
2-1-4-3- 66.7	2-1-3-4- 66.7	3-1-4-2- 66.7	3-1-2-4- 66.7	4-1-3-2- 66.7	4-1-2-3- 66.7
2-3-1-4- 66.7	2-4-1-3- 66.7	3-2-1-4- 66.7	3-4-1-2- 66.7	4-2-1-3- 66.7	4-3-1-2- 66.7
2-3-4-1- 50.	2-4-3-1- 50.	3-2-4-1- 50.	3-4-2-1- 50.	4-2-3-1- 50.	4-3-2-1- 50.
2-4-1-3- 50.	2-3-1-4- 50.	3-4-1-2- 50.	3-2-1-4- 50.	4-3-1-2- 50.	4-2-1-3- 50.
2-4-3-1- 33.3	2-3-4-1- 33.3	3-4-2-1- 33.3	3-2-4-1- 33.3	4-3-2-1- 33.3	4-2-3-1- 33.3
3-1-2-4- 66.7	4-1-2-3- 66.7	2-1-3-4- 66.7	4-1-3-2- 66.7	2-1-4-3- 66.7	3-1-4-2- 66.7
3-1-4-2- 50.	4-1-3-2- 50.	2-1-4-3- 50.	4-1-2-3- 50.	2-1-3-4- 50.	3-1-2-4- 50.
3-2-1-4- 50.	4-2-1-3- 50.	2-3-1-4- 50.	4-3-1-2- 50.	2-4-1-3- 50.	3-4-1-2- 50.
3-2-4-1- 33.3	4-2-3-1- 33.3	2-3-4-1- 33.3	4-3-2-1- 33.3	2-4-3-1- 33.3	3-4-2-1- 33.3
3-4-1-2- 33.3	4-3-1-2- 33.3	2-4-1-3- 33.3	4-2-1-3- 33.3	2-3-1-4- 33.3	3-2-1-4- 33.3
3-4-2-1- 16.7	4-3-2-1- 16.7	2-4-3-1- 16.7	4-2-3-1- 16.7	2-3-4-1- 16.7	3-2-4-1- 16.7
4-1-2-3- 50.	3-1-2-4- 50.	4-1-3-2- 50.	2-1-3-4- 50.	3-1-4-2- 50.	2-1-4-3- 50.
4-1-3-2- 33.3	3-1-4-2- 33.3	4-1-2-3- 33.3	2-1-4-3- 33.3	3-1-2-4- 33.3	2-1-3-4- 33.3
4-2-1-3- 33.3	3-2-1-4- 33.3	4-3-1-2- 33.3	2-3-1-4- 33.3	3-4-1-2- 33.3	2-4-1-3- 33.3
4-2-3-1- 16.7	3-2-4-1- 16.7	4-3-2-1- 16.7	2-3-4-1- 16.7	3-4-2-1- 16.7	2-4-3-1- 16.7
4-3-1-2- 16.7	3-4-1-2- 16.7	4-2-1-3- 16.7	2-4-1-3- 16.7	3-2-1-4- 16.7	2-3-1-4- 16.7
4-3-2-1- 0.	3-4-2-1- 0.	4-2-3-1- 0.	2-4-3-1- 0.	3-2-4-1- 0.	2-3-4-1- 0.
2-1-3-4-100.	2-1-4-3-100.	2-3-1-4-100.	2-3-4-1-100.	2-4-1-3-100.	2-4-3-1-100.
2-1-4-3- 83.3	2-1-3-4- 83.3	2-3-4-1- 83.3	2-3-1-4- 83.3	2-4-3-1- 83.3	2-4-1-3- 83.3
2-3-1-4- 83.3	2-4-1-3- 83.3	2-1-3-4- 83.3	2-4-3-1- 83.3	2-1-4-3- 83.3	2-3-4-1- 83.3
2-3-4-1- 66.7	2-4-3-1- 66.7	2-1-4-3- 66.7	2-4-1-3- 66.7	2-1-3-4- 66.7	2-3-1-4- 66.7
2-4-1-3- 66.7	2-3-1-4- 66.7	2-4-3-1- 66.7	2-1-3-4- 66.7	2-3-4-1- 66.7	2-1-4-3- 66.7
2-4-3-1- 50.	2-3-4-1- 50.	2-4-1-3- 50.	2-1-4-3- 50.	2-3-1-4- 50.	2-1-3-4- 50.
1-2-3-4- 83.3	1-2-4-3- 83.3	3-2-1-4- 83.3	3-2-4-1- 83.3	4-2-1-3- 83.3	4-2-3-1- 83.3
1-2-4-3- 66.7	1-2-3-4- 66.7	3-2-4-1- 66.7	3-2-1-4- 66.7	4-2-3-1- 66.7	4-2-1-3- 66.7
1-3-2-4- 66.7	1-4-2-3- 66.7	3-1-2-4- 66.7	3-4-2-1- 66.7	4-1-2-3- 66.7	4-3-2-1- 66.7
1-3-4-2- 50.	1-4-3-2- 50.	3-1-4-2- 50.	3-4-1-2- 50.	4-1-3-2- 50.	4-3-1-2- 50.
1-4-2-3- 50.	1-3-2-4- 50.	3-4-2-1- 50.	3-1-2-4- 50.	4-3-2-1- 50.	4-1-2-3- 50.
1-4-3-2- 33.3	1-3-4-2- 33.3	3-4-1-2- 33.3	3-1-4-2- 33.3	4-3-1-2- 33.3	4-1-3-2- 33.3
3-2-1-4- 66.7	4-2-1-3- 66.7	1-2-3-4- 66.7	4-2-3-1- 66.7	1-2-4-3- 66.7	3-2-4-1- 66.7
3-2-4-1- 50.	4-2-3-1- 50.	1-2-4-3- 50.	4-2-1-3- 50.	1-2-3-4- 50.	3-2-1-4- 50.
3-1-2-4- 50.	4-1-2-3- 50.	1-3-2-4- 50.	4-3-2-1- 50.	1-4-2-3- 50.	3-4-2-1- 50.
3-1-4-2- 33.3	4-1-3-2- 33.3	1-3-4-2- 33.3	4-3-1-2- 33.3	1-4-3-2- 33.3	3-4-1-2- 33.3
3-4-2-1- 33.3	4-3-2-1- 33.3	1-4-2-3- 33.3	4-1-2-3- 33.3	1-3-2-4- 33.3	3-1-2-4- 33.3
3-4-1-2- 16.7	4-3-1-2- 16.7	1-4-3-2- 16.7	4-1-3-2- 16.7	1-3-4-2- 16.7	3-1-4-2- 16.7
4-2-1-3- 50.	3-2-1-4- 50.	4-2-3-1- 50.	1-2-3-4- 50.	3-2-4-1- 50.	1-2-4-3- 50.
4-2-3-1- 33.3	3-2-4-1- 33.3	4-2-1-3- 33.3	1-2-4-3- 33.3	3-2-1-4- 33.3	1-2-3-4- 33.3
4-1-2-3- 33.3	3-1-2-4- 33.3	4-3-2-1- 33.3	1-3-2-4- 33.3	3-4-2-1- 33.3	1-4-2-3- 33.3
4-1-3-2- 16.7	3-1-4-2- 16.7	4-3-1-2- 16.7	1-3-4-2- 16.7	3-4-1-2- 16.7	1-4-3-2- 16.7
4-3-2-1- 16.7	3-4-2-1- 16.7	4-1-2-3- 16.7	1-4-2-3- 16.7	3-1-2-4- 16.7	1-3-2-4- 16.7
4-3-1-2- 0.	3-4-1-2- 0.	4-1-3-2- 0.	1-4-3-2- 0.	3-1-4-2- 0.	1-3-4-2- 0.

POULTRY AND EGG JUDGING — Continued

These tables show even cuts only. In actual contests, we occasionally use light and heavy cuts for top, middle, and bottom pairs.

3-1-2-4-100.	3-1-4-2-100.	3-4-1-2-100.	3-4-2-1-100.	3-2-4-1-100.	3-2-1-4-100.
3-1-4-2- 83.3	3-1-2-4- 83.3	3-4-2-1- 83.3	3-1-2-4- 83.3	3-2-1-4- 83.3	3-2-4-1- 83.3
3-2-1-4- 83.3	3-4-1-2- 83.3	3-1-4-2- 83.3	3-2-4-1- 83.3	3-4-2-1- 83.3	3-1-2-4- 83.3
3-2-4-1- 66.7	3-4-2-1- 66.7	3-1-2-4- 66.7	3-2-1-4- 66.7	3-4-1-2- 66.7	3-1-4-2- 66.7
3-4-1-2- 66.7	3-2-1-4- 66.7	3-2-4-1- 66.7	3-1-4-2- 66.7	3-1-2-4- 66.7	3-4-2-1- 66.7
3-4-2-1- 50.	3-2-4-1- 50.	3-2-1-4- 50.	3-1-2-4- 50.	3-1-4-2- 50.	3-4-1-2- 50.
1-3-2-4- 83.3	1-3-4-2- 83.3	4-3-1-2- 83.3	4-3-2-1- 83.3	2-3-4-1- 83.3	2-3-1-4- 83.3
1-3-4-2- 66.7	1-3-2-4- 66.7	4-3-2-1- 66.7	4-3-1-2- 66.7	2-3-1-4- 66.7	2-3-4-1- 66.7
1-2-3-4- 66.7	1-4-3-2- 66.7	4-1-3-2- 66.7	4-2-3-1- 66.7	2-4-3-1- 66.7	2-1-3-4- 66.7
1-2-4-3- 50.	1-4-2-3- 50.	4-1-2-3- 50.	4-2-1-3- 50.	2-4-1-3- 50.	2-1-4-3- 50.
1-4-3-2- 50.	1-2-3-4- 50.	4-2-3-1- 50.	4-1-3-2- 50.	2-1-3-4- 50.	2-4-3-1- 50.
1-4-2-3- 33.3	1-2-4-3- 33.3	4-2-1-3- 33.3	4-1-2-3- 33.3	2-1-4-3- 33.3	2-4-1-3- 33.3
2-3-1-4- 66.7	4-3-1-2- 66.7	1-3-4-2- 66.7	2-3-4-1- 66.7	4-3-2-1- 66.7	1-3-2-4- 66.7
2-3-4-1- 50.	4-3-2-1- 50.	1-3-2-4- 50.	2-3-1-4- 50.	4-3-1-2- 50.	1-3-4-2- 50.
2-1-3-4- 50.	4-1-3-2- 50.	1-4-3-2- 50.	2-4-3-1- 50.	4-2-3-1- 50.	1-2-3-4- 50.
2-1-4-3- 33.3	4-1-2-3- 33.3	1-4-2-3- 33.3	2-4-1-3- 33.3	4-2-1-3- 33.3	1-2-4-3- 33.3
2-4-3-1- 33.3	4-2-3-1- 33.3	1-2-3-4- 33.3	2-1-3-4- 33.3	4-1-3-2- 33.3	1-4-3-2- 33.3
2-4-1-3- 16.7	4-2-1-3- 16.7	1-2-4-3- 16.7	2-1-4-3- 16.7	4-1-2-3- 16.7	1-4-2-3- 16.7
4-3-1-2- 50.	2-3-1-4- 50.	2-3-4-1- 50.	1-3-4-2- 50.	1-3-2-4- 50.	4-3-2-1- 50.
4-3-2-1- 33.3	2-3-4-1- 33.3	2-3-1-4- 33.3	1-3-2-4- 33.3	1-3-4-2- 33.3	4-3-1-2- 33.3
4-1-3-2- 33.3	2-1-3-4- 33.3	2-4-3-1- 33.3	1-4-3-2- 33.3	1-2-3-4- 33.3	4-2-3-1- 33.3
4-1-2-3- 16.7	2-1-4-3- 16.7	2-4-1-3- 16.7	1-4-2-3- 16.7	1-2-4-3- 16.7	4-2-1-3- 16.7
4-2-3-1- 16.7	2-4-3-1- 16.7	2-1-3-4- 16.7	1-2-3-4- 16.7	1-4-3-2- 16.7	4-1-3-2- 16.7
4-2-1-3- 0.	2-4-1-3- 0.	2-1-4-3- 0.	1-2-4-3- 0.	1-4-2-3- 0.	4-1-2-3- 0.
4-1-2-3-100.	4-1-3-2-100.	4-2-1-3-100.	4-2-3-1-100.	4-3-1-2-100.	4-3-2-1-100.
4-1-3-2- 83.3	4-1-2-3- 83.3	4-2-3-1- 83.3	4-2-1-3- 83.3	4-3-2-1- 83.3	4-3-1-2- 83.3
4-2-1-3- 83.3	4-3-1-2- 83.3	4-1-2-3- 83.3	4-3-2-1- 83.3	4-1-3-2- 83.3	4-2-3-1- 83.3
4-2-3-1- 66.7	4-3-2-1- 66.7	4-1-3-2- 66.7	4-3-1-2- 66.7	4-1-2-3- 66.7	4-2-1-3- 66.7
4-3-1-2- 66.7	4-2-1-3- 66.7	4-3-2-1- 66.7	4-1-2-3- 66.7	4-2-3-1- 66.7	4-1-3-2- 66.7
4-3-2-1- 50.	4-2-3-1- 50.	4-3-1-2- 50.	4-1-3-2- 50.	4-2-1-3- 50.	4-1-2-3- 50.
1-4-2-3- 83.3	1-4-3-2- 83.3	2-4-1-3- 83.3	2-4-3-1- 83.3	3-4-1-2- 83.3	3-4-2-1- 83.3
1-4-3-2- 66.7	1-4-2-3- 66.7	2-4-3-1- 66.7	2-4-1-3- 66.7	3-4-2-1- 66.7	3-4-1-2- 66.7
1-2-4-3- 66.7	1-3-4-2- 66.7	2-1-4-3- 66.7	2-3-4-1- 66.7	3-1-4-2- 66.7	3-2-4-1- 66.7
1-2-3-4- 50.	1-3-2-4- 50.	2-1-3-4- 50.	2-3-1-4- 50.	3-1-2-4- 50.	3-2-1-4- 50.
1-3-4-2- 50.	1-2-4-3- 50.	2-3-4-1- 50.	2-1-4-3- 50.	3-2-4-1- 50.	3-1-4-2- 50.
1-3-2-4- 33.3	1-2-3-4- 33.3	2-3-1-4- 33.3	2-1-3-4- 33.3	3-2-1-4- 33.3	3-1-2-4- 33.3
2-4-1-3- 66.7	3-4-1-2- 66.7	1-4-2-3- 66.7	3-4-2-1- 66.7	1-4-3-2- 66.7	2-4-3-1- 66.7
2-4-3-1- 50.	3-4-2-1- 50.	1-4-3-2- 50.	3-4-1-2- 50.	1-4-2-3- 50.	2-4-1-3- 50.
2-1-4-3- 50.	3-1-4-2- 50.	1-2-4-3- 50.	3-2-4-1- 50.	1-3-4-2- 50.	2-3-4-1- 50.
2-1-3-4- 33.3	3-1-2-4- 33.3	1-2-3-4- 33.3	3-2-1-4- 33.3	1-3-2-4- 33.3	2-3-1-4- 33.3
2-3-4-1- 33.3	3-2-4-1- 33.3	1-3-4-2- 33.3	3-1-4-2- 33.3	1-2-4-3- 33.3	2-1-4-3- 33.3
2-3-1-4- 16.7	3-2-1-4- 16.7	1-3-2-4- 16.7	3-1-2-4- 16.7	1-2-3-4- 16.7	2-1-3-4- 16.7
3-4-1-2- 50.	2-4-1-3- 50.	3-4-2-1- 50.	1-4-2-3- 50.	2-4-3-1- 50.	1-4-3-2- 50.
3-4-2-1- 33.3	2-4-3-1- 33.3	3-4-1-2- 33.3	1-4-3-2- 33.3	2-4-1-3- 33.3	1-4-2-3- 33.3
3-1-4-2- 33.3	2-1-4-3- 33.3	3-2-4-1- 33.3	1-2-4-3- 33.3	2-3-4-1- 33.3	1-3-4-2- 33.3
3-1-2-4- 16.7	2-1-3-4- 16.7	3-2-1-4- 16.7	1-2-3-4- 16.7	2-3-1-4- 16.7	1-3-2-4- 16.7
3-2-4-1- 16.7	2-3-4-1- 16.7	3-1-4-2- 16.7	1-3-4-2- 16.7	2-1-4-3- 16.7	1-2-4-3- 16.7
3-2-1-4- 0.	2-3-1-4- 0.	3-1-2-4- 0.	1-3-2-4- 0.	2-1-3-4- 0.	1-2-3-4- 0.