



United States
Department of
Agriculture

Okra for Processing

Agricultural
Marketing
Service

Inspection Instructions

Fruit and
Vegetable
Programs

Fresh Products
Branch

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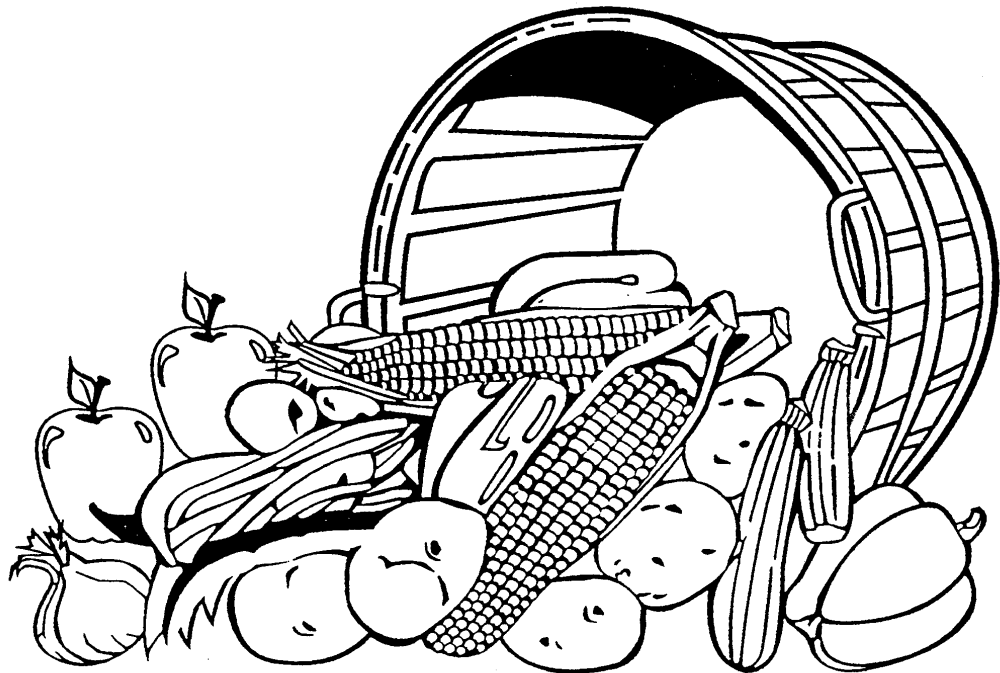


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UNITED STATES DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND QUALITY SERVICE
FRUIT AND VEGETABLE QUALITY DIVISION
FRESH PRODUCTS BRANCH

OKRA FOR PROCESSING
INSPECTION INSTRUCTIONS

INTRODUCTION

Okra or "gumbo" can be produced in most portions of the U. S., but commercial production is confined mostly to the southern half of the country. Most important states processing okra in volume are Tennessee, Texas, Georgia, Arkansas, Florida and Louisiana. (1)

There are a large number of varieties of okra, but only a few of much importance commercially. Preference for rich green color has practically eliminated white podded varieties which used to be grown. The overwhelming favorite variety now is Clemson spineless, which has a rich green color, a fuzzy surface, is distinctly ribbed, ranges from about 5/8 to 1 inch in diameter and is usually in the best stages of maturity at 2 to 5 inches in length. The Emerald variety, a long, slender, dark green podded variety is grown to some extent for sliced pack. (2)

During warm or hot weather, it is essential to pick okra at least every other day. Growth and maturing rates are very rapid, and longer intervals between pickings are likely to result in a percentage of pods which have outgrown the most desirable stage of maturity. (3)

Harvesting is done by hand, and there is no likelihood that mechanical harvesting can be made possible in the near future. A large amount of field labor is essential to the production of okra. (4)

The amount of field trimming given the pods varies with the area and individual plant's buying specifications. Some processors prefer to pay more for the okra and have it trimmed in the field. Others prefer to pay less and do the trimming in the plant. (5)

GENERAL INSTRUCTIONS

The inspector shall be guided by:

1. General Shipping Point Handbook which describes the duties and required conduct of an inspector. (6)

Reprinted September 1979 to include
Branch Notices and Inspection Instruction Memos.

2. Processor- Grower contract which establishes the basis for grading the commodity.
3. This Handbook which contains specific instructions and explanations to supplement the grade standards. Refer to it frequently.
4. Supplemental Instructions which may be issued by the supervisor.

INSPECTION EQUIPMENT

- (7) Items of equipment needed are as follows:

Scales. Accurate scales for weighing samples and defects, preferably graduated in one-tenths of a pound.
- (8) Grading Bench. The bench or table should be constructed with a sloping bin large enough to hold a bushel of okra. At the lower end of the slope, there should be an opening through which the okra can be dropped into a basket below after being graded. The bench should be about 40 inches high to make it easier to work without bending over. By extending the length of the bench, additional table space or several small bins can be provided for sorting out sizes and grades of okra.
- (9) Containers. A half dozen bushel baskets or some similar light weight containers which will hold samples of okra and can be used for weighing.
- (10) Sizers. Marked boards or rectangular shaped slots for measuring the length of pods. If the size classifications described in the standards are used by the contracting parties, the sizes needed for measurements are 1-3/4 inches, 3-1/2 inches and 5 inches. If other than these size specifications are used in the purchase contract, sizers of those specified lengths shall be used. Be sure that the sizers used are exactly of the right measurement.
- (11) Knife. A pocket knife, fruit knife or paring knife may be used, but it must be kept well sharpened.
- (12) Certificates. A specially designed certificate form is required, similar to those used for other products for processing. (See pars.48-54).

SAMPLING

Because of the different methods of hauling okra from the farm to the processing plant, two different methods of sampling are required. Basically the difference depends upon whether the containers are small enough to be moved by hand. (13)

Small containers. Growers operating small farms and producing okra on small acreages usually deliver their okra in relatively small containers such as field crates, hampers, bushel baskets etc. which are light in weight and easy to handle. Containers shall be taken from various locations in the load selected at random for grading. A suggested number of containers to be taken for inspection is as follows: (14)

<u>Number in Load</u>	<u>Number Taken</u>
1 - 4	1
5 - 10	2
11 - 20	3
21 or more	4

If it is apparent from casual observation, or if the grower states that he has two or more different lots on his load, take sample packages from each of the lots in the same ratio as that listed in the table above. In many cases, the grower will have sorted his okra into two distinct lots or "grades", primarily on the basis of size. In rare instances, there may be two lots on the load, each belonging to a different person. The driver of the truck making delivery should be required to point out which containers belong to each of the lots, and give the count of containers in each lot. (15)

Large containers. Growers producing large quantities of okra may deliver their crop to the processing plant in bins or pallet boxes which hold several hundred pounds of okra. If these bins are dumped into piles or into other bins immediately upon delivery, you can obtain a fairly representative sample by taking large handfuls from many parts of the lot as the okra is dumped from the large containers. Under this system no restricted inspection statement should be made. (16)

- (17) Restricted sampling. If sampling and grading are required to be done before the bins are dumped, a restricted inspection will have to be made. Draw large handfuls of okra from at least four or five separate positions in each container, digging down a foot or so into the contents to get some from well beneath the surface. A statement should be made under "Remarks" on the certificate somewhat as follows: "Inspection restricted to upper one foot in containers".

ANALYSIS SAMPLE

- (18) The quantity used for grade and size analysis should be approximately one bushel, except when there are only one or two small containers in the lot. In such cases, a third to a half bushel should be sufficient for analysis.

GRADING SAMPLE

- (19) Mixing. When preparing to analyze a sample, care should be taken to obtain a representative mixed portion of the okra removed from the load. For example, when two or more small containers have been selected for sampling, take approximately the same amount from each container and take enough to make the quantity to be used for analysis. When working with samples drawn from many locations in large containers, mix the composite sample thoroughly before grading by pouring the okra gently from one container to another two or three times.
- (20) Weighing. Determine the weight of the sample to be analyzed whether it be a bushel or less. Exact weights should be marked on the containers used for weighing so that the correct tare weight can be deducted.
- (21) Sorting. Empty the analysis sample onto the grading table or bench where the okra can be spread out for examination. The pods are then sorted by size and quality into as many classes as are required by the purchasing specifications. For example, if the specifications provide for separate pricing on No. 1 pods of small size and No. 1 pods of medium size, the sizes shall be kept separate.
- (22) Sizing. As each pod is examined for quality, it shall also be classified as to size. A sizer should be in a convenient place on the table so that any pods which are very close to the dividing line for size can be measured quickly. A box or small bin space should be available

for each recognized size and those pods which meet No. 1 grade are placed in the various compartments according to size. For example, if the size classifications in the standards are used, there would need to be a place for "very small", "small", "medium" and "large" size pods. In these size separations, place only the pods which meet the requirements of U. S. No. 1 Grade. All pods which fail to grade No. 1 are placed in either the No. 2 Grade or the Cull compartment regardless of their size.

Shape. Okra is classified by the standards into three groups. To meet U. S. No. 1, the pod must be at least "fairly well formed". A pod may meet U. S. No. 2 if it is "moderately misshapen". If it is more than moderately misshapen, the pod is classed as a "cull". Profile sketches have been prepared to illustrate the maximum amount of curve or crook permitted in the two grades. (See page 12). (23)

Maturity. This is considered to be the most important factor affecting the quality of okra. Regardless of its size or appearance, the pod is not desirable for eating unless it is tender. Both grades require pods to be tender, and pods which are not tender must be classed as "culls". (24)

The definition of "tender" in the standards gives two methods of testing the pod for any appreciable amount of fiber or toughness. After a little experience, you can grade for maturity quite accurately by testing a few pods at the beginning of each lot and an occasional pod as you run the sample. Hold the pod in the palm of the hand and press against the tip end with the thumb so that it bends down toward one . If the tip bends easily and breaks off cleanly when at about a right angle to the body of the pod, you can be reasonably sure that the pod is tender. Usually, it is not necessary to actually break the pod, because the ease with which the tip end bends is enough of an indication of its maturity. (25)

The knife test for maturity is useful to check on the tip-breaking test, especially if there is not a definite answer from the tip test. With a little experience, you can learn to judge the amount of pressure required to slice through pods which are tender as compared with those which are tough. Keep the knife blade fairly sharp at all times, because a dull knife requires more pressure to cut the pod, and is therefore likely to be misleading. Make the cut on the lower half of the pod somewhere near the stem. Place the knife blade against the pod at right angles to the long dimension, and draw it across the pod. Very little pressure on the knife will be required if the pod is tender. (26)

- (27) Color. Good green color is very desirable in okra for processing. No. 1 grade requires "fairly well colored" pods, which means that the pod is at least light green or better green with no yellowish cast. If a pod is not well enough colored to meet No. 1 requirements, it may qualify for U. S. No. 2 if it can be classed as "pale green". This is defined in the standards as having a tinge of green predominating over most or all of surface, and not more than one-tenth of the surface showing a yellowish cast. A pod which does not meet this latter color requirement falls in the "cull" classification.
- (28) Trim. The degree of trimming of the stems of the okra in the field varies considerably, depending upon the purchasing specifications established by the processor. Three classes of trimming are defined in the standards: "well trimmed", "fairly well trimmed", and "poorly trimmed". U. S. No. 1 requires that the pods be at least "fairly well trimmed", unless the contract specifies that they shall be "well trimmed" or may be "poorly trimmed". U. S. No. 2 grade permits pods which are "poorly trimmed".
- (29) The chief distinctions between the three degrees of trim is the length of the stem remaining attached to the pod and how it was trimmed. To qualify as "well trimmed", the stem must be neatly cut off and not more than one-fourth inch long. "Fairly well trimmed" permits stems either broken or cut off, but not more than three-fourths inch long. Pods which have been trimmed above the cap scar so that the seed cavities are exposed, and pods with stems longer than three-fourths inch are classed as "poorly trimmed" and placed in the U. S. No. 2 grade, unless the contract or buying specifications expressly permit poorly trimmed in U. S. No. 1 grade.
- (30) In determining the length of a stem which has a slanting cut end or a rough broken end, use the average length as the basis of your classifying the pod. Estimate the average length halfway between the longest and the shortest portions of the stem.
- (31) Defects. As the pods are sorted for size, shape, color, maturity, and trim, they are also checked for blemish types of defects. Both U. S. No. 1 and U. S. No. 2 grade have the same requirements with respect to blemishes, so that a pod which is defective in this respect is classed as a "cull". The definition of "damage" includes sub-definitions on specific types of blemishes, and is so worded as to also cover types of blemishes not mentioned. The various kinds of blemish defects commonly encountered are mentioned below.

Decay. Okra rarely is affected by decay. Do not confuse dark discoloration or bruises with decay. Score a pod as decayed only if it shows breakdown caused by decay organism. Such a pod is classed as a "cull" regardless of the size of the decayed area. (32)

Worm hole. A pod with a hole penetrating the wall is automatically a "cull". (33)

Scars or bruises. Those which will materially detract from the appearance after processing shall be scored. (34)

Cuts or punctures. Those which penetrate the wall of the pod shall be scored. (35)

Insects. Pods containing insects or having appearance distinctly affected by insect action shall be scored. (36)

Discoloration. Any discoloration which will materially detract from the appearance after processing shall be scored. (37)

Dirt or foreign material. Pods with such material so firmly attached that it cannot be removed by the usual processing plant washing shall be scored. If dirt or other attached material will wash off it shall not be scored as a defect. (38)

Extraneous material. The standards mention this factor only under the heading of "culls". Anything found in the sample other than pods of okra shall be considered extraneous material and placed in the cull category as the sample is sorted. (39)

Culls. All okra pods which do not meet the requirements of U. S. No. 2 grade are classed as "culls". In many respects the requirements of U. S. No. 1 and U. S. No. 2 grades are identical. This includes the requirements for varietal types, tenderness, freshness, and freedom from defects -- a pod which will not meet No. 1 requirements on these factors will also not meet No. 2, and it is classed as a cull. (40)

With respect to color, a pod may fail to meet No. 1 grade because it is not "fairly well colored", yet it may have sufficient color to be classed as "pale green" and be placed in U. S. No. 2 grade. If it has insufficient color to be considered "pale green", it shall be classed as a cull. (41)

(42) With respect to shape, pods must be at least "fairly well formed" to meet No. 1 grade. They may be "moderately misshapen" and still be classed as No. 2 grade. Any pod more than moderately misshapen shall be classed as a cull.

(43) With respect to trim, no pod shall be classed as a cull. No. 2 grade permits pods which are "poorly trimmed", which means that they may have any amount of stem attached or may have been cut off above the cap scar leaving the ends of the seed cavities exposed.

WEIGHING VARIOUS CLASSES

(44) After the sample has been completely sorted into the various grade and size classes present on the basis of the standards and the contract specifications, each class of material shall be weighed and the weights recorded. The number of classes to be recorded will vary with the contract specification and the quality of the deliveries. The classes which should be recognized if present (unless the contract provides otherwise) are:

1. U. S. No. 1, very small;
2. U. S. No. 1, small;
3. U. S. No. 1, medium;
4. U. S. No. 1, large;
5. U. S. No. 2 (all sizes); and
6. Culls (including extraneous material).

(45) More accurate percentages can be determined by the use of scales with calibrations in tenths of pounds rather than in ounces. That is to say, the dial or poise bar has each pound division subdivided by ten subdivisions instead of the usual 4, 8, or 16 subdivisions based on quarter pounds, eighth pounds or ounces. If the scale being used is calibrated on the basis of ounces, eighths or quarters, record .06 pound for each ounce of weight as follows:

<u>Scale Reading</u>	<u>Amount to Record</u>
4 pounds, 1 ounce	4.06 pounds
4 pounds, 2 ounces	4.12 pounds
4 pounds, 3 ounces	4.18 pounds
4 pounds, 4 ounces (4-1/4)	4.25 pounds
4 pounds, 5 ounces	4.31 pounds
4 pounds, 6 ounces	4.37 pounds
4 pounds, 7 ounces	4.43 pounds
4 pounds, 8 ounces (4-1/2)	4.50 pounds

(continue on the same scale up to 4 pounds, 15 ounces)

CALCULATING PERCENTAGES

The weight of each class of pods sorted out of the analysis sample is divided by the weight of the entire analysis sample to obtain the percentage of each class. It is strongly recommended that a slide rule, percentage computer or computation table be used for converting weights into percentages, in order to save time and also reduce the possibility of errors. (46)

Slide rules can be made of hard wood, and the printed tapes for calibrating them may be obtained from the Washington office along with instructions on how to cut and attach the tapes. Write or phone the Washington office if you need tapes and detailed information about the construction. (47)

CERTIFICATES

The certificate used should be one designed expressly for reporting the results of inspections of okra. Because of the nature of the commodity, no other certificate form will serve the purpose. A suggested certificate form is shown as an example (page 11). (48)

Numbering. The certificates should be serially numbered if possible, although this is not mandatory. If so numbered, there should be three or four bearing the same number, depending upon how the copies are to be distributed. Four certificates of each number will provide one for the processor, one for the grower, one to be retained by the inspector and one to be given to the supervisor. (49)

Pad binding. For greater convenience, it is desirable to have the certificates bound in pads with the serial numbers in the proper order. (50)

Care of certificates. The certificates will be the responsibility of the inspector while they are in his possession. He shall make sure that they are kept where they will not be damaged or used by unauthorized persons. When the season is over or when the inspector is transferred from the grading station, he shall return all unused certificates to the supervisor. (51)

Correcting certificates. Try to avoid mistakes on the certificates by carefully checking the figures on the rough note sheet before entering them on the certificate. If a mistake has been made in entering the information on the top portion of the certificate, it may be corrected and allowed to go through. However, if the mistake is (52)

in the form of wrong percentages, the certificate should be marked "VOID" in large letters, and a correct certificate should be issued in its place. Voided certificates are to be turned over to the supervisor along with the copies of other certificates.

- (53) Signature. The person making the inspection must sign the certificate with his full name or his initials and full last name. Initials alone or nicknames are not acceptable legally as signatures.
- (54) Printing certificates. Certificate forms may be printed by the state Inspection Service or by the processor. In either case, when initiating inspection service on a commodity for the first time, it is very important that a rough draft of the form of the proposed certificate be sent to the Washington office for approval or required changes. The state supervisor should anticipate the possibility of having an inspection deal, and should clear the certificate form with the Washington office well in advance of the time deadline.

REINSPECTIONS

- (55) A financially interested party may request a second grade because he believes the first grade does not accurately describe the quality of the lot of okra. Any reasonable request should be granted. In such cases, another sample shall be taken with an extra effort to make it representative. The sample shall be analyzed and the percentages determined.
- (56) Report the grade on the basis of the two samples, showing the combined weight analyzed and the average of the two percentages determined for each grade and size. If a certificate had already been written covering the analysis of the first sample, that certificate shall be marked "VOID" and handled in the same manner described in paragraph 52.

OKRA INSPECTION CERTIFICATE

NO. 1

Department of Agriculture
U. S. Department of Agriculture Cooperating

Processor _____ Inspection Point _____
Address _____ Date _____
Grower _____ Hour _____
Address _____

Weight of sample analyzed _____ pounds.

<u>U. S. Grade No. 1</u>	<u>Pounds</u>	<u>Percent</u>
Very small	_____	_____
Small	_____	_____
Medium	_____	_____
Large	_____	_____
<u>U. S. Grade No. 2</u>	_____	_____
<u>Culls</u>	_____	_____
Total	_____	_____

Remarks:

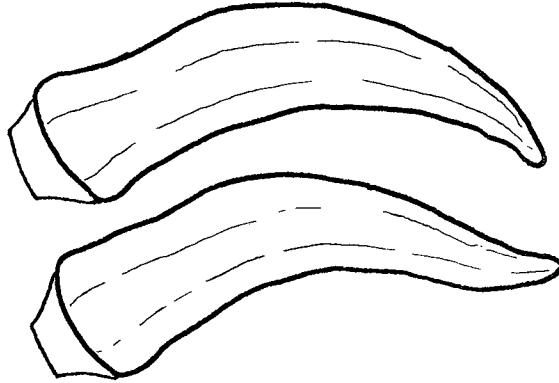
I, the undersigned, on the above date, made personal inspection of a sample believed by me to be representative of the load from which said sample was taken, and do certify that the quality and condition of the sample was as shown above.

Inspector

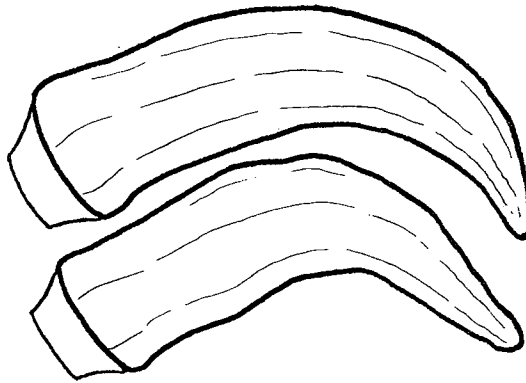
PROCESSOR'S RECORDS

Load No. _____ Weight of load _____
Variety _____

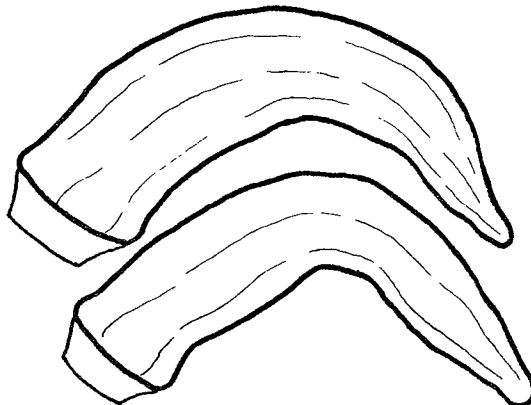
OKRA FOR PROCESSING
SHAPE



FAIRLY WELL FORMED
LOWER LIMIT



MODERATELY MISSHAPEN
LOWER LIMIT



MORE THAN
MODERATELY MISSHAPEN