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Specialty
Crops
Program

Specialty
Crops
Inspection
Division

Frozen Turnip Greens with Turnips

Inspection Instructions

September 2015

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These instructions contain information and guidelines to help personnel of the U.S. Department of Agriculture's (USDA) Specialty Crops Inspection (SCI) Division uniformly apply and interpret U.S. grade standards, other similar specifications, and special procedures.

These guidelines do not supersede the Federal Food, Drug, and Cosmetic Act or any other applicable Federal or State laws or regulations. Compliance with these statutes is mandatory. This publication supersedes any previously issued inspection instructions.

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Inspection instructions are issued by USDA after careful consideration of all data and views submitted. The Department welcomes suggestions for improving the inspection instructions in future revisions.

Comments may be submitted to:

Director, Specialty Crops Inspection Division
Specialty Crops Program
USDA, Agricultural Marketing Service
1400 Independence Avenue, SW, STOP 0240
Washington, DC 20250

These instructions replace the Grading Manual for Frozen Turnip Greens with Turnips dated February 1959, and include, but not limited to, all previous correspondence, memos, inspection instructions, or procedures.

INSPECTION INSTRUCTIONS FOR FROZEN TURNIP GREENS WITH TURNIPS

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GENERAL

The [United States Standards for Grades of Frozen Turnip Greens with Turnips](#) is a Variables Standard. In a variables standard, the number of defective sample units (deviants) allowed for a given sample size is referred to as the acceptance number (or the deviant rate). Variables standards use acceptance numbers of: 0 deviants in 3, 1 deviant in 6, 2 deviants in 13, 3 deviants in 21, and 4 deviants in 29 samples. Sampling plans and deviant rates for frozen turnip greens with turnips are provided in the [AIM Sampling manual](#).

The grade of frozen turnip greens with turnips may be determined by considering, in conjunction with the requirements of the respective grade, the respective ratings for the factors of color, absence of defects, and character.

The relative importance of each scoring factor is expressed numerically on the scale of 100. The maximum number of points that may be given each factor is:

Factors	Points
Color	20
Absence of defects	40
<u>Character</u>	<u>40</u>
Total Score	100

PRODUCT DESCRIPTION

Frozen turnip greens with turnips is the product prepared from clean, sound succulent leaves and clean, sound succulent roots of the turnip plant by proper washing, trimming, draining, and freezing at a proper temperature to preserve the product.

PRODUCTION FLOW

Turnip Green and Turnip Harvest/Topping



Transport



Wash



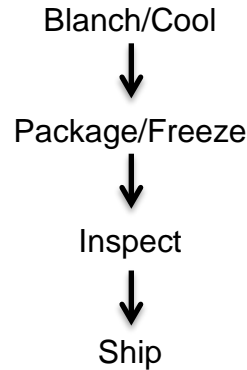
Sort



Peel/Trim/Cut



Inspection Instructions for Frozen Turnip Greens with Turnips (September 2015)



INSPECTION AND GRADING

EQUIPMENT, INSPECTION AIDS, AND INSTRUCTIONS

- [U.S. Standards for Grades of Frozen Turnip Greens with Turnips](#), other applicable specification (state, institution, buyer),
- AIM Inspection Series Manuals,
 - [Condition of Food Container Manual](#)
 - [Foreign Material Manual](#)
 - [General Procedures Manual](#)
 - [Safety Manual](#)
 - [Sampling Manual](#)
 - [Sanitation Manual](#)
 - [Technical Procedures Manual](#)
- [FDA Food Defect Action Level](#),
- Scale, Rule or inspection aid for square areas, pencil or pen,
- Trays – white, shallow laboratory trays for 16-ounce containers and smaller, deep, large sized trays for 2-1/2 pounds or larger,
- No. 10 or No. 12 size cans for thawing samples,
- Stainless steel covered cooking utensil and source of heat for cooking, fork,
- Watch or timer, Wide field microscope or magnifying glass,
- Score Sheet for Frozen Turnip Greens with Turnips [FV-364-140E](#) (intranet link), and
- Special equipment and reagents may be necessary to perform tests or analyses (e.g., enzyme inactivation) required by a specification, requested by the applicant, or necessary to properly certify the product.

SAMPLE UNIT SIZE

Uniformity in the preparation and performance of sampling procedures are a fundamental part of Division services. The [AIM Sampling Manual](#) sections on Sampling Procedure, and Sampling Rate (Table II) provide guidance on the procedures used in

sampling frozen turnip greens with turnips. Lot size and container size determine sampling rates.

When selecting a sample size for grade determination, consider the various factors to be evaluated. The factors of proportion of ingredients, varietal characteristics, uniformity of size (grade A only), and color may be determined using the complete contents of the container (if practical). Select a size that is large enough to be representative of the lot, and yet not so large as to be impractical to examine. The sample size for the factors of defects, character, and flavor and odor is 10 ounces.

ARRANGING SAMPLES AND RECORDING CODE MARKS AND LABEL INFORMATION

Arrange containers to aid the evaluation of data. Generally, code marks that are identical are grouped together; normally in ascending numerical order from left to right if the marks so indicate. Any continuity with respect to individual lots must be retained. Refer to the AIM Inspection Series [General Procedures Manual](#) for additional score sheet completion procedures.

WEIGHT

NET WEIGHT

Processed foods are commonly packed to meet a prescribed net weight or content, and are labeled accordingly. This net weight or content may be specified in a purchase specification or contract. In-depth instructions on performing net weights and drained weights may be found in the [AIM Technical Procedures Manual](#).

DRAINED WEIGHT

Under normal inspection procedure, drained weights are not taken. When specifically requested, or if the samples appear to contain excessive ice, drained weights should be determined and recorded. In making a drained weight determination, use the following method unless the applicant or specification used calls for some other method:

- After removing all wrappings or packaging materials, place the frozen turnip greens with turnips into a pliable bag. Remove the air from the bag, carefully tie or seal the bag, and completely thaw the frozen contents in a water bath held at temperatures of not more than 86° F.
- Empty the bag, evenly distributing the completely thawed turnip greens with turnips into a sieve. Incline the sieve slightly to facilitate drainage. At the end of one minute, tilt the sieve in the opposite direction. Drain for one more minute, for a total of two minutes. The drained weight is the weight of the sieve and the turnip greens with turnips, less the weight of the dry sieve.

- Use an 8-inch diameter sieve for the equivalent of 1-pound net weight packages or smaller, and a 12-inch diameter sieve for packages larger than the equivalent of 1 pound net weight. The samples can then be used to complete the inspection of the product.

TEMPERATURE AND CARE OF FROZEN PRODUCT

As a prerequisite to assigning the grade to frozen turnip greens with turnips, the U.S. standards for frozen turnip greens with turnips state: "frozen in accordance with good commercial practice and maintained at temperatures necessary for the preservation of the product." Interpretive guidance on this statement is found in the Verification of Frozen Sample Units section of the [AIM Technical Procedures Manual](#).

The general appearance of the product and container should be observed, and a description of the condition recorded with particular attention to:

- Abnormal or excessive dehydration and snow;
- Abnormal or excessive ice in container;
- Fill of container;
- Off odors and off colors or any condition that is unusual or abnormal; and
- [Condition of container](#), such as dirt or staining breakage, or torn or broken labels.

THAWING THE PRODUCT

Except when the determination of the drained weight is necessary, the product is thawed as follows:

- Remove the turnip greens with turnips from the package or container and place in a No. 10 can or deep tray, and thaw in water not exceeding 86° F.
- Inspect the product as soon as possible after it is completely thawed. Do not leave the product standing in the water until it becomes water-soaked and affects the character. This procedure is outlined in detail in the thawing procedures section of the [AIM Technical Procedures Manual](#). The water in which the product is thawed should be saved and tested for the presence of earthy material or insects.

STYLE

Styles of frozen turnip greens with turnips applies to the form of the leaf material used and to the turnip root ingredient of the product. When recording the Style of frozen turnip greens with turnips on score sheet [FV-364-140E](#) (intranet link).

Record the style of turnip root ingredient as one of the following:

- Whole;
- Sliced;
- Diced; and
- Cut.

Record the style of leaf ingredient as one of the following:

- **Style I Whole Leaf** is the style of frozen turnip greens with turnips that consists of the leaf with adjacent portions of the stem, together with a single form of the turnip root ingredient.
- **Style II Sliced** is the style of frozen turnip greens with turnips that consists of leaves with adjacent portions of the stem which have been sliced into reasonably uniform strips, together with a single form of the turnip root ingredient.
- **Style III Cut or Chopped** is the style of frozen turnip greens with turnips that consists of leaves with adjacent portions of the stem which have been cut or chopped into small pieces, together with a single form of the turnip root ingredient.

PROPORTION OF INGREDIENTS

The proportion of each of the ingredients is determined on the thawed product by the following procedure:

- Separate the leafy material from the turnip ingredient for all of the containers in the sample;
- Composite the leafy material and weigh;
- Composite the turnip ingredient and weigh;
- Add the weights of each of the ingredients to obtain the total weight of the combined ingredients for all samples;
- Calculate the percent of each of the ingredients by dividing the total weight of the combined ingredients into the composite weight of each ingredient and multiplying by 100.

It is recommended that frozen turnip greens with turnips consist of:

- 50 percent or more, by weight, of turnip greens;

- Not less than 20 percent by weight, nor more than 50 percent by weight, of turnips.

Note: If the proportion of each of the ingredients appears to vary to a great extent from container to container, you may need to calculate the percentage of each ingredient in each container and report this information on the certificate. This method of individual container calculation may also be used when a large number of containers are inspected at one time, or where an applicant requests information on the variation of the ingredients in individual containers.

UNIFORMITY OF SIZE AND SHAPE

The uniformity of size and shape primarily refers to the turnip root ingredient in the product. The turnip root ingredient must be fairly uniform in size and shape within an individual container, and may vary in size but not to an extent that seriously detracts from the appearance of the product. This requirement is not rated by score points and applies only to Grade A. This factor is determined by appearance; if in doubt on classifying this factor, contact your immediate supervisor.

SIMILAR VARIETAL CHARACTERISTICS

Make the determination of similar varietal characteristics immediately after thawing so that the product is sufficiently free from ice crystals to permit proper handling as individual units.

Leaf Material

There are two distinct types of leaves used for the product:

- Cut leaves are serrated, and
- Strap-leaves have smooth edges.

A mixture of these two types of turnip greens is not objectionable provided the overall color is reasonably uniform and does not present a mottled appearance.

Turnip Material

The turnips, if packed as whole style, may vary in shape depending on the variety. The edible roots may be long, slender, crooked, very flat, globular, or round. The internal flesh of the turnip roots may be white, pale yellowish-white, or yellow.

QUALITY FACTORS

COLOR

The factor for color refers to the general brightness of the combined ingredients and should be determined before and after cooking. Instructions and cook times for frozen turnip greens with turnips may be found in the [AIM Technical Procedures Manual](#), Cooking Procedures section.

The turnip green ingredient should be bright green; it may not be brown or exhibit a dull appearance. The very tender small bud-leaves may be pale green compared in color to the more mature leaves. This color difference is normal and this condition should not be scored against the color requirement.

If the turnip greens are mishandled prior to processing by exposing them to extreme heat or if there is too much delay before processing, the overall color may be affected.

The color may be affected when certain enzymes are present if the turnip greens are not adequately blanched to check or destroy the enzymatic activity, even if the storage temperature is maintained below 0° F. An overall brownish color and dull appearance throughout the package of turnip greens may indicate inadequate blanching, exposure to high temperature, or heating of the product during transit or storage.

The descriptions in the grade standards should be followed closely in rating this factor in the respective grade classification. The turnip ingredient usually improves in color upon cooking.

DEFECTS

The factor of defects refers to the degree to which the ingredients are free of sand, grit, or silt, harmless extraneous material, and damaged leaf and turnip ingredients.

FOREIGN MATERIAL

Determine and record if the product contains objectionable foreign material such as rot, decay, insects or insect fragments, or excessive amounts of earthy material of any type. Detailed instructions on Foreign Material procedures may be found in the [AIM Foreign Material Manual](#).

SAND, GRIT, OR SILT

Sand, grit, or silt means any particle of earthy material. It is difficult to process frozen turnip greens with turnips that are completely free of earthy material. The following quick method will allow you to determine the presence of loose sand or grit.

After thawing 10 ounces of the product, place the product and water in a deep flat-bottomed tray. Remove the product from the water and test for grit by placing a 250 milliliters (ml) glass beaker in the tray of water; press it down and move along the inside bottom of the tray. If loose sand or grit is present, you will feel it. The water may also be tested for foreign material. If thrips or other insects are present, they will usually float on top of the water. Sand and other heavy particles will settle to the bottom. Dark colored particles can be seen easily but generally sand particles are clear quartz and not easily seen, especially when the particles are very small.

When sand or grit is embedded in the product, it will be necessary to chew the product after cooking to determine the amount present. Instructions and cook times for frozen turnip greens with turnips may be found in the [AIM Technical Procedures Manual](#), Cooking Procedures section. If after chewing several representative portions, sand, or grit is not more than slightly noticeable in an occasional portion, the product may be considered to be practically free. When the amount of sand or grit is not more than slightly noticeable, can be detected in more than an occasional portion, but does not materially affect the eating quality, the product contains not more than a trace and may be considered fairly free from sand or grit. When the amount of sand or grit is readily detectable upon chewing and the eating quality is materially affected, the product is considered to contain more than a trace of sand or grit.

The water in which the product is cooked may also be tested with a beaker for grit. There is no specific tolerance established for the amount of earthy material allowed in the product. When chewing the product, there should be only an occasional mouthful that contains any sand or grit for a score in Grade B classification. If nearly every mouthful contains sand or grit, the product should be rated as Substandard.

GRADE A CLASSIFICATION FOR DEFECTS

Frozen turnip greens with turnips that are practically free of defects may be given a score of 34 to 40 points. Practically free from defects means that no grit, sand, or silt is present that affects the appearance or edibility of the product, and that the tolerances listed for Grade A in [Table I](#) may not be exceeded.

GRADE B CLASSIFICATION FOR DEFECTS

Frozen turnip greens with turnips that are reasonably free of defects may be given a score of 28 to 33 points. Frozen turnip greens with turnips that fall into this classification will not be graded above U.S. Grade B, regardless of the total score for the product (this is a limiting rule).

Reasonably free from defects means that the product may contain a trace of grit, sand, or silt that does not materially affect the appearance or edibility of the product and that, for the various styles, the tolerances listed for Grade B in [Table I](#) may not be exceeded.

SUBSTANDARD CLASSIFICATION FOR DEFECTS

Frozen turnip greens with turnips that fail to meet at least the requirements for defects outlined in the Grade B classification may be given a score of 0 to 27 points and will not be graded above Substandard, regardless of the total score for the product (this is a limiting rule). See Table I below.

TABLE I – STYLE I (WHOLE LEAF)

Maximum Defects in 10 ounces of Style I (Whole Leaf)

Defect	Grade A	Grade B	Substandard
Sand, Grit	None that affects the appearance or edibility of product.	Trace that does not materially affect the appearance or edibility of product.	Amount that seriously affects appearance or edibility of product.
Tender Grass or Weeds	A total of 6 inches in length of fine tender string-like blades of grass or weeds and coarse green grass and weeds.	A total of 9 inches in length of fine tender string-like blades of grass or weeds and coarse green grass and weeds.	Over 9 inches in length.
Coarse Grass and Weeds	2 inches in length of coarse green grass stems and weeds (these 2 inches are part of 6 inches listed above).	3 inches in length (these 3 inches are part of 9 inches listed above).	Over 3 inches in length.
Damaged Leaf Area	3 square inches (3" x 1") damaged area of leaves and stems (the 10 ounce sample also includes the turnip ingredient.)	6 square inches (6" x 1") damaged area of leaves and stems (the 10 ounce sample also includes the turnip ingredient.)	Over 6 square inches of leaves and stems (the 10 ounce sample also includes the turnip ingredient).
Damaged Turnip Ingredient	5 percent by count of units of turnip ingredient affected by damage.	10 percent by count of units of turnip ingredient affected by damage.	Over 10 percent by count of turnip ingredient affected by damage.

Note: The defects can easily be separated if the product is placed in a deep tray with enough water to cover the product and each unit is removed from the tray and examined separately.

CHARACTER

The factor of character refers to the tenderness and texture of the product, and the degree of freedom from fibrous or pithy turnip material. Evaluate for character after cooking. Instructions and cook times for frozen turnip greens with turnips may be found in the [AIM Technical Procedures Manual](#), Cooking Procedures section.

GRADE A CLASSIFICATION FOR CHARACTER

Frozen turnip greens with turnips that have a good character may be given a score of 34 to 40 points. Good character means that the leafy ingredient is tender and practically free of coarse or tough leaves and stems, and that the turnip ingredient has a tender texture and is practically free of fibrous or pithy units.

Generally, the stems that are nearly mature affect the overall character more than any other item. In Style I (whole leaf), allow a maximum of 1 coarse tough stem per 10 ounces after cooking the combined ingredients in the Grade A classification. This stem should not be extremely fibrous. Any discolored or tough peel on turnip units should be evaluated for character after cooking.

Frozen turnip greens with turnips may appear to contain a high proportion of stems (especially in Style I whole leaf) when compared to the amount of leaf and turnip ingredient. This appearance is normal, especially when the turnip greens are harvested at a stage of maturity for maximum yield. If the stems are not tough after cooking, do not down grade due to the stem material present. Most stems should be tender (not fibrous) after cooking 45 minutes. See [Table II](#).

GRADE B CLASSIFICATION FOR CHARACTER

Frozen turnip greens with turnips that have a reasonably good character may be given a score of 28 to 33 points. Frozen turnip greens with turnips that fall into this classification will not be graded above U.S. Grade B, regardless of the total score for the product (this is a limiting rule). Reasonably good character means that the leafy ingredient is reasonably tender, reasonably free from coarse or tough leaves and stems, and that the turnip ingredient has a reasonably tender texture and is reasonably free from fibrous or pithy units.

In Style I whole leaf, allow a maximum of 3 coarse tough stems per 10 ounces after cooking the combined ingredients in the Grade B classification. These stems should not be extremely fibrous and should be reasonably tender after cooking for 45 minutes. If tough fibers are present to any extent, they will not become tender even after cooking for 1 hour or longer. [See Table II](#).

SUBSTANDARD CLASSIFICATION FOR CHARACTER

Frozen turnip greens with turnips that fail to meet the requirements of Grade B may be given a score of 0 to 27 points and will not be graded above Substandard, regardless of the total score for the product (this is a limiting rule). If an excessive amount of coarse woody inedible seed stems are found in the product, score the factor of character Substandard. See Table II below.

TABLE II – STYLE I (WHOLE LEAF)

Maximum Allowance for Tough and Fibrous Stems in Style I (Whole Leaf)

Character	Grade A	Grade B	Substandard
Allowances	Allow 1 tough stem (after cooking) for each 10 ounces (in Style I whole leaf. This one stem should not be extremely fibrous.	Allow 3 tough stems (after cooking) for each 10 ounces (in Style I whole leaf). These 3 stems should not be extremely fibrous	Over 3 tough stems for each 10 ounces and extremely fibrous stems.

FLAVOR AND ODOR

The flavor, and odor, of frozen turnip greens with turnips is evaluated on the cooked product. Instructions and cook times for frozen turnip greens with turnips may be found in the [AIM Technical Procedures Manual](#), Cooking Procedures section.

Flavor is evaluated at the same time as character. The normal flavor of turnip greens with turnips is slightly bitter. When describing flavor, the standards should be followed.

DETERMINING OVERALL GRADE

U.S. Grade A is the quality of frozen turnip greens with turnips in which:

- The turnip root ingredient is fairly uniform in size,
- Each ingredient possesses similar varietal characteristics,
- Each ingredient possesses a good flavor and odor,
- Each ingredient possesses a good color,
- Each ingredient is practically free from defects,
- Each ingredient possesses a good character, and
- The total score is not less than 85 points when scored in accordance with the scoring system outlined in the [United States Standards for Grades of Frozen Turnip Greens with Turnips](#).

U.S. Grade B is the quality of frozen turnip greens with turnips in which:

- Each ingredient possesses similar varietal characteristics,
- Each ingredient possesses a reasonably good flavor and odor,
- Each ingredient possesses a reasonably good color,
- Each ingredient is reasonably free from defects,
- Each ingredient possesses a reasonably good character, and
- The total score is not less than 70 points when scored in accordance with the scoring system outlined in the [United States Standards for Grades of Frozen Turnip Greens with Turnips](#).

Substandard is the quality of frozen turnip greens with turnips that fail to meet the requirements of U.S. Grade B.

SPECIAL TEST: BLANCH TESTS

Should there be any question about adequate blanch, or if a specification requires an enzyme inactivation test, the test should be performed in accordance with the [AIM Technical Procedures Manual](#). Contact your immediate supervisor with any questions.