**Amendments and Editorial Changes**

## Handbook 133, 2011

## *Checking the Net Contents of Packaged Goods*

The following table lists the amendments and editorial changes that were considered and voted on by the membership of the NCWM. As appropriate, the text on the cited pages indicates the changes to the section or paragraph as indicated in bold **~~strikeou~~**~~t~~ for deletions and bold **underscore** for insertions.

| **Section No.** | **Title** | **Action** | **Page No.** |
| --- | --- | --- | --- |
| All |  | Reformatted and indexed text in complete document. |  |
| **Chapter 1. General Information** | | | |
| * 1. **Scope** | | | |
| 1.1. | Scope | Those manufacturers whose products are sold in such packages have the right to expect that their competitors will be required to adhere to the same **~~standards~~ laws and regulations.** | 1 |
| 1.1.a. | a. When and where to use checking procedures? | a. **~~Where and when~~** **When** and **where** to use **package** checking procedures | 1 |
| 1.1.a.(3) | (3) Retail | Amend sentence 2.  It is acceptable **and** practical **~~means~~** for **~~State, county and city~~** **weights and measures** jurisdictions to monitor packaging procedures and to detect present or potential problems. | 2 |
| * 1. **Package Requirements** | | | |
| 1.2.(1) | (1) Inspection Lot | Replaced **~~this collection~~** with **the lot** for clarification. | 3 |
| 1.2.(3) | (3) Individual Package Requirements | Change the end of the last sentence.  This handbook does not specify limits of overfilling **(with the exception of textiles)**, which is usually controlled by the packer **for economic, compliance and other reasons.** | 3 |
| 1.2.(4) | (4) Maximum Allowable Variation | The limit of **the** “reasonable **minus** variation” for an **~~individual~~** **underweight** package is called a “Maximum Allowable Variation” (MAV). An MAV is a deviation from the labeled weight, measure, or count of an individual package beyond which the deficiency is considered **an** unreasonable **minus error**. | 3 |
| 1.2.a. | a. Why **and when** do we allow for moisture loss or gain? | (Revise the first paragraph, second sentence.)  The amount of **~~lost~~** moisture **loss** depends upon the nature of the product, the packaging material, the length of time it is in distribution, environmental conditions, and other factors.  (Revised the first paragraph, last sentence.)  For loss or gain of moisture**, ~~apply~~** the moisture allowances **may be applied before or after the package errors are determined**. | 4 |
| 1.2.a. | a. Why **and when** do we allow for moisture loss or gain? | **To apply an allowance before determining package errors, adjust the Nominal Gross Weight (see Section 2.3.6. “Determine Nominal Gross Weight and Package Errors for Tare Sample”), so the package errors are increased by an amount equal to the moisture allowance. This approach is used to account for moisture loss in both the average and individual package errors.**  **It is also permissible to apply the moisture allowances after individual package errors and average errors are determined.**  **Example: *A sample of a product that could be subject to moisture loss might fail because the average error is minus or the error in several of the sample packages are found to be unreasonable errors (i.e., the package error is greater than the Maximum Allowable Variation (MAV) permitted for the package’s labeled quantity).***  **You may apply a moisture allowance after determining the package errors by adding the allowance to the Sample Error Limit (SEL) and then, comparing the average error to the SEL to determine** | 4 |
| **1.7. Good Measurement Practices** | | | |
| 1.7.(2) | (2) Certification Requirements for Standards and Test Equipment | This must be done according to the **calibration procedures and other instructions found on NIST’s Laboratory Metrology and Calibration Procedures website at** <http://www.nist.gov/pml/wmd/labmetrology/calibration.cfm> **~~in NIST Handbook 145, “Handbook for the Quality Assurance of Metrological Measurements,”~~**or **using** other recognized procedures (e.g., those adopted for use by a state weights and measures laboratory). | 7 |
| **Chapter 2. Basic Test Procedure – Gravimetric Testing** | | | |
| **2.2 Measurement Standards and Test Equipment** | | | |
| 2.2.f.(3) | f. Which performance tests should be conducted to ensure the accuracy of a scale?   1. Shift Test | **Bench Scales or Balances** use a test load equal to one-**~~half~~ third** of the “maximum test load: used for the “increasing-load test.” For bench scales (see Diagram 1. **“Bench Scales or Balances”), ~~place~~ apply** the test load **as nearly as possible at the center of each quadrant of the load receiving element as shown in Diagram 1. “Bench Scale or Balances.” ~~in the center of four separate quadrants, equidistant between the center and edge of the load-receiving element and~~ ….**  **For Equal Arm Balances use a test load equal to one-half capacity centered successively at four points positioned equidistance between the center and the front, left, back, and right edges of each pan as shown** **~~determine the accuracy in each quadrant for~~ (see Diagram 2.** “**Equal-Arm Balance)**.” For example, where the load-receiving element is a rectangular or circular shape, place the test load in the center of the area represented by the shaded boxes **~~in the following diagrams~~**. | 12 |
| **Diagram 1. Bench Scales or Balances Diagram 2. Equal-Arm Balance**    graphic 10001-box in box image | | | |
| 2.2.g. | Which standards apply to other test equipment? | These publications may be obtained from the Weights and Measures Division **(http://www.nist.gov/pml/wmd)** or the U.S. Government Printing Office. | 13 |
| **2.3. Basic Test Procedure** | | | |
| 2.3. | Basic Test Procedure | If **encased-in-ice or ice** glazed **~~or frozen~~ food** is tested, refer to Section 2.6. “**~~Drained Weight for Glazed or Frozen Foods.~~ Determining the Net Weight of Encased-in-Ice and Ice Glazed Products**.” | 13 |
| 2.3.3.b. | Where are Maximum Allowable Variations found? | Added a missing bullet  •packages bearing a USDA seal of inspection – Meat and Poultry “See Table 2‑9.” | 16 |
| 2.3.3.d. | How many MAVs are permitted in a sample? | d. How many**~~MAVs~~ unreasonable minus errors (UMEs)** are permitted in a sample?  To find out how many minus package errors are permitted to exceed the MAV, **(errors known as unreasonable minus errors or UME’s),** **~~(refer to Appendix A)~~** see Column 4 in either Table 2‑1. “Sampling Plans for Category A” or Table 2‑2. “Sampling Plans for Category B” **(refer to Appendix A).** Record this number in Box 8. | 17 |
| **2.3.5. Tare Procedures** | | | |
| 2.3.5.a.(1) | What types of tare may be used to determine the net weight of packaged goods?  –Used Dry Tare | **Note:** When testing frozen foods with **the** Used Dry Tare **approach**, the frost found inside frozen food packages is included as part of the net contents**, except in instances in which glazed or frozen foods are tested according to Section 2.6. “Determining the Net Weight of Encased-in-Ice and Ice Glazed Products**.” | 18 |
| 2.3.5.(3) | What types of tare may be used to determine the net weight of packaged goods?  –Wet Tare | **We tare is used tare material where not effort is made to dry the tare material. Free-flowing liquids are considered part of the tare weight**  **Wet tare procedures must not be used to verify the labeled net weight of packages of meat and poultry packed at an official United States Department of Agriculture (USDA) facility and bearing a USDA seal of inspection. The USDA Food Safety and Inspection Service (FSIS) adopted specific sections of the 2005 4th Edition of NIST HB 133 by reference in 2008 but not the “wet tare” method for determining net weight compliance. FSIS considers the free-flowing liquids in packages of meat and poultry products, including single-ingredient, raw poultry products, to be integral components of these products (see Federal Register, September 9, 2008 [Volume 73, Number 175] [Final Rule – pages 52189‑52193]).**  If the jurisdiction uses wet tare to determine net weight, follow the procedures described below that reference Used Dry Tare, except make no effort to dry the tare material. If Wet Tare is used to verify the net weight of the packages **~~of fresh poultry, hot dogs, and franks that are subject to the USDA regulations,~~** the inspector must allow for moisture loss. **~~Wet Tare is defined as: Used tare material where no effort is made to dry the tare material. Free-flowing liquids are considered part of the tare weight.~~** | 18 |
| 2.3.5.d. | How are the tare sample and the tare weight of the package material determined? | How **~~are~~** **is** the **total number of packages to be opened for** tare **determined** **~~sample~~** and the tare weight of the package material determined? | 19 |
| 2.3.5.d. | How is the total number of packages to be opened for tare determined and the tare weight of the packaged material determined? | Step 2  For sample sizes of 12 or more, subtract the individual tare weights from the **respective** **package** gross weights (Block a, minus Block b, on the report form) to obtain the net weight for each package and record **~~these~~** each value**~~s~~** in Block c, “Net Wt.,” on the report form. | 19 |
| 2.3.5.e. & 2.3.5.f. | How are the tare sample and the tare weight of the packing material determined? | e. Does the inspection of aerosol containers require special procedures?  f. How is the tare of vacuum-packed coffee determined? | Editorial  (moved to another location within Chapter)  20 |
| **2.3.6. Determine Nominal Gross Weight and Package Errors for Tare Sample** | | | |
| 2.3.6.a. | **a. What is nominal gross weight?** | 1. **~~What is~~ How do I compute** a nominal gross weight?   A nominal gross weight is used to **~~simplify the calculation~~** calculate **~~of~~** package errors. To compute the nominal gross weight, add the average tare weight (recorded in Box 13) to the labeled weight (recorded in Box 1). **~~To obtain the package error, subtract a package’s gross weight from the nominal gross weight.~~** | 21 |
| 2.3.6.b. | **~~What is nominal gross weight?~~**  **b. How do I compute package error?** | **b. How do I compute package error?**  **To obtain the package error, subtract the nominal gross weight from each package’s gross weight. The package error is represented by the formula:**  ***Package error = gross weight – nominal gross weight*** | 21 |
| 2.3.6.e. | e. How is the total package error computed? | Add all the package errors for the packages in the sample. Be sure to subtract the minus package errors from the plus package errors and to record the total net error in Box 15**, indicating the positive or negative value of the error.** | 22 |
| **2.8. Moisture Allowance** | | | |
| 2.3.8.  G30 | Moisture Allowance | **When no predetermined allowance is found in NIST HB 133, the potential for moisture loss must be considered. Inspectors should follow their jurisdiction’s guidance for making their determination on an acceptable moisture allowance.** | 24 |
| 2.3.8.b.  G30 | b. What are the moisture allowances for flour and dry pet food? | b. What **~~is~~** are the moisture allowance**s** for flour, **~~and~~** dry pet food**, and other products?**  (See Table 2‑3. Moisture Allowances)  S**~~The moisture allowance for flour and dry pet food is 3 % of the labeled net weight.~~**  S**~~Note: Dry pet food means all extruded dog and cat foods and baked treat products packaged in Kraft paper bags and/or cardboard boxes with a moisture content of 13 % or less at the time of pack.~~** | 24 |
| 2.3.8.b.  G30 | Table 2-3. Moisture Allowances | **Table 2-3. Moisture Allowances**  Corrected a misprint in moisture allowances for packages of Fresh Poultry **3 ~~5~~ %**. | 24 |
| | **Table 2-3.**  **Moisture Allowances** | | | | --- | --- | --- | | **Verifying the labeled net weight of packages of:** | **Moisture Allowance is:** | **Notes** | | Flour | 3 % |  | | Dry pet food | 3 % | Dry pet food means all extruded dog and cat foods and baked treats packaged in Kraft paper bags and/or cardboard boxes with a moisture content of 13 % or less at time of pack. | | Borax | See Section 2.4. |  | | **Wet Tare Only1** | | | | Fresh poultry | 3 % | Fresh poultry is defined as poultry above a temperature of − 3 °C (26 °F) that yields or gives when pushed with the thumb. | | Franks or hot dogs | 2.5 % |  | | Bacon, fresh sausage, and luncheon meats | 0 % | For packages of bacon, fresh sausage, and luncheon meats, there is no moisture allowance if there is no free-flowing liquid or absorbent material in contact with the product and the package is cleaned of clinging material. Luncheon meats are any cooked sausage product, loaves, jellied products, cured products, and any sliced sandwich-style meat. This does not include whole hams, briskets, roasts, turkeys, or chickens requiring further preparation to be made into ready-to-eat sliced product. When there is no free-flowing liquid inside the package and there are no absorbent materials in contact with the product, Wet Tare and Used Dried Tare are equivalent. | | **1**Wet tare procedures must not be used to verify the labeled net weight of packages of meat and poultry packed at an official United States Department of Agriculture (USDA) facility and bearing a USDA seal of inspection. The Food Safety and Inspection Service (FSIS) adopted specific sections of the 2005 4th Edition of NIST HB 133 by reference in 2008 but not the “wet tare” method for determining net weight compliance. FSIS considers the free-flowing liquids in packages of meat and poultry products, including single-ingredient, raw poultry products, to be integral components of these products (see Federal Register, September 9, 2008 [Volume 73, Number 175] [Final Rule – pages 52189‑52193]). | | | | | | |
| 2.3.8.d. | d. What moisture allowance is used with wet tare? | d. What moisture allowance is used with wet tare**? ~~when testing packages bearing a USDA seal of inspection?~~**  **Wet tare procedures must not be used to verify the labeled net weight of packages of meat and poultry packed at an official United States Department of Agriculture (USDA) facility and bearing a USDA seal of inspection. The Food Safety and Inspection Service (FSIS) adopted specific sections of the 2005 4th Edition of NIST HB 133 by reference in 2008 but not the “wet tare” method for determining net weight compliance. FSIS considers the free-flowing liquids in packages of meat and poultry products, including single-ingredient, raw poultry products, to be integral components of these products (see Federal Register, September 9, 2008 [Volume 73, Number 175] [Final Rule – pages 52189‑52193]).**  **See Table 2-3 Moisture Allowances - Wet Tare Only**.   * **~~Use the following guideline when testing meat and poultry from any USDA inspected plant using Wet Tare and a Category A sampling plan.~~** * **~~For packages of fresh poultry that bear a USDA seal of inspection, the moisture allowance is 3 5 of the labeled net weight. For net weight determinations, only, fresh poultry is defined as poultry above –3 ºC (26 ºF). This is a product that yields or gives when pushed with the thumb.~~** * **~~For packages of franks or hotdogs that bear a USDA seal of inspection, the moisture allowance is 2.5 % of the labeled net weight.~~** * **~~For packages of bacon, fresh sausage, and luncheon meats that bear a USDA seal of inspection, there is no moisture allowance if there is no free-flowing liquid or absorbent materials in contact with the product and the package is cleaned of clinging material. Luncheon meats are any cooked sausage product, loaves, jellied products, cured products, and any sliced sandwich-style meat. This does not include whole hams, briskets, roasts, turkeys, or chickens requiring further preparation to be made into ready-to-eat sliced product. When there is no free-flowing liquid inside the package and there are no absorbent materials in contact with the product, Wet Tare and Dried Used Tare are equivalent.~~**   When there is free-flowing liquid **and liquid** **~~or absorbent~~** **absorbed by** packing materials in contact with the products, all free liquid **and the absorbed liquid** is part of the wet tare. | 25 |

| **Section No.** | **Title** | **Action** | **Page No.** |
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| **2.3.9. Calculations** | | | |
| 2.3.9.a. | a. How is moisture allowance computed and applied to the average error? | a. How is moisture allowance computed and applied **~~to the average error~~**? |  |
| 2.3.9.b. | **b. How is a Moisture Allowance made prior to determining package error?** | b. How is a Moisture Allowance made prior to determining package errors?  **If the Moisture Allowance is known in advance (e.g., flour and dry pet food) it can be applied by adjusting the Nominal Gross Weight (NGW) used to determine the sample package errors. The Moisture Allowance (MA) in Box 13a is subtracted from the NGW. The NGW which is the sum of the Labeled Net Quantity of Contents (LNQC e.g., 907 g) and the Average Tare Weight from Box 13 (for this example use an ATW of 14 g (0.03 lb)) to obtain an Adjusted Nominal Gross Weight (ANGW) which is entered in Box 14.**  **The calculation is:**  ***Labeled Net Quantity of Contents 907 g (2 lb) + Average Tare Weight 14 g (0.03 lb) = 921 g (2.03 lb) – Moisture Allowance 27 g (0.06 lb) = Adjusted Nominal Gross Weight of 894 g (1.97 lb)***  **which is entered in Box 14.**  **Package errors are determined by subtracting the Adjusted Nominal Gross Weight from the Gross Weights of the Sample Packages (GWSP).**  **The calculation is:**  ***Gross Weight of Samples Packages – Adjusted Nominal Gross Weight = Package Error***  **Note: When the Nominal Gross Weight is adjusted by subtracting the Moisture Allowance value(s) the Maximum Allowable Variation(s) is not changed. This is because the errors that will be found in the sample packages have been adjusted by subtracting the Moisture Allowance (e.g., 3 %) from the Nominal Gross Weight. That increases the individual package errors by the amount of the moisture allowance (e.g., 3 %). If the value(s) of the MAV(s) were also adjusted it would result in doubling the allowance. MAV is always based on the labeled net quantity.** | 26 |
| 2.3.9.c. | **c. How is a Moisture Allowance made after determining package error?** | c. How is a Moisture Allowance made after determining package errors?  **You can make adjustments when the value of the Moisture Allowance is determined following the test (e.g., after the sample fails or if a packer provides a reasonable moisture allowance based on data obtained using a scientific method) using the following approach:**  **If the sample failed the Average and/or the Individual Package Requirements both of the following steps are applied.**  **If the sample failed the Average Requirement but has no unreasonable package errors, only step 1 is used. If the sample passes the Average Requirement but fails because the sample included one or more Unreasonable Minus Errors (UMEs), only step 2 is used.**  **Step:**  **1. Use the following approach to apply a Moisture Allowance to the sample after the test is completed. The Moisture Allowance (MA) is computed (e.g., 3 % x 907 g (2 lb) = 27 g (0.06 lb) and added to the Sample Error Limit (SEL) (e.g., if the SEL is 0.023 add 0.06 to obtain an Adjusted SEL of 0.083). The Adjusted Sample Error Limit (ASEL) is then compared to the Average Error of the Sample and:**   * **If the average error (disregarding sign) in Box 18 is smaller than the Adjusted Sample Error Limit, the sample passes.**   **HOWEVER,**   * **If the average error (disregarding sign) in Box 18 is larger than the Adjusted Sample Error Limit, the sample fails.**   **2. If a Moisture Allowance is to be applied to the Maximum Allowable Variation(s), the following method is recommended:**  **The Moisture Allowance (MA) is computed (e.g., 3 % x 907 g (2 lb) = 27 g (0.06 lb) and added to the value of the Maximum Allowable Variation(s) for the labeled net quantity of the package (e.g., MAV for 907 g (2 lb) is 31.7 g (0.07 lb) + 27 g (0.06 lb) = Adjusted Maximum Allowable Variation(s) (AMAV) of 58.7 g). Compare each minus package error to the AMAV. Mark package errors that exceed the AMAV and record the number of unreasonable minus errors found in the sample. If this number exceeds the number of unreasonable errors allowed, the sample fails.**  **~~How is the Maximum Allowable Variation corrected for the moisture allowance?~~**   * **~~Adjust the MAV by adding the moisture allowance to the MAV.~~**   **~~Example: 907 g (2 lb) package of flour: moisture allowance added to the MAV = 31.7 g (0.07 lb) (MAV for 907 g [2 lb] package) + 27 g (0.06 lb) moisture allowance = a corrected MAV of 58.7 g (0.13 lb)~~**   * **~~Correct MAV in dimensionless units by converting the moisture allowance to dimensionless units = 0.06 lb ÷ 0.001 lb = 60. Go to Box 4 and add the moisture allowance in dimensionless units to the MAV in dimensionless units.~~**   **~~Example: MAV = 70 (MAV for 2 lb where the unit of measure = 0.001 lb) + 60 (moisture allowance in dimensionless units) = 130. Minus package errors must exceed the MAV ± gray area before they are declared “unreasonable errors.”~~**   * **~~If the number of unreasonable errors exceeds the allowed number (recorded in Box 8), the inspection lot fails.~~**   **~~How is the average error for the moisture allowance corrected?~~**  **~~If the minus average error (Box 18) is larger (disregarding the sign) than the SEL (Box 23) and moisture loss applies, compare the difference between Box 18 and Box 23 with the moisture allowance recorded in Box 13a. (Make sure that all the values are in units of weight or in dimensionless units before making this comparison.) If Box 13a is larger than the difference between Box 18 and 23, then the lot is considered to be in the gray area.~~**  **~~Example: Box 13a for 2 lb flour is 60 (dimensionless units); Box 18 is 2 (dimensionless units); Box 23 is 0.550 (dimensionless units). The difference between Box 18 and Box 23 is 1.450 (dimensionless units). Since Box 13a is 60 (dimensionless units), Box 13a is larger than the difference between Box 18 and Box 23, the lot is considered to be in the gray area and further investigation is necessary before ruling out moisture loss as the reason for shortweight.~~** | 27 |
| 2.3.9.d. | **d. What should you do when a sample is in the moisture allowance (gray) area?** | **d. What should you do when a sample is in the moisture allowance (gray) area?**  When the average error of a lot of fresh poultry, franks, or hot dogs **~~from a USDA-inspected plant~~** is minus, but does not exceed the established “moisture allowance” or “gray area,” contact the **~~appropriate USDA official and/or~~** **packer or** plant management personnel to determine what information is available on the lot in question. Questions to the **~~USDA official and/or~~** plant management representative may include:  Change the note to read:  **Note:** If **~~USDA or~~** the plant management has data on the lot, such data may help to substantiate that the “lot” **had** met **the** net content requirements at the point of manufacture. | 28 |
| 2.3.9.d. | **d. What should you do when a sample is in the moisture allowance (gray) area?** | **Reasonable deviations** from net quantity of contents caused by the loss or gain of moisture from the package are permitted when caused by ordinary and customary exposure to conditions that occur under good distribution practices. | 28 |
| **2.4. Borax** | | | |
| 2.4.b. | b. How is the volume determined? | Step   1. Compare the net volume of the commodity in the package with the volume declared on the package. The volume declaration **must not ~~is not located~~ appear** on the principal display panel. **Instead, it will appear on the back or side of the package and may appear as: ~~The following example is how the declaration of volume should appear.~~**     **Volume ~~2530 cm~~~~3~~  \_\_\_\_ mL per NIST** **Handbook 133**  **Note:** 1 mL = 1 cm3 | 30 |
| **2.5. Determination of Drained Weight** | | | |
| 2.5. | The Determination of Drained Weight  – Test Equipment | * **For canned tomatoes a U.S. Standard test sieve with 11.2 mm (7/16 in) openings must be used.** | 31 |
| **2.6. ~~Drained Weight for Glazed or Frozen Foods~~ Determining the Net Weight of Encased-in-Ice and Ice Glazed Products** | | | |
| 2.6. | Drained Weight for Glazed or Frozen Foods | ~~Drained Weight for Glazed or Frozen Foods~~ **Determining the Net Weight of Encased-in-Ice and Ice Glazed Products.** | 32 |
| 2.6.a. | a. How is the drained weight of frozen shrimp and crabmeat determined? | How ~~is~~ should the ~~drained~~ net weight of frozen ~~shrimp (e.g., 2.27 kg (5 lb) block of shrimp) and crabmeat~~ seafood, meat, poultry or similar products encased-in-ice and frozen into blocks or solid masses be determined? **Note: For determining the net weight of ice glazed seafood, meat, poultry, or similar products, follow the procedure in Section 2.6.b. “How should the net weight of ice glazed seafood, meat, poultry or similar products be determined?”**   1. **~~Immerse the product directly in water in a mesh basket or open container to thaw (e.g., it is not placed in a plastic bag). Direct immersion does not result in the product absorbing moisture because the freezing process causes the tissue to lose its ability to hold water.~~** 2. **~~Maintain the water temperature between 23 °C to 29 °C (75 °F to 85 °F). This is accomplished by maintaining a constant flow of warm water into the container holding the product (e.g., place a bucket in a sink to catch the overflow, and feed warm water into the bottom of the bucket through a hose).~~** 3. **~~After thawing, drain the product on a sieve for 2 minutes and then weigh it.~~** | 32 |
| 2.6.a. | a. How **~~is~~** **should** the **~~drained~~** **net** weight of frozen **~~shrimp~~** **~~(e.g., 2.27 kg (5 lb) block of shrimp) and crabmeat~~** **seafood, meat, poultry and similar products encased-in-ice and frozen into blocks or solid masses (i.e., not individually glazed) be** determined?  –Test Equipment | * **Balance and weights (used to verify accuracy)** * Partial immersion thermometer or equivalent with 1 °C (2 °F) graduations and a − 35 °C to +50 °C (− 30 °F to + 120 °F) accurate to ± 1 °C (± 2 °F) * Water source and hose with a**n approximate flow rate of** 4 L to 15 L (1 gal to 4 gal) per minute **for thawing blocks and other products ~~flow rate~~** * Sink or other receptacle [i.e., **bucket with a capacity of approximately** 15 L (4 gal) **~~bucket~~**] **for thawing blocks and other products** * A wire mesh basket **used for testing large frozen blocks of shrimp** or **~~other~~** **a** container that is large enough to hold the contents of **one** package (e.g., 2.27 kg [5 lb] box of shrimp) and has openings small enough to retain all pieces of the product (e.g., an expanded metal test tube basket lined with standard 16‑mesh screen). | 32 |
| 2.6.a. | a. How is the drained weight of frozen shrimp and crabmeat determined?  – Test Procedure | Test Procedure **for Encased-in-Ice Product Only**  Steps:   1. Follow **~~the Basic Test Procedure in~~** **Section 2.3.1. “Define the Inspection Lot.”** Use a “Category A” **or a “Category B” sampling plan in the inspection (depending on the location of test);** select a random sample; then use the following test procedure to determine lot compliance. 2. **Place the unwrapped frozen seafood, meat, poultry, or similar products in the wire mesh basket or an open container to thaw (e.g. it is not placed in a plastic bag) and immerse in a 15 L (4 gal) or larger container of fresh water at a temperature between 23 °C to 29 °C (75 °F to 85 °F). Submerge the basket so that the top of the basket extends above the water level.** 3. **Maintain a continuous flow of water into the bottom of the container to keep the temperature within the specified range. This is accomplished by maintaining a constant flow of warm water into the container holding the product (e.g., place a bucket in a sink to catch the overflow, and feed warm water into the bottom of the bucket through a hose).**   **Note: Direct immersion does not result in the product absorbing moisture because the freezing process causes the tissue to lose its ability to hold water.**   1. **As soon as the product thaws, determined by loss of rigidity, transfer all material to a sieve (20 cm [8 in] for packages less than 453 g [1 lb] or 30 cm [12 in] for packages weighing more than 453 g [1 lb]) and distribute it evenly over the sieve.** 2. **Without shifting the product, incline the sieve 30° from the horizontal position to facilitate drainage, and drain for 2 minutes.** 3. **At the end of the drain time, immediately transfer the product to a tared pan for weighing to determine the net weight.** | 33 |
| 2.6.b. | b. How is the net weight of **ice** glazed **~~raw~~** seafood**, meat, poultry or similar products ~~and fish~~** determined? | b. How **~~is~~** **should** the net weight of **ice glazed ~~raw~~** seafood, **meat, poultry or similar products ~~and fish~~** determined?  For **iced** glazed seafood, meat**, poultry or similar products** **~~and fish~~,** determine the net weight after removing the glaze using the following procedure. **~~Use this method for any frozen glazed food product.~~** | 33 |
| 2.6.b. | b. How should the net weight of ice glazed seafood**,** meat, poultry or similar determined?  – Test Equipment | **~~Use the equipment listed in Section 2.6.~~** “**~~Drained Weight for Glazed or Frozen Foods~~**.”   * **Balance and weights (used to verify accuracy)** * **Continuous cold water source** * **Number 8 sieve and receiving pan, 20 cm (8 in) for packages 453 g (1 lb) or less. A 30 cm (12 in) for packages more than 453 g (1 lb)** * **Means to determine a 17° to 20° angle** * **Stopwatch** | 33 |
| 2.6.b. | b. How should the net weight of ice glazed seafood**,** meat, poultry or similar determined?  – Test Procedures **for Ice-Glazed Product Only** | Step:   1. Follow Section 2.3.1. “Define the Inspection Lot.” Use a “Category A” sampling plan in the inspection**;** select a random sample; and use the following test procedure to determine lot compliance. 2. Fill out **the header information on Box 1 through 8 on the Ice Glazed Package Report form (See Appendix C). A tare sample is not needed. Record package price, price per pound, lot size, sample size, and unit of measure in step 1 of the Ice Glazed Package Worksheet (See Appendix C).**   **Note: Use an official inspection report to record the inspection information. Attach additional worksheets, test notes, and other information as needed. This handbook provides an ice glazed worksheet and package report form in Appendix C. Modify the worksheet, package report and the box numbers to meet your agency’s needs. Other formats that contain** **more or less information may be acceptable.**   1. **Number each package. Weigh each package for gross package weight and enter in row 1 “Gross Package Weight” on worksheet.** 2. **Enter the labeled net weight in Row 2 “Labeled Net Weight” for each package on the worksheet. If dual units, determine and enter the larger of the two units.** 3. **Record the maximum allowable variation on row 3 “MAV” on the worksheet.** 4. **Weigh receiving pan and record the weight in row 4, “Receiving Pan Weight” on the worksheet.** 5. **Deglaze the product. Remove a package from low temperature storage; open it immediately and place the contents in the sieve or other draining device (e.g., colander) under a gentle spray of cold water. Carefully agitate the product. Handle with care to avoid breaking the product. Continue the spraying process until all ice glaze, that is seen or felt is removed. In general, the product should remain rigid; however, the ice glaze on certain products, usually smaller sized commodities, sometimes cannot be removed without partial thawing of the product. Nonetheless, remove all ice glaze, because it may be a substantial part of the package weight.** 6. Transfer the product to the **~~weighed~~** sieve **(if the product is not already in the sieve)** Without shifting the product, incline the sieve to an angle of 17 degrees to 20 degrees to facilitate drainage and drain (into waste receptacle or sink) for **~~exactly~~** 2 minutes **using a stopwatch**. 7. **At the end of the drain time immediately transfer the entire product to the receiving pan for weighing to determine the net weight.** 8. Place the product and **~~sieve~~ receiving** pan on the **~~receiving pan~~ scale** and weigh. Record this weight on a **glazed seafood package** worksheet**.** **~~as the “sieve + product weight.”~~** 9. **~~The net weight of product is equal to the weight of the receiving pan plus the sieve plus the product (recorded in step 5) minus the “sieve weight” (recorded in step 2). Record the product net weight on the worksheet.~~** The package error is equal to the net weight of the product as measured minus the labeled weight. Record the Record the package error on the **in Row 6 on the ice glazed** worksheet **~~and transfer it to the report form~~**. 10. Repeat steps **~~3~~** **2** through **~~6~~** **10** for each package in the sample, cleaning S**~~and drying~~** Sthe sieve and **drying** the receiving pan between package measurements. 11. Transfer data from the ice glazed package worksheet to the ice glazed package report. | 34 |
| **Chapter 3. Test Procedures – For Packages Labeled by Volume** | | | |
| * 1. **Scope** | | | |
| 3.1.f. | Table 3-1. Reference Temperature for Liquids | See modified table below. | 38 |
| |  |  |  | | --- | --- | --- | | **Table 3-1.**  **Reference Temperatures for Liquids** | | | | **If the liquid commodity is:** | **Then the volume is determined at the reference temperature of:** | **Code of Federal Regulation Reference\*** | |  |  |  | | Beer | **~~3.9~~** **4** °C (39.1°F) | **27 CFR, Part 7.10** | | Distilled Spirits | 15**.56** °C (60 °F) | **27 CFR, Part 5.11** | | Frozen food - sold and consumed in the frozen state | At the frozen temperature | **21 CFR §101.105(b)(2)(i)** | | Petroleum | 15.**6** °C (60 °F) | **16 CFR §500.8(b)** | | Refrigerated food (e.g., milk and other dairy products labeled “KEEP REFRIGERATED”) | 4**~~.4~~** °C (40 °F) | **21 CFR §101.105(b)(2)(ii)** | | Other liquids and wine (e.g., includes liquids sold in a refrigerated state for immediate customer consumption such as soft-drinks, bottled water and others that do not require refrigeration) | 20 °C (68 °F) | **Food: 21 CFR §101.105(b)(2)(iii)**  **Non-Food: 16 CFR §500.8(b)**  **Wine: 27 CFR, Part 4.10 (b)** | | \*The Code of Federal Regulations can be accessed online at: [***http://www.gpoaccess.gov/***](http://www.gpoaccess.gov/) | | | | | | |
| * 1. **Gravimetric Test Procedure for Liquids** | | | |
| 3.2. | Gravimetric Test Procedure for Liquids  –Test Procedure | Step 4  Because flasks are ordinarily calibrated on a “to deliver” basis, they must be “wet down” before using. Immediately before use, fill the volumetric flask(s) or graduate with water. The water should be at the reference temperature of the product being tested. Fill the flask(s) with water to a point slightly below the top graduation on the neck. The flask should be emptied in 30 seconds (± 5 seconds). Tilt the flask gradually so the flask walls are splashed as little as possible **as the flask** is emptied. When the main flow stops, the flask should be nearly inverted. Hold the flask in this position for 10 seconds more and touch off the drop of water that adheres to the tip. If necessary, dry the outside of the flask. The flask or graduate is then ready to fill with liquid from a package. This is called the “wet down” condition. | 40 |
| * 1. **Other Volumetric Test Procedures** | | | |
| 3.4.a. | a. What other methods can be used to determine the net contents of packages labeled by volume?  – Test Equipment | Updated standards   * + Class A 500 mL buret that conforms to ASTM E287**~~94~~**‑**2(2007)**, “Standard Specification for Laboratory Glass Graduated Burets”   + Class A Pipets, calibrated “to deliver” that conform to ASTM E969**~~95~~**‑**02(2007)**, “Standard Specification for Glass Volumetric (Transfer) Pipets” | 43 |
| 3.4.a. | a. What other methods can be used to determine the net contents of packages labeled by volume?  – Test Equipment | * + - Plastic disks that are 3 mm (1/8 in) thick with diameters equal to the seat diameter or larger than the brim diameter of each container to be tested. The diameter tolerance for the disks is 50 μm (± 0.05 mm [± 0.002 in]). The outer edge should be smooth and beveled at a 30° angle with the horizontal to 800 μm (0.8 mm [1/32 in]) thick at the edge. Each disk must have a 20 mm (¾ in) diameter hole through its center and a series of 1.5 mm (1/16 in) diameter holes 25 mm (1 in) **apart around the periphery of the disk and 3 mm (1/8 in)** from the outer edge. **All edges must be smooth**.     - **Partial immersion thermometer ~~(~~or equivalent~~)~~ with 1 °C (2 °F) graduations and a − 35 °C to + 50 °C (− 30 °F to + 120 °F) accurate to ~~at least 1 °C (1 °F) graduations, and with a tolerance of~~ ± 1 °C (**±**2 °F).** | 44 |
| 3.4.b. | b. How is the volume of oils, syrups, and other viscous liquids that have smooth surfaces determined? | Step 1   1. Bring the temperature of both the liquid and the water to be used to measure the volume of the liquid to the reference temperature specified in Table 3-1. Reference Temperatures for Liquids. **Verify with a thermometer that product has maintained the reference temperature.** | 44 |
| 3.4.c. |  | 1. **How is the volume of mayonnaise, salad dress, and other water immiscible products that do not have smooth and level surfaces determined?** | 45 |
| **3.8. Test Viscous Materials – Such as Caulking Compounds and Pastes** | | | |
| 3.8.b. | b. What type of measurement equipment is needed to test packages of caulk, pastes, and glues? | Calibrate the density cup gravimetrically with respect to the contained volume using the procedure in ASTM E**5**42‑~~94~~**01(2007)**, “Standard Practice for Calibration of Laboratory Volumetric Apparatus.” | 55 |
| **3.9. Peat Moss** | | | |
| 3.9.a. | a. How are packages of peat and peat moss labeled by compressed volume testing? | **Steps:**   1. **Measure the dimensions of the compressed material to determine if it contains the labeled quantity**. 2. **Take three measurements (both ends and middle) of each dimension and calculate their average.** 3. **Multiply the averages to obtain the compressed cubic volume.** 4. **For each dimension (length, width, and height) take three equidistant measurements, take the average of each respective dimension and multiply to determine the cubic measure as follows:**   ***Average height X average width X average length = cubic measurement***  5. Compare measured volume with labeled volume to determine package error. | 57 |
| **Peat Moss Illustration** | | | |
| **3.10. Mulch and Soils Labeled by Volume** | | | |
| 3.10.b. | b. What type of measurement equipment is needed to test packages of mulch?  – Table | Modify table 3-4. – The table format was simplified and the SI units were changed to millimeters.  (Table appears on the next page.) | 60 |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Table 3-4.**  **Specifications for Test Measures for Mulch and Soils** | | | | | | | **Nominal Volume of Test Measure** | **Interior Wall Dimensions 1** | | | **Marked Intervals on Interior**  **Walls 3** | **Volume Equivalent of Marked Intervals** | | **Length** | **Width** | **Height 2** |  |  | | 30.2 L (1.07 ft3) for  testing packages that contain less than 28.3 L  (1 ft3 or 25.7 dry qt) | 213.4 mm (8.**4** in) | 203.2 mm  (8 in) | 736.6 mm  (29 in) | 12.7 mm  (½ in) | 524.3 mL  (32 in3) | | 28.3 L (1 ft3) | 304.8 mm (12 in) | **304.8 mm**  **(12 in)** | **304.8 mm (12 in)** | 1 179.8 mL  (72 in3) | | 56.6 L (2 ft3) | **304.8 mm (12 in)** | **304.8 mm**  **(12 in)** | **685.8 mm**  **(27 in)** | | **406.4 mm**  **(16 in)** | **228.6 mm**  **(9 in)** | **685.8 mm**  **(27 in)** | | 84.9 L (3 ft3) | **304.8 mm (12 in)** | **304.8 mm**  **(12 in)** | **990.6** mm  (**~~48~~ 39** in) | | 406.4 mm  (16 in) | 228.6 mm  (9 in) | **~~1219.2~~ 990.6** mm  (**~~48~~ 39** in) | | Measures are typically constructed of 12.7 mm (½ in) marine plywood. A transparent sidewall is useful for determining the level of fill, but must be reinforced if it is not thick enough to resist distortion. If the measure has a clear front, place the level gage at the back (inside) of the measure so that the markings are read over the top of the mulch.  **Notes:**  1 Other interior dimensions are acceptable if the test measure approximates the configuration of the package under test and does not exceed a base configuration of the package cross-section.  2 The height of the test measure may be reduced, but this will limit the volume of the package that can be tested.  3 When lines are marked in boxes, they should extend to all four sides of the measure if possible to improve readability. It is recommended that a line indicating the MAV level also be marked to reduce the possibility of reading errors when the level of the mulch is at or near the MAV. | | | | | | | | | |
| 3.10.d. | d. How are package errors determined? | *Package Error = Package Net Volume* ***–*** *Labeled Volume* | 61 |
| **3.11. Ice Cream Novelties** | | | |
| 3.11. | Ice Cream Novelties | **Note: The following procedure can be used to test packaged products that are solid or semisolid and that will not dissolve in, mix with, absorb, or be absorbed by the fluid into which the product will be immersed. For example, ice cream labeled by volume can be tested using ice water or kerosene as the immersion fluid.**  **Exception: Pelletized ice cream is beads of ice cream which are quick frozen with liquid nitrogen. The beads are relatively small, but can vary in shape and size. On April 17, 2009, the FDA issued a letter stating that this product is considered semisolid food, in accordance with 21 CFR 101.105(a). The FDA also addresses that the appropriate net quantity of content declaration for pelletized ice cream products be in terms of net weight.** | 61 |
| **3.13. Fresh Oysters Labeled by Volume** | | | |
| 3.13.a. | a. What requirements apply to packages of fresh oysters labeled by volume?  – Test Equipment | * Area: 1935 cm2 (300 in2) or more for each 3.78 L (1 gal) of oysters (**Note: Strainers of smaller area dimensions are permitted to facilitate testing smaller containers.)** | 66 |
| **3.13.2. Test Procedure for Cylinders Labeled by Volume** | | | |
| 3.13.2.a. | a. How is it determined if the containers meet the package requirements using the volumetric test procedure? | Follow Section 2.3.**1.** “**~~Basic Test Procedure –~~** **Define the Inspection Lot.”** | 71 |
| 3.13.2.a. | a. How is it determined if the containers meet the package requirements using the volumetric test procedure? | Step 5  Using NIST Technical Note 1079 “Tables of Industrial Gas Container Contents and Density for Oxygen, Argon, Nitrogen, Helium, and Hydrogen” (available on-line at (**http://www.nist.gov/pml/wmd/),** determine the value (SCF/CF) from the content tables at the temperature and pressure of the cylinder under test. | 71 |
| **3.14. Firewood** | | | |
| 3.14. | Firewood | Editorial: Make 3.14. Main Title, subtitle **Firewood** categories (**3.14.2. Boxed Firewood, 3.14.3. Crosshatched Firewood, and 3.14.4. Bundles and Bags of Firewood**). | Editorial |
| **Chapter 4.** Test Procedures  Packages Labeled by Count, Linear Measure, Area, Thickness, and Combinations of Quantities | | | |
| **4.4. Packages Labeled by Count of More than 50 Items** | | | |
| 4.4. | Packages Labeled by Count of More than 50 Items  – Audit Procedure | Step 9: Added a minus symbol to the equation between Actual Package Gross Weight and Nominal Gross Weight. | 80 |
| **4.6. Special Test Requirements for Packages Labeled by Linear or Square Meters (Area)** | | | |
| 4.6.a. | Are there special measurement requirements for packages labeled by dimensions? | When testing yarn and thread apply tension and use the specialized equipment specified in ASTM D1907-**~~9~~07**, “Standard Test Method for Linear Density of Yarn (Yarn Number) by the Skein Method,” in conjunction with the sampling plans and package requirements described in this handbook. | 84 |
| **4.7. Polyethylene Sheeting** | | | |
| 4.7.a. | a. Which procedures are used to verify the declarations on polyethylene sheeting and bags?  – Test Procedure | Step 3 (footnote)  Updated the year (98) of approval referenced in ASTM Standard D 1505 **~~98~~**‑**03**, “Standard Method of Test for Density of Plastics by the Density Gradient Technique.” | 86 |
| **4.8. Packages Labeled by Linear or Square (Area) Measure** | | | |
| 4.8. | – Test Procedure | Step 11  Added a minus symbol to the equation between “Package Gross Weight and Nominal Gross Weight.” | 91 |
| **4.9. Baler Twine – Test Procedure for Length** | | | |
| 4.9. | – Test Procedure | Step 6  Added a minus symbol to the equation between “Packaged Gross Weight and Nominal Gross Weight.” | 93 |
| **Appendix A. Table** | | | |
| **Table 1-1. Agencies Responsible for Package Regulations and Applicable Requirements** | | | |
|  | Table 1-1. Agencies Responsible for Package Regulations and Applicable Requirements | U.S. Bureau of Alcohol, Tobacco, and Firearms and state and local weights and measures  [**~~http://www.atf.treas.gov~~**](http://www.atf.treas.gov)  **http:// www.ttb.gov** | 102 |
|  | Table 2-1. | Correction to table (see next page) | 103 |
| | **Table 2-1.**  **Sampling Plans for Category A** | | | | | | | --- | --- | --- | --- | --- | --- | | **1** | **2** | **3** | **4** | **5** | **6** | | **Inspection Lot**  **Size** | **Sample**  **Size** | **Sample Correction**  **Factor** | **Number of Minus Package Errors Allowed to Exceed the MAV1** | **Initial Tare Sample Size2** | | | **Glass and Aerosol Packages** | **All Other Packages** | | 1 | 1 | Apply MAV | 01 | 2 | 2 | | 2 | 2 | 8.98**~~4~~5** | | 3 | 3 | 2.484 | | 4 | 4 | 1.591 | | 5 | 5 | 1.24**~~1~~2** | | 6 | 6 | 1.0**~~50~~49** | | 7 | 7 | 0.925 | | 8 | 8 | 0.836 | | 9 | 9 | 0.769 | | 10 | 10 | 0.715 | | 11 | 11 | 0.672 | | 12 to 250 | 12 | 0.635 | | 251 to 3 200 | 24 | 0.422 | 3 | | More than 3 200 | 48 | 0.29**~~1~~0** | 1\* | | 1 For mulch and soils packaged by volume, see Table 2‑10. Exceptions to the Maximum Allowable Variations – 1 package may exceed the MAV for every 12 packages in the sample.  2 If sample size is 11 or fewer, the initial tare sample size and the total tare sample size is 2 samples.  (Amended 2001) | | | | | | | | | |
| **Appendix B. Random Numbers Tables** | | | |
| Appendix B | The Random Number Table | The random number tables in Appendix B are composed of the digits from 0 through 9, with approximately equal frequency of occurrence. This appendix consists of 8 pages. On each page digits are printed in blocks of **~~five~~** columns and blocks of **~~five~~** rows. The printing of the table in blocks is intended only to make it easier to locate specific columns and rows. | 119 |
| **Appendix C. Model Inspection Report Forms** | | | |
| Appendix C |  | **Ice Glazed Seafood Worksheet** | 133 |
| Appendix C |  | **Ice Glazed Seafood Worksheet – Example** | 134 |
| Appendix C |  | **Ice Glazed Seafood Package Report** | 135 |
| Appendix C |  | **Ice Glazed Seafood Package Report – Example** | 136 |
| **Appendix D. AOSA Rules for Testing Seeds** | | | |
| Appendix D |  | **AOSA Rules for Testing Seeds – Section 2: Preparation of Working Samples** | 137 |
| Appendix D |  | **AOSA Rules for Testing Seeds – Section 12: Mechanical Seed Count** | 141 |
| **Appendix E. General Tables of Units of Measurement** | | | |
| Appendix E |  | **General Tables of Units of Measurement** | 143 |
| **Appendix F. Glossary** | | | |
|  | Glossary | **Sample correction factor. ~~Students’ “t: value for a one sided test at the 3 % confidence level and n is the sample size.~~ The factor as computed is the ratio of the 97.5th quantile of the student’s t-distribution with**  **(n – 1) degrees of freedom and the square root of n where n is the sample size.**  **sample error limit (SEL).** A statistical value computed by multiplying the sample standard deviation times the sample correction factor from Column 3 of Table 2‑1. Category A – Sampling Plans for the appropriate sample size. The SEL value allows for the uncertainty between the average error of the sample and the average error of the inspection lot with an approximately 97**.5** % level of confidence. | 165 |