

**How to Determine the Net Weight and Purge of
Packaged Chitterlings¹
Using NIST Handbook 133, “Checking the Net Contents of
Packaged Goods”
Executive Summary**

When a Weights and Measures Inspector tests frozen chitterlings, the purpose of the inspection is to determine if the package contains the labeled net weight and if the purge is 20 % or less after thawing (purge is based on the labeled net weight). Inspectors typically use Section 2.3. “Basic Test Procedure” and other portions of National Institute of Standards and Technology (NIST) Handbook 133, “Checking the Net Contents of Packaged Goods” (the 2005 edition was adopted by USDA in 73 Federal Register 52192 on Sept. 9, 2008) to conduct these tests. To determine the amount of purge, inspectors modify the procedures in Section 2.6. “Determining the Net Weight of Encased-In-Ice and Ice Glazed Products.” The modifications include thawing the product while it is still in the package, then draining it and applying the 20 % purge limit established by the Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture (USDA). Inspectors defer to the USDA purge value because a specific limiting value for the purge for chitterlings has not been adopted by the National Conference on Weights and Measures (NCWM), and, therefore, a value is not in NIST Handbook 133. The USDA recommends that purge determinations be conducted at the packing plant. However, state and local inspections of chitterlings are needed outside packing plants because inspections are usually only carried out in response to consumer complaints about short weight or excessive purge in the packages they purchase at retail or over the Internet. In the past few years, most of the inspection results shared with the Office of Weights and Measures (OWM) at NIST indicated that inspectors have found the purge from chitterlings was often much greater than 20 %. In 2011, several states contacted the OWM seeking technical assistance because of ongoing disputes they were having with packers over the test procedures used and the amount of purge allowed. Some states reported that they found purge amounts as high as 50 % in packages put-up by both domestic and foreign packers. In addition to the test data from inspectors and multiple packers, a study conducted at Iowa State University on the purge from frozen chitterlings revealed purge ranging from 30 % to 50 %. OWM reviewed the test methods used by the states, Iowa State University, and several chitterling packers to identify opportunities for improving the accuracy and repeatability of the test procedure. A few differences between the test procedures used by packers and state inspectors were found, but, overall, the approaches to testing were consistent. As noted above, the NIST Handbook 133 does not include a test procedure or purge allowance for chitterlings. Because state weights and measures officials are required to investigate the complaints they receive, and there is a general need for a nationally uniform test procedure for use in law enforcement, there appears to be sufficient justification for the NCWM to add a specific test procedure and purge limits for this unique product¹ to NIST Handbook 133. The OWM has developed a draft test procedure for review and evaluation by

¹ Because they are similar and have the same issues with freezing and thawing this procedure may be used for testing beef tripe (which is made from the stomach of cows).

packers and officials that may, depending on the level of support it finds among officials and packers, be submitted to the NCWM for possible addition to NIST Handbook 133 later in 2014. Adoption and use of a uniform test procedure should improve test uniformity, increase confidence in the test results and protect consumers and packagers from unfair trade practices.

Other Issues That Can Be Studied if a Uniform Test Method Is Adopted

Further study and guidance is needed regarding the methods used to thaw frozen chitterlings. Several weights and measures inspectors reported that thawing large packages of chitterlings takes an extensive amount of time and is labor and resource intensive (e.g., large quantities of warm water are used or several days are required for the product to thaw so it can be tested). If quicker thawing techniques could be identified, it could improve productivity and reduce inspection costs for packers and officials. Another effort that should benefit packers would be to identify and share good packing and filling practices to reduce variations in the packing process. The purge values on different lots tested by the states and in the university study varied significantly and large variations between packers were found. Reducing variability will benefit packers and consumers alike and may be achieved with only minor changes in the filling process. Perhaps the most significant issue that needs further study is if the 20 % limit is appropriate for frozen chitterlings. Several packers reported that they can only meet the 20 % purge limit and avoid consumer complaints on frozen chitterlings if they target their purge results to fall within 5 % to 10 %. Yet, chitterlings from these packers still do not meet the 20 % limit when their frozen chitterlings are thawed and tested using NIST Handbook 133 procedures.

The NIST Office of Weights and Measures invites interested weights and measures officials and packers to join a work group that will coordinate a review of the draft chitterling test procedure and other issues related to the testing of chitterlings (and beef tripe). If you are interested in participating in this work or if you have comments or questions please contact Ken Butcher at (301) 975-4859 or kbutcher@nist.gov

What are Chitterlings?

The USDA's definition of chitterlings is in 9 CFR Ch. III §317.8 (30). The term "Chitterlings" shall apply to the large intestines of swine, or young bovine animals when preceded with the word "Calf" or "Veal." Meat food products that contain chitterlings or calf or veal chitterlings, in accordance with § 318.6(b)(8) of this subchapter shall be identified with product names that refer to such ingredients, as for instance, "Chitterling Loaf," "Chitterling Pie," or "Calf Chitterlings and Gravy." Their texture is similar to calamari (squid). According to the USDA,² chitterlings are a popular food served in many parts of the United States, the Caribbean, Latin America, western Asia, and Europe. Also called "chitlins," as defined above, they are the large intestines of swine (hogs) or calves. According to one industry source, chitterlings are eaten year round but about 90 % are sold during the Thanksgiving, Christmas, and New Year Holidays. Chitterlings are also used as casings for some sausages.

Chitterling Cleaning, Processing and Packaging

The large intestine of a hog is a soft tubular organ typically 5 meters to 6 meters (16 ft to 20 ft) long. When the intestine is removed from a freshly killed hog, it usually contains undigested food, fecal matter, and fat with glands and connective tissue still attached. To avoid foodborne illnesses, intestines require a thorough cleaning prior to consumption. Chitterlings can become contaminated with the bacteria *Yersinia enterocolitica*, which can cause a diarrheal illness called "yersiniosis." *Yersinia* survives in cold temperatures and can grow inside the refrigerator. Other foodborne pathogens (e.g., salmonella and *E. coli*) may also be present. For these reasons, the FSIS regulations require the product be thoroughly cleaned by the packer to prevent disease.

At most packing plants, the cleaning is performed using machines that flush fecal matter from pig intestines using tap water. The chitterlings are uncoiled and manually placed over a feed tube which sprays water through the tube forcing the fecal material out. During the process, the intestines are cut and cleaned again in centrifugal or agitating washing bowls prior to undergoing final inspection and cleaning before being packaged. Although the cleaning equipment is designed to minimize structural damage to the cells of the intestines, the pressurized water may wash away some of the mucosa (intestinal lining) along with the digested material and fecal matter. The damage to the mucosa may increase the amount of purge released from the chitterlings. Packers tell consumers that even chitterlings sold as "pre-cleaned" should be rinsed and cleaned again before cooking.

²http://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/foodborne-illness-and-disease/yersiniosis-and-chitterlings/ct_index Accessed July 11, 2014.

Water Content³ and Purge

Meat and poultry products have naturally occurring high water content. For example, a whole chicken fryer is 66 % water and a whole beef brisket is made up of about 71 % water. USDA studies show that raw chitterlings typically have water content of 67 % to 69 %.

CURRENT USDA GUIDANCE:

Net Weight on Chitterlings⁴

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QUESTION TO FSIS: *“According to the Food Standards and Labeling Policy Book, frozen chitterlings are permitted to contain 20 % of the frozen net weight as purge. At what point in the process should the determination of the 20 % purge be measured; post packaging and prior to freezing, or post packaging after freezing?”*

FSIS RESPONSE: *“Historically, FSIS has not objected to chitterlings having up to a 20% purge due to the washing and preparation with water. Net weight should be verified after packaging and prior to freezing. When verifying net weights, inspection personnel will not take regulatory action for product containing up to 20% purge. This maximum of 20% purge is representative of actual purge from the washing process; it is not acceptable to add additional liquid to the package.”*

The basis of the FSIS allowance for purge may represent the purge found with fresh-raw chitterlings and may NOT be based on data from actual purge testing on frozen chitterlings. The 20 % purge value appears to have been taken from the 1981 Edition of USDA Agriculture Handbook No. 8-10 prepared by the USDA Human Nutrition Information Service⁵ based on unfrozen chitterlings. As explained earlier several packers reported that they can only meet the 20 % purge limit and avoid consumer complaints on frozen chitterlings if they target their purge results to fall between 5 % to 10 %.

³ “Yield and Comparison of Nutritive and Energy Values; Fatty Acids and Cholesterol Content of Raw and Cooked Chitterlings.” By M.W. Vaughn, D.P. Wallace and B.W. Forster in Journal of Food Science – Volume 43 (1978).

⁴ http://askfsis.custhelp.com/app/answers/detail/a_id/1309 - Accessed on July 10, 2014.

⁵ See Page 126 -- Pork, Fresh Chitterlings, Raw - Composition of Foods: pork products: raw, processed, prepared / Part 2 of 2 of Agriculture Handbook 1983. Volume 008-10 Pages p. 101-206. Author: Anderson, Barbara A Doc ID ah008_10pt2 U.S. Dept. of Agriculture, Human Nutrition Information Service Subject: Pork--Composition--Tables; Canned pork--Composition--Tables; Food Composition Tables (<http://naldc.nal.usda.gov/catalog/CAT84802715>).

See also <http://naldc.nal.usda.gov/naldc/download.xhtml?id=CAT84802715&content=PDF> which was accessed on July 10, 2014.

Does USDA consider Purge to be retained water?

No, FSIS Directive 6700.1 (11/27/2002) addresses this question:

17. How is the retained water statement handled with chitterlings since the product is allowed to be packaged with up to a 20 percent purge?

Answer: Many years ago, before 1992, FSIS allowed, under normal conditions and good manufacturing practices, purge in containers of chitterlings not to exceed 20 percent of the marked weight of the product. The policy is long-held and is practiced industry wide. Consumers who purchase this product are aware of the policy and practice and have come to expect moisture content in chitterlings. As a result of this long-standing policy, no retained water statement is required when chitterlings are packaged with a purge. If chitterlings retain water during post evisceration processing and are not packaged with a purge, the product's labeling is required to bear a retained water statement.

The Impact of Freezing on Cells – Industry Approaches to Compliance

When meat or poultry products are frozen, the water that is a natural component of all meats turns to solid ice crystals. The water expands when it freezes and the sharp-edged crystals push into the surrounding tissue, rupturing the cells. The water that is outside the cell wall freezes first. As it does, it leeches water from the cell walls. After thawing, the product will have lost some of its natural springiness because the water released from the cells during freezing flows out of the thawing meats. Studies have shown that under some conditions, cell destruction can also occur during the thawing process.⁶ After chitterlings are washed, they are weighed in advance of packaging. The weight includes the chitterlings (and the fluid held within the cell walls), and water accumulated in the folds and on the surface of the chitterlings, which are then packaged for freezing. Chitterlings are made up of gelatinous cells that easily rupture and the amount of damage depends primarily on the speed of the freezing process. When the chitterlings are thawed, the purge flowing out includes water that was originally held within many of the cells, the surface water, and water trapped in the crevices and folds of the product.

There are studies showing freezing damages the cells and releases water that cannot be reabsorbed. If chitterlings are tested before freezing and a purge of 20 % is found, any test conducted after freezing and thawing will find a much higher level of purge. Purge occurs with all meats, but with chitterlings, the amount of purge is measured and is required to meet a limit. The USDA limits the amount of water at point of pack to 20 % so consumers receive a certain amount of meat solids in a product that is packaged in water. A limit on purge is similar to a standard-of-fill that the Food and Drug Administration defines for other food products with similar water versus solid content issues (e.g., tuna fish). For these reasons, and to ensure they meet the USDA requirements, several chitterling packers keep their pre-packaged chitterling purge levels to 7 % to 10 %. Yet, as mentioned above, packages from those packers are often

⁶ Mazur, Peter, "Freezing of Living Cells: mechanisms and implications." American Journal of Physiology, 247. 1984.

found to have purge levels of 24 % to 34 % when thawed, and the NIST Handbook 133 procedures are used to test purge levels.

Background

In 2011 the OWM was contacted by several state weights and measures officials for assistance in resolving disagreements with packers over the use of NIST Handbook 133, "Checking the Net Contents of Packaged Goods." Several state inspectors reported they routinely receive consumer complaints about the amount of purge in chitterlings, and they had used Section 2.6. "Determining the Net Weight of Encased-in-Ice and Ice Glazed Products" to verify the net weight. They also reported that the amount of purge had been determined after thawing the frozen chitterlings. Data from the inspectors revealed that the purge from all of the chitterlings tested exceeded a 20 % limit specified by USDA. OWM also learned that at least one state had taken legal action against a packer whose chitterlings failed the 20 % purge limit. The state had collected its evidence using a test procedure similar to Section 2.6. but had added some practical modifications so it was usable in testing chitterlings.⁷

Another concern raised by the inspectors was that neither a purge limit nor test procedures for the determination of purge are included in NIST Handbook 133. As noted above, the test procedures in Section 2.6. were originally developed for drained weight testing of shrimp and other frozen foods to verify only net weight declarations. OWM agreed to review the test methods used by the state inspectors to see if the current test procedure could be revised to make it appropriate for use in testing chitterlings.

Note: The 2005 edition of NIST Handbook 133 was adopted by the Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture for use in testing meat and poultry products in 2008 (see 9 CFR 442.2 "Quantity of Contents Labeling and Procedures and Requirements for Accurate Weights" and 73 FR 52192).

Based on the information presented above, state weights and measures inspectors need to have a test procedure tailored to the testing of chitterlings in NIST Handbook 133 so inspectors can test in retail stores in response to consumer complaints. States do not have access to packing plants located in other states or countries; therefore, they rely on tests at retail or wholesale locations for their investigations. Testing at the retail level (the end point in distribution) allows inspectors to look at a variety of packers to ensure fair competition, and state inspectors are able to discover changes to the product that may occur during distribution from environmental factors, mishandling or tampering of product. Packers and consumers both benefit from having retail marketplace surveillance to maintain equity and fair competition.

⁷ In November 2010, San Diego County District Attorney's Office filed a complaint and stipulated judgment against Clougherty Packing, LLC for \$451,564. Clougherty settled without admitting fault or liability. The case resulted from a consumer complaint to the California Department of Measurement Standards (CDMS) regarding large amounts of purge from chitterlings. More than 60,000 packages of chitterlings were ordered off-sale after samples were tested and shortages ranging from 31 % to 45 % were found.

Net Weight versus Purge

A review of test results from several states and a university indicates that a majority of the packaged chitterlings tested comply with the average and individual package requirements for net weight as required under NIST Handbook 133. Currently, the handbook does not include limits on the amount of purge from chitterlings. State weights and measures officials follow a 20 % limit published by the USDA. Determining the amount of purge goes beyond net weight testing. Several inspectors reported the test procedure to conduct the purge tests in Section 2.6. had to be modified. Inspectors asked for technical assistance in evaluating whether their modifications to the current procedure were acceptable and requested revisions to accommodate purge testing be made to NIST Handbook 133 so the test procedure would be uniform and accepted nationally.

USDA established the limits on purge to ensure that packages of chitterlings contain a certain percentage of meat. Currently, the USDA policy sets the upper limit of purge at 20 % of the labeled quantity. Recent inspections conducted by several states and a comprehensive study by a university found that packages of frozen chitterlings from several packers (including one supplier from Europe) contain purge in the range of $\pm 30\%$ to $+50\%$. The following results were obtained using the current test procedures based on Section 2.6. Inspections by state weights and measures inspectors in California, Florida, Mississippi and Louisiana, which were carried out in response to consumer complaints about high amounts of purge in packages of chitterlings, revealed the following: (1) In October 2010, weights and measures inspectors from Louisiana tested samples from 10 lots (totaling more than 7740 containers) and found an average purge of 49 %; (2) In October 2010, Florida weights and measures inspectors tested samples from a lot of 324 packages and found an average purge 33 %; and (3) In November 2010, the San Diego District Attorney announced a settlement in an investigation of a consumer complaint. In this case weights and measures inspectors had tested lots totaling 60,588 packages from one packer and had found shortages of 31 % to 45 %.

Several chitterling packers have expressed concerns about the appropriateness of the test procedures used by inspectors and about the high purge levels inspections had uncovered. One packer/retailer commented that it was difficult for his company to compete against many other packers because chitterlings are not routinely tested for compliance with purge limits. Several packers shared in-plant test data from their plants showing they target for a purge of 7 % to 10 % on in-plant tests. These packers reported that if they do not target for low purge levels in their testing, they see a dramatic jump in consumer complaints about excessive purge.

The data from one university study of five packers indicates that the purge from sample lots (total $5 \times 30 = 150$ packages) ranged from 26.9 % to 57.3 % or from about 7 % to 37 % higher than the 20 % limit set by the USDA. The data was obtained in laboratory conditions and showed significant differences in purge amounts. The differences are likely caused by packers having different pre and post freezing purge targets and variations in test equipment and drain procedures. There are also likely to be different fill target weights, weighing devices (e.g., different scale divisions), and other unique packaging procedures or freezing processes.

Variations in the standard deviations found on packages produced by the different packers ranged from 1.7 % to 5.2 %. The results include samples with purge rates as low as 18 % and as high as 66 %. The range of net contents is so wide that it would likely frustrate the ability of consumers to estimate how many packages to purchase to obtain a specific amount of chitterlings for use in a recipe, to determine serving size, and to make value comparisons. Even packages from the same packer had a wide range of purge values.

Packer	a	b	c	d	e
Average Purge*	34.2 %	57.3 %	26.9 %	33.6 %	27.9 %
Standard Deviation (σ)	1.9	3.2	1.7	5.2	2.4
Range of Results ($\pm 3 \sigma$)	28 % to 40 %	47 % to 66 %	21 % to 31 %	18 % to 49 %	20 % to 35 %
*Data is percentage purge based on labeled quantity from a 2008 study conducted by Dr. Ken Prusa, Professor, Iowa State University of Science and Technology on samples from five packers of 30 packages of frozen chitterlings using the procedures in Section 2.6. of NIST Handbook 133. Published with permission.					

Thawing Procedures

Several inspectors requested guidance on how to efficiently thaw chitterlings to improve the proficiency of their tests and accuracy of the results. Inspectors stated the thawing process for large frozen packages (e.g., 2.2 kg, 5.0 kg [5 lb and 10 lb] packages of frozen product) is time consuming regardless of the product. Access to large quantities of hot water and sink space are significant problems in many locations (the National Marine Fisheries, an agency of the U.S. Department of Commerce has indicated that their inspectors face similar challenges when they conduct inspections of imported seafood). A few state inspectors reported that they have to let sample packages of chitterlings sit in room temperature water for long hours or in a refrigerator for several days to allow them to thaw. Another packer reported that its tests had not revealed any correlation between thaw time and increased purge. Still, reviewing the current thawing procedures to identify ways to increase uniformity, repeatability, and accuracy may be beneficial.

The thawing procedure in NIST Handbook 133 specifies that the water temperature be maintained between 23 °C to 29 °C (75 °F to 85 °F). Some inspectors asked if the temperatures of the water increases purge or if the temperature of the chitterlings at the time they are drained impacts purge levels. One packer has conducted some preliminary testing to explore that question. The results of those tests indicated that the water temperature used to thaw the chitterlings probably does not increase purge results, however, the water must not be too hot because it may cause the proteins in the chitterlings to denature. The packer's tests indicated the temperature of the chitterlings at the time they are drained may increase purge values. The data showed that warm chitterlings (e.g., room temperature or about 70 °F) lost about 10 % more purge than chitterlings cooled to 40 °F before draining. Because the packer's data is limited more study is needed to better understand this aspect of purge testing.

Draft Proposed Section 2.7. for a Chitterling (and Beef Tripe) Test Procedure

Introduction

This test procedure was originally developed for the Food and Drug Administration (FDA) in the 1960s for its use in testing frozen blocks of seafood and other products. Over the years it has been modified for use in testing a variety of products including frozen seafood and glazed chicken breasts. Based on a review of the USDA procedures and information received from several weights and measures inspectors and chitterling packers, several changes are proposed for Section 2.6. “Determining the Net Weight of Encased-in-Ice and Ice Glazed Products” to make it appropriate for use in testing frozen chitterlings when determining their net weight and the amount of purge in the package.

The draft test procedure can be used in USDA inspected packing plants and in wholesale and retail locations by weights and measures officials to determine if it is practical and to identify additional areas for improvement. For the test procedure to be added to NIST Handbook 133, it must be adopted by the NCWM.⁸ Before submitting any proposal to the NCWM, support from both packers and weights and measures officials must be garnered. One goal of this paper is to raise the question of whether or not the 20 % purge limit set by USDA is appropriate for previously frozen chitterlings. Based on the information presented below, the current purge value of 20 % may not be appropriate for use in testing frozen chitterlings. However, increasing it to 30 % would not dramatically increase compliance levels. Before an appropriate purge value for frozen chitterlings can be recommended, data from tests of packages from many packers must be collected using a uniform test procedure.

The OWM recommends the formation of a work group to review of the draft chitterling test procedure. The group should consider investigating some of the other issues mentioned above, including developing and sharing good packing practices and alternative thawing procedures. Once a uniform test method and good packing practices are in place, data could then be collected to determine if a different purge limit for frozen chitterlings should be considered. OWM will use the draft test procedure to provide training to interested state officials and will recommend that states use it in investigations of consumer complaints. OWM will also encourage states to share their experience with the draft procedure so it can be improved, and invite them to share test data with the group so the data can be used to evaluate the test procedure and existing purge limit.

⁸ The NCWM is a not-for-profit corporation dedicated to developing the U.S. standards for weights and measures. The NCWM is open to all interested parties and among its membership are representatives of the American Meat Institute and Food Marketing Institute and many of their member companies.

Modifications of Section 2.6. Net Weight of Encased-In-Ice and Ice Glazed Products for Use with Chitterlings

1. As with other foods where drained weight testing is used, the weight-per-volume of solids is approximately the same as the fluid poured from the package so all of the samples must be opened. For this reason, the use of an average tare weight or an average purge value cannot be used to compute package errors.

Change: Add the following note to the test procedure in NIST Handbook 133:

Note: All of the packages in the sample must be opened. This is because the purge from each package may vary significantly. Another reason is that the weight-per-volume of solids is often nearly equal to the weight of the liquid poured from the package. For these reasons an average tare weight or average purge value calculated using just a few packages would not be representative of the sample.

2. A Weights and Measures Inspector reported that a 300 mm (12 in) sieve could hold 2.2 kg (5 lb) of chitterlings when tilted at 30 degrees but several measurements were required when larger containers were tested. It was suggested that a note be added to the test procedure to clarify that multiple measurements were permitted and to alert inspectors that some sieves may not hold the entire contents of larger packages.

Change: Add the following:

Note: If the amount of chitterlings in the package exceeds the capacity of the sieve, divide the solids evenly among several sieves of the same dimensions or make multiple determinations using a single sieve.

Addressing Differences from Current Field Use

3. **Packed or Unpacked** – Section 2.6. requires products to be unwrapped so they can be thawed in a water bath. The temperature is typically maintained using a constant flow of warm water. In discussions with state weights and measures inspectors who have tested chitterlings, we learned that they thaw the chitterlings while they are still packaged so they can obtain an accurate measurement of the purge from each package. State inspectors also report that allowing selected frozen sample packages to thaw for several days at 4 °C (40 °F) and then using a warm water bath to complete the process is a practical alternative that should be recognized when limited time and other resources exist (e.g., a sample size of 48 packages is needed to test a large inspection lot and there are limited sinks and water supplies at the point of inspection.)

Change: Revise the procedure so frozen chitterlings can be thawed in the package and add a statement indicating that alternative thawing procedures may be used. Also, delete reference to the wire mesh basket used to hold unwrapped products under water while preventing the loss of product solids.

Associated with this provision is a note which reads that “Direct immersion does not result in the product absorbing moisture because the freezing process causes tissue to lose its ability to hold water.” If the procedure is modified to allow frozen chitterlings to be thawed in the package the note is no longer relevant and it should be removed.

Change: Delete the NOTE.

4. **Thawing Procedure** – Inspectors have reported difficulties using the thawing techniques prescribed in Section 2.6. due to the size of the containers, sample sizes, availability of an adequate size water bath, and supply of hot water. The draft procedure calls for the packages to be immersed in a water bath. But, when the sample is made up of 4.0 kg (10 lb) buckets, many sinks cannot hold more than a few containers. To determine if the center of a bucket has thawed an inspector recommended that a dowel rod be inserted gently into the container to determine if there is any remaining frozen product or chunks of ice.

Change: Amend the section to allow for the use a sink, ice chest or other large vessel. Add a note for the inspector to use a dowel rod to determine if the product has completely thawed and that there are no chunks of ice in the container.

5. A packer suggested guidance to help inspectors decide when chitterlings are “thawed out.” The recommendation was to add a statement that a “thawed condition” is one in which no ice crystals are observed or felt in or on the chitterlings.

Change: Insert a note that the chitterlings are thawed when it is determined by touch that they are not rigid and no ice crystals are observed or felt within or on their outside surface.

6. **Drain Angle** – The techniques that inspectors use to tilt the sieve to drain chitterlings (and other frozen products) vary widely which may affect test results. The current procedure specifies that the sieve be tilted at a 30 degree angle for two minutes. To address this issue, a tilt-angle block was fabricated so that it raises a 304 mm (12 in) sieve to the correct height of 152 mm (6 in) to achieve a 30 degree angle. (See figure 1 on page 17 for an example). The angle block was designed for use with both the 203 mm (8 in) and 304 mm (12 in) sieves and at other drain angles. A drawing of one type of angle block is available upon request from OWM to allow for local construction.

Change: Add Figure 1 (page 17) to the test procedure and provide access to drawings of one type of tilt-angle block so it can be fabricated locally. Include the following note:

Note: Other methods may be used for draining as long as the correct drain angle is used.

7. **USDA Policy on Chitterling Purge** – Several inspectors pointed out that NIST Handbook 133 does not include a purge limit. It was suggested that the current USDA limit on purge be added to NIST Handbook 133.

Change: Add a requirement to NIST Handbook 133 to include the USDA 20 % limit on purge.

8. **USDA Policy on Chitterling Purge** – The USDA procedure for purge tests conducted inside a packing plant is to calculate it using the individual labeled quantity and actual net weight of the package, not the gross weights of the individual packages (standardized). USDA policy also only applies an average requirement to purge tests. No Maximum Allowable Variation is applied to the individual purge results. This USDA policy must be added to the NIST Handbook 133 procedure to ensure consistent testing and application of the purge requirements between the packing plant and the field.

Change: Add a step in the procedure to calculate purge values for each package using the quantity labeled on the package.

10. **Other Changes** – Amend the procedure to explain how to determine purge values and net weight requirements. These additions are incorporated in the following draft of 2.X.

A draft procedure for determining the net weight and percent of purge of chitterlings is presented below. If the procedure is added to NIST Handbook 133, it will be added as a new Section 2.7. in Chapter 2. “Test Procedures – For Packages Labeled by Weight – Gravimetric Testing.” Worksheets for use in testing chitterlings with both the Category A and Category B Sampling Plans are included.

Draft NIST Handbook 133 – Chitterling Test Procedure 2.7.

Because of the unique properties of chitterlings, they require special test methods to ensure the integrity and consistency of the test.

2.7. Determining the Net Weight and Percent of Purge in Packages of Fresh and Frozen Chitterlings

2.7.1. Test Equipment

- Scale or balance and mass standards (the standards are used to verify the accuracy and repeatability of the weighing device).
- 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).
- Sink (e.g., water bath, ice chest) or other receptacle of suitable size to hold the packages for thawing and water source and hose with fresh water that can be maintained at a temperature between 23 °C to 29 °C (75 °F to 85 °F) (for thawing plastic bags or buckets of chitterlings).

An alternative thawing procedure for packages requires access to a refrigerator that must be available for storing sample packages for several days to thaw.

- Stainless Steel Sieve(s) and Drain Pan(s) - Number 8 mesh, 203 mm (8 in) or 304 mm (12 in). Use is based on the labeled net weight of the package under inspection.
- Stopwatch (to measure drain periods).
- Knife or box cutter (to open packages).
- Waterproof marking pen (for numbering the packages).
- Disposable (non-latex) gloves.
- Paper towels (drying sieve drain pan, packages and work area).
- Large plastic bags (to hold product emptied from packages).
- Plastic rod (to insert into buckets of chitterlings to determine if the product is thawed and to ensure there are no chunks of ice remaining).

2.7.2. Test Procedure for Net Weight and Purge Determination for Fresh and Frozen Chitterlings.

This procedure is used to determine (1) the net weight and (2) the purge in packages of fresh and frozen chitterlings. The purge determination procedure requires the destructive testing of all of the sample packages.

1. Follow Sections 2.3.1. Define the Inspection Lot, 2.3.2. Select Sampling Plans (use the “Category A” Sampling Plans in Table 2-1 if the testing is outside of a USDA inspected packing facility or, the “Category B” Sampling Plan in Table 2-2 if the testing is inside a USDA inspected packing facility), 2.3.3. Record Inspection Data, and 2.3.4. Random Sample Selection.
 - Select the random sample of packages.
 - Dry the sample packages and number each (e.g., 1-12) using a waterproof marker.
 - Record the Product Brand, Inspector Name, Labeled Net Weight (top of Column A), Packer Identity, Lot Code, Number of Unreasonable Errors, MAV from Table 2-9, and the Unit of Measure of the scale used for weight determinations on the worksheet. The appropriate information can be transferred to an official inspection report at the conclusion of the inspection. The worksheet should be added to the official record of the inspection.

2.7.2.1. Net Weight and Purge Determinations

Follow these procedures to determine the net weight and amount of purge from chitterlings.

2.7.2.1.1. Test Procedure for Determining the Net Weight and Purge from Fresh and Frozen Chitterlings.

1. Determine the Gross Weight of each sample package (record in Column B).
2. Determine the tare weight of the sieve drain pan (record in Drain Pan Tare above Column F).

Frozen Chitterlings

3. Fully immerse the unopened package of frozen chitterlings in a water bath maintained at a temperature between 23 °C to 29 °C (75 °F to 85 °F).

Note: An alternative approach to thawing large frozen packages (e.g., 5 kg [10 lb] plastic pails) is to randomly select [mark them to be held for inspection] the

sample packages and place them in a refrigerator for partial thawing over several days and then carrying out the final thawing using the water bath technique.

Note: If the products are to be placed in refrigerated storage for several days for partial thawing, segregate them from other product inventory and mark each container with an identifier to allow the inspector to ensure that they were the samples selected for testing (mark both lid and container on buckets) when the inspection is resumed after the thawing process. Also, mark the packages with a conspicuous notice that they are being held for inspection.

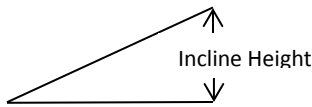
4. Maintain a continuous flow of water into the bath to keep the temperature within the specified range until the chitterlings are thawed. The chitterlings are thawed when it is determined by touch that they are not rigid and no ice crystals are observed or felt within or on their outside surface.

Note: for buckets insert a plastic rod into the chitterlings to determine if the product is thawed and to ensure there are no chunks of ice remaining.

Fresh and Frozen Chitterlings

5. Draining the Chitterlings: depending on the availability of a sink and work space and the inspector's preference, use the procedures in either Method a. or Method b. to drain the chitterlings.⁹ Refer to the Table for the appropriate size sieve to use based on the labeled net weight on the package.

⁹ If carried out with proficiency, which comes with practical experience, the procedures in Method a. and Method b. will provide identical results. The procedure in Method b requires additional steps to calculate the Purged Net Weight but some inspectors have indicated that they prefer Method b. because the drain time and product is easier to control (because the chitterlings in the sieve may continue to drain). Regardless of the method used the inspector must handle the product carefully but quickly to avoid errors that may void the test. Also, some inspectors often use a waste container to collect the package liquids so that all of the product can be returned the package for subsequent return to the packer. Other inspectors report that some retailers do not want the product repackaged so the liquids are drained into a sink, the solids discarded, and the disposition reported on the inspection report.

Table 1.			
Labeled Net Weight	Sieve Diameter	30 Degree Tilt from Horizontal	Incline Height
If more than 453 g (1 lb) use a:	300 mm (12 in)		175 mm (6.9 in)
If less than 453 g (1 lb) use a:	203 mm (8 in)		116.8 mm (4.6 in)
<ul style="list-style-type: none"> This procedure requires that the sieve and drain pan be cleaned and dried after each use. It is a good measurement practice to obtain the dry weights of both the sieve and pan and recheck those weights periodically during the test to make sure the cleaning and drying procedures are efficient. If the amount of chitterlings in the package exceeds the capacity of the sieve, divide the solids evenly among two or more sieves of the same dimensions or make multiple determinations using a single sieve. Exercise care when transferring the chitterlings into the sieves to avoid spilling liquid which can void the test. 			

Method A. Place a sieve over a sink or waste collection container.⁹ Pour the chitterlings into the sieve and distribute them over the surface of the sieve with a minimum of handling. Hold the sieve firmly and incline it 30 degrees (see Figure 1 for an example of a tilt block for use with a sink drain set at 30 degrees) to facilitate drainage, then start the stop watch and drain for exactly two-minutes. At the end of the drain time immediately transfer the chitterlings to a Drain Pan for weighing. Determine the Purged Net Weight of the chitterlings using the following formula and Record in Column F of the worksheet.

$$\text{Drained Chitterlings and Drain Pan} - \text{Drain Pan Tare} = \text{Purged Net Weight}$$

Method B. Place a sieve on its Drain Pan. Pour the chitterlings into the sieve and distribute them over the surface of the sieve with a minimum of handling. Hold the sieve firmly and incline it 30 degrees to facilitate drainage, then start the stop watch and drain for exactly two-minutes. At the end of the drain time immediately transfer the Drain Pan with the Purged Liquid to the scale for weighing. Dry the empty package to determine its tare weight and enter it in Column C. Determine the Purged Net Weight of the chitterlings using the following formula and Record in Column F of the worksheet.

$$(\text{Gross Weight of Package} - \text{Package Tare Weight}) - (\text{Weight of Purged Liquid \& Drain Pan} - \text{Drain Pan Tare}) = \text{Purged Net Weight}$$

$$(\text{Column B} - \text{Column C}) - (\text{Weight of Purged Liquid \& Drain Pan} - \text{Drain Pan Tare}) = \text{Purged Net Weight}$$

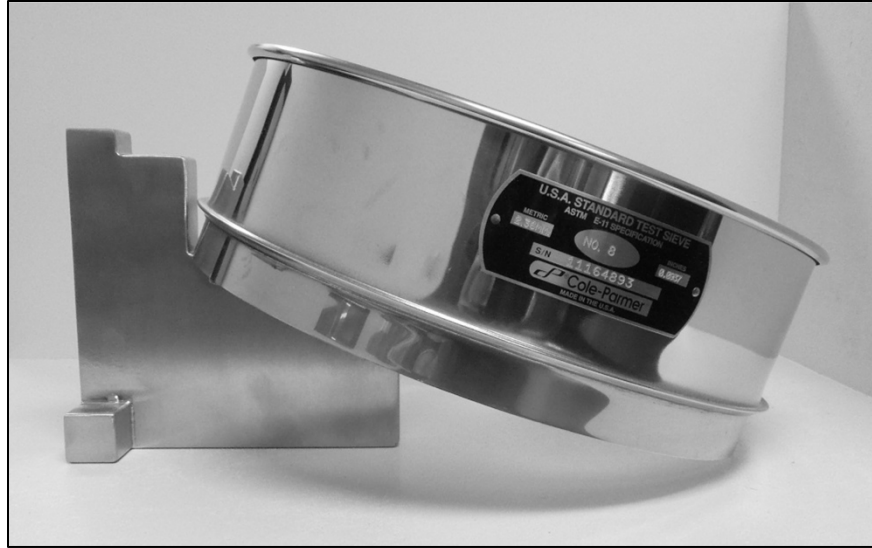


Figure 1. Tilt Block set at 30 degrees

- Calculate Purge using the formula shown below (use the labeled net weight in Column A and NOT the gross weight of the package in Column B) and record the result in Column G of the Worksheet.

$$\text{Purge in \%} = (\text{Labeled Weight} - \text{Purged Net Weight}) \div \text{Labeled Weight} \times 100$$

$$\text{Purge in \%} = \text{Column A} - \text{Column F} \div \text{Column A} \times 100$$

Example: The labeled net weight is 5 lb and the Purged Net Weight is 4.19 lb

$$5 \text{ lb} - 4.19 \text{ lb} = 0.81 \text{ lb} \div 5 \text{ lb} = 0.162 \times 100 \% = 16.2 \% \text{ purge}$$

- Dry the empty package and determine its tare weight (record in Column C of the worksheet.)
- Subtract the individual Package Tare Weight from the individual Package Gross Weight to obtain the Actual Package Net Weight (record in Column D of worksheet). Do not use an Average Tare Weight. Use the formula:

$$\text{Actual Package Net Weight} = \text{Gross Weight} - \text{Tare Weight}$$

$$\text{Actual Package Net Weight} = \text{Column B} - \text{Column C}$$

- Subtract the Actual Package Net Weight from the Labeled Net Weight (record in Column E of worksheet). Use the formula:

Package Error = Labeled Net Weight – Actual Package Net Weight

Package Error = Column A – Column D

Repeat for all packages in the sample.

Note: The determination of compliance with the net weight and purge requirements are carried out concurrently. The calculation of the average net weight and average purge is completed after all of the packages are opened and all purge amounts are obtained. The sample must pass both the net weight and purge tests to comply with this section.

2.7.3. Evaluations of Results – Compliance Determinations

1. Net Weight

- a. **Individual Package Requirement:** If there are negative package errors, determine if any of the values exceed the Maximum Allowable Variation (MAV) for the packaged quantity in NIST Handbook 133, Appendix A, Table 2-9. “U.S. Department of Agriculture, Meat and Poultry Groups and Lower Limits for Individual Packages” (i.e., if the labeled net weight is more than 3 lb up to 10 lb then the MAV = 42.5 g (0.094 lb) 1.5 oz).
 - If a package error exceeds the MAV, mark it as “Failed” in the MAV Fail column.
 - Count the number of packages that exceed the MAV. If the number of packages that exceed the MAV is greater than the number allowed in NIST Handbook 133, Appendix A, Tables 2-1. Sampling Plans for Category A or Table 2-2. Sampling Plans for Category B, the sample fails. Mark the sample as “Failed” in the Net Weight Compliance section of the worksheet.
 - If the sample passes the Individual Package Requirement, apply the Average Error Requirement.
- b. **Average Error Requirement:** Sum the package errors in Column E and enter the value in E1 – Total Error. Divide the value in E1 by the Sample Size (n) to obtain an Average Error and enter the value in E2. If the Average Error (E2) is a positive number, the sample passes. Go to the Net Weight Compliance Section and mark the sample as “Passed.”
 - If the Average Error (E2) is a negative number, calculate the sample standard deviation of the package errors (Column E) and enter it in the block provided in the Net Weight Compliance section.
 - Use the Sample Correction Factor (SCF) to calculate the Sample Error Limit (SEL).

Sample Error Limit (SEL) = Sample Standard Deviation × Sample Correction Factor

- Disregarding the signs,
 - if the Average Error (E2) is larger than the SEL, the sample fails. Mark it “Failed” in the Net Weight Compliance Section of the worksheet,
- or
- if the Average Error is less than the SEL, the sample passes. Go to the Net Weight Compliance Section and mark the sample as “Passed.”

2. Purge

Follow these procedures to determine the amount of purge from the chitterlings. Apply the Average Requirement in Section 2.3.7.2. to the purge to determine if the sample passes or fails the requirement. The Average Adjusted Purge (AAP) for the sample shall not exceed 20 % of the labeled weight. The Maximum Allowable Variations (Lower Limits for Individual Packages) in NIST Handbook 133, Appendix A, Table 2-9. are not applied in the purge test.

- Sum the purge values in Column G and enter the value in G1 – Total Purge. Divide the value in G1 by the Sample Size (n) to obtain an Average Purge and enter the value in G2. If the Average Purge (G2) is less than or equal to 20 %, the sample passes. Go to the Purge Compliance Section and mark the sample as “Passed.”
- If the Average Purge is greater than 20 %, calculate the Sample Standard Deviation of the values in Column G and enter it in the block provided in the Purge Compliance section.
- Use the Sample Correction Factor (SCF) to calculate the Purge Sample Error Limit (PSEL) in percent.
- Subtract the PSEL from the Average Purge (G2) to obtain an Adjusted Average Purge (AAP) and enter that value in G3.
- Pass or Fail
 - If the AAP (G3) is greater than 20 %, the sample fails. Enter the Purge Value (G3) in the Purge Compliance section and mark the sample as “Failed.”

or

- if the AAP (G3) is 20 % or less, the sample passes. Enter the Purge Value (G3) in the Purge Compliance section and mark the sample as “Passed.”

INSPECTOR: <i>S. INSPECTOR</i>		CHITTERLING WORKSHEET							
DATE: <i>July 12, 2014</i>		NET WEIGHT & PURGE DETERMINATIONS							
PACKER: <i>PACKER INC. 1000 ROADWAY PACKINGTOWN, USA</i>		LOT CODE: <i>A342012</i>			DRAIN PAN TARE:		UNIT OF MEASURE: <i>lb</i>		
		BRAND: <i>ALLBRAND</i>			<i>0.997 lb</i>				
PACKAGE NUMBER	A	B	C	D	E	IF ERROR EXCEEDS MAV = FAIL	F	G	
	LABELED NET WEIGHT	PACKAGE GROSS WEIGHT	PACKAGE TARE WEIGHT	ACTUAL PACKAGE NET WEIGHT B - C =	PACKAGE ERROR D - A =		PURGED NET WT WEIGHT OF DRAINED CHITTERLINGS (OR PURGED LIQUID) AND DRAIN PAN - DRAIN PAN TARE =	PURGE % $\frac{(A - F) \times 100}{A}$	
1	<i>5 lb</i>	<i>5.130</i>	<i>0.032</i>	<i>5.098</i>	<i>0.098</i>		<i>4.19</i>	<i>16.2</i>	%
2		<i>5.160</i>	<i>0.033</i>	<i>5.127</i>	<i>0.127</i>		<i>4.21</i>	<i>15.8</i>	%
3		<i>5.012</i>	<i>0.032</i>	<i>4.980</i>	<i>-0.020</i>		<i>4.17</i>	<i>16.6</i>	%
4		<i>5.170</i>	<i>0.034</i>	<i>5.136</i>	<i>0.136</i>		<i>4.20</i>	<i>16.0</i>	%
5		<i>5.020</i>	<i>0.033</i>	<i>4.987</i>	<i>-0.013</i>		<i>4.18</i>	<i>16.4</i>	%
6		<i>5.102</i>	<i>0.032</i>	<i>5.070</i>	<i>0.070</i>		<i>4.22</i>	<i>15.6</i>	%
7		<i>5.051</i>	<i>0.033</i>	<i>5.018</i>	<i>0.018</i>		<i>4.24</i>	<i>15.2</i>	%
8		<i>5.116</i>	<i>0.032</i>	<i>5.084</i>	<i>0.084</i>		<i>4.20</i>	<i>16.0</i>	%
9		<i>5.120</i>	<i>0.034</i>	<i>5.086</i>	<i>0.086</i>		<i>4.19</i>	<i>16.2</i>	%
10		<i>5.023</i>	<i>0.032</i>	<i>4.991</i>	<i>-0.009</i>		<i>4.20</i>	<i>16.0</i>	%
11		<i>5.122</i>	<i>0.032</i>	<i>5.090</i>	<i>0.090</i>		<i>4.26</i>	<i>14.8</i>	%
12		<i>5.020</i>	<i>0.033</i>	<i>4.987</i>	<i>-0.013</i>		<i>4.18</i>	<i>16.4</i>	%
NUMBER OF UNREASONABLE ERRORS ALLOWED: NONE Table 2-9. MAV: <i>0.0094 lb</i>		E1 - TOTAL ERROR			<i>0.054 lb</i>	G1 - TOTAL PURGE		<i>191.2</i>	%
		E2 - AVERAGE ERROR (E1 ÷ n =)			<i>0.0045</i>	G2 - AVERAGE PURGE (G1 ÷ n =)		<i>15.9</i>	%
		G3 - ADJUSTED AVERAGE PURGE (G2 - PSEL =)							%
<p>NET WEIGHT COMPLIANCE: (1) If any of the minus package errors (see Column E) exceed the MAV, the sample fails. (2) If none exceeds the MAV and the Average Error (E2) is a positive number, the sample passes. (3) If the Average Error (E2) is a minus number, calculate the sample standard deviation and enter it below. (4) Use the Sample Correction Factor (SCF) to calculate the Sample Error Limit (SEL). (5) Disregarding the signs, (a) if the Average Error (E2) is larger than the SEL, the sample fails or (b) if the Average Error is less than the SEL the sample passes.</p> <p>STANDARD DEVIATION: 0.0601×0.635 (SCF) = <i>0.0382</i> (SEL) PASSED \checkmark FAILED</p>									
<p>PURGE COMPLIANCE: MAVS ARE NOT APPLIED IN THE PURGE TEST (1) If the Average Purge Error (G2) is less than or equal to 20 %, the sample passes. (2) If the Average Purge Error is greater than 20 %, calculate the sample standard deviation and enter it below. (3) Use the Sample Correction Factor (SCF) to calculate the Purge Sample Error Limit (PSEL) in percent. (4) Subtract the PSEL from the Average Purge (G2) to obtain an Adjusted Average Purge (AAP) and enter that value in G3. (5)(a) If the AAP (G3) is greater than 20 %, the sample fails or (b) if the AAP (G3) is 20 % or less, the sample passes.</p> <p>STANDARD DEVIATION: 2.420×0.635 (SCF) = <i>1.536</i> (PSEL) PURGE (G3) <i>18.83 %</i> PASSED \checkmark FAILED</p>									
<p>SAMPLE DISPOSITION: <i>Lot passes on both criteria.</i></p>									

INSPECTOR: <i>S. INSPECTOR</i>		CHITTERLING WORKSHEET FOR USE INSIDE A USDA INSPECTED PACKING PLANT								
DATE: <i>July 14, 2014</i>		NET WEIGHT & PURGE DETERMINATIONS								
PACKER: <i>PACKER INC.</i> <i>1000 ROADWAY</i> <i>PACKINGTOWN, USA</i>		LOT CODE: <i>A34526</i>		DRAIN PAN TARE: <i>0.997 lb</i>		UNIT OF MEASURE: <i>lb</i>				
BRAND: <i>ALLBRAND</i>										
PACKAGE NUMBER	A	B	C	D	E	IF ERROR EXCEEDS MAV = FAIL	F	G		
	LABELED NET WEIGHT	PACKAGE GROSS WEIGHT	PACKAGE TARE WEIGHT	ACTUAL PACKAGE NET WEIGHT B - C =	PACKAGE ERROR D - A =		PURGED NET WT DRAINED CHITTERLINGS (OR PURGED LIQUID) AND PAN - DRAIN PAN TARE =	PURGE % $\frac{(A - F) \times 100}{A}$		
1	5	5.130	0.032	5.098	0.098		4.19	16.2	%	
2		5.160	0.033	5.127	0.127		4.21	15.8	%	
3		5.012	0.032	4.980	-0.020		4.17	16.6	%	
4		5.170	0.034	5.136	0.136		4.20	16.0	%	
5		5.020	0.033	4.987	-0.013		4.18	16.4	%	
6		5.102	0.032	5.070	0.070		4.22	15.6	%	
7		5.051	0.033	5.018	0.018		4.24	15.2	%	
8		5.116	0.032	5.084	0.084		4.20	16.0	%	
9		5.120	0.034	5.086	0.086		4.19	16.2	%	
10		5.023	0.032	4.991	-0.009		4.20	16.0	%	
NUMBER OF UNREASONABLE ERRORS ALLOWED: NONE Table 2-9. MAV: 0.094 lb		E1 - TOTAL ERROR				0.057 lb	G1 - TOTAL PURGE		160	%
		E2 - AVERAGE ERROR (E1 ÷ n =)				0.057 lb	G2 - AVERAGE PURGE: (G1 ÷ n =)		16	%
NET WEIGHT COMPLIANCE: (1) If any of the minus package errors (see Column E) exceed the MAV the sample fails. (2) If none of the package errors exceeds the MAV and the Average Error (E2) is a positive number the sample passes. (3) If the Average Error (E2) is a minus number the sample fails. PASSED: <input checked="" type="checkbox"/> FAILED:										
PURGE COMPLIANCE: MAVS ARE NOT APPLIED IN THE PURGE TEST (1) If the Average Purge Error (G2) is less than or equal to 20 %, the sample passes. (2) If the Average Purge Error (G2) is greater than 20 %, the sample fails. PURGE: 16 % PASSED: <input checked="" type="checkbox"/> FAILED:										
SAMPLE DISPOSITION: <i>Approved for sale.</i>										

BLANK FORMS FOR CATEGORY A AND CATEGORY B SAMPLING
PLANS ARE PROVIDED ON THE FOLLOWING PAGES

INSPECTOR:		CHITTERLING WORKSHEET								
DATE:		NET WEIGHT & PURGE DETERMINATIONS								
PACKER:		LOT CODE:				DRAIN PAN TARE:		UNIT OF MEASURE:		
		BRAND:								
PACKAGE NUMBER	A	B	C	D	E	IF ERROR EXCEEDS MAV = FAIL	F	G		
	LABELED NET WEIGHT	PACKAGE GROSS WEIGHT	PACKAGE TARE WEIGHT	ACTUAL PACKAGE NET WEIGHT B - C =	PACKAGE ERROR D - A =		PURGED NET WT WEIGHT OF DRAINED CHITTERLINGS (OR PURGED LIQUID) AND DRAIN PAN - DRAIN PAN TARE =	PURGE % $\frac{(A-F) \times 100}{A}$		
1									%	
2									%	
3									%	
4									%	
5									%	
6									%	
7									%	
8									%	
9									%	
10									%	
11									%	
12									%	
NUMBER OF UNREASONABLE ERRORS ALLOWED: Table 2-9. MAV:			E1 - TOTAL ERROR				G1 - TOTAL PURGE		%	
			E2 - AVERAGE ERROR (E1 ÷ n =)				G2 - AVERAGE PURGE (G1 ÷ n =)		%	
			G3 - ADJUSTED AVERAGE PURGE (G2 - PSEL =)						%	
<p>NET WEIGHT COMPLIANCE: (1) If any of the minus package errors (see Column E) exceed the MAV, the sample fails. (2) If none exceeds the MAV and the Average Error (E2) is a positive number, the sample passes. (3) If the Average Error (E2) is a minus number, calculate the sample standard deviation and enter it below. (4) Use the Sample Correction Factor (SCF) to calculate the Sample Error Limit (SEL). (5) Disregarding the signs, (a) if the Average Error (E2) is larger than the SEL, the sample fails or (b) if the Average Error is less than the SEL the sample passes.</p> <p>STANDARD DEVIATION: × 0.635 (SCF) = (SEL) PASSED FAILED</p>										
<p>PURGE COMPLIANCE: MAVS ARE NOT APPLIED IN THE PURGE TEST (1) If the Average Purge Error (G2) is less than or equal to 20 %, the sample passes. (2) If the Average Purge Error is greater than 20 %, calculate the sample standard deviation and enter it below. (3) Use the Sample Correction Factor (SCF) to calculate the Purge Sample Error Limit (PSEL) in percent. (4) Subtract the PSEL from the Average Purge (G2) to obtain an Adjusted Average Purge (AAP) and enter that value in G3. (5)(a) If the AAP (G3) is greater than 20 %, the sample fails or (b) if the AAP (G3) is 20 % or less, the sample passes.</p> <p>STANDARD DEVIATION: × 0.635 (SCF) = (PSEL) PURGE (G3) PASSED FAILED</p>										
SAMPLE DISPOSITION:										

INSPECTOR:		CHITTERLING WORKSHEET FOR USE INSIDE A USDA INSPECTED PACKING PLANT NET WEIGHT & PURGE DETERMINATIONS WORKSHEET FOR SAMPLE OF 10 PACKAGES – HB 133 CATEGORY B							
DATE:									
PACKER:			LOT CODE:			DRAIN PAN TARE:	UNIT OF MEASURE:		
			BRAND:						
PACKAGE NUMBER	A	B	C	D	E	If ERROR EXCEEDS MAV = FAIL	F	G	
	LABELED NET WEIGHT	PACKAGE GROSS WEIGHT	PACKAGE TARE WEIGHT	ACTUAL PACKAGE NET WEIGHT B – C =	PACKAGE ERROR D – A =		PURGED NET WT DRAINED CHITTERLINGS (OR PURGED LIQUID) AND PAN - DRAIN PAN TARE =	PURGE % $\frac{(A - F) \times 100}{A}$	
1									%
2									%
3									%
4									%
5									%
6									%
7									%
8									%
9									%
10									%
NUMBER OF UNREASONABLE ERRORS ALLOWED: NONE Table 2-9. MAV:			E1 – TOTAL ERROR			G1 –TOTAL PURGE		%	
			E2 – AVERAGE ERROR (E1 ÷ n =)			G2 – AVERAGE PURGE: (G1 ÷ n =)		%	
NET WEIGHT COMPLIANCE: (1) If any of the minus package errors (see Column E) exceed the MAV the sample fails. (2) If none of the package errors exceeds the MAV and the Average Error (E2) is a positive number the sample passes. (3) If the Average Error (E2) is a minus number the sample fails. PASSED: FAILED:									
PURGE COMPLIANCE: MAVS ARE NOT APPLIED IN THE PURGE TEST (1) If the Average Purge Error (G2) is less than or equal to 20 %, the sample passes. (2) If the Average Purge Error (G2) is greater than 20 %, the sample fails. PURGE: PASSED: FAILED:									
SAMPLE DISPOSITION:									