

**Committee Final Reports are considered DRAFT until acknowledged by Council or accepted by the Executive Board**

**COMMITTEE NAME: Safe Handling and Cooking of Roaster Pig Committee**

**DATE OF FINAL REPORT:** *November 1, 2019*

**COMMITTEE ASSIGNMENT:**  Council I  Council II  Council III  Executive Board

**REPORT SUBMITTED BY:** *Erika Stapp-Kamotani and Susan Shelton*

**COMMITTEE CHARGE(S):**

**Issue # 2018-III-023**

1. Identifying best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Developing a comprehensive guidance document for food handlers, particularly caterers, that include detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determining appropriate methods of sharing the committee's work.
4. Reporting the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

**Issue # \_\_\_\_\_**

- 1.
- 2.
- 3.

**COMMITTEE WORK PLAN AND TIMELINE:**

**1. Charge 1: October 10, 2018 - November 19, 2018**

- a) *The Literature Review Subcommittee conducted the literature review to identify existing materials related to Charge 1. Literature review included other countries and species, epidemiological findings from previous outbreaks, scientific reports on temperatures in roaster pigs, and non-expert opinions. The non-expert opinions provided background on what is done and knowledge on the intended audience's thought-process.*
- b) *Identified materials posted to FoodSHIELD page specific to committee for screen sharing and material repository.*
- c) *Dr. James Dickson (Iowa State University, Department of Animal Science) provided his review on roaster pigs and associated food safety issues.*

**2. Charge 2: November 19, 2018 - October 2019**

- a) *The committee divided into two subcommittees to review the articles. The Theoretical Aspects Subcommittee reviewed the articles to glean best practices "in theory," develop the "why this is important," and the "how this relates to the intended audience." The Practical Aspects Subcommittee reviewed the articles to determine what is really done in practice and document the key points (what they did right, what they did wrong).*
- b) *Develop of guidance document outline. Five additional subcommittees were created to draft the language for each section of the outline. These subcommittees are numbered for the section they will be working on. Subcommittee 1 and 2 will develop the purpose of the guideline and relate the document to the intended audience. Each section will comprise about 2% of the document. Subcommittee 3 will review the epidemiological findings associated with the outbreaks. This section will comprise about 24% of the document. Subcommittee 4 will discuss the special considerations of roaster pigs and will comprise approximately 70% of the document. The last Subcommittee will focus on where to go for additional information and will comprise about 2% of the document.*
- c) *Provide scientific basis for key points. In section 4, the Subcommittee will take key points from the literature review and expand on why those actions were good or bad, how those actions impacted food safety, and what are some things to consider if electing to perform certain actions (like resting the pig for an hour after cooking - monitoring the temperature needs to be considered).*
- d) *Draft guidance document created.*
- e) *Review and edit draft guidance document into a final version.*

**3. Charge 3: August 2019 - October 2019**

- a) Determine methods for sharing work.
- b) Develop accessory materials, if needed.

**4. Charge 4: November 2019 - March 2020**

- a) Provide final committee report and prospective committee issues to the Executive Board for review.
- b) Report committee findings at the 2020 Biennial Meeting of the Conference for Food Protection.

**COMMITTEE ACTIVITIES:**

**1. Dates of committee meetings or conference calls:**

- 1.a.** 10/10/18: Introductory Committee conference call: Introduction of members, charges, FoodSHIELD repository, and process; development of working timeline; develop subcommittees to conduct literature review
- 1.b.** 10/17/18: Conference call with Dr. James Dickson (Iowa State University) reviewing cooking handling, cooking, and common practices with preparing roaster pigs
- 1.c.** 11/19/18: Conference call to discuss literature review results and assign subcommittees (Theoretical and Analytical Aspects) to read literature to identify key points for guidance document outline
- 1.d.** 11/27/18 Technical Aspects Subcommittee teleconference to identify highlights from literature review related to outbreaks and historical references linked to food preparation practices of roaster pigs or similar cooking styles
- 1.e.** 12/4/18 Analytical Aspects Subcommittee teleconference to identify highlights from literature review related to the process for handling, preparing, and cooking roaster pigs from farm to fork
- 1.f.** 1/7/19: Conference call rescheduled for 1/28/19 due to federal work stoppage
- 1.g.** 1/28/19: Conference call to review subcommittee work on guidance document key points; Analytical Aspects subcommittee affected by federal work stoppage and was reformed
- 1.h.** 2/11/19: Conference call to adjust the draft outline to incorporate key points identified by subcommittees and new subcommittees formed to create Guidance Document Draft 1
- 1.i.** 3/11/19: Conference call to share rough draft of the guidance document and to create a subcommittee to initiate the review process.
- 1.j.** 4/23/19: Section 4 Subcommittee met to review the draft and provide preliminary comments before sending to the group.
- 1.k.** 5/28/19: Conference call to review Section 4 with the entire group and create subcommittee to perform initial edits to draft guidance document.
- 1.l.** 6/4/19: Guidance Review Subcommittee met to conduct the first review of the draft guidance document and decide on the style to be used.
- 1.m.** 9/23/19: Review complete document with the Committee and discuss edits and comments.
- 1.n.** 10/22/19: Brainstorm of various avenues for sharing and disseminating the guidance document.

**2. Overview of committee activities:**

Committee has used multiple subcommittees to complete a literature review of applicable materials, draft an outline of key points to be covered in final guidance, and begun drafting language. The committee appears to have an effective representation of stakeholders, knowledge, skills, and abilities to produce quality material.

**3. Charges COMPLETED and the rationale for each specific recommendation:**

- a.** Charge 1: Literature review complete and the committee identified existing guidance materials and epidemiological data related to roaster pigs.
- b.** Charge 2: Guidance document drafted and finalized.
- c.** Charge 3: Determined methods to share the document (included in the SHC-RPC 03 Issue).
- d.** Charge 4: Committee findings will be reported at the 2020 Biennial Meeting.

**4. Charges INCOMPLETE and to be continued to next biennium:**

- a.
- b.

**COMMITTEE REQUESTED ACTION FOR EXECUTIVE BOARD:**

**No requested Executive Board action at this time; all committee requests and recommendations are included as an Issue submittal.**

- 1
- 2.

**LISTING OF CFP ISSUES TO BE SUBMITTED BY COMMITTEE:**

- 1. **Issue #1: Report - Safe Handling and Cooking of Roaster Pigs Committee**

**a. List of content documents submitted with this Issue:**

**(a.1) Committee Final Report (see attached PDF)**

**(a.2) Committee Member Roster (see attached PDF)**

**(a.3) Other content documents: Committee Guidance Document - "Whole Roaster Pigs: Guidance for the Safe Handling and Cooking"**

**b. List of supporting attachments:  No supporting attachments submitted**

**(b.1) Committee meeting minutes**

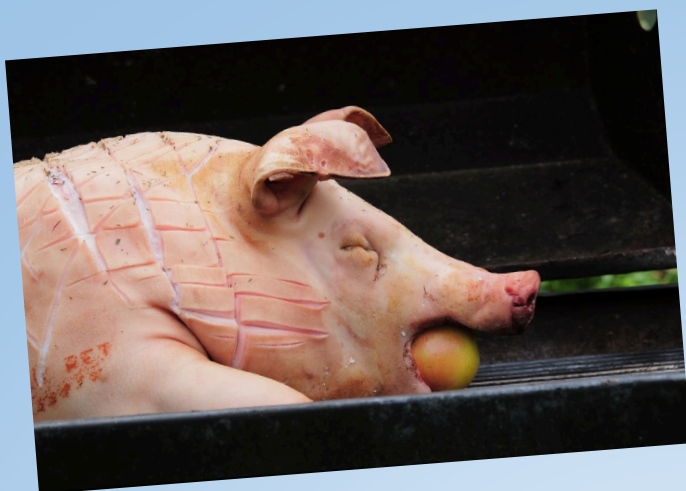
**(b.2) Articles, abstracts, and studies**

**2. Committee Issue #2 - Guidance Document for the Safe Handling and Cooking of Roaster Pigs Approval**

**3. Committee Issue #3 - Sharing of Guidance Document for the Safe Handling and Cooking of Roaster Pigs**

## Committee Roster

Committee Name: Safe Handling and Cooking of Roaster Pigs								
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This document is to help you safely prepare a whole roaster pig. Information is provided on how to safely purchase, store, and prepare this food that is served at events and celebrations to avoid spreading foodborne illness.

# Whole Roaster Pigs

Guidance for the Safe Handling  
and Cooking

Conference for Food Protection Safe Handling  
& Cooking of Roaster Pigs Committee

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## Introduction

This document includes data from past outbreaks from the United States and other countries, existing guidance, and currently accepted best practices to provide guidance for the retail food industry (chefs, caterers, and restaurant owners/employees), fundraiser organizers, community event sponsors, and the general public when handling, preparing, cooking, and serving whole roaster pigs. This document does not supersede any regulatory requirements. The recommendations in this guideline are not regulatory. The information is intended to assist individuals in meeting the FDA Model Food Code regulatory requirements and to produce a safe food.

In the United States, a whole pig is occasionally roasted to celebrate a holiday or special event. Unfortunately, there have been several foodborne illness outbreaks connected to these special events due to improper handling of the roaster pig. Between 2015 and 2017 there were three confirmed *Salmonella* outbreaks associated with roaster pigs in the United States. Public health investigations identified that inadequate handling and inappropriate cooking of the pig contributed to these illness outbreaks. Consumer and food handler preparation techniques are essential to prevent foodborne illness.

Pigs, like other livestock, are a known source of bacteria that can cause human illnesses. These bacteria may be transferred to the carcass during slaughter, processing, and handling. In addition to the presence of bacteria, roaster pigs are large. Ranging in size between 50 to 200 pounds, pigs require careful handling to reduce cross-contamination and proper monitoring of internal temperature to ensure thorough cooking. To address the size of the animal and the desired finished product, there is also a wide range of cooking methods from roasting on an open spit to using an imu pit in the ground, which presents multiple food safety challenges. Therefore, there are numerous opportunities for bacteria to multiply to dangerous levels and cause foodborne illness if mishandled.

## History of Associated Illnesses and Lessons Learned

There is an established history of foodborne outbreaks that have been attributed to events where roaster pigs were cooked and served. Suspected bacteria identified during the outbreak investigations as the likely sources of illness include *Clostridium perfringens*, *Bacillus cereus*, *Escherichia coli*, and *Salmonella*, with *Salmonella* being the most commonly reported cause. This document summarizes published outbreak investigations from several roaster pig outbreaks (Novotny, et al., 1987; Trotz-Williams, et al., 2012; Connecticut Department of Public Health (DPH), 2016; Todd, 2013). The investigations reported on interviews with food handlers regarding their roaster pig preparation and handling processes. The investigations identified concerns regarding handling of roaster pigs that may be contributing factors to these outbreaks, including storage, cooking, cooling, and cross-contamination. This section discusses each contributing factor in more detail, from the perspective of the outbreak. Guidance on how to control for these contributing factors is addressed in the [Preparing the Pig](#) section.

### Improper Storage

Food service workers and food handlers play a critical role in the receipt and storage of whole roaster pigs. Pigs were received a day or more before the event. The roaster pigs were generally between 45 and 65 pounds. The size of the pig presented a challenge for storage, particularly with events held in private homes. Proper storage can have a significant impact on control of these bacteria. Refrigeration units were often too small or not designed for holding a carcass of the size and shape of the roaster pig. In one outbreak, the pig was stored in a home refrigerator with the door partially open, which prevented adequate cold holding of

the pig and, thus, providing ideal temperatures to promote bacterial growth (Novotny, et al., 1987). In an outbreak in England, the pig was stored at room temperature for 38 hours (Todd, 2013). In other outbreaks, the pig was covered with bags of ice, but no indication as to completeness of coverage or monitoring of temperature to ensure the pig was kept at an appropriate temperature (Washington State Department of Health, unpublished, 2016).

Commercial facilities associated with outbreaks often had large mechanical coolers; however, these facilities were often used for storing other cooked or ready-to-eat foods, providing potential for cross-contamination. When roaster pigs were stored in someone's home, ice was commonly used and was found to be inconsistent as a method of temperature control, posing an increased risk of bacteria growth (Washington State Department of Health, unpublished, 2016).

### Inadequate Cooking

The lack of uniformity in pig size and shape presents another risk factor. This requires that temperatures are taken in multiple locations on the carcass to confirm that final cook temperatures are achieved. Most outbreak investigations demonstrated attempts to monitor temperatures with a thermometer. However, there were no records verifying the temperatures or the locations of where the temperature was collected. Due to the lack of records, it was unknown if all parts of the pig reached the minimum cooking temperature or how long it took to achieve the final temperature.

### Improper Cooling

Many of the outbreak investigations identified improper cooling of leftover meat as a likely contributor to the outbreak. In one outbreak, it was noted that food was left to cool on the counters and not placed into refrigeration quickly. Improper cooling exacerbated the growth of bacteria, causing rapid proliferation of the suspected agents *Clostridium perfringens* and *Bacillus cereus* (Trotz-Williams, et al., 2012). Another outbreak with *Clostridium perfringens* occurred in New Zealand. This outbreak was attributed to the 90-minute rest period between cooking and serving (Todd, 2013). Both of these bacteria may survive the cooking process and can produce toxins if the meat is not cooled properly. Reheating the meat will not destroy these toxins.

### Cross-Contamination

The most predominate bacteria noted in the outbreak investigations was *Salmonella* spp. Contributing factors included cross-contamination due to brining, mishandling of large carcasses, and lack of handwashing.

In situations where brining was a concern, large volumes of meat, both large and small cuts, were brined at the same time in the same brine solution, a common practice for large events. Mishandling of these large volumes of brine led to cross-contamination which was enhanced through the improper disposal of the brine solution into sinks that were then improperly cleaned and sanitized afterwards (Connecticut Epidemiologist, 2016). The contamination in the sinks then led to cross-contamination throughout the facility when the sinks were later used for other ready to eat product preparation as well. Ready-to-eat food products were implicated in the outbreak; however, their source of contamination was likely due to the mishandling of the brine and its disposal.



## Preparing the Pig

Roasting a whole pig is no small feat. From purchasing and storage to cooking and serving, the large size complicates every step of the process and provides ample opportunity for things to go wrong. Both USDA and FDA recommend to keep the pig 41°F or colder prior to cooking, to cook the pig to 145°F with a 4-minute rest time ([USDA Cooking Guide](https://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/compliance-guides-index/bacteria-guidance) [also known as Appendix A; under the *Salmonella* heading, <https://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/compliance-guides-index/bacteria-guidance>], [FDA Model Food Code](https://www.fda.gov/food/retail-food-protection/fda-food-code) [<https://www.fda.gov/food/retail-food-protection/fda-food-code>] subparagraph 3-401.11(B)(1)), and to avoid cross-contamination. In reality, this is easier said than done. This section reviews some of the common practices in roasting whole pigs and how those practices relate to food safety.

## Purchasing and Receiving

There are several considerations when purchasing a whole pig, like where does one buy a whole pig? What age or size should be selected? Will the pig come already dressed (clean and eviscerated where the innards are removed)? How is the pig going to be transported?

Whole pigs may be purchased directly from a slaughter establishment, grocery store, butcher, or in some states, a local farmer. Most places will require one to three weeks' notice to ensure availability and often require special order. Grocery stores receive their pigs from a state or federally-regulated slaughter establishment. These processing facilities have the proper equipment to slaughter and eviscerate the pig to minimize fecal contamination. In a state or federally-regulated establishment, each carcass will also undergo inspection to ensure it is fit for human consumption. All food establishments must use a state or federally-approved source for customers.

Some pigs may have specific raising claims, such as antibiotic-free or naturally raised. These claims are consumer preferences and do not impact the food safety since all slaughtered animals are required to be free of antibiotics, achieved by either never giving the animal antibiotics or by observing an FDA-regulated withdrawal time (time for the body to eliminate the antibiotic).

Regardless of where the pig will be purchased, the seller will need to know the desired age and/or size. Some consumers prefer the suckling pig to the adult. Suckling pigs are still nursing off the mother. They are 2 to 6 weeks old and generally under 25 pounds, but some may be up to 50 pounds. When deciding on the size of the pig, the general rule is to estimate 1 to 2 pounds of dressed weight per person. Larger animals will have a higher meat to bone ratio, and therefore, may be on the low end of that estimate. Respectively, smaller animals will have a lower meat to bone ratio and may be on the higher end of that estimate. This estimate assumes a 25-50% meat yield after cooking and that each person will eat roughly half of a pound. The number of expected guests will greatly influence size determination, however, keep in mind that as the size of the pig increases, so do the risk factors of temperature abuse, improper cooking, and cross-contamination. Depending on the situation, it may be safer to select a smaller pig and offer more side dishes or alternate meat choices.

Some may ask what the term dressed weight means. Dressed weight is the weight of the pig after it has been slaughtered, cleaned, and eviscerated. Some places sell uneviscerated pigs, which would require the pig to be eviscerated by the buyer. For food safety reasons, pigs should not be eviscerated at home. Evisceration is a messy process and is critical for food safety. If not done properly, and with appropriate equipment, the intestinal contents can transfer to the work surface and onto the meat. This will increase the risk of cross-contamination and increase the number of bacteria that would need to be killed during cooking, thus increasing the possibility of bacteria surviving the cooking process and causing illness.

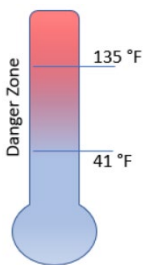
**Dressed weight** is the weight of the pig after it has been slaughtered, cleaned, and eviscerated.

**Evisceration** is the process of removing the internal organs from an animal.

As part of the dressing process, there may be the option to have the pig split so it will lay flat. This process is referred to as spatchcocking. The decision to split is based on the desired appearance of the end-product and whether the pig will be stuffed. With either option, there needs to be a method to ensure the hams and shoulders are cooked to the proper time and temperature to ensure food safety. Split pigs open up the hams and shoulders to allow for heat exposure, thus decreasing cooking time. If it is desired that the pig retains its roundness, then increasing the amount of coals in the area heating the hams and shoulders or applying a direct heat source, such as a hot rock, can provide better heat distribution.

Once the pig has been purchased, then the question is how to transport the pig. During the purchasing process, ask the seller if they will provide a food-grade plastic bag for transport. If not, then one should be purchased to prevent cross-contamination from the juices. The bag will need to be large enough to cover all parts of the pig, including the feet. Ask the seller about approximate length and girth so an appropriately-sized bag can be purchased. For larger pigs, consider searching for a food-grade 55-gallon barrel liner or box liner.

## Thawing and Storage



Depending on the seller, the pig may come fresh or frozen. Either option has significant food safety implications. Bacteria are capable of growing at temperatures between 41°F and 135°F (referred to as the danger zone; [FDA Model Food Code](#) paragraph 3-501.16(A) and corresponding Annex) and it only takes a couple hours for some bacteria to double in number. High bacterial numbers could overwhelm the cooking step and result in their survival. For this reason, it is necessary to keep all parts of the pig cold -- 41°F or below. Ideally, a fresh pig would be available for pickup right before the big event and the thawing and/or storage would not be necessary.

If the pig is frozen, it will need to be thawed completely before cooking. When done properly, this process can take a couple days to even a week, depending on the size of the pig. There are two safe options for thawing a whole pig – refrigeration and keeping the pig under ice cold water. These are also safe options for storing a fresh pig.

Of the two options, the best option is to place the pig in a refrigerator. As most home refrigerators are not large enough to accommodate anything larger than a small suckling pig, it may be necessary to keep the pig at a local grocery store, butcher, or restaurant that has a walk-in refrigerator. If a large refrigerator is not available, another option is to place the pig in a large, clean and sanitized cooler, bathtub, or other container filled with ice and water. The water will ensure even distribution of the ice. The maintenance of ice in the water ensures the water stays close to 32°F and the pig stays below 41°F as long as the pig is submerged.

Use a thermometer to determine if enough ice is present. If the temperature approaches 41°F, add more ice. The ice water should cover all parts of the pig. If part of the pig is sticking out, then that part could rise above 41°F and allow for bacterial growth. Likewise, just ice alone will not ensure that all parts of the pig are kept cold enough unless the pig stays completely buried by the ice at all times.

If the pig will be brined, then the brining solution can be added to the ice water. If the brining solution contains high amounts of salt, it could cause the ice to melt quicker. The salt lowers the freezing temperature of water. If this happens, then add more ice if the temperature of the brining solution starts approaching 41°F.

If the pig is not going to be brined, then it is recommended to keep the pig in its food-grade bag while it is in the ice water bath. Another option is to put the brine in the bag with the pig, then submerge the bag in the ice water. The bag will help reduce cross-contamination between the ice water bath and the pig.

If a container is used to thaw or store the pig, make sure the container is thoroughly cleaned and sanitized prior to use and again after the pig is removed. Since pigs can carry bacteria such as *Escherichia coli* (*E. coli*) and *Salmonella*, it is important to select an appropriate sanitizer, concentration, and contact time. Refer to the section on [Clean Up and Preventing Cross-Contamination](#) for more information.

## Cooking Methods Overview

There are numerous variations in cooking a whole pig, but most can be categorized into one of three methods: underground, open pit, or closed pit/oven. All three methods involve preparing a fire a couple of hours *prior* to transferring the pig to the heat source for cooking.

1. The **underground method** is most often used in Hawaii and the Polynesian Islands. Cooking a whole roaster pig underground begins with digging a hole into the ground, called an imu. The imu should be three times the width of the pig and twice as long. Rounding the corners aids in air circulation. Prepare the imu by starting a fire using untreated hard wood that burns hot. You may place river rocks on the firewood prior to lighting or wait and place the rocks on the bed of hot coals created from burning the firewood. Once the rocks are heated, they are spread out over the base of the imu. A few rocks will be removed from the imu and added to the pig's cavity near the hams and shoulders to provide extra heat to the thick muscles. (Cooking tip: Keep the pig on a grate throughout the cooking process to help with moving the pig around without disrupting the location of the hot rocks.) Green vegetative material with a high-water content (banana trunk, cabbage, corn husks) is layered on top of the coals. Aim to have the pit around 225°F to 250°F. The pig is lowered into the imu and covered with more vegetative material. Moistened burlap bags or gunny sacks are added on top. The imu is filled in with dirt. The moisture from the vegetative materials and moistened sacks will create steam to transfer heat to cook the pig. If any steam is leaking through, then more dirt is added to prevent the heat from escaping.



2. **Open pits** most commonly involve a spit or rotisserie-style of cooking. As with an imu, start a fire first. Either wood or coals can be used. The goal is to get a hot bed of coals that will provide the heat source for cooking the pig. Additional wood or coal will be needed periodically to maintain heat. The spit is placed between the thighs, along the inside of the body cavity, and out through the mouth. The pig is then secured to the spit to prevent it from falling off or rotating independently of the spit. There are several how-to videos and instructions on the internet for securing a pig to a spit, often referred to as trussing. Once done, the pig should not be able to move around the spit. The distance between the pig and the fire may vary depending on weather or individual circumstances. Most people aim to place the pig where it will be exposed to an air temperature of 225°F to 250°F. Rotate the pig frequently throughout the process to provide even heating and to keep the opposite side from cooling down. If rotation is performed manually, thermometers placed in each ham and shoulder can help gauge when the pig should be rotated. Rotation should occur at a frequency to keep the parts facing away from the fire from cooling down. Time intervals will vary based on ambient temperature, distance from the fire, and other contributing factors.



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- **Purchasing Equipment.** Specialized hog rotisserie equipment is available for purchase. If you are a food establishment, ensure the rotisserie equipment meets your local jurisdictional requirements before purchasing. Electric rotisseries are also available and can rotate the pig automatically and continuously.
- **Making Equipment.** If you create your own rotisserie out of Y-shaped sticks, spare lumber, or cinder blocks pay attention to the materials you use. This style typically uses a food-grade stainless steel rod for the spit. **Do not use galvanized material, because toxic zinc may leach into the meat and into the air around the fire.** Carbon steel may impart off flavors into the meat.

3. **Closed pits** can include an oven, caja china box, grill, smoker, or even a homemade pit using cinderblocks. Ovens are typically used for the small suckling pigs. Caja china boxes are specifically designed for roasting large amounts of meat, including whole pigs. Some of the larger roasting boxes can hold a 110-pound pig live weight (approximately 80 pounds dressed weight). Large grills may be available to rent from party suppliers, home improvement stores, or barbeque rental companies. If you prefer to create your own outdoor oven using cinderblocks and covered with metal, **do not use galvanized metal, as this may release toxic zinc into the air and into the meat.** Lining the inside of the pit with aluminum foil may help to hold in more radiant heat and decrease cooking time, but it is not required. Aim to have the pit around 225°F to 250°F prior to placing the roaster pig in the oven.



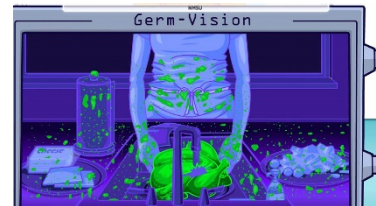
## Pig Preparation

Regardless of the cooking method chosen, the fire will need time to build up and get a bed of hot coals. Use that time to prepare the pig. Depending on cooking preferences and style, some pig preparation will take place before the fire is started, such as brining. But much of the pig preparation will take place after the fire is started. Whenever handling the pig, it is recommended to wear gloves and a plastic or disposable apron. This will make clean up easier and minimize cross-contamination.

Brining is done to increase the flavor and tenderness of the pig. As mentioned in the [Thawing and Storage](#) section, brining can be performed while thawing or storing the pig prior to cooking. If brining is done, the solution needs to be kept at 41°F or below to prevent bacteria from multiplying.

Other methods to increase flavor and tenderness include scoring, salt rubs, and injections. Scoring involves making partial thickness cuts through the skin. Salt rubs are applied directly to the skin, and if made, into the scored areas. Injections means injecting a marinade solution directly into the meat. If the marinade solution will be used for basting during the cooking, then it is important to thoroughly cook and properly cool the solution prior to using it as a baste. This will kill bacteria that are present in the solution, which is especially important if the solution is applied near the end of cooking. Properly refrigerate the solution between injection and basting applications to prevent bacteria from multiplying and potentially producing toxins.

At no point during the preparation is it appropriate to hose down or wash the pig. The act of hosing or washing the pig actually increases the risk of cross-contamination. Bacteria can be transferred to nearby surfaces through the water used to wash the pig. In addition, the bacteria can travel through the air on tiny water droplets, a process referred to as aerosolization. This aerosolization spreads the bacteria around the area where the pig is being washed and may not be visible due to the small size. Since these bacteria-contaminated droplets may not be visible, they may not get cleaned appropriately. Do not hose down or wash the pig.



BACTERIA AEROSOLIZATION AFTER WASHING A CHICKEN. WASHING A PIG WOULD CREATE GREATER AEROSOLIZATION OF BACTERIA. PICTURE FROM NEW MEXICO STATE UNIVERSITY AT: [HTTPS://ACES.NMSU.EDU/DONT WASHYOURCHICKEN/INDEX.HTML](https://aces.nmsu.edu/dontwashyourchicken/index.html)

Similar guidance is provided for chickens. As shown in the picture, bacteria (depicted by the green coloring) were splattered onto the counter and the person's clothing.

Some people choose to dry the pig prior to cooking. Drying can make the pig less slippery and easier to handle. It can also increase the browning of the skin during the cooking process. If drying is done, use disposable paper towels instead of a kitchen towel. Bacteria can survive on the kitchen towel and increase the risk of cross-contamination. Be sure to throw the paper towels in the trash immediately after use. Do not set them down on countertops or other food preparation surfaces where they could leave behind bacteria from the pig.

Another part of preparation includes wrapping the ears and snout in aluminum foil. If the eyes have been removed, then place crumbled aluminum foil into the eye sockets. While this is not a food safety hazard, these areas are prone to burning and creating a smoky, undesirable ash. The aluminum foil can be removed near the end of cooking.

An apple or wood block may be placed in the mouth. While this is not required, it keeps the mouth open and improves heat circulation through the thicker head regions.

### Special Considerations If Stuffing a Pig

Best practice is to cook the pig unstuffed to ensure proper cooking in the shortest time possible with minimal temperature variations and risk to safety. However, when feeding a large number of people, it is not uncommon for the pig to be stuffed with additional meat, vegetables, or grains if cooking multiple pigs is not possible due to space or availability.

Stuffing uncooked pigs with any food will increase the length of time it takes to cook. It also increases the food safety risk, as the stuffing is the slowest to cook and the hardest to get accurate temperatures. If the pig needs to be stuffed, then the safest method is to cook the stuffing to the appropriate temperature prior to stuffing the pig and place the stuffing inside the pig's abdominal cavity immediately before service and only after both the pig and the stuffing have been separately and thoroughly cooked.

If the pig will be stuffed prior to being cooked, loosely pack the pig's abdominal cavity. Overly packing the stuffing will slow down the heat disbursement. Regardless of the stuffing used, it should be moist, not dry, because heat destroys bacteria more rapidly in a moist environment ([USDA Stuffing and Food Safety, https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/poultry-preparation/stuffing-and-food-safety/ct\\_index](https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/poultry-preparation/stuffing-and-food-safety/ct_index)). Stuffed raw pigs must be cooked to an increased internal temperature of 165°F ([FDA Model Food Code 3-401.11 \(A\)\(3\)](#)). Refrigerate the cooked pig and stuffing within 2 hours. It is best to remove any stuffing when cooling to speed the cooling process.

### Cooking

Now that the fire is hot, and the pig is prepared, it is time to cook the pig. Depending on weight of the pig, it can take several hours for the pig to reach its final temperature. Most people estimate one hour of cook time per ten pounds of weight, but time will vary depending on the breed and size of the pig, type of heating element, distance from heat source, weather conditions, etc.

The amount of work required during cooking depends on the method of cooking. If cooking the pig underground in an imu, then once the pig has been properly covered to ensure minimal heat / steam loss, there is not much left to do until the pig comes to the proper temperature. If cooking in a closed oven, then it is imperative to maintain the heat in the oven. If cooking over an open fire, then it is imperative to maintain the fire and rotate the pig. Since the open fire utilizes a direct method of cooking, the pig will need to be rotated frequently so all parts of the pig are heated evenly and the parts facing away from the fire do not cool between rotations.

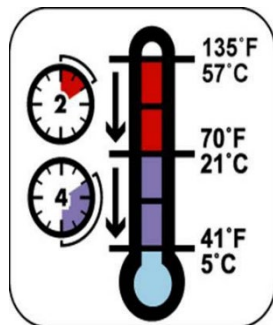
Some people prefer to baste the pig during the cooking phase. Basting is a preference and is not performed to meet any food safety criteria. Basting will help the skin retain moisture and provide brown color. However, it can also make the skin leathery. Ensure the basting solution has been properly cooked and cooled appropriately prior to use so that it does not contaminate the pig. Keep the basting solution in the refrigerator between applications. If the pig is not basted, then the fats in the skin will make it crispy. If using a closed pit to cook the pig, then opening the lid to apply basting solution will allow heat to escape and increase the cooking time.

For food safety purposes, the entire pig needs to reach a minimum temperature of 145°F and hold that temperature for at least four minutes (also known as a rest period). This will ensure the bacteria and parasites in the meat are destroyed, provided that the pig was not temperature-abused earlier. The challenging part, though, is that some areas of the pig will heat up faster than others. For that reason, it is necessary to take multiple temperature readings. The hams, shoulders, and in between the shoulders are the thickest portions and the last to heat up. If the pig was stuffed with meat or vegetables, the stuffing will heat up even slower than the hams and shoulders. To ensure appropriate depth, the thermometer should be placed all the way down to the bone and then pulled back just enough so that the thermometer is not resting on the bone. That way, the temperature is taken at the deepest part of the meat. If the thermometer is resting on the bone, the temperature will not be representative of the meat.

Many people will cook the pig to higher temperatures, such as 180°F to 200°F. The increased temperatures break down the collagen within the meat, especially in the hams and shoulders. This makes the meat more tender. It also helps to ensure all parts of the pig reach the minimum 145°F, just in case the thermometer missed a cold spot. And with higher temperatures, rest periods will be less or not necessary for food safety purposes, depending on the temperature achieved ([USDA Cooking Guide](#) (under *Salmonella*); [FDA Model Food Code](#) subparagraph 3-401.11(B)(1)). However, the rest period allows for the protein to break down and make the meat juicier.

## Serving and Leftovers

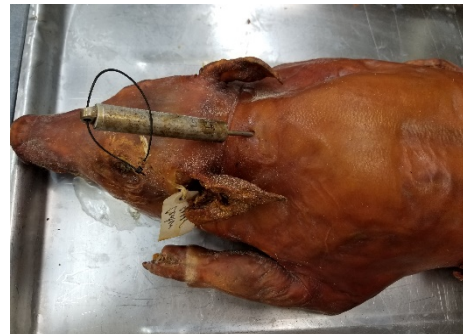
Once the pig has finished cooking, it is time to eat. But it is important to not forget about food safety while everyone is enjoying the meal. Bacteria can start to grow once the temperature of the pig drops below 135°F. It is recommended to place a thermometer into the pig to monitor temperature. Once the



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## Temperatures and Thermometers

- It is necessary to take multiple temperature readings.
- Hams, shoulders, in between the shoulders, and stuffing (if added) are the last to reach a proper cooking temperature.
- Stuffing the roaster pig with meat or vegetables will increase the needed cooking time.
- The thermometer should be placed all the way down to the bone and then pulled back just enough so that the thermometer is not resting on the bone.
- If possible, use a thermometer probe that can be left in the pig during the cooking process. This will help ensure the pig is being cooked appropriately throughout the process.



temperature drops to 135°F, the pig will either need to be consumed within four hours ([FDA Model Food Code](#) paragraph 3-501.19(B)) or be in the refrigerator to start its cooling process. If it appears there are going to be leftovers, start cutting up the pig into small pieces and place in small, shallow containers for placement in the refrigerator. Deeper dishes will slow the cooling process, which could allow bacteria to grow. In addition, it is better to place hot food directly into the refrigerator and leave the lid loose to allow for efficient cooling, as opposed to letting the food come to room temperature prior to placing in the refrigerator. If

the refrigerator is full or unavailable, then seal the food in food storage bags and immerse the bags in an ice bath. Full refrigerators can limit the cold air flow and slow the cooling process. In order to prevent bacteria from growing, the food needs to be cooled from 135°F to 70°F within 2 hours and from 70°F to 41°F within 4 hours ([FDA Model Food Code](#) paragraph 3-501.14(A)).

## Clean Up and Preventing Cross-Contamination

It is important to prevent cross-contamination and the spread of bacteria from raw meat to food preparation surfaces, equipment, and utensils. Cross-contamination is where contaminants are transferred from one object or food to another object or food. As discussed in [History of Associated Illnesses and Lessons Learned](#), cross-contamination is one of the major risk factors leading to foodborne illness. Cross-contamination can be prevented by maintaining good hygiene practices, separating raw foods from cooked foods, and properly cleaning equipment and food contact surfaces.

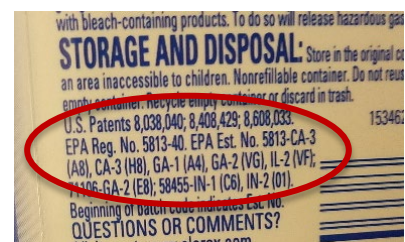
In food safety, good hygiene practices involve not working when sick, good handwashing practices, and the use of gloves or other tools to prevent hand contact with food. Wash hands in soap and water for at least 20 seconds with a full rinse. This will remove visible and invisible contamination from the hands. Dry hands with a clean towel or disposable paper towel to further remove contamination. Wash hands after handling raw product, prior to handling cooked product, and whenever the hands become dirty. After washing hands, wear gloves. Gloves will prevent bacteria from transferring to the hands when handling raw foods. They also prevent the transfer of bacteria from the hands to cooked foods. Waterless hand sanitizers do not remove contamination and may become inactivated when the hands are visibly contaminated and are not recommended to replace handwashing.

In addition, good hygiene practices also include handling of roaster pigs. Roaster pigs present a unique challenge in maintaining good hygiene practices because of the size and shape. It is recommended to wear clean or disposable aprons when preparing the pig for cooking. Once the pig is on the fire, it is recommended to remove the apron and gloves as well as change clothes if possible to prevent these objects from contaminating other food items or the cooked pig.

Separating raw foods from cooked or ready-to-eat foods will help prevent the raw food from contaminating the other food items. This includes refrigerating the raw pig in a separate location from other foods, using separate utensils and cutting boards for handling raw food, and cleaning all equipment and food contact surfaces between preparing raw and ready-to-eat foods.

When cleaning the equipment and food contact surfaces, be sure to clean all coolers, sinks, cutting boards, knives, countertops, roasting pans, or other equipment that come into contact with raw meat using these three steps:

1. Wash in hot, soapy water to remove all visible material.
2. Rinse in running water to remove all soap and visible material.
3. Sanitize with an EPA-registered sanitizer. EPA-registered sanitizers will have the EPA number and directions for use printed on the label. An effective sanitizer commonly used for food equipment is a solution of 1 teaspoon of plain bleach in 1 gallon of cold water.





When cleaning equipment and food contact surfaces, all visible material should be removed prior to applying a sanitizer. Sanitizers may become ineffective when organic material such as food, juices, and dirt is present. By not removing all visible material, the sanitizers may not be able to kill the bacteria, thereby increasing the risk of foodborne illness.

## General Safety

While not directly related to food safety, the roasting of a whole pig can present some physical safety hazards. Safety hazards should be considered when beginning the project of preparing, cooking and serving a roaster pig. Many roaster pigs are over 50 pounds, thus making handling difficult. Physical injuries can be prevented by having the proper equipment for lifting and handling the pig.

Most cooking methods use a form of open flame or charcoal. Precautions should be in place to prevent injuries or damage from open flames, especially if it is windy. Flame control may also become challenging if the fat from the pig is dripping onto the fire. Minimizing the amount of fuel supplied to the fire to minimize flame development, wind blocks, and use of a drip pan to catch the fat from the pig will help reduce accidents. Even with measures in place to control the flame, accidents can happen. Be prepared and have a water hose readily available with the water spigot already turned on (can have a nozzle on the end of the hose to prevent water from continuously running) or a fire extinguisher. Remember to aim at the base (bottom) of the flames and not the top.

Once the pig is fully cooked, it will be hot. Use tongs and knives to pull the meat from the bone to prevent burns to the hands. Using clean tongs and knives have the added benefit of minimizing cross-contamination from the hands to the food.

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# Roaster Pig Safety

Preparing roaster pigs takes special planning to prevent foodborne illness. Follow these safe handling and cooking tips to help ensure your special event is safe, happy, and healthy.



## PLAN

Roaster pigs have unique food safety risks.

- How big is the party?** Plan 1-2 pounds dressed weight per attendee.
- How big is the pig?** Big pigs are harder to keep cold, awkward to handle, difficult to fit in equipment, and take longer to cook.
- Fresh or frozen?** Frozen pigs take several days to thaw.
- To stuff or not to stuff?** Stuffing increases risk and cooking time.
- Cooking in a pit, a box, or on the grill?** Make sure the weather is right and you have enough fuel to keep the pig cooking for hours.

## WASH

Wash hands, utensils, and cutting boards with soap and water often.

- Cleanliness is key.** Stop the spread of germs by using soap, running water, and disposable towels.
- Cooking outside?** Be sure to take soap, water, and disposable towels where the action is to wash your hands and the food prep area.
- Step up your game.** After washing surfaces, you may also use a food-grade sanitizer to help reduce risk.

## SEPARATE

Take care! Bacteria can spread to you and your equipment.

- Will the store give you the pig in a water-proof bag?** A bag will help keep the pig juices from contaminating your equipment.
- Using a kitchen sink, an ice chest, counter, or bathtub?** Wash and sanitize the area after handling the pig to destroy illness-causing bacteria.
- Don't wash the pig!** Splashing water on the pig will spread germs around.
- Dress the part.** A raw pig can spread germs to your clothes. Consider wearing a disposable apron while preparing the pig.

## COOK

Roaster pigs cook unevenly. Make sure all parts get 145°F or hotter!

- Cooking time varies by the pig, the weather, and cooking method.** Plan for at least 1 hour of cooking for every 10 pounds of meat.
- You can't tell by looking.** Use a thermometer to check for doneness.
- Take several temperatures.** The hams, shoulders, stuffing, and between the shoulders take the longest to get fully cooked.

## COOL

Have leftovers? Get them cold to keep bacteria at bay.

- Shallow is better!** Shallow, uncovered containers cool faster than thick layers of food in the refrigerator.
- No refrigerator?** Serve or discard all of the food within 4 hours of cooking or immediately cool the foods in small containers with ice.

## CHECKLIST

### PURCHASE THE PIG

- Fresh or frozen
- Intact or eviscerated
- Water-tight bag for transport

### KEEP IT COLD (41°F OR COLDER)

- Keep at store until day of event
- Store in refrigerator
- Use ice chest/bathtub: Buy ice

### PREVENT CROSS-CONTAMINATION

- Keep pig away from other food and equipment (and don't wash the pig!)
- Wash hands and equipment with soap and water after handling the pig
- Use a sanitizer
  - Mix 2 Tsp unscented bleach in 1 gallon water
  - Buy EPA-labeled food-grade sanitizer

### GET IT HOT

- Imu/In Ground (Keep pig covered)
- Open pit (Rotate pig frequently)
- Closed pit/smoker (Make sure pig fits)

### KNOW IT'S HOT (AT LEAST 145°F)

- Buy a food-grade thermometer
- Measure the hams, the shoulders, between the shoulders, and in areas away from the heat source

### LEFTOVERS

- Cool in uncovered containers or ice immediately after cooking
- Plan to serve or discard food in 4 hours after cooking

# CFP Safe Handling and Cooking of Roaster Pigs Committee Conference Call

**Date:** October 10, 2018 (11:00-11:52 a.m. Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

## Roll Call:

Baldwin, Tanja  
 Beyer, Nancy  
 Bush, Lauren  
 Cadet, Melissa  
 Hanson, Dana  
 Hilton, DeBrena  
 Jackson, Jeff  
 Johnson, Thomas  
 Martin, Dave

McGuire, Meg  
 Patel, Jaymin  
 Rivas, April  
 Seaman, Chuck  
 Sedlak, Mandy  
 Sparks, Christopher  
 Vaccaro, Melissa  
 Villareal, Rolando  
 Westbrook, Tim

## *Non-Voting Members*

Abley, Melanie  
 Idjagboro, Charles  
 Krzyzanowski, Becky  
 Moore, Veronica  
 Shelton, Susan  
 Stapp-Kamotani, Erika

**Quorum:** Yes  No  14/24 Members Present

**Vote on previous conference call's Roll Call and Summation:** Not Applicable.

APPROVE  DISAPPROVE  (document date and results of email vote, if applicable)

APPROVE AS AMENDED

**Agenda review:** Yes  No

## Summation of call proceedings:

Committee read the antitrust statement at the beginning of the call. The antitrust statement is additionally posted on the shared FoodSHIELD site.

Members on the call reviewed formation of the committee due to issue submittal (2018-III-023) from USDA for a CFP-developed guidance document for safe handling and cooking of roaster pigs following several outbreaks of Salmonella linked to unsafe preparation at retail/consumer level.

The committee reviewed the four charges for the committee:

1. Identifying best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Developing a comprehensive guidance document for food handlers, particularly caterers, that include detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determining appropriate methods of sharing the committee's work.
4. Reporting the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

Each of the participants introduced themselves and included information about their strengths to offer the committee. Participants indicated substantial regulatory and industry experience with

several identifying strengths in food safety experience/knowledge, educational/training principles, policy development, and research as well as a desire to help prepare and provide competent, current guidance.

The members next discussed a work plan to complete each charge. The members stated that a literature review would be needed to better determine work plan, timeline, and any needed subcommittees.

- **Stage 1: October 10-November 19, 2018 (Charge 1)**

Literature review to be conducted by a small group of members that volunteered to identify existing materials related to Charge 1. Literature review will include other countries and species (such as Greece and goats). Materials need to be directed toward meeting charges of committee and intended audience (retail food handlers) and should include epidemiological data if possible. Members tasked with the literature review include Christopher Sparks, Rolando Villareal, April Rivas, Erika Stapp, and Susan Shelton. Identified materials will be posted to FoodSHIELD.

Committee voted to invite Dr. James Dickson (Iowa State University, Department of Animal Science) on call #2 to update committee on his research on roaster pigs and associated food safety issues (*Melissa Vacarro motioned; Dana Hanson seconded; vote unanimous*).

- **Stage 2: Begins November 19, 2018 (Charge 2)**

Committee call scheduled for 11/19/18. Committee will be presented materials identified during literature review to develop outline of guidance document and meeting charge 2. Subcommittees and tasks to be determined during stage 2.

- **Charges 3 and 4 will be addressed after completion of literature review and guidance document development.**

The final two charges to be addressed after completion of charge 2. By November 1, 2019, final committee report and prospective committee issues are due to the Executive Board for review.

**Action Items:**

- Erika Stapp to determine if Dr. Dickson is able to participate in call #2 or share literature resources.
- Subcommittee (Christopher Sparks, Rolando Villareal, April Rivas, Erika Stapp, and Susan Shelton) complete literature review by 11/19/18. Post materials in FoodSHIELD.

**Next conference call:** November 19, 2018 1:00 p.m. (Eastern)

## CFP Safe Handling and Cooking of Roaster Pigs Committee Conference Call

**Date:** October 17, 2018 (3:00-3:45 p.m. Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

**Roll Call:** Not taken

**Quorum:** Yes  No  Informational call; no vote.

**Vote on previous conference call's Roll Call and Summation:** Not Applicable.

**Agenda review:** Yes  No

### **Summation of call proceedings:**

Dr. James Dickson (Iowa State University, Department of Animal Science) provided an update on recent research on the handling, cooking, and common practices with preparing roaster pigs. The work was done in response to an outbreak in 2015 associated with pork products.

See attached slide notes for more information. Call was recorded on FoodSHIELD.

### **Action Items:**

- Dr. Dickson will provide additional literature identified by his work on roaster pig guidance.

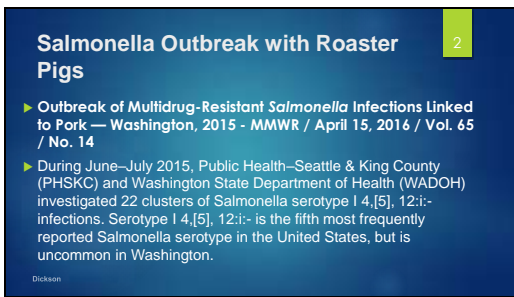
**Next conference call:** November 19, 2018 1:00 p.m. (Eastern)

Slide 1



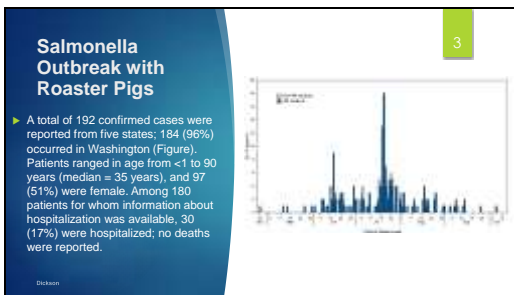
Presentation provided by Dr. James Dickson to *CFP Safe Handling and Cooking of Roaster Pig Committee* members on 10/17/18.

Slide 2



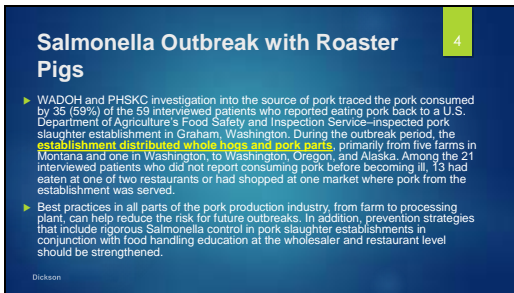
While this was a unique type of Salmonella for the state of Washington, the serotype is commonly identified in pigs in Iowa.

Slide 3



The peak in the epicurve is not uncommon due to the seasonality of roasting pigs at outdoor BBQ.

Slide 4



Information regarding the 2015 outbreak in Washington.

Slide 5



On the left of the slide is a commercially processed roaster pig. They are sorted by carcass weight and individually packaged. On right is a pig roasted for the project.

Slide 6

### Live Pig

- ▶ Live weight may range from as low as 35-40 pounds to almost 200 pounds
- ▶ Smaller pigs (~80%; ~<120 pounds) are sourced from large scale operations, usually as "overflow" pigs
- ▶ Some pigs (~20%) sourced from sale barns

Pigs in the 35-40 pounds size are likely newly weaned and about 3 weeks old.

"Overflow" pigs are young ones that can be sold because the establishment doesn't need the larger hogs these young pigs would become. Large establishments with efficient operations are the facilities most likely to have these 'overflows'— which is why they have the larger percentage of sales of the smaller pigs.

Slide 7

### Roaster Pigs

- ▶ Processed differently from market hogs
  - ▶ Hung by head, not hind legs
  - ▶ Sternum not split
  - ▶ Carcass remains intact, with head
  - ▶ Carcass weight = 78% live weight
  - ▶ Meat (yield) = 30% carcass weight
  - ▶ (not all are processed under Federal Inspection)

Although they are generally stunned and bled out the same way, roaster pigs have quite a few differences than the market hogs when processed:

- Because they're generally smaller than hogs, they're hung by their head instead of their hind legs.
- Consumers want the visual display of the whole pig, so the sternum isn't split down the middle of the pig.
- The carcass includes the head which increases the carcass weight but ultimately reduces the meat yield for a comparable carcass weight of a market hog.
- Ultimately, roaster pigs have very little meat yield so operators will possibly need to stuff them to feed a large gathering.
- The major processors are under FSIS, but smaller scale are under state oversight or likely custom/market exempt.

Slide 8

### Yield Comparison

Live Weight	Carcass Weight	Meat (Yield)
35.0	27.3	8.19
40.0	31.2	9.36
45.0	35.1	10.53
50.0	39	11.7
55.0	42.9	12.87
60.0	46.8	14.04
70.0	54.6	16.38
80.0	62.4	18.72
90.0	70.2	21.06
100.0	78	23.4
110.0	85.8	25.74
120.0	93.6	28.08

There's about a 1/3 of usable meat from a roaster pig. Again—this may drive people to stuff the carcass before cooking.

Slide 9

### Roaster Pig – Cooking Methods

- ▶ Carcass are cooked under a variety of highly variable conditions
  - ▶ Pit
  - ▶ Open Grill
  - ▶ Closed grill
- ▶ May be stuffed with boneless pork or other protein

There was a limitation of pig size in the study due to the size of the cooking grill available. They were only able to fit a carcass up to 45 pounds in the size of cooking chamber for their grill.

There is substantial the cooking variability of different cooking chambers—pit, closed metal case, grills too small to allow air flow, etc. This should be a point of discussion with end consumers, restaurants, caterers.

Slide 10

**Roaster Pig – Cooking Methods** 10

- ▶ Carcass are cooked by a variety of individuals
  - ▶ Some operations and restaurants cook regularly (weekly)
  - ▶ Some are cooked by operations that cook infrequently (< 5/year)

Dickson

A key point is there is a range of experience from the cooks—they anecdotally figured that anyone that does it less than 5 times per year is potentially more likely to have errors due to the infrequency of process.

Slide 11

**Experimental Data** 11

Dickson

Slide 12

**Cooking Roaster Pigs** 12

- ▶ Maximum carcass weight 45 pounds; limited by size of cooker
- ▶ Range from 42-45 pounds
- ▶ Cooked 4 pigs on 4 different occasions
- ▶ Monitored temperature from cold (~32F) to end point (minimum 200F)

Dickson

Testing was conducted at Iowa State University meat lab (by a coworker that had won awards in numerous national BBQ championships).

Slide 13

**Roaster pig stuffed with boneless pork** 13




Dickson

This pig is about 43 pounds and stuffed with boneless pork and tied back together.

Slide 14

**Thermocouple Insertions** 14



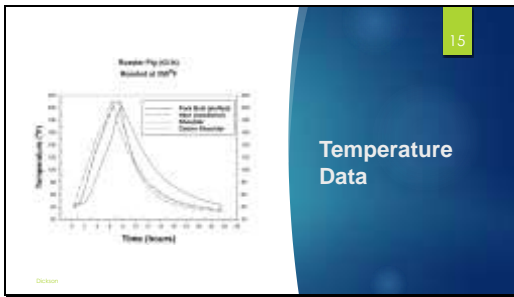
Dickson

The yellow boxes indicate thermocouple locations: right and left hams, the stuffing, right and left shoulders, and between the shoulder blades.

[Spoiler: the stuffing and between the shoulder blades were the slowest to get to cook temp.]

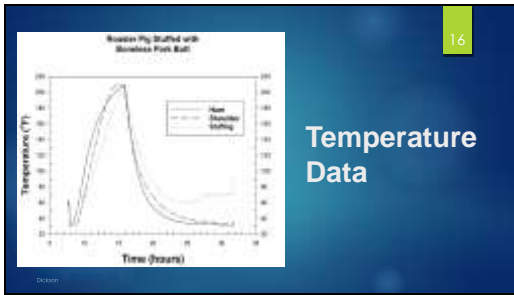


Slide 15



Note the right shift of the temperature/time with the stuffed product indicated by the solid line (it took longer to get to temp).

Slide 16



(Note: We didn't discuss cooling patterns—the products were planned to be rendered so proper cooling was not monitored.)

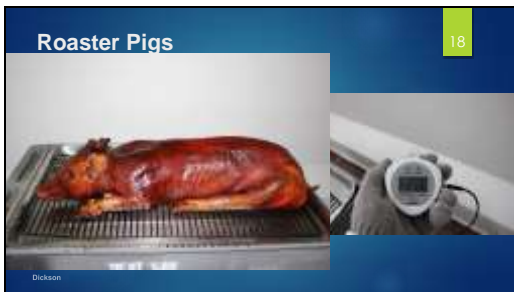
Slide 17

**Time to Specific Temperatures**

Location	Time to 145°F (hours)	Time to 160°F (hours)
Left Ham	3.11	3.53
Right Ham	2.73	3.14
Left Shoulder	2.79	3.4
Right Shoulder	3.42	4.18
Center Shoulder	4.12	4.89
Roast (Body Cavity)	4.83	5.33

Shoulder temp variation between right and left was likely due to the limitations of the cooking vessel. The center shoulder took longer to reach temps— likely a bit sheltered from the heat source. Clearly, the stuffed product in the cavity was routinely the longest to get to temp.

Slide 18



Here's what the pigs looked like when they are removed from the roaster. The data logger indicates the internal temperature exceeded 200°F.

Slide 19



Since this product is generally “pulled” most operators prefer to cook to 185°F or hotter for quality and yield.

Slide 20

Salmonella Typhimurium I 4,[5],12:i:-

Thermal resistance

63C	6.5 log reduction (sec)			Appendix A		
	Min	Sec	Temp	6.5 log reduction (sec)	Temp	
Mean	0.40	25.72	167.15	62.3	240	
Std Dev.	0.22	13.03		63.3	169	
68C	Mean	0.18	14.93	97.04	67.8	27
	Std Dev.	0.07	4.23		68.3	22

In the lab, six different isolates of the target organism were tested for thermal resistance from 6 different herds.

The reduction times were compared to the processing in the USDA Lethality Performance Standards for Salmonella listed in Appendix A. Ultimately, he said they were unable to identify any heat resistance with this strain.

Slide 21

Next Steps?

They identified very few materials available on whole roast pig cooking—he will provide the current material provided by some processors.

Slide 22

Next Steps?

- ▶ Information provided with Roaster pigs (information included in the box by processor)
- ▶ Iowa Meat Processor's Association – February 2018
  - ▶ Presentation on food safety, including roaster pigs
  - ▶ 1 page handout on basic food safety practices
  - ▶ Hand out thermometers with demonstration on calibration

They've provided outreach to industry.

Suggestions to focus on:

- Lack of thermometer usage
- Operators that run out of time/get behind/rush the cooking process
- Lack of taking temps in right portion of pig— between shoulders and stuffing are key
- Increasing cooking time if pigs are partially frozen (it takes about 4 days for a pig to thaw when distributed frozen)
- Lack of proper equipment/cooking chambers (some mentioned the metal box that's covered with charcoal might be a better cooking method than a pit or bbq grill)
- Obvious risk of cross contamination and potential Bare Hand Contact issues

Contact Information

- ▶ Jim Dickson
- ▶ 515.294.4733
- ▶ [jdickson@iastate.edu](mailto:jdickson@iastate.edu)

He's happy to answer emails if we have questions or provide additional input.

# CFP Safe Handling and Cooking of Roaster Pigs Committee Conference Call

**Date:** November 19, 2018 (1:00-1:45 p.m. Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

<http://www.foodprotect.org/administration/policies/antitrust-policy/>

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## Roll Call

Baldwin, Tanja  
 Beyer, Nancy  
 Bush, Lauren  
 Cadet, Melissa  
 Hanson, Dana  
 Hilton, DeBrena  
 Jackson, Jeff  
 Johnson, Thomas  
 Martin, Dave

McGuire, Meg  
 Patel, Jaymin  
 Rivas, April  
 Seaman, Chuck  
 Sedlak, Mandy  
 Sparks, Christopher  
 Vaccaro, Melissa  
 Villareal, Rolando  
 Westbrook, Tim

### *Co-Chairs*

Shelton, Susan  
 Stapp-Kamotani, Erika

### *Non-Voting Members*

Abley, Melanie  
 Idjagboro, Charles  
 Krzyzanowski, Becky  
 Moore, Veronica

**Quorum:** Yes  No  11/20 Voting Members

**Vote on previous conference call's Roll Call and Summation (Initial Call Conducted 10/10/18):**

APPROVE  DISAPPROVE

APPROVE AS AMENDED

**Vote on previous conference call's Summation (Call with Dr. Dickson Conducted 10/17/18):**

APPROVE  DISAPPROVE

APPROVE AS AMENDED

**Agenda review:** Yes  No

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## Summation of conference call proceedings:

Committee read the antitrust statement at the beginning of the call. The antitrust statement is also posted on the shared FoodSHIELD site.

After roll call, a brief summary of the two conference calls conducted in October 2018 was provided for the committee to vote on the written meeting summations. The meeting summaries had been housed on FoodSHIELD, shared electronically with members immediately after the conference calls, and emailed with the current meeting agenda for committee review.

Conference call 1: The committee's initial conference call was conducted on 10/10/18 and the written meeting summation included committee member introductions, reviewed the committee charges, drafted the initial timeline for completion of charges, included a request to Dr. Dickson to present on roaster pigs at a future call, and identified the first

subcommittee to conduct a literature review. Committee voted to accept the roll call and summation as written (*Jeff Jackson motioned; Dave Martin seconded; vote unanimous*).

Conference call 2: The committee's second conference call was conducted on 10/17/18 and included a presentation by Dr. James Dickson regarding his research of roaster pig preparation. No roll call was conducted for this meeting and the meeting notes/summation included the slide set provided by Dr. Dickson. Committee voted to accept the summation as written (*Dana Hanson motioned; Jeff Jackson seconded; vote unanimous*).

Committee was reminded that the committee charges will be routinely included on shared committee materials to help ensure charges are met. The individual charges are included here but were not reviewed during the conference call.

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determine appropriate methods of sharing the committee's work.
4. Report the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

To begin Charge 2, the committee next reviewed a draft guidance document outline and divided the document topics into two sections (informally named Theoretical Aspects and Practical Aspects) to facilitate forming subcommittees. It was determined that the subcommittees would review the twenty-seven documents identified during the literature review in Charge 1 to identify key concepts/bullet points to include for each section in the guidelines. The subcommittees will report back to the committee at the next conference call to enable the committee to determine points to include in the guidelines.

The members self-selected to volunteer for either the Theoretical group or the Practical Aspects sections with the results posted below.

### **Theoretical Aspects:**

#### ***Topics to Cover:***

- Purpose of Guideline
- Intended Audience
- History of Associated Illnesses and Lessons Learned
- Where to go for more answers

#### ***Volunteers:***

- Jeff Jackson
- Nancy Beyer
- Susan Shelton

### **Practical Aspects:**

#### ***Topics to Cover:***

- Special Considerations & Equipment Rationale for Roasted Pigs
- Receiving, Thawing, and Holding

- Avoiding Cross-Contamination
- Preparing and Cooking
- Serving and Handling Leftovers

**Volunteers:**

- Dave Martin
- Erika Stapp-Kamotani
- Jaymin Patel
- April Rivas
- Tanja Baldwin
- Dana Hanson

**Action Items:**

- Erika Stapp and Susan Shelton will reach out to subcommittees to coordinate work on bullet points.
- Each subcommittee (Theoretical Aspects and Practical Aspects) volunteer will use literature review materials to develop key concepts for each of the listed topics listed

**Next conference call set:** Monday, January 7, 2019 at 1p.m. (Eastern). The purpose of the call will be for the committee to review the key concepts identified by the Theoretical and Practical Aspect subcommittees and to form next tasks to develop the guidance document.

**CFP Safe Handling and Cooking of Roaster Pigs Committee  
Meeting Summary  
January 28, 2019 1:00 p.m. (Eastern)**

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**Welcome and Roll Call**

- Baldwin, Tanja
- Beyer, Nancy
- Bush, Lauren
- Cadet, Melissa
- Hanson, Dana
- Hilton, DeBrena
- Jackson, Jeff
- Johnson, Thomas
- Martin, Dave

- McGuire, Meg
- Patel, Jaymin
- Rivas, April
- Seaman, Chuck
- Sedlak, Mandy
- Sparks, Christopher
- Vaccaro, Melissa
- Villareal, Rolando
- Westbrook, Tim

*Co-Chairs*

- Shelton, Susan
- Stapp-Kamotani, Erika

*Non-Voting Members*

- Abley, Melanie
- Idjagboro, Charles
- Krzyzanowski, Becky
- Moore, Veronica

**Quorum:** Yes  No

**Reminder of Anti-trust Statement:** [www.foodprotect.org/administration/policies/antitrust-policy/](http://www.foodprotect.org/administration/policies/antitrust-policy/)

**Vote on previous conference call's Roll Call and Summation:** N/A

**Reminder of Charges**

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
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4. Report the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

**Current Status of Charge 2**

Interim Reports from Theoretical and Practical Concepts.

Reviewed the outline developed from the Theoretical Aspects Subcommittee

Reviewed April's chart (Practical Aspects Subcommittee) that provided bullet points for 5 of the articles pertaining to each topic.

Three of the members for the Practical Aspects Subcommittee were not able to attend this meeting to provide an update – Jaymin, Dana, and Tanja. Mandy volunteered to check in with Jaymin to see if he needs assistance. Melissa V. is to check in with Dana. And Melissa C. is to check in with Tanja.

Committee will meet again in 2 weeks with the anticipation that the remaining articles will be reviewed for key concepts and important considerations.

**Set date and time for next conference call.**

February 11 at 1pm ET.

CFP Safe Handling and Cooking of Roaster Pigs Committee  
**Meeting Summary**  
February 11, 2019 1:00 p.m. (Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

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**Welcome and Roll Call**

Baldwin, Tanja

Beyer, Nancy

Bush, Lauren

Cadet, Melissa

Hanson, Dana

Hilton, DeBrena (retired)

Jackson, Jeff

Johnson, Thomas

Martin, Dave

McGuire, Meg

Patel, Jaymin

Rivas, April

Seaman, Chuck

Sedlak, Mandy

Sparks, Christopher

Vaccaro, Melissa

Villareal, Rolando

Westbrook, Tim

*Co-Chairs*

Shelton, Susan

Stapp-Kamotani, Erika

*Non-Voting Members*

Abley, Melanie

Idjagboro, Charles

Krzyzanowski, Becky

Moore, Veronica

**Quorum:** Yes  No

**Vote on previous conference call's Roll Call and Summation:**

N/A. Please review meeting summaries from 1/28/19 and 2/11/19 fore vote at next conference call.

**Reminder of Charges**

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determine appropriate methods of sharing the committee's work.
4. Report the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

**Committee Member Retirement**

Local Regulator, DeBrena Hilton, has retired from the committee. With three remaining local regulator representatives on the committee, we have been advised we do not need to find a replacement. We will provide official notification and a revised roster to the Executive Board via a periodic status report.

**Periodic Status Report**

We have two periodic reports updating on our progress toward the charges of our committee due to the CFP Executive Board. Our first status report is due by March 1, 2019 and the second will be due by July 1, 2019. A draft will be shared for committee review.

## Current Work on Charge 2

- The committee adjusted the draft outline to discuss key points from theoretical and practical concepts literature review. Several committee members volunteered to draft language for each of the sections (see Action Items below).
- USDA sees cross contamination as substantial concern and potential for pigs drying out could increase Salmonella resistance. Erika will reach out to food scientists at USDA to verify safety steps.

## Action Items:

- Erika and Susan to work with subcommittees to draft language:
  - Section 1 and 2: **Jeff Jackson** to draft language for the introduction to the document and intended audience.
  - Section 3: **Nancy Beyer, Melissa Vaccaro, and Jaymin Patel** to draft language for *History of Associated Illnesses and Lessons Learned 3* incorporating Theoretical Concepts.
  - Section 4: **Erika Stapp-Kamotani, Veronica Moore, Dana Hanson, and Susan Shelton** to draft language for *Special Considerations & Equipment Rationale for Roasted Pigs* incorporating Analytical Concepts.
- Draft language to be completed by 3/11/19 prior to next meeting

**Date and time for next conference call: 3/11/19 at 1:00 p.m. (eastern) to review draft language developed.**



**CFP Safe Handling and Cooking of Roaster Pigs Committee**  
**Meeting Summary**  
March 11, 2019 1:00 p.m. (Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

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**Welcome and Roll Call**

Baldwin, Tanja

Beyer, Nancy

Bush, Lauren

Cadet, Melissa

Hanson, Dana

Hilton, DeBrena (retired)

Jackson, Jeff

Johnson, Thomas

Martin, Dave

McGuire, Meg

Patel, Jaymin

Rivas, April

Seaman, Chuck

Sedlak, Mandy

Sparks, Christopher

Vaccaro, Melissa

Villareal, Rolando

Westbrook, Tim

**Co-Chairs**

Shelton, Susan

Stapp-Kamotani, Erika

**Non-Voting Members**

Abley, Melanie

Idjagboro, Charles

Krzyzanowski, Becky

Moore, Veronica

**Quorum:** Yes  No

**Vote on previous conference call's Roll Call and Summation (Call Conducted 1/28/19):**

*Vote delayed due to lack of quorum.*

APPROVE  DISAPPROVE

APPROVE AS AMENDED

**Vote on previous conference call's Summation (Call Conducted 2/11/19):**

*Vote delayed due to lack of quorum.*

APPROVE  DISAPPROVE

APPROVE AS AMENDED

**Reminder of Charges**

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determine appropriate methods of sharing the committee's work.
4. Report the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

**Periodic Status Report**

Our first periodic status report has been received and accepted by the Executive Board. A copy was provided to the committee. We plan to participate in the Executive Board meeting (April 3, 2019)

to present current activities of the committee. If you have suggestions for inclusion, please let Erika or Susan know.

### **Current Work on Charge 2**

Draft 1 of the guideline presented today. Currently, draft language from the three groups was combined into one document with minimal edits. Thank you Jeff Jackson, Nancy Beyer, Melissa Vaccaro, Jaymin Patel, and Erika Stapp-Kamotani for drafting several sections of the first version of the guidance document.

**Question:** Is there a preferred length of document? CFP committees have materials that range in length; the key is to meet the needs of the audience. We might want to consider preparing shorter sheets or infographics for changing audience needs.

**Question:** Does FSIS plan to take ownership of the document? No. While FSIS may link to the document if it is available, it will be a product of CFP and will not be owned by FSIS.

**Question:** Should we share this draft with others outside the committee for review? Discussed waiting until Draft 2 is available for review; current draft is not ready for an external audience and does not include full information.

### **Action Items:**

- March-April: Erika Stapp-Kamotani, Veronica Moore, and Susan Shelton will update Draft 1 with additional material to create Draft 2. Erika will forward to FSIS partners for continued food safety review.
- May: Draft 2 to be sent to committee members.
- Consider other partners you think would be able to provide a review of Draft 2. Also think about how to share the document with audiences—info sheets, infographics, etc.

**Date and time for next conference call: May 13, 2019 1:00 p.m.**

**CFP Safe Handling and Cooking of Roaster Pigs Committee**  
**Meeting Summary**  
May 28, 2019 1:00 p.m. (Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

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**Welcome and Roll Call**

Baldwin, Tanja

Beyer, Nancy

Bush, Lauren

Cadet, Melissa

Hanson, Dana

Hilton, DeBrena (retired)

Jackson, Jeff

Johnson, Thomas

Martin, Dave

McGuire, Meg

Patel, Jaymin

Rivas, April

Seaman, Chuck

Sedlak, Mandy

Sparks, Christopher

Vaccaro, Melissa

Villareal, Rolando

Westbrook, Tim

*Co-Chairs*

Shelton, Susan

Stapp-Kamotani, Erika

*Non-Voting Members*

Abley, Melanie

Idjagboro, Charles

Krzyzanowski, Becky

Moore, Veronica

**Quorum:** Yes  No

**Vote on previous conference call's Roll Call and Summation:**

N/A

**Reminder of Charges**

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determine appropriate methods of sharing the committee's work.
4. Report the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

**Review of Section 4 – the Practical Section**

The members on the call reviewed the common practices associated with roaster pig handling and cooking. With each practice, the document covered the potential food safety concerns and practical recommendations to mitigate those food safety concerns.

**Action Items:**

- Combine the various sections together and review

CFP Safe Handling and Cooking of Roaster Pigs Committee  
**Meeting Summary**  
September 23, 2019 11:00 a.m. (Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

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**Welcome and Roll Call**

Baldwin, Tanja

Beyer, Nancy

Bush, Lauren

Cadet, Melissa

Hanson, Dana

Hilton, DeBrena (retired)

Jackson, Jeff

Johnson, Thomas

Martin, Dave

McGuire, Meg

Patel, Jaymin

Rivas, April

Seaman, Chuck

Sedlak, Mandy

Sparks, Christopher

Vaccaro, Melissa

Villareal, Rolando

Westbrook, Tim

**Co-Chairs**

Shelton, Susan

Stapp-Kamotani, Erika

**Non-Voting Members**

Abley, Melanie

Idjagboro, Charles

Krzyzanowski, Becky

Moore, Veronica

**Quorum:** Yes  No

**Vote on previous conference call's Roll Call and Summation:**

N/A.

**Reminder of Charges**

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
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**Review of Edits to Current Draft**

The members on the call reviewed the tracked changes on the draft shared on 9/9/19. In addition to providing a few word changes or deletions, the participants identified the following suggestions for the next draft:

- Add specific language regarding outbreaks linked to retail food establishments to help apply to FDA Model Food Code.
- Still need to add missing sources for several outbreaks in *History of Associated Illnesses and Lessons Learned* section.
- Modify safe instructions for how to stuff a pig in the *Pig Preparation* section. Emphasize the increased cooking time and other considerations.

**Next Steps**

1. Compile changes into next draft. Share prior to next conference call.
2. Determine communication to stakeholders.
3. Draft CFP Issues.

**Action Items:**

- April to provide comments on safe stuffing of roaster pigs to Erika and Susan.
- Erika to add additional photos; work on edits.
- Susan to provide citations for Washington-associated outbreaks and provide image of EPA Registry Number for sanitizer. Also review outbreaks to identify commercial establishments. Provide one-pager infographic before next meeting.

**Date and time for next conference call: Tuesday 10/22/19 1:00 p.m. (eastern)**

**CFP Safe Handling and Cooking of Roaster Pigs Committee**  
**Meeting Summary**  
October 22, 2019 1:00 p.m. (Eastern)

**Recording on:** Yes  No

**Reminder of Anti-trust Statement:** Yes  No

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**Welcome and Roll Call**

Baldwin, Tanja

Beyer, Nancy

Bush, Lauren

Cadet, Melissa

Hanson, Dana

Hilton, DeBrena (retired)

Jackson, Jeff

Johnson, Thomas

Martin, Dave

McGuire, Meg

Patel, Jaymin

Rivas, April

Seaman, Chuck

Sedlak, Mandy

Sparks, Christopher

Vaccaro, Melissa

Villareal, Rolando

Westbrook, Tim

**Co-Chairs**

Shelton, Susan

Stapp-Kamotani, Erika

**Non-Voting Members**

Abley, Melanie

Idjagboro, Charles

Krzyzanowski, Becky

Moore, Veronica

**Quorum:** Yes  No

**Vote on previous conference call's Roll Call and Summation:**

N/A.

**Reminder of Charges**

1. Identify best practices, or any existing guidance documents, that relate to proper handling and storage of roaster pigs of various sizes.
2. Develop a comprehensive guidance document for food handlers, particularly caterers, that includes detailed best practices for roaster pig preparation. These recommendations would include proper handling, thawing, cooking, and temperature measurement of roaster pigs.
3. Determine appropriate methods of sharing the committee's work.
4. Report the committee's findings and recommendations to the 2020 Biennial Meeting of the Conference for Food Protection.

**Review of Edits to Current Draft**

The members on the call brainstormed different ways the document could be shared. FDA recommended sharing during their partnership meetings with stores, restaurants, and institutions. The states that have a Food Protection Taskforce could make the document available on their websites. AFDO may be able to distribute directly to states and local jurisdictions. It may also be possible to work with NEHA, IAFP, and NAMI to have them share the document with their constituents. In addition, the Centers for Excellence may be willing to share the document.

April Rivas could not attend the meeting, but later emailed with her recommendations of press release, Food Safety News, NEHA (and to announce it in JEH/NACCHO), and ServSafe / NRFSP (and National Restaurant Association).

**Next Steps**

1. Finalize the draft.
2. Finalize CFP Issues.

**Action Items:**

- Erika to work on the final CFP Issues.
- Susan to provide citations for Washington-associated outbreaks and provide image of EPA Registry Number for sanitizer. Also review outbreaks to identify commercial establishments. Provide one-pager infographic before next meeting.

**Date and time for next conference call: N/A**

**Safe Handling and Cooking of Roaster Pigs Committee**  
**Articles and Studies Used to Develop Guidance**

A Beginner's Guide to Roasting a Whole Pig (PDF provided as some government computers block the link)

<http://globetrotterdiaries.com/recipes/a-beginners-guide-to-roasting-a-whole-pig>

Before Roasting a Pig, the Pros Advise Food Safety Homework (PDF provided)

Charcoal – How to Roast a Pig

<https://broadwaypartyrental.com/wp-content/uploads/Pig-Roasting-Charcoal.pdf>

Foodborne Illness Associated with a Pig Roast

<https://www.ncbi.nlm.nih.gov/pubmed/30978824>

Globalization and Epidemiology of Foodborne Disease (pages 4-7)

[https://books.google.com/books?id=KTA0AAAAQBAJ&pg=PA5&lpg=PA5&dq=todd+ewen+guide+to+foodborne+pathogens&source=bl&ots=OvrCr\\_NgFo&sig=ACfU3U3-8mcbxdc7yjSOe7\\_S8xGISJtf4Q&hl=en&sa=X&ved=2ahUKEwjBv7T50L\\_IAhWouVkkHQ2oCOUO6AEwAnoECAkQAQ#v=onepage&q=todd%20ewen%20guide%20to%20foodborne%20pathogens&f=false](https://books.google.com/books?id=KTA0AAAAQBAJ&pg=PA5&lpg=PA5&dq=todd+ewen+guide+to+foodborne+pathogens&source=bl&ots=OvrCr_NgFo&sig=ACfU3U3-8mcbxdc7yjSOe7_S8xGISJtf4Q&hl=en&sa=X&ved=2ahUKEwjBv7T50L_IAhWouVkkHQ2oCOUO6AEwAnoECAkQAQ#v=onepage&q=todd%20ewen%20guide%20to%20foodborne%20pathogens&f=false)

Going Whole Hog: What You Need to Know to Roast a Hog or Suckling Pig

<https://amazingribs.com/tested-recipes/pork-recipes/going-whole-hog-what-you-need-know>

How to Cook a Whole Pig

<https://www.wikihow.com/Cook-a-Whole-Pig>

How to Roast a Pig in the Ground, Hawaiian Style

<https://www.artofmanliness.com/articles/how-to-cook-a-pig-in-the-ground-hawaiian-style/>

How to Prep, Brine and Roast a Pig in a Caja China

<https://stevedolinsky.com/how-to-prep-brine-and-roast-a-pig-in-a-caja-china>

How to Roast a Pig on a Spit

<https://www.seriousseats.com/2010/06/how-to-roast-a-pig-on-a-spit.html>

How to Roast a Whole Pig: It's Easier Than You Think

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# A Beginner's Guide To Roasting A Whole Pig

by Karen on ~~Monday, June 20, 2011~~

It all started like most of my conversations with people. One night I was at my friends Mike and Ofelia's house sitting around the kitchen chit-chatting about food. Mike, who has the job I only dream of (he's a chef), and I talked through the night about different methods of cooking a whole pig. Before the night was over, permission to destroy the lawn was given by my lovely friend Ofelia and a deal was struck. We were going to try what everyone aspires to do one day: roast a whole pig. Well, at least everyone I know.

Valerie was soon on board with us and we set the date, invited some people to help eat, and started our research. This was new territory for me and Mike so a lot of books, blogs and friends were consulted. Many methods of cooking were available to us as we realized that people around the world have discovered incredible and diverse ways to cook pig. However, one of the first options we nixed was the “buried pig” method. A large fire is burned in a deep pit lined with lava rocks or bricks for hours, heating the earth. The fire is put out, the pig is lowered and the hole is covered and sealed completely, using the residual heat to cook the pig through. Because of a seeming lack of control over the heat (which is extremely important when it comes to barbeque) we decided that this was not the best option for beginners. Besides, I'm not sure how the neighbors would've felt about an enormous bonfire one yard over.

The Caja China, a pre-made wooden box that produces [lechón](#)-style pork, was recommended many times but after considering the cost, we decided to forego the investment– they're not cheap. We decided to consider purchasing it if our first roast turned out well.

The third and best option for us was a cinder-block barbeque. A rectangular barbeque is built from cinder blocks and a sheet of expanded metal or grates holds the pig a few feet above the hot coals. It requires a bit of elbow

grease and sweat, but as someone put it before, it “builds character.”

When it comes to determining the size of the pig you choose it depends on how many people you are going to feed. We planned for roughly 30 people coming so we got a 50 pound pig (after it's been cleaned). Although, we had more guests arrive than planned for (about 45) and everyone was eager to eat so I would get a larger pig next time, about 70 pounds. I learned that at an all-day barbeque if you keep bringing out the pork, people will keep eating!

So, let's get this process started, shall we?

### **Building the Pit**

*Start this process at least one day before the roast.*

You'll need:

- 30 cinderblocks
- foil
- a shovel
- a level
- a sheet of expanded metal or metal grate about 36 by 54 inches\*
- Optional: about 10 heat resistant bricks

*\*Do not use galvanized metal. The fumes it releases will make you and everyone who eats the food sick.*

A few words on obtaining a sheet of expanded metal. After some research we found the best option (if you don't already have some lying around) is to get one custom made from shops that make oil drum barbeques. Not only is it much cheaper but you can design the grate as you want. We decided here to get it reinforced and with handles attached. Since you can reuse it, the effort to find a place that can do this is worthwhile.



Clear a patch of land about the size of the barbeque pit (about 4 feet by 6 feet). Start by forming a rectangle of cinderblocks, 2 cinder blocks wide and 3 cinder blocks long. Lay this first row on it's sides so air can run

through this bottom layer, which helps the coals to continue burning. We used heat resistant bricks to line the inside of the length of the bottom row so that there wouldn't be *too* much oxygen in the pit. However, you could seal up those holes using foil or any other barrier you can get your hands on.

Use a level tool to make sure the first row is even. If it isn't each brick thereafter will be off making your whole barbeque unstable and rickety.

Then stack the rest of the rows on top of the barbeque with the solid sides facing out. Line the bottom of the barbeque with tin foil.

### **Prepping the Pig**

*Start this process the day before the roast.*

If the idea of picking out a live animal that you will later eat creeps you out, I implore you to open your mind to this process. I too was reluctant about it, fearing that my love for meat would be stifled by the stark reality of being a human who kills living things for our consumption. However, after the process (in which Val was the brave one pointing the finger) I would say it made me, Mike, Ofelia and Val more conscientious consumers and more appreciative of the meat we eat.

You'll need:

- 1 50-pound pig, gutted and cleaned
- Kosher salt
- a box cutter
- latex gloves
- Ice and cooler

Wherever you are able to source a whole hog, ask the butcher to crack the spine and head for you. This allows the pig to splay out flat over the grill. You can do this yourself but you will need a hammer, a small ax, and *very* careful hands.

When you get your pig, rinse it off very well and place it on a large clean surface. We used sheet pans on a table, and this is where latex gloves come in handy! Carefully score the surface of the pig with a box cutter in large

criss-crossing diagonals. Don't cut past the skin and layer of fat into the flesh. On a younger pig the skin will be much thinner and easier to cut through and on larger pig the skin will be thicker and tougher to penetrate.



With heaping handfuls of kosher salt, rub generous amounts all over the pig. Don't be concerned about over salting it; it is a lot of meat. We didn't measure the amount we used but I would say roughly 2 cups of kosher salt was used.

Place it in a cooler with bags of ice over it to rest overnight. We left the ice in the bag so it wouldn't melt and dilute the salt rub.

### **Starting the Grill**

*Start this early in the morning the day of the roast.*

You'll need:

- 60 pounds of charcoal
- 1 coal chimney
- a small rake or shovel
- BBQ tongs
- meat thermometer *(Use one that reads the external temperature as well as the meat temperature. Having this is absolutely critical to rookie BBQing!)*
- 6-8 sheet pans or a large sheet of metal
- \*Optional: meat syringe, BBQ mop, more heat resistant bricks

Start with one 20-pound bag of charcoal spread in two even piles on both ends of the barbeque. Light this and let it burn down until the coals are ashy and glowing. For our pig, we lowered the grate so it was resting on top of the second layer of cinder blocks about 16 to 18 inches from the ground. Layer the third row of cinder blocks on top of the grate. This provides a short wall around the pig so a sheet of metal can be placed over the pig while it cooks, trapping in the heat.

It will take a while for the initial coals to burn down, so in the meantime get the pig out of the chest and patted dry. We injected ours with a *mojo* of fresh pineapple juice (which has enzymes that helps break down protein), Seville orange juice, chillies, garlic, oregano, cumin and salt. We had a bowl of this on the side that we occasionally basted the pig with.





Getting the temperature right at the beginning is really the hardest part. After you have your pig ready, it's just about maintaining that temperature. Once the coals are ready, throw your pig on the grate belly-side down and stick your thermometer in the thickest part of the thigh. Cover with a sheet of metal or in our case a carefully arranged layer of sheet pans.

Once your pig is on, reserve a few coals to start a full chimney of coals (about 5 pounds) so that they're ready to add to the pit. From here it's all about keeping an eye on the temperature. You generally want the "oven" temperature to stay around 225 to 250 degrees. After adding coals to each side, just have another chimney full of coals burning so that they're ready any time you need them. It takes babysitting, but you can play cornhole in the meantime.

To add new coals, we just removed a couple of the corner cinder blocks and used a shovel and BBQ tongs to add to the pile. As ash starts to build up just push it carefully towards the center so that you're not putting new coals over a pile of ash. Just do this gently so the ash doesn't fly up all over the pig.

After about 1 hour (when the inside had gotten some good color on it) we flipped the pig onto its back and let it roast for another 2 hours or so before flipping it back onto its stomach again. We basted it a few times with the *mojo* we injected into it, but not a lot. We really wanted the results to be pure pork— just enhanced. It cooked the rest of the way like this until the internal temperature of the meat hit about 200 degrees and was served immediately.

There was one thing I would recommend doing differently. Get some oil on that skin— we thought there was enough fat to crisp up the skin, but while some parts were, others weren't.

### **Eating the Pig**

*(I think this is pretty self-explanatory.)*



Our group of friends is an adventuresome bunch so we decided to serve the pig as is, straight off the barbeque, and allow guests to pick what parts they wanted.

We made a finishing *mojo* with garlic slowly cooked in olive oil, Seville orange juice and spices to go with the pig. Rice, black beans, grilled plantains, grilled corn and a salad was a great way to finish off the meal!

# Before Roasting a Pig, the Pros Advise Food Safety Homework

By **Cookson Beecher** on July 31, 2015

While summer often conjures up mouth-watering thoughts of pig roasts, if you're actually contemplating tackling this culinary feat, some homework is in order. And that includes some homework about food safety. You certainly don't want to sicken your guests, which can be avoided if you play it safe. When you roast a whole pig, your first thought may be that since you'll be cooking the heck out of it, surely you'll also be killing any bacteria such as *Salmonella* or *E. coli* that might be on the meat. But that isn't always the case since some parts of the pig will cook more quickly than others, so a simple jab of the meat thermometer in just one part of the pig isn't going to tell you the whole story.

And you certainly can't base your decision of whether the pig is cooked enough by the length of time it's been cooking and how hungry your guests are. As with any type of cooking, what you do before and after preparing the roast is also important.

a last-minute decorative flourish.) **Ways to roast a whole pig** There are all manner of methods to roast a whole pig, among them burying it in a pit, boiling it in oil, cooking it over coals in a pit above ground, and using an electric rotisserie. The first of these, which originated in Hawaii, brings up thoughts of idyllic celebrations: A wild boar is wrapped in banana leaves and buried in a pit of hot lava stones. Many people who cook whole pigs in a pit have adapted this basic practice but use other “backyard” **techniques** that involve digging a pit and burning wood in it to build up a bed of coals. This method takes a lot of time, anywhere up to 12 hours in cooking time alone, not to mention the many hours (and often beers) it takes to build up that bed of coals. **Building** a pit above ground, usually of cinder blocks, is another popular method, with the pig turned every now and then. But care needs to be taken so the coals don’t flare up and touch the meat and that the equipment you’re using isn’t made of galvanized metal, which can exude toxic fumes. This takes care and diligence on the part of the person cooking the pig. (Important note: The temperature noted in the magazine article cited in the first sentence of this paragraph is lower than the pros in this article advise.) Perhaps the most popular method is using a rotisserie, which **SpitJack** prefers. The Massachusetts company specializes in “cooking with fire” equipment, not only because it’s “the easiest or tastiest way” to go, but also because it represents ‘the most authentic and entertaining way’ to do it. “There is nothing like watching a whole hog turn slowly over several hours, slowly browning and transforming into a delicious meal,” states SpitJack’s website. The site also refers to roasting a whole pig as “a great American tradition” that has come to symbolize “the essence of the community cookout and the shared work and pleasure that is involved.” Of course, this is not only an American culinary favorite. Chefs and backyard cooks around the globe also like to cook whole pigs this way. But, as those who have done it already know, it is not a simple or easy task and, as the SpitJack site notes, “there is much to be considered if everyone is to enjoy the feast.” In a sometimes humorous **article** about his experience roasting a whole pig, “Do Not Go Gently into That Pig Roast,” Ryan Tate warns of how “messy and inelegant it can get.”

site notes, “there is much to be considered if everyone is to enjoy the feast.” In a sometimes humorous **article** about his experience roasting a whole pig, “Do Not Go Gently into That Pig Roast,” Ryan Tate warns of how “messy and inelegant it can get.”

He also offers this advice: “Finally, remember that no enormous cooking project will be as simple as you imagine. You see a whole pig, and you imagine the roasting, and the eating, and the joy and camaraderie that goes along with it. But don’t forget the transportation, the setup, the fuel management, stray sparks and coal and ash, grease, estimating cooking progress and correcting your schedule, and of course the cleanup.” **A generous helping of food safety** Food safety must be kept in mind from start to finish, say those who roast whole pigs professionally or sell meat-roasting equipment. A good example of why this is so important can be seen in a **recent press release** from the Washington State Department of Health about an investigation into at least 56 *Salmonella* infections that department officials say “appear to be linked to eating pork.” The same release notes that the investigation “shows a potential exposure source of several cases was whole roasted pigs, cooked and served at private events.” (Important note: The temperature noted in the state’s press release is much lower than the temperature advised by the pros interviewed in this article.) Salmonellosis, the illness caused by *Salmonella* infection, can cause severe and even bloody diarrhea, fever, chills, abdominal discomfort, and vomiting. Serious bloodstream infections may also occur. That’s definitely not anything you want at your barbecue. SpitJack’s Bruce Frankel, a former chef/restaurantier, knows only too well

how many mistakes can be made along the way, especially when people don't follow basic food-safety practices. But he said that when roasted to the right temperature and served properly, a whole pig is perfectly safe to eat. But he warns that roasting a whole pig is not like cooking a pork roast that you put in the refrigerator until it's time to cook in the oven. To begin with, a whole pig is usually roasted for a lot more people than would be at a family meal. "If you're serving a lot of people, logistics demand more care," he told **Food Safety News**. "The bigger the event, the more care needs to be taken." He said that the cook should actually be thinking like a caterer and be well-versed in the food-safety practices that caterers are required to follow. The person or group doing the cooking needs to come into the venture well-prepared. To start with, the quality of the meat needs to be good, whether it's bought from a farm or a butcher shop. It also needs to be kept cold at the site. Even the USDA stamp can't ensure that it has been kept at the right temperature. That's something that needs to be verified. In most cases, the slaughtered whole pig is picked up and taken home. Being such a large "piece of meat," means you're going to have to have something to carry it in, Frankel said. His company sells "transport bags," which he likens to "body bags." They can be closed up so bloody water doesn't drip all over the car. You'll also need some bags of ice to keep the meat cold.

Where do you put the pig when you get home? Certainly not in the refrigerator; it's far too large for that. And most coolers aren't large enough either. "A large enough cooler is not easy to find," said Frankel. First things first, though. Hose the pig off and

salt it down to help prevent bacteria such as *Salmonella* and *E. coli* from growing on the surface. You can also wipe it down with towels soaked in a strong salt solution. Frankel said a common home practice is to put the pig in a bathtub with a lot of ice. Of course, the tub should be cleaned with a bleach solution once the pig is taken out. Leaving it out on the porch with a cover over it to keep the flies off won't work since the pig not only needs to be kept clean but also cold. And you don't want a dog to come along and gnaw off part of a leg. When it's time to get the cooking apparatus ready, Frankel advises using food-grade stainless steel (304 Or 316) for the **spit**. He warned that carbon steel can impart off-flavors to the meat. In addition, galvanized metal can leach toxic zinc and should not be used as a rotisserie spit. And forget using that old rusty galvanized pipe lying around out in the yard. "You don't want to poison the meat," he said, adding, "The entire system needs to be food-safe."

**Cooking the meat** Temperature, of course, is critical — not just the temperature of the meat but also the temperature of the air around the meat. Frankel advised keeping the air temperature around the meat to 225-250 degrees F and cooking the meat to 195 degrees F. "There's a culinary reason for that," he explained. "When meat is cooked this way, it becomes soft and pullable — fork-tender." While some federal and state agencies recommend cooking the meat to 165 or 170 degrees F, Frankel said at that temperature you'll get some bloody meat and blood at the joints. Barbecuing a whole pig is an entirely different way to cook pork," he said. "Every part of the animal should be at least 180 degrees." He also said that at 195 degrees F, there will be no food-safety problems with the meat, at least in the cooking process. When roasting a whole pig, Frankel said you need to keep an eye on what the temperature is in various parts of the pig since different sections, such as the shoulders and legs, are much thicker than other parts, such as the ribs, which means that some parts will take longer to cook.



That's why his company offers a package of three thermometers. Two provide not only a constant reading for the leg or shoulder but also a good indication of the ambient, or cooking, temperature. The third thermometer, an instant read thermometer, provides a quick read for any part of the roast. Frankel emphasized that someone needs to watch that the temperature is OK — at least 175 degrees F. — all the way through the cooking process. When using a smoker, he recommends cooking the whole animal to beyond the safe temperature. As for cooking a whole pig in a pit, he warns that there are a lot of variables in this method. "It's an ancient practice and can be a bit dangerous," Frankel said. **Serving the meat** For food safety's sake, the meat shouldn't go below 140 degrees F for any length of time once it comes off the spit. Frankel recommends quickly cutting up the meat and putting the pieces into containers placed over chafing dishes to keep it warm. "It's nice to have hot meat to serve," he said, pointing out that not only is the meat tastier that way, but it's also safer. There's no need to let the meat "rest" before serving it because it's been cooking the entire time at a reasonable temperature. Leftovers should be cooled down and packaged with ice for people to take home. **Challenging, but satisfying** Frankel describes cooking a whole pig as "a tricky thing" and not for the faint of heart. "But when it's done right, it's very satisfying," he said. "It's a great show to see the meat turning on the spit and a great feeling to know that you've done it right." He also said that providing people with the proper information about food safety pertaining to cooking a whole pig is an important issue that needs to be

pursued. “People should know how to make sure it’s safe all the way through — until the last leftover has been eaten,” Frankel said. **Another vote for food safety**

Lance Anderson of **Marv’s Marvius Pit BBQ Catering** also can’t stress enough the importance of food safety. “It’s our number-one priority,” he told **Food Safety News**. It’s important not to make people sick, plus a company’s reputation is based on word of mouth. “It can go two ways,” Anderson said. “Really good and customers will tell other people and you get more customers, or really bad and you can lose your business.” He said that roasting a whole pig to the proper temperature is standard practice for his business. “Our business model is to cook the fresh pork on site and serve it,” he said. Pointing out that *Salmonella* can’t live at temperatures higher than 160-165 degrees F, Anderson said that Marv’s cooks whole pigs they bring to a site to 200-205 degrees F. “We go way above and beyond,” he said, adding that if people want them to cook the pig to a lower temperature, they won’t go. “There’s just too much risk involved,” Anderson said. Marv’s also provides coolers with ice. And they won’t leave the leftovers behind unless they know the people will use the ice to keep it cold. “Most people are good about it,” he said, “although we rarely have leftovers.” Summing up some of the principles his company follows, Anderson said that using the proper equipment, making sure the cooking and serving temperatures are right, and working in a clean environment are critical. “The risks can be severe, especially for older people and children,” he said, referring to foodborne illnesses such as *Salmonella* and *E. coli*. Anderson compared the know-how required when roasting a

whole pig to services that other companies provide. “If your car needs to get fixed, you take it to a mechanic,” he said. “If you want a haircut, you go to a barber. Roasting a whole pig is similar — sometimes it’s better to leave it to the professionals.” **Some physical safety tips** When a pig is being cooked, it’s a jacket of hot fat, Frankel noted. This is why it’s so important to have a drip pan or sand for the drippings to fall into so the coals won’t flare up into flames. “It’s like a bomb when a pig catches fire,” he said. “It explodes. That’s why you need to have a fire extinguisher for grease fires handy.” In addition, since you’ll be working with very hot objects, you shouldn’t wear loose clothing that can catch on fire or shoes that are not fire-safe. Long, heavy leather gloves are also advised when handling hot objects and food-safe gloves for processing or transporting the meat. If you’re using an electric motor, make sure the power cord is away from the fire and that any extension cord used is properly rated and secured. Frankel also said that there should be nothing near the rotisserie that people can trip over and to make sure that kids are kept at a safe distance. It’s also important that the operator doesn’t drink alcohol. “If you’re managing an open fire, you should be sober,” he said.

(To sign up for a free subscription to **Food Safety News**, click [here](#).)

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## Pig Roasting and Food Safety

**Dec 21, 2016**

By: *Bridgette Keefe, Food Safety Education Staff, Food Safety and Inspection Service, USDA*

Roasting a pig is as exciting as it is delicious, but it is also a serious undertaking. If done incorrectly, people can get sick. It is critical that you safely handle and prepare the pig and choose the roasting method—grilling, rotisserie cooking, or roasting in a rock-lined pit—you are most comfortable with.

If you are unsure of the method or process for pig roasting, you may want to consider hiring a professional or breaking the animal down into individual cuts for easier cooking.

The first step before roasting the pig is food safety. That begins when the pig is picked up and ends when the last piece of pork is eaten or safely refrigerated. By following these basic food handling and food safety tips, you can reduce your risk of Salmonellosis caused by cross-contamination or eating undercooked pork.

### Ordering and Transporting

After choosing the roasting method, you need to determine the number of guests you plan to serve. Allow 1½ pounds of pre-cook weight per person; this will result in approximately six ounces of cooked meat per serving. You should buy the pig from a reputable supplier and order at least seven days in advance to ensure your pig is ready for pick-up. If your supplier also sells frozen swine, ask them to thaw the pig for you under refrigerated conditions at 40 °F or less. It is not safe to roast a frozen or partially frozen pig.

Be sure to ask the supplier to wrap the pig in food grade plastic or a large good grade plastic bag to contain the juices. It is strongly recommended you pick the pig up just before you are ready to cook it. Otherwise, as soon as you get home you will need to put it in a cooler (be sure to check that you have one large enough before you order the pig) or in a food grade plastic-lined bathtub full of ice to keep it cold at 40 °F or below. Use an appliance thermometer to continuously monitor the temperature. If you do put your swine on ice, don't forget to disinfect your tub afterwards.

### Preparing for the Big Event

In addition to whatever is required for your preferred roasting method, be sure to have the following items on hand: two food thermometers, a clean table for preparation and final carving, clean utensils and serving dishes, paper towels and disinfectant wipes, a clean apron, a box of disposable gloves, and most importantly, access to soap and warm water. Be sure to use clean utensils to remove and carve the roasted pig and not the dirty utensils you used during the cooking process to prevent cross contamination.

The station where you prepare and carve the pig must be clean at all times. Anything that comes into contact with the raw pig should be washed with warm water and soap immediately. Be sure to dispose of gloves after each use. It is important to prepare the pig for roasting completely separately from other food items—such as vegetables for salads and fruits that won't be cooked—to prevent cross contamination.

If you plan to stuff the pig, keep the stuffing to a minimum to reduce risk. The more you put inside the pig, the longer it will take to cook and the more difficult it will be to use your thermometer to check the internal temperature. It is important that the stuffing be cooked to at least 165 °F to destroy bacteria that may be present.

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## Roasting the Pig

Take your time and follow the roasting instructions carefully. Your pig can take anywhere from 4 to 12 hours to cook depending on the size and roasting method. It could take even longer if stuffed. Check the temperature in the deepest part of each shoulder and leg, several places along the loin area, and stuffed areas. For best flavor and quality, cook the meat to at least 195 °F. It will ensure that the meat near the joints is fully cooked since there may be parts that you can't reach to measure with a thermometer. Meat should be fork-tender, and falling off the bone. Replenish wood or coals often to make sure the fire stays hot.

## Feeding your Group and Packing Leftovers

Now that the pig is fully cooked, take extra care when transporting the pig from the heat source to the table using freshly cleaned utensils. You should expect to spend an hour or so on carving so be mindful of the 2-Hour Rule to refrigerate perishable food within 2 hours after cooking (or 1 hour if the weather is 90 °F or above). Serve meat on clean serving dishes as you carve. While serving, keep trays of the cooked pig on the heat to keep it warm.

Pack leftovers in shallow containers and refrigerate within 1-2 hours. It is not necessary to cool before you refrigerate it. Freeze for 4-12 months for optimal quality.

Follow these basic food safety tips and have fun roasting the pig!

For more information on cooking pork, visit [Fresh Pork from Farm to Table](#).

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# The Whole Pig Roast: How to Cook a Full Sized Pig

A whole pig roast is a wondrous event, but if you've read [How to Cook a Whole Pig](#) then you know there is a lot that goes into it. A whole hog can be quite large and therefore requires special equipment and skills to pull off. While you may know the basics so far, this page will go into more of the details of things to plan for to make your whole hog roast go off without a hitch.



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## Some things to consider and plan for when cooking a whole pig roast:

### Invite a Lot of Friends!

This may seem obvious, but most people do not realize just how much meat is on a large hog! Don't plan a hog roast without sufficient friends and family to help you devour the tasty goodness when it is done. You'd hate to see all your hard work go to waste wouldn't you!

### The Hog Rotisserie

1. A suckling pig is typically under 25 lb. Therefore, whole hogs are generally significantly larger than that. While many that you'll see roasted are 30 to 60 lb., larger adult hogs can easily weight from 100 to 200 lb. For this reason, you need a very heavy-duty and sturdy rotisserie, as seen above, to slowly and safely turn your pig roast over your fire.
2. Why do you need a rotisserie in the first place? Why not just support the pig over your fire pit on a rack? A whole pig is a large roast! If left in one position over a fire or charcoal, one side would be burnt and crispy while the other side would be raw. Just like any cut of meat, you need to turn it to be fully cooked throughout. However, turning a whole hog is not as easy as flippin' a burger! Just imagine trying to flip the hog, several times, while it is inches over hot embers. Think you could handle it? Well you're wrong, this is a set-up for disaster. Turning a large whole pig roast over a fire



by hand is next to impossible and you will end up with charred arms and eyebrows. A sturdy hog rotisserie is the only solution and in my opinion is critical to a successful pig roast.

3. Many companies make whole hog rotisseries. Whatever you use, make sure it is weight tested for more than your pig weights so you know it will hold, and turn, that weight.

### Buying a Whole Pig

1. Plan ahead for your pig roast! In most areas a whole fresh hog is not that easy to come by. Find a source for a whole hog well before you plan your party.
2. Talk to your butcher. Most can special order whole pigs. Ethnic markets and butchers, Latin and Asian particularly, are a good place to start. Check out my [Where to Buy a Whole Hog for Barbecuing](#) page.
3. When buying a whole pig, find out if it will come frozen or fresh. If frozen, be sure to leave sufficient time once you get it to defrost. An average sized hog will take at least 48 hours to defrost completely. If you are planning to marinate or brine it as well, this will take additional time before the whole pig roast so plan ahead and make sure you don't run out of time!
4. Also ask your butcher how the pig will come. Most are prepped for cooking, meaning their hair and internal organs have been removed. If they haven't been prepped, make sure you have someone who can clean and prep the hog for you before cooking.

### Prepping Your Whole Pig Roast: Marinating, Brining and Injecting

1. A whole pig needs to be flavored. If you just throw it on your rotisserie and cook it, the large cuts of meat will be rather bland. But do not fret, pork takes to marinating and brining like a fish to water!
2. There are many types of recipes for prepping a whole pig roast, but I particularly like brining. Brining uses a salt water solution to tenderize the meat and also to help the muscle fibers retain moisture. This helps infuse flavor and keep your roast succulent and moist. It will not dry out and become tough.
3. There are many options for brine or marinade mixtures. One brine that I particularly love and works beautifully with pork is an apple cider brine described on my [pork tenderloin barbecue recipe](#). The apple flavor and subtle sweetness really enhance and compliment the natural flavor of the meat. To add even more flavor, I like to add an abundance of herbs, onions, lemons, oranges and/or hot peppers to the brine solution.
4. A whole pig should be brined or marinated for at least 24 hours overnight, if not longer. Additionally, injecting the thickest parts of meat with the marinade or brine solution will help to be sure your brine penetrates all of the meat, not just the surface cuts.

### Prepping Your Whole Pig Roast: Trussing

1. Proper trussing of your whole pig roast to the rotisserie spit is critical. As your pig cooks it will loosen, move and shift. The muscle fibers will pull apart and away from the bone. The result? Your whole hog could fall off your spit! That would be disaster. Prevent this by trussing aggressively and tightly.



2. In general, the spit should go between the thighs, along the inside of the body just under the spine and out through the mouth. Because the spit is not really going through meat, this is not secured to the spit. A large trussing need and heavy-duty kitchen twine should be used to secure the spine to the spit every 6 inches along the length of the meat. This should be tied as tightly as

possible with the knots on the back. Cut off excess twine so that it will not burn.

3. The hips, thighs and legs should also be trussed securely to hold them tight against each other and the spit. Same goes for the head and shoulders. You don't want any wiggle or give in your pig, it should move as one with the spit.
4. A great demonstration of how to truss a whole hog to a spit with pictures is available at [SpitJack](#).

### Go Slow and Easy

1. A whole pig roast takes a long time, you cannot, and should not, rush it. Quickly grilled pork leads to burnt skin and dried out meat. Cook slowly over the fire pit on the rotisserie at lower temperatures (around 250 degrees or so at the surface of your roast is ideal).
2. Whole hogs can take from 4 to 24 hours to cook completely depending on their size and the cooking temperature. So plan ahead and take your time.
3. When you think the roast is nearing doneness, test the doneness with a [meat thermometer](#). All internal temperatures of the deepest meat (the hams and shoulders will be the last to cook thoroughly) should be at least 160 degrees and ideally about 165.

### Basting, Basting, and Then More Basting

1. Basting with a good basting mixture helps to develop a nice thick, dark caramelized glaze on the surface of the roast. It also helps prevent the skin and superficial meat from drying out.
  2. Baste frequently throughout the cooking period, particularly when you notice the surface getting dry.
  3. Basting mixtures vary and can use any number of flavoring ingredients. Some examples of things to include are olive oil, wine, fruit juices, herbs and lemon juice. Even a little honey or sugar can enhance the flavor and help the caramelization. Just be careful not to put too much sugar on the surface of your whole pig roast or it will burn if it gets too hot. Remember, you want caramelization, not charcoal!
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