

Slow Cooking & Sous Vide Methods for Pork Cookery





LESSON OBJECTIVES:

The student will:

- Prepare pork recipes using sous vide and slow cooker methods.
- List advantages and disadvantages of slow cookery and sous vide.
- Identify minimum cooking temperatures of pork cuts.
- Compare nutritional values of pork versus other protein sources.

GRADE LEVEL: High School Culinary Classes

LESSON LENGTH: 4 class periods (45 minute class periods)

NATIONAL FCS STANDARDS:

- Demonstrate food safety and sanitation procedures.
- Demonstrate industry standards in selecting, using, and maintaining food production and food service equipment.
- Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

PROSTART OBJECTIVES:

- Identify food sources of protein.
- Outline basic slow cookery and Sous Vide technique used for cooking pork.

Day 1

Students will learn about Sous Vide cookery by comparing and contrasting it to using a slow cooker. Cooking times and temperatures for pork will be emphasized, along with the basics of using a meat thermometer.

Activity:

INTRODUCTION TO SLOW COOKERY AND SOUS VIDE

- Quickwrite: Provide students 2-3 minutes to write down everything they already know about sous vide and slow cooking. Assure students that many may not be aware of these cooking methods, but the teacher wants to know students current knowledge level.
- Collect quickwrite for private review. Come back to this activity to assess learning on day three.
- Students are responsible for this information and it will be needed at the end of the lesson for an assessment. Students will each need to decide the best way to record lesson information and be prepared to share notes with teacher.





Activity:

WHAT IS SLOW COOKING?

- View Video: Simple Slow Cooker Tips <https://www.youtube.com/watch?v=tFFYxPz8Jjk>
- For additional information refer students to Slow Cookers and Food Safety <https://extension.umn.edu/preserving-and-preparing/slow-cookers>

Teacher Notes:

- A slow cooker is a convenient portable electric appliance popular in today's kitchens. Slow cookers have several advantages. It's "all-day cooking without looking." These are economical to operate and a great way to tenderize less expensive and tougher cuts of meat (shoulder, round, and chuck). The slow cooker cooks foods slowly at a low temperature, generally between 170 and 280 degrees F, over several hours. The combination of direct heat from the pot, lengthy cooking and steam, destroys bacteria making the slow cooker a safe process for cooking foods.
- Water or other liquids such as juice or broth are necessary to create steam. When cooking pork in a slow cooker, the water liquid level should cover the ingredients to ensure effective heat transfer throughout the crock. Some manufacturers of slow cookers recommend adding liquid to fill the stoneware 1/2 to 3/4 full. Follow the manufacturer's recipes and directions for best results.

Activity:

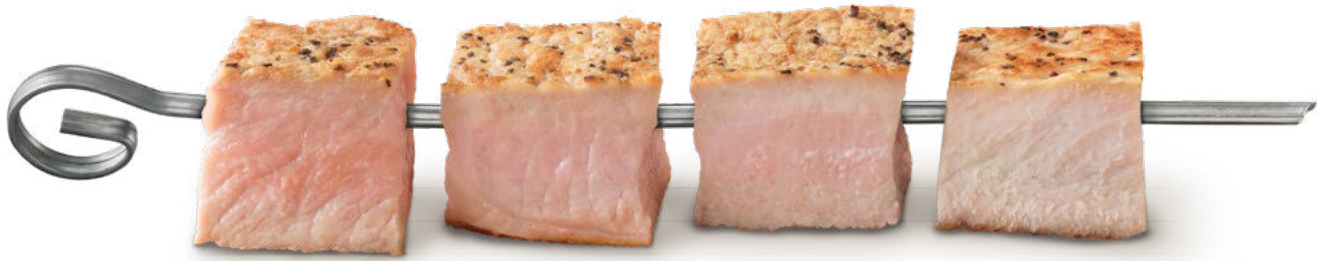
WHY SOUS VIDE PORK?

- Background information on sous vide <https://anovaculinary.com/what-is-sous-vide/>
- Based on video students write three Q & A to exchange with partner. Check each other's understanding of sous vide.

Teacher Notes:

- In the cooking method world, sous vide is considered an “other cooking method.” Sous Vide: French for “under vacuum,” this is a cooking method in which food is cooked for a long time, sometimes well over 24 hours. Rather than placing food in a slow cooker, food is placed in airtight plastic bags in water that is hot but well below boiling point. This cooks the food using precisely controlled heating, at the temperature at which it should be served. Sous vide water bath temperatures are measured in tenths of a degree. The exact range is narrow and precise.
- The aroma of food cooking means that molecules of flavor are escaping from the food. Sous vide locks all of the flavor molecules in with the vacuum seal. Sous vide items do not lose flavor. In fact, the flavors are enhanced and improved.





Medium-Rare
145-150°F

Medium
150-155°F

Medium-Well
155-160°F

Well
160°F

Activity:

COOKING TEMPERATURES FOR PORK

- Pork Cooking Times and Temperatures Handouts <https://www.pork.org/wp-content/uploads/2019/10/pork-cooking-times-and-temperatures.pdf> and <https://www.pork.org/cooking/pork-temperature/>
- Students add recommended pork cooking temps to their class notes.
- Meat Thermometer Basics (one minute review video from National Pork Board): <https://www.pork.org/blog/using-meat-thermometer/>
- The USDA recommends cooking chops, roasts, loins, and tenderloin to an internal temperature of 145° F, followed by a three-minute rest.
- Ground pork should always be cooked to 160° F. Doneness for some pork cuts, such as small cuts that are difficult to test with a thermometer or large cuts that cook slowly at low temperatures, is designated as “tender.” Pre-cooked ham can be reheated to 140° F or even enjoyed cold, while fresh ham should be cooked to 145° F.
- Adhering to recommended pork cooking temperature guidelines will result in an optimum eating experience of enhanced flavor and safety.
- The National Pork Board follows the guidance of the U.S. Department of Agriculture (USDA).



Activity:

INTRODUCING RECIPES FOR DAY TWO

- Introduce the recipes for tomorrow (recipes listed in Day #2 lesson). Teachers may annotate the recipe or read together as a class. If unfamiliar with the annotation process, please visit <https://www.sps186.org/downloads/blurbs/23663/Marking%20The%20Text.pdf> for step by step directions. To annotate with recipes:
 - Number the paragraphs (typically done within recipes)
 - Circle key terms (action words)
 - Underline relevant information
 - Ask students to use question marks for any areas that are still unclear

Day 2

Food Safety is of the utmost importance when preparing pork for commercial food service and at home. A variety of recipes are introduced for students to prepare. The annotation process outlined increases student's comprehension of recipe steps.

Slow Cooked Cajun Sausage Jambalaya
<https://www.yummly.com/recipe/Cajun-Sausage-Jambalaya-2248020>
(Boneless Pork Loin Roast)



Activity:

T-CHART ACTIVITY

- Divide students into groups of 2 or 3. Each group needs easel paper for the T-Chart Slow Cooker Activity.
- Students will divide their paper into two sections: advantages and disadvantages.
- Students will record advantages and disadvantages of slow cooking in both their homes and commercial food service. Students will check accuracy of responses using class notes.
- Allow students 3-5 minutes to record responses before processing as a class.
- Post T-Charts in classroom to view throughout today's lesson. (white board, flip chart on easel, etc.).

Teacher notes:

Advantages

- Safe method
- Typically uses lesser cost cuts of meat to make tender and flavorful
- Load slow cooker and no more work is required
- "All day cooking without looking"
- Economical

Disadvantages

- Requires additional equipment (slow cooker)
- Time
- Need to defrost ingredients before cooking
- Human error (did you plug it in?)
- May not be practical in commercial food service



Activity:

SLOW COOKER RECIPES

- Provide info to students about Slow Cookers and Food Safety https://www.fsis.usda.gov/shared/PDF/Slow_Cookers_and_Food_Safety.pdf
- If time on Day #1 did not allow annotation of recipes, or reading together as a class, do that now. If unfamiliar with the annotation process, please visit <https://www.sps186.org/downloads/blurbs/23663/Marking%20The%20Text.pdf> for step by step directions. To annotate with recipes:
 - Number the paragraphs (typically done within recipes)
 - Circle key terms (action words)
 - Underline relevant information
 - Ask students to use question marks for any areas that are still unclear
- Slow Cooker Recipes (choose one to demonstrate or students prepare several as a lab).
 - * **Slow Cooked Cajun Sausage Jambalaya** <https://www.yummly.com/recipe/Cajun-Sausage-Jambalaya-2248020> (Boneless Pork Loin Roast)
 - * **Slow Cooker Winter White Chili** <https://www.yummly.com/recipe/Winter-White-Chili-2249621> (Ground Pork)
 - * **Tasty Slow Cooker Honey Garlic Pork Sliders** <https://www.pork.org/blog/tasty-slow-cooker-honey-garlic-pork-sliders/> (Boneless Pork Shoulder)



Activity:

SOUS VIDE RECIPES

- Choose recipe to demonstrate or students prepare (dependent on equipment available)
- Sous Vide Pork Tenderloin <https://www.pork.org/cooking/how-to/sous-vidé-pork-tenderloin/> (Pork Tenderloin)
- Sous Vide Pork Chops <https://www.pork.org/cooking/how-to/sous-vidé-pork-chops/> (New York Pork Chops)

Activity:

PREPARING FOR FOOD PREP LAB

- Students prepare market order.
- Divide tasks and students prepare to become the experts with the recipe they are making.



Sous Vide Pork Chops <https://www.pork.org/cooking/how-to/sous-vidé-pork-chops/>

Day 3

Taste testing recipes using a variety of pork cuts enables students to better understand the versatility of pork. Challenge students to try out more recipes featuring pork tenderloin, shoulder, loin roasts and ground pork.

Activity:

FOOD PREPARATION LAB -SOUS VIDE RECIPES

- Determine if this will be a teacher demonstration or prepared by students. Adjust daily lesson plan accordingly to accommodate teacher demonstration.
- Sous Vide Pork Tenderloin <https://www.pork.org/cooking/how-to/sous-vidé-pork-tenderloin/> (Pork Tenderloin)
- Sous Vide Pork Chops <https://www.pork.org/cooking/how-to/sous-vidé-pork-chops/> (New York Pork Chops)





Activity:

SLOW COOKER RECIPE TASTING & EVALUATION

- Students will prepare slow cooker recipes according to their plan.
- Slow Cooked Cajun Sausage Jambalaya (Boneless Pork Loin Roast) <https://www.yummly.com/#recipe/Cajun-Sausage-Jambalaya-2248020>
- Slow Cooker Winter White Chili (Ground Pork) <https://www.yummly.com/#recipe/Winter-White-Chili-2249621>
- Tasty Slow Cooker Honey Garlic Pork Sliders (Boneless Pork Shoulder) <https://www.pork.org/blog/tasty-slow-cooker-honey-garlic-pork-sliders/>

Activity:

QUICKWRITE RECAP

(if time permits or move to Day #4)

- On the first day of this lesson, students completed a quickwrite about sous vide and slow cooking. Pass back students quickwrites. Using a different color, have students write everything they now know about slow cooking and sous vide and cross off anything they now know is incorrect. Provide 5-7 minutes to complete this activity.

Day 4

Recipes are a work in progress. Encourage students to recommend changes and/or additions to recipes prepared in class. Students assess their lab experience considering preparation techniques, teamwork plus safety and sanitation standards.

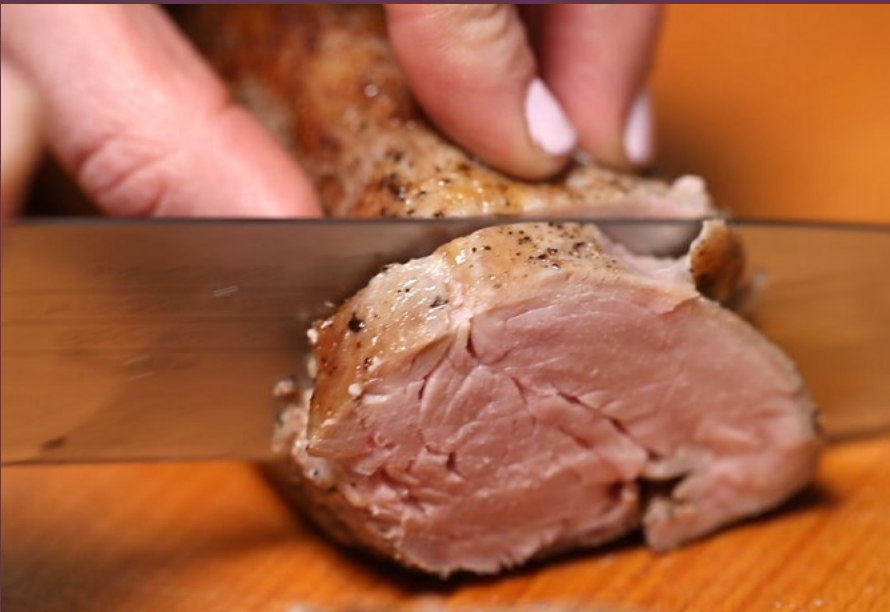


Kapusta Pork <https://www.yummly.com/recipe/Kapusta-Pork-2248916>

Activity:

SOUS VIDE RECIPE TASTING & EVALUATION

- Students set up taste testing on buffet table/food island with signage.
- Each group is responsible for preparing comments about a recipe they taste tested – color, temperature, flavor, appearance, etc. Make one or two suggestions on a change to make next time recipe is prepared.
- Students use “Evaluation of Laboratory Experience” form to assess food prep skills during lab.





PRINT

EVALUATION OF LABORATORY EXPERIENCE

Criteria	Exceeds Expectations	Meets Expectations	Working to Meet Expectations	Not Evident
Planning	Participated in planning the lab - market order included all required elements, only one trip to supply area, gathered all necessary equipment, assisted in completing an effective time work schedule	Some participation in planning the lab - market order included most required elements, limited trips to supply area, needed to locate additional equipment after beginning to work, assisted in completing a manageable time work schedule	Limited participation in planning the lab - market order missing several required elements, many trips to supply area, did not locate all necessary equipment, time work schedule had flaws which led to time management issues	Did not participate
Safety & Sanitation Procedures	Followed safety & sanitation procedures; wore closed toed shoes, hair pulled back, demonstrated personal hygiene & food safety standards, washed, rinsed, dried items used & returned to proper location, wiped sinks, appliances, counters, & table, disposed of trash & recyclables, swept if needed	Minor violations of safety & sanitation procedures; failed to satisfactorily complete 1-2 of the required tasks	Major violations of safety & sanitation procedures; failed to satisfactorily complete 3 -5 of the required tasks	Major violations of safety & sanitation procedures: failed to satisfactorily complete more than 5 of the tasks
Preparation Techniques	Proper utensils/equipment were used, correct measures of ingredients, followed principles & techniques given in class, completed recipe as stated	Most utensils/equipment were used properly, mostly correct measures of ingredients, followed many of the principles & techniques, generally followed recipe as stated	Many errors in utensil/ equipment usage and/or measures of ingredients, principles & techniques were ignored, limited understanding of the recipe	Did not demonstrate any preparation techniques or recipe was not followed
Lab Analysis & Reflection	Accurately completed cost analysis, reflection included personal comments, sampled all items available for tasting	Completed cost analysis with only a few errors, reflection completed, sampled most of the items available for tasting	Cost analysis had several errors, reflection incomplete, sampled some of the items available for tasting	Cost analysis or reflection not completed, did not sample any of the items available for tasting

FOR OBSERVATION ONLY – NOT INCLUDED IN LAB SCORE

Teamwork & Communication	Worked well with others, stayed on assigned task, worked quietly, problem solved cooperatively, assisted others when needed	Mostly able to work with others, frequently on assigned task, usually worked quietly, required assistance from instructor to solve problems	Lacked ability to work with others, often not on assigned task or quiet, unable to resolve problems, required supervision	Unable to participate due to lack of cooperation and removal from lab
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Exceeds Expectations=Consistently displays
 Meets Expectations=Often displays
 Working to Meet Expectations=Rarely displays
 Not Evident=No displays

A=All areas exceed expectations
 B=3 or more meet expectations and none not evident
 C=3 or more working to meet expectations
 INC=3 or more not evident

Source: Susan Turgeson, Ed. D., CFCS, Assistant Professor of Family and Consumer Sciences, University of Wisconsin-Stevens Point



Activity:

PORK NUTRITION

- Students include pork nutrition facts in their class notes.
- Refer to resource at <https://www.pork.org/cooking/pork-nutrition/>

Teacher Notes:

- In the marketplace today, lean, nutrient-rich pork is versatile, affordable and accessible for many Americans. Pork has many beneficial qualities to make pork easy to incorporate into any healthy and balanced diet. The class as prepared several pork recipes. Take a closer look at the health benefits of consuming lean protein like pork.
- How does pork compare to other meats for fat, calories and cholesterol? Pork today compares favorably for fat, calories, and cholesterol with many other types of meat and poultry. While providing a greater amount of vitamins and minerals, many cuts of pork are as lean or leaner than chicken.

Activity:

BENEFITS OF PORK IN YOUR DIET

- Students include dietary benefits of pork in their class notes.
- Refer to resource at <https://www.pork.org/cooking/pork-nutrition/compare-pork-nutrition/>

Teacher Notes:

- Pork is both a good source of protein and also provides several important vitamins and minerals. A 3-ounce serving of pork is an “excellent” source of thiamin, selenium, protein, niacin, vitamin B6 and phosphorus, and a “good” source of riboflavin, zinc and potassium.
- Pork is naturally low in sodium and a “good” source of potassium – two nutrients that, when coupled, can help regulate blood pressure.
- The American Heart Association has certified the pork tenderloin and pork sirloin roast meet the criteria as heart-healthy foods, indicating that they contain less than 5 grams of fat, 2 grams or less of saturated fat and 480 milligrams or less of sodium per label serving, among other criteria.

Activity:

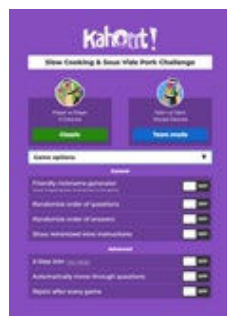
WRAP-UP

- Use one or all of the questions below to wrap up this unit and transition to the Kahoot Challenge. These questions can be processed orally or in written format.
- How has our study of slow cooking and sous vide increased your confidence in these cooking methods?
- Has preparing pork using slow cooking and sous vide methods increased your likelihood of preparing pork in the future? Why or Why not?
- What are ways pork can be part of a healthy diet?

Activity:

KAHOOT

- Students take the Slow Cooking & Sous Vide Pork Challenge Kahoot <https://create.kahoot.it/share/slow-cooking-sous-vide-pork-challenge/4c2635ba-81f9-4ce0-b03f-5b155328103a>



Teacher Notes:

- Kahoot! is a game-based learning platform, used as educational technology in schools and other educational institutions. Its learning games, “Kahoot”, are multiple-choice quizzes that allow user generation and can be accessed via a web browser. Registration is not required for students using a Kahoot quiz.
- This Kahoot can be used as a summative or formative assessment or simply as a review game. There are 14 questions that can also be duplicated and edited based on your needs.

OPTIONAL ACTIVITIES TO ENHANCE LEARNING:

Pork Comparison

- <https://www.pork.org/cooking/pork-nutrition/compare-pork-nutrition/>
- Nutrition of Lean Meats Chart shares comparative nutrition information for pork, chicken, beef and fish.
- Engage students in discussion about the comparisons and making healthy choices.

Grading System for Pork

- Research the federal grading system used for pork
- Visit meat market/counter and locate examples of how meat cuts are graded, take photos
- Interview staff about grades of meat they have available to consumers
- Create a slide show describing the federal grading system for pork, including photos/examples you discovered at meat market/counter you visited
- List advantages and disadvantages of grading system for consumers
- Last slide lists the resources you used
- Be prepared to share with class



Simple Slow-Cooker Pork Adobo <https://www.yummly.com/recipe/Simple-Slow-Cooker-Pork-Adobo-1339761>

Resources

ONLINE VIDEOS:

Simple Slow Cooker Tips

National Pork Board
<https://www.youtube.com/watch?v=tFFYxPz8Jjk>

Meat Thermometer Basics

National Pork Board
<https://www.pork.org/blog/using-meat-thermometer/>

OTHER RESOURCES:

Slow Cookers and Food Safety

University of Minnesota Extension
<https://extension.umn.edu/preserving-and-preparing/slow-cookers>

Sous Vide

Anova Culinary

<https://anovaculinary.com/what-is-sous-vid/>

Pork Cooking Times and Temperatures

National Pork Board
<https://www.pork.org/wp-content/uploads/2019/10/pork-cooking-times-and-temperatures.pdf>

Pork Temperature

National Pork Board
<https://www.pork.org/cooking/pork-temperature/>

Marking the Text

AVID Weekly
<https://www.sps186.org/downloads/blurbs/23663/Marking%20The%20Text.pdf>

United States Department of Agriculture Food Safety Information

Slow Cookers and Food Safety (this resource is excellent for those who are new to slow cooking or who need a refresher in food safety around slow cooking)
https://www.fsis.usda.gov/shared/PDF/Slow_Cookers_and_Food_Safety.pdf

Evaluation of Laboratory Experience for Slow Cookery & Sous Vide Recipes,

Susan Turgeson, Ed. D., CFCS, Assistant Professor of Family and Consumer Sciences, University of WI-Stevens Point

Pork Nutrition

<https://www.pork.org/cooking/pork-nutrition/>

Compare Pork Nutrition

<https://www.pork.org/cooking/pork-nutrition/compare-pork-nutrition/>

Slow Cooking and Sous Vide Pork Challenge Kahoot

<https://create.kahoot.it/share/slow-cooking-sous-vid-pork-challenge/4c2635ba-81f9-4ce0-b03f-5b155328103a>

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