



SoCalGasTM

Intermediate Cooking with Gas

Lesson 8: Braising

BEGINNER



Introduction

Welcome to Intermediate Cooking with Gas. Today's topic is braising using a combination oven. Once you learn about braising, you will learn how to cook with gas to make your own braised root vegetable dish.

This lesson can be completed in a classroom or at home. Your teacher will provide instructions for completing the assignment from home.

Opening Assessment

1. Which type of protein would best be used for braising?
 - a. clams
 - b. brisket
 - c. pork shoulder
 - d. chicken breast
2. Which nonrenewable resource produces the most carbon emissions?
 - a. coal
 - b. gasoline
 - c. natural gas
 - d. liquid propane
3. Which method is most related to braising?
 - a. boiling water
 - b. submerging food into oil
 - c. plunging food into ice water
 - d. searing at high temperatures
4. Why is natural gas a preferred energy source for cooking?
 - a. It is easy to obtain due to its wide availability.
 - b. It allows for the temperature to be controlled easily.
 - c. It produces byproducts that can be used for other things.
 - d. It has a minimal cost per unit of volume compared to others.
5. What is an advantage of using a combination oven?
 - a. It allows for focusing on one type of food at a time.
 - b. It takes the place of multiple other appliances in the kitchen.
 - c. It offers customization of oil temperatures to meet a variety of needs.
 - d. It produces dry heat in a steaming mode that has a wide range of uses.

Cooking with Natural Gas

A combination oven is a tool used in professional kitchens that can greatly save time and effort. As the name implies, a combination oven (or “combi oven”) is a machine that can be used for both moist and dry cooking methods, often at the same time. These ovens do cost a bit more upfront, but in the long run, they can save kitchen money by taking the place of several appliances and cooking more food at once. The image below shows a combination oven.



There are several benefits to using a combination oven. First, they have a wide range of functions. These include roasting, braising, steaming, smoking, baking and even air frying. Having one device that does all of these can save space in a kitchen and also save time and effort. Next, combination ovens allow for very accurate temperature controls. When using natural gas as a fuel source, the controls on a combination oven can be set to an exact degree. This lets the food cook to precisely the right temperature to ensure doneness.

Combination ovens usually have three main cooking modes. These include steam, convection and combination. The steam creates moist heat that keeps food juicy during the cooking process. **Convection** forces hot air around the inside of the oven, creating dry heat that browns foods and removes moisture from them. In combination mode, both hot air from convection and steam are used for cooking foods without losing moisture. This is the ideal setting to use when braising. Meats and vegetables stay juicy but also experience some browning on top.

Cooking Methods

There are three types of cooking methods that utilize natural gas:

1. **Moist cooking** involves cooking with moisture in either liquid or steam form.
2. **Dry cooking** involves cooking without any moisture.
3. **Combination cooking** combines moist and dry heat cooking.

Today, you will be learning about and preparing food using a combination cooking method.

Combination Cooking: Braising

Combination cooking methods include braising and stewing. Each method utilizes dry and moist heat to cook the food. This lesson will utilize a Dutch oven or a combination oven and the *braising* cooking method. To braise the meat or vegetables, they are first seared in a pot or in the combination oven to brown them. The food is removed, and the pot is then filled with a liquid, often a broth or stock, to loosen the crust formed during browning. This process is called **deglazing**. The food then gets returned to the pot and allowed to simmer. This allows the liquid to reduce and thicken, leaving behind tender meats and vegetables.



Foods like meats, such as pork shoulder and chuck roast, vegetables, potatoes, beets and legumes, such as chickpeas and kidney beans, cook well by braising. You will learn how to utilize combination heat for cooking various proteins, vegetables and starches throughout your lessons on combination cooking.

Instructor Demonstration

Watch the instructor's demonstration on proper natural gas range safety and how to use a Dutch oven on the range or a combination oven to make braised root vegetables. Answer the following questions as you watch the demonstration.

- What safety tips did the instructor give during the demonstration?
- At what setting was the burner set on the range?
- Why are the vegetables cut into smaller pieces before braising?
- What purpose does adding the liquid to the pan serve when braising?
- How did the instructor determine how long to cook the vegetables?
- At what setting was the combination oven set?
- How many steps did the instructor create for the braising profile in the combination oven?*
- How much time was saved braising with the combination oven?
- What cooking tips did the instructor give during the demonstration?

** Combination ovens are designed with the memory for multiple cooking profiles. These profiles can be single or multi-step and may be saved and then accessed from the internal cookbook.*

Selecting and Preparing a Recipe

The following section can be completed at home if the preparing and cooking can be performed safely. Residential and commercial cooking equipment vary; while the information focuses on natural gas equipment, electric ranges and stoves may also be used to complete the cooking assignment.

Now you are going to make your own braised root vegetables using vegetables and potatoes. Once browned, the liquid and seasonings will be added to the vegetables to simmer and reduce. Optionally, you can top the vegetables with fresh herbs or additional seasonings or serve alongside a protein of your choice.

Your teacher will review your recipe and dish based on the criteria listed below. If you are learning remotely, your teacher will provide instructions on how to submit your recipe and images or video(s) of your completed dish.

Criteria	Excellent 3	Proficient 2	Emerging 1
Procedure	clearly followed given instructions and the example provided in the demonstration	somewhat followed given instructions and/or the example provided in the demonstration	did not follow given instructions and/or the example provided in the demonstration
Content (submitted photos, procedure, videos, etc.)	content and explanations were thorough and well detailed	included content and explanation but included few specific details	included little to no additional content or explanations and/or no specific details
Organization	organized when preparing and making their recipe	somewhat organized when preparing and/or making their recipe	not organized when preparing and/or making their recipe

Create Your Recipe

You will need to choose one item from the vegetables, one item from the fats and one item from the starch categories for this recipe. You can choose to add any additional toppings or flavors based on your preference, dietary preferences, allergies and available ingredients. Before starting to cook, it is important to have all of your ingredients, tools and equipment prepared ahead of time, what chefs call “mise en place” or “everything in its place.”

Select a root vegetable:

carrots
parsnips
rutabaga
onion

Select a fat:

vegetable oil
olive oil

Select a starch:

white potatoes
sweet potatoes

Select additional toppings and seasonings:

celery
garlic
fresh rosemary
fresh sage
fresh basil
sea salt
black pepper
shredded cheese
bacon pieces

Safety first:

- Always keep a Class ABC fire extinguisher nearby.
- When braising in the Dutch oven, make sure there are no pot holders, towels or other flammable materials next to the burner.
- Make sure there are no plastic or meltable objects next to the burner.
- Always use dry, flame retardant potholders to protect your hands from burning on the hot pot.
- Always pour hot liquids away from you.
- Be sure to keep your face away from the pot when braising the vegetables.
- Always use a spoon or tongs to remove the vegetables from the Dutch oven.
- Practice knife safety when cutting the vegetables on a green cutting board and use properly sharpened knives. (Green is the food safety color for produce cutting boards.)

Equipment:

- Sharp kitchen knife
- Cutting board
- Dutch oven or combination oven
- Baking sheet

Ingredients:

- 2 carrots
- 2 parsnips
- 1 large rutabaga
- 1 onion, sliced
- Choice of potatoes
- Celery
- 3 cloves garlic (optional)
- 2 cups broth (flavor optional)
- 2 teaspoons oil
- Optional seasonings (rosemary, thyme, basil, sage)

Procedure: Dutch Oven

1. Cut the carrots and parsnips into medium chunks. Cut the potatoes and any other vegetables into similar-sized pieces.
2. In a large, heavy-bottomed Dutch oven, heat the oil over medium-high heat. Season the carrots, parsnips and onion with salt and pepper, then add to the pot. Toss to coat in the hot oil. Turn the vegetables so they will be brown on all sides.
3. Add the optional ingredients, such as garlic, rosemary, thyme and sage. Stir into the vegetables, then add the broth and allow it to come to a boil. Reduce the heat to low and cover the pot. Allow cooking for about 15 minutes or until vegetables are fork tender.
4. Uncover the pot. Turn the heat to medium-high and allow the liquid to reduce and slightly thicken to a flavorful sauce. Adjust seasonings and/or salt and pepper.

Procedure: Combination Oven

1. Turn on the combination oven and select the cooking profile for braising. The oven will begin to preheat. During preheat, start your mise en place. When the oven is ready, an alarm will sound.
2. Cut the carrots and parsnips into medium chunks. Cut the potatoes and any other vegetables into similar-sized chunks.
3. Place all the vegetables and seasonings in a large roasting pan and toss with the oil. When the oven preheat alarm sounds, open the oven, place the uncovered roasting pan in the oven, close the door and hit start on the control panel.
4. Since braising is a multi-stage profile, the oven will sound when the first step is done. The alarm will sound for the second step to open the door, add the liquid, stir, then taste and add seasonings. Close the door and hit start.
5. Once the second stage is complete, open the door and check the reduction of the liquid and the tenderness of the vegetables. If done, remove the roasting pan and hold until service.
6. Serve with your preferred starch or accompaniments.



Tips:

- Make sure the vegetables and potatoes are cut into similar sized pieces to allow for even cooking.
- Take care not to cut the pieces too thin or you will end up with mush. Uneven sizes will not cook uniformly.
- About halfway through braising, use a wooden spoon or tongs to rearrange the vegetables so they do not burn to the bottom.
- Don't leave the pot unattended when it is uncovered to avoid overcooking and too much evaporation of the liquid.

Activity

After you complete braising your vegetables, select one prompt to write about.

1. The dish you just cooked is fairly simple in terms of preparation. What efforts could be made to increase the complexity of the recipe for a very experienced chef? Think about other ingredients and flavors to add, other techniques to include and how this would possibly change the outcome of the dish.
2. The root vegetables you used are perfect for braising because they contain just the right amount of moisture. They do not readily dry out. Why do you think vegetables like peas, broccoli and zucchini are not ideal for this form of cooking? Provide evidence as to why chefs steer away from these ingredients when braising.

Final Assessment

1. Which type of protein would best be used for braising?
 - a. clams
 - b. brisket
 - c. pork shoulder
 - d. chicken breast
2. Which nonrenewable resource produces the most carbon emissions?
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3. Which method is most related to braising?
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4. Why is natural gas a preferred energy source for cooking?
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Intermediate Cooking with Gas—Beginner

Lesson 8: Braising

Teacher Guide

(1 class session)

Introduction

This lesson covers a basic understanding of how natural gas compares to other energy sources and the benefits of using a combination oven. Then, students will learn how natural gas is used for cooking with a Dutch oven or a combination oven to braise and cook root vegetables. Keep in mind that students may have dietary preferences, restrictions or allergies that may need to be accommodated to complete the recipe. If the student is preparing food at home, ensure that appropriate adult supervision will be available.

This lesson could be completed in a classroom or at home. Suggestions and instructions will be given for both scenarios.

Opening Assessment: Answer Key (3 minutes)

Use these questions to obtain a baseline for what your students know before beginning the lesson. The correct answers are highlighted.

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Cooking with Natural Gas (3 minutes)

Students will read about the advantages of using a combination oven for cooking. The following questions could be used for a class discussion or given to students to complete individually.

- What is the purpose of a combination oven?
- Why would a chef prefer using a combination oven over a regular oven?
- What types of food preparation techniques can be performed with a combination oven?

Cooking Methods (2 minutes)

Students will understand three cooking methods that utilize natural gas: moist cooking, dry cooking and combination cooking.

Combination Cooking: Braising (3 minutes)

Students will read about cooking with combination heat and the braising technique. The following questions could be used for a class discussion or given to students to complete individually.

- What are the benefits of cooking with combination heat?
- What advantages does a combination oven provide to a chef?
- Why might food be more tender cooked in a combination oven than on the range?

Instructor Demonstration (6 minutes)

The demonstration can either be performed in class or recorded for remote use. If the demonstration is done in person, preheat the Dutch oven or combination oven while the students complete their readings so they are ready for your demonstration.

Prepare the vegetables and other ingredients ahead of time so that the students can cook along with the demonstration.

The demonstration should include:

- how a Dutch oven or combination oven works
- safety tips when using a Dutch oven or combination oven
- how to braise, including tips for how hot the oven or Dutch oven should be
- the benefits of using braising as a cooking technique
- how to cook root vegetables and how to check the root vegetables for doneness
- the benefit of cutting the vegetables into uniform pieces
- finishing the braised root vegetables with cheese and other flavorings, and incorporating other optional ingredients
- knife techniques and safety when cutting the vegetables

Students will use the following questions as a guide to either a class discussion after or note-taking during the demonstration:

- What safety tips did the instructor give during the demonstration?
- How many carrots did the instructor put into the Dutch oven?
- How high did the instructor have the temperature?
- How did the instructor determine how long to cook the vegetables?
- What cooking tips did the instructor give during the demonstration?

Selecting and Preparing a Recipe (30 minutes)

If the students will be cooking in the classroom, ensure ingredients are available to the students ahead of time. Make sure that student allergies, dietary restrictions and preferences are taken into account. Also, be sure to plan a few minutes at the end of class for cleanup.

If the students are cooking at home, be sure to provide the ingredients or the “mise en place” ahead of time to give the students time to assemble the ingredients. Consider the time the recipe typically takes to cook and the ability for students to purchase their ingredients from the grocery store.

Students will use the instructor demonstration as a guide to cooking their own braised root vegetables. Students will select a root vegetable, starch and optional flavorings and toppings from a list to complete their recipe.

Students cooking at home can submit a description of the ingredients and procedure they used along with pictures of their completed dishes or a video of themselves cooking the recipe. Be sure to share instructions with your students on what to submit and how to share it with you.

Scoring Rubric:

Criteria	Excellent 3	Proficient 2	Emerging 1
Procedure	clearly followed given instructions and the example provided in the demonstration	somewhat followed given instructions and/or the example provided in the demonstration	did not follow given instructions and/or the example provided in the demonstration
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Activity (5 minutes or as homework)

Students will select a writing prompt to answer.

1. The dish you just cooked is fairly simple in terms of preparation. What efforts could be made to increase the complexity of the recipe for a very experienced chef? Think about other ingredients and flavors to add, different techniques to include and how this would possibly change the outcome of the dish.

Student answers will vary but may describe that adding unique spices and protein or potatoes to the dish would increase the complexity of the braised root vegetable recipe. Adding protein would involve browning it beforehand and then deglazing the pot before adding the vegetables. Adding the protein would add protein to the meal and add new textures and flavors. The vegetables would absorb the juices from the protein to add a more robust flavor.

2. The root vegetables you used are perfect for braising because they contain just the right amount of moisture. They do not readily dry out. Why do you think vegetables like peas, broccoli and zucchini are not ideal for this form of cooking? Provide evidence as to why chefs steer away from these ingredients when braising.

Student answers will vary but should describe that vegetables like peas, broccoli and zucchini are not appropriate for braising because they hold too much water. When braising, the vegetables are exposed to high levels of heat. This heat would cause the water in these vegetables to evaporate, leaving behind wilted, pale vegetables that would not look appetizing. Additionally, chefs steer away from these types of vegetables because they do not provide the added flavors of others.

Scoring Rubric:

4	3	2	1
<p>The student response ...</p> <ul style="list-style-type: none"> • fully responds to each part of the writing prompt with relevant, strong details • has logical organization • uses effective language and word choice for purpose and audience • contains no errors in usage or grammar 	<p>The student response ...</p> <ul style="list-style-type: none"> • addresses each part of the writing prompt with sufficient details • has sufficient organization • uses mostly effective language and word choice for purpose and audience • contains minor errors in usage or grammar that do not affect meaning 	<p>The student response ...</p> <ul style="list-style-type: none"> • addresses some of the writing prompt with weak details • attempts organization • uses some language and word choice for purpose and audience • contains minor errors in usage or grammar that slightly affect meaning 	<p>The student response ...</p> <ul style="list-style-type: none"> • does not address a large portion of the writing prompt • lacks organization • rarely uses appropriate language and word choice for purpose and audience • contains major errors in usage or grammar that greatly affect meaning

Final Assessment: Answer Key (3 minutes or as homework)

Use these questions in conjunction with the discussion questions in each section to formally assess student growth throughout the lesson. Address any student misconceptions that remain at the end of the lesson. Consider having students compare their opening assessment with their final assessment to see how their understanding of cooking with gas improved in the lesson.

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