SECTION 11.1 POTATOES

Potatoes are native to North and South America. In the fifteenth century, the Spanish explorer Francisco Pizarro introduced them to Europe and sent them back to Spain. Potatoes became a staple in many countries, particularly in Ireland, because they were inexpensive and easy to grow. Today, the potato is the most important noncereal crop in the world.
Study Questions

After studying Section 11.1, you should be able to answer the following questions:

- What are the different types of potatoes?
- What are the methods to selecting, receiving, and storing potatoes?
- What types of cooking methods and recipes are there for preparing potatoes?

Types of Potatoes

All potatoes are not the same. Potato varieties differ in starch and moisture content, shape, and skin color. That's why different varieties produce a different end product. Potatoes are categorized by the potato's starch and moisture content. The starch content of any potato increases with age.

High-starch, low-moisture potatoes are dense because they have a high amount of dry starch. These potatoes swell and separate as they cook, which makes the potato fluffy. High-starch, low-moisture potatoes are best when baked, puréed, or fried. They include Idaho and russet potatoes.

Medium-starch, medium-moisture potatoes are versatile. The high moisture prevents the potato from swelling when cooked. These types of potatoes hold their shape, so they are good for potato salads and potato cakes. Medium-starch, medium-moisture potatoes are best for boiling, steaming, sautéing, oven roasting, stewing, mashing, and braising. They include chef's all-purpose, Yukon gold, and yellow-fleshed potatoes.

Low-starch, high-moisture potatoes are new potatoes. New potatoes are best for boiling, steaming, and oven roasting.

Sweet potatoes, yams, and russet potatoes are suited to baking, puréeing, and frying because they are high in starch and low in moisture. Table 11.1 lists the characteristics of the different types of potatoes.
### Table 11.1: Characteristics of Potatoes

<table>
<thead>
<tr>
<th>Name</th>
<th>Characteristics</th>
<th>Best Cooking Methods</th>
</tr>
</thead>
</table>
| **Sweet potatoes** | - Sweet potatoes (as other potatoes) are tubers. Tubers are fat, underground stems capable of growing a new plant.  
                     - Their thick skin ranges in color from light to brownish red.  
                     - They are high in starch and low in moisture.  
                     - They have an orange, mealy flesh that is very high in sugar.  
                     - Unlike the russet or chef's potato, sweet potatoes are available canned in a sweet, sugary sauce.  
                     - They are available year-round.  
                     - They are popular ingredients in breads, pies, puddings, soups, and casseroles.                                                                 | Boiling  
                                                      Baking  
                                                      Puréeing  
                                                      Roasted |
| **Yam**          | - Yams are not related to the sweet potato.  
                     - They originated in Asia.  
                     - They are less sweet than sweet potatoes.  
                     - They range in color from creamy white to deep red.  
                     - Yams have more natural sugar and a higher moisture content.  
                     - Yams and sweet potatoes are used interchangeably                                                                                       | Baking  
                                                      Puréeing  
                                                      Frying |
| **Russet**       | - They are referred to as Idaho potatoes, although many other states also produce these potatoes.  
                     - They are the standard white baking potato.  
                     - Their skin is generally a brownish-red color.  
                     - Their flesh is mealy and white.  
                     - They are available in many shapes and sizes.  
                     - Russet potatoes are good for baking, frying, mashing, roasting, and broiling. They are often used to make French fries.                   | Baking  
                                                      Frying |
| **Chef's/All-purpose** | - They are drier and less starchy than russet potatoes.  
                     - They are less expensive than russet potatoes.  
                     - Since they are irregularly shaped, they are most suited to preparation in which the final shape of the potato is not visually important, such as mashing, puréeing, in salads, scalloped or casseroles dishes, soups, braising, and sautéing. | Mashing  
                                                      Puréeing  
                                                      Braising  
                                                      Sautéing |

*continued*
<table>
<thead>
<tr>
<th>Name</th>
<th>Characteristics</th>
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</tr>
</thead>
<tbody>
<tr>
<td>New potatoes</td>
<td>• These are small, immature red potatoes that are harvested when they are very small, less than 2 inches in diameter.</td>
<td>Boiling</td>
</tr>
<tr>
<td></td>
<td>• Unlike other baking potatoes, new potatoes are high in moisture and sugar, but have a low starch content.</td>
<td>Steaming</td>
</tr>
<tr>
<td></td>
<td>• Boiling and steaming brings out the natural sweetness and fresh flavor of new potatoes.</td>
<td>Roasting</td>
</tr>
<tr>
<td></td>
<td>• They are good to use in any preparation where the potato must keep its shape.</td>
<td></td>
</tr>
<tr>
<td>Yellow-fleshed</td>
<td>• Yellow-fleshed have become increasingly popular in the United States in recent years.</td>
<td>Mashing</td>
</tr>
<tr>
<td></td>
<td>• They are common in other parts of the world, including Europe and South America.</td>
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</tr>
<tr>
<td></td>
<td>• They produce a golden color and a buttery flavor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• They are good, all-purpose potatoes.</td>
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<tr>
<td></td>
<td>• Yukon gold is one well-known variety.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• They are good for baking, mashing, frying, whipping, or roasting. They are especially good for potato pancakes.</td>
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</table>

**Did You Know...?**

The U.S. Census Bureau 2008 reports that 1.8 billion pounds of sweet potatoes were produced by major sweet potato-producing states in 2007. North Carolina produced the most sweet potatoes, with 667 million pounds. California was a distant second with 426 million pounds of sweet potatoes produced.
One Bad Apple

There is an old expression: "One bad apple will spoil the whole bunch." Apples aside, this is true with potatoes. Soft bacterial rot in potatoes can begin with one infected tuber and spread to an entire pile. Some potato problems are carried in bacteria or mold spores in the dirt that clings to the potatoes. Store and clean them properly before preparation, and these potential problems will never develop into real problems.

However, if grown, harvested, or stored improperly, a potato can develop diseases with names like soft rot, pink rot, silver scurf, and pythium leak. Most of these ailments are discovered and treated on the farm level before the crop goes to market. However, improper storage of potatoes in the pantry can initiate growth of bacteria that can do great damage to an entire shipment.

Potatoes are amazing. They breathe and circulate and can even heal their own wounds. But if rot begins, they can no longer breathe and heal. This creates decay as the bacteria feed on the starch and sugar and proliferate throughout the spud. Once growing, the bacteria can take hold on neighboring tubers and block their respiration and otherwise wreak havoc. As the bacteria do their work, they generate heat, which increases the temperature of the storage pile of potatoes, moving them into the danger zone for more bacterial growth. A vicious cycle ensues, and before too long, the entire pantry is filled with rotting potato stench.

Store potatoes in a cool, dry, well-ventilated environment away from sunlight. Store them in an area that is too cool, and the potato will "stress," which reduces the cooking quality. The ideal temperature is 45°F to 55°F, with good airflow. Avoid storing potatoes in plastic. Store them in paper or cardboard, or in open crates. Remove excess dirt and clean the storage bins of dirt and debris between shipments.

If you notice small flying insects (fruit fly-type) or smell a musty, rotten, or ammonia odor near the potatoes, check all the potatoes immediately, especially toward the bottom of the pile. If one dark, soft, wrinkled, damp, or foul-smelling potato is found, immediately remove it from the pile. Check all the remaining potatoes, especially the neighbors to the bad one, and rotate them bottom to top. Remove and discard any suspicious potatoes.

If potatoes seem wholesome, but have begun to slightly wrinkle or shrink, clean and boil them for use in recipes. Only bake firm, fresh potatoes. And always purchase potatoes from approved, reputable farms, vendors, and suppliers.
Selecting and Storing Potatoes

When selecting potatoes, choose potatoes that are firm and smooth. Do not accept potatoes with dark spots, green areas, mold, or large cuts. Store potatoes in a cool, dry place at temperatures ranging from 45°F to 55°F. The maximum storage period for russet and all-purpose potatoes is 30 days. Store yams for up to two weeks. Store sweet potatoes for up to one week. Store new potatoes—a small, immature red potato—no longer than one week. All potatoes are best stored in ventilated containers in indirect light. Figure 11.1 shows potatoes in a ventilated container.

A wide variety of market options exists when purchasing potatoes. These forms include fresh, frozen, refrigerated, canned, and dried. Value-added forms are also available, such as potatoes cut into shapes.

Peruvian Purple and Red Thumbs
Potatoes, just like other fresh produce, can be colorful. Although potatoes might not seem like the most colorful tuber, heritage varieties are filled with bright color. Fingerling potatoes are small, mature potatoes from delicious historic seed lines that come in yellow, orange, red, and even purple.

The naturally occurring colors come from pigment nutrients called flavonoids. The purple and red pigments are flavonoids called anthocyanins, which is the same pigment in blueberries or red cabbage. These are antioxidants that might even help fight off cancer.

Gorgeous color and great flavor aside, these foods are worth eating for the health-giving qualities of the pigments. As with all anthocyanin foods, a slightly acidic cooking medium keeps the color perky red, while a little alkaline causes a dull blue.
Cooking Potatoes

Potatoes that are exposed to light may develop a greenish color. Although the color is harmless, it means that the potato contains solanine (SOLE-ah-neen), a harmful, bitter-tasting substance. Potato sprouts can also contain solanine. Cut away and discard sprouts and any green portions before using potatoes. Always discard potatoes if you have any doubts about their freshness or safety. Figure 11.2 is a greenish potato with sprouts.

The potato is one of the most popular vegetables because it is inexpensive, adaptable, versatile, and tasty. Apply any cooking methods, including boiling, steaming, baking, sautéing, *en casserole*, deep-frying, and puréeing to produce a number of preparations with special flavors, textures, and appearances. Different potato varieties will produce different results.

The two categories for cooking potatoes are single-stage and multiple-stage techniques. In the **single-stage technique**, take potatoes directly from the raw state to the finished state by using one cooking method. Boiled and baked potatoes are examples of single-stage techniques.

In a **multiple-stage technique**, prepare potatoes using more than one cooking method before they are a finished dish. One example of potatoes prepared using the multiple-stage method is **lyonnaise** (LEE-on-AZEE) potatoes. In this recipe, the potatoes are precooked, sliced, and then fried with onions, as shown in Figure 11.3.

Boiling is one of the easiest methods of cooking potatoes. In addition, boiling is often the first step for other preparations, such as puréed potatoes.
Essential Skills

**Boiling Potatoes**

1. Place washed potatoes in a pot of cold, salted water with enough liquid to cover them.
2. Bring the water to a boil and simmer until they are done.
3. To test for doneness, pierce the potato with a fork or knife. If the fork slides easily through the potato, the potato is done. The boiled potato can then be served immediately or held for up to an hour. See Figure 11.4.

![Figure 11.4: Step 3—Boiling potatoes.](image)

Steaming is an especially good cooking method for new potatoes because of their high moisture content. Steam new potatoes until they are very tender. Like boiled potatoes, serve them right away or hold and use with another dish.

Unlike boiled and steamed potatoes, baked potatoes are always served in their skins. The best baking potatoes are Idaho or russet potatoes. There are a variety of ways to bake potatoes. Wrap potatoes in foil prior to baking to keep the skin soft, which makes the inside less fluffy. Rub the potato with oil to keep the skin soft while allowing the inside to get soft and fluffy. Bake with no foil or oil to leave the skin crisp. Figure 11.5 on the following page shows a baked potato.
Scrub all potatoes clean and pierce with a fork before placing in the oven, no matter the technique. Piercing the potato with a fork allows heat and steam to escape and prevents the potato from exploding. Cook baked potatoes directly on an oven rack or sheet pan and serve immediately.

For *en casserole* potato dishes, combine peeled and sliced raw potatoes with heavy cream, sauce, or uncooked custard. See Figure 11.6. Slowly bake these dishes in a buttered pan. Toppings include bread crumbs, butter, and grated cheese, after which the food preparer broils the dish briefly to give it a golden, golden-brown color. These potatoes are excellent for banquet service because servers can divide them into individual portions very easily, and they can be held without losing quality.

*Figure 11.5:* Baking a potato with foil around it keeps the skin soft.

*Figure 11.6:* Baking *en casserole* means that potatoes are sliced and baked in the oven in a creamy, tasty liquid.
Chef's potatoes are the best for sautéing. Sautéed potatoes should have a crisp, evenly browned exterior with a tender interior. Sauté the potatoes in oil or butter, stirring or flipping them frequently until they are golden brown. For best results, serve immediately.

Did You Know...?
Potatoes are 80% water and 20% solid.
Potatoes are more nutritious with their skin on.
The potato was the first vegetable grown in space in 1995.

Another popular method of cooking potatoes is deep-frying. Use this method to make French fries, cottage fries, steak fries, and many other fried potato dishes. Russet potatoes are best suited for deep-frying because of their low moisture content.

At service time, fry potatoes in fat heated to 350° to 375°F until golden brown. Deep-fry in two stages because of the long cooking time. When they are done, place the potatoes on a paper towel and season immediately. Do not hold deep-fried potatoes; serve immediately, as shown in Figure 11.7.

Figure 11.7: The average American eats more than 16 pounds of French fries each year.
Making the French Fries

The automatic potato peeler in a commercial kitchen can process up to 20 pounds of potatoes at a time. Whole washed potatoes are put into the drum. A rotating sharpened disc blade in the bottom removes the skin while the potato is tumbled to expose all sides to the blade. If you forget and leave the potatoes in there too long, there are no potatoes left at all.

In Idaho, the Spud Gun was invented to fire a potato. This is a fun idea that has its roots in the food service industry.

The Lamb Water Gun Knife is a long tube with a sharp slicing grid inside. A peeled potato is launched by a water jet through the tube. It is forced through the grid, making perfect French fries. Mr. Lamb first tested the invention in the parking lot of his potato processing operation. He shot potatoes through the tube with a fire hose.

Make potato pancakes with grated potatoes and other ingredients. Pan-fry them to a crispy brown. They are traditional in many Eastern European cuisines, particularly in American-Jewish cooking, where they are called latkes (LAHT-keys). Latkes are traditionally served with apple sauce and sour cream. Figure 11.8 shows latkes.

Puréeing potatoes is another way to prepare potatoes. Puréed potatoes are important as the basis of many popular dishes, including mashed or whipped potatoes, duchesse potatoes, and potato croquettes.

For puréed, whipped, and mashed potatoes, first boil, steam, or bake the potatoes before combining them with other ingredients or mashing. Hold them for service in a bain-marie or a steam table. Refrigerate puréed potatoes that are to
be used in other
dishes for several
hours. Figure 11.9
shows mashed
potatoes served
with meat.
Whenever
possible, cook
potatoes in their
skins to retain
their nutrients.
Cover the cut and
peeled potatoes in
a liquid to prevent
discoloring.

Figure 11.9: Potatoes are a great accompaniment to meat dishes.

Did You Know...?
In 1802, President Thomas Jefferson served French fries at a White House dinner.
Soon after, French fries became very popular. Today, French fries are one of the most
profitable food items in restaurant and foodservice operations.

Bioplastic Quick-Service Packaging
Quick-service restaurants often package menu items in take-away containers. These
have historically been made of polystyrene or other petroleum-based polymer plastic. A
polymer is a long-chain molecule.

Potatoes, legumes, and grains can also be used for polymers. New technology has
made it possible for food polymers called *bioplastics* to be used for disposable and
take-away foodservice items.

Bioplastics are completely biodegradable and compostable. They are made from crops
instead of petroleum, so they are renewable and sustainable.

The best part is they work. A water-resistant coating helps keep them from decom-
posing when filled with hot, steaming food. You might not even be able to tell the
difference.
Summary

In this section, you learned the following:

- Potato varieties differ in starch and moisture content. Types of potatoes include sweet potatoes, yams, russet potatoes, Idaho potatoes, all-purpose potatoes, and new potatoes. Sweet potatoes are tubers. Tubers are fat, underground stems capable of growing a new plant.

- Select potatoes that are firm and smooth without dark spots, green areas, mold, or large cuts. Store potatoes in a cool, dry place at a temperature ranging from 45°F to 55°F. It is best to store potatoes in ventilated containers in indirect light. Store russet and all-purpose potatoes for 30 days; store yams for two weeks; store sweet potatoes for one week. Potatoes are available fresh, frozen, refrigerated, or dried.

- The two categories for cooking potatoes are single-stage and multi-stage techniques. Take single-stage potatoes directly from the raw state to the finished state by using one cooking method. Boiled and baked potatoes are examples of single-stage techniques. When using a multiple-stage technique, prepare potatoes using more than one cooking method. Lyonnaise potatoes are precooked, sliced, and then fried with onions. En casserole potato dishes combine peeled and sliced raw potatoes with heavy cream, sauce, or uncooked custard. Boiling is the easiest method for cooking potatoes.