



IDAHO POTATO COMMISSION

*Foodservice*  
**TOOLKIT**



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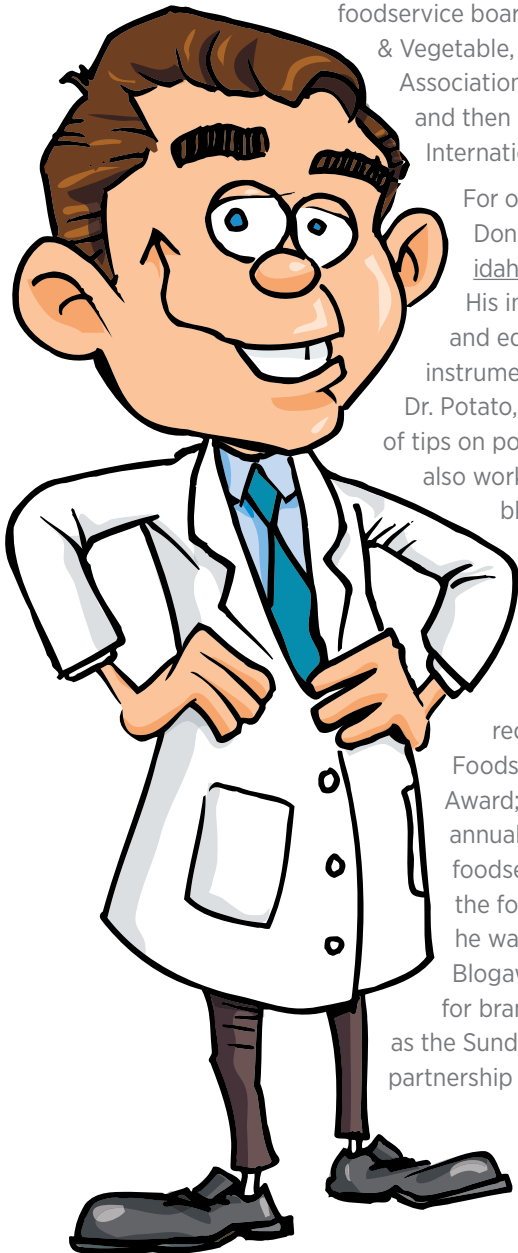
# Dr. Potato

[idahopotato.com/dr-potato](http://idahopotato.com/dr-potato)

Have a potato question? Visit [idahopotato.com/dr-potato](http://idahopotato.com/dr-potato). It's where Dr. Potato has the answer!

You may wonder, who is Dr. Potato? He's Don Odiorne, Vice President Foodservice (not a real doctor—but someone with experience accumulated over many years in foodservice).

Don Odiorne joined the Idaho Potato Commission in 1989. During his tenure he has also served on the foodservice boards of United Fresh Fruit & Vegetable, the Produce Marketing Association and was treasurer and then president of IFEC, the International Food Editors Council.



For over ten years Don has directed the [idahopotato.com](http://idahopotato.com) website. His interest in technology and education has been instrumental in creating a blog, Dr. Potato, with over 600 posts of tips on potato preparation. He also works with over 100 food bloggers to encourage the use of Idaho® potatoes in their recipes and videos.

*Awards:* *The Packer* selected Odiorne to receive its prestigious Foodservice Achievement Award; he received the IFEC annual “Betty” award for foodservice publicity; and in the food blogger community he was awarded the Camp Blogaway “Golden Pinecone” for brand excellence as well as the Sunday Suppers Brand partnership award.



# Idaho<sup>®</sup> Potatoes

From the  
best earth  
on Earth™

Idaho<sup>®</sup>  
Potatoes

# Idaho® Potatoes

From the best earth on earth™

Until recently, nearly all potatoes grown within the borders of Idaho were one variety—the Russet Burbank. This variety was actually discovered by accident when a brilliant horticulturist, Luther Burbank, was experimenting with another potato variety in the back yard of his New England home. Burbank brought his first potato to California, and it later was planted in Washington and Oregon. Finally, it was modified in Colorado to have a reticulated, rough-skinned texture. Once it arrived on Idaho soil, everything changed. This grown-in-Idaho variety was perfect—dry and fluffy when baked and crispy when fried. University scientists believe it was not the Russet Burbank that made Idaho famous, but Idaho that made the Russet Burbank famous.



Luther Burbank

The reasons are simple: Idaho's unique growing conditions, coupled with warm, sunny days and cool, crisp nights. The rich volcanic soil was just waiting for the application of water from irrigation to be able to produce bountiful crops of potatoes. These conditions are similar to those needed by vineyards to produce fine wine.

The standards adopted by Idaho® potato growers, shippers, and processors were influential in the development of a federal marketing order establishing premium grade criteria. As decades passed and agricultural technology advanced, Idaho® potatoes began commanding attention from markets all over the United States. The development of additional russet, red, gold and fingerling varieties over the years has further contributed to Idaho's market share.

While growing and shipping advances were evolving, new technology was improving Idaho® potato products. Scientists and food technologists were exploring methods for capturing the freshest of Idaho flavors to create top-quality frozen and dehydrated Idaho® potatoes. The industry's quality controls are so sophisticated that processed potato foods are often able to maintain their nutritional content with an extended shelf life.



# The Founding of the Idaho Potato Commission

In 1937 the Idaho legislature organized a promotional body to oversee the needs of the potato growers, shippers, and processors. Nine volunteer commissioners, nominated by the industry and appointed by the governor, along with a staff in the Boise, Idaho area, oversee Idaho® potato industry's marketing strategies in advertising, public relations, and field merchandising of potato products. In addition, the Idaho Potato Commission orchestrates the licensing contracts for the use and reproduction of the copyright **Idaho®** and **Grown in Idaho®** seals. A close relationship is maintained with the University of Idaho and other agricultural institutions actively involved in research and educational programs.

## Your assurance of quality: the Grown in Idaho® seal



For customers to accept a symbol of quality, it must represent a history of consistent quality. In this regard, the **Grown in Idaho®** seal is identified as a preeminent symbol with a strong reputation. Multiple surveys conducted by the industry journal, *The Packer*, reported: "Idaho® potatoes have the best growing region and brand recognition of all fresh produce items," concluding that consumers have a greater awareness of the Idaho® name than of Dole pineapples, Washington apples, Chiquita bananas, or Florida oranges.

The state of Idaho requires strict inspection of its fresh potato crop and sets standards which are higher than those of the U.S. Department of Agriculture. Only U.S. Grades No. 1, Standard, and No. 2 potatoes can leave the state with the Grown in Idaho® seal. This ensures that genuine Idaho® potatoes will be consistent in appearance, size, shape, and the high quality upon which their reputation has been established.

# Idaho Soil and Climate

Idaho Soil  
and Climate

High elevation,  
warm days, cool  
nights, and  
well-drained soil:  
ideal conditions  
for growing the  
best potatoes

# Idaho Soil and Climate

High elevation, warm days, cool nights, mineral-rich soil and abundant fresh water produce ideal conditions for growing the best potatoes.

Plants adapt to environmental conditions through thousands of years of natural selection. The ancestors of today's Idaho® russet potato as well as niche varieties were originally found growing on the slopes of the Peruvian Andes, where they had adapted to high elevation, warm days, cool nights, and mineral-rich soil.

The native population of the area used the tubers produced by these wild potato plants for food before Spanish explorers took samples back to Europe in the 16th century. The cultivation of the plant soon spread throughout the European continent. These plants were brought back to North America in the 18th century.

Although plant breeders have changed many varieties of potatoes, the ever-popular Russet Burbank (one of the most famous Idaho® potatoes) retains its love for mountain climates where it grows best. Years after the seeds were brought to Idaho, the Russet Burbank continues to make up 50% of all potato production. The newer Russet Norkotah makes up about 20%. In Idaho, the potato growing area varies from about 2,500 feet above sea level in the lower Snake River Valley to 6,000 feet near the river's source in eastern Idaho. Because of this elevation, the climate during the growing season produces cool nights and sunny days, providing the warmth and photosynthetic energy that the plants need to grow a nutritious potato.

The leafy canopy of the potato vine transfers energy to the tubers when the temperature drops at night. Idaho's climate has proven ideally suited to growing Russet Burbank and Norkotah Russets, as well as many other varieties.

Soil type also affects the character of potatoes. Rich, sandy loams are most suitable for producing the light, fluffy types favored by American tastes. The geological events that formed the mountain systems in Idaho are also responsible for the soil. Mountains formed by volcanic eruptions and the intrusion of granite-like batholithic rock have eroded and covered the river valleys with a light, well-drained soil, rich in the minerals needed to grow potatoes.



# Growing and Harvesting Idaho® Potatoes

The quality of Idaho® potatoes is a product of both the heredity of the varieties and the ideal environmental conditions under which a superior potato is grown. It typically requires 120–150 days to grow a crop of Idaho® russet potatoes—days of constant attention and hard work. The Idaho® Russet Burbank has proven very difficult to grow commercially but its superior quality and versatility make it well worth the effort.

The potato-producing area in the state of Idaho has natural attributes of elevation, soil, climate, and water that make it ideal for growing potatoes. Even with these advantages, growing the perfect potato requires substantial labor, knowledge, and expense.

The process begins in the autumn with soil preparation of fields to be used for potato production the following year. Typically, the land will have been in another crop in the planned rotation cycle, which is necessary to produce a bountiful yield of the best quality. Idaho farmers rotate the potato crop once every two to three years in order to balance the soil's ability to produce a good yield.

Fall irrigation, plowing, and bedding of the soil help ensure the decomposition of grain straw from the previous crop and favor a clod-free texture with ideal moisture for planting in early spring. A grower may elect to use fertilizers in the field in the fall to aid organic decomposition and to save precious hours at planting time.

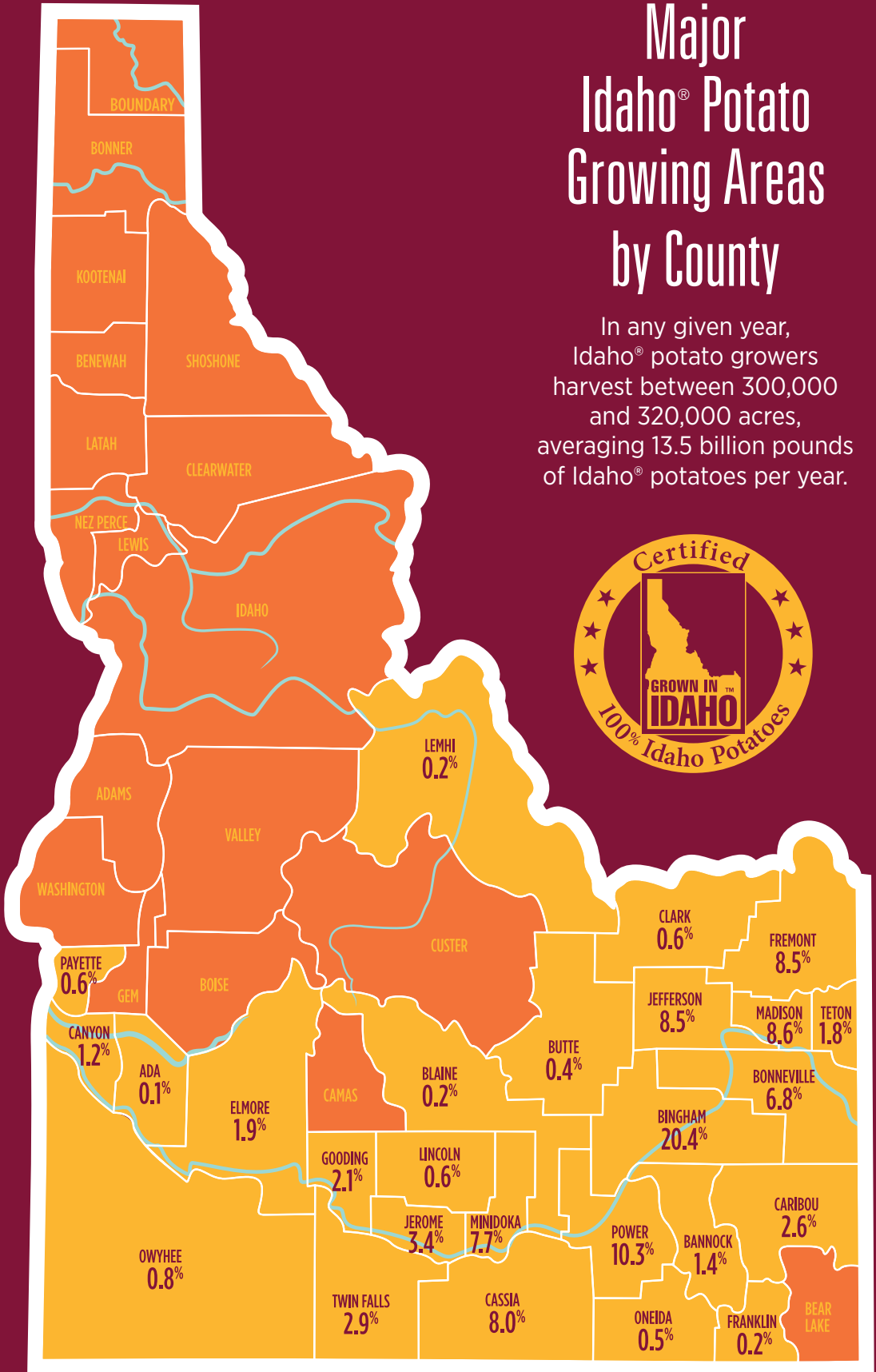
During the winter, the Idaho® potato grower will typically make arrangements to buy seed potatoes. These certified seed potatoes are specially grown to maintain ideal heredity type, organic vigor, and freedom from the many diseases that can ruin a crop.

The Idaho Crop Improvement Association, an objective third party, inspects all seed potato lots to ensure the highest standards. The seed may remain with the grower until the customer is ready to plant the crop in April or May.

Before planting, the tubers are cut into seed pieces, each of which must have at least one eye. The cut surfaces are sprayed or dusted to promote healing and discourage disease organisms. All chemical substances used in any phase of soil treatment or crop production are approved and licensed by the federal and state governments. These licenses are obtained only after extensive testing to establish the safety of the material for use on potatoes grown for food.

# Major Idaho® Potato Growing Areas by County

In any given year, Idaho® potato growers harvest between 300,000 and 320,000 acres, averaging 13.5 billion pounds of Idaho® potatoes per year.



# Planting



A potato planter is a highly specialized agricultural machine that opens a furrow, places seed pieces at a predetermined spacing in the row, and covers them with soil. Each seed piece will sprout and produce a potato vine under which the tubers of the new crop will form and grow during the four months ahead. Growers often contend with rain, wind, and cold weather at planting time, usually in April to May. However, they time planting

so that rising soil temperatures will enable sprouting and growth to begin immediately.

# Irrigation

Summer's rainfall is not sufficient in Idaho to grow most farm crops, so farmers have elaborate irrigation systems to supply the needed water. Idaho may only average 11–12 inches of moisture annually. Most of this falls as snow in the mountains during the winter months. As the snowpack melts, the water is stored in huge reservoirs, from which it is drawn as needed during the growing season. Some farms rely on wells that reach down into underground aquifers as deep as several hundred feet.

Sprinkler systems largely dominate surface irrigation techniques. The grower's task is to maintain adequate moisture content of the soil within rather narrow limits. Too much water will hurt quality, while too little will stress the plants, causing irregular shapes and sizes.

Many Idaho® potato growers now utilize a management system that integrates air temperature, relative humidity, and natural precipitation into a measurement of the potato plant's water needs. The timing and amount of irrigation are calibrated to maintain consistent soil moisture, which will produce the maximum yield and highest quality for the grower.





## Other Horticultural Practices

Other factors that can influence the quality of an Idaho® potato crop are weeds, insects, and a variety of plant diseases. Competition from these elements during the growing season would seriously reduce quality and yield potential without the watchful eye of the farmer.

Weeds are controlled in potato fields by a variety of management practices. Herbicides are often applied to kill weeds both before and just after they emerge from the soil. Mechanical cultivation can destroy weeds as the grower builds up the soil along the rows of potato vines.

Insect pests that attack potatoes, both above and below the surface of the soil, come in many shapes and sizes. Some insecticides are applied as soil treatments and others are sprayed on the foliage as needed.

Potatoes are also vulnerable to a variety of bacterial, viral, and fungal diseases. The use of disease-free certified seed, combined with horticultural practices, can accomplish a big part of disease control. Some maladies such as blight, which caused the famous 19th-century potato famine in Ireland, may require the application of sprays at strategic times during the growing cycle. Any such treatment must be made with approved materials and proper application rates to ensure the purity of the harvested crop and to protect farm workers.

Plant nutrition is another extremely important area affecting the success of the Idaho® potato farmers' efforts.

Science again provides help, with soil sampling and analysis. Primary plant foods and trace elements that prove to be necessary are applied before and during the growing season to ensure healthy, high-yielding plants. Another helpful scientific technique is tissue analysis, in which samples of foliage reveal falling levels of nutrients before they can damage the quality of the crop.



With so many factors to monitor and control, growing a crop of Idaho® potatoes is a demanding job. Potato farms in the Gem State vary from a few hundred to several thousand acres, and fields are visited daily to check the progress of the crop and look for signs of any potential problems.

## Sustainability

Idaho growers have been farming for multiple generations. Taking care of the land is a top priority for the future of their sons and daughters.

Growers are continually trying to limit the amount of fertilizers, fungicides and pesticides that are needed to grow potatoes. This effort, combined with best practices such as a crop rotation or using cover crops, is key to preventing disease, enhancing soil quality, and boosting the productivity of the crop.

The goal is a reduction in chemical applications. Growers seek alternative methods whenever possible. For example, integrated pest management means anticipating what may be needed and applying only what is necessary.

The days of carelessly applying needless amounts of any resources are over. Attention to better-integrated pest management can restore natural ecosystems, prevent erosion, support native plants and animals, conserve water quality, and improve production, often all at the same time.

Growers are required to follow EPA guidelines for any applications and are permitted to use only approved products for potatoes that are based on a reasonable certainty of doing no harm.

Growers are improving their water use efficiency and irrigation methods, often considering the type soil, the section of the field and the timing of water applications.

Compared to their counterparts 100 years ago, today's U.S. potato growers are able to produce three times as much volume on one-third of the acreage.



# Harvest

Some of the quality attributes of potatoes and their ability to store well are dependent on maturity. Potato vines, under most conditions, will continue growing until killed by freezing weather. The tubers under the ground are not ready to harvest immediately when the vine dies, but should remain in the soil for about two weeks to fully mature. During this period, the skin is toughened and the physiological factors of the tubers adjust to a period of dormancy. Most growers kill potato vines to allow sufficient time for the tubers to mature and harvest to be completed before cold weather arrives. Vine killing by mechanical or chemical means usually begins in Idaho in mid-August to early September.

The scale of commercial potato production in Idaho demands that mechanical harvesting methods be used. Digging potatoes is a labor-intensive project at a time of the year when the farmer is racing against the coming cold weather to get the crop into storage.

The potato harvester is a specialized piece of farm equipment. Pulled by a large tractor, the harvester digs underneath the potato hills and lifts the potatoes onto a chain elevator, where they are separated from undersized tubers and soil, most of which falls through the chain. The potatoes are further elevated by a series of conveyor chains. Dead vines and debris are removed mechanically or by the hands of workers riding the harvester.

Another elevator/conveyor belt, called the boom, delivers the freshly dug tubers into a truck, which is driven alongside the moving harvester. As one truck is filled, another moves into position to take its place. The filled trucks are driven to a potato storage facility, where they are mechanically unloaded. As potatoes pass over a conveyor, any remaining clods, debris, and vines are removed. The freshly harvested potatoes are piled several feet deep in the storage facility, where they will spend weeks or months until removed for packing and shipping to the consumer.

# Storage

One reason the Idaho® potato has become such a favorite worldwide is because it is available the entire year. It is an extremely versatile vegetable, packed with nutritional food value, and is a key volume category for the supermarket or restaurant.



This year-round availability of potatoes from Idaho is due not only to the nature of the potato itself, but also to the large number of modern storage facilities that have been built across the state, and the availability of scientific knowledge about storage conditions.

The potato tuber remains a living organism even though its vine has died. After being removed from the ground and placed in storage, the tubers enter a period of dormancy and under the proper conditions of temperature and humidity, remain so throughout the marketing season.

The Idaho® potato grower, along with technology developed over the years by the University of Idaho, has learned to create the ideal environment to keep the tubers in fresh, firm physical condition and to preserve the flavor and texture for long periods. The two most important factors are temperature and humidity.



In the early days of potato cultivation in Idaho, potatoes were stored in “pits” or cellars. The greater part of the interior space of these homemade facilities was underground—a long, wide trench dug in the earth. Most often, the roof, which started at the ground level, was supported by rafters made from peeled logs. This structure was covered with wire netting to support a thick layer of straw, which served as insulation. Soil was spread over the straw to complete the roof structure.

The only real walls that had to be built were the ends of the buildings, which had large doors to accommodate trucks for loading and unloading. Control of temperature in these cellars was difficult, and control of humidity was completely absent. The potatoes were simply piled from the earth floors to the rafters, and buildings closed up to keep cold air out. Rudimentary as they were, these storage pits held potatoes reasonably well until early spring.

Idaho shippers were constantly receiving requests from customers who wanted them to supply fresh Idaho® potatoes in the “off” season. And, as the processing industry developed, the processors found that they needed to operate their plants on a year-round basis. Research on storage was accelerated, and it paid off handsomely.



Researchers found that the ideal storage temperature for commercial potatoes was 42–45°F and that relative humidity should be kept at 95 percent. They also found that an air circulation system enabled the storage facility to blow air up through the huge piles of potatoes in storage buildings, which made it possible to control these vital environmental conditions.

Careful handling and storage are also required at the warehouse level. Potatoes should be stored and handled in a cool (42-50°F) environment. Every effort is made to minimize light throughout the entire warehousing process.

The two most important factors to keep tubers in fresh, firm physical condition are temperature and humidity.

At first, ventilation systems mixed outside air with air from inside the storage building to get the correct temperature.

This worked until summer arrived. When refrigeration was added, growers could keep potatoes as long as 12 months while maintaining quality acceptable to both fresh-market customers and processors. Humidifiers were also introduced to keep the water vapor content of the air high and provide the last needed measure of control.

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While very few “dirt cellars” still exist in Idaho, today’s typical potato storage is a metal building of immense size. Some are large enough to cover a football field. The potatoes are still bulk-piled on the floor, which is often now concrete. When the potatoes go into storage, perforated pipes are buried under the piles and connected to large air plenums in the walls or under the floor. The buildings are heavily insulated, and sophisticated control systems turn the air circulation, refrigeration and humidifiers on and off automatically to optimize environmental storage conditions.

Although current storage technology makes it possible to keep the crop for a full year, only the portion that is packed or processed last need be held for the maximum time. Storage buildings are opened up and emptied throughout the marketing season as the potatoes are needed; thanks to modern techniques, the quality remains excellent.

# Sizing

The Idaho® potato is the key ingredient for an amazing variety of menu options served by the nation's foodservice operators. Potatoes can be elegant or commonplace; they can be the entrée or a specialty side order. The basic goodness and nutritional value remain important components, whatever flavors are added in an old-favorite or exotic recipes. Different serving styles, however, may require special grading or sorting standards to provide the best raw material for a particular use.

The following chart indicates the most popular russet count sizes, number of potatoes per carton, maximum size range, and the sizes that most of the potatoes in each carton will be. Each carton contains 50 pounds of potatoes.

Note: If your needs call for cartons containing a narrower range of sizes, check with your Idaho® potato supplier.

Carton Size	Potatoes Per Carton	Potato Size (ounces)																	
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
120-count	114-126	■	■	■	■	■													
110-count	105-116		■	■	■	■	■	■											
100-count	95-105			■	■	■	■	■	■										
90-count	86-95				■	■	■	■	■	■	■								
80-count	76-84					■	■	■	■	■	■	■							
70-count	67-74						■	■	■	■	■	■	■	■					
60-count	57-63							■	■	■	■	■	■	■	■				
50-count	48-53									■	■	■	■	■	■	■	■		
40-count	38-42												■	■	■	■	■		

■ Most potatoes in the carton    ■ Maximum size range

## Baked Potatoes

Because the Idaho®-grown russet potato has become such an international favorite when baked whole in its skin, foodservice menu planners have become discriminating in the cosmetic and physical aspects of their purchases. When baked potatoes are prepared in quantity, large trays are placed in commercial ovens and all the potatoes in an oven get the same amount of baking time. Large potatoes take longer to bake than smaller ones do, so uniform size is important to a quality end product.

Idaho has long been involved in sizing potatoes because of the important market that was developed very early in the food service sector. Shippers once trained employees to select various size ranges by eye from a flow of field-run potatoes over sorting tables. Now sophisticated electronic sizers do a much faster and more accurate job.

Sized potatoes, being a premium-priced item, also created a packaging innovation: the 50-lb.-count carton. The double-walled fiber cartons provide better protection for their contents and are easier to store and handle in the kitchen than 100-lb. burlap bags, which were once the standard of the industry.

## Grading

Serving baked potatoes imposes an additional quality requirement, that of appearance. Since the potato is served whole, with the skin on, it should be of regular shape, free from knobs and with a minimum of surface and internal defects. U.S. No. 1 grade is not good enough to consistently satisfy these requirements. Potato growers and shippers in Idaho operate under a federal marketing order administered by a state potato control committee. This body sets grading and quality standards that ensure quality higher than U.S. No. 1 on all shipments leaving the state. Federal/state inspectors are on duty in all packing warehouses and are continually sampling the merchandise being packed to be sure it meets the grade requirements set by the marketing order.

Count cartons are regularly packed in a range of sizes from 40s to 120s. The 50-lb. carton containing 50 potatoes obviously delivers an average size of 1-lb. or 16-oz. tubers. These giants may be the trademark of Morton's of Chicago, while the 6.5-oz. tubers in the 120-count are much better suited to a grade school lunch program. Both users require uniformity of size and shape as well as good quality.

## Other uses, other grades

Nature does not provide all perfect potatoes to reward the grower's efforts. Field-run lots have a wide range of sizes, grades, and shapes. The flavor, texture, food value, and most importantly, the performance of the misshapen spuds are as good as their more beautiful siblings, but they will not meet No. 1 grade requirements.

When field-run lots are sorted in Idaho shippers' warehouses, the workers on the sorting table clip off knobs or ends and route the tubers into the U.S. No. 2 channels. Although the skin



heals where the knobs are cut off, the “deuces” will not bring the No. 1 price, but have their fans, nevertheless. A foodservice operator who is preparing French fries, mashed potatoes, or hash browns from fresh potatoes may prefer No. 2s for their lower price, while not compromising quality or taste. A special state grade called “The Idaho® Standard” is another specification, which may satisfy the needs for cost. No clipped ends are allowed, but shape and cosmetic requirements are not as strict as U.S. No. 1 grade.

## Custom Requirements

A foodservice operator who develops a potato specialty that requires something unique in packaging or sizing should inform the produce specialist or broadline distributor. Shippers in Idaho handle a huge volume of potatoes and have the capability to meet special requirements if they are requested. The wholesaler can usually find a shipper who will include special orders in a truckload or carload to provide customers with their specific needs.

Remember that genuine Idaho® potatoes are identified with the state’s Grown in Idaho® certification mark on all containers.

### Nutritious & Delicious

- Fat-free
- Cholesterol-free
- High in vitamin C
- High in potassium
- Good source of vitamin B<sub>6</sub> and dietary fiber

<b>Nutrition Facts</b>	
<b>Serving size 1 potato (148g/5.2oz)</b>	
<b>Amount per serving</b>	
<b>Calories</b>	<b>110</b>
<b>% Daily Value*</b>	
<b>Total Fat</b> 0g	<b>0%</b>
Saturated Fat 0g	<b>0%</b>
Trans Fat 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 0mg	<b>0%</b>
<b>Total Carbohydrate</b> 26g	<b>9%</b>
Dietary Fiber 2g	<b>7%</b>
Total Sugars 1g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 3g	
Vitamin D 0g	0%
Calcium 20mg	2%
Iron 1.1mg	6%
Potassium 620mg	15%
Vitamin C 27mg	30%
Vitamin B <sub>6</sub> 0.2mg	10%

\* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



# Scientific Distinction

Potatoes from  
Idaho have  
optimum  
appearance, size,  
and quality

Scientific  
Distinction



# Scientific Distinction

Potatoes from Idaho® have optimum appearance, size, and quality.

The Idaho® potato harvest is a race to beat the hard freeze, which comes in mid- to late October. From the time the potato vines die or are killed, the decision to dig is put off as long as possible. This period just before the potatoes are dug is the first phase of maturing that is essential to the distinctive appearance, size, and quality of the Idaho® potato.

The outer cells phase in the “aging” process takes place in the potato cellar. A “sweat” period, which allows the field heat to leave the tubers, puts the potatoes in dormancy and prevents sprouting from occurring during hard freeze, which comes in early months of storage. For example, with Russet Burbanks, the outer skin continues to take on the characteristics of coarse, reddish-brown homespun cloth. Idaho® potatoes are not ready for distribution until this phase of the maturing process has been completed.

Exclusion of light, 95 percent humidity and ventilation systems, thermostatically controlled to keep the air circulated at approximately 42–45°F, are conditions necessary to maintain quality, taste, and texture.

This quality control helps Idaho growers and shippers meet standards for the Grown in Idaho® seal and guarantee a year-round supply of Idaho® potatoes.

The Idaho® Potato Commission wishes to thank Dr. Gale Kleinkopf, Ph.D., professor of plant physiology, University of Idaho, Research and Extension Center, for his expertise and assistance with the preceding information.

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# Specific Gravity

Specific gravity in the potato industry is a measure of maturity and quality involving a number of factors.

Simply stated, specific gravity is a measurement of the solids or starch content relative to the amount of water contained in a potato. Low moisture means high solids content, the distinguishing characteristic that makes an Idaho Russet Burbank potato light, fluffy, and mealy when baked, mashed, or fried.

Development of solids or starch begins in the fields as the tubers form. Temperature, irrigation, and controlled plant nutrition play an important role in producing the world's highest-quality potatoes.

Warm Idaho days cause the plant's leaves to make sugars from sunlight and carbon dioxide. Cool Idaho nights aid in transferring the sugars through the plant stems into the tubers, where they are converted into starch. This process, called translocation, is also affected by a closely monitored system that regulates plant nutrition and moisture. Technicians frequently test the soil and plant tissue to determine the plants' needs. Excessive nutrition and irrigation will promote vine growth, which prevents the tubers from maturing and developing a high solid content.

Proper storage is one of the most important factors contributing to the high quality and specific gravity of Idaho® potatoes.

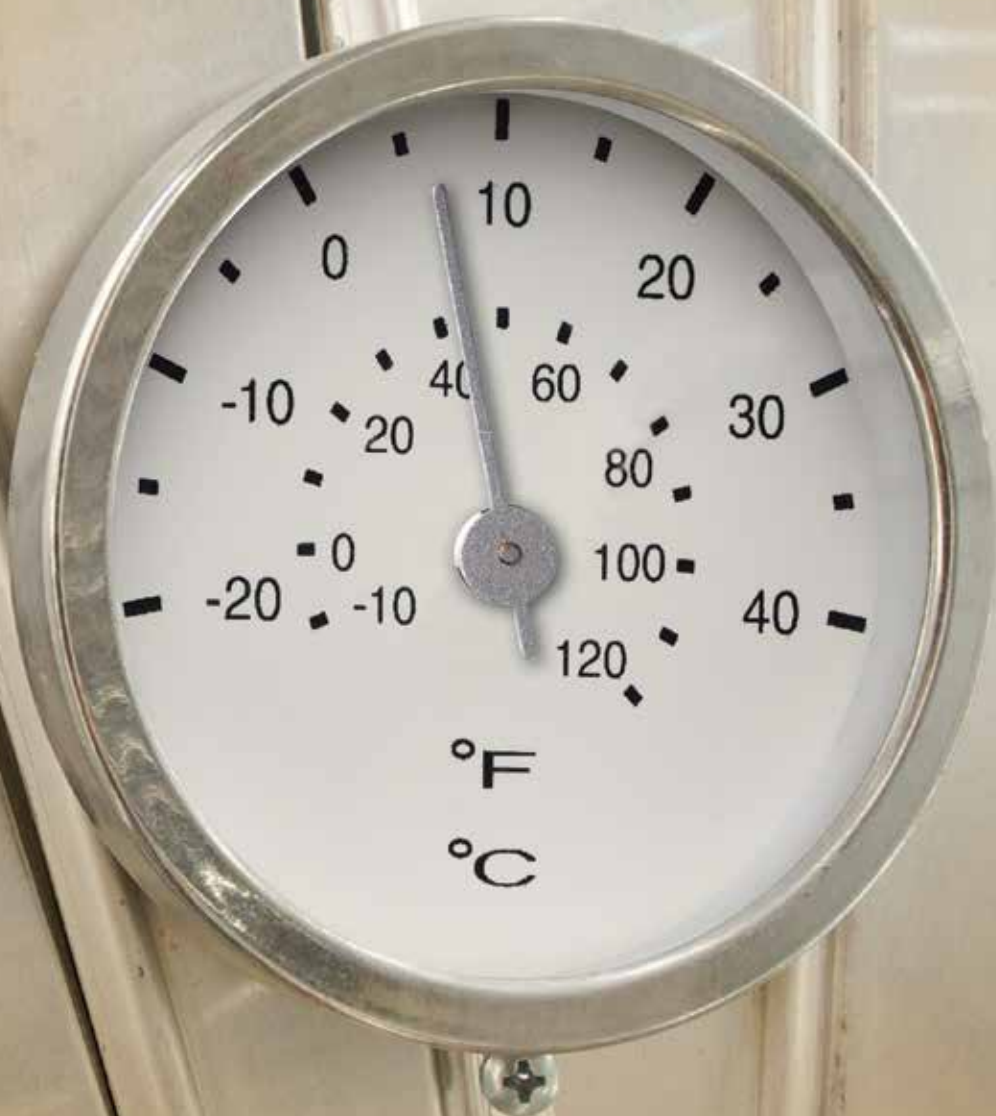
Potatoes are living organisms, since biological reactions continue to take place within the potato after it has been harvested. In order to keep these metabolic changes from occurring too rapidly, cooler temperatures are needed to decrease metabolism and prevent reduction of the solids content. Shed temperatures are controlled, ranging from approximately 41°F needed for seed potatoes to 42–45°F for potatoes that remain in storage.

Since 60 percent of the potatoes grown in Idaho are used for processing, specific gravity plays an extremely important role in the consistent production of high-quality Idaho® potato products. As perceived by both consumers and processors, the ideal French fry is light in color, crisp on the outside, fluffy on the inside, with minimum oiliness. Potatoes with high specific gravity are needed to produce such a product. When tested, if the specific gravity is less than 1.070, the potatoes will not meet the standards maintained in the industry.





A simple method that can be used to separate high- and low-specific-gravity potatoes is to prepare an 11 percent brine solution of one cup of salt per 9½ cups of water. The resulting solution will have a specific gravity of close to 1.080, the figure used to measure the high quality of solids content in a Russet Burbank potato. Potatoes that sink in the solution have a high specific gravity and a light, mealy texture when cooked. Low-specific-gravity potatoes will float, have lower starch content, and may have a waxy, soggy texture.



## Sugar/Starch Transformation

Since potatoes are constantly undergoing biological changes, they are greatly affected by temperature, humidity, ventilation, and exposure to light. These are conditions that must be carefully monitored not only by Idaho shippers and processors, but by retail and foodservice operators. The Russet Burbank, as grown in Idaho, consistently averages 21 percent solids. Most of this is starch, which is particularly sensitive to temperature changes.

If potatoes are stored at temperatures below 40°F, part of the starch turns to sugar, bringing about an undesirable sweetness and discoloration when cooked. This darkening is not to be confused with the normal oxidation that occurs when a cut surface is exposed to air.

Under controlled storage conditions, the starch and sugars in potatoes are in a balance. This balance is altered when sugars slowly begin to accumulate at 45°F. Reconditioning, or reserving the sugar accumulation, may be possible, depending on how the tuber will be prepared for service, and how long it has been refrigerated.

If potatoes have been stored under refrigeration for several weeks, they should be placed in a dark, well-ventilated room at 60° to 70°F for one to two weeks. The higher temperature increases the tuber's respiration, causing it to "burn up" the accumulated sugars. This reconditioning method is best for potatoes that are to be baked and boiled.

Because the higher temperatures can cause moisture loss and rapid deterioration, it is important to monitor the process. Diabetic tape, purchased from a local drugstore, can also be used to determine the sugar level in potatoes. Simply run a piece of tape across the cut surface of a raw potato. If the glucose (sugar) level registers a dark color on the tape, this will mean that the potato may taste sweet or darken when cooked.

For potato processors, the starch/sugar content in the tuber is especially important because it directly affects the color and texture of products such as chips and fries.

Tubers that have been held under refrigeration for longer periods of time may not be able to be completely reconditioned. The residual sugars can lead to "streaks" appearing when the potatoes are fried. The high temperatures needed for deep-fat frying bring about an

interaction between sugars and amino acids, known as the Maillard Reaction. This causes the surface of the fries to darken before completely cooking on the inside. The high sugar and low starch contents also result in excess oil absorption. Blanching cut potatoes in hot water (170°F) for several minutes will leach out sugars, cleansing the surface of the fries, to allow them to brown evenly.

## Bruising

A great deal of planning, time, money, and effort are required to produce a high-quality Idaho® potato crop. However, all of these investments by Idaho growers and shippers are of little importance when potatoes which reach the foodservice operator in prime condition and are then damaged by mishandling.

Despite their hardy appearance, potatoes can be bruised as easily as a banana or an apple.

Potatoes are living organisms made up of a network of cells that form skin (cork layer) and inner tissue (cortex). Bruising occurs when the tissue is crushed and cells rupture, releasing enzymes that produce a black discoloration. There are two types of bruising: internal bruising and shatter bruising.

**INTERNAL BRUISING.** Sometimes referred to as blackspot, internal bruising happens when potatoes are dropped more than six inches, or if something heavy is placed on top of them. The degree of bruise is directly related to the fall. It can appear beneath the surface of the skin, or penetrate deep into the tuber. The damage does not appear immediately, but becomes noticeable after one or two days in storage. Since the skin is not broken, the damage may not be found until the potato is cut or pared.

This type of internal bruising frequently takes place when potatoes are piled too high or dumped into a display bin, dropped into a shopping cart, or dragged along a storeroom floor.

## Shatter Bruising

Shatter bruising occurs when the skin of the tuber has been broken. The potato then produces a substitute covering known as wound or scar tissue. This is usually a thick, unsightly layer that is hard to peel and results in excessive waste. Shatter bruising happens most often when potatoes have been refrigerated. The inner tissue becomes brittle and susceptible to impact damage.

## One Positive Note

Nature provides its own protection. Dirt on the potatoes can act as a natural protection barrier against storage loss and abrasion.

To avoid bruising, potatoes should be handled as little as possible. Store them in a cool, dark, well-ventilated place at 45–48°F to keep the bruised area from spreading or rotting and possibly damaging surrounding spuds.

The Idaho® Potato Commission wishes to thank Robert Dwelle, Ph.D., associate professor of potato physiology, Idaho Research & Extension Center, for his expertise and assistance with the preceding information.

## Greening

Controlled temperature, humidity, and light contribute to maintain the high quality of Idaho® potatoes. Variations in one of these important factors can cause significant changes in appearance and taste. Greening is the result of one such change.

The “greenish” hue sometimes seen on potato skin occurs when the tubers have been exposed to natural, artificial, or fluorescent lights in storerooms or in supermarket displays.

The color is actually chlorophyll developing in the skin. In some varieties, it is green; in others, purple. Along with this change, an increased quantity of solanin is also formed. Solanin, a glycoalkaloid present in all potatoes, is actually part of the flavoring complex that gives the potato its taste.

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More of this naturally occurring substance is found in some varieties than in others. In the Russet Burbank, the level is very low. However, in all varieties, green potato skin is an indication that excessive solanin is present. The brighter the color is, the higher the level of solanin and the more bitter the taste.

Solanin is generally concentrated close to the potato's surface and is easily removed when peeled. Only if the potato has had prolonged exposure to light will the bitter taste and color penetrate into the tuber. The green portions can easily be discarded in preparation.

There is little concern about solanin being harmful. At levels that could cause an adverse reaction, the solanin level would have to be so high that the potato would be inedible. Furthermore, solanin, if accidentally eaten, does not accumulate in the body. Animal research shows that it is poorly absorbed and rapidly excreted.

Careful measures are taken by the potato industry to keep greening at a minimum. During storage, the tubers are held in darkened cellars and are carefully inspected before shipping. The poly film, burlap, and cardboard containers used are designed to filter or block out light. Even the dirt left on the potato can have a protective effect in blocking light.

Similarly, in your foodservice operation, fresh potatoes should be stored in a cool, dry, dark, well-ventilated place to maintain quality. When potatoes are on display in retail settings, they should be rotated regularly and covered whenever possible to reduce overexposure to light.

# Problem Solving

Potato cooking chemistry

Problem Solving  
Potato Cooking Chemistry



# Problem Solving

## Potato cooking chemistry

A little knowledge about potato chemistry will go a long way toward understanding why Idaho® potatoes are special, and what contributes to their dry, fluffy texture when properly prepared.

Starch is the chief form of carbohydrate stored in plants. Idaho® russet potatoes are grown and stored under controlled conditions to produce a tuber that has a high-quality starch, which is more commonly called solids content.

One of the keys to successful potato cooking is awareness about the starch grains that make up the “meat” of the potato. Each grain is composed of molecules of starch and pectin that are linked together chemically.

During baking, as the molecules are heated and absorb the surrounding moisture in the potato, the grains swell and separate. This process of starch-grain bonding is called gelatinization, and can differ in potato varieties, depending on the size and amount of starch. A potato with small grains, such as a round red, will stay firm and waxy, while an Idaho® Russet Burbank with large grains and high starch content will cook to a characteristically light, fluffy texture. An internal temperature of 208°F to 211°F is the test for doneness.

During frying, the same process of gelatinization takes place, dehydrating the surface of the potato and forming a rigid structure that seals each piece. If the potato has a high moisture and low solids content, the fries will become limp if held before serving because of steam captured beneath the sealed surface. For best taste and texture, potatoes should be fried at 350°F or lower.

During microwave cooking, the order of events actually changes. The cooking process takes place by molecular friction...the starch cells rub against each other creating heat. This causes a breakdown that can result in a wet, soggy potato.

Traditional boiling methods are generally not effective with Idaho® potatoes. A better method consists of precooking potato chunks in cold water until 140°F for 20 minutes, then bringing to a full boil and cooking until done. This will cause the starch to form a firm gel and prevent separation. This process is called retrogradation and will ensure that the Idaho® Russet Burbank can be used in salads, soups, and stews without crumbling or disintegrating.

During all methods of cooking, proper handling is essential. If a potato is overcooked or overwhipped, the cells will actually separate and gelatinized starches will leak out, resulting in a sticky, gummy potato product.

# Q & A

## *Questions and Answers*

**Q:** How do I know if I'm really getting Idaho® potatoes?

**A:** By state law the Grown in Idaho® seal must be on all bags or boxes. Check the containers. If the seal is not there, you are not getting genuine Idaho® potatoes.

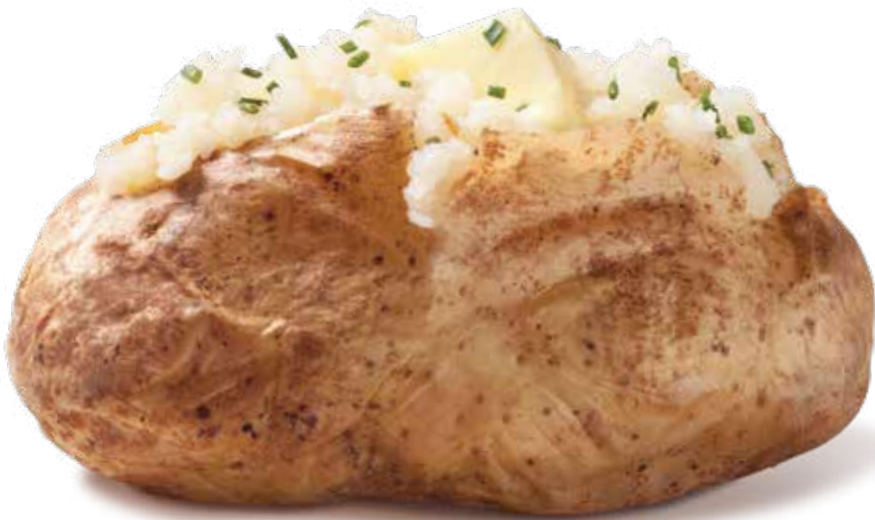
**Q:** Are all baking potatoes...Idaho®?

**A:** No. Only those potatoes grown in the State of Idaho can be called Idaho® potatoes. Your guarantee of genuine Idaho® product is the Grown in Idaho® seal. Even if potatoes are repacked in your local area, the repacker must be licensed in order to use the Grown in Idaho® seal.

**Q:** What is the difference between Idaho® potatoes and those grown in other areas?

**A:** Moisture content. The Russet Burbank potato grown in Idaho has a high solid, low moisture content. This is often referred to as specific gravity. Idaho's soil, climate, and controlled irrigation guarantee that the potatoes grown in Idaho will have a dry, fluffy texture—the premium properties for an excellent baked potato, crispy French fries or hash browns, or fluffy mashed potatoes.





**Q:** Why do my potatoes turn gray when I bake them?

**A:** This is a possible indication that your potatoes have been refrigerated during storage. At temperatures below 42°F, when the starch turns to sugar, during the cooking process the sugars caramelize, causing the potatoes to take a darkened color.

**Q:** Is it OK to use a microwave to bake potatoes?

**A:** Our age of high technology offers us many pieces of equipment to speed preparation and production of products. Microwaving a potato can change the characteristics of a normally fluffy, dry product. The molecular friction of the molecules rubbing together in the cooking process may cause the potato to take on a somewhat gummy or pasty texture. This is particularly true of a potato product that has a slightly higher moisture content. Piercing the potato in several spots before cooking helps to evaporate some excess moisture. Potatoes may also be wrapped in paper towels to absorb excess moisture while cooking.

**Q:** How do I know if the potato has been refrigerated during storage?

**A:** Use a piece of diabetic (litmus) tape. Place a piece of tape on the cut surface of the potato. If the paper turns dark, this means that the sugar content of the potato is elevated, and it should not be used for cooking until it has been “cured.” This means that the potato should be left at room temperature for 5-10 days prior to using. This will allow the sugars to return to starch and reduce the possibility of darkening during cooking.

**Q:** Why are my fresh French fries greasy?

**A:** Poor preparation techniques often result in poor French fry products. When preparing fresh French fries it is important to be sure that the surface of the potato is free from all moisture before it goes into the deep fat fryer. Water left on the surface of the potato creates a steam vacuum as bubbles form on the surface of the fry. This causes starch cells to expand in the potato, and fat is absorbed into these starch cells, causing the potatoes to take on the greasy characteristic. Too many fries in the basket can also “steam” the potato.



**Q:** What is the reason for fries going limp?

**A:** Moisture content. If a potato has high water content and the surface is sealed during the frying process, this excess moisture is trapped inside the crispy surface, causing it to steam and making the potatoes go limp as soon as they are removed from the fryer. The best solution is to start with a potato that has high solids and low moisture content.

**Q:** What is the best way to get a crispy French fry?

**A:** Preblanching French fries offers the best solution. Potatoes should be precooked at a 325°F frying temperature just until the surface of the potato begins to take on a pale color. The potatoes should then be removed and placed in a single layer on baking sheets or in plastic bus tubs. They can be

held at room temperature or refrigerated until the potato is completely cooled down. During the second fry process, the fryer should be turned up to 350°F and the potato browned to the desired color. The second frying process adds a crispy coating to the surface of the potato, resulting in a French fry that will hold up well for service.

**Q:** Why is it hard to get my French fries to brown, especially when the new crop comes in (in the fall)?

**A:** Early in the season, the starch content in the potato is very high. This reduces the possibility of browning because of the lack of surface sugars. Solution: Rinse the potatoes several times in water to eliminate surface starches.

**Q:** Why do my fries turn very dark before they are even cooked?

**A:** This means that the potatoes have been refrigerated and that the starch has turned to sugar, causing the sugars to caramelize on cooking. A certain amount of sugar is necessary to aid in browning. However, excess sugars will darken the surface of the potato, giving the impression that the potatoes have been cooked on the inside. Solution: Since sugar is water soluble, gently rinse the potatoes in warm water to help remove the excess sugars from the surface of the potato.

**Q:** Is it all right to preblanch potatoes and hold them several hours?

**A:** It is perfectly all right to hold potatoes as long as they have been completely cooked during the preblanched stage. There are two types of blackening that take place in potatoes: enzyme darkening and oxidation. Oxidation occurs when the surface of the potato is exposed to air, and the potato becomes dark. Enzyme blackening occurs when the potato has not been completely cooked through and a reaction takes place, causing the potatoes to turn dark on the inside. The preblanch phase of cooking should be done slowly and thoroughly to guarantee product quality. Most health departments will allow the preblanched potatoes to cool to room temperature, but require them to then be placed in refrigeration until the final fry usage.

**Q:** Should I let my frozen French fries thaw before I fry them?

**A:** We recommend that frozen French fries be kept completely frozen before using. This guarantees that the surface of the potato is sealed during the frying process, resulting in a crispy surface and high-quality fry. Some chains thaw frozen potatoes prior to cooking. This technique—called slacking—will result in excess absorption of fat and an added flavor to the potato that may be unacceptable as a quality product.

**Q:** When frozen fries seem to be broken more than usual when I open the container, what am I doing wrong?

**A:** This is a handling problem. This means that the case of potatoes has been dropped during handling and storage. A three-foot drop in a case of product can result in more than 30 percent damage to the frozen fries.

**Q:** What can be done to stop fresh-cut potatoes from turning black now that sulfites or potato whiteners are banned?

**A:** There are several solutions: Simply hold the fresh cut potatoes in ice water that contains a small amount of vinegar or ascorbic acid, such as lemon juice. This will reduce the surface oxidation. Several manufacturers have products on the market to retard browning and maintain the fresh appearance of fresh-cut potato products.

**Q:** What is the internal doneness temperature for a baked potato?

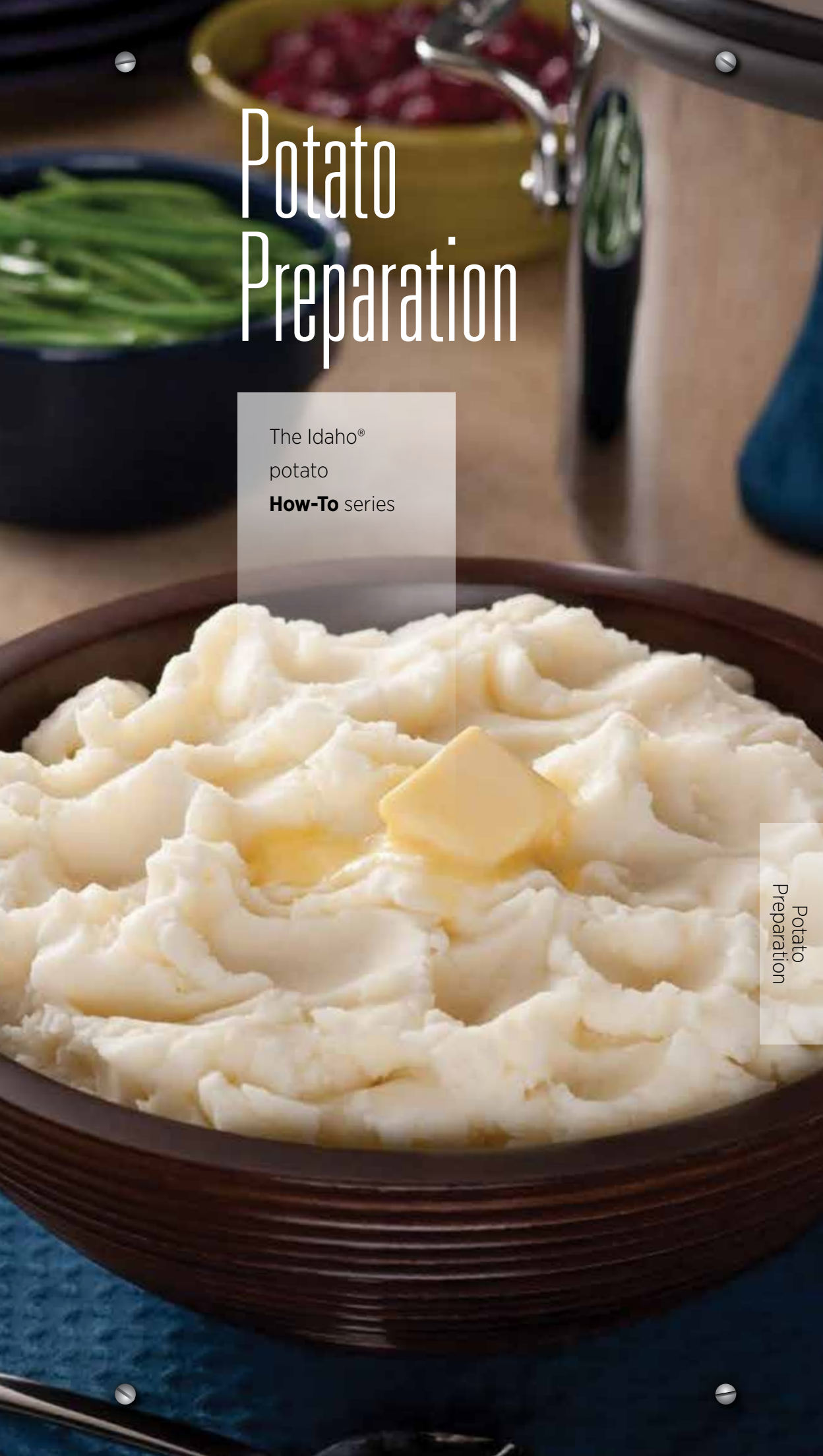
**A:** 208°F to 211°F is the internal temperature for a perfectly done baked potato.



# Potato Preparation

The Idaho®  
potato  
**How-To** series

Potato  
Preparation



# Potato Preparation

The Idaho® potato **How-To** series has several wall posters available for download. Posters are available at [idahopotato.com/downloads/posters](http://idahopotato.com/downloads/posters).

## IDAHO® POTATO HOW-TO

### 1

### How to Bake Idaho® Potatoes

#### SELECTION

Potato Count	Approximate Weight
140 count	5-6 oz.
120 count	6-7 oz.
100 count	7-9 oz.
90 count	8-11 oz.
80 count	9-12 oz.

#### PRODUCT IDENTIFICATION

Look for these signs of Idaho® potato quality:

- Grown in Idaho® seal on the bag
- Oval shape
- Net-textured skin
- Few eyes
- Russet brown skin
- Shallow eyes



## WASHING TIPS

- Soak and scrub to remove dirt but not break the skin
- Place potatoes in the swirling water of a pot washer tank
- Drain into a colander
- Special brushes can be installed inside a vegetable peeler

## PREPARATION

- Pierce the skin with a fork to prevent possible bursting in oven.
- To prevent excessive shrinkage on the steam table or in holding warmers, the skin may be coated lightly with a vegetable oil. This will, however, prevent the skin from becoming crispy.
- For extra flavor, strained bacon drippings or infused olive oil flavors can be used for the coating.
- Foil covering **before** baking holds in the moisture and steams the potato. **After** baking, it still traps in the steam to soften the crispy skin. Remember that the skins are good to eat because of the added nutrients in the skin and directly under them.

## BAKING

- Always place washed potatoes on a baking sheet in a single layer.

	Convection	Conventional	Microwave
Equipment	18" x 26" tray		18" x 26" tray
Potato Count	80-140	80-140	80-140
Oven Temperature	400°F	400°F	High
Time	45 min.	60 min.	*

## HOLDING

- A baked potato should be held at 180° for no longer than 45 minutes before serving to ensure the best quality.

## STORAGE

- Fresh potatoes should be held in a cool place—45°. **Do not** refrigerate. The potato starch turns to sugar and the potato becomes sweet at temperature below 42°. Excessive light will turn the outer skins greenish and cause a bitter flavor. Excessive heat (above 50°) will cause shrinkage of the outer skin. Store with the carton lid to prevent greening.

## CHILLED FOOD SYSTEMS

- If it is necessary to cut a baked potato in half for service, place the cut side down on the plate to prevent drying and darkening of the surface. Dip surface in a mixture of water and concentrated lemon juice (1 tablespoon to 1 gallon water) to help prevent oxidation. A pat of butter may be added by piercing the top before heating.



## SERVING

- For best results, **do not wrap in foil**.
- With a fork or potato popper, pierce the skin in the form of a cross. **Do not cut with a knife**. It flattens the surface, seals the cells so they won't absorb dairy products (e.g., butter, sour cream), and prevents the potato from being fluffy.
- **"Blossom"** or open the potato as close to service as possible by pressing the ends toward the center, lifting and fluffing the meat of the potato.

## TOPPING TIPS

- Flavored sour cream, yogurt, cottage cheese (whipped), cheeses, sautéed pepper and onion, mushrooms and herbs, herbed or seasoned butters, gravies.



# IDAHO® POTATO HOW-TO

## How to Prepare French Fries from Fresh Idaho® Potatoes

### SELECTION

Idaho Fresh Whole Potatoes Institutional Pack Forms Available		
	Packing	Product Description
Unpeeled Potatoes	50-lb bag 50-lb box	U.S. Grade No. 1 Idaho® potatoes fresh, whole; packed 60 to 120 count*
Peeled Potatoes	30-lb bags	U.S. Grade No. 1 Idaho® potatoes fresh, whole; packaged loose in assorted sizes

\*For ease in handling 10- to 14-oz. potatoes are recommended.

### STORAGE AND HANDLING

#### Fresh Unpeeled

Fresh potatoes need to be stored in a dark, cool area, preferably 45°F. **They should never be refrigerated.** To allow proper air circulation, remove carton lid. Temperatures below 35°F cause potato starch to turn to sugar. Darkness keeps outer skins from turning green and prevents development of a bitter flavor. Outer skins may begin to shrink in environments warmer than 50°F.

#### Commercially Peeled

Unopened bags of peeled potatoes must be stored at refrigerator temperature (35°F to 40°F). They may be held in unopened bags up to 14 days. Once bag is opened, peeled potatoes should be used within a week.





## **PREPARATION**

### **Fresh Unpeeled**

- Scrub thoroughly to remove dirt but not break the skin. Leaving skins on will add flavor and nutrition to fries.

### **Fresh Peeled**

- For removing skins, potatoes can be easily peeled in commercially available automatic vegetable peelers.
- A solution of water and acid, such as white wine vinegar or concentrated lemon juice,\* should be used to treat potatoes after peeling to prevent browning. Once treated, potatoes will hold up to 24 hours before frying.

\*1 tablespoon lemon juice to 1 gallon water

- Chilling French fries up to 2 hours before frying will increase crispness. Remove excess liquid before frying to avoid spattering.

### **Commercially Peeled**

- Wash thoroughly or soak in clear water before using.
- Keep chilled for crispness.

## **OIL CARE**

- Keep the oil fresh and equipment spotlessly clean.
- Drain and filter the fat frequently, adding new oil daily.
- Strain out burnt pieces of food from baskets.
- Replace oil completely if it starts to smoke, forms bubbles along the side, or becomes excessively dark. This indicates that the oil is breaking down and will result in fries that have poor color, poor flavor, and a greasy texture.

## **FRYING**

- Be sure to find the right temperature for your frying conditions. This varies with the type of equipment, amount of oil, temperature setting, heat recovery, amount of food fried, and the thickness of the cut.
- Remember, the lower the fat temperature, the longer the cooking time and the greater the fat absorption.
- Use a timer and a fat thermometer for best results.
- Always cook in small batches, filling the baskets only half full.

## TIME, TEMPERATURE AND YIELD

Time, Temperature and Weight Yield Chart for One-Step Frying of Fresh Idaho® Peeled & Unpeeled Potatoes

Original Form of Potato/Cut	Maximum Oil Temperature	Time	Raw Weight	*Average Total Yield After Frying
Whole, Unpeeled 1/4" Fries	375°F	3½ min.	4 lb.	2 lb. 12 oz.
Jacket-Fries with skin on	375°F	3½ min.	4 lb.	2 lb. 10 oz.
Shoestring Fries	375°F	3 min.	4 lb.	3 lb.
Whole, Peeled 1/4" Fries	375°F	3½ min.	4 lb.	1 lb. 4 oz.
Round Fries	375°F	3½ min.	4 lb.	1 lb. 10 oz.
Shoestring Fries	375°F	4 min.	4 lb.	1 lb. 12 oz.

\*Weight loss is due to loss of moisture in potatoes.

## PURCHASING

Average Quantity of Fresh Idaho® Potatoes\* Required to Prepare and to Yield 4-Ounce Servings of French Fries

Form of Potato	25 Servings	50 Servings	100 Servings
Whole, unpeeled 1/4" fries	10¾ lb.	21 lb.	41½ lb.
Jacket fries	9¾ lb.	18½ lb.	37 lb.
Shoestring fries	9½ lb.	19 lb.	37½ lb.
Whole, peeled 1/4" fries	20 lb.	40 lb.	80 lb.
Round fries	15¾ lb.	30½ lb.	61 lb.
Shoestring fries	14¾ lb.	28½ lb.	57 lb.

\*Weight designated is as purchased.

## HOLDING

Holding Fresh French Fried Potatoes			
Holding Equipment	Time	Temperature	Approximate Weight of Fries and Holding Container
Warming Cabinet	5–10 min.	300°F	1¼ lb. in perforated full pan inside deep full pan
Heat Lamp	10 min.	100°–120°F	1¼ lb. per full pan
Steam Table	5–10 min.		¾ lb. per half pan

## SERVING TIPS

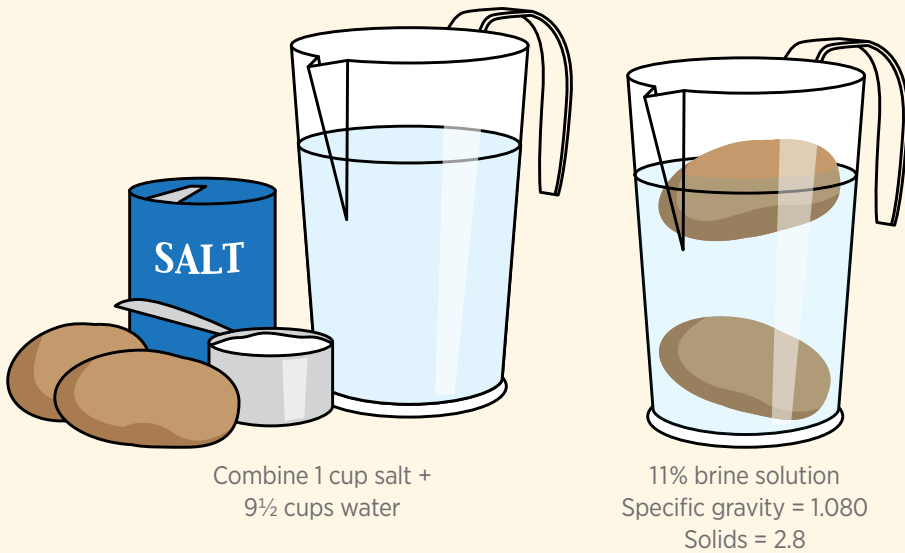
- Golden brown color indicates fries are done. Drain before serving, then salt or season. French fries can be served with dips as hors d'oeuvres. Sprinkle with any shake-on seasoning (herb, lemon, pepper, barbecue, etc.) or with grated cheese.
- Individual serving sizes range from 3 to 5 oz. in fast food establishments. Restaurants usually serve 4½ to 5 oz.; healthcare facilities 2½ to 3 oz.; college dining 3½ to 4 oz.; and school lunch programs 3 to 3½ oz.

# Specific Gravity in Potatoes

The high water content of some non-Idaho® russet potatoes can result in a mushy, steamed texture, as well as lower yield when preparing French fries. Idaho® potatoes, with an average of 21 percent potato solids, ensure superior texture, great flavor, and a crisp, golden appearance.

Perform this simple experiment to pretest your potatoes for optimum moisture content before you fry them.

## SIMPLE TEST TO SEPARATE HIGH- AND LOW-SPECIFIC-GRAVITY POTATOES



Combine 1 cup salt +  
9½ cups water

11% brine solution  
Specific gravity = 1.080  
Solids = 2.8

Potatoes high in solids will sink and those lower in solids will float.

## Solids Chart

Specific Gravity	Total Solids	Specific Gravity	Total Solids
1.069	18.2	1.083	21.4
1.070	18.5	1.084	21.7
1.071	18.7	1.085	21.9
1.072	19.0	1.086	22.1
1.073	19.2	1.087	22.3
1.074	19.4	1.088	22.5
1.075	19.7	1.089	22.7
1.076	19.9	1.090	22.9
1.077	21	1.091	23.2
1.078	2.3	1.092	23.5
1.079	2.5	1.093	23.8
1.080	2.8	1.094	24.1
<b>1.081</b>	<b>21.0</b>	1.095	24.3
1.082	21.2	1.096	24.5

■ Ideal solids average for dry, fluffy potatoes

Source: Simplot Foods

# IDAHO® POTATO HOW-TO

## How to Prepare Mashed Potatoes from Fresh, Whole Idaho® Potatoes

### SELECTION

Idaho® potatoes may be used for mashed potato production in the following forms:

Idaho Fresh Whole Potatoes Institutional Pack Forms Available		
	Pack	Product Description
Unpeeled Potatoes	50-lb. bag 50-lb. box	U.S. Grade No. 1 Idaho® potatoes fresh, whole; packed 60 to 160 count
Peeled Potatoes	30-lb. bag	U.S. Grade No. 1 Idaho® potatoes fresh, whole; packaged loose, unsized

### STORAGE

#### Fresh Unpeeled

- Fresh potatoes need to be stored in a dark, cool area, preferably 45°F. They should never be refrigerated. Allow proper air circulation. Temperatures below 35°F cause potato starch to turn to sugar. Darkness keeps outer skins from turning green and prevents development of bitter flavor. Outer skins may begin to shrink in environments warmer than 50°F.

#### Commercially Peeled

- Unopened bags of peeled potatoes must be stored at refrigerator temperature (35°–45°F) and may be refrigerated up to 14 days. Once bag is opened, prepeeled potatoes should be used within one week.

### PREPARATION

- Unpeeled potatoes may be peeled prior to cooking or cooked with skins on, rinsed under cool water, and peeled.
- Commercially peeled potatoes must be rinsed before cooking.

## FINAL PREPARATION

Whole Idaho® potatoes may be cooked in a steam jacket kettle, in a pressure steamer, on rangetop burners, or in convection steamers.

Heating Times Required to Cook Potatoes from Whole Unpeeled or Peeled Idaho® Potatoes			
	25 Servings	50 Servings	100 Servings
Steam-jacket Kettle*	35–40 min.	40 min.	40–45 min.
Pressure Steamer	25–30 min.	30–35 min.	30–35 min.
Rangetop Burners*	60 min.	70 min.	75 min.
Convection Steamer	40–45 min.	40–45 min.	45–50 min.

\*Water level should be approximately 4" above potatoes.

Ingredients and Procedure to Prepare Mashed Potatoes from Fresh Whole Idaho® Potatoes			
	25 Servings (½ cup)	50 Servings (½ cup)	100 Servings (½ cup)
<b>Potatoes (weight as purchased)</b>			
Whole, unpeeled	6 lb.	12 lb.	25 lb.
Whole, peeled	5 lb.	10 lb.	22 lb.
Milk	3–4 cups	1½–2 qt.	3–4 qt.
Margarine or Butter	¼ lb.	½ lb.	1 lb.
Salt	1½ Tbsp.	3 Tbsp.	½ cup

1. Cook potatoes until fork tender.
  2. Heat milk to scalding.
  3. Drain potatoes, peel if necessary. Place in mixer.
  4. Pour heated milk into mixer with potatoes. Whip on “low” setting until smooth, 1–2 minutes.
  5. Add margarine or butter and salt. Whip on “high” setting 3–4 minutes.
- Yield may vary depending upon amount of milk used and whipping time. The more milk used and the longer the product is whipped, the greater the volume of mashed potatoes. Therefore, a No. 8 scoop (½ cup) may hold between 4.5 and 6.5 fluid ounces. A No. 10 scoop (¾ cup) holds between 3.5 and 4.5 fluid ounces of prepared mashed potato.

## HOLDING

	Holding Time
Steam Table (moist heat) #7*	Up to 60 min.
Warming Cabinet (175°–200°F)	50–60 min.

- Use a deep half steam table pan (13½" x 10½" x 6" deep). Keep covered.
- If dry-heat table is used, set pan in water bath.



## SERVING

- Garnish just prior to serving with margarine or butter and parsley.
- Use No. 8 or No. 10 scoop, yielding  $\frac{1}{2}$  cup and  $\frac{3}{8}$  cup servings, respectively. For less stringent portion control, serve with an unslotted spoon.

## CHILL PLATING

- Prepared mashed potatoes may be pre-plated using a scoop. Rounded top of potatoes should be depressed with underside of scoop and margarine added.

Microwave Oven		
Internal Temp. 150–160°F	1000-Watt	1300-Watt
Heating times for plated meals containing approximately $2\frac{1}{2}$ cup mashed potatoes, 2nd vegetable, and entrée	1 min. 45 sec. to 2 min.	1 min. 30 sec. to 1 min. 45 sec.



# How to Prepare Hash Browns from Precooked Baked or Steamed Idaho<sup>®</sup> Potatoes

## SELECTION

Idaho <sup>®</sup> Fresh Whole Potatoes—Institutional Pack Forms Available		
	Pack	Product Description
Unpeeled Potatoes	50-lb. bag 50-lb. box	U.S. Grade No 1 Idaho <sup>®</sup> potatoes, fresh, whole (packed 60-160 count)
Peeled Potatoes	30-lb. bag	U.S. Grade No 1 Idaho <sup>®</sup> potatoes, fresh, whole (packaged loose, unsized)

## STORAGE

- Leftover unpeeled baked Idaho<sup>®</sup> potatoes and steamed/boiled potatoes should be covered with plastic wrap or other airtight covering and refrigerated.
- Unused, cooked Idaho<sup>®</sup> potatoes may be refrigerated (35° to 40°F) for three to five days, depending on length of time before refrigeration.

## PREPARATION

Average Yield of Pre-Cooked Peeled Idaho <sup>®</sup> Potatoes Required to Prepare and Yield ½-cup (approximately 4 oz.) Servings of Hash Browns			
	25 ½ cup servings	50 ½ cup servings	100 ½ cup servings
Pre-Cooked Peeled Potatoes	6 lb.	12 lb.	25 lb.

Note: approximate yield of 88% after peeling

- Baked potato skins may be removed using a paring knife,
- A commercial food cutter should be used to slice or dice whole, peeled potatoes. Let bowl rotate until most potatoes are in ¼- to ⅜-inch pieces. **Caution:** Do not run too long. Potatoes should not be cut into small pieces.

## FINAL PREPARATION

- Add all optional ingredients and seasoning before cooking.
- Preheat grill to 375° and *generously* grease surface with pan/griddle shortening, vegetable oil, strained bacon fat, margarine, or a combination.

- Pour potatoes on grill and mix gently to coat all pieces. Spread ½" to ¾" thick on grill surface.
- Do not flatten potatoes.
- During cooking process additional fat is necessary to prevent sticking and increase browning of hash browns. This shortening/oil should be added directly to the grill and not poured over potatoes.
- Mixture should remain loose and be lightly tossed during cooking to allow uniform browning.

## TIMES AND TEMPERATURES

At a grill temperature of 375°F, potatoes should be cooked 2–4 minutes each side. Twenty-five servings are easily handled on a standard 31" x 32" food service grill. For large quantities, repeat procedure.

NOTE: Increased grill temperature may cause spattering of fat and burning of potatoes.

## HOLDING

	Temperature	Time
Dry Heat Steam Table	5 to 7*	25 to 30 minutes
Warming Cabinet	175°F	15 to 20 minutes

\*On a scale of 10

- Layer hash browns about ½" thick in steam table pan 13" x 21" x 2" and hold in dry heat with lid slightly off.
- In preheated warming cabinet, hash browns should be spread on baking sheet pans 18" x 26" and left uncovered.

## SERVING

- Garnish hash browns just prior to serving with paprika, parsley, dollop of sour cream or grated cheese.
- For portion control service, ready-to-serve hash browns should be placed into measure but not firmly packed.
- For less stringent portion control, serve with a spatula or spoon.

## VARIATIONS

- Prepared hash brown potatoes may be used to prepare Lyonnaise with onions, O'Brien with parsley and chopped pimiento, and Italian with oregano, rosemary and mozzarella cheese.
- Flavored vinegars, honey, syrups, herbs or seasoned salt, Tabasco, etc., are some regional favorites.

# Potato101.com

Preparation  
and care for  
perfect Idaho<sup>®</sup>  
potatoes

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Preparation and care for perfect Idaho® potatoes

## Storing

Store potatoes in their original cartons or bags, completely covered, and away from light. The ideal storage temperature range is 45–48°F, unless using for fresh fries. The potatoes for fresh fries should be stored at 55°F.

## Cleaning

Wash Idaho® potatoes lightly in water before boiling or baking. However, if you are not going to cook your potatoes immediately, avoid scrubbing them with water because they can start to go moldy in warm or damp weather.





## Peeling

Carefully trim any green or discolored patches or dark eyes with the tip of a knife or potato peeler. This is not necessary if you are going to peel them after cooking, when they will come out of their skins easily. Place the potatoes in enough water to cover them. We recommend a solution of 1 teaspoon of acid such as lemon juice or white wine vinegar to a gallon of water to prevent potatoes from turning brown.



You can boil the potatoes, allow them to cool, and then peel them. The taste is fresher and earthier if they are prepared this way, and they are perfect for eating plain or simply garnished. Much of the goodness and flavor of an Idaho® potato is in the skin. Leaving the skins on adds more flavor and texture, and is a vital source of fiber in the diet.



To peel potatoes, use a sharp potato peeler to remove the thinnest layer possible in long, even strips. Place the potatoes in a saucepan of water so they are just covered. Cook them immediately to avoid loss of vitamin C.

## Chopping

Recipes for potatoes often require them to be chopped or diced for salads or “oven fried potatoes.” If you are cooking them first, the best potatoes to choose are those high in solids and starch, which stay firm. They chop most easily when they are cold and peeled.

To chop, cut the potato in half, then in half again and again until it is cut up evenly.

## Slicing

How you slice potatoes will affect both the appearance of the dish and the cooking time. Cut slices the same thickness to cook evenly.

To make rounder slices, cut across the width of the potato; for longer slices, cut along the length. If you

need to slice cooked potatoes for a recipe, undercook them slightly so they don't fall to pieces, and chill before handling.

Put the tip of the knife on the work surface or cutting board first, then press the heel of the knife down firmly to create nice even slices.



## Slicing with a Mandolin

Named after the musical instrument, the mandolin has several different cutting blades, which vary both the size and the shape of the cut potato. The blades are fitted into a metal, plastic, or wooden framework for ease of use. It is excellent for slicing potatoes evenly, and can produce slices from very thin to very thick, as well as fluted slices for crinkle-cut potato chips. The mandolin must be used with care because of its very sharp blades. Rotate the knob on the side of the mandolin to adjust the blade to the thickness required, then, holding the potato, carefully slide it firmly up and down or across the blade, using the protective guard to safeguard fingers.



## Dicing

If the recipe calls for diced potatoes, this means you have to be more precise than for chopping and cut the potato into evenly shaped cubes. When the dices are uniform in size, they cook evenly and brown nicely.

To dice the potatoes, cut the sides and ends of the potato to make a neat rectangle (keeping the outside pieces for other uses or for adding to a soup). Then cut the rectangle into thick, even slices. Turn over the stack of slices and cut them lengthwise into thick lengths and finally crossways into even cubes that are the size needed for the recipe you are following.



## Grating

Potatoes can be grated before or after cooking, depending on how you will be using them. They are easier to grate after cooking, but must have had time to cool. They can be grated on the large blade straight into the cooking dish or frying pan. Don't overcook the potatoes, as they will just fall to pieces. Starchy potatoes are ideal for mashing, and waxy ones for making salads or hash, like reds or Yukon Golds.

Raw potatoes, like russets, exude a surprising amount of starchy liquid that is vital to helping some dishes stick together. Check the recipe before you begin as to whether you need to keep this liquid. The recipe typically will tell you whether to rinse off the starchy liquid or just dry the potatoes in a paper towel.

# Making Potato Chips

Homemade potato chips can be very difficult if you do not have the right tools for making them. To make a large batch, slice the potatoes in a food processor, but for a small batch, use the slicing blade on a standard grater or the mandolin. It is possible to use a sharp knife to make chips, but you need to be very careful to cut fine slices.

# French Fries

There are many different names for French fries, depending on how thin or thick they are cut. The larger you cut them the healthier they will be, since they will absorb less fat during the cooking. You can also make fries with their skins on, giving additional fiber and a more homemade appearance.

**Traditional fries:** Use the largest suitable potatoes and cut into  $\frac{5}{8}$ " thick slices, or thicker if you wish. Turn the slices on their side and cut into  $\frac{5}{8}$ " strips or use a French fry cutter.

**Pommes frites:** Cut as for traditional French fries, but slice again into neat, even strips about  $\frac{1}{3}$ " thick, either by hand or with a machine.

**Pommes allumettes:** Cut the potato into a neat rectangle by removing the rounded sides, then into thin slices and then julienne strips. Pommes allumettes should be about half the thickness of pommes frites.

**Steak fries:** Cut the potato lengthwise into 8 sections before frying.

**Shoestring fries:** These are quite thin, cut into slices lengthwise, then small Julienne strips.

**Crinkle cut fries:** When making from scratch, use the mandolin for the fluted slices.



## Making Ribbons or Curls

Thin ribbons or curls, which are delicious when deep-fried, can be simply cut with a potato peeler (an apple peeler can also be used).

Peel the potato like an apple, to give long strips. Keep the ribbons in a bowl of cold water and pat dry before frying.



## Hasselback and Fan Potatoes

To make Hasselback potatoes, wash and dry potatoes. Then slice vertically, nearly all the way through. You can use a flexible cutting board, or wooden chopsticks, placed on either side of the potato to cut to a consistent depth. Brush with oil, season with salt and pepper, and put them in to roast as soon as possible, before they begin to discolor.

To make potato fans, use medium russet potatoes of long or oval shape and cut them at a slight angle, slicing almost, but not quite all the way through. Press the potato gently on the top until it flattens and fans out at the same time. If you don't cut far enough through it will not fan, but if you cut too far it will split into sections. The best way to cook both of these preparations is to coat them with melted butter and oil and roast them in the oven, preheated to 375°F, for 40–50 minutes.





# Blanching

Potatoes are blanched (part-cooked) to soften the skin for several reasons—for easy peeling, to remove excess starch for certain recipes, and to par-cook before frying or roasting. Use a draining spoon or basket to remove large chunks or slices of potato, but when you are cooking small pieces, put them in a wire basket for easy removal.

Place the prepared potatoes in a pan of cold water. Bring slowly to boil and boil gently for 5 minutes or until fork tender. Drain and use or leave in fresh, cold water until ready to use.



# Steaming

All potatoes steam well, but this gentle way of cooking is particularly good for very starchy potatoes and those that fall apart easily. Small potatoes, such as new potatoes, taste really delicious when they are steamed in their skins. Make sure that larger potatoes are cut quite small, in even-size chunks or thick slices. Leaving cooked potatoes over a steaming pan of water is also a good way to keep them warm.

1. Place the prepared potatoes in a sieve, colander, or vegetable steamer over a deep pan of boiling, salted water. Cover as tightly as possible and steam for 5-7 minutes. For smaller cuts or slices, increase the time to 20 minutes or more if the potatoes are in large pieces.
2. Towards the end of the cooking time, test a few of the potatoes with the tines of a fork. If they are cooked, turn off the heat and leave until you are ready to serve them. They will keep warm above the water.



# Boiling

Boiling is the simplest way of cooking potatoes. Place potatoes of a similar size, either whole or cut into chunks, with or without their skins, in a pan with sufficient water to cover them.



- Starchy potatoes need very gentle boiling, or you may find the outside is cooked before the inside is ready, and they will become mushy or fall apart.
- New potatoes, which have a high vitamin C content, should be put straight into boiling water, cooked for about 15 minutes, and not left soaking.
- Very firm potatoes for salads can be put into boiling water and simmered for 5–10 minutes. Reduce heat. Simmer in the hot water for an additional 5–10 minutes.
- When they have finished cooking, drain in a colander and return potatoes to the pan to dry off. For really dry potatoes (for mashing, for instance), leave them over a very low heat so any moisture can escape. Additionally, you can sprinkle the potatoes with salt and shake occasionally until the potatoes stick to the sides of the pan.
- Cover potatoes with a lid or clean dish towel until ready to serve.

# Shallow Frying or Sautéing

This is a quick way to use up leftover potatoes. Use a large cast iron frying pan for even distribution of heat and to give sufficient room to turn the food as it cooks:



1. Heat together about 2 Tbsp. butter and 2 Tbsp. oil until bubbling. Put an even layer of cooked or par-cooked potatoes in the hot fat. Cook potatoes for 4–5 minutes without turning until the undersides turn golden brown.
2. Turn over the potatoes gently with a large spatula once or twice during cooking, leaving 4–5 minutes between turning, until they are golden brown all over.



## Deep-Frying

Whether you fry with vegetable, peanut, or olive oil, be sure it is fresh and clean. Fry in small batches to prevent the temperature from dropping and to avoid uneven cooking. Remove any burned pieces after each batch, as this can break down the fat.

To deep-fry potatoes, preheat the oil in a deep, heavy saucepan with a tight-fitting lid or use a deep-fat fryer. Fill the saucepan about half full or to the indicated fill line on the deep-fat fryer. To test, drop a piece of bread in the oil. It should turn to a golden color in about one minute.

The best fries are blanched before frying. This removes excess starch and ensures even browning. You can use the water-blanching method by boiling 2–3 minutes, rinsing, and covering again in cold water. When ready to fry, dry the potatoes thoroughly in a cloth or on paper towels—any moisture will make the oil splash and spit.

The alternative blanching method is to par-fry the potatoes at 325°F for 3–5 minutes. This partially cooks and seals the potatoes without browning. Drain potatoes and when cooled, spread fries in single layer on a parchment-lined tray and freeze. When cooked, these fries will crisp up and turn golden brown.

While frying, shake the pan of potatoes (or the fry basket) occasionally to allow even cooking. Cook until they are crisp and golden. Remove with a slotted spoon or drain the fryer basket well against the side of the fryer. Place French fries on paper towel to absorb excess oil before serving. Sprinkle with salt.

# Roasting

For soft, fluffy roasted potatoes, you need to use large Idaho® russet potatoes. Peel and cut into even-size pieces (you can roast potatoes in their skins, but you won't get the crunchy result most people love). Blanch for 5 minutes in water, then leave in the cooling water for a further 5 minutes to par-cook evenly. Drain well and return to the pan to dry off completely. Well-drained potatoes with roughened surfaces produce the crispiest results.

A successful roasted potato also depends on the oil and the temperature. Beef drippings give the best flavor, although goose fat is delicious too and gives a very light, crisp result. With other roasts you can use lard or, where possible, drain off enough dripping from the meat. A vegetarian alternative is a light olive oil, or olive and sunflower oils.

The oil must be hot enough to seal the potato surfaces immediately. Use a large roasting pan so that you have room to turn the potatoes at least once.

1. Peel the potatoes and cut them into even-size pieces. Blanch the peeled chunks of potato in water and drain, then shake in the pan or fork over the surfaces to roughen them up.
2. Pour a shallow layer of your chosen oil into a good heavy roasting pan and place it in the oven, heating it to a temperature of 425°F. Add the dry potatoes and toss immediately in the hot oil.
3. Return to the top shelf of the oven and roast for up to one hour. Remove the roasting pan from the oven and, using a spatula, turn the potatoes over once or twice while roasting to coat evenly them in oil.





# Baking

One of the most healthful, comforting and economical meals is an Idaho russet potato baked in its skin with a fluffy center topped with melted butter, sour cream, or cheese. Use a 10- to 12-oz. russet potato for a good size portion. Cook in the middle of a hot oven at 400°F for 1 hour for very large potatoes or 40-60 minutes for medium potatoes. To test that they are cooked, squeeze the sides to make sure that they are soft or use a fork to pierce the potato to in the middle. The potato is done when a temperature of 210°F is reached in the center.



1. Wash and dry baking potatoes thoroughly, then optionally rub with oil and add a generous sprinkling of salt. Cook on a baking tray. To speed up cooking time and to ensure even cooking throughout, cook the baking potatoes on skewers, on special potato baking racks, or directly on the oven racks.
2. When tender, pierce a cross in the top of each potato with a fork and set the tray aside to cool slightly.
3. Hold each hot potato in a clean cloth and squeeze gently from underneath to open up.
4. Place the open potatoes on individual serving plates and put a pat of butter in each one. For a quick topping, add a little grated hard cheese, or a dollop of sour cream and chopped fresh herbs, such as chives or parsley. Season well.

# Potato Skins

Deep fry or bake the potatoes at 400°F for 1-1½ hours for large potatoes and 40-60 minutes for medium. Cut in half lengthwise and scoop out the soft centers. (Mash the insides for a dinner side dish).

Brush the skins inside and out with melted butter or a mixture of butter and oil and return to top shelf of oven.

Bake at 400°F for 20 minutes or until the skins are beautifully crisp and golden brown. For deep frying, omit brushing with butter or oil and deep fry until golden brown. Fill with toppings such as shredded cheese and bacon bits and return to oven to melt.





# Microwaving

Baking potatoes in the microwave is a big time-saver. Small potatoes and potato pieces can also be cooked very quickly and easily. Always cut or prick the potato skins first, to prevent



bursting. To bake, allow 4–8 minutes for each potato, with the setting on high, increasing by 2–4 minutes for every additional potato. Place large potatoes in a circle on parchment or a paper towel on the microwave tray. Turn once during the cooking process. Place small potatoes in a microwave-safe bowl with 2–3 Tbsp boiling water. Cover tightly with microwave film and pierce the film two or three times to allow steam to escape during cooking.

Alternatively, cover the potatoes with a close-fitting microwave lid. Leave for 3–5 minutes before draining, adding a few pieces of butter and seasoning.

# Mashing

The best mashers are those that have a strong but open cutting grid that is not too fine (or a potato ricer).

Simply push down on the cooked potatoes, making sure you cover every area in the pan, and you will get a smooth, yet slightly textured result. Do not overmix, as the potatoes will turn gluey.

For light and fluffy mashed potatoes, press through a potato ricer.



Add plenty of butter, some cream or milk and seasoning to taste, then continue mashing the potatoes until you have a creamy, fluffy mixture.

Set the bowl over a pan with hot water to keep warm.

# Cost per Serving

Idaho® potatoes are delicious and affordable



# Cost per Serving

For additional **cost per serving** and **Idaho® potato size guide** information, visit [idahopotato.com/foodservice/cost-and-size](http://idahopotato.com/foodservice/cost-and-size).

50-lb. Idaho® Potato Count Cartons									
Cost/ Carton	Count/Carton								
	140	120	110	100	90	80	70	60	50
5.00	.036	.042	.045	.050	.056	.063	.071	.083	.100
5.50	.039	.046	.050	.055	.061	.069	.079	.092	.110
6.00	.043	.050	.054	.060	.067	.075	.086	.100	.120
6.50	.046	.054	.059	.065	.072	.081	.093	.108	.130
7.00	.050	.058	.064	.070	.078	.087	.100	.117	.140
7.50	.054	.062	.068	.075	.083	.094	.107	.125	.150
8.00	.057	.067	.073	.080	.089	.100	.114	.133	.160
8.50	.061	.071	.077	.085	.094	.106	.121	.142	.170
9.00	.064	.075	.082	.090	.100	.112	.129	.150	.180
9.50	.068	.079	.086	.095	.106	.119	.136	.158	.190
10.00	.071	.083	.091	.100	.111	.125	.143	.167	.200
10.50	.075	.088	.095	.105	.117	.131	.150	.175	.210
11.00	.079	.092	.100	.110	.122	.138	.157	.183	.220
11.50	.082	.096	.105	.115	.128	.144	.164	.192	.230
12.00	.086	.100	.109	.120	.133	.150	.171	.200	.240
12.50	.089	.104	.114	.125	.139	.156	.179	.208	.250
13.00	.093	.108	.118	.130	.144	.162	.186	.217	.260
13.50	.096	.112	.123	.135	.150	.169	.193	.225	.270
14.00	.100	.117	.127	.140	.156	.175	.200	.233	.280
14.50	.104	.121	.132	.145	.161	.181	.207	.242	.290
15.00	.107	.125	.136	.150	.167	.188	.214	.250	.300
15.50	.111	.129	.141	.155	.172	.194	.221	.258	.310
16.00	.114	.133	.145	.160	.178	.200	.229	.267	.320
16.50	.118	.138	.150	.165	.183	.206	.236	.275	.330
17.00	.121	.142	.155	.170	.189	.212	.243	.283	.340
17.50	.125	.146	.159	.175	.194	.219	.250	.292	.350
18.00	.129	.150	.164	.180	.200	.225	.257	.300	.360
18.50	.132	.154	.168	.185	.206	.231	.264	.308	.370
19.00	.136	.158	.173	.190	.211	.238	.271	.317	.380
19.50	.139	.162	.177	.195	.217	.244	.279	.325	.390
20.00	.143	.166	.182	.200	.222	.250	.286	.333	.400
20.50	.147	.171	.186	.205	.228	.256	.293	.342	.410
21.00	.150	.175	.191	.210	.233	.262	.300	.350	.420
21.50	.154	.179	.195	.215	.239	.269	.307	.358	.430
22.00	.157	.183	.200	.220	.244	.275	.314	.367	.440
22.50	.161	.188	.205	.225	.250	.281	.321	.375	.450
23.00	.164	.192	.209	.230	.256	.288	.328	.383	.460
23.50	.168	.196	.214	.235	.261	.294	.336	.392	.470
24.00	.171	.200	.218	.240	.267	.300	.343	.400	.480
24.50	.175	.204	.223	.245	.272	.306	.350	.408	.490
25.00	.178	.208	.227	.250	.278	.312	.357	.417	.500
25.50	.182	.212	.232	.255	.283	.319	.364	.425	.510
26.00	.185	.217	.236	.260	.289	.325	.371	.433	.520
26.50	.189	.221	.241	.265	.294	.331	.379	.442	.530
27.00	.192	.225	.245	.270	.300	.338	.386	.450	.540
27.50	.196	.229	.250	.275	.306	.344	.393	.458	.550
28.00	.200	.233	.255	.280	.311	.350	.400	.467	.560
28.50	.204	.238	.259	.285	.317	.356	.407	.475	.570
29.00	.207	.241	.264	.290	.322	.362	.414	.483	.580
29.50	.211	.246	.268	.295	.328	.369	.421	.492	.590
30.00	.214	.250	.272	.300	.333	.375	.429	.500	.600
30.50	.218	.254	.277	.305	.339	.381	.436	.508	.610
31.00	.221	.258	.282	.310	.344	.388	.443	.517	.620
31.50	.225	.262	.286	.315	.350	.394	.450	.525	.630
32.00	.229	.267	.290	.320	.356	.400	.457	.533	.640
32.50	.232	.271	.295	.325	.361	.406	.464	.542	.650
33.00	.236	.275	.300	.330	.367	.412	.471	.550	.660
33.50	.239	.279	.305	.335	.372	.419	.479	.558	.670
34.00	.243	.283	.309	.340	.378	.425	.486	.567	.680
34.50	.246	.288	.314	.345	.383	.431	.493	.575	.690
35.00	.250	.292	.318	.350	.389	.438	.500	.583	.700
35.50	.254	.296	.323	.355	.394	.444	.507	.592	.710
36.00	.257	.300	.327	.360	.400	.450	.514	.600	.720
36.50	.260	.304	.332	.365	.406	.456	.521	.608	.730
37.00	.264	.308	.336	.370	.411	.462	.528	.617	.740
37.50	.268	.312	.341	.375	.417	.469	.536	.625	.750
38.00	.271	.317	.345	.380	.422	.475	.543	.633	.760
38.50	.275	.321	.350	.385	.428	.481	.550	.642	.770
39.00	.279	.325	.355	.390	.433	.488	.557	.650	.780
39.50	.282	.329	.359	.395	.439	.494	.564	.658	.790
40.00	.286	.333	.364	.400	.444	.500	.571	.667	.800

**IDAHO® POTATOES**  
What does it cost to serve the very best?  
Find out with this new potato cost guide.

**COST PER CARTON:** \$3.00, \$5.00, \$6.00, \$7.00, \$8.00, \$9.00, \$10.00

**COUNT PER CARTON:** 140, 120, 110, 100, 90, 80, 70, 60, 50

**COST PER SERVING:** .036, .039, .043, .046, .050, .054, .057, .061, .064, .068, .071, .075, .079, .083, .086, .090, .092, .096, .100, .104, .107, .111, .114, .117, .121, .125, .129, .133, .138, .143, .148, .153, .158, .163, .168, .173, .178, .183, .188, .193, .198, .203, .208, .213, .218, .223, .228, .233, .238, .243, .248, .253, .258, .263, .268, .273, .278, .283, .288, .293, .298, .303, .308, .313, .318, .323, .328, .333, .338, .343, .348, .353, .358, .363, .368, .373, .378, .383, .388, .393, .398, .403, .408, .413, .418, .423, .428, .433, .438, .443, .448, .453, .458, .463, .468, .473, .478, .483, .488, .493, .498, .503, .508, .513, .518, .523, .528, .533, .538, .543, .548, .553, .558, .563, .568, .573, .578, .583, .588, .593, .598, .603, .608, .613, .618, .623, .628, .633, .638, .643, .648, .653, .658, .663, .668, .673, .678, .683, .688, .693, .698, .703, .708, .713, .718, .723, .728, .733, .738, .743, .748, .753, .758, .763, .768, .773, .778, .783, .788, .793, .798, .803, .808, .813, .818, .823, .828, .833, .838, .843, .848, .853, .858, .863, .868, .873, .878, .883, .888, .893, .898, .903, .908, .913, .918, .923, .928, .933, .938, .943, .948, .953, .958, .963, .968, .973, .978, .983, .988, .993, .998, 1.00

Do you know how much you're spending on spuds? Our handy chart will help you determine the price of serving the most delicious Idaho® potatoes. If you order a 50-count carton, use the produce supplier charges \$9.50, the net cost per potato is \$0.19. If you order a 140-count carton, the net cost per potato is \$0.21. If you order a 200-count carton, the net cost per potato is \$0.23. If you order a 300-count carton, the net cost per potato is \$0.25. If you order a 400-count carton, the net cost per potato is \$0.27. If you order a 500-count carton, the net cost per potato is \$0.29. If you order a 600-count carton, the net cost per potato is \$0.31. If you order a 700-count carton, the net cost per potato is \$0.33. If you order an 800-count carton, the net cost per potato is \$0.35. If you order a 900-count carton, the net cost per potato is \$0.37. If you order a 1000-count carton, the net cost per potato is \$0.39. If you order a 1100-count carton, the net cost per potato is \$0.41. If you order a 1200-count carton, the net cost per potato is \$0.43. If you order a 1300-count carton, the net cost per potato is \$0.45. If you order a 1400-count carton, the net cost per potato is \$0.47. If you order a 1500-count carton, the net cost per potato is \$0.49. If you order a 1600-count carton, the net cost per potato is \$0.51. If you order a 1700-count carton, the net cost per potato is \$0.53. If you order a 1800-count carton, the net cost per potato is \$0.55. If you order a 1900-count carton, the net cost per potato is \$0.57. If you order a 2000-count carton, the net cost per potato is \$0.59. If you order a 2100-count carton, the net cost per potato is \$0.61. If you order a 2200-count carton, the net cost per potato is \$0.63. If you order a 2300-count carton, the net cost per potato is \$0.65. If you order a 2400-count carton, the net cost per potato is \$0.67. If you order a 2500-count carton, the net cost per potato is \$0.69. If you order a 2600-count carton, the net cost per potato is \$0.71. If you order a 2700-count carton, the net cost per potato is \$0.73. If you order a 2800-count carton, the net cost per potato is \$0.75. If you order a 2900-count carton, the net cost per potato is \$0.77. If you order a 3000-count carton, the net cost per potato is \$0.79. If you order a 3100-count carton, the net cost per potato is \$0.81. If you order a 3200-count carton, the net cost per potato is \$0.83. If you order a 3300-count carton, the net cost per potato is \$0.85. If you order a 3400-count carton, the net cost per potato is \$0.87. If you order a 3500-count carton, the net cost per potato is \$0.89. If you order a 3600-count carton, the net cost per potato is \$0.91. If you order a 3700-count carton, the net cost per potato is \$0.93. If you order a 3800-count carton, the net cost per potato is \$0.95. If you order a 3900-count carton, the net cost per potato is \$0.97. If you order a 4000-count carton, the net cost per potato is \$0.99. If you order a 4100-count carton, the net cost per potato is \$1.01. If you order a 4200-count carton, the net cost per potato is \$1.03. If you order a 4300-count carton, the net cost per potato is \$1.05. If you order a 4400-count carton, the net cost per potato is \$1.07. If you order a 4500-count carton, the net cost per potato is \$1.09. If you order a 4600-count carton, the net cost per potato is \$1.11. If you order a 4700-count carton, the net cost per potato is \$1.13. If you order a 4800-count carton, the net cost per potato is \$1.15. If you order a 4900-count carton, the net cost per potato is \$1.17. If you order a 5000-count carton, the net cost per potato is \$1.19.

Idaho Potato Commission  
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208.334.2300  
[www.idahopotatoes.com](http://www.idahopotatoes.com)

**A SIZE GUIDE TO AMERICA'S FAVORITE POTATO**

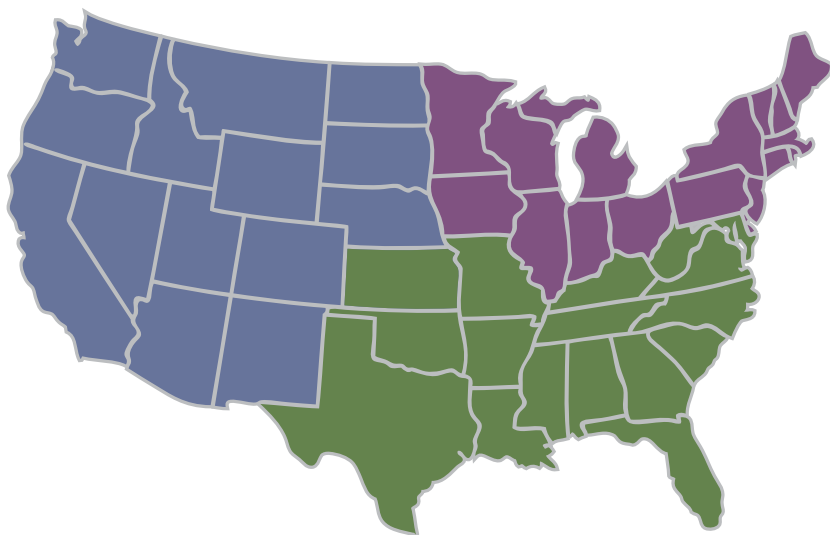
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# The Commission as a Resource

The Idaho Potato Commission foodservice professionals are available to provide you with educational programs, merchandising material and concepts, and quality recipes—all designed with your success in mind. For the most current information, [www.idahopotato.com/foodservice](http://www.idahopotato.com/foodservice).

## Commission Representation

The vice president of foodservice and promotion directors represent all regions of the United States. To get in touch with the representative nearest you, visit [www.idahopotato.com/foodservice/contacts](http://www.idahopotato.com/foodservice/contacts).



## University and Extension Service

The Idaho Potato Commission can put you in touch with the extension and university research services. For further information, contact the commission office in Eagle, Idaho at 208-334-2350.

*Foodservice*  
**TOOLKIT**



**IDAHO POTATO COMMISSION**

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