

Nuts: Safe Methods for Home Gardeners to Harvest, Store, and Enjoy

Almonds, Chestnuts, Pecans, Pistachios, and Walnuts

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The quality, quantity, and safety of your home orchard's nut crop depend on the harvesting, processing, and storage techniques that you use. This publication offers advice for safely handling almonds, chestnuts, pecans, pistachios, and walnuts.

WHY EAT NUTS?

Nuts are delicious and they are good for you. After an extensive review of nutrition and health studies, the US Food and Drug Administration has affirmed that:

- Including nuts in a diet low in saturated fat and cholesterol may help reduce the risk of heart disease.
- Almonds, pecans, pistachios, and walnuts contribute to health through their protein, dietary fiber, and unsaturated fat.

To enjoy nuts and get the most health benefits, nuts must be handled safely.

- Proper storage is necessary to keep the oil in nuts from going rancid.
- Careful handling is needed to prevent nuts from being a source of harmful bacteria.

SAFE HANDLING OF NUTS

Bacteria are everywhere. Some types of bacteria are beneficial to human health, many have no impact on health, and some cause severe illness and even death. Dry foods like nuts are not a common source of harmful bacteria. However, in recent years a number of dried foods have been associated with outbreaks of salmonellosis. This has included outbreaks with raw almonds, cereal,



Photo: Suzanne Paisley

Photo: Jack Kelly Clark.



peanut butter, dried pet food, black pepper, and sesame seeds. **Refrigeration and freezing do not destroy this bacteria. The presence of harmful bacteria cannot be determined by sight, smell, taste, or texture.**

Because of their association with two raw almond outbreaks, California almonds sold in retail stores must be treated in some way to eliminate *Salmonella*. Commercial blanching and roasting processes are examples. Almonds that are not roasted or blanched may be treated with a lighter steam or heat treatment or may be treated with the gas propylene oxide or other approved processes. These lighter treatments are designed to eliminate *Salmonella* but retain the flavor and texture characteristics of a raw almond and retain the nut's ability to germinate.

The ability to germinate is considered important to some people. **The health benefits, storage life, and flavor of nuts are not affected by these treatments.** Almonds that are not obtained through regular market channels may not be pasteurized. Other nuts available at retail markets may also be treated to eliminate *Salmonella*.

When harvesting tree nuts from the home orchard, it is important to take steps that would reduce the potential for contamination of the nuts with harmful bacteria like *Salmonella*. These steps are discussed further in the section on harvesting and drying of nuts. Once your nuts are harvested and dried, it is also important to follow good hygienic practices when shelling and eating them:

- Wash hands with soap and water before and after handling nuts.
- Crack nuts in a clean area and into clean containers.
- Store cracked nuts in clean, closed containers and follow the guidelines in table 1 for appropriate storage times and temperatures.

Table 1. Typical storage time for nuts at refrigerator or freezer temperatures

Nut type	Storage time at refrigerator temperature (40°F [4°C] or colder)	Storage time at freezer temperature (0°F [-18°C] or colder)
almonds		
in-shell	1 year	1 year +
shelled	1 year	1 year +
chestnuts		
in-shell	2–3 months	1 year +
shelled	1 year	1 year +
pecans		
in-shell	1 year	2 years +
shelled	1 year	2 years +
pistachios		
in-shell	1 year	3 years
shelled	1 year	3 years
walnuts		
in shell	1 year	2 years +
shelled	1 year	2 years +

Source: Adapted from *Commodity Storage Manual*. 1995. The Refrigeration Research Foundation (942). Bethesda, MD.



Photo: Roger Duncan.

Almonds ready for harvest.

WHEN TO HARVEST

Harvest all types of nuts as soon as they are ready. Late harvesting reduces crop volume, lowers nut quality, and shortens storage life. In California harvest timing varies somewhat with location. The earliest harvest generally occurs in the southern San Joaquin Valley, followed by the central San Joaquin Valley, the Sacramento Valley, and finally the coastal valleys. An interval of about seven days separates the beginning dates for harvest in each succeeding district.

Almonds

Depending on variety, almonds are ready for harvest from early August to late September. Harvest should begin when about 95 percent of the nuts have hulls that have split open to expose the in-shell almond inside. Hull split begins in the top of the tree and progresses downward. To prevent birds such as scrub jays from stealing your crop and insects such as the navel orangeworm from infesting the nuts, harvest as soon as most (75 percent or more) of the hulls have split open. It is also important to keep your tree well watered up to the time of harvest, since the hulls will not split well if the tree is water stressed.

Almonds

Nutrition Facts	
Serving Size 1.0 cup, whole	
Amount Per Serving	
Calories	Calories from Fat 652
	827
% Daily Value *	
Total Fat 72g	111%
Saturated Fat 6g	28%
Polyunsaturated Fat 17g	
Monounsaturated Fat 46g	
Cholesterol 0mg	0%
Sodium 1mg	0%
Total Carbohydrate 28g	9%
Dietary Fiber 17g	67%
Sugars 7g	
Protein 30g	
Vitamin A 0%	Vitamin C 0%
Calcium 35%	Iron 41%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	
1.0 oz (23 kernels) has 163 calories	



Photo: Jack Kelly Clark

Almond shell within hull.

Raw Chinese Chestnuts

Nutrition Facts	
Serving Size 1.0 oz	
Amount Per Serving	
Calories 64	Calories from Fat 3
% Daily Value *	
Total Fat 0g	0%
Saturated Fat 0g	0%
Polyunsaturated Fat 0g	
Monounsaturated Fat 0g	
Cholesterol 0mg	0%
Sodium 1mg	0%
Total Carbohydrate 14g	5%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 1g	
Vitamin A 0% • Vitamin C 17%	
Calcium 1% • Iron 3%	
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

Chestnuts

The chestnuts on a tree do not mature all at one time but instead ripen over a 10- to 30-day period in late August and September. Some years, depending on chestnut variety and weather conditions, it may take as long as 5 weeks for an entire crop to mature. As chestnuts mature, they fall naturally from the tree. Do not knock the nuts from the tree, but allow them to fall naturally. (A chestnut accumulates more than 50 percent of its final weight in the two weeks just before natural drop.) Shaking or knocking would cause many immature nuts to fall.

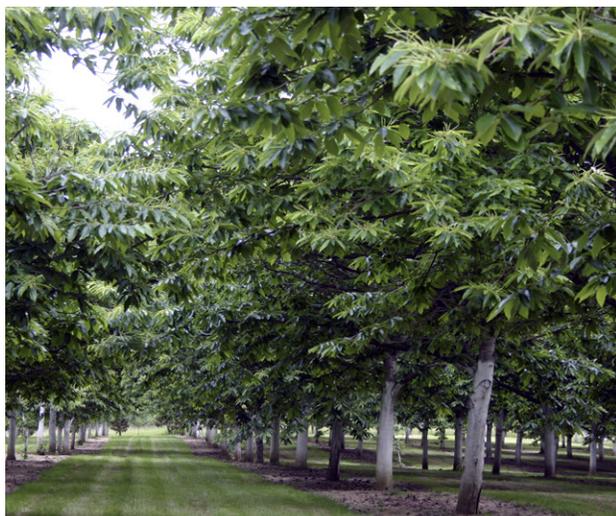
Pecans

Pecans mature from late September through November in the interior valleys of California, depending on variety. Shucks that are split open and shells that are completely brown indicate mature kernels. You can begin to harvest once you can remove the hulls from the nuts. When fall temperatures are abnormally warm, hulls can be removed from nuts before the shells are completely brown. Delay harvest until shell browning is complete to ensure complete kernel development.

Pecans

Nutrition Facts	
Serving Size 1.0 cup, halves	
Amount Per Serving	
Calories 684	Calories from Fat 641
% Daily Value *	
Total Fat 71g	110%
Saturated Fat 6g	31%
Polyunsaturated Fat 21g	
Monounsaturated Fat 40g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 14g	5%
Dietary Fiber 10g	38%
Sugars 4g	
Protein 9g	
Vitamin A 0% • Vitamin C 2%	
Calcium 7% • Iron 17%	
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	
1.0 oz (19 halves) has 196 calories	

Photo: Paul Vossen.



Chestnut trees.

You can leave pecans on the tree into the winter months since they do not readily drop from the trees like other nuts and they are not readily infested by insects. However, nut quality (especially kernel darkening) and losses to birds such as scrub jays increase as harvest is delayed. To ensure the greatest quantity of high-quality nuts that will store well, harvest as soon as the hulls have split and the shells are brown.

Harvest pistachios as early as possible in order to avoid navel orangeworm infestations and losses in kernel quality. You can begin to harvest when you can easily dislodge the nuts from the cluster, usually within 1 to 3 weeks after hulls turn red. Periodically tap a few fruiting branches in the tree to see how many nuts fall free and so determine when the tree is ready for harvest. It is best to wait until most of the crop is mature and then harvest the whole tree at once.

Raw Pistachios

Nutrition Facts	
Serving Size 1.0 cup	
Amount Per Serving	
Calories	Calories from Fat 492
685	
% Daily Value *	
Total Fat 55g	84%
Saturated Fat 7g	33%
Polyunsaturated Fat 17g	
Monounsaturated Fat 29g	
Cholesterol 0mg	0%
Sodium 1mg	0%
Total Carbohydrate 34g	11%
Dietary Fiber 13g	51%
Sugars 9g	
Protein 25g	
Vitamin A 0% • Vitamin C 10%	
Calcium 13% • Iron 34%	
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	
1.0 oz (49 kernels) has 161 calories	

Pistachios

The first sign that pistachio kernels are mature and nearing harvest is when the hulls covering the nuts change from green to a reddish color. This color change occurs in late August or early September, depending on the growing area. You can remove the red hull from a nut easily by squeezing the hull between finger and thumb. The hulls that remain green after most have turned red will not separate easily from the nut shells and indicate *blanks* (shells with no kernels inside).

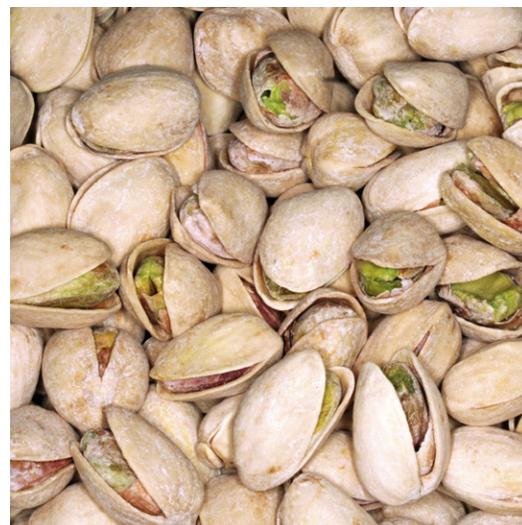


Photo: iStockphoto.com/Howard Terrell

Pistachios in shell.

Raw Walnuts

Nutrition Facts

Serving Size 1.0 cup shelled (50 halves)

Amount Per Serving

Calories 654
Calories from Fat 587

% Daily Value *

Total Fat 65g	100%
Saturated Fat 6g	31%
Polyunsaturated Fat 47g	
Monounsaturated Fat 9g	
Cholesterol 0mg	0%
Sodium 2mg	0%
Total Carbohydrate 14g	5%
Dietary Fiber 7g	27%
Sugars 3g	
Protein 15g	

Vitamin A 0% • Vitamin C 2%

Calcium 10% • Iron 19%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs:

		Calories: 2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:

Fat 9 • Carbohydrate 4 • Protein 4

1.0 oz (14 halves) has 185 calories

Walnuts

Depending on variety and location, you can harvest walnuts from early September to early November. Walnuts are considered mature when the packing tissue (the membrane between the kernel halves) turns completely brown. At this point, kernels are at their lightest color and highest quality. Usually harvest must wait until the hull begins to split from the nut. As fall approaches, crack open a few nuts, especially from the upper part of the tree. Browning of the packing tissue and loosening of the hull are good signs of the approaching harvest. Hulls loosen last in the tree top, so it is important to sample nuts there to determine when to harvest. It is also important to keep the tree

well watered through harvest time to promote hull split; hulls will not separate readily from nuts if the tree is water stressed.

For best kernel quality, harvest as soon as you can separate the hulls from the in-shell nuts. If you delay harvest past the optimum time, serious problems may result, including darkened kernels, insect infestation of both the hull (walnut husk fly) and the kernel (navel orangeworm), and losses to birds. Begin harvesting when most (95 percent or more) of the nuts can easily be removed from the tree, and when the hulls can readily be removed from nearly all (95 percent or more) of the harvested nuts.



Photo: Jack Kelly Clark

Walnut in hull.



Photo: Courtesy of the Mariani Nut Company.

Walnuts.

HARVESTING

Health and Safety Precautions

To harvest nuts (except chestnuts), knock or shake them from their trees with long wooden, fiberglass, or plastic (PVC) poles (fig. 1). **When harvesting nuts with a pole, use extreme caution.** Any contact between the pole and power lines will result in serious injury or death. Do not use aluminum or other metal poles to harvest nuts: these are especially hazardous around power lines. Loosened nuts often follow the pole to the ground as they fall, striking the person holding the pole. Wear protective head and eye gear to avoid injury while harvesting nuts.

The greatest opportunity for contamination of nuts with harmful bacteria like *Salmonella* occurs during harvest. However, there are some relatively simple steps you can take to reduce the risk. First, prepare the ground underneath the tree by sweeping away any debris, especially if you plan to knock the nuts to the ground rather than onto a tarp. Using a clean tarp or sheet of plastic is recommended to avoid contact between the nuts and the ground.

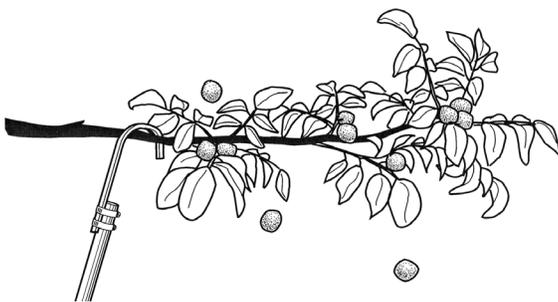


Figure 1. A hook affixed to a pole can be used to shake nut tree branches for harvest.

This may be especially important if you have applied uncomposted or inadequately composted manure to the trees or if you have animals (wild or domestic) in your orchard. Make sure the container that you use for collecting the nuts is clean, and wash your hands before and during harvest. Likewise, when drying nuts, make sure your drying screens are clean and that you cover the nuts with a screen to prevent access to birds.

Almonds

You can knock almonds from the trees using rubber mallets or poles that are available from farm supply stores. The best way to knock almonds from trees is to strike the small branches with a pole or to strike the major branches with a rubber mallet made for that purpose. It is a good idea to spread a tarp beneath the tree to help catch the falling nuts. Pick nuts up promptly to prevent ants from invading and damaging kernels.

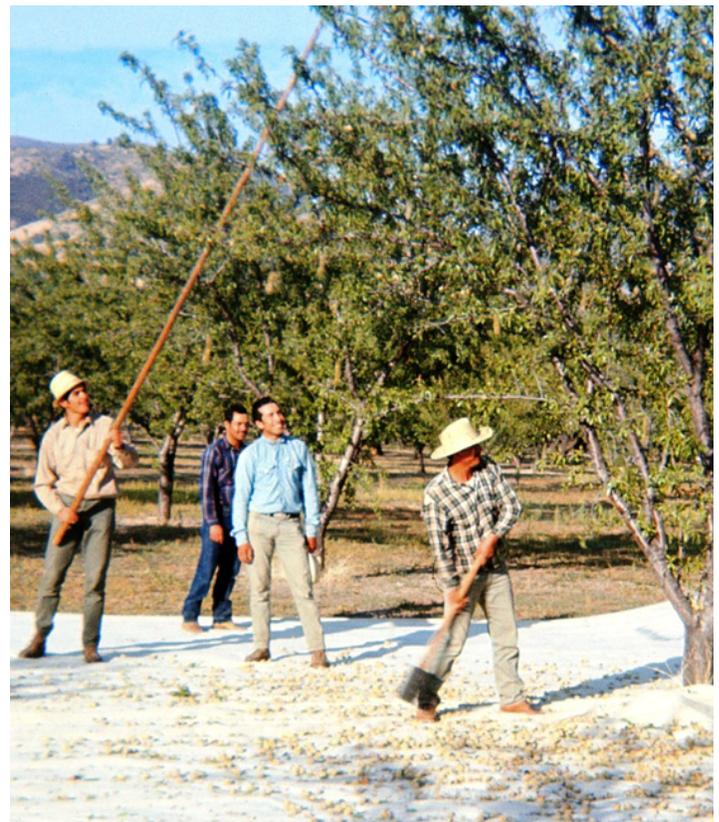


Photo: John Bruhn.

Harvesting almonds.

Chestnuts

Gather the fallen chestnuts at least every other day as they drop. The *bur* (hull) of a mature nut will usually split open and drop with the nut.

Gather only those nuts with split burs, since those with burs intact are usually blanks. A tarp spread beneath the tree makes nuts easier to pick up, and thick leather gloves make the spiny burs easier to handle. Strike nuts with split burs with a clean mallet to pop out the nuts inside.



Photo: Paul Vossen.

Chestnuts ready for harvest.

Pecans

Hand harvesting the nuts from the upper portions of a tall, mature pecan tree is difficult. To make harvesting easier, prune every year to keep the tree small. Knock nuts from the tree with a long, stout



Photo: Michelle D. Danyluk.

Pecans in the hull.

pole. Use a pole with a hook at one end to shake branches. Place a clean tarp or sheet of plastic under the tree to avoid contact between the nuts and the ground. Pick the nuts as soon as possible after harvest. Leaving nuts on the ground for very long invites damage from ants, birds, and molds.

Pistachios

Harvest pistachios by using a stout pole to knock the nuts from the branches onto a tarp spread beneath the tree. Because the nuts have split shells and hulls at harvest, they are very susceptible to contamination. Do not allow the nuts to come into direct contact with the ground.



Photo: Diane Nelson.

Pistachios.

Walnuts

Knock the walnuts from the tree by striking the branches and small shoots with a long, stout pole. For smaller trees, you will only need a pole; for larger trees, use a long pole with a large hook affixed to the end to enhance shaking (see fig. 1). The hook should be large enough to go over a branch up to 3 inches (7.6 cm) in diameter. Use the hook to shake nuts loose. Place a clean tarp or sheet of plastic under the tree to prevent the nuts from touching the ground. Pick the walnuts up immediately after harvest. Nuts that lie on the ground are very susceptible to mold infections, darkened kernels, and ant invasion.

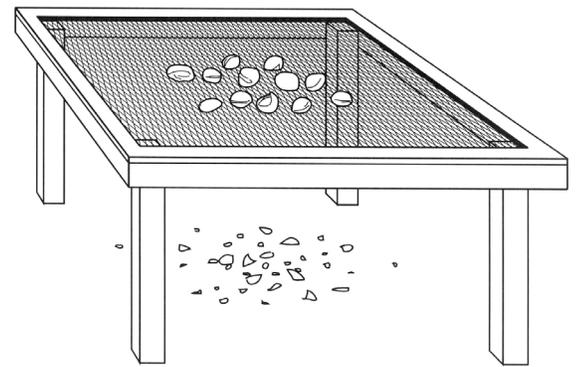


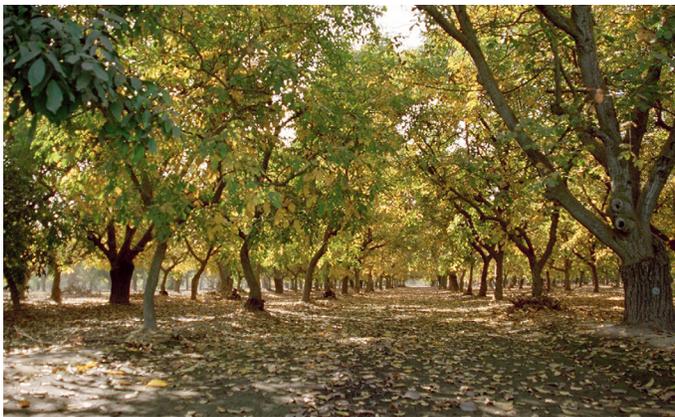
Figure 2. A table fitted with an expanded metal top can be used for hulling pecans, pistachios, and walnuts. Use smaller mesh screens to keep pecans and pistachios from falling through.

unpleasant flavor. For additional information on aflatoxin, see the USDA fact sheet available at the USDA Web site, http://www.fsis.usda.gov/fact_sheets/Molds_On_Food/index.asp. Birds, rodents, and other animals often carry *Salmonella* and other bacteria that can cause serious foodborne illness, so take care to keep them away from nuts by covering with a screen.

Almonds

Almonds harvested at the proper time usually require additional drying to prevent mold growth in storage. To dry the nuts, spread them in a thin layer on a clean tray or screen to allow good air circulation. Stir often. Birds commonly steal almonds while they are drying; cover the drying nuts with a screen or plastic netting to prevent loss and reduce contamination. If rain threatens,

Photo: Courtesy of the California Walnut Commission.



English walnut trees.

HULLING AND DRYING

Nuts have an inedible outer hull (also called a *husk*, *shuck*, or *bur*) that you must remove promptly after harvest so the nuts can dry properly. The longer the hulls remain on nuts after harvest, the more the nut quality deteriorates. After harvesting and hulling (fig. 2), you will need to adequately dry the nuts (except chestnuts) to reduce kernel moisture. If nuts are dried at too warm a temperature, the nut oils will turn rancid more quickly, reducing quality and storage life. Undried or improperly dried nuts are more likely to develop molds which produce harmful chemicals (aflatoxin) and

Photo: Courtesy of the Mariani Nut Company.



Almonds.

cover the nuts or move them to a covered patio. Check the nuts often for dryness. Remove shells from several nuts and break the kernels. Rubbery kernels indicate that additional drying is necessary. Almonds are ready for storage when their kernels are crisp to brittle when broken.

Chestnuts

Using leather gloves, remove the burs from the nuts as soon after harvest as possible; otherwise, the nuts may mold. Because chestnuts sink in water and burs float, you can use a tub of water to sort the burs from the nuts. In rare cases, nuts may not separate from the burs. Set those nuts aside for a day or two at 55° to 65°F (13° to 18°C); after that, the burs and nuts should separate from one another.



Photo: Paul Vossen.

Chestnuts ready for harvest.

Pecans

To prevent mold growth and ensure best kernel quality, hull the nuts promptly. The shucks (hulls) on many of the pecans will drop off the nuts or remain in the tree after shaking, especially if you harvest late and the shucks are dry. Shucks do adhere to some of the nuts, and you will need to hull those. A large number of *stick-tights* (nuts with tightly adhering shucks) usually indicates that the nuts are not yet fully mature and ready



Photo: Courtesy of USDA.

Pecans.

for harvest. The few green stick-tights that remain after harvest are usually blanks.

Pecans harvested at the optimum time still have considerable shell and kernel moisture, so you have to dry them before storage. Even late-harvested nuts will require some drying. To prevent shell cracking, you have to dry the nuts slowly at ambient air temperatures (75° to 85°F [24° to 29°C]). Spread the pecans in a thin layer on a plastic sheet somewhere with partial shade where air can circulate freely, such as a covered patio, and stir the nuts daily. A fan blowing air across the nuts will speed the drying process. Depending on air temperatures and the harvest date, drying will take 2 to 10 days. During the drying process you may need to cover the nuts with screen or netting to prevent loss or contamination from birds. Pecans are properly dried when the kernels are brittle and the packing tissue separates readily from the kernel.

Pistachios

Remove the hulls right after harvest. If you allow the hulls to remain on the nuts for an extended period after harvest, you will encourage shell and kernel staining and possibly mold growth. To remove the hulls easily, spread the nuts out on a table with a screen top and gently rub the nuts over the screen. Hardware cloth works well as a hulling screen: it is rigid, and the 1/2-inch (1.3 cm) mesh allows hulls, but not nuts, to fall through. You can make a smaller huller by placing the screen over the top of a 5-gallon (18.9 liter) bucket.

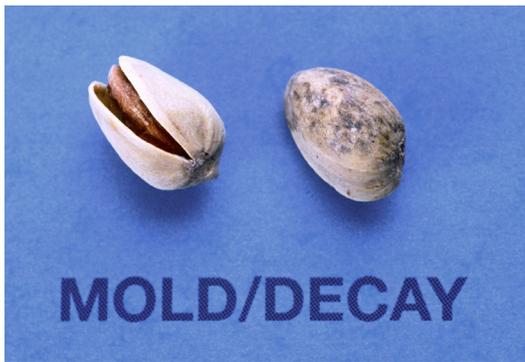


Photo: Suzanne Paisley.

Pistachios.

Blank nuts are common wherever pistachios are grown. The number of blank nuts you harvest each year depends on the pistachio variety, the climate, the root-stock, and your cultural practices. After removing the hulls, float the nuts in water to separate blank nuts (which float) from filled nuts (which sink).

You can dry pistachios in the sun on a plastic tarp somewhere with good air circulation. Spread the nuts in a shallow layer no more than two nuts deep. Under normal fall temperatures, sun-drying pistachios to the proper moisture content will take 3 to 4 days. You can also dry pistachios in a household oven at 140° to 160°F (60° to 71°C) for 10 to 14 hours. For oven drying,

spread the nuts on a pan or tray in a shallow layer and stir occasionally to promote uniform drying. Pistachios are properly dried when the kernels are crisp but not brittle.

Walnuts

Hull the walnuts as soon as possible after harvest. You can hull a small quantity of nuts by hand using a pocket knife. For larger quantities, use a table fitted with an expanded metal top (see fig. 2). Rub the nuts over the expanded metal to remove the hulls and other debris, which will then fall through, leaving the hulled in-shell nuts on top of the table. To help loosen the hulls of green stick-tights, moisten them and store them for a day or two under a wet canvas tarp. Wash the nuts after hulling; this helps prevent shell staining and removes any adhering soil before drying.

CAUTION: Walnut hulls contain chemical compounds (phenols) that stain hands and can cause skin irritation. Wear rubberized gloves when hulling walnuts.

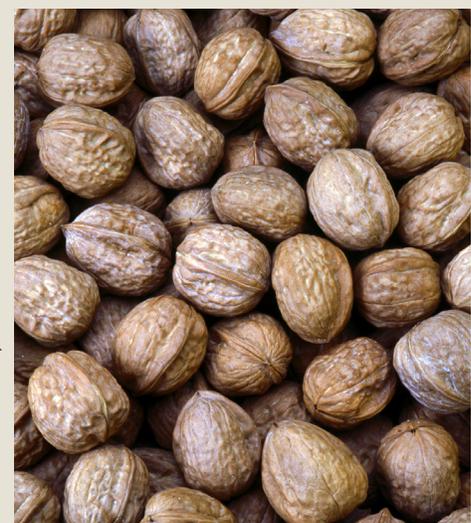


Photo: Suzanne Paisley.

Walnuts in shell.

To dry walnuts, spread the hulled in-shell nuts in a single layer on a smooth, flat, clean surface in a shady area where the air can circulate freely. Drying walnuts in the sun will darken the kernel. Stir the nuts daily. If rain threatens, cover the nuts with a tarp or move them to a covered patio. If necessary, cover the nuts with screen or plastic netting to prevent theft by scrub jays and other birds.

At normal September air temperatures, walnuts will dry adequately in 3 to 4 days. Drying will take longer as harvest progresses into the fall and temperatures turn cooler. Walnuts should not be dried in the oven because they are very sensitive to high heat. The drying temperature should be below 110°F (43°C) to prevent quality deterioration and rancidity. Walnuts are considered adequately dried when they have brittle kernels and brittle packing tissue; those with rubbery kernels require further drying. Inadequately dried walnuts are susceptible to mold and quickly become rancid.

STORAGE

The length of time you can store nuts depends on storage temperature and humidity (see table 1). Storage life is shorter at room temperature than in a refrigerator or freezer.

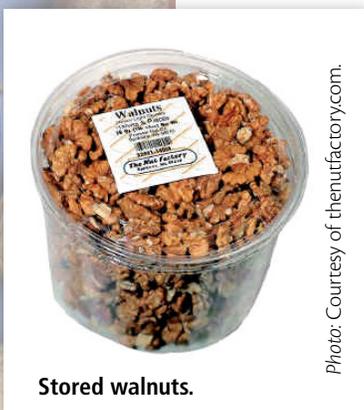
- Room temperature storage encourages insect growth (which may be important for backyard-harvested nuts) and causes nut oils to become rancid quicker. Nuts can maintain quality for up to a few months at room temperature, with shorter time in a warmer environment. Rancid nuts are not unsafe but they have a sharp flavor that most people find unpleasant.

- Nuts retain quality for a year or more at refrigerator temperature (40°F [4°C or below]), or up to 2 years in the freezer (0°F [-18°C] or below).
- Shelled nuts absorb moisture and external flavors, so they should be packed in moisture-free and odor-tight packaging such as plastic or glass containers. Storing nuts this way also reduces the risk of contamination by harmful bacteria.

If you want to store nuts obtained from a backyard orchard at room temperature, you will need to first freeze the nuts at 0°F (-18°C) for 48 hours to kill insect pests and their eggs and prevent them from destroying your harvest. Freezing the nuts is not necessary if you intend to store the nuts in the refrigerator. You can also use dry ice (frozen carbon dioxide) to destroy insect pests prior to storage. For information on how to treat almonds with dry ice, see UC Cooperative Extension Publication 7184, *Dry Ice: Easy Fumigation for Navel Orangeworm Control in Stored Almond Meats*. These treatments, however, do not destroy harmful bacteria such as *Salmonella*.

Almonds

When properly dried, in-shell almonds can be stored for 8 months at room temperature (68°F [20°C]), and for a year or more at 40°F (4°C) or below. Shelled almonds will retain quality for 1 year at 40°F (4°C) and for a year or more at 0°F (-18°C) (see table 1). Almond kernels can absorb objectionable odors in storage. Take care to store them in airtight containers away from strong-smelling materials such as onions or garlic.



Stored walnuts.

Photo: Courtesy of thenutfactory.com.

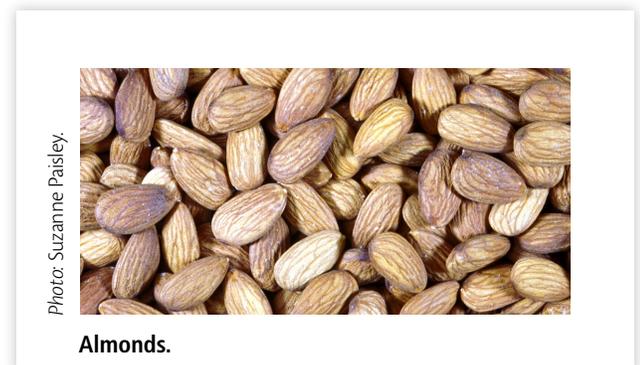


Photo: Suzanne Paisley.

Almonds.

Chestnuts

The chestnut is a perishable, high-starch, low-fat food more like a potato or apple than a tree nut. You have to handle chestnuts very carefully to avoid cracking or scratching the shell, and you must store them properly to prevent mold. They will roast properly and taste fresh if you store

them at 40°F (4°C) and at least 90 percent relative humidity, starting within 1 or 2 days of harvest. Maintain proper moisture conditions by storing in-shell nuts in a plastic bag or closed plastic container in a refrigerator. You can store in-shell chestnuts for 1 month at 40°F (4°C) or for a year or more at 0°F (-18°C) (see table 1).

You can store shelled, dried chestnuts for a year or more in the refrigerator at 40°F (4°C) or colder or in the freezer at 0°F (-18°C). Dried chestnuts will store longer, but they lose both flavor and texture and will not roast properly. To rehydrate dried chestnuts, soak them in cold water for 3 or 4 hours before use. Chestnuts lose moisture quickly at room temperature and humidity, causing the kernels to dry and harden. If stored at temperatures above 50°F (10°C), chestnuts usually mold within 2 weeks.



Photo: Ashley and Aron Muir Bruhn.

Chopped chestnuts ready for dressing.

Photo: Steve Hurst, USDA-NRCS PLANTS Database.



Chestnuts.

Pecans

Pecans are semiperishable: unless you store them properly, mold, storage insects, poor flavor, and kernel discoloration will render them inedible. You can store in-shell pecans for 1 year at 40°F (4°C) and for 2 years or more at 0°F (-18°C). Shelled pecans will store for 1 year at 40°F (4°C) and for 2 years or more at 0°F (-18°C) (see table 1).

Pistachios

Store pistachios in the shell. Pack the nuts in sturdy containers with tight-fitting lids to prevent insect infestation. In-shell pistachios can be stored for 1 year in the refrigerator at 40°F (4°C) or colder and for 3 years in the freezer at 0°F (-18°C). Shelled pistachios can be stored for 1 year at 40°F (4°C) or for 3 years at 0°F (-18°C) (see table 1).

Walnuts

When properly dried and stored, in-shell walnuts will retain their quality and flavor for 1 year at 40°F (4°C), and for 2 years or more at 0°F (-18°C). Shelled walnuts will store well for a year or more at 40°F (4°C) and for 2 years or more at 0°F (-18°C) (see table 1).

Photo: Courtesy of the California Walnut Commission.



Spinach lasagna with walnut pesto.

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FOR MORE INFORMATION

You will find detailed information on all aspects of walnut, almond, and pistachio production and pest management in these UC ANR publications:

Walnut Production Manual, Publication 3373

Integrated Pest Management for Walnuts, Publication 3270

Almond Production Manual, Publication 3364

Integrated Pest Management for Almonds, Publication 3308

Pistachio Production, Publication 2279

Insect and Mite Pests of Pistachios in California, Publication 21452

*Key Points of Control and Management for Microbial Food Safety:
Edible Landscape Plants and Home Garden Produce*, Publication 8101

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