

From Orchard to Table: Apples!



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Do you have a favorite type of apple? Some people like crunchy apples, while others prefer a mealier cultivar.

In the U.S., we have more than 2,500 cultivars, and several types are available in most grocery stores. Apples are members of the rose family, and the color of their skin varies from red to green to yellow or a mixture of colors. In North Dakota and Midwestern states, many apple cultivars grow well.

You've probably heard the expression "An apple a day keeps the doctor away." Research continues to show that the fiber and natural antioxidants and other phytochemicals (plant chemicals) in apples may help prevent chronic diseases. Enjoy your favorite apple and learn more about apples in this guide.

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Apple Tree Cultivars for Planting in North Dakota

The key to growing apple trees is selecting cultivars that are well-adapted to the state's continental climate and soils (1). Many popular cultivars that you see in the grocery store, such as 'Gala,' 'Fuji' and 'Golden Delicious,' simply are not hardy enough for North Dakota. Fortunately, many tasty but lesser-known cultivars thrive throughout the state.

When selecting apple trees for your yard, pay close attention to the plant hardiness zone on the nursery tag. This refers to the U.S. Department of Agriculture (USDA) plant hardiness zone map, which depicts planting zones based on the 30-year average of the state's coldest winter temperatures (Figure 1).

Residents in southern North Dakota can protect their investment by selecting an apple tree cultivar with a plant hardiness zone of 4 or lower, while northern residents should select zone 3 hardy cultivars or lower.

The USDA plant hardiness zone map boundaries lack precision. Residents living near the zone boundary line should err on the side of caution and select the hardier (lower) zone. Table 1 lists cultivars that commonly are available in the state by hardiness zone.

One apple tree by itself will not produce fruit. Apple flowers require pollen from a different cultivar. Cross-pollination is achieved when a honeybee or native bee carries pollen from a different apple cultivar and deposits it on the flower of the first apple cultivar.

For example, 'Honeycrisp' pollen can pollinate a 'Sweet Sixteen' tree but not a second 'Honeycrisp' tree. Therefore, horticulturists recommend that you plant two different cultivars of apple trees within 100 feet of each other. Alternatively, a flowering crabapple can supply the necessary pollen for cross-pollination if flowering times overlap.

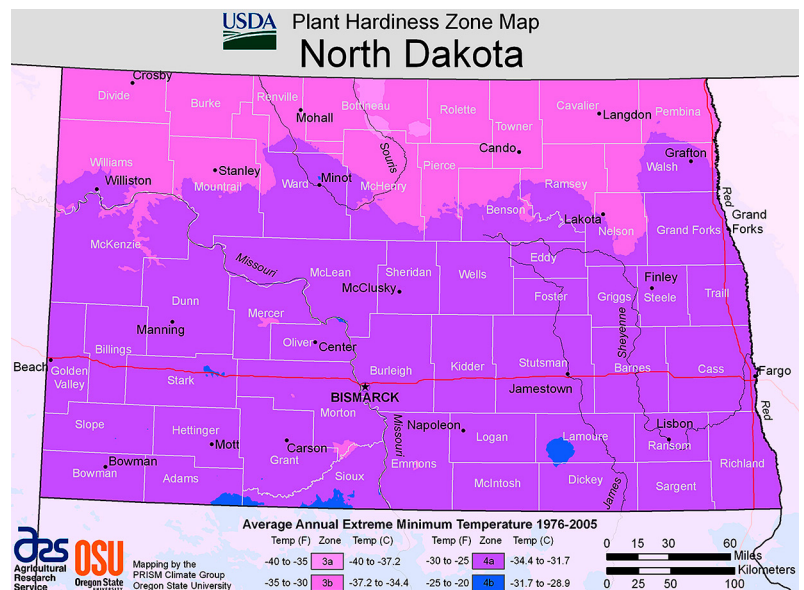


Figure 1. USDA Plant Hardiness Zone Map for North Dakota.

Elevation is another important factor to consider. Apple trees are particularly susceptible to flooding and must not be planted in low spots or in areas where the water table brings salts to the soil surface. Low spots also are more vulnerable to early spring frosts that may kill apple blossoms.

A soil test is advisable to determine the soil pH, soluble salts and the level of nutrients. Apple trees that are planted in high-pH soils (greater than 7.5) may develop micronutrient deficiencies. While abundant in North Dakota soils, iron and manganese become tied up in the soil and unavailable for plant uptake in high-pH soils. Apple trees can be grown in soils with a pH slightly exceeding 7.5, but the trees will require more monitoring and maintenance.

When planting apple trees, the rule of thumb is to space them a distance that is equal to the maximum height of the tree. Tree height will be affected by the type of rootstock: standard, semidwarf and dwarf. For a more complete discussion of apple rootstocks, see the NDSU Extension publication "Tree Fruit Culture and Cultivars in North Dakota" (2).

Digging the right size hole is extremely important. Trees that are planted too deeply may languish in the environment because the roots are oxygen-deprived. The hole should be only as deep as the bottom of the root ball.

As for the width, the hole should be two times as wide as the root ball. Check for circling roots that eventually may strangle the tree. Circling roots should be cut.

When planted, the graft union should be 2 to 4 inches above the soil line. The graft union is denoted by a swelling between the rootstock and upper part of the tree. Burying the graft union may negate the beneficial characteristics of the rootstock.

Tree Planting and Culture

Careful site selection before planting is very important. On farms and in open areas, new apple trees benefit from the protection of shelter belts and buildings. However, apple trees must be planted far enough away from other structures to ensure full sun exposure. Apple trees will fail to bear fruit if heavily shaded.

Backfill the hole with the original soil and tamp it down. Thorough watering will help remove the air pockets. Remember to water regularly for the first year or two to help the tree become established.

Stake the tree for the first few years and surround the tree with wood mulch. Mulching reduces the competition between the new tree and the lawn. In addition, mulching helps retain moisture and reduces the chance of mower or weed whip injury.

Depending on the cultivar and the rootstock, your new apple trees may take two to six years to bear fruit.

For pruning and maintenance tips, see the NDSU Extension publication “Tree Fruit Culture and Cultivars in North Dakota” (2).

Apples and Health

Many researchers have focused their attention on potential health benefits associated with apples. Apples may help with weight maintenance or loss and blood glucose control, and may reduce the risk for heart disease, cancer or some behaviors associated with Alzheimer’s disease. These short summaries of the research provide evidence of the role of apples in promoting health, but more research is needed.

Along with several vitamins and minerals, apples provide pectin, a soluble fiber that may help reduce or maintain blood cholesterol levels. Apples also provide health-promoting antioxidant compounds, especially in the peeling. When apples are processed into juice, many of the health-promoting phytochemicals decrease; therefore, nutritionists advise eating more whole fruit than juice. (3) (4)

Weight Loss and Diabetes Management

Researchers studied the influence of eating three apples or pears per day or an oat cookie with added

fruit fiber. Forty women ages 30 to 50 (all overweight, all with high blood cholesterol) participated in the study for six weeks and 35 women participated for 12 weeks.

All of the women were provided with diet instructions to encourage a 2.2-pound (1 kilogram) weight loss per month. The researchers reported that weight decreased and blood glucose decreased significantly among the women who ate fruit but not among those who ate the oat cookies. (5)

Heart Disease and Stroke

Researchers analyzed the diets of 34,489 women between the ages of 55 and 69 recruited from the Iowa Women’s Health Study. Amounts of flavonoids in foods were analyzed using the U.S. Department of Agriculture database because flavonoids are believed to have anti-inflammatory properties. The researchers reported that consumption of apples, pears and several other plant-based foods was associated with a reduced risk of coronary heart disease and total cardiovascular disease mortality. (6)

Apple intake was linked with a reduced risk of cerebrovascular disease/strokes, but the researchers did not link the amount of quercetin (a naturally occurring flavonoid phytochemical) in apples to the protective effect. They noted that other compounds in apples may be linked to the protective effect. (7)

Cancer

Several researchers have conducted studies to determine if apple extracts can reduce the risk of cancer. The results have been promising.

For example, a group of researchers studied the capacity of apple extract to reduce breast cancer using rats as an animal model. The dosage of apple extract was equal to one, three or six apples per day. They found that the number of tumors decreased with an increasing amount of the extract. (8)



Nutrition

On average, one medium apple with skin (3 inches in diameter) is a good source of fiber, vitamins and minerals for less than 100 calories. Apples are naturally cholesterol-free and low in fat and sodium. Be sure to eat the peel because it is a good source of fiber and disease-fighting natural antioxidants.

95 calories	11 mg calcium
0.6 grams (g) fat	0.22 mg iron
0.5 g protein	195 mg potassium
25 g carbohydrate	8 mg vitamin C
4.4 g fiber	98 International Units vitamin A
2 milligrams (mg) sodium	5 mg folate



*Source: U.S. Department of Agriculture Nutrient Database

In another animal study, quercetin was shown to reduce prostate cancer in rats. (9) Other scientists have conducted lab studies to determine whether apple extracts inhibited the growth of liver tumor cells and colon cancer cells. They reported that the extract containing the skin of the apple was more potent than the extract with only the flesh. (10)

Another research group reported that quercetin in apples and onions may protect against certain forms of lung cancer. (11) A study conducted in Finland followed 9,959 men and women for 20 years. People who ate more apples were less likely to have lung cancer, and the researchers concluded that diets high in flavonoid-rich foods (such as apples and onions) may have protective effects. (12)

Asthma and Lung Function

A research team reported beneficial effects of eating apples among pregnant women. They used a questionnaire mailed to the participants at 32 weeks of gestation. When the researchers followed up with the women five years later, they noted a reduced risk of asthma/allergy symptoms among the children whose mothers consumed more apples while pregnant. (13)

Antioxidant-rich foods may help protect lungs from environmental stresses, including ozone and cigarette smoke. In a study of 2,512 Welshmen ages 45 to 59, consuming five or more apples per week was associated with maintaining lung function. (14) In another study, adults ages 20 to 44 who consumed more apples and pears had fewer asthma incidents, compared with adults consuming dietary supplements. (15)

Alzheimer's Disease

Researchers studied 21 nursing home residents with moderate to severe Alzheimer's disease. Two (4-ounce) glasses of apple juice were added to their daily diet while maintaining their regular diet, vitamins and medications. Although no changes were reported by caregivers on the Dementia Rating Scale or other rating systems, a 27 percent improvement was noted in the behavioral and psychotic symptoms on the Neuropsychiatric Inventory, especially related to anxiety, agitation and delusion. (16)



**Although having
a bowl of apples may
welcome guests, be
aware that storing apples
at room temperature
will shorten their
usable life.**

Selecting and Storing Apples



Apple Selection

Look for fruits with shiny, smooth skin and the characteristic color of the variety. Avoid selecting bruised or punctured apples. Treat apples gently to avoid bruising them.

For longest storage, keep apples in a plastic bag in a refrigerator away from strong-smelling foods because apples may absorb the flavors of other foods. Apples give off ethylene gas, which may cause browning of other produce; the plastic bag helps prevent this issue.

Apples are high in water content, so they may shrivel if they are kept in low-humidity areas. Remove any decayed apples from the storage container because the decayed fruit may speed the decay of other apples.

Table 1 shows several characteristics of apple cultivars. Many apple cultivars can be used in a variety of ways in your recipes, so try several kinds of apples.

What Kind of Apples Do Consumers Prefer?

NDSU Extension food and nutrition and horticulture programs conducted an online survey to determine apple preferences among consumers, with 686 responses (88 percent female) from 39 states. Most respondents (64 percent) were home gardeners.

The participants rated several attributes of apples on a 9-point scale (1=least important; 9 =most important). Flavor (8.33), crispness (7.96) and firmness (7.92) were rated as the most important attributes used to select apples, followed by variety (6.62), price (5.84), color (5.63) and size (5.61).

Half red, half green apples were the most popular type of apple among 63 percent of the respondents, followed by bright red (28 percent). When rating their preference for sweetness (1=sweet; 9=sour), the respondents indicated an average sweetness preference of 3.94. The respondents also indicated a preference for crisp apples; the average score was 8.36 on a 9-point scale (1=mushy; 9=crisp).

Table 1. Apple Cultivar Characteristics and Culinary Use.

Cultivar	Harvest Season	Hardiness Zone	Apple Appearance	Flavor	Culinary Use	Storage Life
State Fair	Mid- to late August	3	Red-striped	Juicy, crisp, pleasing acid taste	Fresh use and cooking	1 month
KinderKrisp	Late August to early September	4	Red-striped, small fruit	Crisp, sweet, juicy	Fresh eating	'Honeycrisp' is a parent; storage life expected to be good
Zestar!®	Late August to early September	3/4*	Yellow background with red blush	Sweet, zesty, juicy, crisp	Fresh eating and cooking	6-8 weeks
Hazen	Early September	3	Dark red	Mild "apple-y"	Fresh eating and cooking	1 month
Duchess	Early September	3	Red-striped	Tart	Pie, sauce, jelly	6 weeks
Prairie Magic®	Mid-September	3	Yellow background with pink blush	Sweet, crisp	Fresh eating and cooking	Short storage life 1-2 months
Wolf River	Mid-September	4	Pale yellow with red stripes; extremely large apple	Sweet, sharp	Fresh eating, cooking, drying	Short storage life 1-2 months
Goodland	Mid- to late September	3	Yellow background with pink blush	Crisp and aromatic	Fresh eating and pie	Short storage life 1 month
Red Baron	Late September	3	Red and yellow	Juicy, crisp, pleasantly tart	Fresh eating	2 months
Sweet Sixteen	Late September	3	Red-striped	Sweet, crisp, uniquely cherry flavored, aromatic	Fresh eating and desserts	2 months
Honeycrisp	Late September	3/4*	Yellow and red	Sweet, balanced, crisp	Fresh eating and cooking, salads and fruit trays	7-10 months
Haralred	Late September to early October	3	Deep red	Tart, juicy, crisp	Fresh eating and cooking	3-5 months
Haralson	Early October	3	Red-striped	Pleasantly tart	Fresh eating and cooking Good pie apple	3-5 months
SnowSweet®	Early October	4	Yellow background with red blush	Sweet, slightly tart	Ideal for snacks, fruit salads, fruit trays, baking	2 months
Wodarz	Early October	3	Yellow background with pink blush	Very sweet	Eating and baking	3 months
Frostbite™	Early to mid-October	3	Small, dark, red fruit	Intense and sugary	Apple cider, eating, dried chips	3-4 months

*Those marked with an asterisk are only marginally hardy in USDA plant hardiness zone 3.

Preserving Apples

Apples can be frozen, dried or canned to make relishes, sauce or pie filling.

Freezing

Apples freeze well, but they require some preparation to prevent browning. Apples can be packed with or without sugar or syrup.

Apple slices – Select firm, crisp, full-flavored apples. Wash, peel and core. Slice medium apples into twelfths, large sizes into sixteenths. Pack in one of the following ways:

Syrup pack: Use 40 percent syrup. For a better-quality frozen product, add ½ teaspoon crystalline ascorbic acid to each quart of syrup. Slice apples directly into cold syrup in container, starting with ½ cup syrup to a pint container. Press fruit down in containers and add enough syrup to cover. Leave head space. Seal and freeze.

Sugar pack: To prevent darkening of apples during preparation, dissolve ½ teaspoon ascorbic acid in 3 tablespoons water. Sprinkle over the fruit. To retard darkening, place slices in a single layer in steamer; steam 1½ to two minutes, depending on thickness of the slice. Cool in cold water; drain. Over each

quart (1¼ pounds) of apple slices, sprinkle evenly ½ cup sugar and stir. Pack apples into containers and press fruit down. Leave head space. Seal and freeze.

Unsweetened pack: Follow directions for sugar pack, omitting sugar.

For pies – Follow directions for sugar pack, omitting sugar. Arrange steamed slices in a pie plate as for a pie. Put the filled plate into a plastic bag and freeze. The solid chunk of slices may be removed from the plate when frozen. Wrap it tightly and return to the freezer. At pie-making time, lay the pie-shaped chunk of slices in your pastry. Add the sugar and spices; top with a crust and bake.

Applesauce – Select full-flavored apples. Wash apples, peel if desired, core and slice. To each quart of apple slices, add a cup of water; cook until tender. Puree and add ½ cup sugar, if desired, for each quart of hot puree, stirring until dissolved. Cool and package in freezer containers or bags. Seal and freeze. For easy stacking, freeze the bags of applesauce on a tray.

Canning Apples

See the NDSU Extension publication “[Home Canning Fruit and Fruit Products](#)” (FN174) to learn how to can apple juice, applesauce and sliced apples.

See the NDSU Extension publication “[Let’s Preserve Fruit Pie Fillings](#)” (FN434) to learn how to make fruit pie fillings.

Visit www.ag.ndsu.edu/food and type the title and number in the search box.

Drying

Apples are rated “excellent” for preservation through drying/dehydration.

To dry apples, select mature, firm apples. Wash well. Pare and core. Cut in rings or slices ⅛ to ¼ inch thick, or cut in quarters or eighths. Prepare an anti-darkening solution (ascorbic acid or other anti-darkening solution) made according to the manufacturer’s directions. Dip apples in the solution for 10 minutes. Remove from the solution and drain well. Arrange in a single layer on trays, pit side up. Dry until soft, pliable and leathery, with no moist area in the center when cut (six to 12 hours). Pack cooled dried fruits in glass jars or moisture- and vapor-proof freezer containers, boxes or bags.

See the NDSU Extension publication “[Drying Fruits](#)” (FN1587) for more information about pretreating, drying, packaging and storage. Visit www.ag.ndsu.edu/food and type the title and number in the search box.

Using Apples

Apples can be eaten fresh, baked, cooked, dried and frozen. Pick up any cookbook and you probably will find a salad, snack or dessert featuring apples.

Be sure to rinse apples in cool, running water before eating them, and keep in mind these food safety tips:

- **Clean** - Be sure to wash your hands for at least 20 seconds in warm, soapy water before handling food. Use clean knives, cutting boards and other equipment.
- **Separate** - Keep fresh fruit separate from raw meats and eggs.
- **Chill** - Maintain cold foods, such as cut fruit or salads, in a refrigerator that maintains food at 40 F. Keep freezers at 0 F or lower.
- **Cook** - Cook foods to safe temperatures.



Making Jams, Jellies and Relishes

Sweet spreads and relishes are tasty additions to your menus. Apples are naturally rich in pectin, and some jelly recipes do not require the addition of commercial pectin.

Search for the NDSU Extension publication “Jams and Jellies from North Dakota Fruits” (FN590) at www.ag.ndsu.edu/food for more information about extracting juice, preparing jars and lids, and processing jams and jellies.



Key to abbreviations

c. = cup
tsp. = teaspoon
Tbsp. = tablespoon
lb. = pound
qt. = quart
oz. = ounce
g = gram
mg = milligram

Harvest Time Apple Relish

8 lb. apples (crisp cooking variety such as Honeycrisp, Cameo or Pink Lady)
3 c. white vinegar (5 percent)
2½ c. sugar
2 c. water
2 tsp. ground cloves
8 pieces stick cinnamon (3 inches each)
1 Tbsp. ground allspice
4 tsp. ground ginger
¼ c. finely chopped red serrano pepper
(about 4 to 6 peppers as purchased)

Wash and rinse pint or half-pint canning jars; keep hot until ready to fill. Prepare lids and ring bands according to manufacturer's directions.

Rinse apples well, peel if desired for best quality, and core. Immerse prepared apples in a solution of 1 teaspoon ascorbic acid and 4 quarts of water to prevent browning. Coarsely shred with food processor or dice by hand and return to ascorbic acid bath as you work.

Rinse peppers and remove stem ends; trim to remove seeds, then finely chop.

Combine vinegar, sugar, water, cloves, cinnamon sticks, allspice, ginger and red pepper. Heat while stirring to dissolve sugar; bring to a boil.

Drain apples and add to hot syrup. Bring back to a boil. Boil gently five minutes, stirring occasionally, until apples are mostly translucent. Turn off heat. Remove cinnamon sticks from relish mixture and place one piece in each jar.

Fill hot jars with hot fruit and syrup, leaving ½ inch of head space, making sure fruit is completely covered with syrup. Remove air bubbles and adjust head space if needed. Wipe rims of jars with a dampened, clean paper towel. Apply and adjust prepared canning lids.

Process in a boiling-water canner according to the recommendations in Table 2. Let cool, undisturbed, 12 to 24 hours and check for seals.

Table 2. Recommended process time for Harvest Time Apple Relish in a boiling-water canner.

Style of Pack	Jar Size	0 - 1,000 ft.	1,001 - 6,000 ft.	Above 6,000 ft.
Hot	Pints or half-pints	10 min.	15 min.	20 min.

Makes seven to eight pints. Each pint has eight (¼ c.) servings. Each serving has 60 calories, 16 g carbohydrate and 2 g fiber.

Source: Developed at The University of Georgia, Athens. Released by Elizabeth L. Andress, Ph.D., Department of Foods and Nutrition, College of Family and Consumer Sciences. April 2015.



Sweet Apple Relish

4 lb. apples, peeled, cored and thinly sliced
 1¼ c. distilled white vinegar (5 percent)
 1 c. sugar
 ½ c. light corn syrup
 ⅔ c. water
 1½ tsp. whole cloves
 4 pieces stick cinnamon (1½ inches each)
 1 tsp. whole allspice

Wash apples, peel, core and thinly slice. Immerse cut apples in a solution of ½ teaspoon ascorbic acid and 2 quarts of water to prevent browning.

Combine vinegar, sugar, corn syrup, water, cloves, cinnamon and allspice; bring to a boil. Drain apples and add to syrup. Simmer three minutes, stirring occasionally.

Remove cinnamon from syrup and place one piece in each jar. Pack hot apple slices into hot jars, leaving ½ inch head space. Fill jars with boiling-hot syrup, leaving ½ inch of head space, making sure apples are completely covered. Remove air bubbles and adjust head space if needed. Wipe rims of jars with a dampened, clean paper towel; adjust two-piece metal canning lids. Process in a boiling-water canner according to the recommendations in Table 3.

Table 3. Recommended process time for Sweet Apple Relish in a boiling-water canner.

Style of Pack	Jar Size	0 - 1,000 ft.	1,001 - 6,000 ft.	Above 6,000 ft.
Hot	Pints	10 min.	15 min.	20 min.

Makes four to five pints. Each pint has eight (¼ c.) servings. Each serving has 70 calories, 18 g carbohydrate and 1 g fiber.

Source: This recipe was adapted from "So Easy to Preserve," 6th ed., 2014. Bulletin 989, Cooperative Extension Service, The University of Georgia, Athens. Revised by Elizabeth L. Andress, Ph.D., and Judy A. Harrison, Ph.D., Extension foods specialists.



Reduced-sugar Apple Butter

4 lb. apples
 1 c. apple cider
 ½ c. granulated sucralose
 1 Tbsp. ground cinnamon
 ¼ tsp. ground cloves
 ½ tsp. ground allspice

Wash and rinse half-pint or pint canning jars; keep hot until ready to fill. Prepare lids and screw bands according to manufacturer's directions.

Wash apples well and remove stems. Cut apples into quarters or eighths and remove cores. Combine unpeeled apples and cider in 8-quart saucepan. Cook slowly and stir occasionally to prevent sticking. Cook until apples are very soft (falling apart), about 35 to 40 minutes.

Position a food mill or strainer securely over a large bowl. Press cooked apples with cider through the food mill or strainer to make a pulp. Be sure to collect all the pulp that comes through the food mill or strainer; for example, scrape any pulp clinging under the food mill into the bowl.

Combine pulp with sucralose and spices in an 8-quart saucepan. Simmer over low heat, stirring frequently, approximately 45 minutes. To test for doneness, spoon a small quantity onto a clean plate; when the butter mounds on the plate without liquid separating around the edge of the butter, it is ready for processing. Another way to test for doneness is to remove a spoonful of the cooked butter on a spoon and hold it away from steam for two minutes. It is done if the butter remains mounded on the spoon.

Fill hot apple butter into clean hot jars, leaving ¼ inch of head space. Wipe jar rims with a clean, dampened paper towel and adjust two-piece metal lids and bands.

Process in a boiling-water canner according to the recommendations in Table 4. Let cool, undisturbed, 12 to 24 hours and check for seals.

Table 4. Recommended process time for Reduced-sugar Apple Butter in a boiling-water canner.

Style of Pack	Jar Size	0 - 1,000 ft.	1,001 - 6,000 ft.	Above 6,000 ft.
Hot	Pints or half-pints	15 min.	20 min.	25 min.

Additional Notes:

(1) Refrigerate any leftover apple butter after filling jars, and enjoy it freshly made.

(2) For best quality, store processed jars that have vacuum sealed in a cool, dark place (away from light). Jars that did not seal should be stored in the refrigerator. Reduced-sugar or no-sugar-added spreads often experience quality losses faster than products made with added sugars, so your best option is to make smaller batches at first until you see if you are happy with the quality through time.

Makes four to five half-pints. Each half-pint has eight (2 Tbsp.) servings. Each serving has 35 calories, 9 g carbohydrate and 1 g fiber.

Source: Developed at The University of Georgia, Athens, for the National Center for Home Food Preservation. Released by Elizabeth L. Andress, Ph.D., Department of Foods and Nutrition, College of Family and Consumer Sciences. October 2009.



Apple Chutney

- 2 qt. chopped, cored, pared tart apples (about 10 medium)

1 c. chopped onions

1 c. chopped sweet red bell peppers (about 2 medium)

2 hot red peppers, seeded and chopped

1½ lb. seedless raisins
- 4 c. brown sugar

3 Tbsp. mustard seed

2 Tbsp. ground ginger

2 Tbsp. ground allspice

2 tsp. canning salt

1 clove garlic, crushed

1 qt. white vinegar (5 percent)

Combine all ingredients; simmer until thick, about one hour and 15 minutes. As mixture thickens, stir frequently to prevent sticking.

Pour boiling-hot chutney into hot jars, leaving ½ inch of head space. Remove air bubbles and adjust head space if needed. Wipe rims of jars with a dampened, clean paper towel; adjust two-piece metal canning lids. Process in a boiling-water canner according to the recommendations in Table 5.

Table 5. Recommended process time for Apple Chutney in a boiling-water canner.

Style of Pack	Jar Size	0 - 1,000 ft.	1,001 - 6,000 ft.	Above 6,000 ft.
Hot	Pints	10 min.	15 min.	20 min.

Makes six to seven pints. Each pint has eight (¼ c.) servings. Each serving has 130 calories, 1 g protein, 33 g carbohydrate, 2 g fiber and 105 mg sodium.

Source: This recipe was adapted from "So Easy to Preserve," 5th ed., 2006. Bulletin 989, Cooperative Extension Service, The University of Georgia, Athens. Revised by Elizabeth L. Andress, Ph.D., and Judy A. Harrison, Ph.D., Extension foods specialists.



Tomato-Apple Chutney

- 3 qt. chopped tomatoes (about 6 pounds)

3 qt. chopped apples (about 5 pounds)

2 c. seedless white raisins

2 c. chopped onion

1 c. chopped green bell pepper

2 lbs. brown sugar

1 qt. white vinegar (5 percent)

4 tsp. canning salt

1 tsp. ground ginger

¼ c. whole mixed pickling spice

Wash tomatoes and remove skins. Chop tomatoes to make 3 quarts. Wash and pare apples; remove seeds and cores; chop to make 3 quarts.

Combine all ingredients except the whole spices. Place spices loosely in a clean, white cloth; tie with a string and add to tomato-apple mixture. Bring to a boil; boil gently, stirring frequently, until mixture is thickened and reduced about one-half in volume (about one hour). Remove spice bag.

Pack the boiling-hot chutney into hot pint jars, leaving ½ inch of head space. Remove air bubbles and adjust head space if needed. Wipe rims of jars with a dampened, clean paper towel; adjust two-piece metal canning lids. Process in a boiling-water canner according to the recommendations in Table 6.

Table 6. Recommended process time for Tomato-Apple Chutney in a boiling-water canner.

Style of Pack	Jar Size	0 - 1,000 ft.	1,001 - 6,000 ft.	Above 6,000 ft.
Hot	Pints	10 min.	15 min.	20 min.

Makes seven to eight pints. Each pint has eight (¼ cup) servings. Each serving has 100 calories, 1 g protein, 27 g carbohydrate, 2 g fiber and 170 mg sodium.

Source: This recipe was adapted from "So Easy to Preserve," 5th ed., 2006. Bulletin 989, Cooperative Extension Service, The University of Georgia, Athens. Revised by Elizabeth L. Andress, Ph.D., and Judy A. Harrison, Ph.D., Extension foods specialists.

Recipes

Apple Cinnamon Microwave Oatmeal

2 c. rolled oats*
4 c. low-fat milk
1/8 tsp. salt
2 unpeeled apples, chopped
1 tsp. vanilla
1 tsp. ground cinnamon

*Old-fashioned oats will provide a chewier texture, while quick oats will result in a smoother texture.

Mix together all ingredients in a large microwave-safe bowl.

Microwave on high for five to six minutes, stirring every two minutes, until oats are soft and most of the liquid has been absorbed.

Spoon into bowls and serve while hot. Top with brown sugar if desired.

Makes five servings. Each serving has 240 calories, 4.5 g fat, 11 g protein, 42 g carbohydrate, 5 g fiber and 140 mg sodium.



Apple Peanut Butter Nachos

2 medium apples
2 Tbsp. peanut butter
2 tsp. honey
1 1/2 Tbsp. semisweet dark chocolate chips
Shredded coconut (optional)

Slice apples and arrange on a serving dish or plate.

Combine peanut butter and honey in a small bowl. Place in microwave for about 10 seconds (enough so that it can drizzle). Drizzle over apples.

Top with chocolate chips.

Makes four servings. Each serving has 130 calories, 6 g fat, 2 g protein, 21 g carbohydrate, 3 g fiber and 30 mg sodium.



Apple Slaw

1/4 c. mayonnaise
1/2 tsp. lemon juice
1 Tbsp. sugar
3/4 c. whipping cream
1 c. unpared red apples, diced
1 c. unpared Golden Delicious apples, diced
1 c. celery, chopped
1/2 c. coconut
1/2 c. walnuts, chopped
1 large banana, sliced

Note: You may use 2 cups of your favorite apples. To prevent browning, prepare apples right before combining with mayonnaise and other ingredients.

Blend together dressing ingredients except whipping cream.

Whip cream until soft peaks form. Fold into mayonnaise mixture.

Wash and cut up apples and celery.

Gently combine in bowl with dressing.

Note: If salad will not be eaten right away, wait to add banana.

Makes 10 servings. Each serving has 190 calories, 17 g fat, 2 g protein, 10 g carbohydrate, 2 g fiber and 50 mg sodium.

Apple Pancakes

1 medium apple	1 egg
1 1/4 c. pancake mix (use the type that only requires adding water)	2 tsp. oil
1/2 tsp. cinnamon	1 c. low-fat milk

Lightly coat a griddle or skillet with cooking spray and heat over medium-high heat.

Peel, core and thinly slice apple into rings.

In a large mixing bowl, combine ingredients for pancake batter. Stir until ingredients are evenly moist.

For each pancake, place apple ring on griddle and pour about 1/4 cup batter over apple ring, starting in the center and covering the apple. Cook until bubbles appear. Turn and cook other side until lightly brown.

Makes six servings. Each serving has 150 calories, 4 g fat, 5 g protein, 24 g carbohydrate, 1 g fiber and 230 mg sodium.



**Special thanks to
Allie Benson and
Stacy Wang for
recipe testing and
photography.**



Apple Smiles

1 Tbsp. smooth peanut butter,
SunButter or
other nut butter
1 medium apple, cored and sliced
into eighths
1 lemon, squeezed (or bottled
lemon juice*)
20 miniature marshmallows

Rinse apples and cut as directed.

*If you will not be serving the
apples immediately, dip the apple
slices in lemon juice.

Spread peanut butter or nut
butter on one side of each apple
slice.

Place four to eight miniature
marshmallows on apple slice
(for the “teeth”), then top with
another apple slice, peanut butter
side down.

Secure with toothpick.

Makes four servings. Each serving
has 60 calories, 2 g fat, 1 g protein,
11 g carbohydrate, 2 g fiber and
20 mg sodium.



Apple Spice Hummus

2 (15-oz.) cans chickpeas, rinsed and
drained
2 medium apples, peeled and chopped
 $\frac{1}{3}$ c. freshly squeezed lemon juice
 $\frac{1}{2}$ c. creamy peanut butter
2 to 3 Tbsp. water
 $\frac{1}{2}$ tsp. salt
1 tsp. cinnamon
 $\frac{1}{4}$ tsp. nutmeg
 $\frac{1}{2}$ tsp. all spice
 $\frac{1}{4}$ tsp. cayenne pepper, optional

In a food processor bowl or blender
container, place the following
ingredients: chickpeas, chopped apple,
lemon juice, peanut butter, water, salt
and spices.

Cover and process or blend until
smooth; transfer to bowl.

Cover and refrigerate up to three days.

Serve dip with apple slices, carrot
slices and/or whole-wheat crackers.

Makes 28 servings (2 tablespoons each).
Each serving has 80 calories, 3 g fat,
3 g protein, 10 g carbohydrate, 1 g fiber and
140 mg sodium.



Warm Cinnamon Apples

5 apples
2 Tbsp. butter
2 Tbsp. brown sugar
2 tsp. cinnamon
2 tsp. lemon juice

Core and chop apples into
medium bite-sized pieces (you
do not need to peel the apples).

Melt butter in a large saucepan
over medium heat. Add
chopped apples and remaining
ingredients. When mixture boils,
stir and reduce heat to medium
low. Cook for 20 to 30 minutes,
stirring occasionally, until
desired tenderness has been
reached. Remove from heat and
serve warm.

Makes four servings. Each serving
has 200 calories, 6 g fat, 1 g protein,
39 g carbohydrate, 6 g fiber and
0 mg sodium.



Apple Sandwiches

1 medium apple
3 Tbsp. nut butter
3 Tbsp. granola

Slice the apple into half-inch rounds.

Using a knife, spoon or melon baller, remove the apple's core.
Spread $\frac{1}{2}$ tablespoon of nut butter onto each apple round.
Top with granola and enjoy.

Makes three servings. Each serving has 150 calories, 8 g fat, 5 g protein,
16 g carbohydrate, 3 g fiber and 75 mg sodium.



Apple Granita

1 c. apple cider
1 red apple, peeled, cored, chopped
1 green apple, peeled, cored, chopped
1 Tbsp. sugar

Combine all ingredients in a medium saucepan. Bring to a boil, stirring occasionally, until apples are softened, about 10 to 15 minutes. Remove from heat and let cool slightly.

Place apple mixture in a blender and blend until smooth. Pour into an 8- by 8-inch pan.

Place pan into the freezer and allow to partially freeze, pausing every 30 minutes to scrape the mixture up with a fork. Continue until it is totally frozen, about one to three hours.

To serve, scrape with a fork. If desired, top with minced green apple and candied ginger tossed with lemon juice.

Makes two servings. Each serving has 170 calories, 0 g fat, 0 g protein, 45 g carbohydrate, 4 g fiber and 15 mg sodium.

This publication was supported by the U.S. Department of Agriculture's (USDA) Agricultural Marketing Service through grant 14-SCBGP-ND-0038. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.

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Slow Cooker Applesauce

4 large apples
Juice from 1 lemon
½ tsp. cinnamon
1 Tbsp. brown sugar
¼ c. water

Peel and core apples; cut into quarters. Add apples, lemon juice, cinnamon, brown sugar and water to a slow cooker; stir. Cover and cook on low four to six hours, until apples are very tender. Mash with the back of a fork or potato masher.

Makes four servings. Each serving has 130 calories, 0 g fat, 1 g protein, 35 g carbohydrate, 6 g fiber and 0 mg sodium.



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