

Flavored Vinegars and Oils

Fact Sheet No. 9.340

Food and Nutrition Series | Preparation

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Flavored vinegars and oils add excitement to salads, marinades and sauces. They also make special gifts, provided a few simple precautions are followed. Of the two, flavored vinegars are easiest and safest to make. Because vinegar is high in acid, it does not support the growth of *Clostridium botulinum* bacteria. However, some vinegars may support the growth of *Escherichia coli* bacteria. Infused oils have the potential to support the growth of *C. botulinum* bacteria. These products may cause great harm if not made and stored properly. By following the procedures below, both types of products can be safely prepared and used.

Flavored Vinegars

Pre-Preparation

Containers. Select and prepare containers first. Use only glass jars or bottles that are free of cracks or nicks and can be sealed with a screw-band lid, cap or cork. Wash containers thoroughly, then sterilize by immersing the jars in a pan of hot water and simmering for 10 minutes. Once the jars are sterilized, remove from the simmering water and invert on a paper towel to dry. Fill while the jars are still warm.

Herb vinegars. Commercial companies that make herbal vinegars dip the herbs in antibacterial agents not readily available to consumers. As an alternative, briefly dip the fresh herbs in a sanitizing bleach solution of 1 teaspoon household bleach per 6 cups (1½ quarts) of water, rinse thoroughly under cold water, and pat dry. For best results, use only the best leaves and flowers. Discard any brown, discolored, trampled or nibbled parts of the herbs. Fresh herbs are best picked just after the morning dew has dried. Allow three to four sprigs of fresh herbs or 3 tablespoons dried herbs per pint of vinegar.

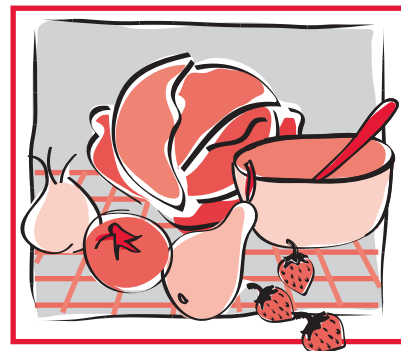
Fruit, vegetable and spice vinegars.

Fruits often used to flavor vinegars include strawberries, raspberries, pears, peaches and the peel of oranges or lemons. Allow the peel of one orange or lemon or 1 to 2 cups of fruit per pint of vinegar flavored. For variation, try fruits in combination with herbs or spices. Vegetables, such as garlic, cloves and jalapeno peppers, can also be used to add zest to vinegars. Thread these on thin bamboo skewers for easy insertion and removal. Thoroughly wash all fruits and vegetables with clean water and peel, if necessary, before use. Small fruits and vegetables may be halved or left whole; large ones may need to be sliced or cubed.

Vinegar selection. Use only high quality vinegars. Even the strongest herbs cannot diminish the sharp flavors of some vinegars. The type of vinegar to use as the base depends on what is being added. Fruits blend well with apple cider vinegar. Distilled white vinegar is best with delicate herbs and wine vinegar works well with garlic and tarragon. Do be aware, however, that wine and rice vinegars contain protein that provides an excellent medium for bacterial growth, if not stored properly.

Preparation

To make flavored vinegars, place the prepared herbs, fruits or spices in the sterilized jars, being careful to avoid over-packing the bottles. Use three to four sprigs of fresh herbs, 3 tablespoons of dried herbs or 1 to 2 cups of fruit or vegetables per pint of vinegar to be flavored. Heat vinegar to just below boiling (190F), then pour over the herbs and cap tightly. Allow to stand for three to four weeks for the flavor to develop fully. Then, strain the vinegar through a damp cheesecloth or coffee filter one or more times until the vinegar is no longer cloudy. Discard the fruit, vegetables or herbs. Pour the strained vinegar into a clean sterilized jar. Add a sprig or two of fresh herbs or berries that have been sanitized as described above.



Quick Facts

- Flavored vinegars can be safely prepared. They are best stored in the refrigerator.
- Garlic, vegetable or herb in oil mixtures may support the growth of *C. botulinum* bacteria. For safety reasons, they should be made fresh. Leftovers should be frozen, refrigerated for use within 10 days, or discarded.

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Seal tightly. Store in the refrigerator for best flavor retention.

The flavoring process can be shortened by a week or so by bruising or coarsely chopping the herbs and fruits before placing in the bottles and adding the hot vinegar. To test for flavor development, place a few drops of the flavored vinegar on some white bread and taste. When the flavor is appropriate, strain the ingredients one or more times through a damp cheesecloth or coffee filter. Pour the strained vinegar into a clean sterilized jar. Add a sprig or two of fresh herbs that have been sanitized as described above. Seal tightly.

Fresh Dill Vinegar

- 8 sprigs fresh dill
- 4 cups (1 quart) white vinegar

Wash dill and dip in solution of 1 teaspoon household bleach in 6 cups water. Rinse thoroughly under cool running water. Place dill in sterilized quart jar. Heat vinegar to just below boiling point (190 F); pour over dill. Cap tightly and allow to stand in cool, dark place for three to four weeks. Strain vinegar, discarding dill. Pour vinegar into clean sterilized bottles with tight fitting covers. Add a fresh sprig of cleaned and sanitized dill, if desired. Store in the refrigerator. Makes 1 quart.

Herbal Vinegar

- 4 cups red wine vinegar
- 8 sprigs fresh parsley
- 2 teaspoons thyme leaves
- 1 teaspoon rosemary leaves
- 1 teaspoon sage leaves

Thoroughly wash herbs and dip in solution of 1 teaspoon household bleach in 6 cups water. Rinse thoroughly under cool running water and pat dry. Place herbs in sterilized quart jar. Heat vinegar to just below boiling point (190 F); pour over herbs. Cap tightly and allow to stand in cool, dark place for three to four weeks, shaking occasionally. Strain out herbs. Pour vinegar into clean sterilized bottles with tight fitting covers. Add a fresh sprig of cleaned and sanitized parsley, if desired. Store in the refrigerator. Makes 1 quart.

Raspberry Vinegar

- 2 cups raspberries
- 2 cups white or wine vinegar

Wash 2 cups fresh raspberries in clean water. Bruise raspberries lightly and place

in sterilized quart jar. Heat vinegar to just below boiling (190 F). Pour over raspberries in jar and cap tightly. Allow to stand two to three weeks in cool, dark place. Strain vinegar, discarding fruit. Pour vinegar into a clean sterilized jar. Seal tightly and store in the refrigerator. Makes 1 quart.

Strawberry Vinegar

- 2 cups fresh strawberries
- 3 cups cider vinegar
- 1/4 cup sugar

Clean strawberries, remove stems and halve; set 1/4 cup aside. Place remaining strawberries in a large bowl. Pour vinegar over strawberries; cover and set aside for 1 hour. Transfer vinegar and strawberries to a large sauce pot. Add sugar, bring to a boil. Reduce heat and simmer, covered, for 10 minutes. Strain strawberry mixture, pressing out as much liquid as possible. Pour vinegar into a clean and sterilized quart jar. Add reserved strawberries. Cover tightly. Store in the refrigerator. Makes about 1 quart.

Storage and Use

For the best retention of flavors, store flavored vinegars in the refrigerator or a cool dark place. If properly prepared, flavored vinegars should retain good quality for two to three months in cool room storage and for six to eight months in refrigerated storage. Some people enjoy displaying pretty bottles of herb and fruit vinegars on a kitchen window sill. If left out for more than a few weeks, these bottles are best considered as decoration and not used in food preparation.

Flavored vinegars can be used in any recipe that calls for plain vinegar. They add zest to marinades for meats and fish and interesting flavors to dressings for salads, pastas and vegetables.

Flavored Oils

Safety Concerns

Infused oils and oil-based mixtures of garlic, herbs or dried tomatoes can pose a health hazard if not kept refrigerated. There have been a number of cases of botulism poisoning traced to commercially and home prepared mixtures of garlic in oil that were not refrigerated. Refrigeration is necessary because all other conditions that favor growth of *C. botulinum* are met: low acid environment with pH higher than 4.6, anaerobic conditions (oil), food

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FDA recommends that home-prepared mixtures of garlic in oil be made fresh and not left at room temperature.

Storing flavored oils in the refrigerator helps keep the oils from becoming rancid or toxic.

and moisture source (garlic), not boiled before eating.

Garlic in oil. For added safety, the Food and Drug Administration (FDA) now requires that all commercial garlic in oil products contain specific levels of microbial inhibitors or acidifying agents such as phosphoric or citric acid. Although most garlic products do contain these additives, some boutique or specialty mixes may not. Always check the label to be sure.

As for home-prepared mixtures of garlic in oil, the FDA recommends that these “be made fresh for use and not left around at room temperatures.” Refrigerate leftovers for use within 10 days, freeze or discard.

The reason for the concern is that unrefrigerated garlic in oil mixtures lacking antimicrobial agents have been shown to permit the growth of *C. botulinum* bacteria and its toxins, **without** affecting the taste or smell of the products. Toxin production has been known to occur even when a small number of *C. botulinum* spores were present in the garlic. When the spore-containing garlic is bottled and covered with oil, an oxygen-free environment is created that promotes the germination of spores and the growth of microorganisms at temperatures as low as 50 F.

Botulism is a potentially fatal food poisoning characterized by blurred or double vision, speech and breathing difficulty, and progressive paralysis. Without prompt and correct treatment, one-third of those diagnosed with botulism may die. *C. botulinum* spores are widespread in the environment but cause no harm as long as oxygen is present. Also, the toxin produced by *C. botulinum* bacteria is readily destroyed by heat. Boiling a potentially suspect mixture for 10 minutes, plus one minute for each

1,000 feet above sea level, will destroy any botulism toxin that may be present.

Vegetables and herbs in oil. Less has been documented on the dangers of storing whole chilies, fleshy vegetables or herbs in oil, but they, too, are best made fresh, with leftovers stored in the refrigerator for use within 10 days. Vegetables have a high water activity level which further encourages the growth of *C. botulinum* bacteria in an anaerobic environment. Even when dried, there is still the potential for risk, unless the vegetable has been acidified to a pH of 4.6 or lower.

Dried tomatoes in oil are less of a safety concern than other mixtures in oil because the pH of tomatoes is generally 4.6 or lower. In addition, by drying the tomatoes, conditions become even less favorable to growth of *C. botulinum* due to a decrease in water activity. Dried herbs in oil also are less of a safety concern because of their low water activity. However, to ensure safety, it is recommended that all tomato in oil and herb in oil products be stored at refrigerator temperatures.

Avoid Rancidity

In addition to reducing the potential for growth of *C. botulinum* bacteria, storing flavored oils in the refrigerator helps keep the oils from becoming rancid. A putrid “off” odor indicates the development of rancidity. All fats and oils will become rancid given enough exposure to air,

sunlight and heat. Polyunsaturated fats, like vegetable oils, are especially prone to such deterioration. Eating rancid food won't make you sick, but it may be unhealthy in the long run. Rancid fat contains chemicals called peroxides and aldehydes that can damage cells and may even encourage cholesterol to clog arteries.

It is important to note that rancidity and the presence of botulism toxins are not necessarily related. Toxins may be present without any hint of an off-odor. Likewise, an off-odor does not necessarily indicate the presence of botulism toxin. It does, however, indicate the product may have been left for long periods at room temperature, which would promote the growth of *C. botulinum*. Therefore, it's best to discard any oil-based mixtures that have become rancid so they're out of the reach of humans or animals.

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