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CANNING

Problems & Preventions

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CANNING BEST PRACTICES

- Test canner dial gauges yearly for accuracy before use.
- ALWAYS use current research-based, tested recipes.
 - USDA *Complete Guide to Home Canning*, 2015 revision
 - Ball publications, 2015 to present
 - *So Easy to Preserve*, 6th Edition, 2014
 - University of Wyoming Food Preservation publications and other Extension publications
- ALL recipes must be canned either in a boiling water canner or steam canner (high acid foods) or in a pressure canner (low acid foods).
- Do not alter proportions of ingredients in recipes other than seasonings.
- Recipes adjusted for altitude.
- After 24 hours, test to be sure the jars are sealed.
- Don't taste or use canned food that shows any sign of spoilage!



HANDLING SPOILED CANNED FOOD

Don't taste or use home-canned food that shows any sign of spoilage! Look closely at all jars before opening them. A bulging lid or leaking jar is a sign of spoilage. When you open the jar, look for other signs such as spurting liquid, an off-odor or mold.

Spoiled canned food should be discarded in a place where it will not be eaten by humans or pets. Spoiled canned food should be treated as having produced botulinum toxin and handled carefully in one of two ways:

- If the swollen metal cans or suspect glass jars are still sealed, place them in a heavy garbage bag. Close and place the bag in a regular trash container or dispose of it in a nearby landfill.
- If the suspect cans or glass jars are unsealed, open or leaking, they should be detoxified before disposal.

Spoiled low-acid vegetables (including tomatoes), meats and seafood should be detoxified to destroy any poisons that might be present before being discarded.

To detoxify canned low-acid foods that have spoiled, wear disposable rubber or heavy plastic gloves. Carefully place the suspect containers and lids on their sides in an 8-quart volume or larger stockpot, pan or boiling-water canner. Thoroughly wash your hands with gloves. Carefully add water to the pot and avoid splashing the water. The water should completely cover the containers with a minimum of one inch of water above the containers. Place a lid on the pot and heat the water to boiling. Boil 30 minutes to ensure detoxifying the food and all container components. Cool and discard the containers, their lids, and food in the trash or dispose of it in a nearby landfill.

Surfaces and equipment that come in contact with spoiled or questionable food should be cleaned with a solution of one part unscented chlorine bleach (five to six percent sodium hypochlorite) to five parts water. Wet the surface with this bleach solution and let stand 30 minutes before rinsing. Discard gloves when the cleaning process is complete.

GENERAL

Problem: Loss of liquid during processing. Never attempt to replace liquid without reprocessing.

Cause	Prevention
Starchy foods absorbed liquid.	Make sure dried beans are completely rehydrated before canning. Use the hot pack method for other starchy foods. Loosely pack starchy foods.
Food packed too tightly in jars.	When using the hot pack method, loosely pack the food. Leave the appropriate headspace.
Failure to work out air bubbles from jars before processing.	Run a nonmetallic spatula or knife between food and jar to release the trapped air.
Imperfect seal.	Wipe the sealing surface of jar clean after filling, before applying lid. Use new flat lids for each jar and make sure there are no flaws. Pretreat the lids per manufacturer's directions. Use ring bands in good condition – no rust, no dents, no bends.
Ring bands not tight enough.	With fingers, tighten ring band until resistance is met, then increase to fingertip-tight, but do not overtighten.
Jars not covered with water in boiling water canner.	Jars should be covered with one to two inches of water throughout the processing period.
Excessive boiling in boiling water canner.	Maintain boil but turn heat to a gentle boil.
Fluctuating pressure during processing in the pressure canner.	Maintain a constant temperature throughout processing time.
Lowering the pressure in canner suddenly after the processing period.	<ul style="list-style-type: none"> Do not force pressure down by placing canner in a draft, opening the vent too soon, running cold water over the canner, etc. Hurrying this process will result in under-processed food; siphoning of liquid from the jars and jar breakage may also occur. For boiling water canner, when processing time is complete, remove the lid and turn the heat off. Before removing jars, wait five minutes. For pressure canner, follow manufacturer's directions for cooling before removing canner lid. Allow pressure to drop to zero naturally; wait 10 minutes before opening after the weight is removed from canner lid.



Problem: Imperfect seal – seal fails or jar seals and then unseals. Discard food unless the trouble was detected within 24 hours.

Cause	Prevention
Chips or cracks in the jar sealing surface.	Examine the jar carefully before applying the lid by observing and gently rubbing a finger around the mouth of the jar.
Improper headspace.	Use the recommended headspace for the food product. Use a clean, damp cloth to wipe jar rim and threads before applying flat lids and ring bands.
Failure to properly prepare flat lids and/or improper adjustment of ring bands.	Follow the manufacturer's directions for lids. With fingers, tighten ring band until resistance is met, then increase to fingertip-tight, but do not overtighten.
Using bad ring bands.	Use ring bands in good condition – no rust, no dents, no bends.
Flat lid buckles or bulges upward under ring bands.	With fingers, tighten ring band until resistance is met, then increase to fingertip-tight, but do not overtighten.
Buckling during food storage is food spoilage. Heat processing was insufficient.	Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude. Food must be discarded in the proper manner.
Minimum or inadequate vacuum caused by underprocessing or not heat processing filled jars.	Do not let food for hot pack cool in the jars before processing. Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size.
Failure to adjust processing time or pressure for high altitude.	Know the altitude of your home and adjust processing time or pressure as needed.
Inverting or tilting jars after processing or lifting jars by ring bands while hot.	Use jar lifter for removing jars from canner, placing below ring band. Leave jars in an upright position.

Problem: Product darkens at top of the jar.

Cause	Prevention
Air left in the jars permits oxidation.	Run a nonmetallic spatula or knife between food and jar to release trapped air before sealing jars. Use the recommended headspace for the food product.
Insufficient amount of liquid to cover all food in jar.	Cover the product entirely with liquid. Use the recommended headspace for the food product.
Packing and processing did not expel air.	Use the hot pack method when indicated in the recipe.
Food is not heat processed after filling jars and applying lids.	Process the recommended length of time.

Problem: Undesirable color changes.

Cause	Prevention
Contact with minerals such as iron, zinc, or copper in cooking utensils or water.	Avoid these conditions by using carefully selected cooking utensils. Use soft water.
Overprocessing food product.	Follow directions for processing times and operation of canners.
Immature or overmature product.	Select fruits and vegetables at their optimum stage of maturity.
Exposure to light.	Store canned foods in a dark place.
May be a distinct spoilage.	Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude.
Natural and harmless substances in fruits and vegetables. Apples, cauliflower, peaches, pears or quinces may turn pink, red, blue or purple color.	None.

Problem: Cloudy liquid.

Cause	Prevention
Starch in vegetables.	Select products at the desirable stage of maturity. Do not use overmature vegetables. If canning potatoes, use fresh boiling water to cover and not cooking liquid from preparing hot pack. The starch will settle with time.
Minerals in water.	Use soft water.
Additives and/or anti-caking agents in salts.	Use pure refined pickling or canning salt without additives.
Crushed Vitamin C tablets were used for pretreatment.	Tablets contain fillers that do not dissolve well and may result in floating particles. Use crystalline ascorbic acid.
Spoilage.	Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude.

Problem: Sediment in jars.

Cause	Prevention
Starch in vegetables.	Select products at the desirable stage of maturity.
Minerals in water.	Use soft water.
Additives in salts.	Use pure refined salt (pickling or canning salt) without additives.
Yellow sediment in green vegetables or onions.	None – natural occurrence.
White crystals in spinach.	None – natural occurrence.
Spoilage.	Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude.

Problem: Floating.

Cause	Prevention
The fruit is lighter than sugar syrups.	Use firm, ripe fruit. Heat before packing. Use a light to medium syrup instead of heavy syrup.
Air trapped in food pieces.	Use the hot pack method.
Improper packing.	Pack fruit as tightly as possible without crushing it. Release trapped air bubbles and readjust liquid level before applying lids. Make sure liquid covers food pieces completely.

Problem: Corroded lids.

Cause	Prevention
The reaction of the acid with metal in the lid.	Following the manufacturer's instructions for preparing and using lids will reduce the possibility of corrosion. Use proper headspace.

Problem: Spoilage – discard food!

Cause	Prevention
Poor selection of fruits and vegetables or foods with high levels of spoilage bacteria.	Use high-quality food. Select product of suitable variety and at the proper stage of maturity. Process immediately after harvest, if possible.
Mold, musty odor, slimy food.	Mold growth indicates a broken seal or under-processed food. Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude.
Incorrect canning processing temperature used.	Low acid vegetables and meats must be pressure canned for safety. Most fruits and pickles can be canned in boiling water. Process jams and jellies in a boiling water canner after filling jars. Do not use the open kettle canning method.
Incorrect process time.	Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude. Do not overfill jars.
Incorrect pressure.	Dial gauges should be checked every year for accuracy. Follow directions for the operation of canners.
Imperfect seal on the jar.	Check jars and lids for defects before using them. Wipe jar rim before closing. Do not overfill jars.

Problem: Fermentation – gas or bubbles and may have an alcoholic odor.

Cause	Prevention
Yeast fermentation.	Process for the proper amount of time in the boiling water canner.
Indication of improper processing or no processing.	Avoid the open kettle method of processing.

JAMS AND JELLIES

Problem: Formation of crystals.

Cause

Excess sugar.

Undissolved sugar sticking to sides of the saucepan.

Tartrate acid is naturally present in grapes.

Mixture cooked too slowly or too long.

Prevention

Use a research-tested recipe and precisely measure ingredients.

Dissolve all sugar as jelly cooks. If necessary, wipe the side of pan free of crystals with a damp cloth before filling jars.

Extract grape juice and allow tartrate crystals to settle out by refrigerating the juice overnight. Strain the juice before making jelly.

Cook at a rapid boil. Remove from heat immediately when the gelling point is reached. Make small batches at a time; do not double research-tested recipes.

Problem: Bubbles.

Cause

Air became trapped in hot jelly.

May denote spoilage. If bubbles are moving, do not use it.

Prevention

Remove the foam from jelly or jam before filling jars. Ladle or pour jelly quickly into the jar. Do not allow the product to start gelling before the jars are filled.

Heat process filled jars using the method and time recommended in a research-tested recipe for the specific food and jar size. Adjust processing time or pressure for altitude. Follow the recommended methods for applying lids and processing to get an airtight seal. Also, see the Mold or Fermentation section.



Problem: Too soft.

Cause	Prevention
Overcooking the fruit to extract the juice.	Avoid overcooking as this lowers the gelling capacity of pectin.
Too much water used to extract the juice.	Use only the amount of water suggested in the instructions.
Incorrect proportions of sugar and juice used in the recipe.	Follow the recommended proportions.
Undercooking causing insufficient concentration of sugar.	Cook rapidly to the gelling point. Slow boiling destroys the pectin in the fruit juice.
Insufficient acid.	Lemon juice is sometimes added if the fruit is acid deficient. Avoid using overripe fruit.
Too large of a batch is made at one time.	Use only four to six cups of juice in each batch of jelly. Do not double recipes.
The product is moved too soon.	Do not move jellied products for at least 12 hours after they are made.
Insufficient time for the product to gel before using.	Some fruits take up to two weeks to set up completely; plum jelly and jellies or jams made from bottled juices may take a longer time.

Problem: Too stiff or tough.

Cause	Prevention
Overcooking. Make small batches at a time; do not double research-tested recipes.	Cook the product mixture to a temperature 8°F higher than the boiling point of water at your altitude or until it “sheets” from a spoon.
Too much pectin is in the fruit.	Use ripe fruit. If using commercial pectin, decrease the amount.
Too little sugar, which requires excessive cooking.	When pectin is not added, try $\frac{3}{4}$ cup sugar to one cup juice for most fruits.

Problem: Syneresis or “weeping” - separation of liquid from the gel.

Cause	Prevention
Excess acid in juice makes pectin unstable.	Maintain the proper acidity of the juice.
Storage place is too warm or the storage temperature fluctuated.	Store processed jars in a cool, dark and dry place. Refrigerate after opening.

Problem: Darker than normal color.

Cause	Prevention
Overcooking sugar and juice.	Avoid long boiling. Only make a small quantity of jelly and rapidly cook it.
The product was stored too long or at too high a temperature.	Store processed jars in a cool, dry, dark place and use within one year. Refrigerate after opening.

Problem: Fading color.**Cause**

Storage place too warm or too light. Stored too long.

Prevention

Store processed jars in a cool, dry, dark place. Use the oldest products first and use within one year.

Problem: Cloudiness.**Cause**

Green fruit (starch).

Imperfect straining of homemade juice.

Jelly or jam allowed to stand before it was poured into jars or poured too slowly.

Prevention

Use firm, ripe fruit or slightly underripe fruit.

Do not squeeze the juice, and let it drip through the jelly bag.

Pour into jars immediately upon reaching the gelling point. Work quickly.

Problem: Fruit floats in jam.**Cause**

Underripe fruit. Fruit not thoroughly crushed. Undercooking.

Prevention

Use ripe fruit. Uniformly crush the fruit. Cook according to instructions.

Problem: Wine-like flavor or odor.**Cause**

Inadequate heat processing or stored too long in the refrigerator.

Prevention

It is caused by yeast fermentation of the sugar to alcohol and carbon dioxide. If there is no mold on or in the jelly, it is safe to eat.

Problem: Mold or Fermentation (Denotes spoilage; do not use!)**Cause**

Yeasts and mold grow on jelly.

Imperfect sealing.

Improper storage.

Prevention

Sterilize jars when processed less than 10 minutes in boiling water. Process in a boiling water canner. Test the seal before storing jars. Opened products should be kept in the refrigerator at 40°F or lower.

Use new flat lids for each jar and make sure there are no lid flaws. Pretreat the lids per manufacturer's directions. Wipe the sealing surface of jar clean after filling, before applying lid. Use ring bands in good condition – no rust, no dents, no bends.

Store processed jars in a dark, dry, cool place. Refrigerate after opening.

PRESERVES

Problem: Not a characteristic fruit flavor.

Cause	Prevention
Overcooked or scorched.	The mixture should be frequently stirred when it begins to thicken to prevent sticking. Cook only to the gelling point.
Poor quality fruit used.	Select only sound, good flavored fruit of optimum maturity.

Problem: Shriveled product.

Cause	Prevention
The syrup is too heavy.	Follow instructions for the type of fruit being preserved.

Problem: Tough product.

Cause	Prevention
Starting the cooking of fruit in syrup that is too heavy (too much sugar).	Cook each fruit according to directions; by evaporation, the syrup concentration will gradually increase.
Not plumping fruit properly.	Fruit should plump at least 24 hours covered in syrup before canned.
Overcooking.	Cook according to directions.

Problem: Sticky, gummy product.

Cause	Prevention
Overcooking.	Follow the recommended directions for each product. (Cook only until syrup is quite thick and fruit is fairly translucent.)

Problem: Darker than normal color.

Cause	Prevention
Cooking too large of quantities at one time.	It is usually best to cook not more than two to four pounds of prepared fruit at a time.
It was cooked too slowly.	A better color is usually produced if the product is cooked rapidly.
Overcooked.	Cook only until syrup is quite thick (gelling point) and the fruit is fairly translucent.

Problem: Loss of color.

Cause	Prevention
Improper storage.	Store processed jars in a dark, dry, cool place.

Problem: Mold or Fermentation (Denotes spoilage; do not use.)

Cause	Prevention
Imperfect sealing.	Use new flat lids for each jar and make sure there are no flaws. Pretreat the lids per manufacturer's directions. Wipe sealing surface of jar clean after filling, before applying lid. Use ring bands in good condition – no rust, no dents, no bends.
Yeast or mold growth.	Pre-sterilize jars when processed less than 10 minutes in boiling water. Process in a boiling water canner. Test seal before storing.
Improper storage.	Store processed jars in a dark, dry, cool place. Refrigerate after opening.

PICKLES AND FERMENTATIONS

Problem: Soft or slippery pickles (If spoilage is evident, do not eat!)

Cause	Prevention
Vinegar too weak.	Use vinegar of at least five percent acidity.
Insufficient amount of brine.	Keep cucumbers immersed in the brine.
Pickles not processed properly to destroy microorganisms.	Process pickles in canner after filling jars.
Moldy garlic or spices.	Always use fresh spices.
Blossom ends not removed from cucumbers.	Slice at least 1/16th inch off the blossom end of cucumbers and discard.



Problem: Strong, bitter taste.

Cause	Prevention
Spices cooked too long in vinegar, or too many spices used.	Follow directions for the amount of spices to use and the boiling time.
Vinegar too strong.	Use vinegar of the proper strength (five percent acidity).
Dry weather.	No prevention. The bitter taste is usually in the peel or skin of fruits and vegetables.
Using salt substitutes.	Potassium chloride, the ingredient in most of these, causes bitterness.

Problem: Shriveled pickles.

Cause	Prevention
Placing cucumbers in too strong brine, too heavy syrup, or too strong vinegar.	Follow a research-tested recipe. Use amounts of salt and sugar called for in a recipe, and vinegar that is five percent acidity.
Overcooking or overprocessing.	Follow a reliable recipe exactly.
Dry weather.	No prevention. Bitter taste is usually in the peel or skin of fruits and vegetables.

Problem: Dark or discolored pickles (If brass, copper, or zinc utensils and brining equipment were used, do not use pickles.)

Cause	Prevention
Minerals in hard water.	Use soft water.
Ground spices used.	Use whole spices.
Spices left in jars of pickles.	Place spices loosely in a cheesecloth bag so they can be removed before canning.
Brass, iron, copper, or zinc utensils used.	Use food-grade unchipped enamelware, glass, stainless steel or stoneware utensils.
Iodized salt used.	Use canning or pickling salt.
Green food color added.	Do not add food coloring.

Problem: Spotted, dull, or faded color.

Cause	Prevention
Excessive exposure to light.	Store processed jars in a dark, dry cool place.
Cucumbers of poor quality or over mature.	Use produce of optimum quality, and grown under proper conditions (weather, soil, etc.).
Cucumber held too long before brining.	Brine cucumbers immediately after harvesting.

Problem: White sediment in jar.**Cause**

Salt contains an anti-caking agent or other additives.

Prevention

Use canning or pickling salt.

Problem: Blue or purple garlic.**Cause**

Immature garlic. Copper in the water.

Prevention

Garlic contains anthocyanins, water-soluble pigments. With acid conditions, they may turn blue or purple.

Garlic contains sulfur compounds, which may react with copper to form copper sulfate, a blue compound.

Problem: Fermented pickles – hollow.**Cause**

Cucumbers too large for brining.

Improper fermentation.

Long lapse of time between harvest and brining.

Growth defect of cucumber.

Prevention

Use smaller cucumbers for brining.

Keep brine proper strength and the product well covered. Cure until fermentation is complete.

Fermentation process should be started within 24 hours after harvesting cucumbers.

None. During washing, hollow cucumbers usually float. Remove and use for relishes instead of fermented pickles.

Problem: Fermented pickles – scum on brine surfaces while curing.**Cause**

Wild yeasts and bacteria that feed on the acid, thus reducing the concentration if allowed to accumulate.

Prevention

Remove scum as often as needed.

SAUERKRAUT

Problem: White scum on top.

Cause

Weight on top of cabbage and liquid not sufficient to exclude air during fermentation. Does not occur often; skim off.

Prevention

Follow directions for covering with plate or plastic bag filled with brine.

Problem: Slimy kraut.

Cause

Too high temperature during fermentation. Too low salt content.

Iodized salt was used. Uneven salting. Too high curing temperature. Too warm storage conditions or stored for a long period. Cabbage not trimmed and appropriately washed.

Prevention

Keep sauerkraut between 70-75°F during fermentation. Use one cup salt for 25 pounds sauerkraut.

Follow directions for salting sauerkraut and storage.

Problem: Soft kraut.

Cause

Insufficient salt (1.7 percent or less concentration of the salt solution is too low). Too high temperature during fermentation. Uneven distribution of salt. Air pockets caused by improper packing before fermentation.

Prevention

Use correct amount of salt, mix salt into cabbage well, ferment in a cool place (75°F or less).

Problem: Pink kraut.

Cause

Yeast growth on the surface caused by too much salt, uneven distribution of salt, or if the kraut is improperly covered or weighted during fermentation. Yeast thrives on salt concentration over 2.25 percent.

Prevention

Follow directions for salting and fermenting.

Problem: Rotten kraut.

Cause

Usually on the surface where cabbage has not been covered sufficiently to exclude air during fermentation.

Prevention

Cover to exclude air. Discard.

Problem: Moldy kraut.

Cause

Usually on the surface when fermented in too warm condition and not covered tightly.

Prevention

Cover to exclude air. Ferment at a temperature less than 75°F. Discard.

FRUITS AND TOMATOES



Problem: Medicinal, sour or bitter flavor; no gas.

Cause

Generally occurs in tomatoes. Bacteria-thermophilic (optimum temperature above 113°F).

Prevention

Process properly. Use clean equipment and food. Cool food quickly and store at a cool temperature.

Problem: Floating fruit.

Cause

Packed too loosely. Fruit is lighter than syrup.

Prevention

Use hot pack. Use ripe fruit; use medium or light syrup.

Problem: Crystals in grape products.

Cause

Tartaric acid naturally present in grapes.

Prevention

Strain juice, refrigerate 24 hours. Save clear liquid for processing. Reprocessing dissolves the crystals.

MEAT, POULTRY AND FISH

Problem: Pin holes in the flesh of fish.

Cause

Fish held before canning. Fish worms.

Prevention

Inspect fish carefully. Buy fish from reliable sources. Immediately process fish.

Problem: Sulfide blackening in tuna, chicken or turkey

Cause

Black deposits formed when no oxidizing agent was present and when there was no residual air. A chemical reaction of iron and sulfur compounds at temperatures higher than 150°F. Sometimes action of metal compounds in salt or cooking utensils.

Prevention

Avoid iodized salt and iron containers for preparing meats, poultry and fish for canning.

Problem: Meat products have little broth.

Cause	Prevention
Not enough liquid used when hot-pack product was packed. Uneven temperature or pressure caused liquids to “siphon” out of the jar.	Pack according to directions for proper heat penetration in the jar. Do not overfill. Keep the pressure constant during processing in a pressure canner. Let pressure decrease gradually to zero. Then open the petcock and the canner.

Note: Raw packed meat has no liquid added, so will have little broth.

FRUIT JUICES

Problem: Fermentation or spoilage.

Cause	Prevention
Failure to process adequately.	Filled jars of juices should be processed in a boiling water canner long enough to destroy spoilage organisms.
Imperfect seal.	Use recommended canning methods and processing times. Use new flat lids for each jar and make sure there are no flaws. Pretreat the lids per manufacturer’s directions. Use ring bands in good condition – no rust, no dents, no bends. Wipe sealing surface of jar clean after filling, before applying lid. Filled jars should be processed in a boiling water canner long enough so a vacuum seal will form after cooling the jars.
Air left in jars.	Proper application of two-piece canning lids and boiling water processing will exclude air from jars before the lid seals.

Problem: Cloudy sediment in the bottom of the jar.

Cause	Prevention
Solids in juice settle.	Minimize by straining juice before canning. Canned juice may be strained and made into jelly. Shake juices if used as a beverage.

See spoilage, above.

Problem: Separation of tomato juice.

Cause	Prevention
Enzymatic action after cutting of raw tomatoes.	Heat tomatoes quickly to simmering temperature immediately after they are cut.

Note: To prevent juice from separating, quickly cut about one pound of fruit into quarters and put directly into saucepan. Heat immediately to boiling while crushing. Continue to slowly add and crush freshly cut tomato quarters to the boiling mixture. Make sure the mixture boils constantly and vigorously while you add the remaining tomatoes.

Problem: Poor flavor.

Cause	Prevention
Immature, overripe or inferior fruit used.	Use only good quality, firm, ripe fruit or tomatoes for making juice.
Use of too much water for extracting fruit juice.	Use only amount of water called for in directions. No water is added to tomatoes.
Improper storage.	Stores jars in cool, dark and dry storage area.

VEGETABLES

Problem: Black beets.

Cause	Prevention
Bacteria—mesophilic (optimum temperature 68-113°F) or the presence of high iron in the water.	Proper processing. Avoid using iron utensils or chipped enamel utensils. Avoid using water high in iron. Food is safe if the color change is due to iron.

Problem: Light-colored or white beets

Cause	Prevention
Loss of pigment with processing and storage. May be variety not suitable for canning.	Avoid over-mature beets; use beets shortly after picking; use varieties known to be satisfactory for canning.

Problem: Brown corn.

Cause	Prevention
Chemical change occurring in corn due to over maturity, variety, or excess temperature. Copper or iron in pan or water.	Use corn of proper maturity and variety. Cover corn with liquid before capping jar. Maintain constant pressure in canning. Super sweet varieties of corn may turn brown when canned.

Problem: Olive green color in green vegetables.

Cause	Prevention
Breakdown of chlorophyll with heat and acid.	Some avoidance by hot pack—drives some acid off before canning.

Problem: Green vegetables turn brown.

Cause	Prevention
Overcooking. Vegetables too mature.	Process properly, use properly mature vegetables.

Problem: Yellow crystals in asparagus called rutin.

Cause

When heated, crystals dissolve into canning liquid; when cooled, crystals precipitate out.

Prevention

None—generally, crystals dissolve with heating.

Problem: White crystals on canned spinach.

Cause

Calcium oxalate precipitate.

Prevention

None.



REFERENCES

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