



# For Safety's Sake . . .

## Pickle and Pickle Product Problems

Making homemade pickles is a time-consuming and expensive operation. There are a variety of steps along the road from cucumbers to sweet gherkins, so there are a number of places where the process can break down. Pickle problems usually can be traced to the method by which the pickles, brine, or syrup is prepared:

- ✓ Weather and growing conditions, which affect the quality of your vegetables
- ✓ Kind of salt used (canning or pickling vs. iodized table salt)
- ✓ Vinegar (5 percent acetic acid, or 50 gram)
- ✓ Temperature during fermentation
- ✓ Pickling method (fermented, quick-pack)
- ✓ Time between gathering and pickling the vegetables

### PROBLEMS

• *White scum appears during fermentation.*

*Answer:* Safe—the scum is a layer of yeast and/or mold but is not harmful.

*Possible reasons*

- Vegetables are not submerged in brine.
- Pickling container is not sealed.

• *Pickles or sauerkraut is soft or slippery.*

*Answer:* Unsafe—slime-producing microorganisms are present.

*Possible reasons*

- Brine is too weak (less than 10 to 12 percent salt), allowing growth of organisms that cause texture softening and sliminess.
- Vinegar is too weak (less than 5 percent acetic acid), allowing growth of organisms that cause texture softening and sliminess.
- Temperature was too high during brining (over 75°F).
- Too little brine—all cucumbers must be immersed.
- Salt was unevenly distributed on cabbage.
- Sauerkraut was improperly packed, leaving air pockets that allowed undesirable microorganisms to grow.
- Scum was not removed daily from surface of brine.
- The cucumber blossom was not removed—enzymes from the blossom cause softening.

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• **Pickles are hollow.**

*Answer:* Safe

*Possible reasons*

- Improper curing: weak brine, pickles uncovered during curing, curing stopped short of full fermentation.
- Too much time elapsed between gathering and brining (more than 24 hours).
- Temperature was above 75°F during fermentation.

• **Pickles shriveled.**

*Answer:* Safe—problem was caused by excessive loss of water from the cucumbers.

*Possible reasons*

- Curing brine was too strong (more than 12 percent salt, vinegar more than 6 percent acetic acid).
- Too much time elapsed between gathering and brining (more than 24 hours—cucumbers are dehydrated.)
- Pickling solution contained too much vinegar or vinegar that was too strong, or it contained too much sugar.

• **Pickles or sauerkraut is dark or discolored.**

*Answer:* Depends—color change is safe to some extent when caused by iron but not when caused by other metals. Metals such as copper, brass, and lead will leach harmful chemicals into the product.

*Possible reasons*

- Hard water was used in pickling solution—minerals in the water react with pigments in the cucumbers. Iron in the water is the worst offender.
- Brass, iron, copper, or zinc utensils were used during pickle making—they contribute metal ions that react with cucumbers to form dark pigments.
- Ground spices were used, which darken pickles.
- Whole spices were left in the pickles after packing.
- Vegetables (cabbage) were unevenly salted.
- Curing temperature was above 75°F.
- Vegetables made contact with the air—pigments oxidized.
- Cider vinegar was used with light-colored vegetables.
- Brown sugar was used with light-colored vegetables.

• **Sauerkraut turns pink.**

*Answer:* Unsafe—microorganisms are growing improperly.

*Possible reasons*

- Too much salt was used (over 2.25 percent).
- Salt was unevenly distributed.
- Kraut was improperly covered or weighted during fermentation.

• **Pickles or sauerkraut mold during fermentation.**

*Answer:* Unsafe—microorganisms are growing improperly.

*Possible reasons*

- Fermentation temperature was above 75°F.
- Too much salt was used, not allowing adequate lactic acid production.
- The cloth on top of the kraut was not kept clean during fermentation (may need to be replaced after skimming).

• **Pickles are strong or bitter tasting.**

*Answer:* Safe

*Possible reasons*

- Too much spice was used.
- Spices cooked too long in the vinegar.
- Vinegar was too strong (more than 6 percent acetic acid).
- If pickles are too acid, increase the sugar; do not decrease the acid.
- “Old,” overly mature cucumbers with tough, bitter skins were used.

• **There is white sediment in the jars.**

*Answer:* Depends—A small amount of sediment in the jars is normal. But if pickles are soft and slippery, they are unsafe to eat because of the improper growth of microorganisms.

*Possible reasons*

- Yeasts grow on the pickle surface, then settle to the bottom—they are harmless but can be prevented by water bath processing filled jars.
- Table salt was used instead of pickling salt—it contains anti-caking ingredients, which settle out.
- Poor temperature control throughout the pickle-making process.

• **Pickling liquid in the jars is cloudy.**

*Answer:* Unsafe—microorganisms are growing improperly.

*Possible reasons*

- Pickles are spoiled—discard.

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- Hard water minerals may cause clouding.
  - Table salt was used instead of pickling salt—it contains anti-caking ingredients, which cause clouding.
  - Unstrained brine (from fermentation) was used for pickling liquid, which may cause clouding.

• **Pickles or sauerkraut “spoils.”**

*Answer:* Unsafe

*Possible reasons*

- Sterilized jars were not used.
- Ingredients that had lost their strength (vinegar) were used.
- Ingredients were measured inaccurately.

• **Pickles are “dull” or “faded” in color.**

*Answer:* Safe

*Possible reasons*

- Overly ripe or yellow cucumbers were used.
- Fruits with pale color were used.

- Beet pickles were overprocessed—pigments are damaged.
- Pickles were exposed to excessive light. Use a well-ventilated, semi-lit area.

For more information about pickle making and for pickle and sauerkraut recipes, see *Making Pickles in North Carolina* on the web at

<http://www.ces.ncsu.edu/depts/foodsci/ext/pubs/497-06.pdf>

### **For Safety's Sake**

For more information on food safety, visit N.C. Cooperative Extension's Food Safety Website at <http://www.ces.ncsu.edu/depts/foodsci/agentinfo/> You also may view publications from the departments of Family and Consumer Sciences and Food Science at <http://www.ces.ncsu.edu/depts/fcs/general/resource.html> and <http://www.ces.ncsu.edu/depts/foodsci/ext/pubs/>

Prepared by

Judy Henderson, Rose Massey, Carrie Thompson, and Lillie Tunstall, Extension Agents, Family and Consumer Education  
Members of the Food Safety Agent Resource Team

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