

Good Agriculture Practices for Cucumbers

Western Kentucky University



General Information

Cucumbers, a member of the same family as pumpkins and gourds, are primarily eaten raw or pickled. A native of India, cucumbers were grown in North America as early as the 16th century by European settlers.

Cucumbers grow best during summer and cannot tolerate cold. For best flavor, cucumber harvest should occur when they are 6-8 inches long and 1-2 inches in diameter.

Foodborne Illness Outbreaks

Several large-scale foodborne illness outbreaks have been attributed to cucumbers. In 2015, an outbreak of *Salmonella* from imported cucumbers sickened 767 consumers. The outbreak caused 157 hospitalizations occurred and 4 deaths. In 2014, cucumbers contaminated with *Salmonella* caused 275 illnesses in 29 states, with 1 death.

Bacteria	Year	Food Vehicle	Location	States Affected	Illnesses	Deaths
<i>Salmonella</i>	2015	Cucumbers	US	36	767	4
<i>Listeria</i>	2014	Cucumbers	US	29	275	1
Non-O157 STEC	2013	Cucumbers	US	9	84	1

Table 1. Selected Foodborne Illness Outbreaks Attributed to Cucumbers, 2013-Present (Outbreak Database, 2015)

Harvest Considerations

Because cucumbers are pollinated by bees at differing times, multiple harvests will occur during a growing season.

A clean, sterilized knife should be used to harvest cucumbers. After cutting, cucumbers should be moved to a cool environment immediately.

Workers should wash hands regularly during the harvest. If possible, workers should also use sterile disposable gloves while handling cucumbers. Any workers who display symptoms of illness, such as fever or coughing, should be immediately removed from the cucumber production area. Additionally, any worker with open wounds, cuts, or bruises should be excluded from handling fruit.

Use of single-use containers should be avoided, if possible. Disposable container liners are preferable. If containers are reused, they should be cleaned and sanitized after each use.

Cooling and Storage Conditions:

Cucumbers are best stored at approximately 12°C (55°F) with high humidity. Cucumbers should be chilled immediately to remove all field heat, to protect flavor and shelf life. Cucumbers should not be washed before being stored. They may be stored in plastic bags or wrapped in plastic to help preserve moisture content.

Produce	Optimal Storage Temp., °C	Optimal Humidity (%)	Cooling with top ice acceptable	Cooling with water sprinkle acceptable	Ethylene Production	Ethylene Sensitivity to	Storage Life
Cucumbers	10-15	95	No	Yes	Very Low	Yes	10-14 Days

Table 2. Storage and Cooling Conditions for Cucumber (Fellow, 2000)

Good Agriculture Practices

- Cool cucumbers immediately after harvesting to remove field heat.
- If pruning of cucumber plants is necessary, green trimmings should be removed from field.
- Regularly inspect cucumber plants for signs of wildlife intrusion.
- Use a clean and sanitized knife to cut ripe cucumbers from vine.
- Ensure water used is of sufficient microbial quality level (e.g. EPA drinking water standards).
- Inspect seedlings for signs of disease before planting.

Pathogenic Behavior

Feces in a cucumber production field can easily transfer pathogens to cucumber plants and fruits, contaminating the cucumbers. Exclusion of domestic and wild animals from the field is critical to prevent transmission of pathogens. Irrigation water is another leading cause of cucumber contamination, particularly where feedlots or concentrated animal feeding operations may be in the vicinity of the cucumber field. Unsanitary conditions also contribute heavily to cucumber contamination, as human pathogens can easily be transferred from workers to fruit. All workers must observe hygienic and sanitary practices.

References

- Larson, L. (2015, September 6). Salmonella outbreak: how are cucumbers infected? Retrieved from *Food Poisoning Bulletin*: <https://foodpoisoningbulletin.com/2015/salmonella-outbreak-how-are-cucumbers-contaminated/>
- Orzolek, M., Bogash, S., Kime, L., & Harper, J. (2015). *Cucumber Production*. Retrieved from the University of Pennsylvania Extension: <http://extension.psu.edu/business/ag-alternatives/horticulture/vegetables/cucumber-production>
- Outbreak Database. (2015). Search: Cucumbers. Retrieved from <http://www.outbreakdatabase.com/search/?vehicle=cucumber>
- Parker, J., James, L., Jarvis, J., & Parks, S. (2010). *Commercial Greenhouse Cucumber Production, 2010 Edition*. Orange, Australia: NSW Department of Agriculture.
- Siegner, C. (2015, October 14). CDC Update: 4 Deaths, 767 Salmonella Cases in 36 States Linked to Cucumbers. Retrieved from *Food Safety News*: http://www.foodsafetynews.com/2015/10/14-death-more-than-300-confirmed-salmonella-cases-in-27-states-linked-to-mexican-cucumbers/#.VrvwO_lrKhc
- U.S. Department of Agriculture. (2012) *Household USDA Fact Sheet*. Retrieved from http://www.fns.usda.gov/sites/default/files/HHFS_CUCUMBERS_FRESH_Dec2012.pdf

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