

Good Agriculture Practices for Tomatoes

Western Kentucky University



General Information

- United States is world's largest tomato producer, with \$2 billion in annual receipts
- Tomatoes are produced in every state
- 25% of tomato consumption is in unprocessed form

Tomato skin should appear bright, with a strong amount of color consistent with the type of tomato. The skin of the fruit should be firm, and should not wrinkle when a finger is ran over the surface. Fruit with visible dark bruises should be avoided as they may have been mishandled. Damaged fruit will spoil quicker than undamaged fruit and potentially spread microbial contamination.

Harvest Considerations

Tomatoes which have fallen off the vine to the ground should not be harvested, and any fruit which has contacted fecal matter or appears to have been disturbed by animals should also be excluded from harvest. Additionally, fruit with visible bruising or decay should not be harvested and transported with good fruit, as microbial contamination can be spread from damaged fruit. After harvest, produce should always be stored off the floor. Whole fresh tomatoes should be stored in areas without other produce, meats, or poultry, to prevent cross-contamination. If tomatoes are refrigerated, separate storage racks should be used to keep tomatoes separate from other fresh produce which may be stored in the same area.

Foodborne Illness Outbreaks Linked to Commodity

Tomatoes are a common produce to suffer from microbial contamination, often causing foodborne illness outbreaks. Salmonella is a particularly common pathogen to contaminate tomatoes, with 15 multistate outbreaks reported 1973 and 2010; these outbreaks resulted in 2,000 sicknesses and 3 deaths. In 2005 and 2006, tomatoes from a farm in Virginia were linked to foodborne illness in 21 states.

Bacteria	Year	Food Vehicle	Location	States Affected	Illnesses	Deaths
<i>Salmonella</i>	2009	Tomatoes	Michigan	1	21	0
<i>Salmonella</i>	2008	Tomatoes	California	1	9	0
<i>Salmonella</i>	2008	Tomatoes	US	Unknown	61	0
<i>Salmonella</i>	2008	Tomatoes	Iowa	Unknown	12	0
<i>Salmonella</i>	2007	Tomatoes	Minnesota	1	23	0

Table 1. Selected Foodborne Illness Outbreaks Attributed to Tomatoes, 2007-2009 (Outbreak Database, 2015)

Cooling and Storage Conditions:

Tomatoes harvested when ripe maintain well under cool conditions, with 4° - 10°C being ideal. Tomatoes harvested before ripening (green) must be stored above 12°C to prevent injuries from chilling. Ripe tomatoes prefer high humidity in storage. Green tomatoes are sensitive to ethylene and will begin ripening if exposed; however, ripe tomatoes are not highly sensitive to ethylene.

Produce	Optimal Storage Temp., °C	Optimal Humidity (%)	Cooling with top ice acceptable	Cooling with water sprinkle acceptable	Ethylene Production	Ethylene Sensitivity to	Storage Life
Tomatoes, ripe	4-10	90-95	No	No	Medium	No	4--7 Days

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

Good Agriculture Practices (FDA, 2008)

- Remove dirt, stems, and leaves from tomatoes to the degree practicable in the field, in a manner that does not pose a risk of contamination.
- Ensure that containers used for field packing are not stored in the field unless protected from potential contamination.
- Apply extra care to cull and remove any damaged tomatoes during field packing because such packing of tomatoes generally occurs with mature ripe tomatoes.
- Prohibit the reuse of single-use containers, e.g., corrugated boxes, for the field packing of tomatoes.
- Protect containers from direct contact with the ground.

Pathogenic Behavior in Commodity

The vectors of contamination in tomatoes are still largely unknown. When washing tomatoes, it is inadvisable to use detergent or soap. Fresh fruit should be washed with clean potable water which is changed between every batch of produce, and washing water should be 10°F warmer than the temperature of the fruit being washed. Any surface which has direct contact with tomatoes should be regarded as a food contact surface, and cleaned and sanitized.

References

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