

Lesson 2 - Mango Storage, Ripening & Cutting

Objectives: After completing this lesson students will be able to:

- Explain how storage conditions influence the quality of fresh mango
- Understand how mangos ripen
- Cut a mango for the highest yield

Lesson Plan

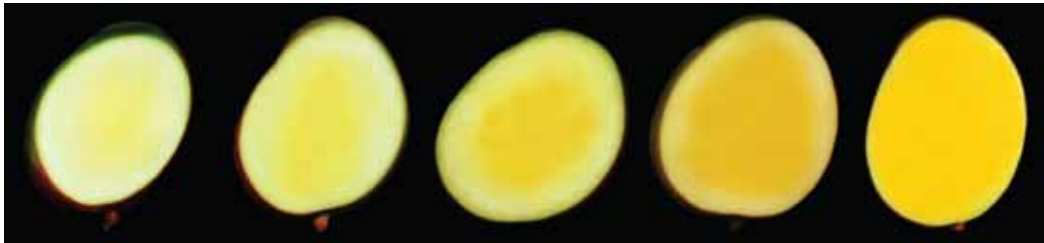
Topic	Suggested Activity	Suggested Time
Storing Fresh Mangos	Intro/Video*	10 minutes
How Mangos Ripen	Lecture/Discussion	5 minutes
Mango Yield and Cutting	Intro Review/Demo Class Activity: Hands-on cutting and clean up	5 minutes 10 minutes 30 minutes

* The *Fresh Mango – The Basics for Foodservice* video supports information found in Lessons 2 and 3 of this curriculum. (mango.org/foodservice/culinary-education)



Receiving & Storing Fresh Mangos

- Mangos are packed in 8.8-pound cartons designed for airflow and to protect the fruit.
- Labeling on mango cartons should provide the following information: mango variety name; count and net weight; source country; special treatments; and U.S. contact information.
 - The size/count of fresh mangos in each box is typically 7/8 for round varieties or 12-18 for the Ataulfo variety.
- Mangos at the desired ripeness level can be refrigerated for up to 5 days.
- Mangos produce ethylene, so be careful not to store next to ethylene sensitive products.



How Mangos Ripen

- Mangos are harvested when mature, but not yet ripe.
 - Mangos can be used in recipes from green to very ripe.
- Mangos do NOT ripen when refrigerated, like bananas.
- The ideal temperature range for mangos to ripen is 54-60° F; never below 50° F.
- Mangos ripen from the seed outward, and the following changes occur:
 - Decrease in flesh firmness and increased juiciness
 - Starch conversion into sugars
 - Increase in soluble solids content (degrees Brix)
 - Increase in aroma
 - Flesh color changes from greenish-yellow to yellow to golden-yellow
 - Skin color changes in some varieties from green to yellow or red



HOW TO JUDGE MANGO RIPENESS

- Squeeze gently. If the mango is ripe it will give a little.
- Color is NOT the best indicator of ripeness. The red blush on some mangos is usually a result of exposure to sun while on the tree.

Mango Cutting & Yield

There are several ways to cut a mango. Using the cutting technique shown here, research confirmed a high fruit yield for fresh mango. The analysis was based on 50 mangos of each variety and size, cut when the mangos were ripe.

MANGO SHAPE	VARIETY TESTED	SIZE/COUNT	% YIELD	USABLE WEIGHT
ROUND	TOMMY ATKINS	8	62.91	11.27 OZ
ROUND	TOMMY ATKINS	12	60.51	6.77 OZ
OVAL/OBLONG	ATAULFO	12	71.29	9.23 OZ

1 CUP 3/8"-DICE MANGO = 6.35 OZ

SOURCE: MATTSON FRESH MANGO YIELD STUDY 2008

SAFE HANDLING PRACTICES

- Wash mangos before cutting.
- Wear gloves to comply with food safety rules and to avoid an allergic reaction. Oil in the skin of mangos can cause an itchy rash for those who are sensitive to poison ivy and poison oak. Most people who are allergic to the oils in the skin can enjoy the fruit without a reaction.



Maximizing Mango Cutting & Yield – Demo & Cutting Exercise

Equipment Needed for Student Exercise

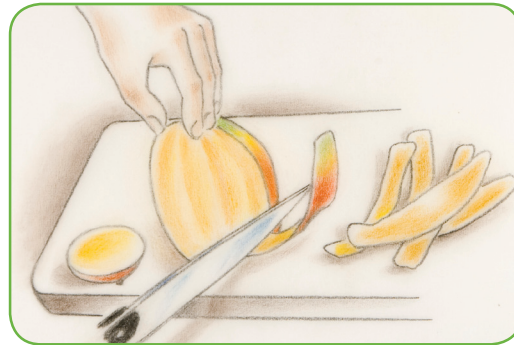
For each person:

- Cutting board
- Peeler*
- Towel
- Food scale
- Knife*
- Food-safe gloves
- 1 or 2 mangos

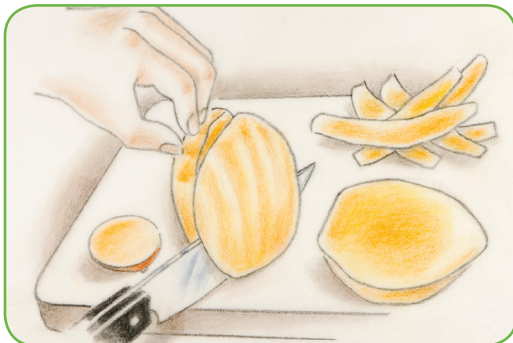
*A vegetable peeler can also be used to remove the skin.



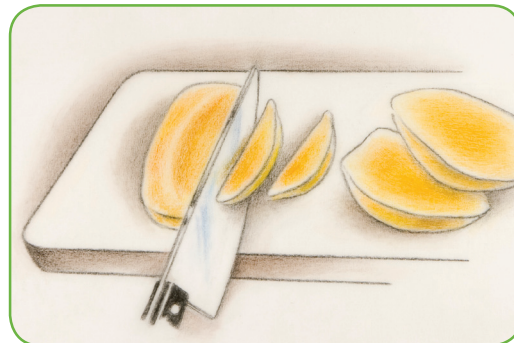
To maximize the yield, it's helpful to understand where the seed is located so you can cut around it.



Cut a thin slice off the stem end, and use the flat surface to steady the mango. Use a knife or peeler to remove the skin.



Slice the cheek away from the seed, beginning $\frac{1}{4}$ inch from the center. Follow the shape of the seed with your knife. Repeat on the other side.



Lay the seed flat, and use an angled cut to remove two wedge-shaped pieces from the sides of the seed. Repeat on the other side.

INSTRUCTOR NOTES

- Vary the ripeness levels and mango varieties, if available.
- Have students weigh the whole fruit and cut fruit to evaluate yield.
- Discuss the different cuts that can be made: cheek, slice, cube, dice, baton, julienne.
- Consider combining Lesson 2 and Lesson 3 to take advantage of cut fruit for the Spices & Ripeness Tasting Exercise in Lesson 3.
- An alternate method for cutting can be found in the Appendix.

QUIZ/REVIEW QUESTIONS

1. Mangos are harvested commercially when mature but not yet ripe.
TRUE or FALSE
2. Green mangos have no use in restaurants.
TRUE or FALSE
3. Mangos ripen _____.
 - a. under refrigeration
 - b. best at 54-60° F, like a banana
 - c. in direct sun
4. Mangos produce ethylene, so be careful not to store next to ethylene sensitive products.
TRUE or FALSE
5. Whole ripe mangos can be refrigerated up to _____.
 - a. 1 day
 - b. 5 days
 - c. 1 month
6. The best indicator of mango ripeness is the color of its skin.
TRUE or FALSE
7. What happens during the ripening of a mango?
 - a. The starch converts into sugars.
 - b. The flesh softens and becomes juicier.
 - c. The flesh color changes from greenish-yellow to golden-yellow.
 - d. The aroma becomes more pronounced.
 - e. All of the above
8. Mango yield ranges from _____, depending on variety.
 - a. 60.5 to 71.3%
 - b. 22.5 to 35.5%
9. To maximize the yield, you start by knowing how the seed is positioned in the fruit.
TRUE or FALSE
10. The largest pieces of mango flesh, found next to the flat sides of the side, are called cheeks.
TRUE or FALSE

QUIZ/REVIEW ANSWERS

1. TRUE
2. FALSE
3. b. best at 54-60° F, like a banana
4. TRUE
5. b. 5 days
6. FALSE
7. e. All of the above
8. a. 60.5 to 71.3%
9. TRUE
10. TRUE