



## Lesson 1

# Watermelon History, Cultivation & Market Insights

# Learning Objectives

After completing this lesson, you will be able to –

- Describe how watermelon is grown and harvested
- Highlight key historical watermelon events
- List reasons consumers like watermelon





# Watermelon History

- Origin traced back to deserts of southern Africa 5,000 years ago
- Ancestor of the modern watermelon was used to store water for tribes crossing the Kalahari Desert
- Egyptian hieroglyphics first recorded people eating watermelon in the 2nd millennium BC
- China began cultivating watermelon in the 10th century
- Moors brought watermelon to Europe and the Mediterranean in the 10th century
- European colonists and the slave trade brought watermelon to the Americas in the 16th century
  - Watermelon was first grown in Florida
- Made it to South America in the 17th century





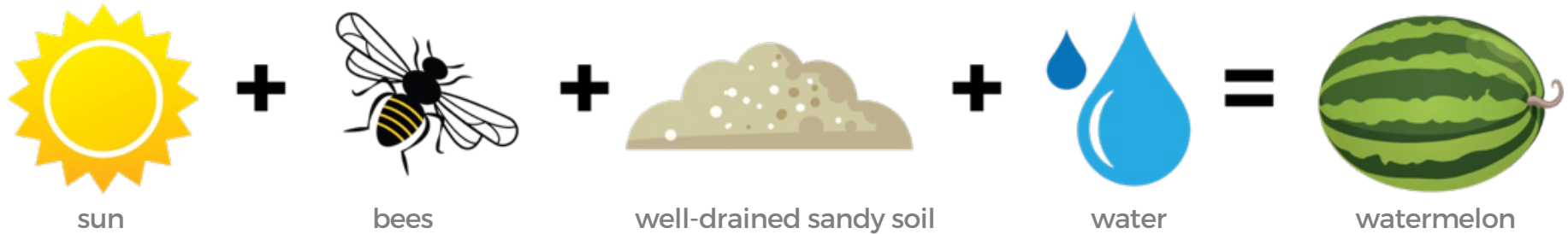
# Watermelon. Fruit or Vegetable?

- Member of Cucurbitaceae
  - Gourd family of flowering plants including squash, zucchini and cucumber
  - Annual vine-like scrambler and trailer
  - Watermelon is a pepo – a berry with a thick rind and juicy, sweet flesh
- Botanically, watermelon is a fruit
- Watermelon is grown using vegetable production practices
  - Planted from seeds
  - Tended throughout growth
  - Harvested
  - Field is cleared (like a vegetable crop)





# Watermelon Cultivation



## For Commercial Production:

- Nursery stock is transplanted into raised beds of well-drained sandy soil 4-12 inches high
- Rows are 8-12 feet apart
- Irrigation is managed throughout growth for fruit set, size and yield
- Bee colonies are placed in fields when male flowers appear
- Bees pollinate large yellow female flowers for the plant to bear fruit
- Vines spread 6-8 feet in 30 days, the first watermelon appear in 60 days and the crop is ready for harvest in 90 days





# Watermelon Harvesting & Packing

- Watermelon is harvested at full maturity – *it does not ripen after it is harvested*
- First pick is based on:
  - Specific physical characteristics for each cultivar
  - Weather conditions throughout the growing season
  - Other variables
- Some use a Brix Test to assess soluble solids
- Most fields are picked twice
- Each plant produces 2-3 harvestable fruits
- Watermelon is covered to prevent sunburn in the field





# Watermelon Harvesting & Packing

- Watermelon is harvested and packed by hand
- A sharp knife is used to cut watermelon from the vine
- Pickers check for ripeness:
  - Firm fruit with pale or buttery yellow ground spot on the bottom
  - Heavy for its size due to high water content
  - Free from bruises, cuts and dents (a few scratches are OK)
- Pitching crew follows the cutters and pitches the watermelon from hand to hand into trucks to be taken to the packing shed
- Watermelon is packed on its side to protect from damage
- During packing watermelon is:
  - Inspected for quality
  - Graded
  - Washed
  - Separated according to size
  - Packed for shipment







# Watermelon Harvesting & Packing

- Seeded and seedless use 700-pound bins for shipping and distribution to markets, wholesalers and distributors
- Use size counts of 36, 45 and 60
  - Refers to the number of watermelon – the higher the size, the smaller the watermelon
- Cartons for minis are 45-50 pounds with 6-10 watermelon
  - 6 and 8 are most common
- Foodservice option for seeded and seedless is a carton weighing 65-70 pounds with 3-6 pieces of fruit
- Labeling on bin and carton includes:
  - Type
  - Count
  - Net weight
  - Source country







## Square Watermelon

- Japanese graphic designer invented molding in 1978
- “Cubic” watermelon go for a premium in Japan
- Growers started growing watermelon in boxes
- Heart- and pyramid-shaped watermelon are also popular
- Benefits are lowered storage and transportation costs



# Watermelon Consumer Insights

- 2021 per capita consumption in the U.S. was 16 pounds
- Watermelon is the most consumed melon
- 2022 consumer research revealed:
  - Top reasons consumers buy watermelon are “it tastes good” and “they like to eat it” followed by “it’s cool/ refreshing/hydrating,” “my family/kids like it,” “it’s in season” and “healthy/nutritious”
  - Selection and nutrition information are what customers like to see displayed in-store
  - At home, most consume watermelon as a snack, lunch or dinner
  - More than half of consumers surveyed purchase watermelon once a month or more





A large pile of watermelons, with one cut open to show the red flesh. The watermelons are green with dark green stripes. The text is overlaid in the center of the image.

**To learn more about  
watermelon, visit  
[watermelon.org](http://watermelon.org)**





## Lesson 2

# Watermelon Types, Product Formats & Availability



# Learning Objectives

After completing this lesson,  
you will be able to –

- List the four types of watermelon
- Describe the evolution of seedless watermelon
- List primary growing regions that supply watermelon for U.S. consumption



# Watermelon Types

- There are more than 300 varieties of watermelon grown here and abroad that feed U.S. supply
- Each year new varieties enter the market through hybridization creating redder, more crisp watermelon
- All watermelon fall into one of four watermelon types based on predominant characteristics





# Watermelon Types



## Seeded

- Round, long, oblong
- 5-45 lbs.

## Seedless

- Round to oblong
- 10-25 lbs.
- White seed coats are edible
- More than 85% of cultivars grown

## Mini

- Round
- Seedless
- 1-7 lbs.
- Thinner rind = greater yield



## Yellow/Orange

- Round
- Seeded and seedless
- 10-30 lbs.



# Seedless Watermelon Story

- Crossbreeding creates new varieties including seedless
- First introduced in 1966
- Seedless watermelon is a sterile hybrid – like a mule!
  - Male pollen containing 22 chromosomes + female flower with 44 chromosomes = seedless watermelon with seed coats containing 33 chromosomes







## Watermelon Formats

Due to foodservice, retail and consumer demand there are more formats of watermelon than ever before:

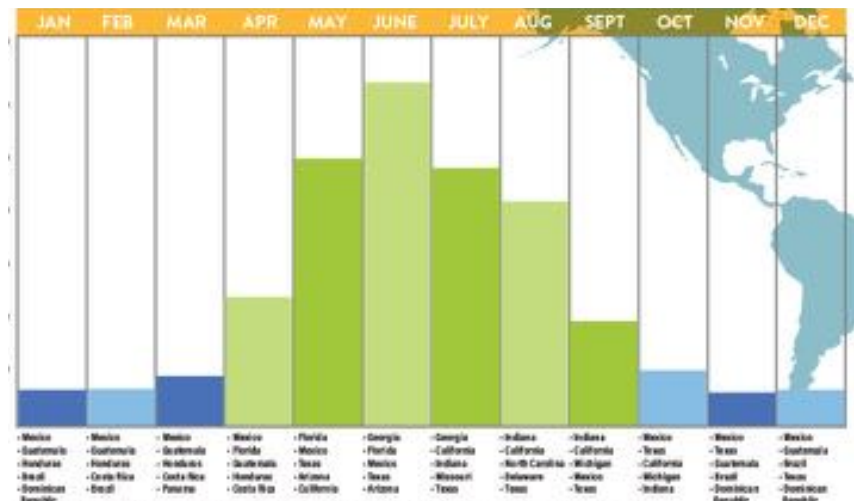
- Whole
- Fresh cut – diced, cubed, plank, etc.
- Juice – concentrated, etc.
- Puree – sometimes frozen



# Watermelon Availability

U.S. consumers crave watermelon year-round

- Grown in the U.S. mid-spring to early autumn, starting in the south and moving north
  - Top producing states: California, Florida, Georgia and Texas
- U.S. is 7<sup>th</sup> in worldwide production
- U.S. exports primarily to Canada
- Central America supplies watermelon to the U.S. mid-autumn to early spring – primarily Mexico





A photograph of several large, green watermelons with dark green stripes, resting in a silver metal shopping cart. The cart's wire mesh is visible in the foreground. One watermelon in the upper right has a red circular sticker with the number '4032' and some text. Another sticker is visible on a watermelon in the middle. In the background, a sign with the words 'MULTIPLE WAYS' is partially visible. The overall scene is brightly lit, suggesting an indoor market or grocery store.

To learn more about  
watermelon, visit  
[watermelon.org](http://watermelon.org)





## Lesson 3

# Watermelon Receiving, Handling & Storage

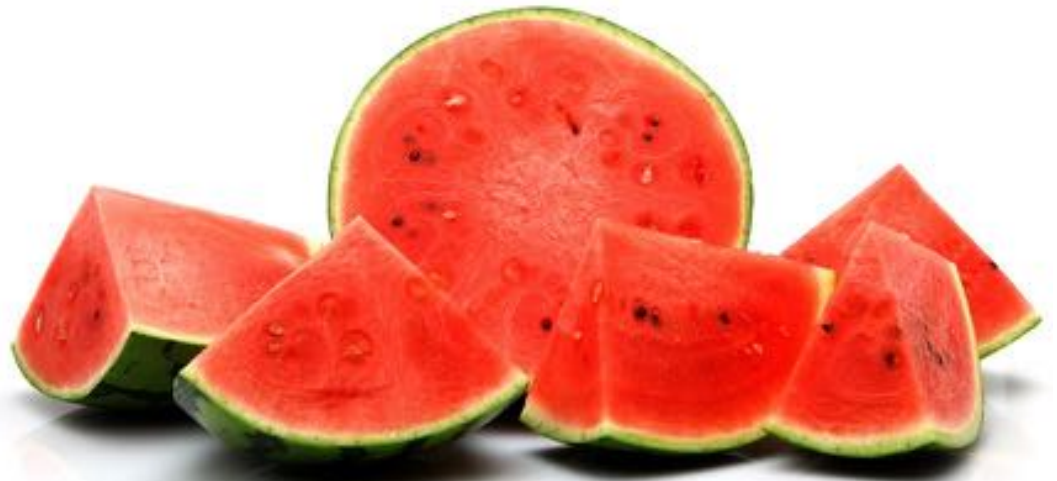


# Learning Objectives

After completing this lesson,  
you will be able to –

- Describe the key characteristics of a ripe watermelon
- Demonstrate appropriate handling and storage techniques for watermelon
- Demonstrate how to cut a watermelon for the highest yield





## Receiving & Storage

- Watermelon should be firm and free of bruises, cuts, dents or soft spots – some surface scarring is normal
- Watermelon should be heavy for its size – 92% water contributing to most of its weight
- The ground spot (the part of the watermelon resting on the soil) changes from pale white to creamy yellow at the proper harvest maturity
- Depending on multiple variables whole watermelon has a 3-4 week shelf life once it's cut from the vine





# Receiving & Storage

- Watermelon does not need to be refrigerated upon receipt unless it arrives refrigerated and is not intended for use that day
  - Ideal storage temperature for whole watermelon is 50-59°F
  - Temperatures below 45°F cause chilling injuries like pitted rind, off flavor and loss of color
  - Fresh-cut watermelon should be refrigerated and kept chilled when offered for self service and on the line
- *Watermelon is an ethylene sensitive food*
  - Ethylene is a natural ripening agent produced by produce such as unripe bananas
  - For some produce items like watermelon, it speeds decay
  - It is important to separate ethylene gas producers from gas sensitive produce



# Hollow Heart

- Growing conditions can cause internal cracking of the flesh known as Hollow Heart
- Hollow Heart is safe to eat
- Often sweeter because sugars are concentrated along the cracks
- Hollow Heart can change the yield





# Cutting, Yield & Shelf Life

- Food Innovation Center at Oregon State University conducted a **Cutting, Yield & Shelf-Life** study in 2015
- Six chefs and retail food handlers were observed cutting watermelon
  - Four different cutting methods were observed
  - Cutting methods were evaluated in the lab based on time to cut and yield
  - Once the best method was defined, the method was tested using 50 watermelons from three key sizes: 36, 45 and 60
- *Please note:* Research stressed the need for education about washing the outside of the watermelon before cutting



# Cutting, Yield & Shelf Life



1. Cut off the ends, providing a base and access to the peel and rind



2. Angle the knife, placing it where the white rind meets the red flesh and following the curve of the fruit, cut off the rind





# Cutting, Yield & Shelf Life



3. Cut the whole watermelon into disks, widthwise in the desired size of cubes



4. Lay the disks face down, pushing the smaller disks to one side and cut same size strips in both directions



# Cutting, Yield & Shelf Life

Yield			
<b>Size</b>	<b>60</b>	<b>45</b>	<b>36</b>
<b>Time (min)</b>	<b>2.50</b>	<b>2.58</b>	<b>3.05</b>
<b>Flesh (lbs.)</b>	<b>8.61</b>	<b>9.54</b>	<b>10.67</b>
<b>Skin (lbs.)</b>	<b>3.61</b>	<b>4.24</b>	<b>7.17</b>
<b>Flesh (%)</b>	<b>70.5</b>	<b>69.2</b>	<b>59.8</b>

## Shelf Life

Depending on shipping and handling procedures, cut watermelon should last 5-7 days in refrigeration







**To learn more about  
watermelon, visit  
[watermelon.org](http://watermelon.org)**



## Lesson 4

# Watermelon Nutrition

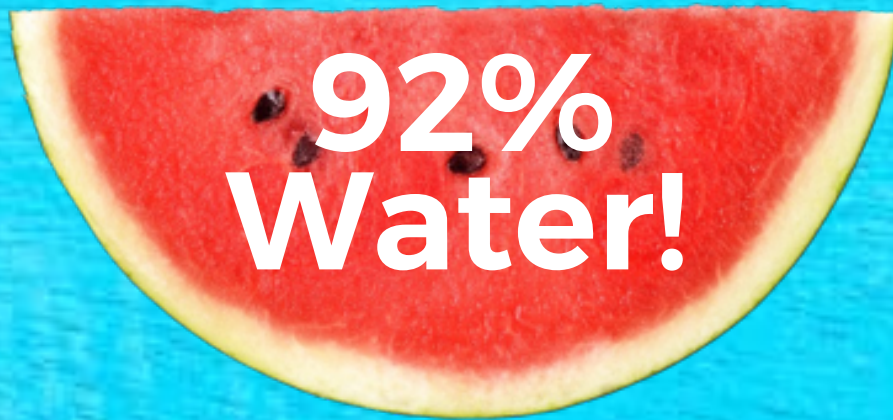


# Learning Objectives

After completing this lesson, you will be able to –

- List key nutrients found in watermelon

There's more to watermelon than just its incredible taste. A 2-cup serving of juicy diced bites is not only perfect for hydration but is also bursting with vitamin C.



**92%  
Water!**

Only 80  
calories per  
serving

0%

Sodium

**Lycopene**  
12.7 mg per serving  
An antioxidant  
studied for its  
potential to protect  
skin against  
harmful UV rays

**Vitamin A**  
8%  
For healthy  
eyes & skin

Nutrition Facts	
1 serving per container	
Serving size about 2 cups, diced (280g)	
Amount Per Serving	
<b>Calories</b>	<b>80</b>
<b>% Daily Value*</b>	
<b>Total Fat</b> 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 0mg	0%
<b>Total Carbohydrate</b> 21g	8%
Dietary Fiber 1g	4%
Total Sugars 17g	
Includes 0g Added Sugars	0%
<b>Protein</b> 2g	
Vitamin D 0mcg	0%
Calcium 20mg	2%
Iron 0.7mg	4%
Potassium 310mg	6%
Vitamin A 80mcg	8%
Vitamin C 23mg	25%

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

INGREDIENTS: WATERMELON, RAW

0%

Fat

0%

Cholesterol

**Vitamin C**  
25%

An antioxidant  
that boosts  
immunity





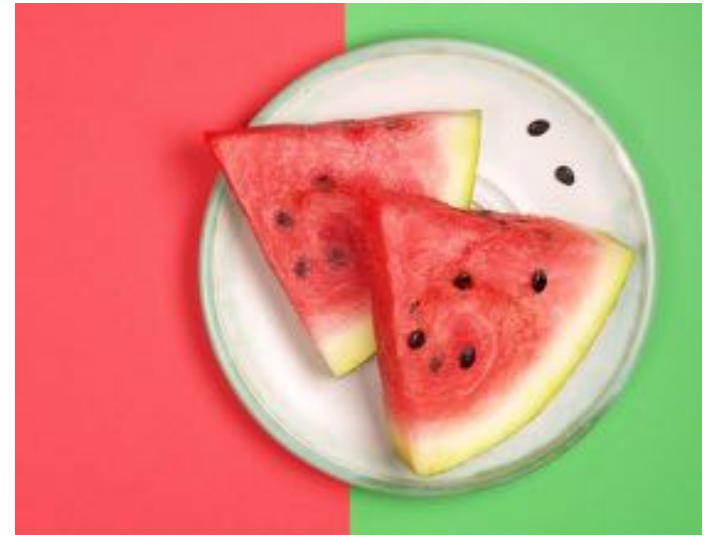
# Watermelon Nutrition

## Watermelon Brings Health Halo to Customers

- A two-cup serving is just 80 calories and a natural hydrator
- The fruit is naturally cholesterol-free, fat-free and sodium-free
- Watermelon is an excellent source of vitamin C (25%), and a source of vitamins A (8%) and B6 (6%)
- Other nutrients listed are understood to benefit well-being when eaten as part of a healthy diet







## Watermelon Nutrition

- Vitamin A (8% DV) helps form and maintain healthy teeth, skeletal and soft tissue, mucus membranes, and skin
  - It is also known as retinol because it produces the pigments in the retina of the eye
- Vitamin C (25% DV) is needed for the growth and repair of tissues in all parts of your body. It is used to –
  - Heal wounds and form scar tissue
  - Aid in the absorption of iron
  - Support a healthy immunity and immune system





## Watermelon Nutrition

● Vitamin B-6 (6% DV) helps the body to –

- Make antibodies – Antibodies are needed to fight many diseases
- Make hemoglobin – Hemoglobin carries oxygen in the red blood cells to the tissues
- Break down proteins – The more protein you eat, the more vitamin B6 you need
- Keep blood sugar (glucose) in normal ranges

● Potassium (6% DV) is a mineral that is found in every cell, it is necessary for water balance

- May help maintain normal blood pressure
- People with low potassium levels can experience muscle cramps







## Watermelon Nutrition

- Citrulline – an amino acid that is usually high in watermelon
  - Our bodies use it to make another amino acid, arginine, that may help divide cells, heal wounds and remove ammonia from bodies
  - May help maintain blood flow to support cardiovascular function
- Lycopene – an antioxidant carotenoid that provides watermelon with its reddish-pink hue
  - Lycopene has been studied for a potential role in reducing risk of heart disease and various cancers as well as protection of skin from harmful UV rays



A large pile of green watermelons with dark green stripes. One watermelon in the foreground is cut open, showing its bright red flesh. The text is overlaid in the center of the image.

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## Lesson 5

# Watermelon Best Practices



# Learning Objectives

After completing this lesson,  
you will be able to –

- Gain insights and techniques on merchandising watermelon year-round
- Learn top tips for marketing watermelon at retail



[watermelon.org](http://watermelon.org)



# Get to Know Watermelon

**Keep your shoppers in the know about watermelon**

- Use consumer research insights to promote watermelon's health, value and versatility
- Take advantage of point-of-sale materials available for display and sampling events in store
- Brush up on your "watermelon 101" to create social posts online or simply help customers select watermelon to take home





# Merchandising Watermelon

- Make the most of displays!
  - Colorful bins and decorated displays grab attention and grab sales
- Display whole and cut watermelon side by side
  - Creates great eye appeal and increases sales for both
- Get the word out — watermelon is nutritious and delicious
  - Include selection and nutrition information not only in newsletters and ads but on signs and displays





# Watermelon Best Practices

- **Avoid mis-rings and lost revenue**
  - Every penny counts! Use proper labeling so customers get what they pay for, and you get the sales you deserve
- **Ensure the tastiest watermelon**
  - Continue the cold chain if applicable for whole watermelon
  - Always keep fresh-cut refrigerated
- **Keep watermelon away from bananas**
  - Store these separately
  - Bananas emit ethylene gas, which changes the flavor and appearance of watermelon





# Watermelon Best Practices

## Take them off the floor

- You wouldn't eat off the floor, so why would your customers

## Easy to reach. Easy to sell.

- Use drop-down panels and transfer hard to reach watermelon to the top of the next full bin

## Lose the leakers

- Look at your display from a customer's point of view and remove any damaged watermelon





# Year-Round Promotion

- Watermelon delivers year-round sales, even in cold climates

- Take advantage of food holidays!

- Examples

- Promote nutrition benefits in the winter months
- July is National Watermelon Month
- National Watermelon Day is August 3<sup>rd</sup>
- Save a Pumpkin, Carve a Watermelon! for October



## Watermelon - Every Month of the Year

Design in-store promotions around seasonal recipes and carvings!



Find these recipes, carvings and more at [watermelon.org](http://watermelon.org)



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