Watermelon Culinary Curriculum

Lesson 1: Watermelon History, Cultivation & Market Insights
Learning Objectives

After completing this lesson students will be able to:

- Highlight key historical events that led to the global consumption of watermelon
- Describe how watermelon is grown
- Describe how watermelon is harvested
- List the top 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

Sun + Bees + Well-drained sandy soil + Water = Watermelon

- For commercial production:
  - Nursey 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 Harvest & 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 are covered to prevent sunburn in the field.
Watermelon Harvest & Packing

- Watermelon is harvested by hand
- A sharp knife is used to cut watermelon from the vine
- Pickers check for ripeness:
  - Firm symmetrical 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 (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 are packed on their sides to protect from damage
Watermelon Harvest & Packing

- Watermelon are packed by hand
- At the packing shed, watermelon are:
  - Inspected for quality
  - Graded
  - Washed
  - Separated according to size
  - Packed for shipment
Watermelon Harvest & 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 -higher the size, 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
- Growers started growing watermelon in boxes
- Benefits are lowered storage and transportation costs
- “Cubic” watermelon go for a premium in Japan
- Heart- and pyramid-shaped watermelon are also popular
Watermelon Consumer Insights

- 2016 per capita consumption in the U.S. was 15.9 pounds
- Watermelon is the most consumed melon
- 2016 consumer research revealed:
  - Top reasons consumers buy watermelon is “it tastes good” and “they like to eat it” followed by “in season,” “cool/refreshing/juicy,” “good snack,” and “healthy/nutritious”
  - At home, most interested in using watermelon in desserts, salads and beverages
  - About one-third of consumers surveyed have tried watermelon at a restaurant - while consumers would still order a fruit salad with watermelon, more are ordering beverages, vegetable salads and entrees that include watermelon
To learn more about Watermelon, visit www.watermelon.org!
Watermelon Culinary Curriculum

Lesson 2: Watermelon Types, Product Formats & Availability
Learning Objectives

After completing this lesson students should be able to:

- List the four types of watermelon
- Describe the evolution of seedless watermelon
- List primary growing regions that supply watermelons 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 predominate 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
- 1-7 lbs
- Thinner rind = greater yield

Yellow/Orange
- Round
- Seeded and seedless
- 10-30 lbs

More than 85% of cultivars grown
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 then ever before:

- Whole
- Fresh cut – diced, cubed, plank, etc.
- Juice – concentrated, etc.
- Puree – sometimes frozen
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 6th in worldwide production
- U.S. exports primarily to Canada
- Central America supplies watermelon to the U.S. mid-autumn to early spring – primarily Mexico

### Watermelon Availability

#### By Month

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<th>Month</th>
<th>Peak</th>
<th>High</th>
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<td>Florida, Guatemala</td>
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[watermelon.org](http://watermelon.org)
To learn more about Watermelon, visit www.watermelon.org!
Watermelon Culinary Curriculum

Lesson 3: Watermelon Receiving, Handling & Storage
Learning Objectives

After completing this lesson students 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
Watermelons should be firm, symmetrical and free of bruises, cuts, dents or soft spots - some surface scarring is normal.

Watermelons should be heavy for their 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 a creamy yellow at the proper harvest maturity.

Depending on multiple variables whole watermelon has a 3 to 4 week shelf life once it’s cut from the vine.

Considering the supply chain, a whole watermelon is expected to have 7 to 10 day shelf life when received at restaurants.
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
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

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### Shelf Life

Depending on shipping and handling procedures, cut watermelon should last 5-7 days in refrigeration.
Demo & Cutting Exercise

Objectives:
1. Increase familiarity with different watermelon types, if available
2. Learn how to break down a whole watermelon into its usable components: peel, rind, flesh and seeds

For each group:
- Cutting board
- Knife (size based on size of watermelon)
- Peeler
- Towel
- Food scale
- Gloves
- Watermelon (use different types of watermelon)
Demo & Cutting Exercise

1. Contact your primary produce supplier about the types of watermelon in the market - request one of each type available
2. As a group review the different types of watermelon (Lesson 2)
3. Break into groups of 4 students
4. Discuss ways to use watermelon fresh, rind and peel
5. Review the watermelon cutting sequence
6. Use the steps to cut the watermelon rind away from the flesh
7. Cut the flesh for end use: wedge, dice, bayonet, etc.
8. Prep the rind and peel for use in recipes and as a garnish
9. Remove the peel from the rind for use as a garnish
10. Cut the rind for use in pickles, slaw and stir fry
11. Each group discuss their experience breaking down a watermelon
To learn more about Watermelon, visit www.watermelon.org!
Watermelon Culinary Curriculum

Lesson 4: Watermelon On The Menu
Learning Objectives

After completing this lesson students will be able to:

- Identify menu trends that reinforce how watermelon adds value to menus
- List the key attributes of watermelon for menu development
- Name preparation techniques that can expand watermelon usage
- List classic and unexpected watermelon flavor pairings
- Recognize how expanding menu use and applications for watermelon can enhance menu success
Menu data collected by Datassential MenuTrends, from 2005 to 2015, was analyzed to understand watermelon usage trends and identify opportunities for watermelon on foodservice menus. Key findings include:

- Fruit is a key menu item featured on 9 out of 10 restaurant menus
- Use of watermelon on menus is consistent across all regions of the U.S.
- Watermelon is mentioned on 8.4% of menus
Watermelon Menu Trends

- Watermelon is featured on 6% of beverage menus, alcoholic and non-alcoholic
  - Watermelon is one of the fastest growing smoothie flavors
  - Vodka is the top spirit mixed with watermelon
- Watermelon is featured on 3% of appetizer, entrée and side menus, a 79% increase since 2005
  - Watermelon is one of the fastest growing fruits on salads
  - Chicken and pork are the proteins most commonly menued with watermelon
  - Cheese is the top ingredient paired with watermelon, growing 54% between 2010 and 2014
  - Watermelon paired with cucumber has grown more than 100%, from 2010 to 2014
Key Watermelon Attributes

- Fresh, natural
- Contrasting color
- Refreshing taste
- Crisp texture
- Delicate green aroma
- Nutritional value
Preparation Techniques

- Juice and puree – Blend until smooth and strain if desired
- Glaze – Mix pureed watermelon into BBQ sauce (U.S. regional to Asian) for a subtle fruit flavor
- Compress – Vacuum-sealing technique that removes air from watermelon, concentrating and intensifying the fruit’s juices, color and flavor
  - The end product is slightly translucent
  - This technique can be used to make carpaccio, stir into poke and prep watermelon prior to grilling
  - Season the watermelon, if desired, before vacuum sealing with ingredients that compliment watermelon
Preparation Techniques

- **Pickle** – Watermelon rind is used to make pickles for Southern dishes and global flavor profiles, such as combining North African sweet spices to make preserved lemon and watermelon chutney
  - Use as an accompaniment when you need a bright, tart, sweet taste, julienne and add to a salad or slaw, or include to add complexity to a beverage
  - Can be “canned” for longer storage or quick pickled

- **Infuse** – Infuse watermelon with single ingredients, like lime juice, tea and vodka or with a marinade before adding to a recipe
  - Watermelon doesn’t typically need more than an hour for marinating
Preparation Techniques

- Jell, gelée – Can be used to slow the release of watermelon flavor or present watermelon flavor with an unexpected texture
- Foam – Create fresh foam from strained watermelon juice for an à la minute topping or freeze for a different texture and later use
- Consommé – Strain watermelon puree (seasoned as desired) through cheesecloth, allow to separate and decant the clear liquid
Watermelon Flavor Pairings

• Watermelon appeals to all of the senses
  ○ Red spectrum and yellow and orange colors brighten recipes and provide a visual cue to its nutritional value
  ○ Delicious aroma doesn’t linger and is often described as having green notes reminiscent of the light fragrance of freshly cut grass

• Refreshing, sweet watermelon pairs simply with lime and salt to more complex pairings that draw on the fruit’s affinity with unexpected ingredients and seasonings in sweet and savory applications
  ○ Explore watermelon with traditional and trendy tastes to understand how to incorporate watermelon on menus
Flavor Pairing Exercise

Objective
- Discover flavor pairings with watermelon for menu development and inspiration

Set up for each person:
- 10 1-inch watermelon cubes
- Plate/bowl for watermelon
- 5 ingredients to taste with watermelon
- 5 sampling cups for ingredients
- 1 fork or toothpicks
- Napkin
- Plate
- Water
- Watermelon Flavor Pairing sheet
- Watermelon Flavor Pairing Tasting sheet
1. Taste watermelon and discuss aroma, flavor and texture

2. Taste and evaluate each pairing, and talk about possible menu items using these combinations

Pairing ideas:
- Thinly sliced radish
- Corn chip
- Curried crispy chickpeas
- Tajin or custom spice blend
- Basil pesto
- Balsamic caramelized onion
- Crispy fried chicken
- Chocolate soft serve
Watermelon on the Menu

Breakfast
- Watermelon Pancake Sandwich with Breakfast Sausage and Watermelon Infused Whipped Cream (flesh, juice)
- Watermelon Oatmeal Smoothie (juice)

• Appetizers, Small Plates
  - Watermelon Feta Bruschetta (flesh)
  - Pickled Watermelon Rind (rind, pickling)
  - Lamb Chorizo Watermelon Bites (flesh, rind, pickling)
  - Sparkling Watermelon with Watermelon, Lemon Sage Oil, Pickled Watermelon Rind, Feta and Crispy Sage (flesh, carbonated, rind, pickling, gelee)
Watermelon on the Menu

Salad

- Watermelon Ancient Grain Salad with Grilled Watermelon, Squash, Black Beans, Sprouted Watermelon Seeds and Pickled Watermelon Rind (grilled, rind, pickling, sprouted seeds)
- Stacked Jicama Chicken Salad (flesh)
- Grilled Watermelon Green Salad (grilled, juice)
- Watermelon Quinoa Salad (flesh)
- Watermelon Beet Salad with Ricotta Salata, Cucumber, Fried Kalettes, Watermelon Radish and Poppy Seed Vinaigrette (flesh)
Watermelon on the Menu

Sides
- Watermelon Rind Slaw (rind)
- Grilled Spicy Watermelon “Steak” (grilled)
- Thai Watermelon, Tart Cherry Coconut Risotto (juice)

Sandwich
- Pulled Lamb Shoulder Watermelon Sliders with Feta Cream and Watermelon Slaw (juice, flesh)
- Grilled Chicken Al Pastor Panini with Grilled Lime-Infused Watermelon Salsa (grilled, infused)
- Beef Hot Dog with Pickled Watermelon Rind and Fresh Watermelon Relish with Warm Spices (flesh, rind, pickling)
- Greek Pita Flatbread (flesh)
Watermelon on the Menu

Entree

- Seared Alaskan Halibut with Heirloom Tomatoes, English Peas, White Asparagus and Watermelon Vinaigrette (flesh, juice)
- Watermelon-Agave Glazed Grilled Salmon with Crispy Onion-Jalapeno Rice (juice)
- Jamaican Shrimp Tacos (flesh)
- Watermelon BBQ Chicken with Watermelon Corn Relish (juice)
Dessert

- Watermelon Pudding with Watermelon-Mint Crème Fraîche, Brown Butter, Pistachio Crumble and Pickled Watermelon Rind Slivers (juice, rind, pickling rind)
- Sweet Milk Pudding with Watermelon Rose Jelly, Minted Watermelon Strawberry Topping and Pistachios (flesh, geleed)
- Watermelon in a Blanket (flesh)
Watermelon on the Menu

Beverage (alcoholic & non-alcoholic)
- Watermelon Ice Cubes (flesh, juice)
- Chunky Watermelon Lemonade (flesh, juice)
- Watermelon Pomegranate Green Tea (juice)
- Tall Glass of Watermelon (juice)
- Watermelon Lavender Sorbet (puree)
- Watermelon Caipirinha (puree)
- Watermelon Sangria (juice)
To learn more about Watermelon, visit www.watermelon.org!
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Lesson 5: Watermelon Carving
Learning Objectives

After completing this lesson students should be able to:

- Demonstrate an understanding of the basic techniques for a 2-D carving
Watermelon Carvings

• Watermelon carvings:
  o Draw attention
  o Add value
  o Suggest something special

• Watermelon carvings can be simple or elaborate

• It’s relatively easy to create a two-dimensional (2-D) carving using a template and simple tools
Create a 2-D Carving

Step-by-Step Watermelon Carving:

- Set up should include: cutting board, towels, food handling gloves, 4-inch paring knife, speedball cutter, toothpicks

- Have the whole watermelon at room temperature when carving because the cuts will be easier to make
  - Chill the watermelon in the refrigerator after carving and before presenting, to preserve work

- Cut a small, thin, flat piece from the bottom of the watermelon before carving
  - This will make a flat base, making the watermelon more stable when carving
Create a 2-D Carving

- Draw the design freehand on the watermelon rind with a fine/medium point waterproof marker or a sharp pencil before you cut
  - A pattern like an ornament, golf or baseball, Easter egg
  - A cutout like a pirate skull or tiki mask
  - A basket like a shark’s mouth or hedgehog
- After the design has been drawn on the rind, insert toothpicks in key places to use as guides for cuts
- Use a sharp knife with a pointed tip – the sharper the knife, the easier and cleaner the cuts will be
- Consider using a channel knife for certain cuts and to hollow out larger areas
Create a 2-D Carving

- For more detailed designs:
  - Draw a template first on a sheet of white paper with a marker or pencil
  - Transfer the image to the watermelon surface by taping the paper to the melon and tracing along the design’s lines with a pencil

- When attaching cut pieces on the watermelon to make your design, use round toothpicks or skewers
  - Flat toothpicks often break due to weight of the piece or the thickness of the rind
2-D Carving Exercise

Objective:
- Understand basic techniques for 2-D carving

Set up for each person:
- 1 mini watermelon
- Cutting board
- Bowl to collect scraps
- Chef’s knife
- Towel
- Food handling gloves (or safety gloves) per individual safety guidelines

- 4-inch paring knife
- Speedball cutter
- Toothpicks
- Fine to medium point waterproof marker
2-D Carving Exercise

1. Lead class through each step of carving a basic logo or design
2. Demonstrate use of tools for specific cuts
3. Evaluate and discuss results
Create a Watermelon Bowl & Garnish

Step-by-step:
- Peel a mini watermelon taking care to remove skin in long strips
- Select the three best strips, and trim them to fit the length of the service plate
- Scrub the outside of the peeled watermelon with a coarse sponge until a smooth, even surface is achieved
- Cut the watermelon in half, then quarters
- Scrape out any remaining watermelon to create four smooth clean serving bowls
- Place the watermelon bowls on top of the watermelon strips and fill with prepared watermelon grain salads, watermelon poke, etc.
Create a Watermelon Bowl & Garnish

For an easier carving, use a mini as a bowl with the rind on:

- Clean the outside rind, cut a mini in half width-wise, clean the watermelon out and clean the outside rind again
- Cut a thick slice off the end to provide a level bottom for the bowl
- Fill with a smoothie, gazpacho, sorbet, etc.
To learn more about Watermelon, visit www.watermelon.org!
Watermelon Culinary Curriculum
Lesson 6: Watermelon Nutrition
Learning Objectives

After completing this lesson students will be able to:
- List key nutrients found in watermelon
- Describe how to use watermelon to build healthy menus
Watermelon Nutrition

Watermelon Brings Health Halo to the Menu

- A two-cup serving is just 80 calories and a natural hydrator
- The fruit is naturally cholesterol-free, fat-free and sodium-free
- USDA has given its stamp of approval to promote watermelon as an excellent source of vitamins A and C, and a good source of vitamin B6
- Other nutrients listed are understood to benefit well-being when eaten as part of a healthy diet
Watermelon Nutrition

- **Vitamin A**: important for optimal eye and skin health
  - May boost immune health by enhancing the infection-fighting action of white blood cells called lymphocytes

- **Vitamin C**: an antioxidant that may aid in the maintenance of normal connective tissues
  - May promote wound healing
  - May support the immune system’s defenses against infections and viruses
  - May protect a body from harmful free radicals that can accelerate aging and conditions such as cataracts
Watermelon Nutrition

- **Pyridoxine (Vitamin B6):** essential for enzymatic functions that convert food into cellular energy
  - May help the immune system produce antibodies needed to fight diseases
  - May help maintain normal nerve function and form red blood cells
  - The body uses it to help break down proteins - the more protein you eat, the more vitamin B6 you need

- **Potassium:** 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 unusually high in watermelon
  - Our bodies use it to make another amino acid, arginine, that may help cells divide, and it can also help wounds heal and ammonia to be removed from the body
  - 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, various cancers and protection of skin from harmful UV rays
Watermelon Nutrition

- Thiamin (Vitamin B1): important for maintaining electrolytes and nervous system signal transmissions throughout the body
  - Also important for energy metabolism
- Magnesium: Watermelon seeds are a rich source of magnesium, which is involved with more than 300 cellular metabolic functions
  - Magnesium is an essential mineral required by the body for maintaining normal muscle and nerve function, keeping a healthy immune system, maintaining heart rhythm, and building strong bones
Building Healthy Menus with Watermelon Exercise

Objective

- Discover ways to incorporate watermelon into menu items that promote/support healthy eating

1. Work in one large group or break into smaller groups
2. Brainstorm ways to incorporate watermelon into menu items that meet consumers demand for taste appeal and nutrition
3. Refer to Watermelon Flavor Pairings, Cooking Techniques and Recipes in Lesson 4
4. Approach by day part (breakfast, lunch), menu part (beverage, appetizer/snack, salad), or health initiative (weight loss, etc.)
5. Discuss results as a larger group or smaller groups report on ideas and inspiration
To learn more about Watermelon, visit www.watermelon.org!