Olive Curing

Bill Kruger UCCE Glenn County

Primary Processing of Table Olives

- Lye-cured
- Water-cured olives packed in brine
- Spontaneously fermented olives
  - Black- Greek
  - Green- Sicilian
- Dried olives - dehydrated - heat or salt dried

Secondary Processing

The embellishment of primary processed table olives - pitting, stuffing, cracking, herbs, spices, marinades, olive pastes and tapenade

Table Olive Processing Equipment

All equipment used should be:
- suitable for food processing
- made from either
  - food grade plastic
  - food grade fibreglass
  - food grade stainless steel that can resist corrosion by salt and/or food acids

Do not use equipment made from:
- Aluminium
- Wood
- Galvanised iron/steel

Table Olive Ripeness Levels

Green Ripe - Flesh and skin is straw coloured

Turning Color - Skin is multicoloured or lightly pigmented

Nearly Black Ripe - Black/violet skin with flesh partly pigmented - best for natural black olives, because flesh is relatively firm

Fully Black Ripe - Black/violet skin with flesh fully pigmented - best for heat dried or salt dried black olives

Kalamata olives at different maturation stages

Greece - Medium size, fleshy, freestone, low in polyphenols
Spanish Style
- Start with green (straw colored olives)
- Treat with lye until ¾ the way to the pit
- Change 3-4 times until not soapy
- Add starter culture
- Store at 70 to 90 degrees
- Will take 2 to 6 months
- May need to add sugar to (Manzanillo or Mission) 1.5 to 2 teaspoons/gal to increase fermentation

Water Cured Olives
- Method
  - Whole/slit/cracked olives green/black TC
  - Pack into containers
  - Add potable water
  - Seal container
  - Change water daily
  - After 10-14 days add 10% salt brine
  - 10% brine = 1kg/10litres, 12.8 oz/gal
  - Allow to equilibrate
  - Taste to ensure processing is complete

Advantage
- Short Processing Time

Disadvantages
- Method involves the use of large amounts of water
- 14 water changes
- Olives have poor organoleptic characteristics
  - Soft
  - Lack color
  - Lack flavor
  - Lose nutrients
  - Need embellishing to be tasty

Water Cured-Kalamata Olives
- Slit Kalamata Olives
- Cracked Raw Manzanilla
What is Fermentation

- Fermentable Substrates eg sugars glucose, fructose
- Fermentation products eg lactic acid, acetic acid, alcohol (ethanol)
- Microorganisms are involved
- Untreated olives - natural spontaneous fermentation by yeasts and lactic acid bacteria
- Acid formed during fermentation + Salt preserve the olives

Brine Cured Olives - 1

- Method
  - Whole/slit/cracked olives
  - Pack into containers
  - Add 10% salt brine
  - 10% brine = 1kg/10litres, 12.8 oz/gal
  - Loosely seal container
  - Gas is produced over 4-5 days
  - When gas production stops fill container to brim and seal tightly

- Fermentation
  - pH falls from 6.5 to 5
  - pH and salt levels fall progressively over 3-4 weeks
  - Maintain pH between 4 to 5 and salt at 6%
  - Olives continue to debitter
  - Black = 3 months
  - Turning = 6 months
  - Green = 12 months

Brine Cured Olives - 2

- Method
  - Taste to ensure processing is complete Pack olives into jars
  - Add a brine with 6-7% salt/20% vinegar
  - Add embellishments
    - Herbs
    - Spices
    - Olive oil
  - Pasteurise (optional)
  - Crisp texture
  - Slightly bitter taste

Commonly used process in countries around the Mediterranean Basin and the Middle East.
Olive are eaten straight out of the brine without embellishment.

- Green - Sicilian Style Green olives (with Sicilian varieties or Sevillano in the US)

- Turning Colour - Ligurian Style (with Italian varieties i.e. Frantoio)

- Black - Greek Style olives (with Greek varieties-Kalamata or Mission)

Brine Cured Olives - 3
Manzanilla TC by Fermentation in Brine

Manzanilla olives fermented in brine

Kalamata Olives by Fermentation in Brine

Processed Kalamata Olives

After Exposure to Air + Olive Oil

Processed Kalamata Olives
Primary Processed Olives
• Mixed varieties/maturation states
• Cracked
• Pitted - whole, halved
• Stuffed
  + Vinegar
  + Olive Oil (or seed oil)
  + Herbs/spices
• Olive pastes and tapenade

Black Kalamata + Green Barnea + Herbs and Spices

Bruised Olives (Cracked) - Using Processed Olives
• Method
  - Bruise processed olives (green/TC/black)
  - Pack into containers
  - Add embellishments
    - herbs
    - spices
    - olive oil
  - Add acid/brine with 6% salt and 20% vinegar
  - Acid/Brine = 800ml of 7.5% salt (75g/litre) + 200ml vinegar = 1 litre
• Ready to eat in a short time
• With green olives + fennel, garlic and olive oil - traditional Sicilian style olive
Types of Vinegars - Chemical, grape, malt, honey, cider (Balsamic)
Black olives - Red wine vinegar
Green and TC olives add light coloured vinegar
Strength of Acetic Acid in Vinegars = 5-6% v/v
Add
10% w/v salt brine (3 parts) + Vinegar (1 part) = 1.25% Acetic Acid
Why add vinegar?
Antimicrobial - several actions
Flavour
Antioxidants - polyphenols
Solvent for herbs and spices - acetic acid, alcohol

Fresh Herbs and Spices
• Suitable for fresh olive products to be consumed within 7 days stored under moderate refrigeration
• Do not add herbs and spices at the primary processing stage
• Can introduce anomalous microbes - Food poisoning, spoilage
Dried Herbs and Spices
• Suitable for marinades
• Use whole or chopped
• Shelf life is reduced compared to primary processed olives

Mediterranean Herbs
Bay Leaf
Rosemary
Oregano
Thyme
Basil
Garlic
Oriental Spices

Chilli, Cinnamon, Lemon Grass, Cardamom Pods

Cracked Pepper, Cumin Seed, Coriander Seed, Cloves

Olives Mixed After Processing + Fetta Cheese and Herbs

Table Olive Recipes 1

Calabrese Green Cracked Olives
Processed green cracked olives
20g
Chopped garlic
Chopped oregano
5g
Crushed dry red chilli
5-10g
Chopped fennel
5g
Whole roasted fennel seeds
5g
Extra virgin olive oil
80mL

Olive Oil - preferably extra virgin olive oil

Chilli Garlic Marinated Mixed Olives
Processed green and black olives
Approximately 1kg
Chopped garlic
20g
Dried Italian mixed herbs
5g
Crushed dry red chilli
5-10g
White wine vinegar
40mL
Extra virgin olive oil
80mL

Tapenade

Nicoise Olives (Fennel and Orange Scented Olives)
Processed small black olives
Approximately 1kg
Chopped orange rind
10g
Dried fennel flower or seed
20g
Chopped garlic
20g
Extra virgin olive oil
80mL

Oriental Style Olives
Processed green olives
Approximately 1kg
Quarter slices of orange
4 pieces
Quarter slices of lime
4 pieces
Chopped lemon grass
5g
Chopped ginger
5g
Cracked coriander seeds
5g
Chopped chilli
5g
Chopped garlic
20g
Extra virgin olive oil
80mL

Other ingredients that are often added
Garlic, salted anchovies (or tuna), lemon juice, Cracked pepper
Aromatics - herbs and spices
Foodstuffs - pine nuts, chilli, sun dried tomatoes

It is an olive paste popular around the Mediterranean region, especially in France

It is used as spreads and dips.

Its basis is ground flesh of processed green, turning colour, or black olives to which capers, anchovies and other foods and spices are added.

Addition of capers differentiates tapenades from other olive-based pastes.

Picholine, Frantoio, Leccino or Koroneiki varieties
Destone processed olives or use commercial destoned olives  
• Drain destoned olives if required  
• Rinse olives with potable water  
• Check that there are no stones or fragments  
• Place the olives, anchovies (if included), capers and garlic into the food processor  
• Apply short sharp impulses to the mixture to give a moderately coarse paste  
• Add sufficient olive oil and mix in to give a slightly granular firm paste (Not runny)  
• Pack into containers and pasteurise (or bulk pasteurise)  
• Send samples to laboratory for testing

Tapenade Recipe to make approximately 1kg

Destoned processed black olives (drained)  
(destoned green or turning colour olives can be used)  900g  
Capers (drained)  180g  
Garlic (equivalent to 15 fresh cloves)  6 grams  
Extra Virgin Olive Oil  GMP*  
Cracked pepper  to taste  
* Sufficient olive oil is added to give the desired consistency. Also anchovy fillets can be added

Note: Tapenades containing seafood or nuts may cause allergic reactions in susceptible consumers so containers should be labelled with appropriate warnings.