Culinary Institute of America

CALIFORNIA SCHOOL FOODSERVICE PROFESSIONALS TRAINING

TRAINING MATERIALS

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BAKING FOUNDATIONS: LEAN AND ENRICHED DOUGHS

STEPS IN BREAD AND ROLL PRODUCTION

TWELVE STEPS IN BREAD PRODUCTION

- Scaling
- Mixing
- Bulk Fermentation
- Folding-over
- Dividing
- Pre-shaping
- Bench Rest
- Shaping
- Final Fermentation
- Scoring
- Baking
- Cooling

Scaling

- Consistent production of the required quantity (varying ingredients may result in too large or too small a quantity)
- Consistent quality
- Uniformity regardless of changes in mixing personnel
- Uniformity in fermentation times
- Controls costs

Mixing

- Brings about a uniform mixture of ingredients
- Develops the gluten in the dough mass to promote the elasticity of the dough and to permit it to retain the gases formed by the yeast
- Distributes the yeast cells uniformly so that they will receive proper nutrition

The average desired dough temperature for most yeast bread doughs is 80°F. but can fall between 65°F. and 85°F. The DDT can be lowered or increased based on the rate of fermentation that is desired. A lower temperature can withstand longer fermentation time, while a higher temperature is used for fast fermenting doughs. Once a DDT is chosen, it must be applied to the total temperature factor. The TTF is calculated by multiplying the DDT times the major factors involved. For straight dough mixing, three factors are considered (x 3). For the use of a sourdough or pre-fermented dough, one additional factor can be applied for each (x 4 or x 5). After the TTF is achieved, the sum of the known temperatures is subtracted from the TTF. The

remaining amount equals the water temperature. When mixing is complete, the dough temperature should fall very close to the DDT.

Stages of Mixing

- Pick-up period: the ingredients are combined into a wet, sticky mass
- Clean-up period
- Development period: elasticity starts and the dough begins to pull away from the sides of the mixing bowl
- Final gluten development--the dough is smooth, dry, and elastic and leaves the sides of the bowl completely clean.

Advantages of Correct Mixing

- Optimum Absorption
- Good Gluten Development
- Slightly Shorter Fermentation Time
- Good Volume
- Good Internal Qualities
- Thin Cell Wall Structure
- Silky Smooth Texture
- Good Keeping Quality

Disadvantages of Improper Mixing

- Low Absorption
- Lack Of Dough Elasticity
- Somewhat Wet, Sticky Dough
- Irregular Dough Condition
- Low Volume
- Poor Internal Qualities
    - Thick Cell Wall Structure
    - Streaked Crumb
    - Harsh Texture
    - Poor Keeping Quality

Bulk Fermentation

Fermentation starts after the dough has been mixed and continues until it reaches a temperature of 138°F. At this point the yeast is killed and fermentation ceases. The most favorable temperature in which fermentation can take place is 76 to 82°F. The length of the fermentation period depends upon the amount of yeast in the dough and the temperature of the room; the lower the temperature, the slower the fermentation. Dough not sufficiently fermented (under-proofed) is called “young dough.” Dough that is over-fermented is called “old dough.”

FOUR STAGES OF FERMENTATION

First Fermentation

- Place dough in warm place (80°F) or a humid environment, in a greased bowl covered with a clean cloth, until doubled in size.
- **Fold Over**: The reason for folding the dough is to redistribute the available food for the yeast, equalize the temperature of the dough, and expel the built-up fermentation gases (carbon dioxide and ethyl alcohol).

Second Fermentation

The second fermentation takes place throughout the next three steps:

- **Scaling:** Cutting the dough into portions.
- **Rolling:** Shaping the cut dough into balls, setting aside until all dough has been scaled.
- **Shaping:** Molding the dough into the desired bread or roll shapes and placing in a banneton, on a linen couche, or on a sheet tray.

Third Fermentation

- **Final Floor Fermentation**: Allowing the dough to expand to double its size in a humid environment that prevents the outside from drying out.

Fourth Fermentation

- **Baking**: The dough continues to rise for a last brief period after it is placed in the oven. This is known as oven spring and takes place during the first few minutes of baking until the dough reaches a temperature of 138°F. All the yeast dies after this temperature is reached.

Fold-Over

Doughs are folded over when the dough has reached its maximum height, about double in size. This is determined by inserting the fingers to a depth of about four inches. The dough is holding maximum gas if it recedes slowly. It is then ready for the fold-over.

The Objective of Folding Over

- Expels Gas and Introduces Oxygen
- Move Yeast Cells to New Food Supply
- Equalize Dough Temperature

Dividing

Accurate dividing assures correct yields of dough pieces. The speed at which scaling should be done is very important. To avoid over-aging of dough, scaling of dough should be done as quickly as possible.

Pre-shaping

During this stage, the dough is given a gentle first shaping. Lay the shaped pieces on the bench in the order they are shaped, in a consistent row. This way, you can return to the first piece when the final shaping takes place.

Bench Rest

During this stage, the pre-shaped loaves relax in preparation for their final forming. Normally this stage lasts from 10 to 20 minutes. It is important to keep the loaves covered with either a plastic sheet or a piece of linen to prevent the formation of a skin on the surface of the bread.

Shaping

Now the loaves are given their final shaping and placed either on a linen couche, into a banneton, onto a sheet pan, or into a steel loaf pan.

Final Fermentation

During this stage, the loaves receive their final rising before being loaded into the oven. Again, it is important to ensure that the surface does not form a skin. This can be prevented by using a temperature and humidity-controlled proof box.

Scoring

Almost all breads are scored before being loaded into the oven. Cutting the skin with a razor, sharp knife, or scissors allows for continued expansion of the crumb until the structure is set. It also enables the baker to control the final shape of the bread. When the bread is not scored, not only can the final loaf have a distorted appearance, but also the crust can form too early, which could prevent the bread from achieving its maximum volume. Some breads, like the baguette, have a traditional scoring pattern that doesn't vary. Many other breads are scored in a wide variety of ways; these different types of cuts not only give a different visual aspect to the finished loaf, but are also, in a sense, the baker's "signature."

Scoring is a Necessary Process

- Facilitates oven spring.
- Strengthens the crust's structure.
- Promotes a lighter, more open crumb.
- Releases the excessive buildup of pressure (gases) which can disfigure the shape of the product (strangled).
- Prevents excessive, isolated expansion within the interior structure of the bread that would cause unwanted air pockets under the crust.

Baking

Baking converts the dough into an edible product and is the culminating act in the process of making bread. Most bread is steamed at the outset of the baking process; this is not true for breads that are egg-washed. The steam gives a final boost of volume known as oven spring. This

provides a sheen to the crust, allows for maximum expansion of the bread, contributes to the color of the crust, and benefits the final flavor of the bread. The length of time that bread bakes is determined by various factors such as the weight of the loaf, the type of oven it is baked in (e.g. hearth, rotating, convection, etc.), oven temperature, and humidity.

Cooling

Once the loaves are baked, it is important that they are cooled properly to preserve the integrity of the crust and to ensure that they are not deformed by the weight of other loaves. Allow the bread to have ample space on a cooling rack so that air can freely circulate around them. This will allow the bread to maintain its final structure.

Poolish, Biga, and Pâte Fermentée

Pre-ferments are a combination of yeast, water, flour, and sometimes salt (pâte fermentée) that are mixed and allowed to ferment in a cool environment. Bakers generally prepare the pre-ferment the day before the final dough is mixed. During the fermentation period, acetic and lactic acids form and contribute to flavor, help the dough to retain moisture, and make the gluten stronger, hence enhancing the bread's final structure. Unlike a sourdough, pre-ferments are less acidic and allow the flavor of the wheat to develop. The three types of pre-ferments that you will encounter in Basic Bread Baking include:

Poolish

At the beginning of the 19th century, a Polish baker replaced the leaven with a fermented mixture of flour, yeast, and water. He discovered that the bread made with poolish, rather than with natural dough leaven (sourdough) tasted less sour and preserved the natural flavor of the flour. The method made its way to Austria and, by 1840, had also made its way to France where it was used to make *pain viennois*.

To make a poolish, combine equal parts of flour and water with a small amount of yeast. (The resulting mixture will be quite loose and soupy.) The amount of yeast depends on the ambient temperature of the bakery but generally runs from 0.02 to 0.2 ounces per pint. Mix all the ingredients together and allow them to ferment at room temperature until tripled in volume, approximately 2 to 12 hours depending on the season.

Biga

In Italy, bakers use a pre-ferment known as biga to add flavor and structure to their breads. This pre-ferment is especially important since Italian flours are low in protein. Unlike the poolish, a biga is firm and made with ratios of 50% hydration and 1% yeast. In general, bigas are more stable than a liquid pre-ferment such as poolish.

PÂTE FERMENTÉE (FERMENTED DOUGH)

Bakers may also use another type of pre-ferment known as pâte fermentée. In this case, the baker will save a scrap of dough from the previous day's batch of dough and add it to the following day's dough. Like the biga and poolish, the pâte fermentée should ferment in a cool environment to prevent over-fermentation.

ENRICHED BREAD DOUGHS

In addition to the ingredients found in a lean dough (flour, water, yeast, and salt), enriched doughs include the addition of fat, eggs, and sugar. Let's look at how these additions affect the final product.

FATS AND OILS

Fats and oils may be added for flavor and to enrich the bread. Fat softens the gluten and makes closer-textured, moister loaves. Some of the other important functions of fats and oils are:

- to tenderize products through disruption of gluten development
- to provide moisture and texture – thus enhancing palatability and shelf life
- to provide satiety and satisfy the consumer (nine calories per gram of fat)

SUGARS

While sugar sweetens bread, it also makes the texture tender by softening the gluten. Sugar also gives the loaf a browner crust. A little sugar added to bread dough accelerates the yeast's action, but high concentrations of sugar can kill the yeast. It should be kept in mind that both wild and commercial yeasts obtain needed sugars by converting the starch in the grain into simple sugars, and it is not necessary to add granulated sugar to bread doughs to obtain a good finished product. Sugars perform a variety of functions in bread baking. Some of the most important functions are:

- to provide sweetness
- to soften the texture of baked goods by delaying gelatinization of starches and denaturing gluten
- to act as a food supply to yeast – in controlled amounts it can help fermentation
- in large quantities, sugar will disrupt yeast growth by drawing water out of the yeast cells and by causing yeast to develop too quickly – drowning in its own waste
- sugar in a bread dough will take longer to develop gluten – takes water away from the gluten developing proteins
- caramelization – it browns and forms a crisp outer crust. Caramelization of pure, white sugar begins at 300°F
- to attract and absorb moisture from other ingredients and thus delay drying of the end product, allowing it to keep a fresher texture for longer

EGGS

Eggs add flavor and color to bread and contribute to the leavening process. A glaze of egg bakes golden like a layer of varnish and gives a more tender crust. Some of their most important functions are:

- to act as binders and emulsifiers, helping to hold other ingredients in mixture together
- to act as shortening, fat in yolk tenderizes product
- to add flavor – combine with sweet and savory flavors well
- to add color – natural color of yolk for interior of product, browns well for exterior finish

BUILD A BETTER SANDWICH

TYPES OF SANDWICHES

1. Cold sandwiches
2. Hot sandwiches
3. Wraps
4. Pocket sandwiches
5. Grilled sandwiches

ELEMENTS OF A SANDWICH

There are four basic parts to a sandwich. Once we know how a sandwich should properly be constructed, we can then add a variety of the basic components to make any combination imaginable.

Bread

The main function of bread in a sandwich is to encase the filling and create an edible casing. Breads give us an opportunity to vary the textures and flavors in our sandwiches. As with other ingredients, the choices are almost endless.

Spreads

The main purpose of spreads is to add moisture and flavor to the sandwich and create a moisture barrier between the filling and the bread.

Body

The body of a sandwich can be comprised of any combination of meats, cheeses, vegetables, or grains. This is the heart of the sandwich. All the other components should complement the body and not overpower or take away from its flavor and texture.

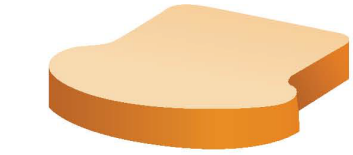
Garnish

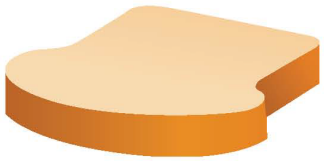
The garnish complements the body of the sandwich and adds both texture and flavor.

How to build a

Better Sandwich

Sandwiches are a school lunch staple. Made up of four parts — bread, spread, body, and garnish — you can create countless varieties.





Garnish

Up to 1/2 cup vegetable

- Herbs
- Slaws
- Tomatoes
- Lettuce

Body

2 oz. eq. meat/meat alternative

- Beef
- Chicken
- Fish
- Lowfat cheese
- Bean puree
- Nut butter
- Roasted Vegetables with cheese or hummus

Spread

1 tablespoon

- Mustard
- Mayonnaise
- Ranch or BBQ
- Cream cheese
- Pesto
- Jelly

Bread

Whole grain rich

- Sliced bread
- Buns/rolls
- English muffin
- Flatbread
- Whole grain waffle
- Biscuit

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TYPES OF BREAD

Loaf bread

- French loaves
- Herb breads
- Rye
- Pumpernickel

Quick Breads

- Fruit breads - banana
- Nut breads
- Vegetable breads – zucchini, carrot

Flatbreads

- Corn tortillas
- Flatbreads
- Flavored flatbreads
- Flour tortillas
- Focaccia
- Lahvosh
- Naan
- Pitas
- Sandwich wraps

Buns and rolls

- Buns
- English muffins
- Hamburger bun
- Hoagie rolls
- Hotdog bun
- Pretzel rolls

Specialty bread

- Bagels
- Biscuits
- Scones
- Waffles

Other sandwich holders

- Lettuce leaves
- Cones
- Sandwiches
- Egg Rolls

SPREADS

The main purpose of spreads is to add moisture and flavor to the sandwich and create a moisture barrier between the filling and the bread.

- Almond butter
- Bean purees (such as white bean spread)
- Butter
- Cashew butter
- Cheese spreads
- Chutneys
- Cream cheese
- Dressings
- Flavored butters
- Flavored cream cheeses
- Flavored mayonnaise
- Ketchup
- Low fat cream cheese
- Mayonnaise
- Mustards
- Olive spreads
- Pepper spreads
- Pesto
- Salad dressing
- Vegetable purees (such as roasted pepper spread)

BODY

The body of a sandwich can be comprised of any combination of meats, cheeses, vegetables, or grains. This is the heart of the sandwich. All the other components should complement the body and not overpower or take away from its flavor and texture.

- Beans
- Beef
- Pork
- Chicken
- Turkey
- Fish
- Chicken salad
- Eggs
- Grilled vegetables
- Low fat cheese
- Meatballs
- Nut butters
- Peanut butter
- Tuna salad

GARNISH

The garnish complements the body of the sandwich and adds both texture and flavor.

- Bell peppers
- Cabbage
- Cucumber
- Grated carrot
- Greens
- Grilled or roasted vegetables
- Herbs
- Lettuces
- Marinated vegetables
- Mushrooms
- Olive salads
- Onions
- Peppers
- Pickled salads
- Pickles
- Radish
- Relishes
- Salad mix
- Salsas
- Slaws
- Sprouts
- Tomatoes

PREPARING SANDWICHES

Mise en place

- All sandwich breads, spreads, and filling ingredients should be prepared.
- Meat, poultry, or fish should be cooked, chilled, and sliced or chopped. Vegetables should be washed, dried, and sliced.
- Spreads should be prepared and chilled.
- Breads should be sliced.

Quick Steps for Cold Sandwiches

1. Arrange preparation area. All sandwich ingredients should be within easy reach of the work area.

2. Arrange sandwich bread on work area. Four rows of 12 slices are a manageable number.
3. Spread all bread slices to the edge with desired spread.
4. Portion filling with a dipper or spoon onto alternate rows of bread. Spread to the edges.
5. Arrange lettuce or other vegetable accompaniments on top of filling.
6. Place bread on top of sandwich.
7. Cut sandwiches as desired, being careful not to mash the bread.
8. Place sandwiches in sandwich bags or wrap in plastic wrap to maintain freshness.
9. Refrigerate until service.

Quick Steps for Grilled Sandwiches

1. Place sandwich bread on a sheet pan.
2. A full sheet pan (18" x 26") will accommodate 24 sandwiches in a 4 x 6 array.
3. Brush the outside with melted margarine or butter or vegetable oil.
4. A brush, roller, or spray may be used. Turn the bread over.
5. Add filling to all slices in the pan. Spread evenly.
6. Top with slices of bread. Brush the top with melted margarine or butter or vegetable oil.
7. Brown the sandwich on a griddle, in a hot oven, or under a broiler.
8. Serve immediately.

Quick Steps for Wraps

1. Arrange preparation area. All sandwich ingredients should be within easy reach of the work area.
2. Lay wraps or tortillas on clean work surface.
3. Evenly distribute dressing or spread on tortilla wrap.
4. Toppings are placed in lower half of tortilla.
5. Evenly distribute your ingredients. Use meat, poultry, fish, beans, grains, vegetables, or fruits. Hard-to-bite ingredients need to be cut small, but most ingredients should be kept in bigger pieces for easiest rolling and eating.
6. Roll the wrap tightly and securely. Fold in the sides and bottom, roll up tightly, and seal the edges with a dab of cream cheese or other spread.
7. Place wraps in sandwich bags or wrap in plastic wrap to maintain freshness.
8. Refrigerate until service.

Sandwich Ideas

Start with a bread, add a spread, a body, then top with a garnish

Chicken Philly


Hoagie

+


Mayonnaise

+


Fajita chicken and bell peppers

+


Shredded lettuce

Falafel with Hummus


Pita

+


Hummus

+


Falafel

+


Tomatoes, cucumbers, olives, and red onions

Barbecued Pulled Pork


Hamburger bun

+


Barbecue sauce

+


Pulled pork

+


Cole slaw

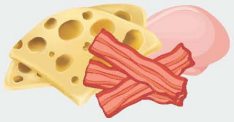
Turkey Deli Sub


Sub roll

+


Spinach pesto

+


Turkey breast, turkey bacon, and swiss cheese

+


Tomato

Culinary Components by Sandwich

Sandwich	Protein/ Filling	Garnishes	Condiments
Musubi	Teriyaki spam or teriyaki chicken or glazed tofu, sushi rice	Furikake, optional cucumber	Teriyaki glaze, soy
Sushi-Rito	Raw salmon or tuna or cooked crab/chicken/tofu	Avocado, cucumber, carrot, scallion	Spicy mayo, soy, eel sauce
Onigiri	Tuna mayo, salmon, pickled plum or chicken/tofu	Nori wrap, sesame seeds	Light salt, soy (optional)
Cubano	Mojo roasted pork, sliced ham,	Swiss cheese, dill pickles	Yellow mustard
Naan	Tandoori-style chicken	Shave red onion, cilantro	Yogurt/Raita sauce
Pirozhki	Mushroom, onion, herb & cheese	Mashed potato, cheese & chicken	Sour cream
Weck	Sliced roast beef	Caramelized onions	Horseradish sauce, au jus
Arepas	Pollo Mechado	Cilantro, avocado, lime, lettuce	Aji verde, crema
Bao	Braised pork shoulder	Pickled cucumber, scallion, cilantro	Hoisin, chili crisp
Milk Bread	BBQ pork	Slaw, corn shoots, pickled red onion	BBQ sauce, mayo
Chapati	Aloo Gobi	Fried onions	Yogurt/ Raita
Empanadas	Picadillo beef	Pollo sofrito	Chimichuri

MUSUBI (SPAM MUSUBI / TUNA MUSUBI)

Origin: Hawaii, United States

Description: Musubi is a handheld snack that reflects Hawaii's Japanese heritage. The most famous version, Spam Musubi, consists of sushi rice topped with grilled Spam and wrapped with nori (seaweed). Modern versions may use tuna, chicken, or other fillings.

Key Ingredients:

- Sushi rice
- Nori
- Spam or seasoned tuna
- Teriyaki-style sauce

Stand-Out Details:

- Developed in Hawaii after World War II when Spam became widely available.
- Combines Japanese rice-ball traditions with local Hawaiian ingredients.
- One of Hawaii's most iconic grab-and-go foods.

Source:
https://www.spam.com/recipes/spam-musubi
https://www.hawaiimagazine.com

SUSHI-RITO

Origin: California, United States

Description: The Sushi-Rito is a modern fusion creation that combines the flavors of sushi with the portability and size of a burrito. It features sushi rice, nori, proteins, vegetables, and sauces rolled into an oversized hand-held format.

Key Ingredients:

- Sushi rice
- Nori
- Seafood or protein

- Vegetables
- Sauces and seasonings

Stand-Out Details:

- Developed in California during the 2010s.
- Reflects contemporary American fusion cuisine.
- Designed as a portable alternative to traditional sushi.

Source:
https://www.sushirrito.com
https://www.foodandwine.com



ONIGIRI

Origin: Japan

Description: Onigiri are Japanese rice balls traditionally shaped into triangles, rounds, or cylinders and often wrapped partially in nori. They are commonly filled with preserved or cooked ingredients.

Key Ingredients:

- Japanese short-grain rice
- Nori
- Salmon, umeboshi (pickled plum), or other fillings

Stand-Out Details:

- Dates back more than 1,000 years.
- Historically served as a portable meal for travelers and soldiers.
- One of Japan's most popular convenience foods.

Source:
https://www.justonecookbook.com/onigiri-rice-balls
https://www.maff.go.jp/e/policies/market/k_ryouri/search_menu/menu/onigiri_tokyo.html



Bulgogi Lettuce Wraps

Origin: Korea

Description: Lettuce wraps are a common Korean dining style in which grilled meat and accompaniments are wrapped in fresh lettuce leaves before eating. Bulgogi is a marinated and grilled beef or chicken preparation known for its sweet-savory flavor.

Key Ingredients:

- Bulgogi-marinated meat
- Lettuce leaves
- Gochujang sauce
- Scallions and vegetables

Stand-Out Details:

- The Korean term *ssam* refers to foods wrapped in leafy greens.
- Encourages customization with sauces and garnishes.
- Provides a fresh, vegetable-forward alternative to bread-based sandwiches.

Source:
https://www.koreanbapsang.com
https://www.maangchi.com

Pulled Pork BBQ Sandwich

Origin: North Carolina, United States

Description: A classic Southern barbecue sandwich featuring slow-smoked or slow-roasted pork that is shredded and served on a soft bun, often with slaw and vinegar-based sauce.

Key Ingredients:

- Pulled pork
- BBQ sauce
- Soft roll or bun
- Coleslaw

Stand-Out Details:

- North Carolina barbecue traditions emphasize pork and vinegar-based sauces.

- Regional variations differ significantly across the United States.
- A hallmark of Southern barbecue culture.

Source:
https://www.visitnc.com
https://www.southernfoodways.org

Chicken Tikka Masala Naan Wrap

Origin: United Kingdom (inspired by Indian cuisine)

Description: A modern handheld combining naan bread with chicken tikka masala, chutneys, and pickled vegetables.

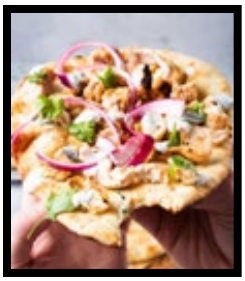
Key Ingredients:

- Naan bread
- Chicken tikka masala
- Chutney
- Pickled vegetables

Stand-Out Details:

- Chicken Tikka Masala is often considered one of Britain's most popular dishes.
- Reflects the influence of South Asian cuisine on British food culture.
- Demonstrates how flatbreads can serve as sandwich carriers.

Source:
https://www.britannica.com/topic/chicken-tikka-masala
https://www.nationalgeographic.com



PIROZHKI

Origin: Russia and Eastern Europe

Description: Pirozhki are baked or fried stuffed buns filled with savory or sweet fillings. Common savory fillings include beef, cabbage, mushrooms, potatoes, and onions.

Key Ingredients:

- Yeasted dough
- Meat or vegetable filling
- Eggs and butter

Stand-Out Details:

- The name means "small pie."
- Found throughout Russia, Ukraine, and neighboring countries.
- Traditionally sold as portable street food.

Source:
https://www.britannica.com/topic/pirozhki
https://www.saveur.com



CHAR SIU BAO

Origin: Southern China (Cantonese cuisine)

Description: Char Siu Bao are soft steamed buns filled with sweet-savory Cantonese barbecue pork known as char siu.

Key Ingredients:

- Steamed bao dough
- Char siu pork
- Hoisin-based sauce

Stand-Out Details:

- A classic dim sum item.
- Originated in Guangdong Province.
- Demonstrates the steamed bread traditions of Chinese cuisine.

Source:
https://thewoksoflife.com
https://guide.michelin.com



CUBANO (CUBAN SANDWICH)

Origin: Cuban immigrant communities in Florida, particularly Tampa and Miami

Description: The Cubano combines roasted pork, ham, Swiss or provolone cheese, mustard, and pickles on Cuban bread, pressed until crisp.

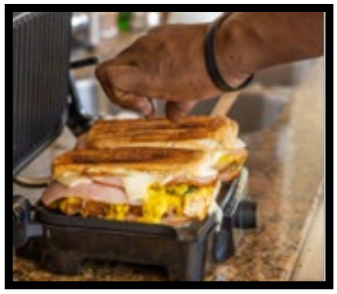
Key Ingredients:

- Cuban bread
- Roast pork
- Ham
- Cheese
- Mustard
- Pickles

Stand-Out Details:

- Developed among Cuban workers in Florida.
- Tampa and Miami maintain a long-running debate about the "authentic" version.
- Famous for its pressed, crispy exterior.

Source:
https://www.history.com
https://www.visitflorida.com


Chapati Wrap with Aloo Gobi

Origin: India

Description: Chapati is an unleavened whole-wheat flatbread used throughout South Asia. In this class it is paired with Aloo Gobi, a spiced potato and cauliflower filling.

Key Ingredients:

- Chapati
- Potatoes
- Cauliflower
- Indian spices
- Yogurt raita

Stand-Out Details:

- Chapati is one of the most common breads in India.
- Traditionally cooked on a flat griddle called a tawa.
- Demonstrates the use of flatbread as a sandwich carrier.

Source:
https://www.britannica.com/topic/chapati
https://www.indianhealthyrecipes.com



Calzone

Origin: Naples, Italy

Description: A folded pizza dough pocket filled with cheese, meats, or vegetables and baked until golden brown.

Key Ingredients:

- Pizza dough
- Cheese
- Meat and/or vegetables
- Tomato sauce

Stand-Out Details:

- The word "calzone" means "trouser leg" in Italian.

- Developed as a portable version of pizza.
- Popular street food throughout southern Italy.

Source:
https://www.britannica.com/topic/calzone
https://www.greatitalianchefs.com

Chicken Adobo with Puto

Origin: Philippines

Description: Chicken Adobo is the Philippines' most recognized national dish, featuring chicken braised in vinegar, soy sauce, garlic, and spices. Puto are steamed rice cakes often served alongside savory dishes.

Key Ingredients:

- Chicken
- Vinegar
- Soy sauce
- Garlic
- Puto rice cakes

Stand-Out Details:

- Adobo predates Spanish colonization.
- The vinegar-based cooking method was used as food preservation in tropical climates.
- Puto provides a traditional steamed bread accompaniment.

Source:
https://www.kawalingpinoy.com
https://www.britannica.com/topic/adobo

Beef on Weck

Origin: Buffalo, New York, United States

Description: Roast beef served on a kummelweck roll, a crusty roll topped with caraway seeds and coarse salt, accompanied by horseradish and au jus.

Key Ingredients:

- Roast beef
- Kummelweck roll
- Horseradish
- Jus

Stand-Out Details:

- A regional specialty of Buffalo.
- The name comes from the German "kümmel" (caraway) and "weck" (roll).

- Traditionally served with beef jus for dipping.

Source:
https://www.visitbuffaloniagara.com
https://www.atlasobscura.com

POLLO AREPAS

Origin: Venezuela and Colombia

Description: Arepas are cornmeal cakes that are grilled, baked, or fried and split open to hold fillings. This version features mojo-marinated chicken, aji verde, and pickled onions.

Key Ingredients:

- Arepa dough (masarepa)
- Chicken
- Aji verde sauce
- Pickled onions

Stand-Out Details:

- Arepas have Indigenous origins predating European contact.
- Both Venezuela and Colombia consider arepas a national food.
- Extremely versatile and eaten throughout the day.

Source:
https://www.britannica.com/topic/arepa
https://www.seriouseats.com

EMPANADAS

Origin: Spain; widely adopted throughout Latin America

Description: Empanadas are stuffed pastry turnovers filled with meat, vegetables, cheese, or seafood and baked or fried.

Key Ingredients:

- Pastry dough
- Savory filling
- Egg wash

Stand-Out Details:

- The name comes from the Spanish verb empanar, meaning "to wrap in bread."
- Every Latin American region has its own style.
- Commonly served as street food and celebrations food.

Source:
https://www.britannica.com/topic/empanada
https://www.saveur.com



BOSTON BROWN BREAD ICE CREAM SANDWICH

Origin: New England, United States

Description: A dessert sandwich featuring slices of Boston Brown Bread paired with ice cream. Boston Brown Bread is a steamed bread made with rye, cornmeal, and wheat flour.

Key Ingredients:

- Boston Brown Bread
- Ice cream

Stand-Out Details:

- Developed in New England during the 19th century.
- Traditionally steamed rather than baked.

- Reflects early American baking traditions.

Source:
https://www.kingarthurbaking.com
https://www.newengland.com

Common Culinary Terms

Term	Definition	Application
Sauté	Cook quickly in a small amount of fat over medium-high heat	Quick vegetable cookery, cooking thinly sliced proteins, developing flavor
Simmer	Gentle cooking right below a boil; look for small bubbles around the edges	Sauces, soups, grains
Roast	Dry heat cooking in the oven	Vegetables, proteins
Blanch	Briefly cook in boiling water, then cool immediately	Vegetables, preserving color/ texture
Steam	Cook food using moist heat from steam	Vegetables, dumplings, retaining moisture and nutrients
Pan-Sear	Cook food over high heat to create browning and flavor development	Proteins, vegetables, crust development
Reduce	Simmer liquid to concentrate flavor	Sauces, glazes
Deglaze	Add liquid to release browned bits from a pan	Sauce and flavor building
Caramelize	Brown sugars naturally through cooking	Onions, roasted vegetables
Emulsify	Combine fat and liquid into a smooth mixture	Dressings, sauces
Fold	Gently combine ingredients without deflating or over-mixing	Salads, delicate mixtures
Toss	Lightly mix ingredients together	Salads, vegetables, grain dishes
Coat	Evenly cover food with sauce, oil, or seasoning	Proteins, vegetables
Marinate	Soak food in seasoned liquid before cooking	Flavor development and tenderness
Season	Enhance flavor using salt, spices, acids, herbs, or aromatics	Flavor balancing
Taste & Adjust	Evaluate and modify seasoning as needed	Salt, acid, sweetness, spice balance

Rest	Allow cooked food to sit before serving	Moisture retention and texture improvement
Dice	Cut food into evenly sized cubes	Vegetables, consistency in cooking
Mince	Cut food into very small pieces	Garlic, herbs, aromatics
Julienne	Cut food into thin matchstick strips	Vegetables, salads, garnishes
Zest	Remove the outer colored layer of citrus peel	Adding bright citrus flavor
Drain	Remove excess liquid from food	Pasta, canned beans, vegetables
Portion	Divide food into consistent serving sizes	Cost control, meal compliance, consistency
Yield	The total amount a recipe produces	Recipe scaling and forecasting
Garnish	Final ingredient added for flavor, texture, or appearance	Fresh herbs, crunchy toppings, citrus
Hold	Keep food at safe serving temperature before service	Batch cooking and school meal service
Batch Cooking	Preparing food in smaller quantities throughout service	Improves food quality and reduces waste
Mise en Place	“Everything in its place”; organized preparation before cooking	Production efficiency and organization
Cross-Utilization	Using the same ingredient across multiple menu items	Inventory management and waste reduction
Fork Tender	Soft enough to easily pierce with a fork	Vegetables, braised meats
Golden Brown	Even browning that develops flavor and texture	Roasted foods, baked items
Crisp-Tender	Cooked but still slightly firm	Vegetables
Al Dente	Tender with slight firmness remaining	Pasta, grains
Aromatics	Ingredients that build foundational flavor and aroma	Onion, garlic, ginger, celery, herbs
Acid	Sour or bright ingredients that balance flavor	Citrus juice, vinegar, yogurt
Umami	Savory, rich flavor profile often associated with depth	Soy sauce, mushrooms, tomato paste, parmesan

Texture Contrast	Combining different textures within a dish	Crunchy slaw with soft rice or crispy toppings
Production Flow	Organizing tasks in a logical cooking sequence	Timing, multitasking, kitchen organization
Visual Appeal	How attractive or appetizing food appears	Color, garnish, presentation, tray composition
Consistency	Producing food with the same quality each time	Portioning, seasoning, cooking standards

MEASUREMENTS

In foodservice operations, culinary measurements are essential components to producing high-quality meals. All recipes require a basic understanding of the different units, the purpose of measuring tools, and the right techniques for measurement. Sometimes, recipes also require conversions or alterations. Because of this, math skills are essential for working in the kitchen.

WEIGHT VS. VOLUME

There are many forms of measurement, such as weight, time, speed, and volume. Each of these forms has a distinct purpose and unit of measure. Weight and volume are two types of measurements that are often confused:

Weight: the measure of an items mass. In foodservice, the most common units of weight are ounces and pounds.

Volume: the measure of the amount of space an item takes up. There are seven units of volume: teaspoon, tablespoon, fluid ounce, cup, pint, quart, and gallon.

To highlight the difference between weight and volume, consider this age-old question; what weighs more, a pound of bricks or a pound of feathers?

Both the bricks and the feathers have an equal weight—one pound. However, the items have very different volumes because they take up different amounts of space. The amount of feathers needed to weigh one pound is much more than the amount of bricks needed.

Due to this, weight is regarded as the more accurate measurement for solid ingredients weighing more than two ounces. Liquid ingredients, on the other hand, are usually best measured with volume.

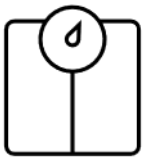
The importance of weight and volume can be further demonstrated by that 1 ¼ cups of flour mentioned earlier. Flour is a solid ingredient that's best measured by weight. If the flour is measured using a volume measuring cup though, the quantity can vary greatly from person to person, even when the same cup is used. Factors that alter quantity include:

- If it was spooned in or scooped in with the measuring cup
- If it was packed down into the cup
- If it was leveled off with a straight edge

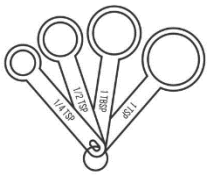
Even small differences in quantity can make a big difference in a recipe's result. Using the correct measuring tools and techniques matters. That's not to suggest that a small portion of flour must always be weighed on a scale. Nevertheless, ensuring that all ingredients are measured with the correct method will greatly improve the quality of food.

MEASURING TOOLS AND TECHNIQUES

There are different measuring tools created for different purposes. Here are the most common tools used within foodservice operations:



Scales measure weight. They are the most accurate way to measure dry ingredients but can also be used for some liquid ingredients as well.



Measuring cups and **measuring spoons** measure volume. They are best used for liquid ingredients but can be used for small quantities of dry ingredients too.

Scoops measure volume. The scoop number equals the average number of scoops in a quart

For graduated dry and liquid ingredients, the standard sizes are:

- 1 quart
- 1 pint
- 2 quarts
- 1 gallon

Since weight is the best measure for dry ingredients, these units are generally not used for quantities greater than 1 quart. Nonetheless, there are variations for tools depending on their intended use, and it's important to understand these differences.

Liquid measures will have a curved lip above the spill line to prevent spilling.

Dry measures have a straight rim to level off any ingredient.

Another important distinction is between ounces and fluid ounces. An ounce is a measure of weight, while a fluid ounce is a measure of volume. Any ingredient labeled with ounces will not equal the same quantity of that ingredient in fluid ounces, as liquid weights may vary.

When it comes to measuring ingredients, the right technique is key. Even if you use the correct tool for the job, the wrong use of that tool will result in inconsistent results when following a recipe. To ensure all ingredients are measured correctly:

- Lightly spoon dry ingredients into a measuring cup. Level off the top by using a flat-edged utensil such as a knife or a metal spatula. Avoid tapping or shaking the measuring container; this will pack the ingredient and lead to inaccurate quantities.
    - An exception to this rule is brown sugar. Typically, this ingredient should be firmly packed into a measuring cup, although the recipe should specify what to do.
- Use a scale whenever possible to measure dry ingredients. If one is not available, use the largest instrument possible to increase accuracy. For instance, measuring four cups of flour using a one-quart container is better than using a four-cup container four different times. Every time the flour is spooned into the cup, it increases the chance of human error.
- Checking the amount of liquid in a measuring cup by sitting it steady on the counter and looking at the meniscus. The meniscus is the natural upward or downward curve seen at the top of the liquid. To do this, examine the container at eye level and determine if the meniscus is at the desired unit. This will produce the most accurate results for your recipe.
- If possible, measure all ingredients before starting the recipe to increase efficiency and decrease the chance of error.

PORTIONING

How food is portioned will directly relate to the yield of a recipe. Most often, scoops are used for portioning. Selecting the right scoop size and following the right technique is essential whenever serving food. If you over portion, you will run out of food too quickly. If you under-portion, you'll be left with excessive leftovers.

Incorrect portioning doesn't only affect the operation's bottom line. It can also negatively impact consumers. If one kid gets a heaping serving of food while another gets a tiny serving, you will have very unsatisfied students on your hands. To avoid this issue, use instruments that measure both weight and volume, and remember the right techniques for accurate measure.

SUCCESSFUL KITCHEN PRODUCTION

STAFF READINESS

- Clean uniform, apron, and hair covering
- Hands washed
- Comfortable, closed-toe, non-skid shoes
- Attentive and organized mindset

GAME PLAN ORGANIZATION

- What am I going to make?
- How much am I going to make?
- How much space will I need?
- How much time will I need?

EQUIPMENT

- What equipment will I use to prepare the product?
- What equipment will I use to cook the product?
- What will I serve the product in?
- What utensils do I need?

FOOD

- Gather the ingredients needed in the correct amounts to produce the recipe
- Keep perishable items refrigerated (cold foods at or below 41°F)
- Prevent cross-contamination with proper sanitation practices

COOKING

Pre-preparation:

- Washing
- Cutting (slicing, dicing, etc.)
- Seasoning strategies (using herbs and spices to reduce or replace sodium)

Preparation:

- Start the item with the longest cooking times first

- Clean as you go
- Batch cooking when needed

Finishing: Finish items as close to service as possible.

SERVING

Set up service line.
- Trays, bowls, serving spoons, etc.
- Hot food hot, cold food cold
- Arrange food properly on the service line
- Monitor and rotate items as needed

COOKING GUIDELINES
PRIORITIES IN FOOD PREPARATION AND SERVICE

TASTE

The most important goal when preparing food is to make it taste GREAT.
Taste is affected by:
- Proper seasoning (acid, herbs, and spices)
- Execution of fundamentals and appropriate cooking techniques
- Texture: consistency (viscosity), crunchiness, smoothness, etc.
- Freshness and quality of the product

PRESENTATION

The appearance of food comes second only to taste in terms of importance. Some of the things that impact on presentation are:
- Portion size
- Proper food placement or arrangement (plating for visual appeal)
- Composition (avoid repetition of the same colors, preparation methods, etc.)
- Execution of fundamentals (properly and uniformly cut meats, vegetables, etc.)

DEGREE OF DONENESS / PROPER COOKING

- Meats are cooked to the required temperature…but not overcooked
- Vegetables are tender but not mushy
- Grains are tender but not overcooked

TEMPERATURE

- Hot foods hot
- Cold foods cold, on cold plates

FINAL CHECKLIST

Before we serve any meals from our kitchens, we should be able to answer "YES" to each of the following questions:

1. Does it taste good?
2. Does it look good?
3. Is it cooked properly?
4. Is it the correct temperature?

Maintaining these guidelines ensures that every meal served is **delicious, visually appealing, and meets quality standards**.

MISE EN PLACE

Everything in its place and a place for everything

Organization is an essential skill that will make kitchen work easier and more efficient. Mise en place, a French term commonly used to express kitchen or workspace organization, requires planning and anticipation of the entire task. Maintaining mise en place ensures efficiency, sustainability, consistency, and professionalism.

BENEFITS OF MISE EN PLACE

- Increased speed and efficiency (cooks not running around gathering ingredients and equipment throughout food preparation)
- Professional appearance of workstation (critical in open kitchens or other situations where customers can view production)
- Sanitary conditions are more easily maintained (products held at correct temperatures, which helps to avoid cross-contamination)
- Ensures inventory management and waste reduction (preventing unnecessary food waste and reducing over-purchasing or spoilage)

KITCHEN ORGANIZATION SHOULD INCLUDE:

- Recipes and ingredients needed to complete the task
- Food safety and sanitation needs
- Small and large equipment needed (Consider equipment needs throughout the entire process, including the final container that will hold the product)
- Planning the time allotted to the process, from start to finish
- Division of labor (identify how the tasks are to be divided among the team)

WORKSPACE ORGANIZATION

- Recipe and recipe ingredients
- Cutting board (set on a wet paper towel or antiskid mat to prevent sliding)
- Chef knife, paring knife, peeler (if needed)
- Refuse pan (for food scraps and waste)
- Small equipment: utensils, mixing bowls, pans, service pans
- Large equipment: ovens, steamers, steam jacketed kettles, tilt skillet

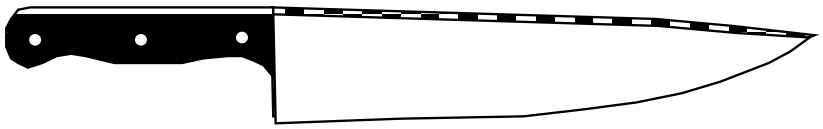
ORGANIZATION AND WORKFLOW

- Table height and cutting board at correct height
- Organization appropriate for individual preferences (right or left-handed)
- Products maintained at appropriate temperatures

KNIFE SELECTION

Knives come in all shapes and sizes. Understanding the function of various knives will help you pick the right tool for the job.

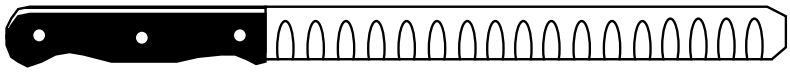
Chef Knife: An all-purpose, versatile knife that can be used for most cutting and dicing. They are available in sizes ranging from 6" to 12" (8" is standard). Choose a knife that you can grip securely. Larger knives fit best in larger hands. Chef knives with forged blades can be used for heavy-duty tasks such as breaking down poultry or cutting through tough vegetables. Thinner, more flexible stamped blades work best for delicate tasks such as removing melon rinds.



Boning Knife: A specialized knife with a narrow blade, used to de-bone meat such poultry, smaller red meat cuts, and filleting fish.

Paring Knife: A knife mostly used for peeling fruits and vegetables, but also for slicing small soft foods such as olives and mushrooms

Slicer: Long knife used for carving meats.

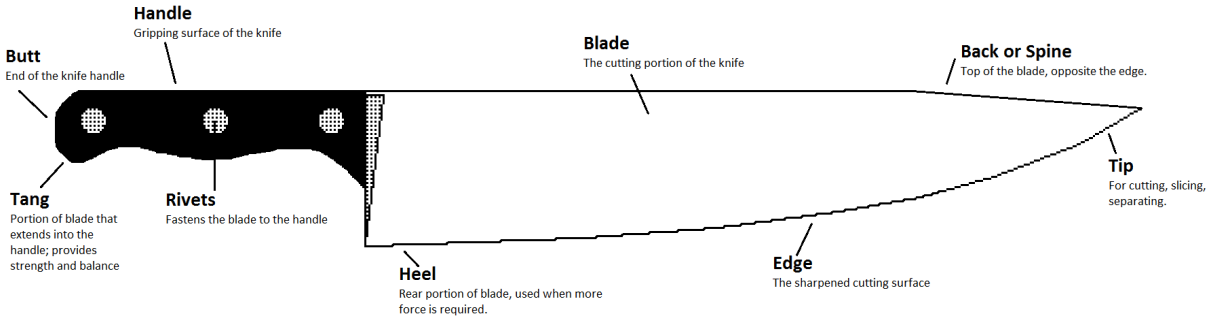


Serrated Knives: Highly specialized knives designed for slicing breads and cakes. Serrated knives have defined teeth and are "saw like" compared to slicing knives. They are not designed for cutting or chopping tasks.

Utility Knives: Used primarily for slicing. They work well with delicate foods such as fruit, small roasts, and poultry.

Sharpening Steel: Used for honing the edge of a knife between sharpenings

KNIFE PARTS AND FUNCTIONS



Blade: The most common blade material is stainless steel, which is either forged or stamped. Forged blades are molded into shape and are generally heavier and more durable, with a prominent heel at the base of the blade. Stamped blades are cut from a solid metal sheet and are more lightweight but dull more quickly. Both types can be sharpened easily and are used in a variety of kitchen settings.

Handle: Wood has traditionally been used for knife handles but modern options like plastic and laminated wood are now more common. Wood warps when wet and can harbor bacteria, making it difficult to clean. Plastic handles are found often in commercial kitchens because they are easy to clean and require no special care. Plastic is often used on stamped knives that do not have a full tang, an extension of the blade to which the handles are attached. On forged knives, the tang continues through the length and width of the handle, providing more balance and durability, and secured with three rivets for stability.

Tip/ point: used for small incisions, around bones, punctures, and detailed work

Back/ spine: gives blade appropriate stability and flexibility, varies in thickness depending on the style of knife and intended uses

Heel: the end of the guard, used to break through small bones or shells

Edge: primary cutting surface of the knife

Bolster: attachment point between the handle and the blade, provides stability, and is found on higher-quality knives

Tang: runs through the handle (full tang) and provides balance and stability to the knife

Rivets: connects the handle to the tang

Sharpening Knives

A sharp knife is safer than a dull one. Sharp knives glide evenly through the food, while dull knives tug, requiring more force.

Knife Sharpeners

Sharpening stones may be used to sharpen knives but require a certain skill.

Electric and hand-held knife sharpeners are designed to imitate the motion of a sharpening stone. When using knife sharpeners, the key is to use a single smooth motion as you pass the blade through. Jerks or pauses result in an uneven, gouged blade that may require professional attention to fix.

Sharpening steels keep your knife blade sharp in between sharpening by realigning the microscopic burrs that make up the fine edge of your blade. Despite their name, these do not sharpen knives. Once the burrs are broken or bent, a sharpening steel will no longer help. To use a sharpening steel, hold your knife at a 20° angle against the steel and run it from tip to heel in one smooth motion. The safest way to use a sharpening steel is to hold it point-down against a countertop or worktable, sweeping your knife against it blade-down.

Storing Knives

- Protect the blade of your knife when it is stored to keep it sharper. Magnetic knife strips or commercial knife blocks work best.
- If knives are stored in a drawer, protect the blade using snap-on knife guards or slice-in knife guards.

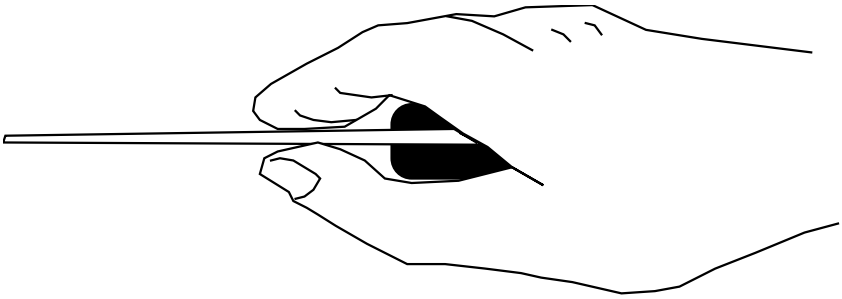
Knife Safety Rules

- Always use a sharp knife. A sharp knife is safer than a dull knife. It requires less cutting pressure. If sharp, the knife will not slip as easily, and your hand will not tire as quickly.
- Always use a cutting board. Anchor the cutting board to avoid slippage.
- Use the correct size and type of knife for the job.
- Hold the knife firmly and securely in your hand. Cut away from your body. Keep your eyes on the knife. Take your time.
- Always place knives on flat surfaces away from the table's edge, with the blade facing away from you. Never cover a knife with towels or other materials; keep it in sight.
- Yield to falling knives. Do not grab a knife blindly; reach deliberately for the handle. If a knife falls off the table, do not grab it.
- When handing a knife to another person, point the handle toward them.
- Never place a knife in the dishwashing area. Always hand-wash and return to your cutting area or storage location.

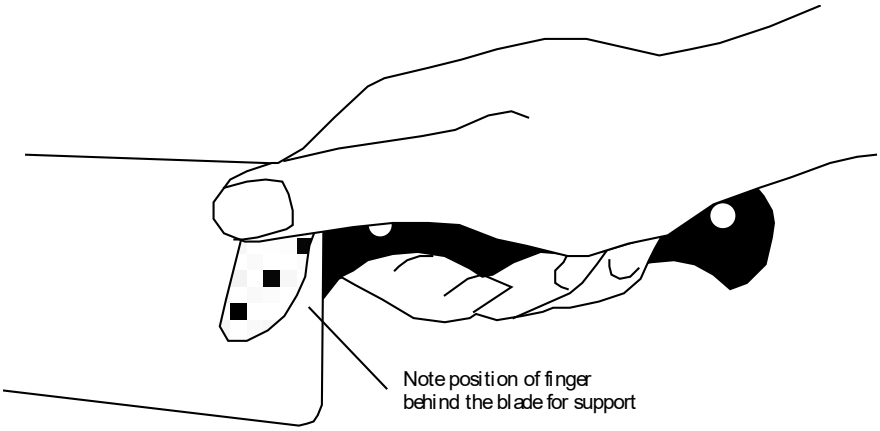
HOLDING A KNIFE

The most secure way to grip a knife is by gripping the top of the blade firmly between your thumb and forefinger. Place your middle finger just behind the heel. This grip may take some getting used to, but it gives you maximum control over your knife and allows you to pivot from the wrist when chopping.

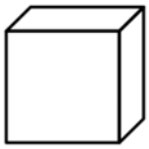
Top View—Some cooks prefer to grip the knife by the handle, allowing the thumb and index finger to rest on the blade for support. However, an individual's preference to hold the knife in other ways is acceptable.



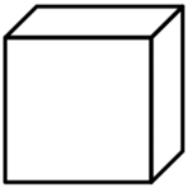
Side View - Note: The finger is placed behind the blade to provide stability.



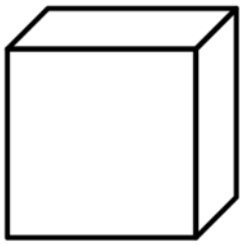
BASIC KNIFE CUTS



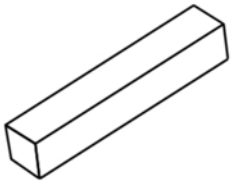
Small Dice
1/4" cube



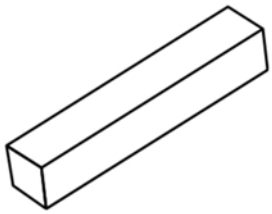
Medium Dice
1/2" cube



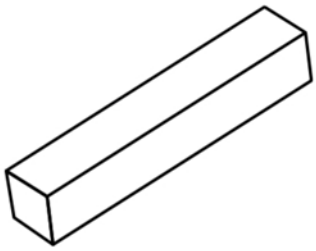
Large Dice
3/4" cube



Fine Julienne
1/16" sq x 2 inch



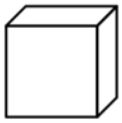
Julienne
1/8" sq x 2 inch



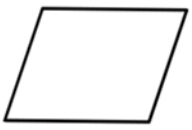
Batonnet
1/4" sq x 2 inch

Mince
<1/16" cube

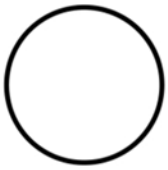
Chop
1/8"-1/4" cube



Brunoise
1/8" cube (fine dice)



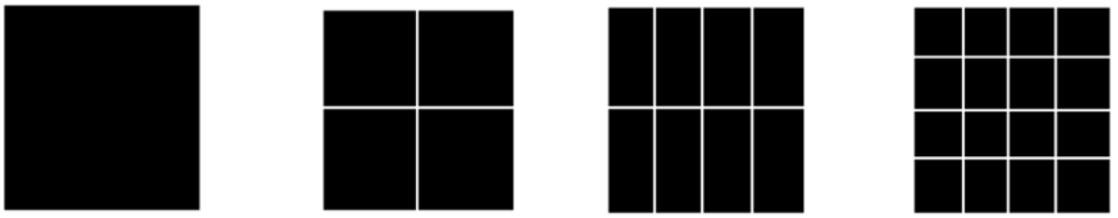
Bias
diagonal cut



Rondelle
1-8"-1/2" round

Chiffonade
rolled, sliced thin

CONVERSION TABLES



1 gallon = 4 quarts = 8 pints = 16 cups

1 gallon=128 oz. 1 qt.=32 oz. 1 pt.=16 oz. 1 cup=8 oz.

METRIC WEIGHTS AND MEASURES EQUIVALENCIES

1 gram (g)	**=**	1/28 oz. (or 0.035 oz.)
½ ounce (oz.)	**=**	14 g
1 ounce	**=**	28.35 g. (approx. 30 g)
2 ounces	**=**	56 g. (approx. 60 g)
4 ounces	**=**	110 g
6 ounces	**=**	170 g
8 ounces	**=**	225 g
12 ounces	**=**	340 g
1 pound (lb.)/ 16 oz.	**=**	453.6 g (454 g)
1 kilogram (kg)	**=**	2.21 lb.
1 liter (L)	**=**	35 fl. oz. (1 ¾ pt.)

Metric Conversion Table

To Change…	To…	Multiply by
Pounds	Grams	453.6
Ounces	Grams	28.35
Pounds	Kilograms	.45
Teaspoons (tsp.)	Milliliters (ml)	5
Tablespoons (Tbsp.)	Milliliters	15
Fluid Ounces	Milliliters	30
Cups	Liters	.24
Pints (pt.)	Liters	.47
Quarts (qt.)	Liters	.95
Gallons (gal.)	Liters	3.8
Fahrenheit (°F)	Celsius (°C)	5/9 after subtracting 32*

**Example: 9°F above boiling equals 5°C above boiling.*

Temperature Equivalencies

Fahrenheit (°F)	Celsius (°C)	Classification
250	130	very cool
300	150	low
325	165	moderate-low
350	180	moderate
400	200	moderate-hot
425	220	hot
450	230	very hot

US Customary Liquid Volume Conversions

1 tablespoon	=	3 teaspoons
1 fluid ounce	=	2 tablespoons
1 cup	=	8 fluid ounces
1 pint	=	2 cups
1 pint	=	16 fluid ounces
1 quart	=	2 pints
1 gallon	=	4 quarts
1 gallon	=	128 fluid ounces

US to Metric Dry Measures Conversions

tsp.	Tbsp.	oz.	cup	lb.	grams
3	1	½	1/16	---	14
6	2	1	⅛	1/16	28
12	4	2	¼	⅛	57
24	8	4	½	¼	113
36	12	6	¾	⅜	170
48	16	8	1	½	227
96	32	16	2	1	454

Volume Measure Conversions

US	Metric
1 teaspoon	5 ml
1 tablespoon	15 ml
1 fl. oz./ 2 Tbsp.	30 ml
2 fl. oz./ ¼ cup	60 ml
8 fl. oz./ 1 cup	240 ml
16 fl. oz./ 1 pint	480 ml
32 fl. oz./ 1 quart	960 ml
128 fl. oz./ 1 gallon	3.84 L

Hotel/ Steamtable Pan Capacity

Pan Size		Full Pan Capacity		85% Pan Capacity	
		Quarts	Cups	Quarts	Cups
Full Size	12" x 20" x 2 ½"	8 ¼	33	7	28
	4"	14	56	12	48
	6"	21	84	18	72
Half Pan	12" x 10" x 2 ½"	4	16	3 ½	14
	4"	6 ½	26	5 ½	22
	6"	9 ½	38	8	32
Third size	12" x 6" x 2 ½"	2 ⅖	9 ⅗	2	8
	4"	3 ⅞	15 ½	3 ¼	13
	6"	6	24	5	20 ½
Fourth Size	10" x 6" x 2 ½"	1 ⅞	7 ½	1 ½	6 ⅜
	4"	3	12	2 ½	10
	6"	4 ½	18 ¼	3 ⅞	15 ½
Sixth Size	6" x 6" x 2 ½"	1 ¼	5	1	4 ¼
	4"	1 ⅞	7 ½	1 ½	6 ⅜
	6"	2 ¾	11	2 ⅓	9 ⅓

Scoops

The number on the scoop indicates how many level scoops make one quart.

Scoop #	Measure	Weight in fl. oz.	Scoops per Cup
4	1 cup	8	1
5	¾ cup	6.4	1 ¼
6	⅔ cup	5.3	1 ½
8	½ cup	4	2
10	⅜ cup	3.2	2 ½
12	⅓ cup	2.6	3
16	¼ cup	2	4
20	3 ⅓ Tbsp.	1.6	5
24	8 tsp.	1.33	6
30	2 Tbsp.	1	7 ½
40	1 ⅔ Tbsp.	.75	10
50	3 ¾ tsp.	.64	12 ½
60	1 Tbsp.	.5	15
70	2 ¾ tsp.	.45	17.5
100	2 tsp.	.32	25