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MENUS, RECIPES, AND COST MANAGEMENT

A menu is a list of dishes served or available to be served at a meal. But a menu is more than this. It is an important management tool. Nearly every aspect of the operation of a food-service business depends on the menu. In fact, it is fair to say the menu is the single most important document in the business. Purchasing, production, sales, cost accounting, labor management, even the kitchen layout and equipment selection of a new facility—all are based on the menu.

Recipes can be said to be the building blocks of the menu. Each item on the menu can be represented by the recipe or the procedure for preparing it. Therefore, recipes, like menus, are important management tools. They indicate ingredients to be purchased and stored, and they give measuring and preparation instructions to the kitchen staff.

In addition, recipes are important tools for the cook because they are a means of recording and passing along essential information. Learning to cook without being able to consult recipes would be like learning to play the piano without using written music.

This chapter discusses menus and recipes as they are used in commercial kitchens. How do we construct a menu that builds sales by offering the best choices to the customer and that also promotes efficiency and productivity? How do we read and understand recipes? How do we measure ingredients and portions, convert recipes to different yields, and calculate food cost with the aid of written recipes?

AFTER READING THIS CHAPTER, YOU SHOULD BE ABLE TO

1. Describe the principal types of menus, their organization, and construction.
2. Describe the structure and functions of food service recipes, including standardized and instructional recipes.
3. Measure ingredients and portions in U.S. and metric units.
4. Perform basic kitchen math, including converting recipes and calculating food cost.



MENUS

MENU FORMS AND FUNCTIONS

Menus must be planned for the people eating the food. This sounds like a simple rule, but it is frequently forgotten. You must never forget the customer is the main reason for being in business.

This rule means that, in most operations, the taste and preferences of the cooks or chefs are of less importance when planning the menu. True, some of the most famous restaurants exist primarily as showcases for the chef's own artistry, but these are a small percentage of all food-service establishments. Instead, the taste and preferences of the clientele must be given top priority if the business is to succeed. The kind of clientele the business serves influences the form the menu takes.

The Clientele

Type of Institution

Each kind of operation has a different menu because each serves the needs of a different clientele.

Hotels must provide a variety of services for their guests, from budget-minded tourists to businesspeople on expense accounts. Thus, their offerings may range from quick breakfast and sandwich counters to elegant dining rooms and banquet halls.

Hospitals must satisfy the dietary needs of the patients.

Schools must consider the ages of the students and their tastes and nutritional needs.

Employee food services need menus that offer substantial but quickly served and reasonably priced food for working customers.

Catering and banquet operations depend on menus that are easily prepared for large numbers but that are lavish enough for parties and special occasions.

Fast-food and take-out quick-service operations require limited menus featuring inexpensive, easily prepared, easily served foods for people in a hurry.

Full-service restaurants range from simple neighborhood diners to expensive, elegant restaurants. Menus, of course, must be planned according to the customers' needs. A menu of high-priced, luxurious foods in a café situated in a working-class neighborhood will probably not succeed.

Customer Preferences

Even facilities with captive audiences, such as school cafeterias and hospital kitchens, must produce food that is appealing to their customers and in sufficient variety to keep those customers from getting bored with the same old things. Grumbling about the food is a favorite sport among students, but at least it can be kept to a minimum.

Restaurants have an even harder job because their customers don't just grumble if they don't like the selections. They don't come back. People are becoming more and more interested in trying unfamiliar foods, especially ethnic foods. Nevertheless, tastes vary by region, by neighborhood, by age group, and by social and ethnic background. Foods enjoyed by some people are completely rejected by others.

Prices must be kept in line with the customers' ability and willingness to pay. Prices, of course, place limits on what foods can be offered.

Kind of Meal

Menus vary not only by kind of operation but by meal as well.

Breakfast

Breakfast menus are fairly standard within any one country. In North America, for example, a restaurant has to offer the usual selection of fruits, juices, eggs, cereals, breads, pancakes, waffles, breakfast meats, and regional specialties because this is what customers want and expect. In addition, featuring one or two unusual items on the menu—such as an English muffin topped with creamed crabmeat and a poached egg, a special kind of country ham, or an assortment of freshly made fruit

sauces or syrups for the pancakes and waffles—often attracts additional customers. Breakfast menus must feature foods that can be prepared quickly and eaten in a hurry.

Lunch

The following factors are important to consider when planning lunch menus:

1. Speed.

Like breakfast customers, luncheon diners are usually in a hurry. They are generally working people who have limited time to eat. Foods must be prepared quickly and be easy to serve and eat. Sandwiches, soups, and salads are important items on many lunch menus.

2. Simplicity.

Menu selections are fewer, and fewer courses are served. In many cases, customers select only one course. Luncheon specials—combinations of two or three items, such as soup and a sandwich or omelet and salad, offered at a single price—satisfy the need for simplicity and speed.

3. Variety.

In spite of the shortness of the menu and the simplicity of the selections, luncheon menus must have variety. This is because many customers eat at the same restaurant several times a week or even every day. In order to keep the menu short, many operations offer several luncheon specials every day, so there is always something new on the menu.

Dinner

Dinner is usually the main meal and is eaten in a more leisurely fashion than either breakfast or lunch. Of course, some people are in a hurry in the evening, too, but, in general, people come to a restaurant to relax over a substantial meal. Dinner menus offer more selections and more courses. Not surprisingly, prices and check averages are also higher than at lunch.

Types of Menus

Static and Cycle Menus

A **static menu** is one that offers the same dishes every day. These menus are used in restaurants and other establishments where the clientele changes daily or where enough items are listed on the menu to offer sufficient variety. A static menu may be in place indefinitely, or it may change at regular intervals, such as every season, every month, or even every week.

Some restaurants use a menu that is part static and part variable. This means they have a basic menu of foods prepared every day, plus daily specials to offer variety without putting too much strain on the kitchen. The daily specials may take advantage of seasonal produce and other occasionally available foods the chef or purchaser finds in the wholesale market.

A **cycle menu** is one that changes every day for a certain period; after this period, the daily menus repeat in the same order. For example, a seven-day cycle menu has a different menu every day for a week and repeats each week. This kind of menu is used in such operations as schools and hospitals, where the number of choices must be kept small. The cycle menu is a way of offering variety.

À la Carte and Table d'Hôte

An **à la carte** menu (Fig. 4.1) is one in which each individual item is listed separately, with its own price. The customer makes selections from the various courses and side dishes to make up a meal. (Note: The term **à la carte** is also used to refer to cooking to order, as opposed to cooking ahead in large batches.)

Table d'hôte (tobbluh dote) originally meant a fixed menu with no choices—like a meal you would be served if you were invited to someone's home for dinner. Banquet menus are familiar examples of this kind of menu. The term has also come to mean a menu that offers a selection of complete meals at set prices. In other words, a customer may choose from among several selections, each of which includes an entrée and side dishes plus other courses, such as appetizer, salad, and dessert. Each full meal selection has a single package price.

Many restaurants use a combination of à la carte and table d'hôte selections. For example, a steak house may include salad, potato, vegetable, and beverage with the entrée choice, while additional dishes like appetizers and desserts may be offered at extra cost.

<i>Appetizers</i> SOUP OF THE DAY MARKET PIADINA SERVED WITH ROASTED FRUIT, SAGE HONEY AND ARTISAN BLUE CHEESE \$10.50 BISTRO HOUSE SALAD WITH BABY GREENS, BALSAMIC VINAIGRETTE AND MANCHEGO \$7.00 STAR PRAIRIE SMOKED TROUT SALAD WITH BIBB LETTUCE AND WARM HORSERADISH/CREME FRAICHE DRESSING \$10.50 CLASSIC CAESAR SALAD WITH BABY ROMAINE, PARMESAN AND SEMOLINA CROUTONS \$8.50 WITH OIL-PACKED SPANISH ANCHOVIES ADD \$2 SASHIMI OF TUNA SERVED ON BABY ARUGULA, PICKLED PINEAPPLE AND FRESH MINT \$12.50 BISTRO CALAMARI WITH THAI DIPPING SAUCE \$8.00 JP'S RUSTIC PIZZA WITH APPLEWOOD SMOKED BACON, CASHEW/CURRENT PESTO AND PECORINO-ROMANO \$11.00 PIZZA WITH SAN MARZANO TOMATO SAUCE, BASIL AND HOUSE-MADE MOZZARELLA \$10.50 PIZZA OF THE DAY MARKET SEARED MINNESOTA FOIE GRAS SERVED WITH CARAMELIZED SHALLOTS AND QUINCE CONFIT \$15.00 SIDES YUKON GOLD POTATO PURÉE \$4.50 OR STEAMED JASMINE RICE \$3.50 POMMES FRITES WITH SMOKED PAPRIKA OR VEGETABLE OF THE DAY \$4.50 BOWL OF OLIVES \$3.50 SPLIT PLATE CHARGE \$1.00	<i>Entrees</i> HOUSE-MADE FETTUCINI TOSSED WITH CHICKEN CONFIT, ORGANIC BROCCOLI, HARISSA AND PARMESAN \$18.50 POTATO GNOCCHI WITH ORGANIC GREEN BEANS, TOASTED HAZELNUT CREME FRAICHE, AND CHIVE OIL \$17.50 CARNAROLI RISOTTO WITH WILD MUSHROOMS, SWEET ONIONS AND GREMOLATA \$22.50 PAN-SEARED GROUPEL SERVED ON YUKON GOLD POTATO PUREE WITH BROWN BUTTER SPINACH AND BLOOD ORANGE RELISH \$27.50 WILD ACRES DUCK CONFIT RAVIOLI TOSSED WITH AN APPLE CIDER DEMI-GLACE, SHAVED APPLE AND FRIED SAGE \$19.50 SEARED RIB-EYE RUBBED WITH GREEN THAI CURRY AND SERVED WITH HOUSE-PICKLED PINEAPPLE, JICAMA AND RED ONION SALAD \$28.50 PAN-ROASTED VENISON STEAK ON YUKON GOLD POTATO PURÉE WITH ROASTED BRUSSEL SPROUTS AND A CRANBERRY RED WINE REDUCTION \$32.50 BONE-IN PORK TENDERLOIN BRAISED WITH APPLE, ONION AND SWEET CURRY, SERVED WITH GOLDEN RAISIN-RED BELL PEPPER RELISH \$24.50 SLOW-ROASTED DUCK BREAST AND CONFIT OF DUCK LEG WITH SPINACH/MANGO SALAD AND ORANGE-MISO VINAIGRETTE \$28.50 ENTRÉE OF THE DAY MARKET <i>etc.</i>
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FIGURE 4.1 An example of an à la carte menu from a fine-dining restaurant.
Courtesy of JP American Bistro, Minneapolis, Minnesota

Closely related to the table d'hôte menu is the **prix fixe** (preefeex), meaning “fixed price,” menu. On a pure prix fixe menu, only one price is given. Each guest may choose one selection from each course offered, and the total meal costs the single price indicated. Often, on such menus, a few items featuring costly ingredients carry an extra charge, called a **supplement**. The supplement is usually indicated in parentheses after the listing. It is best to limit the number of supplements as much as possible. Too many extra charges on a prix fixe menu can leave customers frustrated and angry.

A special variety of the prix fixe menu sometimes used in fine restaurants is the **tasting menu**, also known by its French name, **menu dégustation**. A tasting menu (Fig. 4.2) is offered in addition to the regular menu and gives patrons a chance to try a larger number of the chef’s creations. The menu may feature 5 or 6 or even as many as 10 or 12 individual courses served in small portions. Because of the complexity of service, a restaurant may require that the tasting menu can be served only if everyone at the table orders it. Tasting menus may change daily, depending on the chef’s choices and the availability of ingredients.

BUILDING THE MENU

A **course** is a food or group of foods served at one time or intended to be eaten at the same time. In a restaurant, the courses are normally served in sequence, allowing enough time for each to be eaten before the next is served. In a cafeteria, the customers may select all their courses at once—appetizer, salad, main dish and vegetables, and dessert, for example—but eat them in a particular order.

In the following pages, we discuss the principles that apply to planning the courses that make up a menu. The main purpose of these principles is to lend variety and interest to a meal. They are not arbitrary rules you must follow for no reason.

VEGETABLE TASTING MENU	AUTUMN TASTING MENU
ARTICHOKE BARIGOLE WITH ROASTED PEPPER, TAPENADE AND HERB SALAD	TORCHON OF FOIE GRAS WITH FIGS, PISTACHIO AND MINT
WHITE BEAN PURÉE WITH ESCAROLE, ROASTED TOMATO AND LEMON CONFIT	SEA SCALLOP WITH SALSIFY, SAUTERNES AND VANILLA
ROASTED ROOT VEGETABLES WITH SOUBISE AND TRUFFLE VINAIGRETTE	TURBOT WITH LENTILS, SAVOY CABBAGE, ROOT VEGETABLES AND RED WINE
POLENTA CAKE WITH FIGS AND WILTED GREENS	BRAISED FRESH BACON WITH MOSTARDA AND CHESTNUT-HONEY GLAZED TURNIPS
MUSHROOM TART TATIN	RACK OF LAMB WITH ARTICHOKE, TOMATO AND OLIVE GRATIN
DESSERT AMUSE	DESSERT AMUSE
TASTING DESSERT	TASTING DESSERT
PETITS FOURS	PETITS FOURS
75	90
TASTING MENUS REQUIRE THE PARTICIPATION OF THE ENTIRE TABLE	TASTING MENUS REQUIRE THE PARTICIPATION OF THE ENTIRE TABLE

FIGURE 4.2 An example of two tasting menus from a fine-dining restaurant.

Courtesy of Gramercy Tavern, New York, New York

The Classical Menu

Today's menus are descendants of elaborate banquet menus served in the nineteenth and early twentieth centuries. These menus had 12 or more courses, and the sequence in which they were served was well established by tradition.

The following sequence of courses is typical of one that may have been served at a great banquet early in the twentieth century.

- 1. Cold hors d'oeuvres.**
Small, savory appetizers.
- 2. Soup.**
Clear soup, thick soup, or broth.
- 3. Hot hors d'oeuvres.**
Small, hot appetizers.
- 4. Fish.**
Any seafood item.
- 5. Main course, or pièce de résistance.**
A large cut of roasted or braised meat, usually beef, lamb, or venison, with elaborate vegetable garnishes.
- 6. Hot entrée.**
Individual portions of meat or poultry, broiled, braised, or pan-fried, etc.
- 7. Cold entrée.**
Cold meats, poultry, fish, pâté, and so on.
- 8. Sorbet.**
A light ice or sherbet, sometimes made of wine, to refresh the appetite before the next course.
- 9. Roast.**
Usually roasted poultry, accompanied by or followed by a salad.
- 10. Vegetable.**
Usually a special vegetable preparation, such as artichokes or asparagus, or a more unusual vegetable such as cardoons.
- 11. Sweet.**
What we call *dessert*—cakes and tarts, pudding, soufflés, etc.
- 12. Dessert.**
Fruit and cheese and, sometimes, small cookies or petits fours.

Modern Menus: Courses and Arrangement

Such extensive classical menus are rarely served today. Even grand, elegant banquets comprising many courses are usually shorter than the menu we just described. However, if you study that menu, you will be able to see the basic pattern of modern menus hiding amid all those courses.

The main dish is the centerpiece of the modern meal. If the meal consists of only one dish, it is considered the main course, even if it is a salad or a bowl of soup. There is usually only one main course, although large banquets may still have more than one, such as a poultry dish followed by a meat dish.

One or more dishes may be served before the main dish. These are usually light in character so the customer is not satiated before the main course.

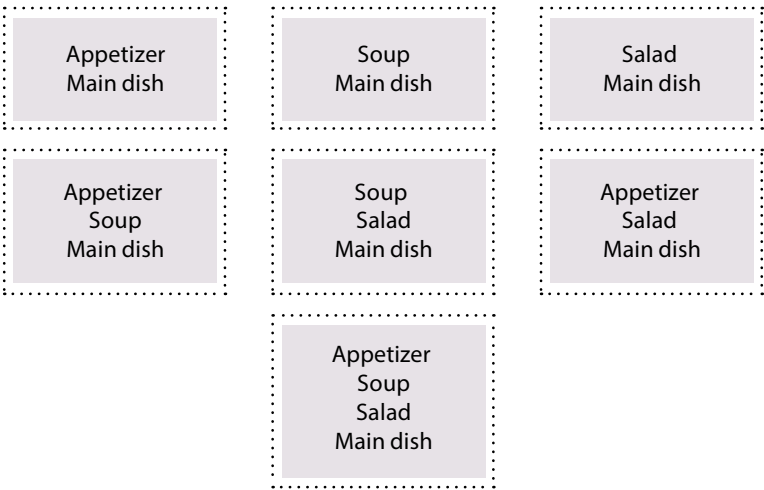
Study the following outline of the modern menu and compare it to the classical menu. The notes that follow explain several aspects that may be puzzling. Then, in the next sections, we discuss how to select specific dishes for each course to arrive at a balanced menu.

The Modern Menu

First Courses	Appetizer
	Soup (Fish)
	Salad
Main Dish	Meat, poultry, or fish Vegetable accompaniment
Dessert Dishes	Salad
	Fruits and cheeses
	Sweets

Notes

- Appetizer, soup, and salad are the three courses usually served before the main course. One, two, or all three of them may be served, and they are usually served in this order. Thus, meals may have the following courses:



- A fish course is sometimes included in more formal dinners, after the appetizer and soup courses. It should be a relatively small portion, and the main dish should not also be fish.
- Salads may be served either before or after the main course (but not both). In more traditional meals, they are served after the main course to refresh the appetite before the cheese and sweet courses. Serving the salad before the main course is a comparatively recent idea.
- Sometimes, one or more of the first courses are served at the same time as the main dish, possibly on the same plate. This is especially popular on luncheon menus, where quick service is desired. Thus, you will find soup and sandwich combinations, salad and omelet combinations, and so on.
- If both cheese and sweets are served for dessert, they may come in either order. English menus have cheese after the sweets, while French menus generally place the sweets last.

Variety and Balance

Balancing a menu means providing enough variety and contrast for the meal to hold interest from the first course to the last. To balance a menu, you must develop a feeling for which foods complement each other or provide pleasing contrasts. And you must avoid repeating flavors and textures as much as possible.

These principles apply whether you are planning a banquet menu, where the diners have no choices; a school cafeteria menu, where students have only a few choices; or a large à la carte menu, where customers have many choices. Of course, with an à la carte menu, the customers' own choices determine how balanced their meals are. There's nothing wrong with listing a creamed dish among the appetizers and another creamed dish among the main dishes. But you should offer enough choices so customers can easily select balanced meals if they desire. In other words, if half the appetizers and half the entrée selections are served in a cream sauce, you're not offering enough variety.

The following factors must be considered in balancing a menu.

- 1. Flavors.** Don't repeat foods with the same or similar tastes. This applies to any predominant flavor, whether of the main ingredient, of the spices, of the sauce, and so on. For example:
 - Don't serve broiled tomato halves with the main dish if the appetizer has a tomato sauce.
 - Don't serve both a spicy, garlicky appetizer and a spicy, garlicky main dish. However, don't make everything too bland.
 - Unless you operate a specialty restaurant like a steak house or a seafood restaurant, balance the menu among meats (beef, pork, lamb, veal), poultry, and fish.
 - Acid or tart foods are often served as accompaniments to fatty foods because they help cut the fatty taste. This is why applesauce and pork, mint sauce and lamb, and orange sauce and duckling are such classic combinations.
- 2. Textures.** Texture refers to the softness or firmness of foods, their feel in the mouth, whether or not they are served with sauces, and so on. Don't repeat foods with the same or similar texture. For example:
 - Serve a clear soup instead of a thick soup if the main course is served with a cream sauce. By contrast, a cream soup goes well before a simple sautéed or broiled item.
 - Don't serve too many mashed or puréed foods.
 - Don't serve too many heavy, starchy items.
- 3. Appearance.** Serve foods with a variety of colors and shapes. Colorful vegetables are especially valuable for enlivening the appearance of meats, poultry, fish, and starches, which tend to be mostly white or brown. Creating attractive food is discussed in Chapter 30.
- 4. Nutrients.** The importance of a nutritionally balanced menu is obvious in the case of menus for hospitals and nursing homes, for example. But even à la carte menus in restaurants should provide enough nutritional variety to allow customers to select nutritionally balanced meals. Dietary health and nutrition are considered in detail in Chapter 5.
- 5. Cooking method.** Cooking methods play an important role in determining the flavors, textures, and appearance of food. For the typical full-service restaurant, it is a good idea to offer a variety of roasted, braised, grilled, sautéed, and simmered foods. Obviously, this guideline doesn't apply to specialty operations such as a barbecue restaurant or a fish-and-chips shop. Using a variety of cooking methods also eases the pressure on each department in the kitchen, as discussed in the next section.

The possible combinations of foods are so many that it is impossible to give rules that cover all of them. Besides, creative chefs are continually experimenting with new combinations, breaking old rules, and coming up with exciting menus. Years of experience, however, are required to develop this kind of creativity and a feel for what makes certain combinations work. In the meantime, pay close attention to the principles discussed.

Kitchen Capabilities and Availability of Foods

Physical conditions place limitations on your menu. Depending on your equipment, your labor force, and the foods available to you, certain items will be inconvenient, difficult, or even impossible to serve.

Equipment Limitations

Know the capacities of your equipment and plan menus accordingly. If your broiler capacity is 200 steaks an hour and you plan a banquet menu for 400 people that features broiled shrimp as an appetizer and broiled steaks as a main course, you're in big trouble.

Spread the workload evenly among your equipment. If you have ovens, a broiler, and a fryer, balance the roasted and braised items, the broiled items, and the fried items. Don't let the broiler stand idle while orders are backed up at the deep fryer. Also, using a variety of cooking methods adds variety of taste and texture to the menu.

Personnel Limitations

Spread the workload evenly among the workers. As with equipment, you don't want the fry cook to have more than he or she can handle, while the broiler cook has little to do.

Spread the workload throughout the day. Balance the cooked-to-order items against the cooked-ahead items so you don't have to do everything at the last minute.

Offer items the cooks are able to prepare. Don't put items on the menu that are above the skill level of the staff.

Availability of Foods

Use foods in season. Foods out of season are expensive and often low in quality, and their supply is undependable. Don't put asparagus on the menu if you can't get good asparagus.

Use locally available foods. Fresh seafood is an obvious example of a food that is hard to get in some regions unless you—and your customers—are willing to pay premium prices.

Menus and Cost Control

Food costs are a major part of the expenses of any food-service operation. You can't afford to throw away food any more than you can afford to throw away money. Total utilization of foods must be planned into menus. Whether or not this is done can make or break an operation.

Cost control requires not only planning but also careful arithmetic. See pages 82–93 for a discussion of kitchen mathematics as well as other factors in cost control, including the role of the menu.

Menu Terminology and Accuracy

After you have selected the items you want to include on your menu, you face the problem of what to call them. Decades ago, when the classical cuisine of Escoffier was the normal offering in fine restaurants, a standard terminology existed. Everyone knew what was meant by *Tournedos Chasseur*, *Suprême de Volaille Orly*, and *Sole Nantua*, and these terms meant the same dish on any menu. Today, however, there is little standardization. Chefs feel obliged to give as much information on their menus as possible in order to describe their dishes adequately to their customers. As a result, one often sees menu descriptions that list almost every ingredient in a dish, including the farms the ingredients came from.

It is probably better to give too much information than too little. The important thing is to provide enough information so the customer will understand the basic character of the dish and not have any unpleasant surprises. An alternative to writing everything out on the menu is to educate the serving staff so they know the dishes well enough to fill in any missing details for the customer.

The menu is a sales tool, so it is understandable to try to make every dish sound as appealing as possible. Accurate and truthful descriptions, however, are required. Giving misleading names to menu items is not only dishonest and unfair to the customer, it is actually illegal in some localities that have adopted truth-in-menu laws, and you can be prosecuted for fraud for doing so. Furthermore, customers who feel confused or cheated may not come back.

Calling something chicken salad if it is made with turkey, veal cutlet if it is made with pork, or whipped cream if it is actually artificial whipped topping is such obvious mislabeling that it can hardly be accidental. However, some kinds of menu inaccuracies result not from intentional deception but from simple misunderstanding. In particular, look out for these types of labeling problems:

1. Point of origin.

If your menu lists “Maine lobsters” or “New Brunswick lobsters,” they must be from Maine or New Brunswick. Roquefort dressing must be made with Roquefort cheese from Roquefort, France. On the other hand, generally accepted names or names that indicate type rather than origin can be used. For example: Swiss cheese, French bread, Swedish meatballs.

2. Grade or quality.

U.S. Choice and Canada A are names of grades, and you’d better be using those grades if you say you are. Incidentally, the word prime in “prime rib” indicates a cut, not a grade.

3. Cooking method.

A menu item described as “grilled” or “roasted” should be cooked by the method indicated. Billing a pan-fried item as “roasted” because it sounds better on the menu misrepresents the item and risks disappointing the customer.

4. “Fresh.”

If you call something **fresh**, it must be fresh, not frozen, canned, or dried. There is no such thing as “fresh frozen.”

5. Origin.

Chefs and restaurateurs who champion local food sources and farm-to-table cuisine (p. 6) often include the sources of ingredients, such as names of farms, on the menu. It is essential that the sources listed be accurate. Similarly, an item labeled *imported* must come from outside the country. Better and more specific than using the term *imported* is to indicate the country of origin.

6. “Homemade.”

The word **homemade** means the item was made on the premises. Adding a few fresh carrots to canned vegetable soup does not make it homemade.

7. “Organic.”

For a food to be labeled **organic**, it must be raised without the use of hormones, antibiotics, synthetic pesticides, irradiated components, genetically modified organisms, or reprocessed sewage. In some countries, including the United States, the use of the word **organic** on labels is defined by law (p. 282).

8. Size or portion.

If you indicate a portion size on the menu, be sure you serve that size (within allowable tolerances). A “10-ounce steak” must weigh at least 10 ounces before cooking. “Jumbo shrimp” are not just big shrimp. They are a specific size.

9. Appearance.

Family-style restaurants that use illustrated menus should serve food that looks like the illustrations. If an illustration of a shrimp plate shows six shrimp, it would be a mistake to serve only five.

Here are other examples of common violations of menu accuracy principles:

Listing “maple syrup” and serving maple-flavored syrup.

Listing a product, such as a carbonated beverage, by brand name and serving another brand.

Listing “butter” and serving margarine.

Listing coffee or breakfast cereal “with cream” and serving milk or artificial cream.

Listing “ground round” and serving other ground beef.

Finally, please use a dictionary. Unfortunately, it is common to see menus full of misspellings. These errors reflect poorly on the restaurant. Customers may think that if you don’t care enough even to spell words on the menu correctly, you may not care enough to cook the food correctly, either. If you use terms from French, Italian, or another language, make sure the terms are spelled and used correctly.

CONTROLLING FOOD COSTS

Calculating food costs is a critical part of the business of selling and serving food. Later in this chapter we explore the basic mathematics of determining these costs. But cost control is much more than calculating costs. Cost control involves every phase of the operation, from purchasing to service, but it begins with menu planning.

Menu Planning

A well-planned menu takes care to utilize ingredients efficiently and in a way that avoids waste. When writing a menu, consider the following guidelines for total utilization of foods.

1. Use all edible trim.

Unless you use only portion-controlled meats, poultry, and fish and only frozen and canned vegetables, you will have edible trim. You can either throw it away and call it a loss, or you can use it and make money on it.

Plan recipes that utilize these trimmings and put them on the menu. For example:

- Use small meat scraps for soups, chopped meat, pâtés, creamed dishes, croquettes.
- Use larger meat trimmings for soups, stews, braised items.
- Use bones for stocks, soups.
- Use vegetable trimmings for purées, soups, stews, stocks, and fillings for omelets and crêpes.
- Use day-old breads for stuffings, breading, French toast, croutons, and meat extenders.

2. Don't add an item to the menu unless you can use the trimmings.

This is really the same as the preceding item, looking from the opposite angle. In other words, don't put rissole potatoes on your menu unless you also plan to serve an item that uses the trimmings, such as whipped potatoes or croquettes.

3. Plan production to avoid leftovers.

The best way to use leftovers is not to create them in the first place. Handling food twice—once as a fresh item and once as a leftover—is more expensive and time-consuming than handling it once, and it almost always results in loss of quality. Limited menus—that is, with fewer selections—decrease the likelihood of leftovers.

4. Plan ahead for use of leftovers.

Careful planning of production can keep leftovers to a minimum. But some leftovers are almost inevitable, and it's better for your costs to use them than to throw them out.

Whenever you put an item on the menu that could become a leftover, you should have a recipe ready that will use it. This is better than being surprised with leftovers you don't know what to do with.

For example, if you served roast chicken for dinner one day, you might plan on chicken salad for a luncheon special the next day.

Remember to handle all leftovers according to proper sanitary procedures.

5. Avoid minimum-use perishable ingredients.

Minimum-use ingredients are those that are used in one or two items on your menu. For example, an operation might serve chicken breast topped with sautéed mushrooms but not use mushrooms in any other item. When the ingredient is perishable, the result is a high percentage of spoilage or waste.

This situation can be remedied in any of three ways:

- Change the recipe to eliminate the minimum-use ingredient.
- Eliminate the item from the menu.
- Add other items to the menu using the ingredient.

Be careful not to unbalance the menu, however, by using an ingredient in too many dishes. Try to avoid both extremes.

Purchasing and Managing Inventory

Par stock is the inventory of goods an operation must have on hand to continue operating between deliveries. It is important to maintain a proper par stock to avoid running out of essential items. However, it is costly to maintain a larger inventory than necessary. This is partly because some of

your operating cash is tied up in unused inventory. Second, excessive inventory of perishable items can lead to spoilage and thus to loss. Accurate forecasting of future business, based on careful study of past business, is key to managing inventory and establishing par stock.

Carefully write specifications for each item purchased so the item is described accurately. Compare price and quality offered by several vendors in order to get the best quality for the best price. Order from up-to-date quotes and price lists.

Receiving

Pay careful attention to receiving procedures:

- Schedule receipts so an employee can devote full attention to checking the shipment without being rushed. Try to schedule deliveries so they don't arrive at the same time. If the employee receiving the goods has kitchen duties as well, schedule deliveries during off hours so he or she has adequate time to check the shipments.
- Check the delivery immediately, while the driver is there. Don't allow the driver to unload the shipment and depart, leaving the order on the loading dock.
- Compare the delivery invoice to the order forms to make sure the right goods are delivered.
- Compare the delivery invoice to the actual goods received to make sure you have received everything you are paying for. Keep a scale at the receiving entrance so items can be checked for proper weight.

Check the delivery for quality:

- Check the temperature of refrigerated goods.
- Check the temperature of frozen goods, and check for signs of thawing and refreezing.
- Check all perishables for freshness.
- Check all containers and packaging for damage.
- Immediately transfer all goods to proper storage.

Storing

Proper storage is essential to avoid spoilage and loss of food items. The basic principles of storing dry foods, refrigerated foods, and frozen foods are detailed in Chapter 2 (pp. 27–28). In addition, storage of specific categories of foods, especially meats, poultry, seafood, produce, and dairy products, is included in the discussions of each. Consult the index for further references.

Measuring and Other Cooking Procedures

As discussed later in this chapter, the concept of measurement applies to two principal areas: measurement of ingredients in recipe preparation and measurement of portions to be served, also known as portion control. The fundamentals of both types of measurement are explained later in this chapter (pp. 78–81).

Measurement is an indispensable part of good kitchen procedures. Think of measurement as part of your basic cooking procedures, not as something separate. All cooking procedures, including measuring, combine to help control food costs, because proper cooking procedures help avoid waste due to improperly prepared foods. For example, lack of attention at the grill station often results in meats returned by the customer for being overcooked. Having to discard and replace badly cooked foods greatly increases food cost.

Serving

All the cook's attention to measurement and portion control goes for nothing if a server drops the plate on the way to the dining room. A well-trained serving staff is an important part of controlling food costs. Serving staff must be trained in serving techniques and in portion control for those items, such as desserts or salads, they are responsible for plating. Servers must understand the menu well so they can explain each item to customers and avoid returned dishes. The chef often may wish to sell more of some items than others as part of inventory and cost control, so serving staff must also be trained to be effective but pleasant salespeople. The demands made on the service personnel can best be met when the chef and the service manager cooperate in their training.



KEY POINTS TO REVIEW

- How do the contents and design of a menu depend on the type of meal served and the type of food-service institution using it?
- What is a static menu? a cycle menu? an à la carte menu? a table d'hôte menu?
- What courses are usually listed on a modern dinner menu?
- What techniques can you use to create a menu that offers a good balance of choices for the customer?
- Why should the design and limitations of the kitchen and the skill level of the staff be considered when designing a menu?
- What are some good ways to keep food costs as low as possible?

RECIPES

A **recipe** is a set of instructions for producing a certain dish. In order to duplicate a desired preparation, it is necessary to have a precise record of the ingredients, their amounts, and the way in which they are combined and cooked. This is the purpose of a recipe.

In spite of their importance, written recipes have many limitations. No matter how detailed a recipe may be, it assumes you already have certain knowledge—that you understand the terminology it uses, for example, and that you know how to measure ingredients.

THE USES AND LIMITATIONS OF RECIPES

Many people believe learning to cook means simply learning recipes. Knowledgeable cooks, in contrast, are able to prepare food without written recipes, if they have to, because they have a good understanding of basic principles and techniques. A recipe is a way of applying basic techniques to specific ingredients.

If you have already read Chapter 6, or have even casually leafed through this book, you know it is not just a book of recipes. Although it contains hundreds of recipes, they take up a relatively small part of it. Your main concern is learning techniques and procedures you can apply to any recipe.

The main purpose of learning basic cooking principles is not to be able to cook without recipes, however, but to understand the recipes you use. As we said in the beginning of this section, every recipe assumes you have certain knowledge that enables you to understand the instructions and follow them correctly.

Some recipes supply very little information, and some supply a great deal. But no matter how detailed it is, a written recipe can't tell you everything, and some judgment by the cook is always required. There are several reasons for this:

1. Food products are not uniform.

Food ingredients are natural products, so they are not uniform like machine bolts, ballpoint pens, and printer paper. One tomato may be riper than another, one carrot more tender or sweeter than another, one oyster saltier than another. Such variations may affect how the ingredients are handled, how long they are cooked, what proportions are needed, and how much seasoning is required.

2. Kitchens do not have the same equipment.

Different pans distribute heat at different rates. Different broilers heat to different temperatures. Liquid evaporates from wide pots faster than from tall, narrow ones, and so on.

3. It is impossible to give exact instructions for many processes.

How do you set the burner if the instructions say, "Cook over medium heat"? How thick is a "thick" sauce? How long do you broil a rare steak? Training and experience will help you learn to make accurate judgments about such questions.

The difference between an experienced cook and a beginning cook is the ability to make judgments about these variables.

STANDARDIZED RECIPES

1. Definition.

A **standardized recipe** is a set of instructions describing the way a particular establishment prepares a particular dish. In other words, it is a customized recipe developed by an operation for the use of its own cooks, using its own equipment, to be served to its own patrons.

2. The structure of a standardized recipe.

Recipe formats differ from operation to operation, but nearly all of them try to include as much precise information as possible. The following details may be listed:

- Name of the recipe.
- Yield, expressed as total yield (volume or weight), or number of portions and portion size.
- Ingredients and exact amounts, listed in order of use. Exact description of ingredients is included.
- Directions for preparing or fabricating each ingredient, such as trimming and cutting instructions.
- Expected trim yields for any produce or other ingredients that must be fabricated.
- Equipment needed, including measuring equipment, pan sizes, portioning equipment, and so on.
- Directions for preparing the dish. Directions are kept as simple as possible.
- Preparation and cooking temperatures and times.
- Directions for portioning, plating, and garnishing.
- All necessary food safety instructions, including critical storage, holding, and cooking temperatures and cleaning and sanitation procedures. See discussion of Critical Control Points below and on pages 33–34.
- Directions for breaking down the station, cleaning up, and storing leftovers.

3. The function of standardized recipes.

An operation's own recipes are used to control production. They do this in two ways:

- **They control quality.** Standardized recipes are detailed and specific. This is to ensure the product is the same every time it is made and served, no matter who cooks it.
- **They control quantity.** First, they indicate precise quantities for every ingredient and how they are to be measured. Second, they indicate exact yields and portion sizes, and how the portions are to be measured and served.

By controlling quality and quantity, recipes are a key tool in controlling costs.

4. The limitations of standardized recipes.

Standardized recipes have the same problems as all recipes—the problems we discussed earlier regarding variations in foods and equipment and vagueness of instructions. These problems can be reduced by writing the recipe carefully, but they cannot be eliminated. Even if an operation uses good standardized recipes, a new employee making a dish for the first time usually requires supervision to make sure he or she interprets the instructions the same way as the rest of the staff. These limitations don't invalidate standardized recipes. If anything, they make exact directions even more important. But they do mean that experience and knowledge are still very important.

Table 4.1 gives an example of a standardized recipe based on a recipe in this book. Compare and note the differences between this recipe and the instructional recipes in this book (explained in the following section). In particular, note the following differences:

- There are no metric units. Because this recipe is designed for a single kitchen that always uses U.S. measures, only one set of measurements is needed.
- The procedure appears below the ingredients rather than in a column to the right. An operation can choose any recipe format, but the operation using this recipe wants to emphasize collecting and measuring all ingredients before beginning to cook.
- The recipe includes Critical Control Points. The operation using this recipe has established a HACCP system. Food safety instructions are included as part of the standardized recipe. (Read or review the section on HACCP, pp. 33–35, if necessary.)

TABLE 4.1 Chicken Breasts Parmesan

Portion size: 1 chicken breast, 4 oz Total yield: 12 portions		
Quantity	Ingredients	Equipment
4 oz	Flour	2 half-size hotel pans
1¼ tsp	Salt	one 2-qt stainless-steel bowl
½ tsp	Ground white pepper	1 wire whip
5	Whole eggs, size large	1 meat mallet
3½ oz	Grated parmesan cheese	four 12-in. sauté pans
1½ oz	Whole milk	1-oz ladle
12	Boneless, skinless chicken breasts, 4 oz each	tongs
4 oz	Clarified butter	plastic wrap instant-read thermometer, sanitized
For Service		
12 slices, ⅛ inch thick	Fresh lemon (washed before slicing)	full-size hotel pan

PROCEDURES

ADVANCE PREP

- CCP 1. Collect and measure all ingredients. *Refrigerate eggs, cheese, milk, and chicken at 40°F or lower until needed.*
2. Collect all equipment.
3. Place the flour in the hotel pan. Season with the salt and white pepper.
4. Break the eggs into the stainless-steel bowl and discard the shells. Beat with the wire whip until foamy. Add the grated cheese and milk. Mix in with the whip.
- CCP 5. *Cover the bowl with plastic wrap and refrigerate at below 40°F until needed.*
6. Flatten the chicken breasts lightly with the meat mallet until ½ in. thick. Place the breasts in a hotel pan.
- CCP *Cover with plastic wrap. Refrigerate at below 40°F until ready to cook.*
- CCP 7. *Clean and sanitize the mallet and the work surface. Wash hands thoroughly.*

COOKING

8. Place one of the sauté pans over moderate heat. Allow to heat 2 minutes.
9. Measure 1 oz clarified butter into the pan.
10. One at a time, dip 3 chicken breasts in the seasoned flour until completely coated on both sides. Shake off excess. Dip in the egg mixture.
- CCP Coat both sides completely. *Return remaining chicken and egg mixture to refrigerator.*
- CCP 11. Place the 3 breasts in the sauté pan. *Wash hands after handling the raw chicken and before handling cooked food.*
- CCP 12. Cook the chicken over moderate heat until golden brown on the bottom. Using the tongs, turn over and continue to cook *until chicken reaches an internal temperature of 165°–170°F. Test internal temperature with sanitized instant-read thermometer.*
- CCP 13. Repeat with the remaining chicken breasts, using clean sauté pans. *If your work is interrupted before completion, cover and refrigerate chicken and egg mixture.*
14. Arrange in single layer in hotel pan. Top each chicken breast with 1 slice of lemon, placed in center of breast.
- CCP 15. Send pan of chicken breasts immediately to steam table in hot buffet line. *Ensure that steam table is turned on and food maintains an internal temperature of 145°F.*
- CCP 16. *Discard leftover egg mixture and seasoned flour. Do not use for any other products. Clean and sanitize all equipment.*

INSTRUCTIONAL RECIPES

Recipes published in cookbooks and textbooks are different from standardized recipes, because they are not designed for use in a single specific kitchen. The recipes in this book are used in a great variety of situations and in different ways.

The purpose of a standardized recipe is to direct and control the production of a particular food item. Directions must be as complete and exact as possible.

The purpose of the instructional recipes in this book is to teach basic cooking techniques. They provide an opportunity for you to practice, with specific ingredients, the general procedures you have learned.

If you glance at any of the recipes in this book, you will see they do not contain all the features of a standardized recipe, as described in the previous section. In particular, you will see the following differences:

1. Instructions for preparation.

In most cases, recipes in this book follow a discussion of a basic procedure. The recipes are examples of the general procedure, and they give you experience in applying what you have learned. The information you are given in the recipe instructions is intended primarily to encourage you to think and to learn a technique, not just to turn out a product. You should consult your instructor when you have a question about a procedure.

2. Variations and optional ingredients.

Many recipes are followed by variations. These are actually whole recipes given in abbreviated terms. It is possible to write them out as separate, full-length recipes. (You are encouraged to do this before preparing a variation, as a learning experience.)

Giving recipes as variations rather than as separate recipes encourages you to see the patterns behind each. Again, you are learning techniques, not just recipes. You develop a lot more understanding of what you are doing if you see Spanish rice and Turkish pilaf, for example, or coconut cream pie and chocolate pudding as variations of the same basic techniques rather than as separate, unrelated recipes.

Your instructors may have their own variations, or they may wish to make changes in the basic recipes in order to teach you certain points. Unlike standardized recipes, instructional recipes are not engraved in stone.

COOKING WITH JUDGMENT

When you make a recipe for the first time, you should apply your knowledge and think about the recipe in relation to the skills you have. The first step in preparing a recipe is to read it carefully. Then read it again. Make sure you understand every ingredient and every instruction in the procedure. A common fault is to prepare a recipe according to what you think it says rather than what it actually says. You are especially likely to make this error if the procedure in the recipe is different from the way you usually prepare a similar dish.

After you have reread the recipe carefully, you should determine the following points:

1. What are the basic cooking methods?

When you read the recipe for Sauerbraten (p. 529), you will quickly figure out the cooking method used is braising (even if the word *braise* is never used in the recipe). Then you should review in your mind everything you know about basic braising procedures.

2. What are the characteristics of the ingredients?

If the sauerbraten recipe calls for bottom round of beef, for example, you should ask yourself, "What do I know about bottom round? Is it lean or fatty? tough or tender? How do these traits affect cooking?"

3. What are the functions of the ingredients?

What does the vinegar do in the sauerbraten recipe? What about the vegetables? the gingersnaps?

When you have gained more experience, you will be able to easily answer these questions. You will know what ingredients contribute to flavor, to texture, or to body, and how they do it.

4. What are the cooking times?

Most of the recipes in this book do not give cooking times, except as general guidelines to help you plan production. This is because cooking times are too variable to be stated exactly.

Instead, you will learn how to test for doneness by observing changes in the product. You must be able to judge when a product has reached the right temperature, the proper texture or consistency, or the desired taste.

When you learn to cook with judgment, you will be able to prepare foods with most recipes, even poorly written ones. You will be able to see what might be wrong with a new recipe



KEY POINTS TO REVIEW

- Is this statement true? “If you have a good recipe, you don’t need to know how to cook, because the recipe tells you what to do.” Explain.
- What are standardized recipes? How are they used?

before you try it and to make adjustments in it. You will know how to substitute ingredients or use different equipment. You will even be able to create new recipes.

Remember we said that some recipes supply very little information and depend largely on the cook’s knowledge. With enough experience, you will even be able to cook from recipes like the following, a complete recipe for Filets of Sole Bercy, quoted in its entirety from *Le Répertoire de la Cuisine*, a favorite book used by chefs in classical French cooking: “Poached with shallots and chopped parsley, white wine and fish stock. Reduce the stock, add butter, and coat the fish, glaze.”

MEASUREMENT

Many restaurants budget a net profit of 10 percent or less. This means a sandwich selling for \$5.00 makes a profit of only 50 cents. If the cook happens to put a half-ounce too much meat in the sandwich, the operation may be losing money on it. No wonder so many restaurants go out of business. (See the sidebar on p. 88 for an explanation of net profit and gross profit.)

Careful measurement is one of the most important parts of food production. It is important for consistent quality each time a recipe is prepared and served. And it is important for cost controls.

There are two important kinds of measurement in the kitchen:

1. Ingredient measurement
2. Portion measurement, or portion control

INGREDIENT MEASUREMENT

Weight

Weighing measures how heavy an item is. Weighing is the most accurate method of measuring ingredients. It is the method used for most solid ingredients.

Accurate scales are necessary for weighing. Small portion scales are often used in the kitchen because of their convenience. Balance scales are used in the bakeshop (see p. 905 for procedure).

To be able to weigh ingredients, you must observe the difference between AP (as purchased) weight and EP (edible portion) weight.

AP weight is the weight of the item as purchased, before any trimming is done. Also known as **APQ** (as purchased quantity).

EP weight is the weight after all inedible or nonservable parts are trimmed off. Also known as **EPQ** (edible portion quantity).

Recipes sometimes specify which weight they are referring to. When they don’t, you must judge from the instructions.

1. If a recipe calls for “2 lb potatoes” and the first instruction is “scrub, peel, and eye the potatoes,” then you know AP weight is called for.
2. If the recipe calls for “2 lb peeled, diced potatoes,” then you know EP weight is called for. You will need more than 2 lb AP.

PROCEDURE for Weighing Ingredients on a Portion Scale

1. Place the receiving container, if any, on the scale.
2. Set the scale so it reads zero.
3. Add the item being weighed to the container (or place directly on the scale, if no container is used) until the scale reads the desired weight.

Volume

Volume measures how much space an item fills. Volume measures are used for liquids. Measuring a liquid by volume is usually faster than weighing it, and accuracy is good.

Solid ingredients are usually not measured by volume because they cannot usually be measured accurately by this method. One pint of chopped onions will vary considerably in weight, depending on how large or small the onions are cut and whether the pint measure is filled loosely or packed.

Dry ingredients such as flour or sugar are usually weighed in the bakeshop. However, they are sometimes measured by volume in the kitchen, when speed is more important than accuracy. To measure dry ingredients by volume, fill a dry-volume measure until the ingredient is mounded over the top. Then level it off with a spatula or other straightedge.

Very small quantities, such as $\frac{1}{4}$ teaspoon salt, may be measured by volume when the amount is too small to weigh.

Count

Measuring ingredients by count is done in these circumstances:

1. When units are in fairly standard sizes. **Examples:** 6 large eggs for a pancake batter; 8 parsley stems for a stock.
2. When serving portions are determined by numbers of units. **Examples:** 1 baked apple per portion; 6 fried shrimp per portion.

PORTION CONTROL

Portion control is the measurement of portions to ensure the correct amount of an item is served. In order for portion control to be carried out, cooks and service personnel must be aware of proper portion sizes. These are usually indicated on the house recipes and on the working menu used in the kitchen and service areas.

Portion Control in Preparation

Portion control actually begins with the measuring of ingredients. If this is not done correctly, then the yield of the recipe will be thrown off.

When portions are determined by count—1 hamburger patty, 2 tomato slices, 1 wedge of pie—then the units must be measured or cut according to instructions: 4 ounces meat per patty; $\frac{1}{4}$ -inch slices of "5 × 6" tomatoes; 8 equal wedges per pie.

Portion Control in Plating and Service

Portioning for service may be done by the cook, as in a short-order restaurant, or by the service personnel, as in a cafeteria. The following tools and techniques are used.

1. Count.

Examples: 1 slice of ham per order; 5 shrimp per order. This is accurate if cutting and other prep work have been done correctly.

2. Weight.

Example: 4 ounces of sliced ham per order. A portion scale must be at the serving station for this method of portion control.

3. Volume.

Ladles, scoops, and kitchen spoons come in standard volume sizes and are used for portioning. The exact size of the ladle or scoop needed for a portion must be determined in advance and indicated on service instructions.

Kitchen spoons, either solid or perforated, are not as accurate for portioning but are often used for convenience and speed. You must be able to judge by eye how full to fill the spoon (rounded, heaped, etc.). Check a spoonful on a portion scale from time to time to make sure you are being consistent.

4. Even division.

Examples: Cut a pie into 8 equal wedges; cut a pan of lasagne 4 × 6 to make 24 equal portions.

5. Standard fill.

Standard-size dishes, cups, or glasses are filled to a given level, as judged by eye. **Example:** a glass of orange juice. This is actually a form of volume measure.

TABLE 4.2 Abbreviations of U.S. Units in This Book

pound	lb
ounce	oz
gallon	gal
quart	qt
pint	pt
cup	cup (abbreviation not used)
fluid ounce	fl oz
tablespoon	tbsp
teaspoon	tsp
inch	in.

TABLE 4.3 Units of Measure—U.S. System

Weight

1 pound = 16 ounces

Volume

1 gallon = 4 quarts

1 quart = 2 pints
or
4 cups
or
32 fluid ounces

1 pint = 2 cups
or
16 fluid ounces

1 cup = 8 fluid ounces
1 fluid ounce = 2 tablespoons
1 tablespoon = 3 teaspoons

Length

1 foot = 12 inches

Note: One fluid ounce (usually called simply ounce) of water weighs 1 ounce. One pint of water weighs 1 pound.

UNITS OF MEASURE

The system of measurement used in the United States is complicated. Even when people have used the system all their lives, they still sometimes have trouble remembering things like how many fluid ounces are in a quart or how many feet are in a mile.

Table 4.2 lists abbreviations used in this book. Table 4.3 lists equivalents among the units of measure used in the kitchen. You should memorize these thoroughly so you don't have to lose time making simple calculations.

THE METRIC SYSTEM

The United States is the only major country that uses almost exclusively the complex system of measurement we have just described. In Canada, this system is also used, at least part of the time, although the metric system has been introduced. Other countries use a much simpler system called the **metric system**. It is possible that someday the metric system may be used in U.S. kitchens. In fact, many kitchens practicing avant-garde cuisine (p. 7) use metric measures exclusively, because of their ease of use and precision. In any case, it is useful, in this age of international influences on cooking, to be able to read and use recipes from around the world. So it is a good idea to become familiar with the metric system.

Basic Units

In the metric system, there is one basic unit for each type of measurement:

The **gram** is the basic unit of weight.

The **liter** is the basic unit of volume.

The **meter** is the basic unit of length.

The **degree Celsius** is the basic unit of temperature.

Larger or smaller units are made simply by multiplying or dividing by 10, 100, 1000, and so on. These divisions are expressed by **prefixes**. The ones you will need to know are:

kilo- (kill-o) = 1,000

deci- (dess-i) = 1/10

centi- (sent-i) = 1/100

milli- (mill-i) = 1/1,000

Once you know these basic units, there is no longer any need for complicated tables like Table 4.3. Table 4.4 summarizes the metric units you will need to know in the kitchen. (*Note:* The prefix deci- is rarely used in Canada, although the deciliter is a regularly used unit of volume in Europe.)

Converting to Metric

Most people think the metric system is much harder to learn than it really is. This is because they think about metric units in terms of U.S. units. They read there are 28.35 grams in an ounce, and they are immediately convinced they will never be able to learn metrics.

Do not worry about being able to convert between U.S. and metric units. This is a very important point to remember, especially if you think the metric system might be hard to learn.

The reason for this is simple. You will usually be working in either one system or the other. You will rarely, if ever, have to convert from one to the other. (An exception might be if you have equipment based on one system but want to use a recipe written in the other.) If U.S. kitchens change to the metric system, everyone will use scales that measure in grams and kilograms, volume measures that measure in liters and deciliters, and thermometers that indicate degrees Celsius. And everyone will use recipes that indicate these units. No one will have to worry about how many grams are in an ounce. All one will have to remember is the information in Table 4.4.

To become accustomed to working in metric units, it is helpful to have a feel for how large the units are. The following equivalents may be used to help you visualize metric units. They are not exact conversion factors. (When you need exact conversion factors, see Appendix 1.)

A **kilogram** is slightly more than 2 pounds.

A **gram** is about $\frac{1}{30}$ ounce. ($\frac{1}{2}$ teaspoon flour weighs a little less than 1 gram.)

A **liter** is slightly more than 1 quart.

A **meter** is slightly more than 3 feet.

A **centimeter** is about $\frac{3}{8}$ inch.

0°C is the freezing point of water (32°F).

100°C is the boiling point of water (212°F).

An increase or decrease of 1 degree Celsius is equivalent to about 2 degrees Fahrenheit.

Metric Recipes

Many recipe writers in the United States print exact metric equivalents in their recipes. As a result, you will see recipes calling for 454 grams potatoes, 28.35 grams butter, or a baking temperature of 191°C. No wonder many Americans are afraid of the metric system!

Kitchens in countries that use the metric system do not work with such impractical numbers, any more than cooks in the United States normally use figures like 1 lb 1¼ oz potatoes, 2.19 oz butter, or a baking temperature of 348°F. That would defeat the purpose of the metric system, which is to be simple and practical. If you have a chance to look at a French cookbook, you will see nice, even numbers like 1 kg, 200 g, and 4 dL. (Note that the metric abbreviations used in this book are consistent with common usage in Canada. Abbreviations used in Europe are somewhat different, such as lowercase l instead of uppercase L for liter.)

The metric equivalents in the recipes in this book are rounded off. What's more, they are not always rounded off in the same way. In some places, you may see 1 pound rounded off to 500 grams, in other places to 450 grams. The object is to keep the recipe proportions and the total yield as close as possible to the original while arriving at practical measurements. Unfortunately, it is not always possible to keep the proportions exactly the same because the U.S. system is not decimal-based like the metric system. In some cases, the metric quantities may produce slightly different results due to these varying proportions, but these differences are small. If you have U.S. equipment, use the U.S. units, and if you have metric equipment, use the metric units. You should rarely have to worry about converting between the two. ***Never use U.S. measures for some ingredients and metric for other ingredients in the same recipe in this book.*** Think of the U.S. and metric columns as belonging to separate recipes.

Please note that in a few recipes in this book, quantities are given in metric units only. These recipes use some of the specialty ingredients of avante-garde cuisine (p. 7) that are used in extremely small amounts. For example, dealing with a weight of 1 gram is fairly simple, while scaling its equivalent in U.S. units (approximately 0.035 oz) is comparatively difficult.

TABLE 4.4 Metric Units

Basic Units		
Quantity	Unit	Abbreviation
weight	gram	g
volume	liter	L
length	meter	m
temperature	degree Celsius	°C
Divisions and Multiples		
Prefix/Example	Meaning	Abbreviation
kilo-	1,000	k
kilogram	1,000 grams	kg
deci-	$\frac{1}{10}$	d
deciliter	0.1 liter	dL
centi-	$\frac{1}{100}$	c
centimeter	0.01 meter	cm
milli-	$\frac{1}{1,000}$	m
millimeter	0.001 meter	mm

ROUNDING OFF NUMBERS

Rounding off means bumping a number up or down to the closest number that is “clean” and easiest to work with. For example, 197 is not a round number, but 200 is. In most cases, round numbers end in one or more zeros (such as 10, 300, 6,000), although sometimes we use round numbers that end in 5.

The first step in rounding is to find the “rounding digit.” If you are rounding off to the nearest 10, your rounding digit is the tens’ place (the second digit from the right). If you are rounding to the nearest hundred, the rounding digit is the hundreds’ place.

Second, look to the place just to the right of the rounding digit. If that number is 1, 2, 3, or 4, the number is rounded down. Leave the rounding digit alone, and change all digits to the right to zero. But if the number to the right of the rounding digit is 5, 6, 7, 8, or 9, the number is rounded up. Change the rounding digit to the next higher number, and change all digits to the right to zero.

For example, 236, rounded off to the nearest ten, is 240. Thus, 240 is the closest “clean” number.”

234, rounded off to the nearest ten, is 230.

3,216, rounded off to the nearest hundred, is 3,200, while 3,278 rounded off to the nearest hundred is 3,300.



KEY POINTS TO REVIEW

- How are most recipe ingredients measured?
- What tools are used for measuring in the kitchen?
- How are portion sizes measured?
- In the metric system, what are the units of measure for weight, volume, and length?

KITCHEN MATH

Basic arithmetic skills are essential in the kitchen. This section explains the most important kinds of math problems you will have to solve in a professional kitchen.

CONVERTING RECIPES

Unless you are working in an operation that uses only its own standardized recipes, you will frequently be required to increase or decrease recipes to different quantities. Each recipe is designed to make a specific amount of finished product. This amount is called the **yield**. For example, you may have a recipe for 50 portions of Swiss steak but need only 25 portions. You need to change the yield of your recipe. This is called **converting the recipe**.

Converting recipes is an important technique. It is a skill you will probably need to use many times in this book. There is no “best” yield to write recipes for, as every operation, every school, and every individual has different needs.

CHANGING TO COMMON UNITS

Before we start converting recipe yields, we must deal with one more problem with our measuring system. As explained earlier, the U.S. system of measurement has many units that simply must be memorized: 16 ounces in a pound, 2 cups in a pint, 4 quarts in a gallon, and so on. When you are converting recipes, you often have to change back and forth between large and small units to get measurements you can work with. In most cases, the easiest way to make the calculations is to change larger units to smaller units.

- To change pounds to ounces, multiply by 16.
- To change cups to fluid ounces, multiply by 8.
- To change pints to fluid ounces, multiply by 16.
- To change quarts to fluid ounces, multiply by 32.

Note that these are the same numbers as found in Table 4.3.

After you have finished converting the recipe, you usually must convert the ounces and fluid ounces back to larger units in order to get units that are easy to work with. To do this, divide by the same numbers you used to multiply in the previous calculations. For example, to change ounces back to pounds, divide by 16.

If you divide by hand, you often get a remainder. Leave this remainder in the smaller unit. For example:

Change 60 ounces to pounds.

$$60 \div 16 = 3, \text{ with a remainder of } 12$$

$$60 \text{ oz} = 3 \text{ lb } 12 \text{ oz}$$

If you are using a calculator, you often get a decimal. In order to change the numbers to the right of the decimal point to ounces, you have to again multiply this decimal portion by 16. Either way, you end up with the same answer.

$$60 \div 16 = 3.75$$

$$0.75 \times 16 = 12$$

$$60 \text{ oz} = 3 \text{ lb } 12 \text{ oz}$$

Yields

Recipe yields are expressed in several ways. For example:

- As a total quantity. (A soup recipe that makes 3 qt; a pot roast recipe that makes 5 lb meat.)
- As a total number of portions. (A recipe for Eggs Benedict that makes 12 portions; a recipe for grilled breast of duck that makes 4 portions.)
- As a total number of portions of a specified size. (A recipe for beef stew that makes 8 portions of 6 oz each; a recipe for individual chocolate soufflés that makes 6 soufflés, 4 oz each.)

Most recipe conversions require changing the total quantity or the total number of portions. The math for doing both of these is the same. As long as the portion size stays the same, you can use either the **total quantity** or the **total number of portions** as the yield when you make your calculations.

A little later in the discussion, after you are familiar with solving these problems, we discuss how to change both the number of portions and the portion size when converting recipes.

Conversion Factors

Nearly everyone instinctively can double a recipe or cut it in half. It seems more complicated, though, to change a recipe from 10 to 18 portions, say, or from 50 to 35. Actually, the principle is exactly the same: You find a number called a **conversion factor**, and then multiply every quantity by this number.

The conversion factor can be defined as the number used to increase or decrease each ingredient when converting a recipe to a different yield. The first step in converting a recipe is to calculate the conversion factor (see Procedures for Calculating Conversion Factors and Converting Total Yields, p. 83).

In order to make these procedures clearer, let's work through the conversion of a full recipe to give you practice with the equations. The following examples are in the U.S. system of measures. For metric examples, see Appendix 4, page 1038.

In the sample recipe that follows (p. 84) are the ingredients and quantities for a sautéed beef dish. As you can see, the quantities indicated are enough to make 8 portions each.

PROCEDURE for Calculating Conversion Factors

There is only one step in this procedure:

Divide the desired yield by the old yield stated on the recipe. This formula may be written like a mathematical calculation, as on a calculator, or as a fraction:

Mathematical Calculation: $\text{New yield} \div \text{Old yield} = \text{Conversion factor}$

Fraction: $\frac{\text{New yield}}{\text{Old yield}} = \text{Conversion factor}$

Example 1: You have a recipe with a yield of 8 portions, and you want to make 18 portions.

$$18 \div 8 = 2.25$$

Your conversion factor is 2.25. If you multiply each ingredient in your recipe by 2.25, you will prepare 18 portions, not the 8 of the original recipe.

Example 2: You have a recipe that makes 20 liters of soup, and you want to make 5 liters.

$$5 \div 20 = 0.25$$

Your conversion factor is 0.25. That is, if you multiply each ingredient by 0.25, you will prepare only 5 portions.

Notice in the second example the conversion factor is a number less than 1. This is because the recipe yield is decreased. You are making the recipe smaller. This is a good way to check your math. Decreasing the recipe yield will involve a conversion factor less than 1. Increasing the yield of a recipe will involve a conversion factor larger than 1.

PROCEDURE for Converting Total Yield

1. Calculate the conversion factor as explained in the procedure given above.
2. Multiply each ingredient quantity by the conversion factor:

Old quantity $\times$ Conversion factor = New quantity

Note: In order to do this in the U.S. system, you may have to convert all weights to ounces and all volumes to fluid ounces. (This is not necessary in the metric system.) See page 82 for more explanation.

Example 1: You have a recipe for 10 portions of Broccoli Mornay requiring 3 lb AP broccoli and 2½ cups Mornay Sauce. Convert to 15 portions.

$$\frac{\text{New yield}}{\text{Old yield}} = \frac{15}{10} = 1.5$$

Broccoli: 3 lb = 48 oz

$$48 \text{ oz} \times 1.5 = 72 \text{ oz} = 4 \text{ lb } 8 \text{ oz}$$

Sauce: 2½ cups = 20 fl oz

$$20 \text{ fl oz} \times 1.5 = 30 \text{ fl oz} = 3\frac{3}{4} \text{ cups}$$

Example 2: You have a recipe for 10 portions of Broccoli Mornay requiring 1,500 grams AP broccoli and 600 mL Mornay Sauce. Convert to 15 portions.

$$\frac{\text{New yield}}{\text{Old yield}} = \frac{15}{10} = 1.5$$

Broccoli: 1,500 g $\times$ 1.5 = 2,250 g

Sauce: 600 mL $\times$ 1.5 = 900 mL

Beef Tenderloin Tips and Mushrooms à la Crème

Portions: 8		Portion size: 8 oz	
Butter	2 oz	Prepared mustard	2 tsp
Onion	4 oz	Brown sauce	1½ pt
Flour	1 tbsp	Heavy cream	1 cup
Mushrooms	½ lb	Salt	to taste
Beef tenderloin	2½ lb	Pepper	to taste
White wine	½ cup		

Let’s say we need 18 portions instead of 8. To find the conversion factor, we divide the new yield by the old yield:

$$\frac{\text{New yield}}{\text{Old yield}} = \frac{18}{8} = 2.25$$

To convert the recipe to 18 portions, we multiply each ingredient quantity by the conversion factor of 2.25.

First, to make this easier, we should change pounds to ounces and cups, pints, and quarts to fluid ounces, using the figures in Table 4.3. This is called *converting to common units of measure*, as explained earlier. For example, to change the measurement for beef tenderloin to ounces, multiply 2½ (the weight in pounds) by 16 (the number of ounces in a pound) to get 40 ounces.

The equivalents we need for this recipe are as follows:

- ½ pound equals 8 ounces
- 2½ pounds equals 40 ounces
- 1½ cup equals 4 fluid ounces
- 1½ pints equals 24 fluid ounces

In Example 1, we have substituted these equivalent quantities. Then we have multiplied all the ingredient quantities by the conversion factor to get the quantities we need for 18 portions. Check through all the calculations to make sure you follow them. The quantities for salt and pepper will still, of course, be indicated as “to taste.”

EXAMPLE 1

Ingredient	Quantity	Times	Conversion Factor	Equals	New Quantity
Butter	2 oz	×	2.25	=	4.5 oz
Onion	4 oz	×	2.25	=	9 oz
Flour	1 tbsp	×	2.25	=	2.25 tbsp or 2 tbsp plus ¾ tsp
Mushrooms	8 oz	×	2.25	=	18 oz or 1 lb 2 oz
Beef tenderloin	40 oz	×	2.25	=	90 oz or 5 lb 10 oz
White wine	4 fl oz	×	2.25	=	9 fl oz
Prepared mustard	2 tsp	×	2.25	=	4½ tsp or 1½ tbsp
Brown sauce	24 fl oz	×	2.25	=	54 fl oz or 3 pt plus 6 fl oz
Heavy cream	8 fl oz	×	2.25	=	18 fl oz or 2¼ cups

Now let’s suppose we want to find the quantities needed to give us 40 portions, 6 ounces each. Because the portion size changes, we have to add extra steps to our procedure for calculating the conversion factor. The Procedure for Calculating Conversion Factors When Portion Size Changes (p. 85) explains these steps. Then we use this new conversion factor in the same way as we did in Example 1 above. For our Beef Tenderloin Tips recipe, we first calculate our new conversion factor:

$$8 \text{ (portions)} \times 8 \text{ oz} = 64 \text{ oz}$$

Do the same calculation for the desired yield:

$$40 \text{ (portions)} \times 6 \text{ oz} = 240 \text{ oz}$$

When we divide the new yield by the old yield ($240 \div 64$), we arrive at a conversion factor of 3.75. In Example 2, we have done the conversions using the new factor of 3.75.

The new calculations, using the conversion factor of 3.75, are shown in the Example 2 table.

EXAMPLE 2

Ingredient	Quantity	Times	Conversion Factor	Equals	New Quantity
Butter	2 oz	×	3.75	=	7.5 oz
Onion	4 oz	×	3.75	=	15 oz
Flour	1 tbsp	×	3.75	=	3.75 tbsp or 3 tbsp plus 2¼ tsp
Mushrooms	8 oz	×	3.75	=	30 oz or 1 lb 14 oz
Beef tenderloin	40 oz	×	3.75	=	150 oz or 9 lb 6 oz
White wine	4 fl oz	×	3.75	=	15 fl oz
Prepared mustard	2 tsp	×	3.75	=	7½ tsp or 2½ tbsp
Brown sauce	24 fl oz	×	3.75	=	90 fl oz or 5 pt plus 10 fl oz
Heavy cream	8 fl oz	×	3.75	=	30 fl oz or 3¾ cups

PROCEDURE for Converting Factors When Portion Size Changes

1. Determine the total yield in the old recipe by multiplying the number of portions by the portion size:

$$\text{Old recipe number of portions} \times \text{Portion size} = \text{Old yield}$$

2. Determine the total yield desired (new yield) by multiplying the number of portions desired by the portion size desired.

$$\text{Desired number of portions} \times \text{Desired portion size} = \text{New yield}$$

3. Divide the new yield by the old yield. This formula may be written like a mathematical calculation, as done on a calculator, or as a fraction:

$$\text{Mathematical Calculation: New yield} \div \text{Old yield} = \text{Conversion factor}$$

$$\text{Fraction: } \frac{\text{New yield}}{\text{Old yield}} = \text{Conversion factor}$$

Example: You have a recipe with a yield of 20 portions, 4 ounces each, and you want to make 30 portions, 5 ounces each.

1. Calculate the total yield of the original recipe.

$$20 \text{ portions} \times 4 \text{ ounces} = 80 \text{ ounces}$$

2. Calculate the total yield desired.

$$30 \text{ portions} \times 5 \text{ ounces} = 150 \text{ ounces}$$

3. Divide the new yield by the old yield.

$$150 \div 80 = 1.875$$

The calculation gives us a conversion factor of 1.875. We use this conversion factor the same way as explained above, using the Procedure for Converting Total Yield.

PROBLEMS IN CONVERTING RECIPES

For the most part, these conversion procedures work well. But when you make some very large conversions—from 10 to 400 portions, for example, or from 500 to 6—you may encounter problems.

For example, you may have to make major equipment changes, like from a 2-quart saucepot to a large steam kettle. Consequently, you have to adjust your techniques and, sometimes, even ingredients. Evaporation rates may be different, thickening agents may need increasing or decreasing, seasonings and spices may have to be cut back. Sometimes quantities are too large or too small to mix properly.

This is one more example of the importance of cooking with judgment. Experienced chefs develop a feel for these problems over the years. When you make such adjustments on converted recipes, be sure to make a note of them for future reference.

Although there are no fixed rules you can learn for these adjustments, it is possible to list the most common types of problems encountered so you can be on the alert for them when making recipe conversions. In general, most of the pitfalls fall into one of the following categories.

Measuring

This is most often a problem when you are expanding small recipes, such as when you want to take a consumer recipe for 4 portions and adapt it to a high-volume operation such as a large cafeteria. Many such recipes use volume measures for both solids and liquids. As we explained earlier, volume measurement of solids is inaccurate. Of course, small inaccuracies become large ones when a recipe is multiplied. Therefore, it is important to be cautious and to test carefully when you are converting a recipe that uses volume measures for solid ingredients.

Problems also occur in the opposite situation—when converting a large-quantity recipe to a much smaller yield. This is a typical problem when adapting a quantity recipe to single-portion size for à la carte service. Some quantities in the converted recipe may be so small as to be difficult to measure.

These problems usually can be avoided when all solids are measured by weight. But such items as spices and seasonings may be too small to be measured easily by weight, unless you use a scale that is accurate to a tiny fraction of an ounce. For this reason, it is usually a good idea to cut back on spices and salt in a converted recipe. You can always add more if you taste the product and decide it needs more seasoning.

Surface and Volume

If you have studied geometry, you may remember that a cube with a volume of 1 cubic foot has a top surface area of 1 square foot. But if you double the volume of the cube, the top surface area is not doubled but is in fact only about 1½ times as large.

What in the world, you ask, does this have to do with cooking? Consider the following example.

Suppose you have a good recipe for ½ gallon cream soup, which you normally make in a small soup pot. You want to make 16 gallons of the soup, so you multiply all ingredients by a conversion factor of 32 and make the soup in a steam kettle. To your surprise, not only do you end up with more soup than you expected but also it turns out rather thin and watery. What happened?

Your converted recipe has 32 times as much volume to start, but the amount of surface area has not increased nearly as much. Because the ratio of surface area to volume is less, there is less evaporation. This means there is less reduction and less thickening, and the flavors are not as concentrated. To correct this problem, you would have to use less stock, and preferably a stock that is more concentrated.

Suppose instead that you made the expanded recipe in a tilting skillet. In this case, there is so much surface area that the liquid would evaporate very quickly, resulting in an overly thickened and overly seasoned soup.

Differences in surface area and volume can cause other problems as well. Food-service operations must be more careful than home cooks do about food spoilage and the Food Danger Zone (Chapter 2) because large volumes of food cool and heat much more slowly than small volumes do.

For the same reason, a home baker worries about keeping a bread dough warm so it will ferment, but a commercial baker worries about keeping a dough cool enough so it doesn't ferment too fast. This is because a large batch of dough has so much volume in comparison with its surface area that it tends to retain heat rather than cool quickly to room temperature.

Equipment

When you change the size of a recipe, you must often change the equipment, too. This change often means the recipe does not work in the same way. Cooks must be able to use their judgment to anticipate these problems and to modify their procedures to avoid them. The example just given, of cooking a large batch of soup in a steam kettle or in a tilting skillet, is among the kinds of problems that can arise when you change cooking utensils.

Other problems develop because of mixers or other processing equipment. For example, if you break down a salad dressing recipe to make only a small quantity, you might find there is so little liquid in the mixing machine that the beaters don't blend the ingredients properly.

Or you might have a recipe for a muffin batter you usually make in small quantities and mix by hand. When you increase the recipe greatly, you find you have too much to do by hand. Therefore, you use a mixer but keep the mixing time the same. Because the mixer does the job so efficiently, you overmix the batter and end up with poor-quality muffins.

Many mixing and stirring jobs can be done only by hand. This is easy with small quantities but difficult with large batches. The result is often an inferior product. In contrast, some handmade products are better if they are done in large batches. It is hard, for example, to make a very small batch of puff pastry because the dough cannot be rolled and folded properly.

Time

Some people make the mistake of thinking that if you double a recipe, you must also double the cooking time. That this is an error can be shown by a simple example. Assume it takes 15 minutes to cook a steak in a broiler. If you put two steaks in the broiler, it still takes 15 minutes to cook them, not 30 minutes.

If all other things are equal, cooking times stay the same when a recipe is converted. Problems arise, however, because all other things are not always equal. For example, a large pot of liquid takes longer to bring to a boil than a small pot. Therefore, the total cooking time is longer.

On the other hand, a big kettle of vegetable soup you are making ahead for tomorrow's lunch takes longer to cool than a small pot. Meanwhile, the vegetables continue to cook in the retained heat during the cooling. In order to avoid overcooking, you may need to undercook the large batch slightly.

In cases where the cooking time must be increased, you might find you must increase the amount of herbs and spices. This is because the flavors are volatile (p. 129), and more flavor is lost because of the increased cooking time. (Another answer to this problem is to add the spices later.)

Changing recipe sizes can affect not only cooking times but also mixing times. The best way to avoid this problem is to rely not on printed cooking and mixing times but on your own judgment and skills to tell you when a product is properly cooked or properly blended.

Recipe Problems

Many recipes have flaws, either in the quantities or types of ingredients or in the cooking procedures. When the item is made in small quantities, these flaws may not be noticeable, or the cook may almost unconsciously or automatically make adjustments during production. When the recipe is multiplied, however, the flaws may suddenly become apparent and the product quality lower. The only solution here is to carefully test recipes and to have a good understanding of basic cooking principles.

FOOD COST CALCULATIONS

Food-service operations are businesses. This means someone in the operation must worry about budgets, cost accounting, bills, and profits. Usually this is the job of the manager, while the cook takes care of food production.

Cooks have a great deal of responsibility for food cost controls, however. They must always be conscious of accurate measurement, portion control, and careful processing, cooking, and handling of foods to avoid excess trimming loss, shrinkage, and waste.

The manager, on the other hand, is concerned with determining budgets, calculating profits, and expenses, and so on. We cannot deal with these subjects here, as this is a book about food preparation. But you may encounter them later in your studies or in your career.

Regardless, every cook should understand three areas of cost accounting: doing yield analyses, calculating raw food cost or portion cost, and using food cost percentages.

Food Cost Percentages

An individual operation's food cost percentage is usually determined by the budget. The chef is interested in this figure because it tells him or her whether the menu prices and the costs for each item are in line.

The **food cost percentage** of a menu item equals the raw food cost or portion cost divided by the menu price:

$$\text{Percentage} = \frac{\text{Food cost}}{\text{Menu price}}$$

You can use this figure in two ways:

1. If you know the menu price and want to see what your food cost should be in order to be within the budget, multiply the menu price by the percentage:

$$\text{Food cost} = \text{Menu price} \times \text{Percentage}$$

Example: Menu price is \$6.75 and food cost percentage is 35 percent.

$$35\% = 0.35$$

$$6.75 \times 0.35 = \$2.36$$

2. If you know the food cost and want to determine what the menu price should be at a particular percentage, divide the cost by the percentage:

$$\text{Menu price} = \frac{\text{Food cost}}{\text{Percentage}}$$

Example: Food cost is \$1.60 and food cost percentage is 40 percent.

$$\frac{\$1.60}{40} = \frac{\$1.60}{0.40} = \$4.00$$

GROSS PROFIT AND NET PROFIT

When you are working with cost figures, it is important to understand the difference between *gross profit* and *net profit*. Gross profit for a food operation can be defined as 100 percent of sales minus food cost. Thus, if you have a food cost of 30 percent, your gross profit is 70 percent of sales. Net profit can be defined as gross profit minus overhead. Overhead includes labor costs, utility costs, real estate costs (rent or mortgage), interest on loans, and every other expense necessary to running the business. In our example, if you have a gross profit of 70 percent and overhead costs of 60 percent of sales, your net profit is 10 percent.

Yield Cost Analysis

In order to calculate portion costs of recipes, you must first determine the costs of your ingredients. For many ingredients, this is relatively easy. You just look at your invoices or at price lists from your purveyors.

Many recipes, however, specify trimmed weight rather than the weight you actually pay for. For example, a stew might call for 2 pounds sliced onions. Let's say you pay 24 cents a pound for onions, and to get 2 pounds sliced onions, you need 2¼ pounds untrimmed onions. In order to calculate the cost of the recipe correctly, you must figure out what you actually paid for the onions. In this case, the true cost is 54 cents (2¼ lb × \$0.24 per lb), not 48 cents (2 lb × \$0.24 per lb).

The following are two frequently used abbreviations you must understand:

- AP stands for *as purchased*. This means the untrimmed quantity, in the same form in which it is purchased. This is the amount you pay for.
- EP stands for *edible portion*. This means the raw, uncooked quantity after all trimming is done. This is the quantity you actually cook.

In the case of fruits and vegetables, the best way to determine AP quantities for use in costing recipes is to make a note of them when you are preparing the item. Tables of vegetable and fruit trimming yields in Chapters 11 and 22 will also help you. The next section explains how to use these numbers.

Trimming Loss: Calculating Yields and Amounts Needed

The descriptions of vegetables and fruits in Chapters 11 and 22 include a number called *percentage yield*. The percentage yield of a vegetable or fruit indicates, on the average, how much of the AP weight is left after pre-prep to produce the ready-to-cook item, or EP weight. You can use this figure to perform two basic calculations.

1. Calculating yield.

Example: You have 10 lb AP Brussels sprouts. Yield after trimming is 80 percent. What will your EP weight be?

First, change the percentage to a decimal number by moving the decimal point two places to the left.

$$80\% = 0.80$$

Multiply the decimal by your AP weight to get EP yield.

$$10 \text{ lb} \times 0.80 = 8 \text{ lb}$$

2. Calculating amount needed.

Example: You need 10 lb EP Brussels sprouts. What amount of untrimmed vegetable do you need?

Change the percentage to a decimal number.

$$80\% = 0.80$$

Divide the EP weight needed by this number to get the AP weight.

$$\frac{10 \text{ lb}}{0.80} = 12\frac{1}{2} \text{ lb}$$

In the case of ingredients such as meats and fish, figuring the cost can be a little more complicated. If you buy precut portion-controlled steaks or fish filets and use them just as you receive them, your AP and EP costs are the same. But if you buy whole loins of beef or whole fish and cut them yourself, you have to do a yield cost analysis in order to determine your actual costs.

The examples discussed in the remainder of this chapter use U.S. measures. For metric examples, see Appendix 4, pages 1038–1039.

Raw Yield Test

Suppose you work in a restaurant that serves veal scaloppine. The restaurant buys whole legs of veal. It is your job to bone out the veal, trim off all fat and connective tissue, separate the muscles at the seams, and cut the large pieces into scaloppine.

A typical whole leg of veal might weigh 30 pounds and cost \$5 per pound for a total cost of \$150. After finishing your trimming and cutting, you find you have 18 pounds of veal scaloppine. How do you figure the cost per pound of this meat?

The simplest example would be if you threw away all the trimmings, bones, and scrap meat. Then you would know your 18 pounds of veal cost you \$150. Dividing \$150 by 18 pounds gives you a cost per pound of \$8.33.

But in your restaurant, you don't throw away the trimmings. You make stock with the bones, grind up the small trimmings for meatballs, use the larger trimmings for veal stew, and sell the fat to the fat collector who picks up all your waste fat once a week. Now you must do a **yield test** to figure your costs.

Table 4.5 shows a typical form you might use for a yield test. For simplification, the blanks in the form are of two types. The dotted lines are to be filled in by reading your invoices and by taking the weights from your actual yield test. The solid lines are to be filled in by doing calculations.

Note that in Table 4.6, the form has been filled in with the results of a yield test on a leg of veal. We go through the form step by step.

The executive chef in this restaurant fills out the first two lines based on the invoice, gives you the form, and requests you to do the test. You fill out the rest of the form, beginning with blank 1 on the third line. You proceed as follows:

1. Weigh the whole leg of veal and enter the weight in blank 1. Copy the price per pound and total cost from line 2 to blanks 2 and 3.

Note that blank 3 can also be arrived at by multiplying the weight by the price per pound. However, suppose the veal were left in the cooler for several more days and dried out a bit. The weight then might be 29½ pounds. By multiplying 29.5 by \$5.00, you would get a total cost of \$147.50. But because the price you paid was actually \$150, it is important to use that figure and not fill in the blank by multiplying.

2. Break down the veal into all its component parts and record the weights of the trim and waste, starting in blank 4. In this case, there are only six items: fat, bones, small meat scraps for grinding, meat for stew, unusable waste, and cutting loss.

Record the weight of the finished scaloppine in blank 13.

What is **cutting loss**? This is not something you can actually weigh. However, there is always some loss of weight due to particles of meat and fat sticking to the cutting board, to drying, and to other factors. So when you add up all your weights, you find they total less than 30 pounds. To determine cutting loss, add up blanks 4 through 8 and blank 13. Subtract this total from line 1.

TABLE 4.5 Raw Yield Test Form

Item Test number Date
 Purveyor Price per pound Total cost
 AP weight (1) Lb price (2) Total cost (3)

Trim, salvage, and waste:

Item	Weight	Value/lb	Total Value (lb × Value)
(4)			
(5)			
(6)			
(7)			
(8)			
(9)			
(10)			
Total weight of trim (4 thru 10) (11)		Total value of trim (4 thru 10) (12)	
Total yield of item (13)			
Net cost (3 – 12) (14)			
Cost per lb (14 ÷ 13) (15)			
Percentage of increase (15 ÷ 2) (16)			

TABLE 4.6 Completed Raw Yield Test Form

Item veal leg to scaloppine Test number 3 Date 12/8/17
 Purveyor ABC Meats Price per pound \$5 Total cost \$150
 AP weight (1) 30 lb Lb price (2) \$5 Total cost (3) \$150

Trim, salvage, and waste:

Item	Weight	Value/lb	Total Value (lb × Value)
(4) fat	2½ lb	\$0.12	\$0.30
(5) bone	3 lb 5 oz	\$0.38	\$1.26
(6) ground veal	2 lb 2 oz	\$4.89	\$10.39
(7) stew meat	3 lb	\$5.29	\$15.87
(8) unusable trim	14 oz	0	0
(9) cutting loss	3 oz	0	0
(10)			
Total weight of trim (4 thru 10) (11) 12 lb		Total value of trim (4 thru 10) (12)	\$27.82
Total yield of item (13) 18 lb			
Net cost (3 – 12) (14) \$122.18			
Cost per lb (14 ÷ 13) (15) \$6.79			
Percentage of increase (15 ÷ 2) (16) 1.36 (136%)			

3. Enter the values per pound of the trim, salvage, and waste on lines 4 through 10. In this case, these numbers are given to you by the executive chef from the invoices.
- The fat collector pays 12 cents per pound for waste fat.
 - When you have to buy extra bones for your stockpot, you pay 38 cents per pound for them, so this is their value to you. This is also the figure you use when you cost out your stock recipe. If you didn't make stock and threw out the bones, you'd enter 0 in this blank.
 - Similarly, the values entered for ground veal and stew meat are the prices you'd have to pay if you bought them.
 - Unusable trim and cutting loss have no value, so you enter 0.
4. Calculate the total value of each item on lines 4 through 10 by multiplying the weight by the value per pound. Note that this particular form tells you how to do all the calculations.
5. Add the weights in lines 4 through 10 and enter the total in blank 11. Add the total values in lines 4 through 10 and enter this figure in blank 12.
6. Subtract the total value of all the trim (blank 12) from the price you paid for the veal (blank 3). This gives you the net cost of your 18 pounds of scaloppine.
7. To find the cost per pound of the scaloppine, divide the net cost (blank 14) by the weight (blank 13). This is the figure you will use in costing recipes for veal scaloppine.
8. The percentage of increase in the last line is determined by dividing the net cost per pound (blank 15) by the price per pound of the whole leg (blank 2). This figure can be used as follows:
- Suppose next week you buy another leg of veal from the same purveyor, but the price has gone up to \$5.29 per pound. Instead of doing another yield test, you can simply multiply this new price by the percentage of increase (\$5.29 times 1.36) to get a new cost per pound of \$7.19.

Cooked Yield Test

Earlier we introduced two important abbreviations: AP (as purchased) and EP (edible portion). A third expression sometimes used is **AS**, meaning **as served**. When foods such as fruits are served raw, AS may be the same as EP. But if the food is cooked, these weights are different.

In the case of the veal scaloppine, your recipe portions, and therefore your portion costs, are based on raw weight. For example, your scaloppine recipe might call for 5½ ounces raw meat per portion.

In some cases, your portions may be based on cooked weight. This is most often true of roasts. For example, let's say you buy whole fresh hams, bone and trim them, and serve them as roasts, allowing 6 ounces sliced, cooked meat per portion. To arrive at your cost, you will have to do a cooked yield test, as illustrated in Tables 4.7 and 4.8. (This form may be printed on the same sheet of paper as the raw yield test form so the operation can have a complete cost analysis on one form.)

TABLE 4.7 Cooked Yield Test Form

Item	Test number	Date
AP price per lb		
Cooking temperature		
Net raw weight (1)	Net cost per lb (2)	
.....	Total net cost (3)	
Weight as served (4)		
Cooked cost per lb (3 ÷ 4) (5)		
Shrinkage (1 - 4) (6)		
Percentage of shrinkage (6 ÷ 1) (7)		
Total percentage of cost increase (5 ÷ AP price per lb) (8)		

TABLE 4.8 Completed Cooked Yield Test Form

Item	roast fresh ham	Test number	2	Date	12/8/17
AP price per lb	\$3.49				
Cooking temperature	325°F				
Net raw weight (1)	12 lb	Net cost per lb (2)	\$3.93		
		Total net cost (3)	\$47.16		
Weight as served (4)	8 lb 4 oz				
Cooked cost per lb (3 ÷ 4) (5)	\$5.72				
Shrinkage (1 – 4) (6)	3¾ lb				
Percentage of shrinkage (6 ÷ 1) (7)	31%				
Total percentage of cost increase (5 ÷ AP price per lb) (8)	164%				

This form has been filled in with the results of a cooked yield test done on a roast, boneless fresh ham. Let’s assume this same ham has already had a raw yield test done on it.

The first half of the form, through blank 3, is filled in before the test starts. The numbers for blanks 1, 2, and 3 are taken from the raw yield test form, but you should double-check the net raw weight by weighing the item again before roasting.

Enter the total weight of cooked ham served in blank 4. You arrive at this figure by recording the total number of portions served and multiplying this number by the portion size. Let’s say 22 portions are served at 6 ounces each. This gives us a total of 132 ounces (22 × 6), or 8¼ pounds.

You might be tempted to simply weigh the whole roast after cooking and trimming. Remember, though, that there will be some waste—crumbs on the slicer or cutting board, spillage of juices, and so on. It is more accurate to record the weight you actually sell.

If this had been a bone-in roast, you would have another reason to carve the meat before weighing, because you could not include the weight of the bone in your as-served figure.

The remaining blanks on the form are determined by doing the calculations, just as you would do the calculations for the raw yield test.

Portion Costs

Portion cost, or raw food cost, is the total cost of all the ingredients in a recipe divided by the number of portions served:

Portion cost = $\frac{\text{Cost of ingredients}}{\text{Number of portions}}$

Here we cost out a sample recipe to show you how the procedure works. First, note the following points and keep them in mind when you are calculating portion costs. Many errors in costing are caused by forgetting one of these points.

- 1. Costs must be based on AP (as purchased) amounts, even though recipes often give EP (edible portion) quantities. These terms are explained in the preceding section.
- 2. Include **everything**. That means the lemon wedge and parsley garnish for the fish filet, the cream and sugar that go with the coffee, and the oil used for pan-frying the eggplant. These are sometimes called **hidden costs**.

Seasonings and spices are a typical example of hidden costs that are difficult to calculate. Some operations add up the cost of all seasonings used in a year and divide that by the total food cost to get a percentage. This percentage is added to each item. For example, if the cost of an item is \$2.00 and the seasoning cost percentage is 5 percent, the total cost is \$2.00 plus 5 percent of \$2.00, or \$2.10.

Other hidden costs can be calculated in the same way. For example, you could figure out your cost percentage for frying fat and add the percentage to all deep-fried foods.

Some restaurants take an arbitrary figure for all hidden costs, usually 8 to 12 percent, and add this to all menu items.

- 3. Record the number of portions **actually served**, not just the number the recipe is intended to serve. If the roast shrank more than you expected during cooking, or if you dropped a piece of cake on the floor, those costs still have to be covered.

PROCEDURE for Calculating Portion Cost

1. List ingredients and quantities of recipe as prepared.
2. Convert the recipe quantities to AP (as purchased) quantities.
3. Determine the price of each ingredient (from invoices, price lists, etc.). The units in this step and in step 2 must be the same in order for you to do the calculation.
4. Calculate the total cost of each ingredient by multiplying the price per unit by the number of units needed.
5. Add the ingredient costs to get the total recipe cost.
6. Divide the total cost by the number of portions served to get the cost per portion.

EXAMPLE Costing a Recipe Item: Baked Rice

Ingredient	Amount	Recipe Quantity	Price	Total
Rice, long grain	4 lb	4 lb	\$0.62/lb	\$2.48
Butter	12 oz	0.75 lb	1.97/lb	1.48
Onions	1 lb	1.2 lb	0.36/lb	0.43
Chicken stock	4 qt	4 qt	0.25/qt	1.00
Salt	1 oz	1/16 lb	0.15/lb	0.01
Total cost				\$5.40
Number of portions				50
Cost per portion				\$0.11

Note: Cost of chicken stock is determined by costing out the operation's recipe for chicken stock.



KEY POINTS TO REVIEW

- What is the procedure for converting a recipe to a different yield?
- Why do recipes sometimes not give the same results when converted to a different quantity? What kinds of adjustments might you have to make to avoid this problem?
- What are AP quantities and EP quantities? Explain how to perform yield calculations when you know the AP quantity and the percentage yield.
- What is the procedure for calculating food costs?



TERMS FOR REVIEW

static menu
cycle menu
à la carte
table d'hôte
prix fixe
tasting menu
course
fresh
homemade
organic
recipe
standardized recipe

AP (as purchased) weight
EP (edible portion) weight
portion control
metric system
gram
liter
meter
degree Celsius
kilo-
deci-
centi-
milli-

yield
conversion factor
food cost percentage
yield test
cutting loss
as served (AS)
portion cost
hidden cost
minimum-use ingredient
par stock

QUESTIONS FOR DISCUSSION

- What role is played by the chef's favorite dishes when a menu is written?
- What are the main differences among breakfast, lunch, and dinner menus?
- Which of the following are most likely to have static menus?
Fast-food restaurant French restaurant Army mess
High school cafeteria Employee lunchroom
- The following menus are made up of dishes prepared from recipes in this book. Evaluate each for variety and balance.

Clear vegetable soup Green salad with French dressing Chicken fricassée Cauliflower au gratin	Cream of mushroom soup Waldorf salad Veal scaloppine à la crème Broccoli Mornay Rice pilaf
Scotch broth Cucumber and tomato salad Roast rack of lamb with spring vegetables	Oxtail soup Coleslaw Beef pot roast Braised green cabbage Bouillon potatoes
Oysters casino Vichyssoise Broiled steak Baked potato Buttered green beans	Gazpacho Tomato and avocado salad Chicken Pojarski Baked acorn squash Duchesse potatoes
- What is the best solution to the problem of using up leftovers? What is the next best solution?
- What are some reasons written recipes can't be 100 percent exact and must depend on the cook's judgment? Select two or three recipes (from this book or any other) and try to determine where they depend on the cook's judgment.
- What is the purpose of a standardized recipe?
- What are the three basic ways of measuring ingredients? Which method is used for most solid ingredients, and why?
- What is the first step in portion control? List four other techniques of portion control.
- Make the following conversions in the U.S. system of measurement:

3½ pounds = _____ ounces
6 cups = _____ pints
8½ quarts = _____ fluid ounces
¾ cup = _____ tablespoons
46 ounces = _____ pounds
2½ gallons = _____ fluid ounces
5 pounds 5 ounces × 2 = _____
10 teaspoons = _____ fluid ounces

11. Make the following conversions in the metric system:
- 1.4 kilograms = _____ grams
 - 53 deciliters = _____ liters
 - 15 centimeters = _____ millimeters
 - 2,590 grams = _____ kilograms
 - 4.6 liters = _____ deciliters
 - 220 centiliters = _____ deciliters
12. Turn to the recipe for Thai Green Curry of Pork with Vegetables on page 515. Convert it to yield 18 portions.
13. Discuss the main types of problems you may face when converting recipe yields.

14. What is the difference between AP weight and EP weight? Explain how these terms are related to calculating costs per portion of menu items.
15. The following problems are calculations with food cost percentages, portion cost, and menu price. For each problem, two of the figures are given. Find the third.

Food Cost Percentage	Portion Cost	Menu Price
a. _____	\$1.24	\$4.95
b. 40%	_____	\$2.50
c. 30%	\$2.85	_____