
Calculate Food Cost and Menu Prices

Unit: Entrepreneurial Opportunities in the Culinary Business

Problem Area: Food Cost Accounting

Lesson: Calculate Food Cost and Menu Prices

■ **Student Learning Objectives.** Instruction in this lesson should result in students achieving the following objectives:

- 1 Calculate food costs.**
- 2 Calculate variances when determining food cost.**
- 3 Calculate menu prices.**

■ **Resources.** The following resources may be useful in teaching this lesson:

Blocker, Linda, Julia Hill, and the Culinary Institute of America. *Culinary Math*, 3rd ed. Wiley, 2007.

FoodReference.com. Accessed Oct. 22, 2010.
<<http://www.foodreference.com/>>.

Jones, Terri. *Culinary Calculations: Simplified Math for Culinary Professionals*, 2nd ed. Wiley, 2008.

McGreal, Michael J., and Linda J. Padillia. *Culinary Math Principles and Applications*. American Technical, 2009.

Mealey, Lorri. "How to Price Your Restaurant Menu," *About.com: Restauranting*. Accessed Oct. 22, 2010. <<http://restaurants.about.com/od/menu/a/foodcost.htm>>.



■ **Equipment, Tools, Supplies, and Facilities**

- ✓ Overhead or PowerPoint projector
- ✓ Visuals from accompanying masters
- ✓ Copies of sample test, lab sheets, and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Calculators

■ **Key Terms.** The following terms are presented in this lesson (shown in bold italics):

- ▶ as purchased (AP)
- ▶ chain restaurants
- ▶ cooking loss test
- ▶ economy of scale
- ▶ edible portion (EP)
- ▶ food cost (FC)
- ▶ food cost percentage (FC%)
- ▶ market price
- ▶ menu price
- ▶ quantifier
- ▶ standardized recipe
- ▶ standard portion
- ▶ standard portion cost
- ▶ yield
- ▶ yield factor (YF)

■ **Interest Approach.** Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

This lesson is 100 percent applied mathematics; it is not abstract theory. Be sure to stress that as you begin.

Find a student volunteer who acknowledges wanting to be a chef or restaurant owner; he or she will be your guinea pig. Ask the student about the type of food he or she wants to prepare professionally and/or the type of restaurant he or she hopes to own. Use that information to identify a common meal within that student's theme. Ask the student what ingredients would likely be used to create that dish. List the ingredients on the board. Ask the student to estimate the cost charged for that dish, and write that amount to the side.

Now, ask the student (or the class as a whole) what the cost of each ingredient would be for one portion. List those prices on the board. When completed, total

the projected costs and compare it to the projected menu price estimated earlier. Be prepared to take this in any direction. If costs are greater than the menu price, make students understand that the business would lose money on every sale. If costs are somewhat lower than the suggested menu price, ask the class if the profit margin is enough to support the restaurant. If the food cost guess is low, focus on how realistic the projected food costs are, and ask what their guesses are based upon. (An alternative, should participation be low, is to ask about fast food “dollar menus” and what the actual fast food items cost the restaurant.)

This interactive approach is likely to be all over the place, and that is good! The guinea pig is hopefully someone who really wants to be an owner or chef. Ask that student directly why it is going to be essential to know exactly what the food costs, and be sure to use this opening to illustrate that food cannot be accurately priced for sale if the owner does not know the purchase price. The actual cost of the food is meaningless if the owner does not understand how to use data to price the food for sale!

CONTENT SUMMARY AND TEACHING STRATEGIES

Objective 1: Calculate food costs.

Anticipated Problem: What is food cost, and how is it determined?

- I. Food cost control
 - A. Food is the single-largest dollar outlay for foodservices. Depending on the business type, it is estimated to be between 30 and 50 percent of the business income. **Food cost (FC)** is the cost of the ingredients to prepare a food item as opposed to the menu price of an entrée, dessert, or beverage. The amount a person pays for the raw food drives what must be charged to customers. **Food cost percentage (FC%)** is a ratio between the cost of the raw food ingredients and what it takes to get that food to the table. Therefore, for every dollar a guest spends, the restaurant uses a specific percentage for the food and other expenses, and the rest is needed to remain profitable. Most restaurants average a 30 to 35 percent food cost percentage. The food cost percentage is averaged among all the items on the menu to account for fluctuations in food prices and high-end or expensive menu items (market price items). The remaining costs to operate the business are based on the food cost.
 1. With a food cost percentage of 29 percent, \$0.29 of every dollar a customer pays the restaurant for food is spent by the restaurant to purchase the food. In

this example, \$0.71 from every incoming dollar remains to pay for all the other business expenses aside from food, such as:

- a. Payroll (salaries, wages, taxes, insurance, fringe benefits)
 - b. Overhead (rent, utilities, and supplies)
 - c. Profit (before taxes)
2. According to the Culinary Institute of America (CIA), there are four steps that any manager, regardless of the type of foodservice, must take to control costs.
- a. He or she must accurately predict what the customer will buy.
 - b. He or she must purchase and prepare food based on the predictions.
 - c. He or she must ensure accurate portion control to avoid monetary losses.
 - d. He or she must eliminate food waste by minimizing cooking losses, leftovers, improper storage and handling (spoilage), and theft.
3. According to the CIA, the typical ways in which food waste and losses occur are:
- a. Improper storage temperatures
 - b. Excessive storage periods (first in, first out—FIFO)
 - c. Lack of proper ventilation
 - d. Failure to properly separate food items (e.g., Storing melons with or near dairy foods may cause the dairy foods to absorb the odor of the melons.)
 - e. Lack of proper sanitation techniques (e.g., pests, bacteria, and other microorganisms)
 - f. Excessive delays between the time foods are received in the foodservice and the time they are stored (e.g., Perishables should be stored immediately, including frozen foods, meats and fish, and fruits and vegetables.)
 - g. Over-production or excessive leftovers (e.g., The manager must determine what caused the overproduction. Did it occur due to a poor prediction of customer purchases, or was there another factor, such as the weather?)
 - h. Theft
- B. Portion control is a critical element in the financial success of a foodservice operation. **Standard portion** is the size or amount (by weight, volume, or count) of a specific food item served to each guest. For instance, every guest receives the same size piece of cake and the same number of ounces of soda. The management establishes portion sizes, and posted charts of each food item are provided for employees. For the restaurant to make a profit on each order, the portion size must be the same. **Standard portion cost** is the cost of one serving of a food item. For example, the price of a case of potatoes is certainly food cost, but restaurants need to know the food cost per serving. To determine this, restaurants must establish the amount of food that will be served to each guest. Once the standard portion size is determined, the portion cost may be determined. The standard portion size is displayed on the standardized recipe (near the top) and would include how the dish is to be portioned (e.g., using a

scale, scoop, ladle, or measuring cup). The standard portion cost may be determined in a number of ways.

1. Simple food cost is the cost of each food item for a fresh fruit melon salad. Simple food cost includes the sum of all the ingredients in the fresh fruit melon salad. For example:
 - a. Watermelon = \$4.99
 - b. Honeydew melon = \$3.99
 - c. Cantaloupe = \$2.99
 - d. Total food cost is $\$4.99 + \$3.99 + \$2.99 = \11.97
2. Food cost displayed as portion cost requires additional computations. For instance, a case of individually packed yogurt cups costs \$12, and there are 24 cups in the case. The cost per serving (one cup) would be found by dividing the cost by the number of cups or servings in the case.
$$\$12 \div 24 \text{ cups} = \$0.50 \text{ per serving}$$
3. When portion size is not predetermined (as in the individual yogurt cups), the portion size must be calculated and displayed in a volume measurement or a weight, which are both **quantifiers**. The portion is no longer one unit (e.g., one apple or one yogurt cup). Instead, it is one ounce, pound, quart, etc. In this situation, additional division and conversion is required. For example, if a serving of roast beef is 6 ounces, and the cost of the roast is \$5.29 per pound, the portion cost would be determined by dividing the cost per pound by 16 (16 ounces = 1 pound) to determine price per ounce. That price would then be multiplied by the portion size to determine portion cost.
$$\$5.29 \div 16 = \$0.33 \text{ per ounce} \times 6 \text{ ounces} = \$1.98 \text{ per serving (FC)}$$
4. When the price per pound is unknown, it must be determined. For instance, an entire pork loin costs \$22.50 and weighs 14 pounds. The standard portion size is 5 ounces per serving. To find portion cost, the cost per pound and cost per ounce are determined. First, a person must divide the cost of the loin by its weight to find the cost per pound. Next, the cost per ounce is determined by dividing the cost per pound by 16 (ounces per pound). Finally, the cost per ounce is multiplied by the portion size to find the standard portion cost.
$$\begin{aligned} \$22.50 \div 14 \text{ lb.} &= \$1.61/\text{lb.} \\ \$1.61 \div 16 \text{ (16 oz. = 1 pound)} &= \$0.10 \text{ per oz. (rounded)} \\ \$0.10 \times 5 \text{ oz.} &= \$0.50 \text{ per standard portion cost} \end{aligned}$$
5. When converting to a price per ounce from a larger quantifier, the divisor is based on the number of ounces in the larger quantifier. To find the cost of 6 ounces of milk when a gallon costs \$3.29, the problem is solved by:
$$\begin{aligned} \$3.29 \div 128 \text{ (ounces in a gallon)} &= \$0.26/\text{oz. (rounded)} \\ \$0.26 \times 6 \text{ (ounces per serving)} &= \$1.56 \text{ per standard portion cost} \end{aligned}$$
6. Another way to determine the price per serving for a recipe with multiple ingredients would be to follow the processes noted above to find the food cost for the entire recipe (in bulk) and then to divide it by the **yield** (the number of servings). The resulting price would be the food cost for one serving. For instance, a simple bread recipe with flour, yeast, sugar, salt, and shortening

that makes six loaves (each with 12 slices) requires the cost of each ingredient to determine the total recipe cost. The cost of a standard serving (portion) is determined by dividing the recipe cost by the number of servings (yield). For example:

$$\text{Yield} = 6 \text{ loaves} \times 12 \text{ slices per loaf} = 72 \text{ servings per recipe}$$

If the bulk recipe costs \$6, the serving cost would be found as follows:

$$\$6 \div 72 \text{ servings} = \$0.08 \text{ per slice (serving) (rounded)}$$

7. To determine the cost of a full menu item (e.g., “Cheeseburger Deluxe”) that includes fries and coleslaw, the cost of each element of the meal would need to be determined in the standard portion size and added together to find the food cost for the entire meal. In this example, individual serving prices would be calculated for the following:
 - a. Hamburger
 - b. Bun
 - c. Cheese
 - d. French fries
 - e. Coleslaw
 - f. Condiments and garnishes

Teaching Strategy: Use VM–A, VM–B, and VM–C to review basic food cost techniques. Assign LS–A and LS–B for student practice.

Objective 2: Compute variances when determining food cost.

Anticipated Problem: What variance formulas help determine food cost? How are variance formulas calculated?

II. Variance formulas

A. **As purchased (AP)** foods are foods purchased whole and in a natural state (with minimal processing). AP foods will require some processing for use in food preparation. For instance, whole fresh produce, meats, and fish fit the AP description. When they are processed (e.g., peeled, trimmed, or deboned), there is waste. Waste affects the “real” price of the food item. The **edible portion (EP)** is the usable part of the whole food product after initial processing. The inedible part is peeled, trimmed, and/or deboned and discarded or put in the stockpot for stock-making purposes. The difference between the two weights (AP and EP) is critical to determine an accurate food cost.

1. To demonstrate real food cost, a person must consider AP versus EP. The following computations are required:
 - a. It is necessary to start with the product’s AP weight and to subtract the weight of the trimmings or waste. What is left is EP weight: the weight of what is edible.
 - b. AP cost per pound is calculated as “cost \div AP weight = AP cost/pound.”

- c. EP cost per pound will always be higher than the AP cost per pound and is calculated as “AP cost ÷ EP (trimmed) weight = EP cost/pound.

For example:

$$6 \text{ lb. honeydew melon} = \$5 \text{ AP}$$

$$\$5 \div 6 \text{ lb.} = \$0.83/\text{AP pound}$$

$$4.5 \text{ lb.} = \text{EP weight}$$

$$\$5 \div 4.5 \text{ lb. EP weight} = \$1.11/\text{EP pound}$$

2. **Yield factor (YF)** is the ratio between the AP and EP weights or the percentage of the edible items. When “yield factor” is displayed in a recipe, it is shown only as a whole number—75—without the percent sign. The percent is understood when talking about yield factor. For instance, the 6 lb. honeydew melon that provided 4.5 lb. of edible fruit has a yield factor of 75 percent.

$$\text{EP weight} \div \text{AP weight} = \text{YF}$$

$$4.5 \text{ lb.} \div 6 \text{ lb.} = 0.75 \text{ (75 percent)}$$

- a. If the yield factor is already known, it can be used and applied to the problem without having to weigh each item before and after trimming by applying these formulas:

$$\text{AP weight} \times \text{YF (as a decimal)} = \text{EP weight}$$

$$\text{AP food cost} \div \text{EP weight} = \text{EP cost/pound}$$

- b. Broccoli costs \$1.29 per pound and has a 61 YF. The EP cost per pound is determined by:

$$1 \text{ lb.} \times 0.61 \text{ (YF)} = 0.61 \text{ lb. (EP weight)}$$

$$\$1.29 \div 0.61 \text{ lb.} = \$2.11 \text{ (EP cost/pound)}$$

- c. When determining recipe food cost in which whole products would be trimmed of waste, the more accurate EP cost per pound formula should be used.

B. Cooking loss test

1. Cooking affects the total amount of available food just as trimming does, particularly with meats. Generally, meat shrinks when it cooks, and the bones are removed or at least are considered inedible. The only way to be certain how much meat is actually edible (and thereby determine the actual EP food cost) is to perform a test. A **cooking loss test** is a process in which a person weighs the raw meat, trims the meat, cooks the meat, removes bones and trimmings, and finally weighs the meat again. The difference in weight is “cooking loss,” and the process to determine EP food cost works just as it does for trimming.

a. Bone-in pork roast weighs 9.5 lb. raw and at \$2.49 lb. = \$23.66

b. After cooking and with the bone removed, it yields 6.75 lb. (A total cooking loss of 2.75 lb.)

c. $\$23.66 \text{ (AP cost)} \div 6.75 \text{ lb. (EP weight)} = \$3.50/\text{lb. (EP cost/pound)}$

d. $6.75 \text{ lb.} \div 9.5 \text{ lb.} = 0.71 \text{ YF (a 71 YF)}$

- e. The YF could be applied to all subsequent pieces of similar meat.

2. A cooking loss test is conducted periodically to provide a base YF when determining yield and EP cost in the future for similar cuts of meat. When a different cut is chosen and/or a new purveyor is providing meat, the test should be repeated to provide an accurate yield and cost.
3. A cooking loss test is most accurate for large roasts or turkeys that are cooked, sliced, and served by weight in a standard portion size. The test provides the true yield and the true food cost. A cooking loss test would not be conducted for individual steaks, chops, and hamburgers or for cut portions of chicken or fish.

Teaching Strategy: Use VM–D to review the variances to food cost computation formulas. Assign LS–C.

Objective 3: Calculate menu prices.

Anticipated Problem: What is menu cost? How are menu prices set? What other considerations factor into menu prices?

III. Calculating menu prices

- A. The **menu price** is the established selling price of food and beverages to customers. While menu writing is an art form, pricing food is a specific science that uses mathematics to determine the charges to cover business costs and (hopefully) to make a profit. The process of determining a menu price is the same no matter what form the menu takes. Restaurant and foodservice operations provide a level playing field for menu costs through the use of a standardized recipe or formula. A **standardized recipe** is a physical and/or electronic record of the recipe name, yield, portion size, ingredients, weight, measure, unit cost, and total cost. A standard recipe is used for two reasons: The customer is assured of a consistent product, and the food costs remain stable.
- B. One of the most common methods for determining menu price is based on food cost. Specifically, the food cost percentage (FC%) formula helps determine the selling price. Food cost percentage is a ratio between the cost of the food and what it takes to get that food to the table. For example, if the restaurant sets a food cost percentage of 29 percent, then 0.29 of every dollar a customer pays for food is spent by the restaurant to purchase that food. That example would leave 0.71 from every incoming dollar to pay for all the business expenses other than food.
 1. Cost percentage is as much a management tool as it is a pricing tool, and FC% influences pricing. Food cost percentage alerts the executive chef and/or owner when it is advisable to revisit the current menu prices (e.g., not making enough money to pay the bills and earn a profit or making much more than was projected).
 - a. Hitting the FC% does not guarantee that there will be enough money for the overhead expenses and a profit.
 - b. Not hitting the FC% target means it is necessary to take a closer look at the formula, ratio, and current raw food costs.

- c. When a restaurant uses a strict FC% across the board (averaging), it can result in perplexing gross profits. For instance, is the increase in gross profits due to the enormous sales volume of cheeseburgers priced at a low 23% FC%—and a \$3 profit each—that is “making up” for not selling the Lobster Thermidor at a higher 55% FC%—and an \$18 profit? Gross profit is as important as FC%.
2. Restaurants want raw food costs as low as possible and want FC% as low as possible, leaving more room for real income. A common financial industry goal is an average food cost percentage around 30 to 33 percent, compared to the menu price. Food cost percentages higher than that may result in financial losses for the business.
 3. The same food cost percentage may not be applied to every menu item. Some are commonly lower, and others are much higher based on the dishes. For example, fresh seafood tends to have a high FC% because it is naturally expensive. Meanwhile, pasta and beverages have a low FC% because they are quite inexpensive and leave big margins to charge more. The higher the food cost percentage, the lower the menu price and the less money the restaurant makes. The lower the food cost percentage, the higher the menu price and income.
 4. The food cost percentage formula based on beginning and ending inventory is:
 - a. $\text{Beginning inventory (BI) + Purchases (P) - Ending Inventory (EI) } \div \text{ Food Sales (S) or}$
 - b. $\text{FC\%} = \text{BI} + \text{P} - \text{EI} \div \text{S}$
 $30\% = \$5,000 + \$1,000 - \$5,250 \div \$2,500$
 5. Chef Lewis at Oracle® foodservice operations has five possible reasons for a food cost dramatically dropping or spiking.
 - a. The physical inventory count is incorrect.
 - b. The unit input into the inventory is incorrect.
 - c. There is a missing invoice not counted on the inventory.
 - d. An invoice was processed for a product that is not on the inventory (e.g., ordered but not delivered or received).
 - e. Monetary transfers have not been credited to the cost center.
- C. Menu price formula when the FC% is known
1. To help determine menu (selling) price based on a calculated food cost percentage derived from beginning and ending inventory, the following mathematical formula is applied:
 - a. $\text{Raw food cost} \div \text{FC\%} = \textit{minimum}$ menu price. For example, if a slice of cake cost the restaurant \$0.71 in raw food costs, and an FC% of 25 percent has been calculated, the selling price would be determined as follows:
 $\$0.71 \div 0.25 = \2.84 per slice, which is the *minimum* menu selling price to make a profit

- b. A filet mignon dinner with the following raw food costs (\$6 = filet, \$2.50 extra with potato, side dish, salad, and roll) may be priced as follows with a 30 percent FC%:

$\$8.50 \div 0.30 = \28.33 minimum menu selling price (Because \$28.33 is an awkward selling price, it would probably be bumped to \$28.99 or higher.)

- c. The formula would be applied to every single item on the menu. It would be common to round menu prices to a comfortable or natural number. Computed prices (e.g., \$9.69) would likely be rounded to \$9.75 or \$9.95 on a menu.
- d. If the filet mignon dinner menu price were bumped to \$30, the food costs would drop below 30 percent and would result in a higher profit.
- e. The food cost percentage calculation formula when the menu price is known:

$$\text{FC} \div \text{Menu price} = \text{FC\%}$$

$$\$8.50 \text{ FC} \div \$35 \text{ menu price} = 24\%$$

2. Entering a written percentage in a calculator requires that the percent sign be dropped and the decimal place be moved two places to the left (or the number is effectively divided by 100).

D. Other menu pricing considerations

1. Pricing menu items in restaurants must take other costs into consideration to ensure profitability. Labor, utilities, mortgage, equipment purchase and maintenance, insurance, decor, entertainment, and advertising cost money. The primary income is food and beverage. Based on these variables, the size of the restaurant, the location, the decor, and the required qualifications of employees to facilitate the menu are all elements to be considered. They all would require a food cost percentage based menu cost to be the *minimum* price charged.
2. Geography is a particularly important consideration in menu pricing. A cheeseburger in a Manhattan, NY, restaurant would be priced far differently than one at a fast-food restaurant in Omaha, NE, due to the vastly different cost of living in those two areas. Southern locations often spend more on energy for air conditioning, and northern locations often have higher heating costs. Big cities have higher real estate, insurance, and labor rates than rural areas. All of these costs are passed onto customers via the menu prices. Transportation costs, due to geography, also play a huge role in the actual food cost, depending on the specific food. Obviously, fresh fish and seafood are less expensive in areas adjacent to oceans, lakes, and rivers. The transportation costs to bring the seafood inland must be accounted for in the raw food cost and the menu pricing. It is the same phenomenon for beef and fresh produce. Beef is less expensive in the Midwest, and fresh produce is the least expensive where it is grown.
3. “In season” versus “out of season” produce impacts the menu price. **Market price** is the opposite of set price and indicates to the customer that the dish fluctuates in price, which serves to protect the owner’s food cost margin. A market-priced menu item usually represents a seasonal food or an “imported”

food (e.g., fresh fruit or caviar) from another part of the United States or from another country. For example, one week a case of iceberg lettuce may cost \$10. The next week because of weather or supply and demand, the case price could jump to \$40. One way to control this type of fluctuation is through market pricing and by routinely changing the price of menu items according to the market. However, there may be some customer backlash if more than a few items carry the “Market Price” rather than a set price.

4. A complex or high-end menu requires the expertise of an executive chef who has excellent mathematical and organizational skills. A complex menu often results in higher menu prices (beyond a standard food cost percentage up charge). For instance, a restaurant menu at an upscale restaurant often requires a better trained labor force in contrast to the minimal culinary training needed to produce fast-food menu items.
5. Hotel, theme park, and hospital menus—Menu prices are affected by additional considerations that are not necessarily restaurant related. For example, if the restaurant or foodservice is a tertiary (less important or secondary) part of the hotel, the menu prices are usually higher because of the convenience of hotel food service. Similarly, a restaurant in a stadium, theme park, or other entertainment forum (in which the restaurant is not the main attraction) will typically charge higher menu prices to generate more revenue and to take advantage of being the only option on the premises. Conversely, when the foodservice is a true service—as for military installations and hospitals—the FC% pricing usually covers costs and does not rely solely on sales to support the cost center.
6. Menu prices are affected by the store’s status, such as an affiliation with a local or nationwide chain or an independent and individually owned single property.
 - a. **Chain restaurants** are a group of identical restaurants in multiple locations, all with identical or similar menus and similar buildings. Menu prices in these businesses can be quite inexpensive because of the type of food served or from a concept called economy of scale.
 - b. **Economy of scale** is volume purchasing to reduce the raw food cost. A chain purchases for multiple locations, so the price paid for goods is reduced substantially. A chain restaurant may be somewhat overpriced because of the atmosphere provided and the name brand offered. Typically, the food cost percentages are low, but the menu reflects a higher cost to offset related higher operating costs.

Teaching Strategy: Show students various samples of standardized recipes and the process to create and update standardized recipe costs. Use VM–E to review guidelines for menu pricing. Assign LS–C and LS–D.

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at the ends of chapters in the textbook may also be used.

■ **Application.** Use the included visual masters and lab sheets to apply the information presented in the lesson.

■ **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

■ **Answers to Sample Test:**

Part One: Short Answer

1. Food cost percentage is a ratio between the cost of the food and what it takes to get that food to the table or drive thru. In other words, for every dollar a guest spends on food, the restaurant spends a specific percentage of that dollar to pay for the food to remain profitable. For example, if the restaurant sets a food cost percentage of 29%, \$0.29 of every dollar a customer pays the restaurant for food is spent by the restaurant to purchase that food.
2. EP is always higher in price per pound than AP because EP represents the edible amount after trimming or peeling. This is true because the AP cost per pound may be \$5, but the EP cost per pound may be \$7.50 because the whole food product (AP) has been reduced in weight due to trimming, peeling, and/or deboning. The difference between the two weights (AP and EP) is critical to determine an accurate food cost.
3. Standard portion cost is the cost of one serving of a food item. As the portion size is always the same, the food cost is (theoretically) always the same. Once the standard portion size is determined, the portion cost may be determined.

Part Two: True/False

1. T
2. T
3. T
4. F
5. F
6. F

Part Three: Multiple Choice

1. a
2. b
3. b
4. c
5. b
6. a
7. d
8. c

Calculate Food Cost and Menu Prices

► Part One: Short Answer

Instructions: Answer the following.

1. In your own words, explain “food cost percentage” (FC%). Give one example.

2. Which cost per pound is higher: AP or EP? Why?

3. What is a “standard portion cost?”



► Part Two: True/False

Instructions: Write *T* for true or *F* for false.

- ____ 1. A restaurant in Miami may be able to charge less for shrimp than a similar restaurant in Helena, Montana.
- ____ 2. “Yield factor” is determined by the formula $EP \div AP$.
- ____ 3. A “cooking loss test” determines how much weight a product loses in cooking.
- ____ 4. One must know “standard portion cost” to calculate the “standard portion size.”
- ____ 5. If you opened your own steakhouse, your food cost would be low due to the “economy of scale.”
- ____ 6. A cup of cereal costs \$0.59, and a cup of milk costs \$0.23. The total raw food cost is \$0.59.

► Part Three: Multiple Choice

Instructions: Circle the letter of the correct answer.

- ____ 1. A 50-lb. case of potatoes has a food cost (FC) of \$12.18. The cost of 1 lb. of potatoes is ____.
 - a. \$0.24
 - b. \$0.59
 - c. \$0.64
 - d. \$0.72
- ____ 2. A recipe calls for 10 oz. of flour. A 50-lb. bag of flour has a FC of \$28.60. The FC for the flour in the recipe is ____.
 - a. \$0.57 (rounded)
 - b. \$0.40 (rounded)
 - c. \$0.04 (rounded)
 - d. \$28.60 (rounded)
- ____ 3. Ten pounds AP of romaine lettuce has a 69 YF. The EP weight is ____.
 - a. FC%
 - b. 6.9 lb.
 - c. 9.9 lb.
 - d. 14.49 lb.

- _____ 4. The FC of a fried chicken dinner with all the trimmings is \$2.81. The meal is priced at a FC% of 29 percent. The selling price is _____.
- a. \$0.82
 - b. \$5.99
 - c. \$9.69
 - d. \$13.99
- _____ 5. A custard recipe calls for 2 cups of milk, 1 lb. of sugar, and 4 eggs. Milk costs \$2.99 per gallon; sugar costs \$31.40 for 50 lb.; and eggs cost \$1.69/dozen. The raw food cost of the recipe is _____.
- a. \$1.46
 - b. \$1.56
 - c. \$3.11
 - d. \$5.34
- _____ 6. A whole raw chicken weighs 4.5 lb. AP. After cooking and with the bones and waste removed, it weighs 2.9 lb. The YF for this chicken is _____.
- a. 64
 - b. 66
 - c. 69
 - d. EP
- _____ 7. Dave made a pot of chili using a standardized recipe that yields 60 servings. The FC is \$24.55. The food cost of one portion of chili is _____.
- a. \$0.19
 - b. \$0.29
 - c. \$0.31
 - d. \$0.41
- _____ 8. Aside from FC%, _____ affect the pricing of a menu.
- a. ages of employees and hours of operation
 - b. color of linens and paper used to print menus
 - c. the location of the restaurant and difficulty of menu item preparation
 - d. None of the above

CONTROL COSTS

- ◆ Accurately predict what the customer will buy.
- ◆ Purchase and prepare food based on the predictions.
- ◆ Ensure accurate portion control.
- ◆ Eliminate food waste.
 - Minimize cooking losses.
 - Reduce the amount of leftovers.
 - Avoid improper storage and handling (spoilage).
 - Prevent theft.

Source: Culinary Institute of America (CIA)



FOOD WASTE AND LOSSES

Numerous reasons exist for food waste and losses, such as:

- ◆ Improper storage temperatures
- ◆ Excessive storage periods (first in, first out—FIFO)
- ◆ Lack of proper ventilation
- ◆ Failure to properly separate food items during storage
- ◆ Lack of proper sanitation techniques (pests, bacteria, and other microorganisms)
- ◆ Excessive delays between the time food is received and the time it is stored (perishables)
- ◆ Over-production or excessive leftovers (due to poor prediction, weather, etc.)
- ◆ Theft

Source: *Culinary Institute of America (CIA)*



CALCULATE FOOD COST

<p>Simple Food Cost (FC)</p> <p>SUM of all food items in the dish</p> <p>\$0.45/banana + \$0.80 pb =</p> <p>\$1.25 FC</p>	<p>Individual Count FC</p> <p>Divide case cost by the count (number of individual packages)</p> <p>\$7.20 ÷ 24 yogurt cups =</p> <p>\$0.30 FC</p>
<p>Portion FC from a large volume or weight. It is a three-step process that includes division and multiplication.</p> <p>Unit price Ounce price Portion price</p> <p>\$19.45 ÷ 50 lb. flour =</p> <p>\$0.39 per lb. (\$/unit)</p> <p>\$0.39 ÷ 16 (oz./lb) =</p> <p>\$0.02 per oz. (\$/oz.)</p> <p>For a 10-oz. portion</p> <p>\$0.02 × 10 =</p> <p>\$0.20 FC</p>	<p>Yield portion FC for multiple ingredient recipes may be calculated by dividing the recipe cost (the sum of individual ingredients) by the yield (number of servings).</p> <p>3 gallons of chili = \$16.35</p> <p>Yield is 48 servings (16 cups/gal. × 3 gal.)</p> <p>\$16.35 ÷ 48 servings =</p> <p>\$0.34 standard portion FC (rounded)</p>

To ensure that restaurants with great products and high sales stay in business, the menu items must be priced correctly.



FOOD COST VARIANCE FORMULAS

Edible Portion (EP) Cost Formula

$$\text{AP cost} \div \text{EP weight} = \text{EP Cost}^*$$

(*In this case, it is cost per pound.)

Yield Factor (YF) Formula

$$\text{EP weight} \div \text{AP weight} = \text{YF}$$

EP Weight when AP & YF are Known Formula

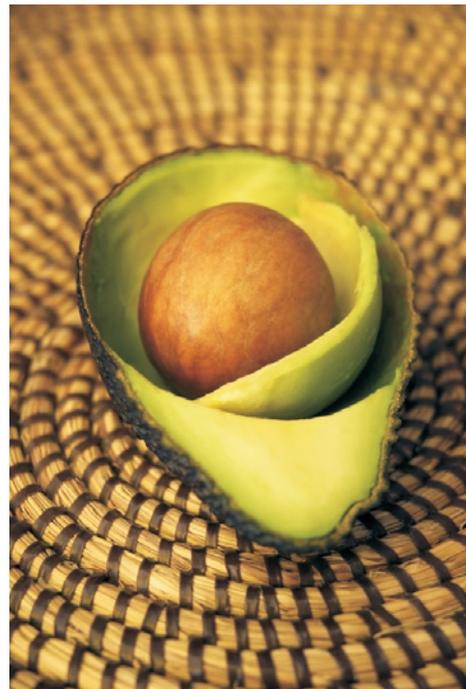
$$\text{AP weight} \times \text{YF (as a decimal)} = \text{EP weight}$$

Cooking Loss Formula

$$\text{AP cost} \div \text{EP weight after trimming and cooking} = \text{EP cost/pound}$$

$$\text{EP weight} \div \text{AP weight} = \text{YF}$$

Between the pit and the skin, notice how much waste there is in an avocado. The edible portion (EP) is much less than the as purchased (AP) weight of the whole fruit.



MENU PRICING AND PRICING CONSIDERATIONS

Food cost percentage when the menu price is known

$$\text{FC} \div \text{Menu Price} = \text{FC\%}$$

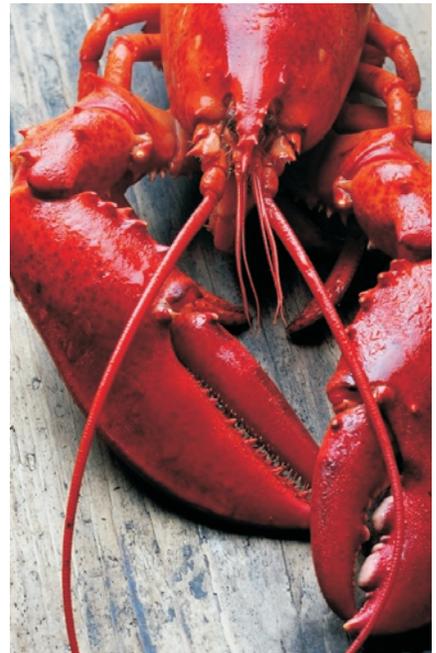
Menu pricing when FC and FC% are known

$$\text{FC} \div \text{FC\%} = \text{Menu (Selling) Price}$$

Considerations When Pricing Menu Items:

- Geography**
- Menu complexity**
- Equipment**
- Insurance**
- Utility costs**
- Location of food source**
- Chain vs. independent**
- Rent**
- Labor costs**
- Decor**
- Part of another business**
- Advertising**

The menu price of fresh seafood (e.g., this Maine lobster) would be marked up on a Midwest menu beyond the average food cost percentage (FC%) because of transportation costs. The other option would be to list it as “market price” on the menu. It would be less expensive at an ocean-side restaurant.



Compute Food Cost and Yield: Part 1

Purpose

The purpose of this activity is to practice basic food cost and yield problems for menu items.

Objectives

1. Use the correct arithmetic operation(s) for each food cost problem.
2. Accurately calculate food cost and yield for each food cost problem.

Materials

- ◆ lab sheet
- ◆ writing utensil
- ◆ calculator (optional)

Procedure

1. Work individually to solve each of the food cost problems below. Food cost (FC) is the menu price of an entrée, dessert, or beverage as compared to the raw cost. In these examples, calculate the raw cost—the actual cost to purchase the ingredients—for a single serving, an entire recipe, and an entire banquet—whatever is specified. Most foodservice ingredients are purchased in bulk quantities, so calculating the cost per pound is often the first step.
2. Try your hand at the following food cost problems. Show your work in the space provided.
 - a. Jill is going to make chocolate chip cookies. She purchased the following items for the recipe: chocolate chips for \$2.99, brown sugar for \$1.14, eggs for \$0.89, milk for \$3.09, and flour for \$2.48. What is the cost of the purchased ingredients?



b. Jeff is making beef vegetable soup.

He bought the following:

- 5 lb. of carrots for \$2.09
- 4 lb. of beef stew meat for \$11.02
- 5 lb. of onions for \$1.29
- 2 lb. of celery for \$1.91
- 3 lb. of green peppers for \$2.89
- 10 lb. of potatoes for \$3.79

The following are individual amounts of the ingredients Jeff's recipe requires to make the soup:

- 1.5 lb. carrots
- 3 lb. beef stew meat
- 2 lb. onions
- 0.75 lb. celery
- 1.25 lb. green peppers
- 2.25 lb. potatoes

What is the raw food cost of the beef vegetable soup recipe?

c. In the vegetable soup recipe above, the raw food yield is 10.75 lb. Jeff also used 1 gallon of water to make his soup, bringing the total weight to 18.75 lb. How many 12-oz. portions of soup will be prepared (assuming little evaporation)?

d. Using the food cost from "Part b" and the serving yield in "Part c," what is the cost per 12-oz. serving of the beef vegetable soup?

3. Participate in a class discussion of the basic food cost procedures in this lab sheet.

4. Turn in your completed lab sheet to your instructor.

Compute Food Cost and Yield: Part 1

2. a. \$10.59

b. Note: Some per pound and ingredient prices are rounded.

1.5 lb. carrots $\$0.41/\text{lb.} \times 1.5 \text{ lb.} = \0.63

3 lb. beef stew meat $\$2.76/\text{lb.} \times 3 \text{ lb.} = \8.28

2 lb. onions $\$0.26/\text{lb.} \times 2 \text{ lb.} = \0.52

0.75 lb. celery $\$0.96/\text{lb.} \times 0.75 \text{ lb.} = \0.72

1.25 lb. green peppers $\$0.96/\text{lb.} \times 1.25 \text{ lb.} = \1.20

2.25 lb. potatoes $\$0.38/\text{lb.} \times 2.25 \text{ lb.} = \0.86

The raw food cost of the soup = \$12.21

c. $18.75 \text{ lb.} \times 16 \text{ (oz./lb.)} = 300 \text{ oz.} \div 12 \text{ (oz./portion)} = 25 \text{ servings}$

d. $\$12.21 \div 25 \text{ servings} = \$0.49 \text{ per serving (raw food cost)}$

Compute Food Cost and Yield: Part 2

Purpose

The purpose of this activity is to practice calculating food costs and yields for menu items.

Objectives

1. Use the correct arithmetic operation(s) for each step of the food cost problem.
2. Accurately calculate food cost and yield for each food cost problem.

Materials

- ◆ lab sheet
- ◆ writing utensil
- ◆ calculator (optional)

Procedure

1. Work individually to solve each of the food cost problems below. Use the provided bulk prices to determine the cost of the ingredients listed. Use the recipe portion to determine recipe yield and other information as required. Remember to convert pounds (#) to ounces (oz.). If the number of pounds is shown as a decimal, multiply it by 16 (as 16 oz. = 1#) to convert from pounds to ounces. To convert from ounces to pounds, divide by 16.
2. Try your hand at the following food cost problems associated with making a batch of peanut butter cookies. Show your work in the space provided.

Bulk Prices:

- 5-lb. tub of peanut butter = \$13.30
- 50-lb. block of shortening = \$61.15
- 50-lb. bag of all-purpose flour = \$9.66
- 25-lb. bag of granulated sugar = \$32.79



1 case of eggs (180 eggs; 2 oz./shelled egg) = \$15.95

1 gallon of vanilla = \$96.12

36-lb. case of margarine = \$14.05

Grandma's Peanut Butter Cookies call for the following ingredient amounts:

3 lb. peanut butter

1.5 lb. shortening

2.875 lb. flour

3 lb. granulated sugar

1 dozen eggs

2 oz. vanilla

0.75 lb. margarine

- a. What is the recipe yield (# and oz.)?
 - b. What is the raw food cost of this recipe?
 - c. A standard portion size for a peanut butter cookie is 1.5 oz. of cookie dough. How many cookies does this recipe yield?
 - d. What is the raw food cost per cookie based on the recipe yield?
 - e. Based on the raw food cost per cookie, what is the raw food cost for 12 dozen cookies that the Cub Scouts want to order?
 - f. The Cub Scouts decide they want a larger cookie that will use 2.25 oz. of dough each. What is the new yield (in cookies) using the original recipe?
 - g. What is the raw food cost per cookie for the 2.25-oz. version?
3. Participate in a class discussion of the basic food cost procedures.
 4. Turn in your completed lab sheet to your instructor.

Compute Food Cost and Yield: Part 2

1. Note: Several amounts in Question 2 were rounded.
2.
 - a. 12 lb. 12 oz.
 - b. \$17.16
 - c. 136 cookies
 - d. Approximately \$0.13/cookie
 - e. 12 dozen cookies = \$18.72
 - f. Approximately 90 cookies
 - g. Approximately \$0.19/cookie

Compute Food Cost Using AP, EP, and YF

Purpose

The purpose of this activity is to practice using food cost variance formulas.

Objectives

1. Accurately calculate edible portion (EP).
2. Accurately calculate yield factors (YF).

Materials

- ◆ lab sheet
- ◆ VM-B
- ◆ writing utensil
- ◆ calculator (optional)

Procedure

1. Work individually to solve each of the food cost problems below. The activities ask you to practice using the food cost variance formulas to compare AP and EP, calculate YF, and apply the factors to solve food cost scenarios.
 - a. To find EP weight, subtract the weight of waste from the AP weight.
 - b. To find the amount of waste, subtract EP weight from AP weight.
 - c. To find YF, divide EP weight by AP weight.
 - d. To find the EP weight, if AP and YF are known, multiply AP weight by YF (as a decimal).
 - e. To find EP cost per pound (example), divide AP food cost by EP weight.



- h. In “Problem g” above, the turkey cost \$1.39/lb. AP. What was the EP cost per pound?
- i. Problems “g” and “h” refer to Sarah’s cooking loss test on a turkey and the resulting EP cost/pound. She could have purchased the turkey boned and trimmed for \$2.09 per pound. Would that have been a better deal than the EP price/pound she paid by trimming it herself? _____ What is the EP price/pound of the boned and trimmed turkey? _____ Explain your answer.
- j. Felix purchased 8 lb. AP of asparagus at \$2.49/lb. He will serve it tonight in his restaurant, and a standard portion size is 3 oz. After trimming, 5.5 lb. EP remained. What was the EP portion cost?

Compute Food Cost Using AP, EP, and YF

1. Note: Some amounts were rounded. Some problems require up to three steps to find the solution.
2.
 - a. 6.5 lb.
 - b. 0.75 lb.
 - c. 62
 - d. 6.05 lb.
 - e. 28 lb.
 - f. \$1.55/lb.
 - g. 58
 - h. \$2.41/lb.
 - i. Yes. The pre-trimmed product is a much better value; it is less expensive per pound, without any added labor cost to process it.
 - j. \$0.68 per 3-oz. portion

Food Cost Percentages and Menu Pricing

Purpose

The purpose of this activity is to practice calculating food cost percentages and selling prices for menu items.

Objectives

1. Accurately calculate food cost percentages.
2. Accurately calculate menu prices.

Materials

- ◆ lab sheet
- ◆ writing utensil
- ◆ VM-C
- ◆ calculator (optional)

Procedure

1. Work individually to calculate the following food cost percentage and menu pricing problems. In the foodservice industry, when we talk about “food cost percentage (FC%),” we are speaking about the comparison between what was spent on the ingredients (raw food cost) compared to the selling price of the finished product. In other words, what percent of the sale price was spent to purchase the ingredients?
2. To determine this percentage, a simple formula is used: **FC (food cost) ÷ Menu price (sale price) = FC% (food cost percentage)**. The FC% is calculated dividing the food cost (FC) by the menu price (or total dollars brought in by the sale of the item)—



specifically, the percent of every dollar generated by food sales that is spent to purchase the menu item ingredients.

- a. For instance, if you spend \$2.09 on ingredients to make pasta and meatballs and sell the meal for \$11.99, the FC% would be calculated as follows:
$$\$2.09 \div \$11.99 = 0.174$$
 - b. To change the decimal 0.174 into a percentage, you multiply the decimal by 100 (or just move the decimal place to the right by two digits).
$$0.174 \times 100 = 17.4\%$$
 - c. The FC% 17.4% means that 17.4% of the selling price was spent on the ingredients to make the food. Therefore, 17.4 cents of every dollar you make on the sale of the pasta and meatballs was spent to purchase the pasta and meatballs.
3. Now practice using this skill. Use the information provided to determine the Food Cost Percentages for each of the problems below. Show your work in the space provided.
- a. One brownie costs \$0.13 FC and sells for \$1.29. What is the FC%?
 - b. The cost of a T-bone steak dinner is \$6.12 FC, and it sells for \$19. What is the FC%?
 - c. Soda costs the restaurant \$0.23 per can and sells for \$1.25. What is the FC%?
 - d. French fries cost \$0.09 per serving and sell for \$1.39/serving. What is the FC%?
 - e. One whole pizza costs \$3.77 FC and sells for \$13.99. What is the FC%?
4. In the foodservice industry, management decides how much profit each item will bring in. The owners/managers decide what the food cost percentage will be; it isn't random. To calculate the menu prices, executive chefs and/or owners use another simple formula: **FC (food cost) ÷ FC% (food cost percentage) = Menu (selling) price**. The FC is divided by the desired food cost percentage (shown as a decimal) to calculate the minimum selling price.
- a. For example, a baker makes an apple pie, and the restaurant food cost percentage is 22 percent of the selling price. Therefore, the restaurant wants to sell the pie for enough money so only 22 cents of every dollar collected from sales is spent on the ingredients the baker used to make the pie.
$$\$1.56 \div 0.22 \text{ (22\% shown as a decimal)} = \$7.09 \text{ minimum selling price}$$

5. Now practice using this skill. Use this menu pricing method to calculate the selling price for each item below, using the information given. Show your work in the space provided.
- a. An Italian beef sandwich has an FC of \$1.71 and the FC% is 26%. What is the minimum menu price?

 - b. A bottle of wine has an FC of \$2.69 and an FC% of 17%. What is the minimum menu price?

 - c. A shrimp dinner has an FC of \$5.85 and an FC% of 31%. What is the minimum menu price?

 - d. Fudge candy has an FC of \$1.09 per lb. and an FC% of 12%. What is the minimum menu price? _____/lb.

 - e. Blue cheese has an FC of \$1.91/lb. and an FC% of 21%. What is the minimum menu price? _____/lb.
6. One gallon of chocolate mousse has an FC of \$9.12.
- a. What is the FC of a 1½-cup serving?

 - b. What is the selling price of a serving of chocolate mousse at an FC% of 13%?
7. An 8-lb. roast has an FC of \$23.18.
- a. What is the food cost of a 10-oz. portion?

 - b. What is the selling price of the 10-oz. serving at an FC% of 26%?

Food Cost Percentages and Menu Pricing

3. a. 10%

b. 32%

c. 18%

d. 6%

e. 27%

4. a. \$6.58

b. \$15.82

c. \$18.87

d. \$9.08/lb.

e. \$9.10/lb.

6. The three-step results are:

$$\$9.12 \div 16 \text{ (16 cups/gallon)} = \$0.58/\text{cup}$$

$$\$0.58 \times 1.5 = \$0.86 \text{ FC per serving}$$

$$\$0.87 \div 0.13 = \$6.69 \text{ minimum selling price}$$

7. The four-step results are:

$$\$23.18 \div 8 \text{ lb.} = \$2.90/\text{lb.}$$

$$\$2.90 \div 16 \text{ (16 oz./lb.)} = \$0.18/\text{oz.}$$

$$\$0.18 \times 10 \text{ oz.} = \$1.80 \text{ FC}$$

$$\$1.80 \div 0.26 = \$6.92 \text{ minimum selling price}$$