Chapter 8: Production & Recipe Formulation

Recipe Formulation

- Used to develop standard recipes that serve as **production controls**
  - Standardizing recipes
  - Adjusting recipes

Standardized recipes

- Recipe is a statement of ingredients and procedures required to prepare a food item
- Yields a known quantity of product of a known quality
- A recipe is standardized when it has been tested and adapted to the requirements of a specific food service operation

Advantages of standardized recipes

- Consistency regarding :
  - Flavor
  - Texture
  - portion size
  - Nutrient composition (to meet the nutritional needs of the customers: schools & hospitals)

Advantages of standardized recipes

- Simplifies other functions of a food service operation (planning, purchasing, forecasting, recipe costing, and pricing)

- Since ingredients and amounts are the same every time the recipe is used

Advantages of standardized recipes

- Minimize the effects of employee turnover on food quality
- Simplify the training of new staff
- Essential for computerized food service operations
  - coded recipes triggers other functions like purchasing and forecasting
- The key to success of centralized ingredient assembly (accuracy in weight and measure)

Standardized recipe format

- **Recipe format** : provides all information needed for production of a menu item

- Arranging the information and following the same pattern every time
- Usually , ingredients are listed according to order of use
- Block arrangement : grouping ingredient that are to be combined
- Listing procedures directly across the ingredient

CHICKEN AND BROCCOLI STIR-FRY

Yield 50 portions — *Portion* 4 oz chicken and broccoli + 4 oz rice

Ingredient	*Amount*	*Procedure*
Water (cold)	4½ qt	Prepare sauce by blending together the liquids, spices, and cornstarch. Stir with a wire whip until well blended.
Soy sauce	2⅔ cup	Cook over medium heat until thick and translucent. Stir often during cooking.
Chicken base	1½ oz	Keep hot (above 165°F). Save for later step.
Garlic, minced fresh	2 oz	
Ginger, ground	1 Tbsp	
Red pepper, crushed	¼ tsp	
Sesame seed oil	4 oz	
Cornstarch	7 oz	
Vegetable oil	½ cup	Saute ginger and garlic in hot oil for 2–3 minutes, until softened.
Ginger, fresh, thinly sliced	1 tsp	Add chicken and cook until done, 165°F, stirring often during cooking.
Garlic, minced	1 tsp	
Chicken, raw, cut in strips	6 lb	
Water chestnuts, sliced, drained	2 lb (EP)	Add water chestnuts and mushrooms to the cooked chicken. Stir-fry until mushrooms are softened.
Mushrooms, sliced fresh	1 lb (EP)	Add Chinese cabbage, broccoli, and onions. Stir-fry for an additional 2–3 minutes, until vegetables are barely tender.
Chinese cabbage, 1-inch slices	2 lb (EP)	Pour hot sauce reserved from earlier step over chicken-vegetable mixture.
Broccoli florets	1 lb 8 oz (EP)	
Green onions, 1-inch slices	6 oz (EP)	
Rice, converted	3 lb 8 oz	Cook rice according to directions on p. 594.
Water, boiling	4¼ qt	Serve 4 oz chicken-vegetable mixture over 4 oz rice.
Salt	2 Tbsp	
Vegetable oil	2 Tbsp	

Approximate nutritive values per portion — **Calories** 275

Amount/portion	%DV	Amount/portion	%DV	Amount/portion	%DV		%DV		%DV
Total Fat 7g	11%	**Cholest.** 38 mg	13%	**Total Carb.** 35 g	12%	**Vitamin A**	5%	**Calcium**	6%
Sat. Fat 1g	6%	**Sodium** 1300 mg	56%	Fiber 2 g	9%	**Vitamin C**	31%	**Iron**	10%
Protein 16 g				Sugars 2 g					

Percent Daily Values (%DV) are based on a 2,000-calorie diet.

Notes
- Potentially hazardous food. *Food Safety Standards:* Hold food for service at an internal temperature above 140°F. Do not mix old product with new. Cool leftover product quickly (within 4 hours) to below 41°F. See p. 105 for cooling procedures. Reheat leftover product quickly (within 2 hours) to 165°F. Reheat product only once; discard if not used.
- Always wash hands and wash and sanitize countertops, utensils, and containers between production steps when preparing raw poultry.

Variations
- **Beef and Broccoli Stir-Fry.** Substitute beef strips for chicken, and beef base for chicken base. Reduce water chestnuts to 1 lb 8 oz and Chinese cabbage to 1 lb 6 oz. Increase broccoli to 3 lb and mushrooms to 1 lb.
- **Chicken and Vegetable Stir-Fry.** Follow recipe for Chicken and Broccoli Stir-Fry. Use a total of 7 lb assorted vegetables. Select from broccoli florets, carrots, Chinese cabbage, mushrooms, water chestnuts, onions (green or mature), snow peas, or sugar snap peas.

Standardized recipe content

- Recipe title
    - Should be printed in large type with the recipe code
- Yield and portion size
    - – Total recipe yield (in measure, weight, # of pans, or # of portions)
    - – The serving utensil for **portioning**
- Cooking time and temperature
    - – At the top of the page
    - – Specify the production **equipment** (eg. Type of oven)

Standardized recipe content

- Ingredients and quantities
  - Names of ingredient on the left side
  - Quantities arranged in one or more column to adjust for different yields
  - Term before the name: as purchased form → the ingredient has been cooked or heated before using it in the product (frozen chopped broccoli, canned tomato, boiling water)
  - Term After the name :indicating that the processing after the ingredient is weighed or measured (onions, chopped; eggs, beaten)
  - As purchased vs. edible portion (table 8.1)
  - Consistent abbreviations (table 8.2)

Applesauce Cake

Desserts No. Ck–3
Portion: 2 × 2¾ in.
Cut 6 × 8

Oven temperature: 350°F
Time: 30–35 minutes

Ingredients	*2 pans*	*3 pans*	*Procedure*
Shortening Sugar	1 lb 7 oz 2 lb 14 oz	2 lb 3 oz 4 lb 5 oz	Cream 5 min. on medium speed, with paddle.
Eggs	2 cups	3 cups	Add and beat 5 min. on medium speed.
Applesauce	2 qt + ⅔ c	3¼ qt	Add gradually on low speed. Beat 1 min. on medium speed after last addition. Scrape down.
Cake flour Salt Soda Cinnamon Nutmeg Cloves Raisins	2 lb 14 oz 4 tsp 1 oz 1 Tbsp 1½ tsp 1½ tsp 12 oz	4 lb 5 oz 2 Tbsp 1½ oz 4½ tsp 2¼ tsp 2¼ tsp 1 lb 2 oz	Sift dry ingredients together and mix with raisins. Add to creamed mixture gradually on low speed. Beat 2 min., medium speed, after last addition. Scrape down once.
Total wt	13 lb 6 oz	20 lb 2 oz	Weigh into greased baking pans, 12 × 22 × 2 in., 6 lb 8 oz/pan.

Figure 8.2 Recipe format with columns for two quantities.

- example :
- 15 pounds (AP) of broccoli would be 12 pounds (EP) or less assuming an 81% yield .

Table 8.1 Approximate yields expressed by weight of selected fruits and vegetables.

FOOD ITEM	YIELD
Apple, fresh	.78
Asparagus	.60
Bananas	.65
Beans, green or wax	.88
Beets, with tops	.45
Blueberries	.95
Broccoli	.70
Cantaloupe, peeled	.52
Carrots	.75
Celery	.70
Corn on the cob	.48
Grapes, seedless	.94
Lettuce, head	.76
Mushrooms	.90
Peaches	.76
Potatoes, white	.81
Squash, acorn	.75
Tomatoes	.85

Table 8.2 Common abbreviations used in food production.

AP	As purchased	oz	Ounce
AS	As served	pkg	Package
c	Cup	psi	Pounds per square inch
EP	Edible portion	pt	Pint
°F	Degrees Fahrenheit	qt	Quart
fl oz	Fluid ounce	tsp	Teaspoon
gal	Gallon	Tbsp	Tablespoon
lb	Pound		

Standardized recipe content

- Procedures
  - Should be divided into logical steps
  - Most effective when placed directly across from the ingredients to be combined
  - Clear and concise
  - **Basic procedures are uniform in all recipes for similar products**
  - Timing for procedures (eg. Cook rice on low heat until …. For 10-15 mins)

Computer generated recipe

- In food services using a computer assisted system, recipes are printed as needed and in the quantities required for the day's production (fig 8.3)

Recipe yield

- A measure of the total amount produced by a recipe
- Can be expressed in weight , measure, count

Quality standards

- Measurable statements of characteristics of food

Score Card for Cake

Date ______________

Factor	Qualities	Standard	Sample No. 1	Sample No. 2	Sample No. 3	Comments
I. External appearance	Shape, symmetrical, slightly rounded top, free from cracks or peaks	10				
	Volume, light in weight in proportion to size	10				
	Crust, smooth uniform golden brown	10				
II. Internal appearance	Texture tender, slightly moist, velvety feel to tongue and finger	10				
	Grain, fine, round, evenly distributed cells with thin cell walls, free from tunnels	10				
	Color, crumb even and rich looking	10				
III. Flavor	Delicate, well-blended flavor of ingredients. Free from unpleasant odors or taste	10				

Directions for use of score card for plain cake:

Standard	10	No detectable fault, highest possible score
Excellent	8–9	Of unusual excellence but not perfect
Good	6–7	Average good quality
Fair	4–5	Below average, slightly objectionable
Poor	2–3	Objectionable, but edible
Bad	0–1	Highly objectionable, inedible

____
Signature of evaluator

Recipe Adjustment

- Two methods :
  - The factor method
  - The percentage method

The factor method

- The quantities of ingredients in the original recipe are multiplied by a conversion factor

1. Divide the desired yield by the known yield of the source recipe to obtain the conversion factor
   - Source recipe yield : 12
   - Desired yield is 75
   - The conversion factor is (75/12 = 6.25)
     - See table 8.3

The factor method

2. Convert all volume measurements to weights

3. Multiply the amount of each ingredient in the original recipe by the factor

4. Round off unnecessary fractions

Table 8.3 **Adjusting a recipe from a yield of 12 to 75: African vegetable stew.**

	STEP 1	*STEP 2*	*STEP 3*	*STEP 4*
INGREDIENTS	ORIGINAL RECIPE YIELD = 2	CONVERTED VOLUME MEASURES TO WEIGHTS	MULTIPLIED BY FACTOR	ROUNDED WEIGHTS
Onion, diced	3 c	1# (16 oz)	6.25#	6.25#
Swiss chard	3 bunches*	2.25# (36 oz)	14.063#	14#
Garbanzo beans	4.5 c	1.8# (28.8 oz)	11.25#	11.25#
Raisins	1.5 c	8 oz	3.125#	3#, 2 oz
Rice, raw	1.5 c	10 oz	3.9#	4#
Sweet potatoes	6 c	2#	12.5#	12.5#
Tomatoes	6 c	2.66# (43 oz)	16.23#	16.25#
Garlic	3 cloves	.5 oz	3.125 oz	3 oz

Factor: 75/12 = 6.25.

*Assume one bunch equals 12 oz.

Adapting small quaintly recipes

- Home recipes can be enlarged to food service operation
- Procedures should be checked because many home recipes lack detailed directions for their preparation

Expanding home size recipes

1. Prepare the product in the amount of the original recipe (following exactly the original recipe)
2. Evaluate the product (written form), and decide if it is potential for the food service
3. Make modification if needed ! Work with the original amount until the product is satisfactory!!

Expanding home size recipes

4. Double the recipe and make notations if needed for the doubled amount (<u>increased cooking time,…)</u>
5. Double the recipe again, then calculate the quantities needed to prepare one pan that will be used in the establishment
6. Converting household measures to ounces and pounds

Expanding home size recipes

7. If the product is satisfactory, continue to enlarge by increments of 25 portions or by pans
8. Adjusting for handling losses (making batters, cooking losses… etc)

Dishes can lose from 10-30% of the water content after cooking

Forecasting

- A prediction of food needs for a day or other specific period of time using past data

- Facilitates :
  - Efficient scheduling of labor
  - Use of equipment
  - Use of space

Reasons for forecasting

- Ensure that all of the production stages are completed in a timely manner and that the final product meets standards of quality

- Know how much food to order,, and when it needs to be available for use

Reasons for forecasting

- Minimizes the chance of overproduction or underproduction
  - Overproduction : leftovers is held for later service or redirected to other area
    - Food may not meet the standards
  - Underproduction : customer dissatisfaction and costly
    - Managers substitute expensive heat and serve items
    - Rushed last minute food preparation and delayed service

Forecasting

- In small long term operations:
  - Amounts to be produced can be determined by simple tally
  - Especially if nonselective menu
  - Number of residents is stable

Forecasting

- In large organizations:
  - More sophisticated forecasting
  - A tally system would be time consuming

- Regardless of the type of organization,, a good forecasting system is based on sound historical date that reflects the pattern of actual menu item demand

Historical Data

- Used to:
  - Determine needs
  - Establish trends
- The data must be consistently and accurately recorded
- Examples p 221

Historical Data

- **Record example p223**
- Overtime, a pattern of menu item demand or total meals served will emerge from the recorded data
- Factors influencing pattern variance include:
  - Holidays
  - Weather conditions
  - Special events

Criteria for selecting a forecasting method

- Table 8.9 p224

Other trends to predict the production demand

- They became relying less on the forecasting due to:
  - Huge day to day fluctuations in patient census
  - Short length of stay/high patient turnover
  - Rapidly changing and increasingly complicated diet orders
  - Implementation of room service/ meals on demand service

Other trends

- Service styles like :
  – Made to order (MTO)
  – Grab-and-go
- Reduced the value of long term forecasting
- Reduced the need to predict demand in advance
- Simply relying on past demand

The quantities to produce

- Recipes adjusted to the predicted number of portions needed
- Most recipes are calculated in modules of 50 or 100
- Or in pan sizes and equipment

- For non computer assisted systems, standardizing and calculating recipes for more than one amount

The quantities to produce

- Steps p225

Product Scheduling

- After formulating the recipe → forecasting demand→ calculating quantities to produce → production scheduling

- **Production scheduling** : communication process whereby the production staff is informed of how the actual activity of food preparation is to take place over specified time

Production Scheduling

- Purpose : to ensure efficient use of time, equipment, and space

- By identifying :
  - Menu items to be prepared
  - Quantities to produce
  - When to produce
  - Who is prepare each item

Phases of production

- Depending on the type of foodservice system in the operation,
- The sequence of food flow may include some or all of the following:

Phases of production

1. Preparation of ingredients
   - Thawing, cleaning and peeling of veg., retrieving and assembling dry ingredients
2. Production of menu items
   - Combining ingredients and cooking
3. Holding under appropriate conditions
   - Frozen, refrigerated, hot-hold
4. Transport and service to consumers

Phases of production

- When planning for production, food managers accounts for the time required for each one of these steps

- And then, schedules the activity of the production accordingly

  - Recipe p227 : complex recipe

Batch cooking

- if the food in the recipe lose it’s nutritional quality → it is prepared by batch cooking method

- **Batch cooking** : the total quantity of a recipe is divided into smaller batch sizes and cooked as needed rather than all at once
  - Steamed broccoli, rice, pasta

Batch cooking method

Production Schedules

- Production sheet include : detailed document used to communicate with production staff and the work that needs to be done for a specific period of time

- Should include :
  - Page 228
  - Example p229