Steps to Easier Quantity Food Production

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A high school graduation party, a 25th wedding anniversary buffet, the church soup supper, or a 4-H Food Stand—each represent a time when you might be asked to cook your mother's "secret" recipe for more than the normal four to six servings.

Quantity food production (for 25 or more servings) can be an intimidating first-time experience. How do you create the same product for 50 as for six? How much food do you buy to prepare 50 servings? If you are trying to make money, how do you set a selling price to ensure a profit?

STEP ONE

The first step is to develop a MENU. The menu is the focal point of serving food, whether cooking at home for the family or catering a banquet for over 100 people. The menu is the primary control tool because it tells which recipes to use, how much food to prepare, and helps determine the cost of the meal. The menu also suggests special equipment, amount of staff, and time-needed for preparation and serving.

A well-planned menu provides foods with a variety of flavors, colors, textures, shapes, temperatures and preparation methods, but also remains nutritious. It is important to make sure that the right equipment and enough space is available for proper menu preparation, and that similar preparation methods are avoided. If you served all fried foods or all baked foods it would be difficult to have enough available equipment—it would also be very unappetizing. For example, consider these two menus for a church banquet:

MENU 1

Fried Chicken
Fried Potatoes
Corn
Peas
Apple Pie
Coffee

MENU 2

Fresh Garden Salad w/dressing
Country Baked Steak
Scalloped Potatoes
Green Beans Almandine
Cherry Pie Ala Mode
Ice Tea or Coffee

Menu 1 is fairly nutritious, but the foods are generally all brown or yellow, warm in temperature, smooth in texture and round in shape. The second menu is nutritious, uses very descriptive words, and has a variety of shapes, textures, temperatures and colors. Which one would you prefer?

When planning a menu for a banquet or catered meal, determine the entree(s) first. These items set the menu theme and are generally the most expensive items on the menu—everything else should balance and compliment them. Country Baked Steak sets a homestyle meal theme as the Menu 2 entree. Vegetables are next selected to compliment the entree, but only one should be high in starch. For example, if a garden salad, scalloped potatoes (a high-starch vegetable) and green beans are served, only one item is starchy. Preparing corn, fried potatoes and peas would mean serving all high-starch foods. Salads and soups are planned third, followed by desserts—all should compliment the entree and vegetables. Appetizers and drinks are planned last. Appetizers are very flexible and can be hot or cold and either crunchy or smooth, depending on what is needed to balance the meal.

STEP TWO

Once the menu is completed, the second step is to find a RECIPE for each menu item. Recipes can come from your mother's favorite recipe file, a popular cookbook, or even the local library. *Food for Fifty* (10th edition) by Mary Molt is is an excellent resource for quantity recipes and is available in most bookstores.

"Standardized recipes" are extremely important in quantity food production. These recipes have been taste-tested and tried at least three times with consistent product results.

Recipe Standardization of a Homestyle Recipe

Good standardized recipes are very specific in ingredient amounts and even ingredient brand names to create desired results. Recipe standardization is the process by which a recipe for a small number of servings is increased to serve a large number, usually 50 or more. However, making a recipe for four servings and trying to increase that recipe to feed 50 does not always yield the same results. Enlarging a small-quantity recipe in degrees is more likely to be successful than increasing the size too quickly.

To expand home-sized recipes:

- First, prepare the original recipe and follow the directions exactly as they are written.
- Evaluate the product and note any unclear procedures or any problems with the recipe.
- If everything appears satisfactory, double the recipe.
- Evaluate the product—record the yield, portion size and acceptability.
- Double the recipe again and repeat the previous evaluation method.
- If the product is satisfactory, continue to enlarge the recipe in increments of 25 portions (or by pans) until you reach the desired number of servings.

Recipes with yields of more than 100 servings should be evaluated for acceptability, and adjustments should be made each time the yield is doubled.

(An example of a standardized recipe is shown on Pg. 4 of this handout.)

Recipe Adjustment / Sizing

The **FACTOR METHOD** is the most common method used in recipe adjustment to determine the amount of ingredients needed for a specific number of servings.

When using the **FACTOR METHOD**, a conversion factor is determined and each ingredient in the recipe is multiplied by this factor. The resulting number is the new amount of the ingredient. (Use Insert A, Recipe Adjustment Form.)

(An example of a factor method recipe adjustment is shown on Pg. 4 of this handout.)

"HOW-TO" ADJUST a RECIPE USING the FACTOR METHOD

Step 1: Divide the "desired" yield by the "known" yield of the recipe to obtain the conversion factor.

<u>Example</u>: *To increase a four portion recipe to 50 portions, divide 50 by four. This results in a 12.5 factor.*

Step 2: Convert measured ingredients to weight. Fluid measures can be converted to ounces. Solids like sugar must be converted using proportions because they do not weigh the same as liquids.

<u>Example</u>: *1 cup Water = 8 oz*

1 lb Sugar (16 oz) = 2.25 cups (See Food for Fifty Table: Page 27)

$$\frac{16\text{ oz}}{2.25\text{ cups}} \times \frac{x}{1\text{ cup}}$$

Multiply diagonally so that: 16 oz(1 cup) = 2.25 cups(x)

Cups cancel each other out so that: 16 oz(1) = 2.25(x)

Divide each side by 2.25 so that: $\frac{16\text{ oz}}{2.25} = x$

Therefore, x = 7.11 = 7 oz

1 cup Sugar = 7 oz

Step 3: Multiply the amount of each ingredient in the original recipe by the factor. Convert this amount to the most likely measurement of use.

<u>Example</u>: *Water = 8 oz X 12.5 = **100 oz** = 12 1/2 cups or 3 qts + 1/2 cup*

*Sugar = 7 oz X 12.5 = **87.5 oz** = 12 1/2 cups*

Recipe Costing

Once a recipe has been adjusted, this information is used to determine the preparation costs. **RECIPE COSTING** is extremely important if a profit wants to be made. Costing the recipe not only tells exactly how much the recipe will cost per portion of food, but this information is then used to calculate the selling price of the menu item. (Use Insert B, Recipe Costing Form.) ***(An example of recipe costing is shown on Pg. 4 of this handout.)***

If a meal price is needed, the costing process should be done for one serving of each menu item. These figures added together determine the meal cost. The only remaining question is, "How much profit do you want to make?"

STEP THREE

Naturally, the next step is MENU or MEAL PRICING. To calculate the selling price of a menu item, first determine what percent of the profit food costs will be.

"HOW-TO" DETERMINE RECIPE COSTING

Ingredient = Flour | **Amount in Recipe = 5 pounds**

Unit Cost = 10 lb bag for $2.53 | **Extended Cost or cost of flour needed = X**

$$\left(\frac{10\text{ lbs of flour}}{\$2.53}\right) \times \left(\frac{5\text{ lbs of flour (amount needed)}}{X\text{ (cost of four needed)}}\right)$$

Follow the same cross-multiplying steps as done in the previous example so that:

10 X flour cost = $12.65

X = 1.265 = $1.27 flour cost

The adjusted recipe uses 10 pounds of flour, which will cost $1.27. After each ingredient has been given an individual cost, these figures are added together to determine the total cost of preparation.

To find a cost per serving, simply divide the total recipe cost by the number of servings the recipe yields.

Example: A 100-serving recipe with a total ingredient cost of $250.00 would be $250/100 or $2.50 per serving, raw food cost.

RECIPE ADJUSTMENT FORM

Recipe: ____

Determine what your new yield will be: NEW (desired) YIELD ÷ ORIGINAL (known) YIELD = FACTOR

__________ ÷ __________ = __________

INGREDIENT	ORIGINAL AMOUNT	ORIGINAL AMOUNT in OUNCES	X FACTOR = NEW AMT. in OZ	NEW AMOUNT in LBS/OZ

RECIPE COSTING FORM

Recipe: ____

Number of Portions: ____________________________

INGREDIENT	AMOUNT in RECIPE (by unit)	UNIT COST	EXTENDED COST
		TOTAL COST	
		NUMBER of PORTIONS	
		COST per PORTION	

"HOW-TO" CALCULATE MENU SELLING PRICE

Generally, commercial food service food costs are 25-35%. The equation used to calculate selling price is:

Menu Selling Price = Food Cost ÷ Food Cost Percentage

Example: Food Cost = $2.50   Food Cost Percentage = 35%

$$X \text{ (Menu Selling Price)} = \frac{\$2.50 \text{ food cost}}{.35 \text{ food cost } \%}$$

X = $7.14 or $7.25 for a rounded menu price

This menu selling price would ensure that expenses would be covered for labor, supplies, etc. A reasonable profit would also be gained on the menu item.

STEP FOUR

The final step is PURCHASING. Purchases should be planned ahead of time by listing all ingredients and the amounts needed for each recipe. If three recipes require sugar, enough sugar should be bought in bulk for all three recipes. If specific brands are needed, list the brand name and the best supplier (or store) for each ingredient. Check the amount of ingredients on hand and deduct the in-stock amount from the amount needed to be purchased. When a product arrives from a supplier, the quantity should be checked to ensure it was the amount ordered—you do not want to realize you are short on eggs in the middle of making 10 meringue pies. Quality should also be checked. A quality end-product is not possible without quality ingredients. Garbage in—garbage out!

FOOD SAFETY is important at all stages of quantity food production. A great meal can be planned and served, but if food safety principles are not followed, a disaster could result. Some important food safety facts include:

- Make sure that food handlers are clean and disease-free. In addition to proper hand-washing, safe food-handling practices must also be followed.
- Keep potentially hazardous foods—milk products, cream pies, meat, eggs, poultry, shellfish, cooked potatoes and cream cheese—out of the temperature danger zone, 40˚ F - 140˚ F. Keep hot foods hot and cold foods cold!
- Hot foods should maintain an internal temperature of 140˚ F or above. The safe internal temperature for gravies, soups and casseroles is 165˚ F. Ground beef should be cooked to an internal temperature of 160˚ F.
- Serve potentially hazardous foods within four hours (or less) of preparation.
- Use a metal-stemmed thermometer (that is accurate to 2˚ F) to measure temperatures of foods. Check temperatures throughout preparation and service, and be sure to check temperatures in a product's center or thickest part.
- If there is leftover food, cool hot foods quickly to 40˚ F or below, within three to four hours after serving. Placing a hot pan in a shallow pan of ice water will help cool the food quickly.
- Quickly reheat unused leftovers to 165˚ F before serving, and maintain that temperature while serving.
- Do not use reheated leftovers more than once.

The K-State Research and Extension publication, "Food Safety and Sanitation: Guidelines for Volunteer Group Social Functions," (MF 1078) includes more detailed food safety information. This would be an excellent resource for volunteers or employees working with quantity food production.

Now you should be ready to tackle any quantity food production challenge.

Starting Your Own Catering Business

If you are interested in starting a home-based catering business, your first call should be to the Kansas Department of Health and Environment (KDHE) sanitarian in your area:

Chanute District Office:
(316) 431-2390

Dodge City District Office:
(316) 225-0596

Hays District Office:
(785) 625-5663

Salina District Office:
(785) 827-9639

Topeka State Office:
(785) 296-5600

Wichita District Office:
(316) 337-6028 or 6029

KDHE also contracts with the health departments in certain counties. If you live in one of the following counties, contact the local health department sanitarian or the district office for information:

Butler and Greenwood Counties:
(316) 321-3400

Geary County:
(785) 762-5788

Johnson County:
(913) 492-0402

Lyon County:
(316) 342-4864

Reno County:
(316) 694-2900

Riley County:
(785) 776-4779, ext. 239

Saline County:
(785) 826-6604

Sedgewick County:
(316) 268-8429, ext. 8351 / 8368

Shawnee County:
(785) 233-8200, ext. 6064 / 6068

Wyandotte County:
(913) 321-4803, ext. 203

A free check list is available from the preceding offices to help establish a certified kitchen for catering purposes. Inspectors will also perform mock inspections before a kitchen is finalized. A Food Service Establishment Regulations handbook is available at the KDHE web site.

The Small Business Development Center (SBDC) at Kansas State University is another useful resource. Phone: (785) 532-5529. If a home-based catering business is desired, the SBDC can provide help by offering free business counseling, specific technical information, and assistance when applying for a tax identification number. Don't forget that the local extension office has more resources available on starting a home-based business, food safety and quantity food production.

If you have World Wide Web access, the following sites have up-to-date quantity food production information. The costing and recipe standardization forms in this publication are also available at the K-State Department of Foods and Nutrition website.

K-State Department of Foods and Nutrition
http://www.oznet.ksu.edu/dep/fnut

Kansas Department of Health and Environment (KDHE)
http://www.ink.org/public/kdhe/index.htm

References:

Molt, Mary. *Food for Fifty*. 10th edition.

Ashley, Stephen and Sean Anderson. *Catering for Large Numbers*. 1993. Butterworth-Heinemann, Sydney, Australia.

Barrett, Elizabeth B., Karen Penner and Carol Shanklin. "Food Safety and Sanitation: Guidelines for Volunteer Group Social Functions." Kansas State University, Manhattan, KS. (MF 1078) December 1993.

EXAMPLES

STANDARDIZED RECIPE: Yeast Rolls

Total Yield: 8 lbs. Dough	Pan Size: 15" x 26" x 1"	Portion Size: 1 oz.
Serves: 72	Amount/Pan: 8 lbs.	Portions/Pan: 72
Total Prep Time: 3 hours	Baking Time: 15 min.	Baking Temp: 350° F

INGREDIENTS	WT. AMT.	VOL. AMT.	EACH AMT.	PROCEDURE
Sugar	3.25 oz.			Place sugar, salt and margarine in VCM with the mixing shaft. Attach the mixing baffle.
Granulated Salt		2 Tbsp. + 1 tsp.		
Margarine	7.25 oz.			
Milk (scalded)		1 qt. + 3/4 cup		Add hot milk to mixture. Blend 5 seconds, then cool to lukewarm.
Yeast (dry)	2.5 oz.			Soften yeast in water. Add soft yeast and eggs to milk mixture. Mix until blended (5 seconds).
Water (80° - 85° F)		1/2 cup		
Eggs (beaten)			5	
Flour (enriched)	4.75 lbs.			Add flour to make a moderately soft dough. Mix for 90 seconds or until smooth and satiny (it should not stick to the sides of the bowl). Turn out onto lightly floured board and shape into a ball. Cover and let rise in a warm place until the size has doubled (approx. 1 1/2 hours). After rising, punch down the dough and pinch off a piece weighing 1 oz. Shape the rolls as desired, using the sample to control portion size. Arrange in a lightly greased bun pan and let rolls rise until their size doubles. Bake in a convection oven at 350° F for 15 minutes or until golden brown.

QUALITY STANDARD: ***Smooth top, evenly rounded, uniform texture and grain size without streaking. Golden crust free of blisters and cracks. Mild flavor without salty taste or "off" flavors.***

GARNISH: ***Not Applicable. Serve in an attractive basket.***

FACTOR METHOD RECIPE ADJUSTMENT: Whole Wheat Sugar Cookies

New (desired) Yield: ***24 Dozen*** ÷ Original (known) Yield: ***8 Dozen*** = Factor: ***3***

INGREDIENT	ORIGINAL AMOUNT	ORIGINAL AMOUNT in OUNCES	X FACTOR = NEW AMOUNT in OUNCES	NEW AMOUNT in LBS/OZ
Margarine	1 lb.	16 oz.	48 oz.	3 lbs.
Sugar (granulated)	2 lbs.	32 oz.	96 oz.	6 lbs.
Eggs	7 oz.	7 oz.	21 oz.	1 lb. + 5 oz.
Vanilla	4 tsp.	.66 oz.	1.98 oz.	2 oz.
Milk	1/2 cup	4 oz.	12 oz.	12 oz.
Flour (whole wheat)	2 lbs.	32 oz.	96 oz.	6 lbs.
Baking Powder	4 tsp.	.57 oz.	1.71 oz.	1 3/4 oz.
Baking Soda	2 tsp.	.28 oz.	.84 oz.	1 oz.
Salt	2 tsp.	.43 oz.	1.30 oz.	1 1/3 oz.
Nutmeg	2 tsp.	.20 oz.	.60 oz.	2/3 oz.
Orange Peel	4 Tbsp.	1 oz.	3 oz.	3 oz.
Sugar	4 oz.	4 oz.	12 oz.	12 oz.
Cinnamon	2 tsp.	.17 oz.	.5 oz.	1/2 oz.

RECIPE COSTING: Biscuits

Number of Portions: 100 Portion Size: 2 Biscuits

INGREDIENT	AMT. in RECIPE (by unit)	UNIT COST	EXTENDED COST
Flour (all purpose)	5 lbs.	60¢ / lb.	$3.00
Baking Powder	5 oz.	9¢ / oz.	.45
Salt	2 Tbsp.	1¢ / Tbsp.	.02
Shortening	1 lb. + 4 oz.	70¢ / lb.	.875
Milk	1.75 qt.	40¢ / qt.	.70

TOTAL COST $5.045
NUMBER of PORTIONS 50
COST per PORTION .... 10¢

This and other publications from Kansas State University are available on the World Wide Web at http://www.oznet.ksu.edu.

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