



Developing Large Batch Recipes

Summary

Successfully converting recipes for large-batch production requires understanding basic principles such as volumetric and weight measurements, conversion factors, and surface and volume.

Key Issues

During the early stages of product development, it is generally advisable to work with small test batches. Small batches are often easier to produce and are less costly than the larger formulations that will eventually become part of the commercialization process. Still, how small is small? If you are working with a "home-style" recipe (typical serving 4-8), it is often recommended that the recipe be quadrupled at the outset. After making adjustments for taste and texture, this formulation becomes the base recipe from which larger batches are developed.

The ingredients of most non-commercial recipes are expressed in volume amounts (teaspoons, cups, quarts, etc.), and for very small batch cooking volumetric measurement will suffice. But for larger batch recipes, it is important to convert as many ingredients as possible to weight measurements. This is especially crucial in baking, where small inconsistencies at the test batch level can lead to large-scale failures as batch size is increased. Simply put, volume measurement is inexact, whereas weight measurement is precise.

Understanding the methods for converting recipes, therefore, is crucial. Most people can instinctively double or quadruple a recipe, but it seems more complicated to move from a base recipe that yields 8 units to one that yields 340. But with practice, and an understanding of the basic principles of recipe conversion, increasing batch size is straightforward.

Definition of Terms

Recipe: A recipe is a set of instructions for producing a certain food product. Recipes have two separate but equally important parts: 1) the ingredients and amounts and 2) the procedure for preparing/cooking/packaging the product.

Conversion factor: To convert a base recipe, begin by simply dividing the new desired yield by the old yield. This quotient is called the conversion factor.



Batching up: Once the conversion factor has been determined, the next step is to multiply each ingredient of the base recipe by the conversion factor. For non-metric recipes, it will be necessary to convert most weights to ounces, and volumes to fluid ounces. Once calculations are complete, gross ounce amounts are adjusted to make batch size measurements convenient (e.g., 5120 fluid ounces is converted to 40 gallons).

Surface and Volume: The relationship of surface area to volume is important to large batch production. A basic premise of geometry is that surface area does not increase in direct proportion to increases in volume (1 cubic foot has exactly 1 square foot of surface area, but 2 cubic feet do not have 2 square feet of surface area-it's actually closer to 1 1/2). Since the ratio of surface area to volume decreases, less evaporation takes place in "batched-up" recipes. In recipes with high moisture content (soups, sauces, condiments, etc.), this dynamic leads to less reduction and can alter dramatically the consistency of the final product. Adjustments in the way the product is either formulated or cooked are necessary to produce a product consistent with the base recipe.

Print Resources

Professional Cooking

Reference Guide for Kansas Food Processors: Establishing a Shared-Use Commercial Kitchen (available through the National Business Incubator Association's bookstore. Visit their web page at www.nbia.org)

Look for these book titles at your public library or local bookstore. All books are also available through online booksellers, such as amazon.com.

Web Resources

Measuring Units Conversion Table

<http://www.french-property.com/ref/convert.htm>