

Converting a Recipe to a Production Formula

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The following steps document the progression that is followed in the process of converting a favourite recipe into a workable, repeatable production process formula. The purpose of following these steps is to create the formula in a very objective manner, providing measurement tools and standards which will allow you to make up the formula batch after batch, without variation in performance, yield, quality, or safety. In this way, your enterprise will profit from knowledge of accurate costs of production, yields, and realistic setting of profit margins through accurate price setting.

1. Select and make up your favourite recipe. Keep the product for a comparison with #3.
2. Ingredients measured by volume must be converted to weights. Do this, and rewrite the recipe in terms of weights of ingredients (weight equivalents).
3. Prepare the recipe again using weight equivalents. Adjust recipe and keep preparing until you are satisfied that the finished product compares favourably with your original recipe. When modifying the recipe, only change one ingredient at a time and record the change. Once you are satisfied, consider this your ideal product. Have a sample of it available for comparative purposes when modifying into a commercial product.
4. Evaluate the ingredients:
 - If your recipe uses a brand-name product, or blend, you will want to replace it with your own less-costly mix of the blend's ingredients in order to reduce your costs. You can determine these basic ingredients through a combination of research and trial and error. Visit your local library to research similar recipes in a variety of cookbooks and compare your ingredients to theirs. Identify the ingredients that your recipe is missing. There is a good chance that these are the ingredients in the brand-name product in your recipe. Experiment with your recipe, replacing your brand-name product with the possible ingredients you've identified. You will probably need to do this many times. Each time you make a batch, change only one ingredient or amount, until you are satisfied that you have an accurate replica of your recipe. Record the modifications to your recipe.
 - Some ingredients may have to be replaced with commercial ingredients (e.g., cornstarch with modified starches, corn syrup with liquid glucose syrup). Obtain commercial ingredients and make up the recipe until satisfied. Record modifications.

5. Write the recipe in the format of a "standard manufacturing procedure" (SMP). This is a step-by-step documentation of the ingredients used, and the procedure used for each step of the process of bringing these ingredients together into a finished product.
6. Make up the formula (no longer a recipe), and measure all relevant objective parameters while progressing through the steps to create the finished product. Examples include:
 - temperature of mix
 - density of batter
 - time and temperatures of ovens
 - pH
 - sugar concentrations
 - etc. – whatever is relevant, measure it
7. When satisfied with your formula and the finished product and you have identified relevant objective parameters, rewrite the SMP, incorporating the objective parameters and setting them as standards for the make up steps. For example, instead of saying "mix on high speed for 3 minutes", say "mix until a specific gravity of 0.8 grams / cc is attained."
8. Professional evaluation – at this point in time, an evaluation of your formula and the process steps should be undertaken. Seek advice on ingredient selection, stability and reliability of materials and finished products and particularly the safety of the finished product.
9. When satisfied, scale-up formulas to pilot plant level (dependent on the equipment available) and prepare the formula on such a level. Make adjustments as required and, since larger quantities of product are being made, prepare shelf life tests to determine how long your product can last without deterioration. This information will help to set code dates or point out the need to adjust formulas to improve shelf life.
10. After satisfying yourself that the product meets demands of shelf life, quality, safety, reliability, marketing approval, etc., scale up the formula to production sizes and undertake short runs on such a scale. When scaling up, round off decimal places to realistic levels to suit the actual scales being used. Sometimes, one ingredient (e.g., colour dye) may be in too small a quantity for you to be able to maintain measurement accuracy (e.g., 1/10 gram). You can pre-mix this ingredient with a carrier (i.e., another common ingredient in your formula such as sugar, salt, water, etc.), but in a much larger quantity than your formula requires. You can store this pre-mix in a separate container and use it each time you make a batch of your product. Since the smaller ingredient is equally distributed throughout the carrier, the net effect is that you get much more accuracy as you apply your formula.

11. When satisfied that your production trials are running smoothly, objective parameters are accurate and are controlling the makeup to form consistent, repeatable products, and the products are being made in a cost efficient manner, turn over the new product to the "production department." Provide formulas, SMPs, and quality control standards based on objective parameters, expectations for efficiencies, yields, etc.
12. Monitor production runs until satisfied that this department has the process under control. Provide technical assistance, train personnel, ensure tests are being performed and are accurate, carry out quality and storage testing, and revise SMPs until you are satisfied.
13. Begin / continue development of your next new product.