



# Least Cost Formulation

# TechWizard™

TechWizard™ is an excellent tool for least cost formulation. In the example shown, TechWizard™ optimizes a processed cheese formula to meet a variety of compositional requirements while minimizing cost. *The following figures were copied from TechWizard™ while formulating a processed cheese recipe.*

### Ingredient Constraints and Ingredient Percentages

Ingredient	% (Wt./Wt.)	Min	Max	Diag
Butter oil (anhydrous)	4.994	0.000	5.000	
Milk powder, skim	2.733	0.000	100.000	
cheese, enzyme modified	0.400	0.400	0.400	Min
Cheese, cheddar young	60.664	0.000	100.000	
Cheese, cheddar aged	20.000	0.000	20.000	Max
Sodium Phosphate, Dibasic	2.250	2.250	2.250	Min
Salt	0.620	0.000	100.000	
Water	8.339	0.000	100.000	
Total	100.000			

Restrictions on ingredient amounts are set for butter oil, enzyme, aged cheddar, and sodium phosphate.

### Property Constraints and Final Formula Composition

Property	Composition	Units to Use	Diag	Min	Max
Total Fat	31.000	g/100g	Min	31.000	31.000
salt	1.800	%	Min	1.800	1.800
Lactose	1.918	%		0.000	5.900
Whey Protein	0.421	%		0.000	100.000
Intact casein	17.065	%		0.000	100.000
Water	39.500	%	Min	39.500	39.500
Calcium	604.353	mg/100g		0.000	10000.000
Phosphorus	857.696	mg/100g		0.000	10000.000
Total Solids	60.499	%		60.000	70.000

The min and max settings for the properties define the desired final composition. TechWizard™ will determine the amount of each ingredient to meet this composition while minimizing price.

### Batching Section

Ingredient	Price Per	Batch Size:		Amount	Production Unit
	Batch Size	lb	gal		
Butter oil (anhydrous)	849.048	17000.00	lb	105.602	gal
Milk powder, skim	464.600	464.600	gal	9.294	bag (50 lb)
cheese, enzyme modified	68.000	68.000	gal	1087.983	oz
Cheese, cheddar young	10312.839	10312.839	gal	515.642	20 lb Block
Cheese, cheddar aged	0.340	3400.000	gal	170.000	20 lb Block
Sodium Phosphate, Dibasic	382.500	382.500	gal	6119.903	oz
Salt	105.458	105.458	gal	1687.302	oz
Water	1417.556	1417.556	gal	170.048	gal
Total	13600.340	17000.000	gal	3331.859	

The batching section can be used to prepare lab quantities, consider ingredient requirements for full-scale production, or to consider the ingredient cost for a given batch size - just to name a few possibilities.

### Nutrition Facts

Once the formula is developed, simply transfer the formula to the Nutrition Labeling section to view the Nutrition Facts. The following is a Nutrition Facts for this cheese formula created using TechWizard™.

Nutrition Facts	
Serving Size 1 Slice (28 g)	
Servings Per Container 1	
Amount Per Serving	
<b>Calories</b> 110	Calories from Fat 80
% Daily Value*	
<b>Total Fat</b> 9g	<b>14%</b>
Saturated Fat 6g	<b>30%</b>
<i>Trans</i> Fat 0g	
<b>Cholesterol</b> 30mg	<b>10%</b>
<b>Sodium</b> 380mg	<b>16%</b>
<b>Total Carbohydrate</b> 1g	<b>0%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars 1g	
<b>Protein</b> 6g	
Vitamin A 6%	Vitamin C 0%
Calcium 15%	Iron 0%
*Percent Daily Values are based on a 2,000 calorie diet.	