



# PRODUCT EXAMPLE

## ICE CREAM



William works for Blandings Specialty Foods as a product development specialist. Today, he is developing an ice cream formula using TechWizard™. William would like to do the following:

- Create a vanilla ice cream recipe that contains 12 % milk fat, 11 % MSNF (milk solids not fat), between 40 and 41 % total solids, 14% sucrose solids, 3 % corn syrup solids, 0.35% stabilizer solids, and 0.15% emulsifier.
- Determine the overrun required for a ½ gallon of ice cream to weigh 2.35 lbs.
- Determine the total ingredient amounts to make 10,000 gal. of finished ice cream.
- Create a batch sheet for 100 gal. of mix.
- Create a nutrition facts panel and ingredient list.

### Create Recipe

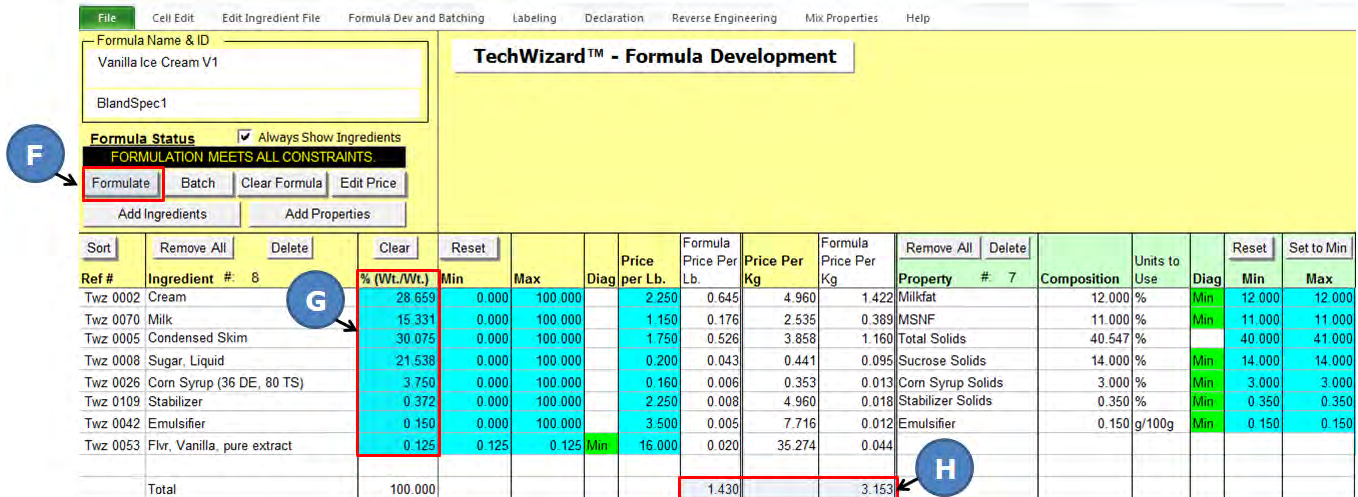
William starts by entering the composition he requires. He selects the desired properties, milk fat (also referred to as butterfat), MSNF, sucrose solids, corn syrup solids, stabilizer solids, and emulsifier (A). Next, he enters his desired composition (B).

Remove All		Delete				Reset		Set to Min	
Property	#	Composition	Units to Use	Diag	Min	Max			
Milkfat			%		12.000	12.000			
MSNF			%		11.000	11.000			
Total Solids			%		40.000	41.000			
Sucrose Solids			%		14.000	14.000			
Corn Syrup Solids			%		3.000	3.000			
Stabilizer Solids			%		0.350	0.350			
Emulsifier			g/100g		0.150	0.150			

William selects the ingredients he will used to make the formula. As he selects each ingredient, the ingredient description (C), price (D), and composition (not shown) are automatically retrieved from the ingredient file. William needs to lock in the amount of vanilla flavoring that is used in this formula. He uses the recipe entry feature (not shown) to set the usage level to 20 fl. oz. per 100 gallon of mix. This corresponds to 0.125 % vanilla (E).

Sort		Remove All		Delete		Clear		Reset					
Ref #	Ingredient #		% (Wt./Wt.)	Min	Max	Diag	Price per Lb.						
Twz 0002	Cream			0.000	100.000		2.250						
Twz 0070	Milk			0.000	100.000		1.150						
Twz 0005	Condensed Skim			0.000	100.000		1.750						
Twz 0008	Sugar, Liquid			0.000	100.000		0.200						
Twz 0026	Corn Syrup (36 DE, 80 TS)			0.000	100.000		0.160						
Twz 0109	Stabilizer			0.000	100.000		2.250						
Twz 0042	Emulsifier			0.000	100.000		3.500						
Twz 0053	Flvr, Vanilla, pure extract			0.125	0.125		16.000						
Total			100.000										

William presses the **Formulate** button (F). This instructs TechWizard™ to find the best combination of ingredients to meet all his composition requirements while minimizing cost. The percent of each ingredient to use (G) is calculated and the formula cost per pound and per kilogram are reported (H).



**TechWizard™ - Formula Development**

Formula Name & ID: Vanilla Ice Cream V1  
BlandSpec1

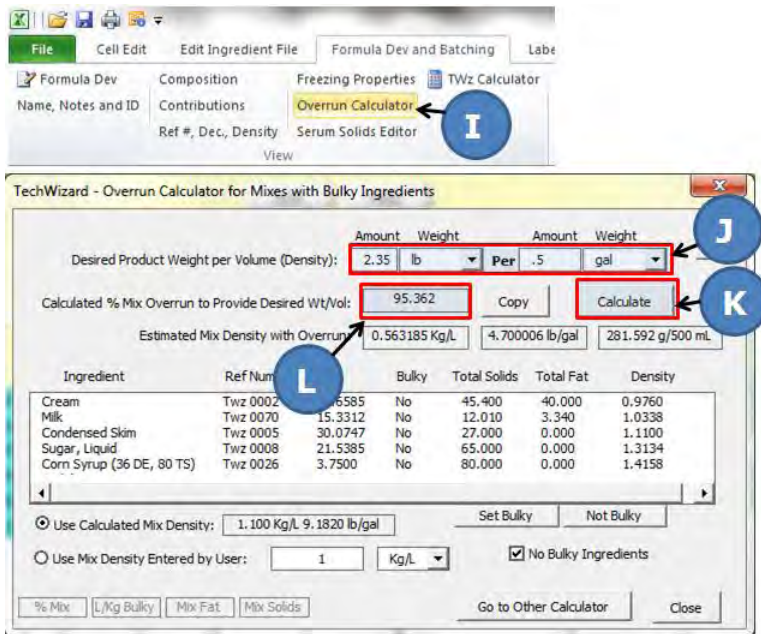
Formula Status:  Always Show Ingredients  
**FORMULATION MEETS ALL CONSTRAINTS.**

Buttons: **F** Formulate, Batch, Clear Formula, Edit Price, Add Ingredients, Add Properties

Ref #	Ingredient #	% (Wt./Wt.)	Min	Max	Diag	Price per Lb.	Formula Price Per Lb.	Price Per Kg	Formula Price Per Kg	Property #	Composition	Units to Use	Diag	Min	Max
Twz 0002	Cream	28.659	0.000	100.000		2.250	0.645	4.960	1.422	Milkfat	12.000 %		Min	12.000	12.000
Twz 0070	Milk	15.331	0.000	100.000		1.150	0.176	2.535	0.389	MSNF	11.000 %		Min	11.000	11.000
Twz 0005	Condensed Skim	30.075	0.000	100.000		1.750	0.526	3.858	1.160	Total Solids	40.547 %		Min	40.000	41.000
Twz 0008	Sugar, Liquid	21.538	0.000	100.000		0.200	0.043	0.441	0.095	Sucrose Solids	14.000 %		Min	14.000	14.000
Twz 0026	Corn Syrup (36 DE, 80 TS)	3.750	0.000	100.000		0.160	0.006	0.353	0.013	Corn Syrup Solids	3.000 %		Min	3.000	3.000
Twz 0109	Stabilizer	0.372	0.000	100.000		2.250	0.008	4.960	0.018	Stabilizer Solids	0.350 %		Min	0.350	0.350
Twz 0042	Emulsifier	0.150	0.000	100.000		3.500	0.005	7.716	0.012	Emulsifier	0.150 g/100g		Min	0.150	0.150
Twz 0053	Flvr, Vanilla, pure extract	0.125	0.125	0.125	Min	16.000	0.020	35.274	0.044						
Total		100.000						1.430	3.153						

### Determine Overrun, Total Amount, and Costs

To assist with scheduling the production of this ice cream, William needs to determine the total ingredient amounts for making 20,000 ½ gallon containers of ice cream or 10,000 gallons of finished ice cream. He also needs to determine the overrun required for a ½ gallon container of ice cream to weigh 2.35 lbs.



**TechWizard - Overrun Calculator for Mixes with Bulky Ingredients**

Buttons: **I** Overrun Calculator

Desired Product Weight per Volume (Density): 2.35 lb Per .5 gal

Calculated % Mix Overrun to Provide Desired Wt/Vol: **L** 95.362 Copy **K** Calculate

Estimated Mix Density with Overrun: 0.563185 Kg/L, 4.700006 lb/gal, 281.592 g/500 mL

Ingredient	Ref Num	Bulky	Total Solids	Total Fat	Density	
Cream	Twz 0002	5.585	No	45.400	40.000	0.9760
Milk	Twz 0070	15.3312	No	12.010	3.340	1.0338
Condensed Skim	Twz 0005	30.0747	No	27.000	0.000	1.1100
Sugar, Liquid	Twz 0008	21.5385	No	65.000	0.000	1.3134
Corn Syrup (36 DE, 80 TS)	Twz 0026	3.7500	No	80.000	0.000	1.4158

Use Calculated Mix Density: 1.100 Kg/L 9.1820 lb/gal

Use Mix Density Entered by User: 1 Kg/L

William determines the overrun first. He clicks the **Overrun Calculator** option (I) and the Overrun Calculator window appears. He enters 2.35 lbs. per 0.5 gal. (J) and presses the **Calculate** button (K). TechWizard™ calculates his overrun value, 95.362 % (L). This is the overrun necessary to make a 0.5 gallon container of his vanilla ice cream weigh 2.35 lbs.

To determine the total ingredient amounts necessary to make 10,000 gallons of ice cream, William clicks the Batch button (M). He enters the overrun (N) he just calculated (95.362 %), the total amount (O) of finished ice cream (10,000 gal.), and clicks the **Include Overrun** check box (P). The total amount of each ingredient (Q), the total pounds (R), and the total ingredient cost (S) are displayed.

**TechWizard - Formula Batcher**

Formula Name & ID: Vanilla Ice Cream V1  
BlandSpec1

Formula Status:  Always Show Ingredients  
**FORMULATION MEETS ALL CONSTRAINTS.**

Formulate **M** Batch **M** Clear Formula Edit Price

Add Ingredients Add Properties

Formula Density: 1.10025 kg/L (g/mL) or 9.18203 lb/gal CALCULATED

Include Overrun Mix Density (with 95.362% Overrun): 0.56319 kg/L (g/mL) or 4.70001 lb/gal

Batch Size: 10000.00 gal **O** 95.362 % Overrun **N**

Ref #	Ingredient #	% (Wt./Wt.)	Price Per Batch Size	lb	gal	Amount	Production Unit
Twz 0002	Cream	28.659	30306.451	13469.534	1653.746	1653.746	gal
Twz 0070	Milk	15.331	8286.416	7205.579	835.191	835.191	gal
Twz 0005	Condensed Skim	30.075	24736.499	14135.142	1525.888	1525.888	gal
Twz 0008	Sugar, Liquid	21.538	2024.619	10123.093	923.580	923.580	gal
Twz 0026	Corn Syrup (36 DE, 80 TS)	3.750	282.000	1762.503	149.173	149.173	gal
Twz 0109	Stabilizer	0.372	393.696	174.976	3.500	3.500	bag (50 lb)
Twz 0042	Emulsifier	0.150	246.750	70.500	8.800	17.601	1/2 gal
Twz 0053	Flvr, Vanilla, pure extract	0.125	940.002	58.750	8.008	16.017	1/2 gal
<b>Total</b>		100.000	<b>67216.433</b> <b>S</b>	<b>47000.077</b> <b>R</b>			

This formula uses 3.5 bags of stabilizer (Q). William would like to know what the batch size would have to be to use an even 4 bags of stabilizer. He clicks on the **Use It Up** feature (T) and the Use It Up window appears. He selects the stabilizer ingredient and enters the amount he would like use, 4 bags (U). He clicks the **Calculate** button (V) and the answer is displayed (W). He would have to make roughly 11,428 gallons of finished ice cream to use 4 bags of stabilizer.

**Use It Up Feature - TechWizard**

Selected Ingredient: Stabilizer **U**

Ingredient Amount: 4 **U** Units: bag (50 lb)

Batch Size: 11428.177869283 **W** gal

Include Overrun **V** Calculate **V** Reset Batch Size Close

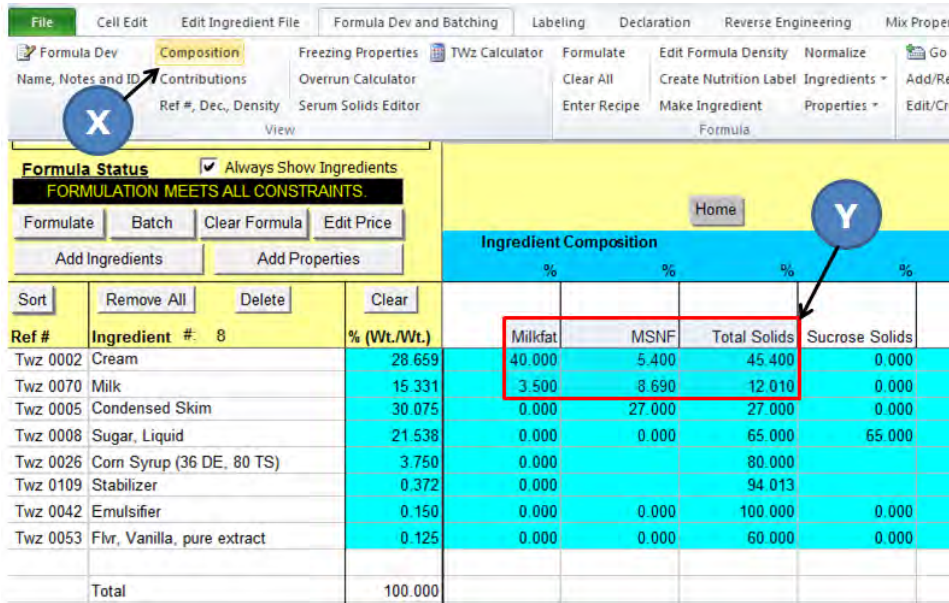
Instructions:

- Select ingredient to use up from the drop down.
- Enter ingredient amount and select units.
- Select Batch Size units.
- Press Calculate button. Batch Size needed to use up ingredient amount calculated.
- Press Reset Batch Size to use calculated amount and unit.
- Press Close.

Note: If batch size based on a volume amount with overrun then click: Include Overrun check box.

## Create Batch Sheet

William needs to make a batch sheet for 100 gallons of ice cream mix. Before he can create his batch sheet, he needs to update the Cream and Milk composition. His changes are just needed to create the batch so William will make temporary changes in the formula instead of modifying the ingredient file. William clicks the **Composition** option (X) and enters his new values in the space provided (Y).



The screenshot shows the software interface with the 'Composition' menu option highlighted with a blue circle and an 'X'. Below it, the 'Ingredient Composition' table is visible, with a blue circle and a 'Y' pointing to the table. The table has columns for 'Ref #', 'Ingredient #', '% (Wt./Wt.)', 'Milkfat', 'MSNF', 'Total Solids', and 'Sucrose Solids'. The data is as follows:

Ref #	Ingredient #	% (Wt./Wt.)	Milkfat	MSNF	Total Solids	Sucrose Solids
Twz 0002	Cream	28.659	40.000	5.400	45.400	0.000
Twz 0070	Milk	15.331	3.500	8.690	12.010	0.000
Twz 0005	Condensed Skim	30.075	0.000	27.000	27.000	0.000
Twz 0008	Sugar, Liquid	21.538	0.000	0.000	65.000	65.000
Twz 0026	Corn Syrup (36 DE, 80 TS)	3.750	0.000	0.000	80.000	0.000
Twz 0109	Stabilizer	0.372	0.000	0.000	94.013	0.000
Twz 0042	Emulsifier	0.150	0.000	0.000	100.000	0.000
Twz 0053	Flvr, Vanilla, pure extract	0.125	0.000	0.000	60.000	0.000
	Total	100.000				

He formulates again to update the recipe with this new information and creates his batch sheet based on one of the many templates available (shown below).

Recipe Formulation 3:24 PM Friday June 17, 2012						
Formula: Vanilla Ice Cream V1			Min	Max	Calc.	
Formula ID: BlandSpec1			Milkfat:	12.000	12.000	12.000
			Total Solids:	40.000	41.000	40.547
Quantity: 100 gal 918.2 lb						
Ref. #	Ingredient	Amount	Note	MSNF	Total Solids	Milkfat
Twz 0002	Cream	32.3 gal		5.40	45.4	40.00
Twz 0070	Milk	16.3 gal		8.69	12.0	3.50
Twz 0005	Condensed Skim	29.8 gal		27.00	27.0	0.00
Twz 0008	Sugar, Liquid	18.0 gal		0.00	65.0	0.00
Twz 0026	Corn Syrup (36 DE, 80 TS)	2.9 gal			80.0	0.00
Twz 0109	Stabilizer	3.4 lb			94.0	0.00
Twz 0042	Emulsifier	22.0 fl oz		0.00	100.0	0.00
Twz 0053	Flvr, Vanilla, pure extract	20.0 fl oz		0.00	60.0	0.00



### Create Ingredient Statement and Nutrition Facts Panel

<b>Nutrition Facts</b>	
Serving Size 1/2 cup (67g)	
Servings Per Container 1	
<b>Amount Per Serving</b>	
<b>Calories</b> 150	Calories from Fat 70
<b>% Daily Value*</b>	
<b>Total Fat</b> 8g	<b>12%</b>
Saturated Fat 5g	<b>25%</b>
<i>Trans</i> Fat 0g	
<b>Cholesterol</b> 35mg	<b>12%</b>
<b>Sodium</b> 45mg	<b>2%</b>
<b>Total Carbohydrate</b> 15g	<b>5%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars 14g	
<b>Protein</b> 3g	
Vitamin A 6%	• Vitamin C 0%
Calcium 10%	• Iron 0%
<small>*Percent Daily Values are based on a 2,000 calorie diet.</small>	

William needs to make a label for his ice cream. He uses TechWizard™ labeling features to create a nutrition facts panel with the footnote hidden and an ingredient list.

INGREDIENTS: CONDENSED SKIM MILK, CREAM, SUGAR, MILK, CORN SYRUP, GUAR AND LOCUST BEAN GUM, MONO- AND DIGLYCERIDES, VANILLA EXTRACT.

### Versatility

TechWizard™ is a very versatile tool. If William thinks the formula should be sweeter or needs to use different ingredients he will simply tell TechWizard™ what he wants. TechWizard™ will reformulate the recipe to meet his requirements. TechWizard™ can choose from a selection of candidate ingredients to develop a less expensive recipe that meets all his requirements. If he needs to add new ingredients to the ingredient file, he can easily do so.