

TO: Product Development Team
FROM: Sales Team
SUBJECT: Powdered Smoothie Mix

(Hint: There is a lot of calculation work involved with this project. Starting this task early will help you to complete this project within the given time.)

Private label foods are one of the hottest areas in the food industry. Low-cost alternative food products are a great way for companies to compete with the established brands. They are able to compete because they have a lower cost to get to market since they don't have advertising costs, slotting fees, and reduced sales force expenses. Retail outlets use private labels to provide lower cost products for their customers.

Our company, NoBrand Inc. manufactures powdered drink mixes. Our largest customer is Wally-Mart, one of the largest retailers in the US. Wally-Mart's goal is to provide low-cost, quality products to their customers, average working class Americans. Wally-Mart has asked us to add a powdered smoothie drink mix to our product line. They want the product to be a lower cost version of the popular branded product *Lickity Fit*. *Lickity Fit* is marketed as a quick & healthy drink that appeals to adults with an active lifestyle. Wally-Mart wants our product to be as similar to *Lickity Fit* as possible, while keeping in mind that price will significantly affect the customer's purchase decision.

Wally-Mart insists that we must get the product to market as soon as possible. To speed up the process we have asked the research firm of JEM Food Technologies to provide us with market research related to *Lickity Fit* as well several prototype formulas to evaluate.

These were their findings:

- ☆ The current willingness of consumers to try new smoothie products is limitless.
- ☆ The popularity of smoothies is driven by consumers' desire for convenient and healthy products. Smoothies are perfect for this category because they meet the needs of consumers: healthy, convenient, tasty and versatile for any meal occasion, breakfast, lunch, snacking, or for dinner.
- ☆ Consumers are aware that dairy products are inherently healthy and manufacturers are enhancing to the healthfulness of these products by adding other healthy ingredients such as protein, fiber, vitamins, and minerals.
- ☆ Consumers want products that are healthy but don't have a typical "healthy" unpleasant flavor that is contributed by the nutrition-enhancing ingredients.
- ☆ The presence of one or more health claims on a product label increases the likelihood that the consumer will purchase the product.

Information about *Lickity Fit* smoothie mix:

- ☆ *Lickity Fit* comes in a box with 10 individual serving packets. The serving size of *Lickity Fit* is 36g of powder (to be mixed in 1 cup of water or milk). One serving of *Lickity Fit* contains 130 calories, 0g fat, 0g dietary fiber, 5.5g protein, 370mg calcium, and 3mg vitamin C.
- ☆ A sensory panel consisting of 25 people evaluated *Lickity Fit*. They described the product as having medium thickness/viscosity; a creamy, smooth mouthfeel, moderate sweetness with a pronounced strawberry flavor. They found that the powder dispersed quickly in cold water and was completely dissolved after a few stirs with a spoon. When asked to rank the product attributes from most important to least important, the panel agreed that perceived health benefits were most important followed by flavor then ease of preparation.
- ☆ To compete for Wally-Mart's business, we will need to have an ingredient cost of less than \$2.22 for a box of 10 packets.
- ☆ The 3 prototype formulas submitted by JEM Food Technologies are found in Table 1.

Food Facts

- Inulin – soluble fiber source, provides creamy mouthfeel
- Vitamin C – fastest degrading vitamin, heat sensitive
- Carrageenan – a gum extracted from seaweed that forms a gel to increase the viscosity of a food
- Maltodextrin - a carbohydrate used as a carrier/bulking agent, not sweet
- Natural ingredients are perceived to be more healthy than artificial ingredients

Mixing it together From *Formulating Dry Mixes for Instant Success* in Food Product Design, July 1991

The process directly affects the final mix performance, and certain ingredients may demand specific processing to make them more dispersible. Three primary techniques used to produce dry mixes include:

• **Dry Blending** -- the most common technique. As the name implies, the ingredients are mixed together until the batch is uniform. The simplest example of this is a formula composed entirely of powdered ingredients. Certain care must be exercised with dry blending in order to assure uniform consistency. The amount and type of ingredients, the order of their addition, along with their density, all play a role in how thoroughly the product is mixed. For every product in a given mixer type and size, there is an optimum mixing time and rate.

• **Spray-drying** a dry mix involves taking a combination of ingredients, wetting them with water or another liquid ingredient, then spray-drying them to a uniform powder. Spray-dried mixes typically are easier to dissolve, are more uniform and attractive prior to reconstitution and maintain better flowability. The process itself, however, is typically more expensive, bringing the decision back toward balancing quality versus cost. Still, the ingredients required in the mix may need spray-drying to improve dispersability.

• **Agglomeration** is the process of clustering particles together. It is a "finishing" step that can help improve the dispersibility, the flowability and the appearance of dry mixes, and can be accomplished by slightly rewetting and drying a finished mix with gentle mixing.

Table 1. Prototype powdered smoothie mix formulas.

Formula #		1		2		3
% Ingredients	49% 16.2% 14% 8.9% 5% 3% 3% 0.6% 0.3%	Sugar Sweet whey powder Nonfat dry milk Maltodextrin Dehydrated strawberry purree Artificial strawberry flavor Carrageenan Vitamin blend FD&C Red #40 color	39% 35% 8% 8% 4% 3% 2% 1%	Nonfat dry milk Sugar Maltodextrin Inulin Natural strawberry flavor Carrageenan Vitamin blend Natural red color	50% 30.1% 12.5% 3% 3% 0.5% 0.6% 0.3%	Maltodextrin Sugar Nonfat dry milk Artificial strawberry flavor Carrageenan Soy protein Vitamin blend FD&C Red #40 color
Attributes		* Flavor preferred over control * Less protein & calcium * Creamy mouthfeel but less viscosity * Soluble with minimal stirring		* Unappealing vitamin aftertaste * Same amount of protein and calcium as control * A good source of fiber * Very thick viscosity * Natural color & flavor lose strength over time * Requires 1 minute of stirring to completely dissolve		* Flavor similar to control * Similar viscosity as control but gritty mouthfeel * Requires 1 minute of stirring to completely dissolve * Lower nutritional value

Reading Label Lingo

In addition to requiring that packaged foods contain a Nutrition Facts label, the FDA also regulates the use of phrases and terms used on the product packaging. Here's a list of common phrases you may see on your food packaging - and what they actually mean.

- No fat or fat free: Contains less than 1/2 gram of fat per serving
- Lower or reduced fat: Contains at least 25 percent less per serving than the reference food. (An example might be reduced fat cream cheese, which would have at least 25 percent less fat than original cream cheese.)
- Low fat: Contains less than 3 grams of fat per serving
- Sugar free: Contains less than 1/2 gram of sugar per serving
- Low sodium: contains less than 140 mgs of sodium per serving
- High fiber: 5 g or more per serving (Foods making high-fiber claims must meet the definition for low fat, or the level of total fat must appear next to the high-fiber claim)
- Good source of fiber: 2.5 g to 4.9 g. per serving

QUESTIONS

Please answer each question completely on the provided answer sheet pages.

1. Which formula are you going to make? What attributes of the formulas influenced your decision (both for the one you chose and the other two you didn't choose)?
2. If you could improve one attribute of the formula you chose, what would that one thing be, and why would you choose that one aspect in particular?
3. Identify the 2 most important aspects of the product that will impact the success of the product (taste, safety, viscosity, nutritional content, price, etc.) and explain why they are important.
4. Describe the role price plays in this type of product. Why is it a key factor in driving product success?
5. How will you ensure that the product you make will uphold to your customer's quality standards (i.e. consumers expectations) and be consistent from batch to batch (i.e. what would you test for, and how often)?
6. How long would you expect the shelf life of the product to be? Will diminishing quality or safety of the product determine the shelf life?
7. Are there any allergen concerns with your product that the consumer should be aware of? How will you make sure the consumer is aware of this information?
8. Of the three primary processing techniques used to produce dry mixes, which will you use for your product? What information influenced your decision?
9. Which processing technique uses a ribbon blender? How does a ribbon blender work?
10. Why should you be aware of the density of ingredients during dry blending?
11. What is the best way to determine optimal mix time during dry blending?
12. What is the cost of your product? What other costs besides ingredients and packaging influence the distribution price set by our team?
13. What aspect of your product (i.e. formulation, packaging graphics, nutritional information) lead or convince your consumer this is a healthy product?
14. Complete the front and side panels for your product label.

Please round all numbers to one decimal place EXCEPT the cost. If any nutrient data is missing, assume the value is 0.

		Data for	Calories	Protein (g)	Total Carbs. (g)	Dietary Fiber (g)	Total Fat (g)	Cholesterol (mg)	Vitamin C (mg)	Calcium (mg)	Cost
Ingredient Data	Nonfat dry milk	1 g	3.8	0.4	0.5	0	0	0	0.2	14.5	\$0.00226
	Soy protein	1 g	3.8	0.9	0	0	0	0	0	1	\$0.00650
	Sweet whey powder	1 g	3.6	0.1	0.8	0	0	0	0	8.1	\$0.00066
	Sugar	1 g	3.6	0	1.0	0	0	0	0	0	\$0.00048
	Maltodextrin	1 g	4.0	0	1.0	0	0	0	0	0.3	\$0.00088
	Art. Straw. Flavor	1 g	3.7	0	0.9	0	0	0	0	0.7	\$0.04185
	Nat. Straw. Flavor	1 g	3.7	0	0.9	0	0	0	0	0.7	\$0.08300
	Dehyd. Straw. Puree	1 g	3.4	0.1	0.8	0.2	0	0	0.5	2.6	\$0.01762
	Carrageenan	1 g	0	0	0.7	0	0	0	0	1.5	\$0.01652
	FD&C Red #40	1 g	0	0	0	0	0	0	0	0	\$0.04405
	Natural red color	1 g	0.4	0	0.1	0	0	0	0	0	\$0.04802
	Vitamin blend	1 g	5	0	0	0	0	0	0.3	230	\$0.02203
	Inulin	1 g	2	0	1	0.9	0	0	0	0	\$0.00330
Formula 1	Sugar	17.7									
	Sweet whey powder	5.8									
	Nonfat dry milk	5.0									
	Maltodextrin	3.2									
	Dehyd. Straw. Puree	1.8									
	Art. Straw. Flavor	1.1									
	Carrageenan	1.1									
	Vitamin blend	0.2									
	FD&C Red #40	0.1									
Total	36.0										
Formula 2	Nonfat dry milk	14.0									
	Sugar	12.6									
	Maltodextrin	2.9									
	Inulin	2.9									
	Nat. Straw. Flavor	1.4									
	Carrageenan	1.1									
	Vitamin blend	0.7									
	Natural red color	0.4									
Total	36.0										
Formula 3	Maltodextrin	18.0									
	Sugar	10.8									
	Nonfat dry milk	4.5									
	Art. Straw. Flavor	1.1									
	Carrageenan	1.1									
	Soy protein	0.2									
	Vitamin blend	0.2									
	FD&C Red #40	0.1									
Total	36.0										