Meal Good Feel Good: Meal Replacement Bar to Reduce Obesity

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Abstract

- Our goal is to develop an affordable meal replacement bar to college students.
- It is important to ensure that student can maintain stable diets to prevent rising obesity rates in the future.
- What we have accomplished:
  - Developed and conducted a survey to obtain knowledge about our target market.
  - Discussed how to create a prototype meal bar with experts to gain insight on macro and micromolecules that would need to be included.
  - Determined at-home inexpensive ingredients that contained our desired components (macro and micromolecules).
  - Produced a physical prototype with at-home ingredients that could be marketed to college students.

Introduction

The grand challenge that we are looking to solve with this project is the issue of the constantly increasing rates of obesity in the United States. Obesity is generally defined by the CDC as a BMI of greater than 30 that can cause an increased chance in certain health issues such as heart disease, respiratory problems, and diabetes (Aditya and Wilding 2011). Obesity presents many challenges for this reason, as it is the result of thousands of American deaths each year. A demographic in which obesity is highly prevalent is college students. Around 27% of college students are overweight or obese, which is usually due to food insecurity due to budget restrictions (Odlaug et al. 2015). A gap that must be closed to solve this problem is that there must be an emphasis on creating an affordable solution. For this reason, the solution that we have proposed is targeted specifically toward this demographic. Our proposed solution is a meal replacement bar that would provide an adult person with all of the necessary nutrients (protein, carbohydrates, fats, vitamins, and minerals) needed in a given meal. A survey was also created to find out if this was a solution that college students would be interested in. This product will be made widely affordable and available so that students may fit it into their budget without financial stress. If this solution were to work amongst this demographic, it would be necessary to use it nationwide in an effort to lower obesity rates in the U.S. for good.

Our Approach

- Discussed that meal replacement would be the most affordable and accessible solution to increasing obesity rates.
- Determined that a meal replacement bar would provide more sustenance than other forms of meal replacement.
- Researched how to conduct surveys accordingly to obtain information from our target population.
- Conducted survey to determine general information and preferences of about our target population.
- Met with expert Dr. Tatiana Miranda, who provided us with guidance on macro and micromolecules to include.
- Further investigated what at-home ingredients contained these macro and micro nutrients to incorporate them into our bar.
- Met with one another to develop a physical prototype using our obtained knowledge as well as at-home protein/ meal bar recipes.

Results

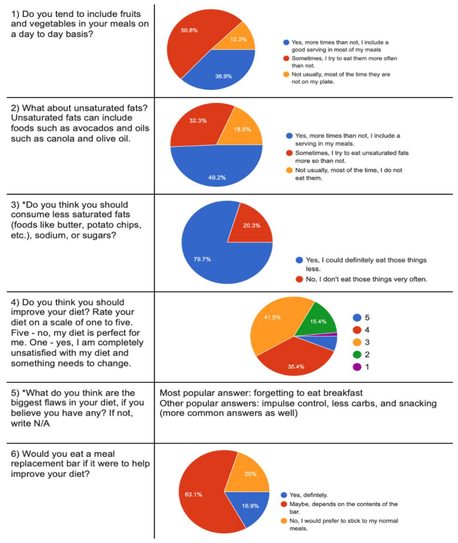

Figure 1. Survey results depicting daily college student diets, thoughts about food replacement bars, and taste preferences.

Nutrition Facts

Servings: 4

Amount per serving

Calories	**503**
	% Daily Value*
Total Fat 28.4g	**36%**
Saturated Fat 4.7g	**23%**
Cholesterol 14mg	**5%**
Sodium 66mg	**3%**
Total Carbohydrate 50g	**18%**
Dietary Fiber 11.1g	**40%**
Total Sugars 18.1g	
Protein 19.9g	
Vitamin D 19mcg	94%
Calcium 171mg	13%
Iron 7mg	37%
Potassium 634mg	13%

Figure 2. The Nutrition facts for our bar EXCLUDING supplement capsules

Figure 3. Baking prototype of food replacement bar

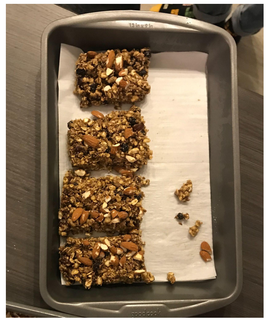

Figure 4. Final product of food replacement bar

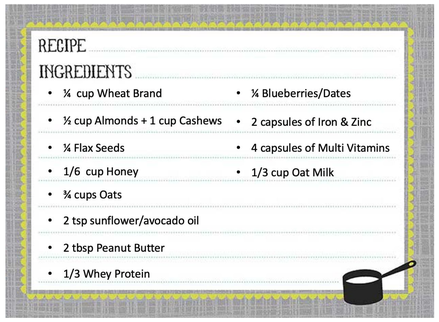

Figure 5. Meal Replacement Food Bar Ingredients + Recipe list.

What We Learned

- What macromolecules are responsible for feeling satiated, proper muscle growth development, and energy storage.
- How to conduct a survey with relevant questions to solve our knowledge gap

Overall, we discovered that proper nutrition for the human body can be achieved with an 'at-home ingredient' food bar. Our survey guided our ingredient choices for flavoring and validated that a food replacement bar would be a favorable meal choice. With the success of our prototype bar, the rise in obesity rates can be mitigated because college students are more likely to choose our food bar for convenience (figure 1) than processed food.

Conclusions

We have developed a prototype bar that is rich in fiber, vitamins, and protein. Of course this may not be enough to supplement people who are currently working out who need over 2000 calories a day. However, those who do not exercise regularly can be at a calorie deficit if a meal were to be replaced with a bar. Afterall diet does contain higher impacts on weight loss compared to physical activity.

The bar itself though was intended for a college audience, but in order to tackle obesity within the US as a whole, it is best that it should be catered to everyone. Those in the country who lack education and access to better dieting are those in underprivileged communities that also do not possess college opportunities.

Citations

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