Acceptability of No-Bake Cheesecake Bites Prepared with Whey, Soy, and Cricket Protein Powders

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INTRODUCTION

College athletes require special nutrients compared to the average person with moderate exercise. Athletes need extra calories, water, protein, and carbohydrates to fuel their bodies properly during training and competition (Cialdella-Kam, Kulpins, & Manore, 2016; Shriver, Betts, & Wollenberg, 2012). Adequate protein, fat, and carbohydrate intake allows athletes to help them have desired muscle growth and recovery and optimal performance (Witard, Garthe, & Phillips, 2019; Żebrowska, Maciejczyk, Żendzian-Piotrowska, Zalewska, & Chabowski, 2019). This can sometimes be a challenge for busy, on-the-go athletes who do not have extra time on their hands to prepare or consume enough nutrients that their body requires. Inadequate nutrition in athletes can lead to poor performance and also serious health issues therefore it is imperative that college athletes consume enough nutrients and calories (Cialdella-Kam, Kulpins, & Manore, 2016). In this research study, cricket powder protein, whey protein, and soy protein will be added individually into a no-bake miniature cheesecake recipe and assessed to find the differences compared to the controlled recipe. These protein additives have many health benefits such as controlling muscle protein synthesis and enhance muscle recovery (Witard, Garthe, & Phillips, 2019; Shenoy, Dhawan, & Sandhu, 2016; Pauter, Różańska, Wiza, Dworczak, Grobelna, Sarbak, & Kowalczewski, 2018)

PURPOSE

The purpose of this study is to compare the nutritional composition, cost, and consumer acceptability of protein fortified no-bake mini cheesecake variations: whey-added, soy-added, and cricket powder added.

METHODS

To control for variability across the recipes, each team member performed the same task for all laboratory experiments. Three lab experiments with taste testing were conducted. A taste-panel made up of fellow classmates ranging in age of 18-22 were used to assess selected sensory qualities that included appearance, texture, flavor and overall acceptability of the four samples presented for each lab. The panelists used a scorecard to assess selected sensory qualities that included appearance, texture, flavor and overall acceptability of the four samples presented for each lab and rated each sample from one to six using a scale (one representing very undesirable to six representing very desirable). Panelist were seated in a room free from distractions and were presented a plate divided into four quadrants with one mini no-bake cheesecake bite representing each recipe variation. Panelists were given instruction on how to proceed with taste-testing and how to use the scorecard to record their assessment of each recipe variation. The panelist also had an opportunity to provide written comments. Recipes were adjusted following each taste-testing session to address challenges and issues with the recipe variations. The scorecard data was calculated using means and the nutritional content of each final recipe was determined using Esha Food Processor software. Cost per recipe and per serving were calculated using sales receipts and the ingredient amounts.

RESEARCH OBJECTIVES

The purpose of this food science project was to:

- Increase protein composition using a traditional mini no-bake cheesecake recipe using whey, soy and cricket protein powders.
- Assess the overall acceptability for selected sensory qualities.
- Compare the cost per serving and cost per recipe of each recipe variation to the control.

RESULTS

Table 1
Average Sensory Analysis Scores of No-Bake Cheesecake Bites Prepared with Selected Protein Powders

Sensory Characteristics	Control	Whey variation	Cricket variation	Soy variation
Appearance	5 (light blue)	4 (slightly blue)	3 (greenish blue)	4 (slightly blue)
Texture	4 (moist)	5 (moist and dense)	3 (chewy)	4 (moist)
Flavor	5 (much too sweet)	5 (much too sweet)	2 (slightly sweet)	4 (somewhat creamy and sweet)
Overall Acceptability	5 (likely to eat again)	4 (may eat it again)	3 (indifferent)	4 (may eat it again)

Table 2
Nutrient Analysis Comparison of No-Bake Cheesecake Bites Prepared with Selected Protein Powders

Variation	Calories per mini cheesecake	Sugar (g) per mini cheesecake	Protein (g) per mini cheesecake
Control	206	14 g	3 g
Whey Protein	218	14 g	5 g
Cricket Protein	209	14 g	3 g
Soy Protein	211	14 g	4 g

Table 3
Costs Comparison of No-Bake Cheesecake Bites Prepared with Selected Protein Powders

Variation	Cost per Serving	Cost per recipe	% difference
Control	$0.42	$4.99	2.71%
Cricket Protein	$0.58	$6.96	12%
Whey Protein	$0.47	$5.64	12%
Soy Protein	$0.51	$6.12	12%

RESULTS

The cheesecake variation with the highest protein content was the recipe prepared with whey protein which had five grams of protein per mini cheesecake, and the variation with the lowest protein content were the control recipe and cricket variation with only three grams of protein. The soy protein variation provided four grams of protein. The traditional cheesecake bite received the highest overall acceptability score of 5 suggesting they would likely eat it again and the cheesecake prepared with cricket powder received lowest overall acceptability score of 3 meaning the panelists were indifferent about the product. The cheesecakes prepared with soy and whey protein received an overall acceptability scores of 4 indicating that they may eat it again. In addition, all four variations contained 63% of the daily value for vitamin A and 23% of the daily value for calcium and similar in calories ranging between 206-211 per serving. In terms of cost per serving and cost per recipe, the traditional cheesecake recipes was least expensive averaging $.42 per serving and $4.99 per recipe (yield per recipe 12 mini bites) followed by the whey protein of $.47 per serving and $5.64 per recipe, soy of $.51 per serving and $ 6.12 per recipe and cricket powder of $.58 per serving and $6.96 per recipe.

CONCLUSION

Adding protein to traditional food items increase the costs. However, enhancing the nutrient composition using unfamiliar ingredients with traditional foods may encourage athletes to adhere to their prescribed diet regimens because their food options are more varied and interesting. Additional research is needed to explore the acceptance of foods items enhanced with protein powders using the audience they are intended for such as health-conscious individuals as well as athletes.