

OBSERVING THE VARIATIONS IN PEANUT BUTTER COOKIES - REPLACING ALL-PURPOSE FLOUR TO MAXIMIZE PROTEIN INTAKE

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INTRODUCTION

Protein plays a vital role in every human’s life. This macronutrient is essential in the diet for cell formation and repair. Protein powder, a nutritional supplement, is used to help build muscle, repair tissue, and make enzymes and hormones. Protein powder has also been found to help people lose weight and tone their muscles.

Since some people have trouble getting enough daily protein, specifically athletes and elderly individuals, this study aims to research and learn the effects of substituting almond flour, whey protein powder, and soy protein powder in place of all-purpose flour to achieve a quality-tasting, protein-packed peanut butter cookie. As listed above, there are many different types of flour and protein powder, including dairy-based and plant-based powders. The purpose of this experiment is to determine the effect on flavor, texture, moisture content, and quality of appearance in a peanut butter protein cookie when substituting all-purpose flour with almond flour, whey protein powder, and soy protein powder. A sensory panel was held to further assist in analyzing the results to test for quality and texture through a detailed scorecard. Additionally, the use of the wettability test evaluated the moisture content of the cookies.

METHODS

- 1.Preheat the oven to 350°F.
- 2.Cream butter, peanut butter, and sugars together for 2 minutes by KitchenAid speed 2.
- 3.Mix in vanilla and eggs for 1 minute by KitchenAid speed 2.
- 4.Add all dry ingredients and mix for 30 seconds on speed 2.
- 5.Scoop 12 dough balls with a size 20 cookie scoop (approx 56g) on a cookie sheet and spacing them out. Place 12 scoops on one pan.
- 6.Bake cookies for 10 minutes.
- 7.Record differences in cooking times if some cookies need longer to cook through.
- 8.Let cool for 15 minutes before measuring the final height of each cookie and before performing the wettability test.
- 9.Measure the height of each variable and perform the wettability test.
- 10.Conduct subjective tests (Rank-Order Test) using the sensory panel.

**Total yield for all samples = approx. 48 cookies

RESULTS

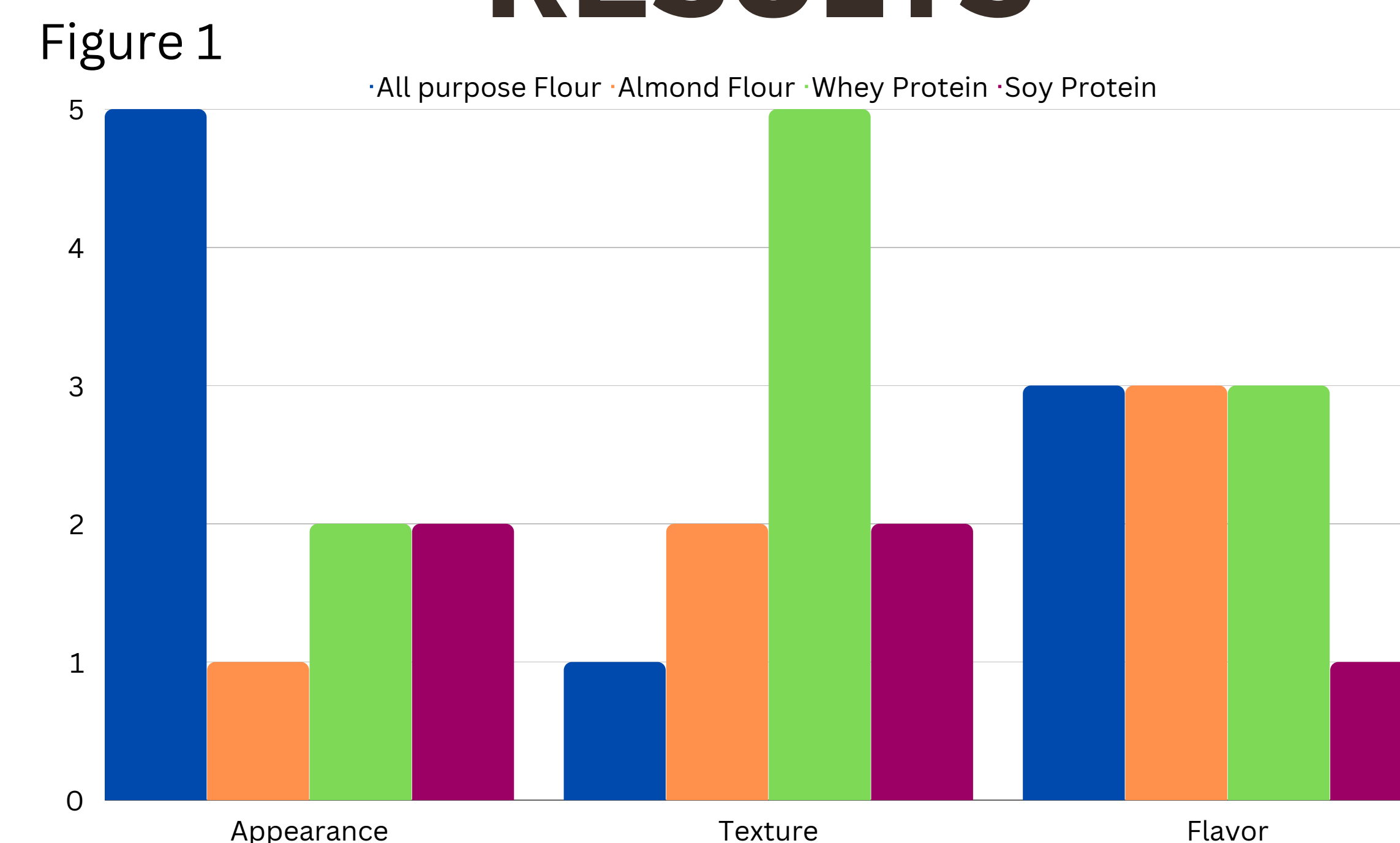


Figure 2

Wettability Test

Cookie Variable	Initial Weight	Post-Wettability Test Weight	Estimated Water Retained (Post-Test - Pre-Test Weight)
All-Purpose Flour	51 grams	63 grams	12 grams
Almond Flour	47 grams	59 grams	12 grams
Soy Protein Powder	62 grams	76 grams	14 grams
Whey Protein Powder	65 grams	84 grams	19 grams

CONCLUSION & FUTURE DIRECTIONS

As shown in Figure 1, the sensory evaluation of the cookies proved that the differences in appearance and texture were significant, but the differences in flavor in each of the cookies were minimal. It was also seen that, in Figure 2, the cookies with the protein powder were able to retain more water, indicating that there are likely more carbs and more calories - a positive factor for many who need more protein in their diets. Calculations indicated that the cookies with soy protein and whey protein had between 8 and 11 grams of protein. This information helps determine what future direction is needed in order to maximize protein intake for individuals in need of higher-protein diets. In the future:

- More experimentation can be done with protein powders and (other alternatives to all-purpose flour) since this study helped show the stability of the variables in baked goods.
- More isolates can be added to other products to assist in individuals with higher protein needs.

ALL-PURPOSE FLOUR



ALMOND FLOUR



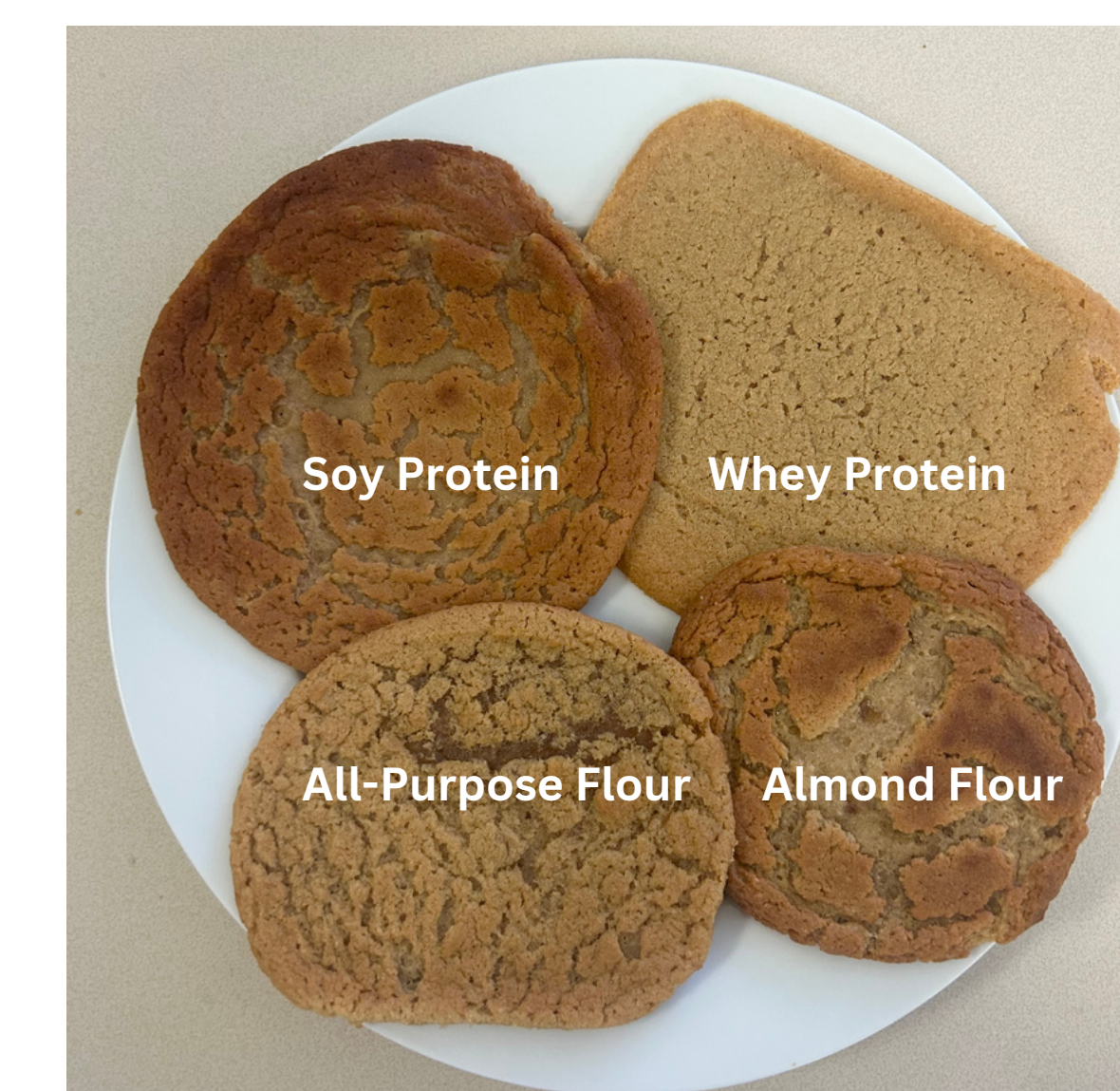
WHEY PROTEIN



SOY PROTEIN



ALL VARIABLES



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