The Development of an Algorithm through the Assessment of Nutrients in a Recycled Food Supplement for Canines to Reduce Waste Production

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The goal of this research is to show an innovative way to reuse food waste that is cost effective and environmentally friendly. An engineered recycled food supplement was developed for use in canine shelters, as well as the individual home, to address the outstanding issue of food waste. Four main problems were addressed within the past three years, these included: ensuring the supplement instilled no harm, providing a nutritionally balanced supplement, optimizing the program for realistic use, and in solving these, reducing the food waste produced by the community. Preliminary research and veterinarian recommendations were utilized to ensure no negative long-term effects. To provide a balanced supplement, USDA standards were referenced to estimate an original prototype recipe. Macronutrient levels were compared to estimations and the recipe was adjusted. Then, micronutrients were analyzed. Initial micronutrient data was deficient, and adjustments were made. Calculations were implemented with self-gathered data to render more accurate recipes. To optimize the process for creating recipes, a spreadsheet algorithm was created to keep up with the complexity of one ingredient altering multiple nutrients. Pursuing an applicable program, nutrients were analyzed in dog food catered to specific breed types of dogs. These results were employed to optimize the system further with a Java program. The customer inputs their canine's breed and ingredients to produce an individualized recipe. The validity of the program was confirmed by having three participants use the program and collecting samples. The program can be applied in a variety of institutions, all the while decreasing the environmental impact that is made from wasting food.

Awards Won: