Thesis Project Portfolio

Nutritional Protein: Plant Based Chicke Nuggets

(Technical Report)

The Effect of Plant-Based Diets on Dietary Recommendation Trends In The U.S.

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

Amidst the challenges posed by climate change, individuals are increasingly making dietary choices to mitigate environmental impact. Conventional meat production contributes to greenhouse gas emissions, further impacting the issue of global warming. Evidence shows plant-based diets can play a role in reducing these emissions and in the United States, 6% of the population now identify as vegetarian or vegan.

Despite the shift towards plant-based diets, the homogeneous nature of the plant-based foods industry creates an obstacle for adopters. The market for plant-based foods, particularly meat alternatives, is both limited and expensive and saturated with soy-based products, which is a top-nine allergen. To address these challenges, the technical project focuses on the development of a process to manufacture plant-based chicken nuggets using sesame protein.

Plant-based foods are intertwined with diet choices, making an exploration into the human and social impact of plant-based diets important. The proliferation of plant-based meats are dependent on the endorsement of these diets in established guidelines. Using Star's concept of infrastructure provides valuable insights into how social forces influence the formulation of these guidelines. Since these guidelines operate within an infrastructure encompassing various technologies and human interactions, understanding these influences can shed light on the reasons behind the endorsement of plant-based diets.

To understand the factors influencing dietary recommendations, an analysis of the U.S. Department of Agriculture (USDA) and U.S. Department of Health and Human Services (HHS) Dietary Guidelines for Americans was undertaken. Employing keyword frequency and qualitative analysis of the context surrounding key phrases facilitated an understanding of the evolution of plant-based diets within these guidelines. The main findings indicate a growing

emphasis in the dietary guidelines for plant-based diets, with more emphasis on vegetable consumption in later editions. However, the acceptance of plant-based diets in the guidelines has exhibited fluctuations. Applying Star's (1999) *Infrastructure* framework, the fluctuations are attributed to a tendency to revert to conventions and the embedded influence of government and politics on the guidelines.

This undergraduate thesis provides a comprehensive foundation for a more in-depth discussion on the integration of plant-based meats into our diet. Despite the popularity of plant-based diets and meat alternatives, meat substitutes are highly processed and not in alignment with nutritional guidelines. For instance, the use of butane and octanol in the process to manufacture sesame-based chicken nuggets, known to be toxic, demands consideration in shaping this discourse. Additionally, the insights from the design of the sesame-based chicken nuggets, coupled with the findings from the analysis of dietary guidelines, can shape the future design of plant-based meats, ensuring a better alignment with established guidelines.