



# Content-Based Complementary Food Menu Recommender System

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## ABSTRACT

A baby's development and growth is not solely reliant on breastfeeding, but also on complementary foods. This is due to breast milk only providing roughly 70% of the infant's nutritional needs, and its ability to meet these needs diminishes as the child grows older. Ensuring the daily provision of complementary meals with appropriate nutritional value may pose challenges for parents. Therefore, this research proposes a content-based complementary food menu recommender system using TF-IDF to assist parents in meeting these nutritional requirements on a daily basis. The expected result of this research is a powerful tool to empower parents with data-driven food choices for their infants, potentially contributing to improved child health and growth.

## INTRODUCTION

This research introduces a Content-Based Recommender System for recommending complementary food menus to infants. Central to this approach is the application of the TF-IDF (Term Frequency-Inverse Document Frequency) technique that enables the system to create a numerical representation of each item based on unique term frequency, facilitating the generation of personalized recommendations. By measuring the similarity between items, the content-based approach aligns suggestions with user preferences, nutritional needs, and developmental stages. TF-IDF ensures precision in navigating the diverse landscape of complementary foods, offering parents tailored and nutritionally optimized suggestions for their infants.

## OBJECTIVES

IMPROVE NUTRITIONAL INTAKE

Help parents ensure their children are getting a balanced and varied diet by recommending complementary foods that complement the nutrients already provided by other foods

REDUCE MEALTIME STRESS

By suggesting suitable and interesting combinations, the system can make meal planning and preparation easier and less time-consuming for parents

PROMOTE DIETARY DIVERSITY

Encourage broader consumption of nutritious foods by suggesting diverse and interesting combinations, contributing to healthier diets for individuals and communities

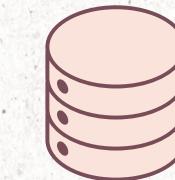
## DATA SOURCES

### RECIPE WEBSITES



Abundant source of food data

### NUTRITIONAL DATABASES



Reliable information on nutritional values

### MEDICAL OR DIETARY GUIDELINES



Age-appropriateness information

### USER FEEDBACK



Incorporate preferences for improvement

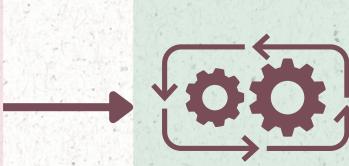
## METHODS

### Data Preparation



- Load and clean dataset
- Preprocess text data
- Extract relevant nutritional values

### Feature Engineering



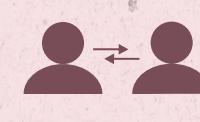
- Represent foods as vectors
- Use TF-IDF to create numerical representations of foods

### Build the Recommendation Model



- Calculate similarities using cosine similarity
- Implement recommendation function

### User Interaction



- Collect user input
- Present recommendations

### Evaluation & Refinement



- Measure performance
- Incorporate user feedback to continuously improve the system's effectiveness

## EXPECTED RESULT

### INPUT (FOR INSTANCE)

- A user enters the age of their child (e.g., 6 months) and any dietary restrictions (e.g., lactose intolerance)
- A user chooses a base food they already know their child enjoys (e.g., sweet potato puree)

### EXPECTED OUTPUT

1

Green Bean and Pea Puree  
(Similarity Score: 85%)

- Ingredients: Steamed green beans, peas, breastmilk/formula
- Instructions: Steam and blend green beans and peas with breastmilk/formula
- Nutritional information: sodium: 5%, fat: 7%, carbohydrates: 48%

2

Mango and Avocado Puree  
(Similarity Score: 78%)

- Ingredients: Ripe mango, avocado, breastmilk/formula
- Instructions: Blend mango and avocado with breastmilk/formula
- Nutritional information: sodium: 3%, fat: 15%, carbohydrates: 70%

3

Chicken and Quinoa Stew  
(Similarity Score: 70%)

- Ingredients: Steamed chicken breast, quinoa, diced carrots, breastmilk/formula
- Instructions: Steam chicken and quinoa, chop carrots, blend with breastmilk/formula
- Nutritional information: sodium: 12%, fat: 8%, carbohydrates: 35%