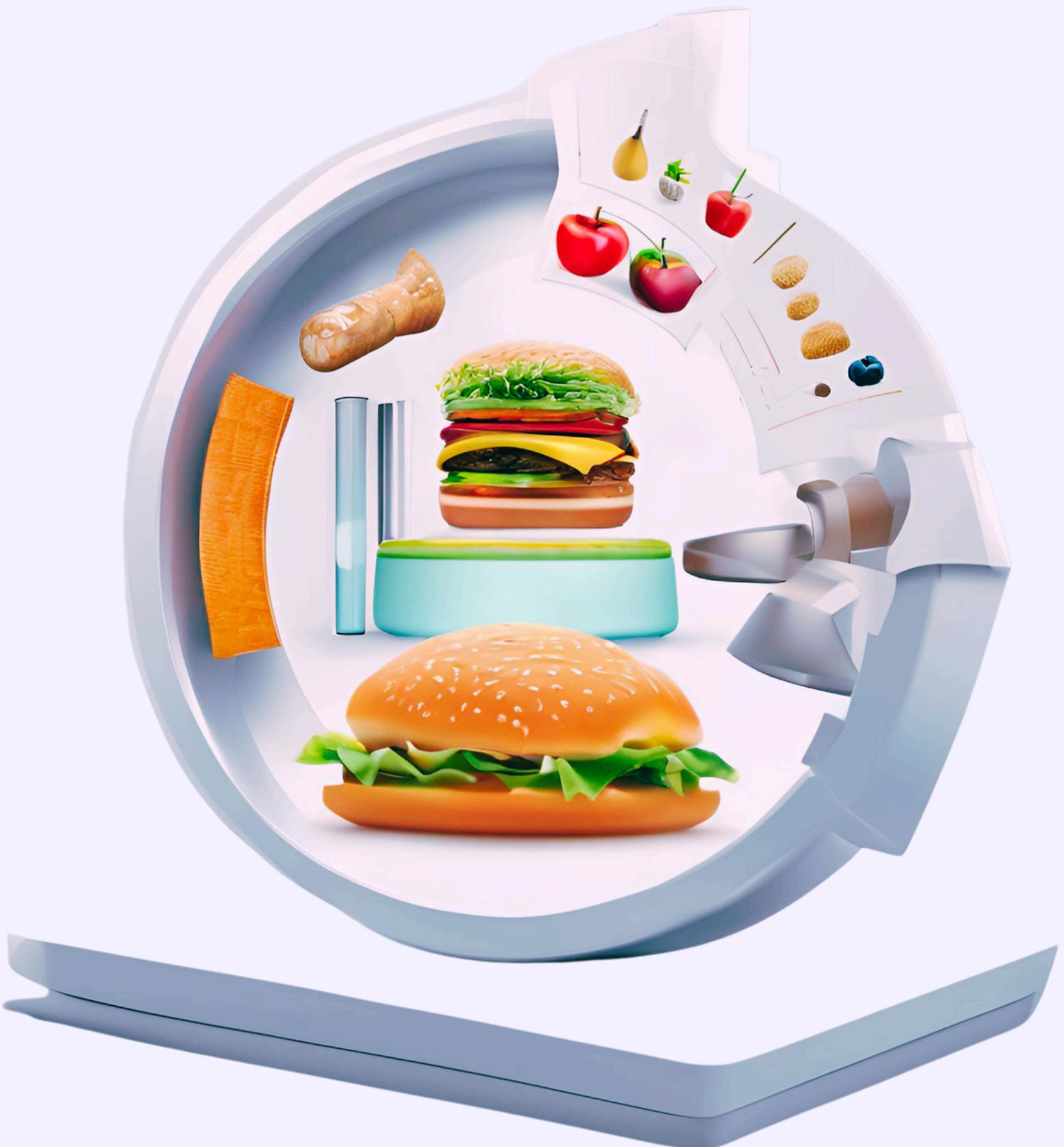


FOODSCAN

# FOOD DETECTION AND ANALYSIS

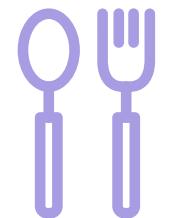
Website for making informed dietary choices  
simple and intuitive



# INTRODUCTION

FoodScan a web application designed to empower users with information about their food choices. Through image upload and analysis, FoodScan bridges the gap between what's on our plate and an understanding of its nutritional value.

- A web application to classify dishes from uploaded images.
- Provides recipes and detailed nutritional information for better dietary decisions.
- Compares nutritional values against recommended daily intake guidelines.



# DELIVERABLES



## Web Interface

A functional web interface built, allowing for image upload, result display and navigation



## Dish Image Classification

ML model trained and deployed further integrated with website for food detection



## Recipe Retrieval

Integrated with TheMealDB API to retrieve relevant recipes with ingredients and instructions



## Nutrient Comparison

Integrated nutrient fetching RapidAPI to provide nutritional information



## Diet Plan

Cuisine and health profile based Meal Finder and a height weight based meal Planner

# DATASET

## Food-101 Dataset

### Categories

101 distinct food classes

1,000 images per category i.e. 101,000 total images

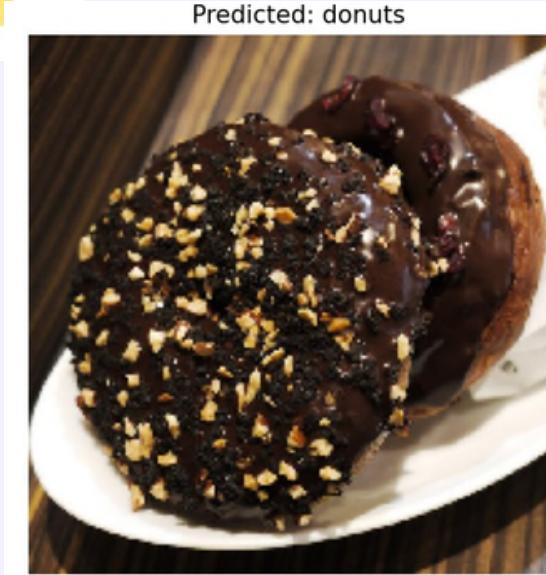
### Data Splitting

Training Data - 75,750 images (75%)

Testing Data - 25,250 images (25%)



Predicted: samosa



Predicted: donuts

# MODEL INCEPTION V3

## Custom Layers

- **Global Average Pooling** to reduce dimensionality
- **Fully connected dense layer** with 128 neurons and **ReLU activation**
- **Softmax output layer** for multi-class classification

## Data Augmentation

Applied rescaling, shear, zoom, and horizontal flipping to enhance model generalization

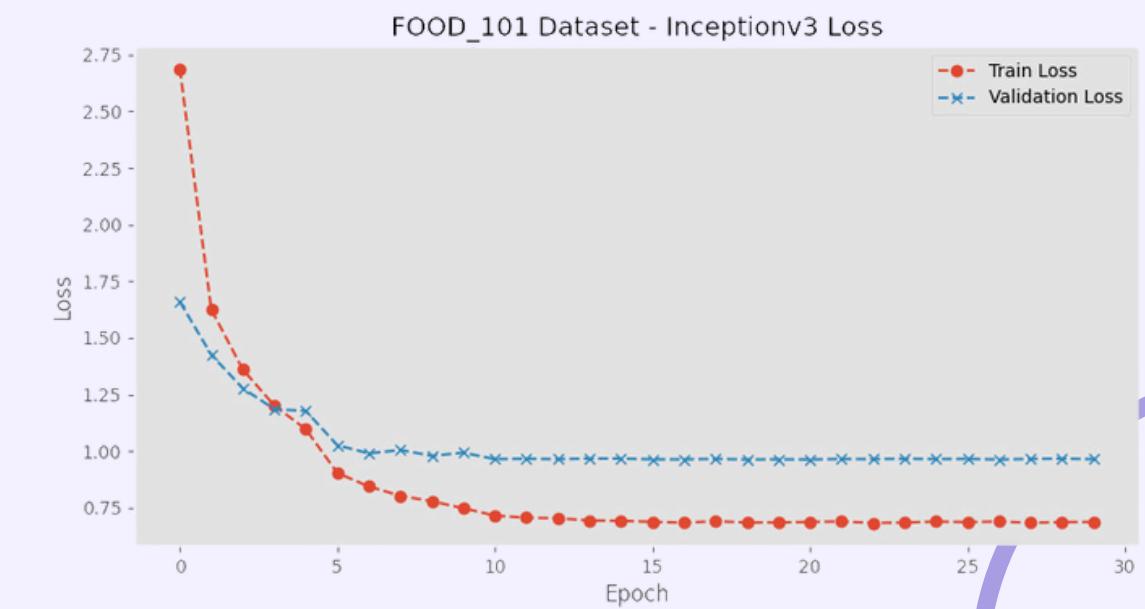
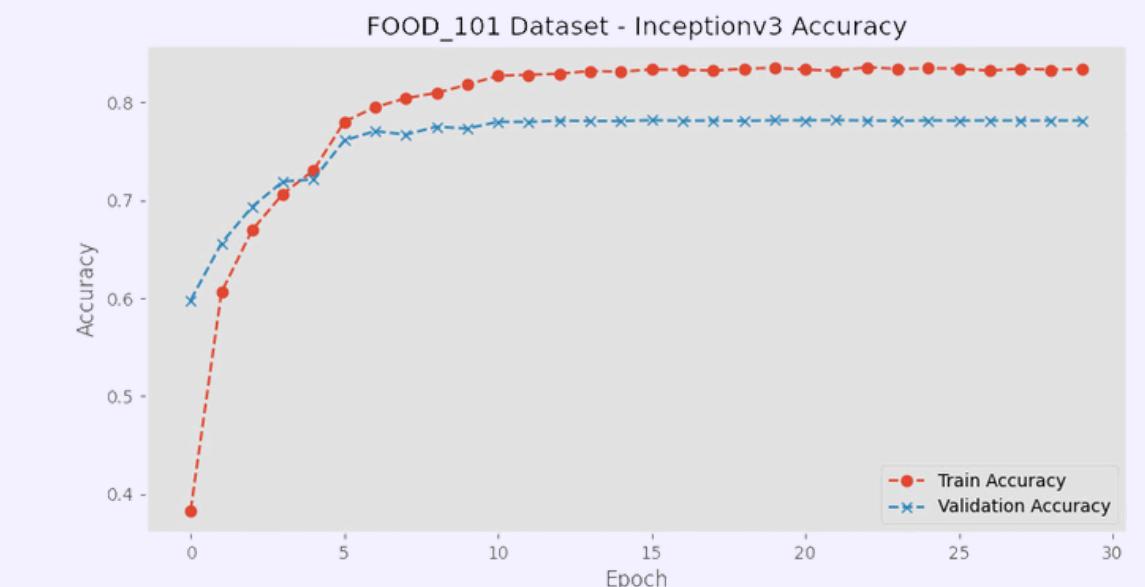
**L2 kernel regularization** and **dropout layers** to prevent overfitting

## Optimization

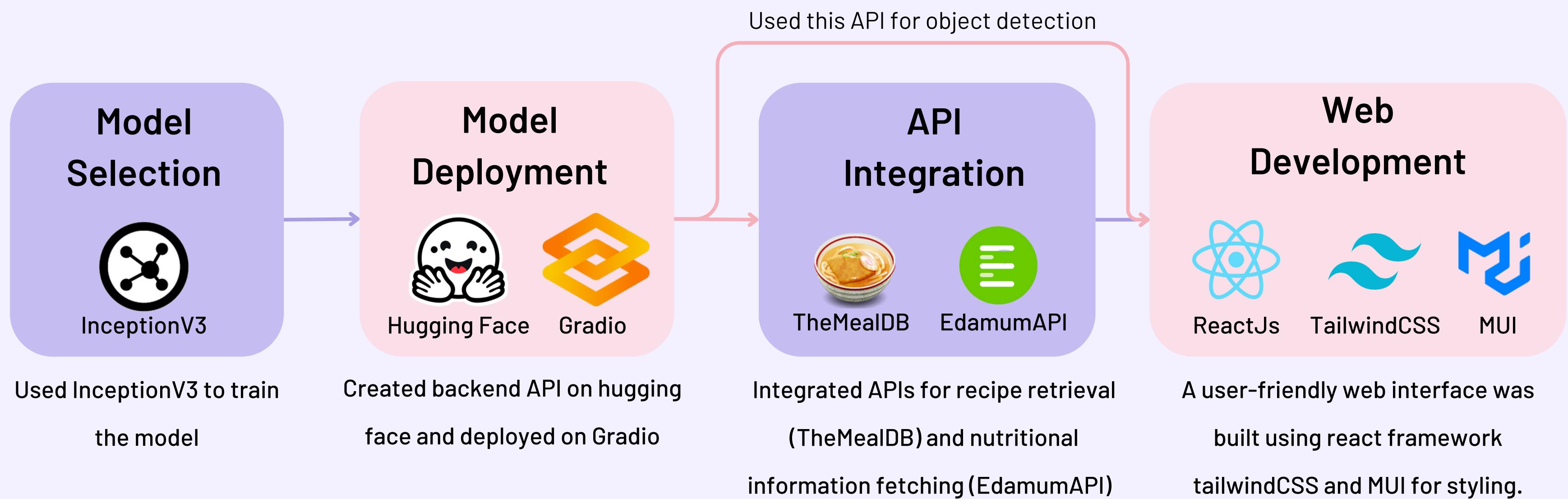
**Stochastic Gradient Descent (SGD)** with a learning rate of 0.0001 and momentum of 0.9 for efficient training

Employed **callbacks** for efficient training:

- **Model Checkpoint** to save the best-performing model.
- **CSV Logger** to monitor training and validation metrics



# METHODOLOGY



The header features the FoodScan logo (a purple circle with a white 'F') and the word 'FoodScan' in white. To the right is a light purple navigation bar with 'Home', 'Features', and 'Diet Plan' links.

## EMPOWER YOUR FOOD CHOICES WITH **FOODSCAN**

Upload images of dishes to classify them, get detailed recipes, and explore their nutritional content. Compare against recommended daily intakes to make better dietary decisions effortlessly.

[Get Started](#)

An illustration showing a smartphone displaying a diet plan app with a bar chart. In front of it is a white plate containing a colorful, healthy meal (a fruit salad). Above the plate are two floating donut-shaped icons, each divided into segments representing different food categories or nutrients.

The image shows the FoodScan mobile application's main screen. At the top left is the logo 'FoodScan'. At the top right are navigation links: 'Home', 'Features', and 'Diet Plan'. The central title 'FEATURES' is bolded above a subtitle 'Discover How We Transform Your Food Experience'. Below the subtitle are three large cards, each representing a feature: 'Food Detection' (showing a refrigerator door with various food items), 'Recipe Retrieval' (showing a plate with a burger and a smartphone displaying a recipe card), and 'Nutritional Insights' (showing a circular graphic divided into segments representing different nutrients like carbohydrates, protein, and fats). Each card has a title, a brief description, and a 'Get Started' button.

The FoodScan interface displays a search result for the dish "Kafteji". On the left, there's a large image of a traditional Tunisian Kafteji dish served in a blue and white patterned bowl, garnished with olives and herbs. Below the image is a purple button labeled "GET NUTRITIONAL INFO". To the right of the image is a title "Kafteji" in bold purple, followed by "Ingredients" in black. A list of ingredients with corresponding icons includes: 5 Large Potatoes (potato icon), 2 lbs Olive Oil (olive oil bottle icon), 1 Green Pepper (green pepper icon), 5-Onions (onion icon), 1 lbs Ras el hanout (spice jar icon), 500g Pumpkin (pumpkin icon), 24 Skinned Eggs (egg icon), and Pinch Salt (salt shaker icon). Below the ingredients is a section titled "Instructions" in black. The instructions provide a detailed cooking guide for preparing Kafteji, mentioning the use of Ras el hanout, olive oil, onions, and eggs, along with specific cooking times and temperatures. At the top of the page, there's a purple navigation bar with the FoodScan logo and links for "Home" and "Features".



FoodScan

Home Features Diet Plan

## NUTRITION COMPARISON

Compare Food Nutritional Information

Enter Dish Name 1

Ingredients

1 Packet Filo Pastry 150g Minced Beef 150g Onion 40g Oil Dash Salt Dash Pepper



Calories Protein Fat Carbs

**HIDE NUTRITIONAL INFO**

Nutritional Breakdown

Nutrient	Quantity	Unit
Energy	23.26	kcal
Total lipid (fat)	0.20	g
Fatty acids, total saturated	0.07	g

Enter Dish Name 2

Ingredients

25g Bulgur Wheat 500g Lamb Mince 1 tsp Cumin 1 tsp Coriander 1 tsp Paprika 1 clove finely chopped Garlic For frying Olive Oil 4 Bun Grated Cucumber 200g Greek Yogurt 2 lbs Mint



Calories Protein Fat Carbs

**HIDE NUTRITIONAL INFO**

Nutritional Breakdown

Nutrient	Quantity	Unit
Energy	79.50	kcal
Total lipid (fat)	3.23	g
Fatty acids, total saturated	0.54	g

**FoodScan**

	11.63	µg
Folate, food	11.63	µg
Folic acid	0.00	µg
Vitamin B-12	0.00	µg
Vitamin D (D2 + D3)	0.00	µg
Vitamin E (alpha-tocopherol)	0.43	mg
Vitamin K (phylloquinone)	8.61	µg
Water	109.29	g

**Folate, DFE**

	12.25	µg
Folate, food	12.25	µg
Folic acid	0.00	µg
Vitamin B-12	0.00	µg
Vitamin D (D2 + D3)	0.00	µg
Vitamin E (alpha-tocopherol)	7.28	mg
Vitamin K (phylloquinone)	20.07	µg
Water	2.80	g

**Nutritional Comparison Plot**

Legend: Bigos (Hunters Stew) (purple), Baingan Bharta (green)

 FoodScan

Home Features Diet Plan







## Avocado-Onion Salad



Cuisine Type: american

Calories: 359

Ingredients:

- 1/2 white onion, thinly sliced
- 1 avocado sliced (peeled and pitted)
- Salt and white pepper
- Salt and white pepper
- 1/2 lemon

[Full Recipe & Instructions](#)

Egg-Free, Peanut-Free, Tree-Nut-Free, Soy-Free, Fish-Free, Pork-Free, Red-Meat-Free, Cucumber-Free, Onion-Free, Cucumber-Free, Celery-Free, Mustard-Free, Sesame-Free, Safflower-Free, Sunflower-Free, Melted-Free, Alcohol-Free, No oil added, Saffite-Free, Sulfite-Free, Sulfur-Free.

[View Recipe](#)

Fish-Free, Soy-Free, Fish-Free, Shellfish-Free, Pork-Free, Red-Meat-Free, Cucumber-Free, Onion-Free, Cucumber-Free, Celery-Free, Mustard-Free, Sesame-Free, Safflower-Free, Sunflower-Free, Melted-Free, Alcohol-Free, Aspartame-Free, No oil added, Saffite-Free, Kosher, Immuno-Supportive

[View Recipe](#)

Tree-Nut-Free, Soy-Free, Fish-Free, Shellfish-Free, Pork-Free, Red-Meat-Free, Cucumber-Free, Onion-Free, Mustard-Free, Sesame-Free, Safflower-Free, Sunflower-Free, Melted-Free, Alcohol-Free, No oil added, Kosher

[View Recipe](#)

 FoodScan

**DEMO**

Website

# RESULT

- Food image classification with an accuracy of 78% on InceptionV3 model
- Integrated with recipe and nutritional data for identified dishes
- User-friendly nutrient comparison and diet planning features

# CONCLUSION

- Successfully integrated food detection, nutritional analysis, and dietary planning
- Provides actionable insights for users to make healthier food choices
- Demonstrates the practical application of APIs for seamless user experience

# FUTURE SCOPE

- Improve food classification accuracy with more diverse datasets.
- Expand support for additional dietary restrictions
- Introduce real-time feedback on meal choices for instant recommendations
- Add calorie tracker and meal history logs

# THANK YOU