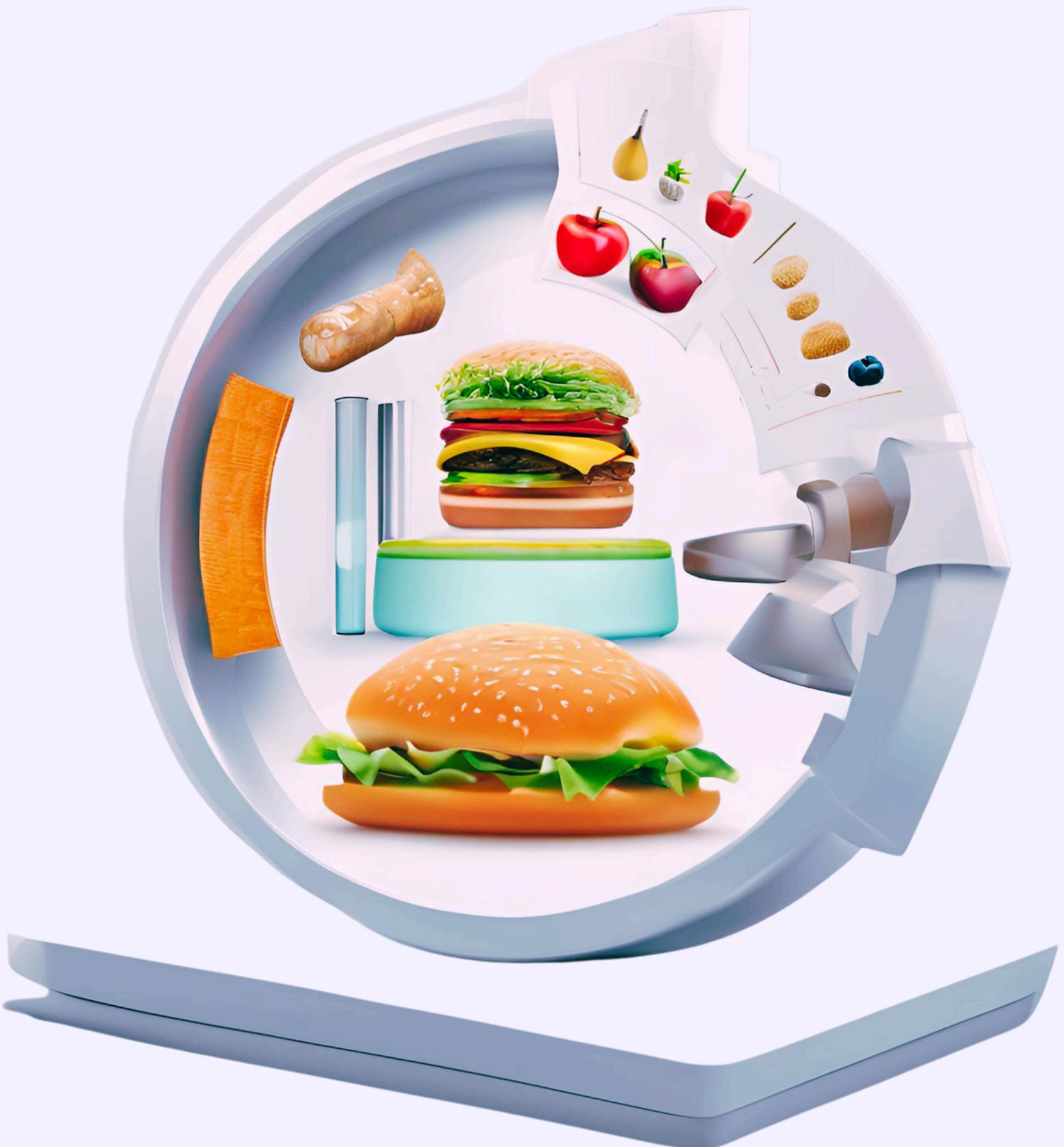


FOODSCAN

FOOD DETECTION AND ANALYSIS

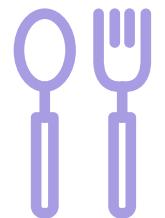
Website for making informed dietary choices
simple and intuitive



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%)



MODEL INCEPTION V3

InceptionV3 for robust feature extraction.

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.

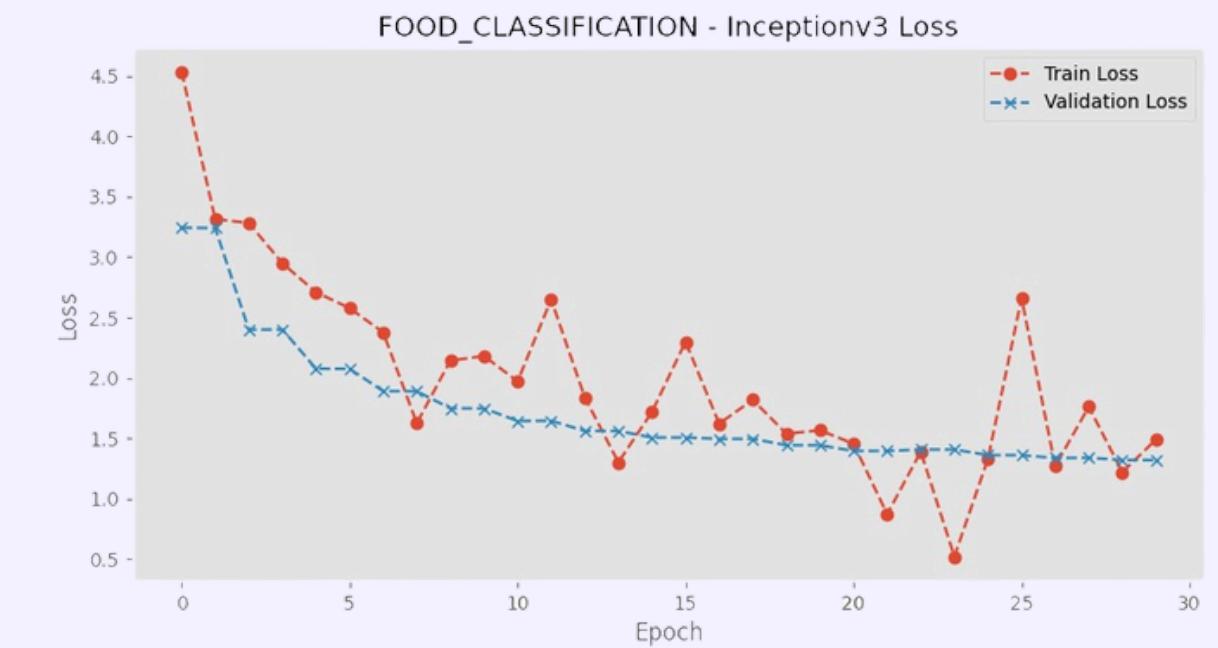
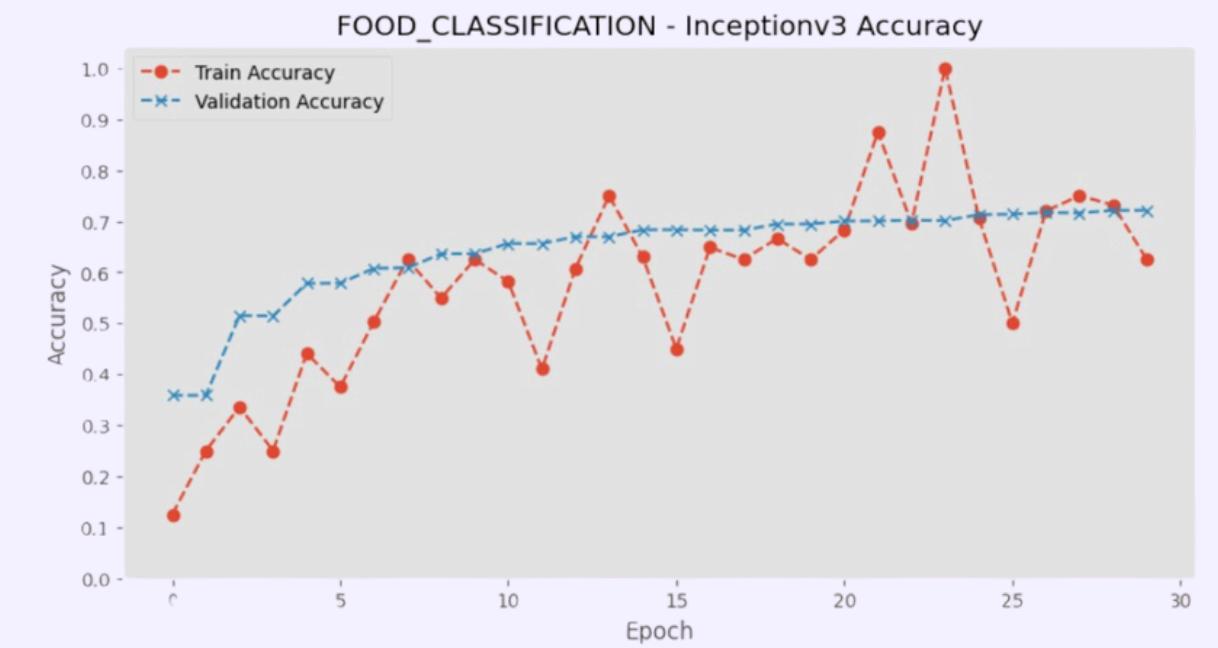
Data Augmentation: Applied rescaling, shear, zoom, and horizontal flipping to enhance model generalization

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

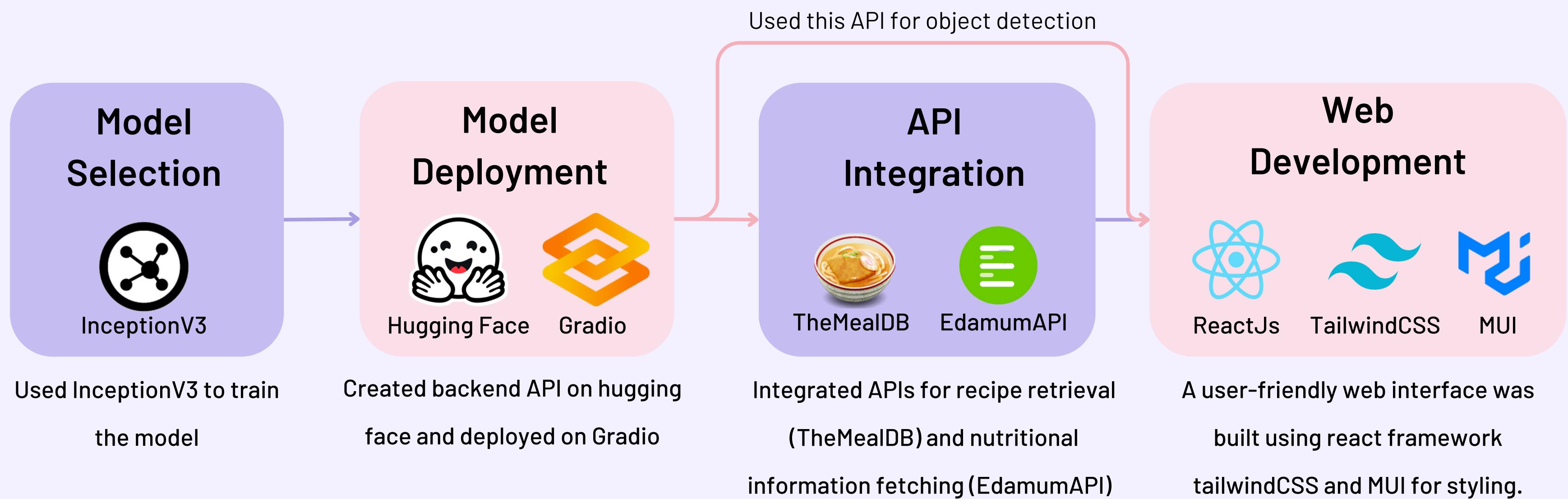
Optimization: Stochastic Gradient Descent (**SGD**) with a learning rate of 0.0001 and momentum of 0.9 for efficient training.

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. The first card, 'Food Detection', shows a refrigerator door with various food items like a turkey, broccoli, and fruit. The second card, 'Recipe Retrieval', shows a plate with a burger and a small bowl of sauce, with a spoon nearby. The third card, 'Nutritional Insights', shows a circular graphic divided into segments representing different nutrients. 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

Nutritional Comparison Plot

Nutrient	Bigos (Hunters Stew)	Baingan Bharta
Water (g)	~15	~40
Energy (kcal)	~18	~20
Cholesterol (mg)	~5	~5
Vitamin A (IU)	~5	~5
Folate, DFE (ug)	~5	~5
Folate, food (ug)	~5	~5
Vitamin B-12 (ug)	~5	~5
Folic acid (ug)	~5	~5
Vitamin B-12 (ug)	~5	~5
Folate, total (ug)	~5	~5
Vitamin D (D2 + D3) (ug)	~5	~5
Fatty acids, total (mg)	~5	~5
Sugars, total included NLEA (g)	~5	~5
Vitamin E (alpha-tocopherol) (mg)	~5	~5
Vitamin K (phylloquinone) (ug)	~5	~5
Carcbohydrate, by difference (g)	~5	~5
Fiber, total dietary (g)	~5	~5

Radar Nutrient Profile

Nutrient	Bigos (Hunters Stew)	Baingan Bharta
Water (g)	~15	~40
Energy (kcal)	~18	~20
Carbohydrates (net) (g)	~5	~5
Carbohydrate, by difference (g)	~5	~5
Fiber, total dietary (g)	~5	~5
Cholesterol (mg)	~5	~5
Vitamin A, RAE (ug)	~5	~5
Folate, DFE (ug)	~5	~5
Folate, food (ug)	~5	~5
Vitamin B-12 (ug)	~5	~5
Folic acid (ug)	~5	~5
Vitamin B-12 (ug)	~5	~5
Folate, total (ug)	~5	~5
Vitamin D (D2 + D3) (ug)	~5	~5
Fatty acids, total trans (g)	~5	~5
Vitamin E (alpha-tocopherol) (mg)	~5	~5
Vitamin K (phylloquinone) (ug)	~5	~5
Sugars, total including NLEA (g)	~5	~5

The image shows a screenshot of the FoodScan mobile application. At the top, there's a navigation bar with icons for Home, Features, and Diet Plan. Below the navigation is a horizontal banner featuring three small images of different salads. The main content area has a title "Avocado-Onion Salad" and a large, detailed image of the salad itself. Below the image, there are sections for "Cuisine Type: american", "Calories: 359", and "Ingredients:" followed by a bulleted list. There are also "View Recipe & Instructions" and "View Recipe" buttons. The bottom of the screen shows partial views of other recipe cards.

The image shows the FoodScan website's diet plan search interface. At the top left is the FoodScan logo. To its right are links for Home, Features, and Diet Plan. The main title "DIET PLAN" is centered in large, bold, black letters. Below it is a subtitle "Search & explore a variety of recipes at your fingertips". The search form below the subtitle includes fields for "Cuisine Type" (set to "British"), "Breakfast" (selected from a dropdown), "Health Labels" (set to "crustacean-free"), "Add Ingredient" (set to "Garlic"), and two small circular buttons for "crustacean-free" and "Garlic" which likely serve as filters or clear buttons. A purple "Search Recipes" button is positioned below the search fields. Below the search area, the word "Results" is centered above three cards, each showing a thumbnail image and the name of a recipe: "English Muffin Tid-Bits", "Egg Muffins", and "Avocado Toasts".

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