# *Intelligent Meal Planner Using Machine Learning*

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***Abstract***:

With growing awareness around healthy eating and personalized nutrition, there is a rising demand for intelligent meal planning solutions. This paper proposes an Intelligent Meal Planner powered by Machine Learning (ML) to generate customized meal plans tailored to user preferences, dietary restrictions, health goals, and nutritional needs. The system employs recommendation algorithms, natural language processing (NLP), and computer vision techniques for food recognition and optimized meal suggestions. Supervised learning models are trained on diverse datasets, including food composition, user behavior, and dietary guidelines. The planner adapts dynamically based on user feedback, caloric intake, and macronutrient distribution, ensuring variety and alignment with individual dietary goals. Integration with wearable health devices enables real-time meal adjustments and tracking. The proposed solution highlights the potential of AI-driven nutrition planning to improve dietary adherence, support better health outcomes, and simplify the meal decision-making process.

### *Datasets*:

∙ For an Intelligent Meal Planner using Machine Learning, you'll need diverse datasets covering nutrition, food composition, user preferences, and health guidelines. Here are some key datasets you can use:

**1. Nutritional & Food Composition Datasets**

* **USDA FoodData Central** (Link) – Contains nutrient information for thousands of foods, including macronutrients, vitamins, and minerals.
* **Open Food Facts** (Link) – A crowdsourced database with food labels, ingredients, allergens, and nutritional data.
* **Food Composition Database (EU/FAO)** – Provides information on food nutrients, widely used for dietary research.

**2. Recipe & Meal Datasets**

* **Recipe 1M+** (Link) – A large dataset with over 1 million recipes, ingredient lists, and images.
* **Epicurious Recipe Dataset** – Contains structured recipe data, including ingredients, cooking instructions, and reviews.
* **Food.com Recipe Dataset** – Includes user-generated recipes, ratings, and reviews for preference modeling.

**3. User Preferences & Dietary Restrictions**

* **MyFitnessPal Dataset (Scraped Data)** – User logs of meals, calorie counts, and macros (requires custom scraping or API access).
* **Health Nutrition Surveys (NHANES)** ([Link](https://www.cdc.gov/nchs/nhanes/index.htm)) – Provides demographic dietary intake and health data.
* **Food Diary Datasets (Kaggle)** – Contains self-reported food consumption patterns.

**4. Health & Fitness Datasets**

* **MIMIC-III/MIMIC-IV** ([Link](https://mimic.mit.edu/)) – Medical dataset with patient dietary and health records (requires authorization).
* **Fitbit/Wearable Data** – Tracks real-time activity, calorie expenditure, and food logs (via API integration).
* **Diabetes and Nutrition Dataset (Kaggle)** – For meal planning based on specific health conditions.

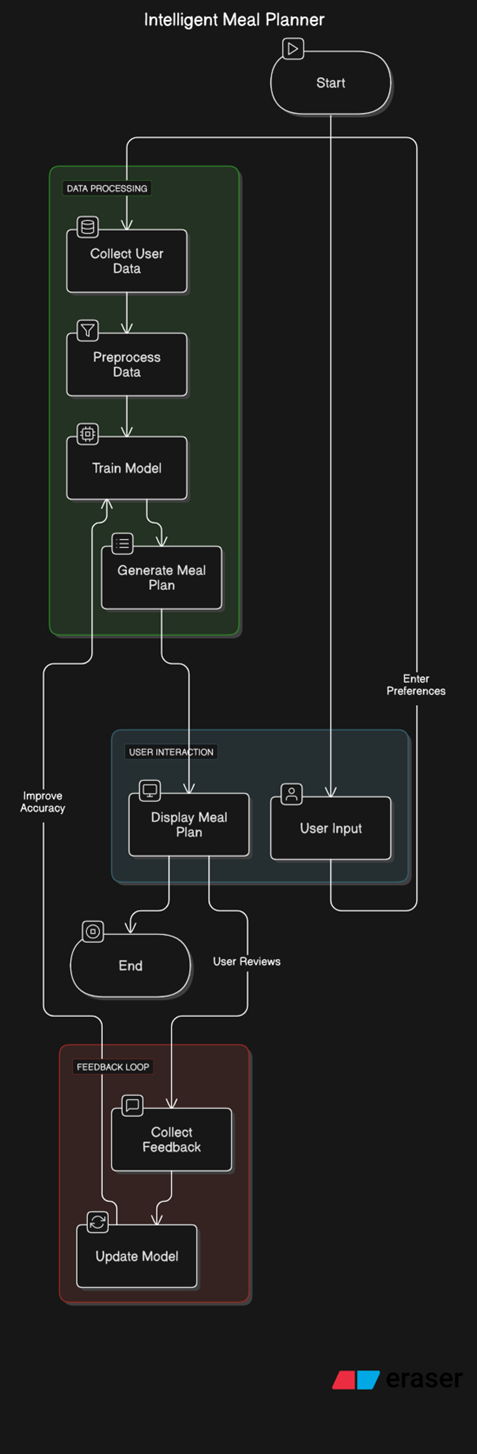
**5. Food Image & Recognition Datasets**

* **Food-101** (Link) – 101 food categories with 101,000 images for training ML models.
* **UEC Food Dataset** (Link – Annotated food images for food recognition tasks.
* **RecipeQA** – A dataset that links recipes with step-by-step visual and textual instructions.

**6. External APIs for Real-Time Data**

* **Spoonacular API** (Link) – Provides nutrition, recipes, and meal planning features.
* **Edamam Nutrition API** (Link – Offers food and nutrition data for personalized meal recommendations.

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***Algorithm: - Machine Learning Algorithm***

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