



A REVIEW OF FITNESS-BASED APPLICATIONS WITH INTEGRATED FOOD CALORIE ANALYSIS

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ABSTRACT

The calorific value of food materials plays a crucial role in understanding their food content, which is essential for both nutritional analysis and energy management. This study focuses on the identification and analysis of calorific value and composition of food materials using mobile applications. This process helps determine the energy available from carbohydrates, proteins, fats, and other macronutrients and micronutrients. The results are compared through mobile applications stored databases which allow us to identify the calorific value and nutritional content of the scanned food materials. In this generation of our life all individuals are more concerned about their health and wellbeing by ensuring the intake of food in their day-to-day life. So, all mobile applications which are useful for knowing and understanding food calorific values and nutritional contents are in high demand. These information's about food are captured through scanning the food materials through the applications and extracting the food content values in that food materials. Mobile and computer-based applications are attracting a lot of interest in healthcare. They have the potential to assist in the management of chronic illnesses such as diabetes, ensuring the patients to eat healthy food, and reducing complications related with unhealthy food.

Keywords: Mobile applications, Calorific value, Nutritional monitoring, Food recognition.

INTRODUCTION

The nutritional quality of food is a key factor influencing human health, and understanding the energy and nutrient composition of food materials is essential for making good dietary choices. One of the most important aspects of food analysis is the determination of its calorific value, which indicates the amount of energy a food provides when metabolized by the body. The calorific value is primarily derived from macronutrients such as carbohydrates, fats, and proteins, and can be identified using mobile computer-based applications, the nutrient composition of food materials must be analyzed to understand their contributions to human nutrition (Ramesh K *et al.*,2021) This includes the identification of essential components such as vitamins, minerals, fiber, and other micronutrients. The nutritional value of food is not only determined by its energy content but also by the types and proportions of

these nutrients, which vary depending on the food's source and processing methods. This study aims to investigate both the calorific value and the nutritional composition of various food materials using mobile computer base applications (Avancha S *et al.*,2004) By analyzing the energy and nutrient profiles, we can better understand how different foods contribute to overall health and well-being, leading both dietary choices and food product development. Applications for measuring calorific values and nutritional contents are in greater demand in these generations as all are curious about the food they intake and their health benefits. There are different types of data based on their applications which produce or display nutritional values in food by introducing different types of data bases of information in their app designing (Boushey C J *et al.*, 2024) Unhealthy diet, physical inactivity and sedentary behaviour are known to track from childhood into adulthood and are difficult to change later in life.

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Snap calorie

The Snap calorie was founded by Scott Baron and Wade Norris in 2021 in Y combinator company. The App uses AI to identify food in photos and provides calories and macronutrient breakdown also Recognizes mixed meal provide free app without any subscription. The snapCalorie app uses different types of software’s like artificial intelligence (AI), Computer vision and comprehensive nutrition database.

Process involved

The first step involves Image upload. The user takes the photo of their food by using app’s camera. The next step is AI Image processing & food recognition that involves the app’s algorithms analyze the photo to identify the different types of food items and the ingredients which are present in it. Then it is followed by The Portion size estimation. Nutritional data verification. Once the food volume and portion sizes are determined it helps to verify the nutrient database to retrieve the calorie and macronutrient values. The last step is Data display that includes the app provides a detailed nutritional breakdown (calories, protein, fat, carbs) and automatically logs the meal of user’s (Boushey *et al.*, 2017).

Cal AI

The Cal AI was founded by Zachary Yadegar. We can track the calories just by taking a picture of our food. He started this app at Roslyn high school. The pricing is 30 dollars per month (paid). It shows accurate and precise measured values which are explained through their data base information's they installed into their application algorithms. Cal AI is a mobile application which performs nutritional tracking for you. You take a photo which is estimated by application by using AI based tools which are pre-installed in their application. The CAL AI application's is based on a process of advanced AI and computer vision that analyzes a photo of a user's meal to estimate its nutritional content. This automation is a more convenient alternative to manual food logging and involves several key stages (Chen J *et al.*,2025).

Process involved

Image capture: The user takes a photo of their meal using the app’s camera. Obtained the number of calories and then Track progress and Change can be seen.

Table 1. Examples of mobile based applications in food materials.

Snapcalorie	Lifesum food	Foodzee	Foodnoms
Cal ai	Cronometer	Healthifyme	Mymacros+
Myfitnesspal	Mynetdairy	Carb manager	Nutriscan
Yazio	Caloriemama ai	Foodvisor	Calnotes
Fatsecrete	Bitesnap	Macrofactor	Macrobalance

My fitness pal

It was developed by Mike lee in 2005. It is a barcode scanning application with a massive food database. It targets calories and macronutrients. It is a paid application with monthly charges. Users register by providing their email address locations, and information's like age, height, and sex. The application helps users to set weekly targets. All the necessary food contents can be easily estimated by using my fitness pal application. The MyFitnessPal (MFP) application relies on a combination of user-submitted data, a proprietary database, and APIs that integrate with other health platforms. This system helps users track their dietary intake and physical activity to manage their weight and health goals (Chenna S *et al.*, 2025).

Process involved

The first step is Food tracer/image upload. Provides Meal tracking along with Nutrient calculation. Then we have to set Goal settings and it gives Exercise tracking.

YAZIO

Yazio app was founded by Sebastian Weber and Florian Welbensten. Introduced in the year 2011 in Germany. It Detects the calories and nutritional values in food content.

It is a paid application which charges monthly as per the benefits provided. The application first extracts the basic information from the users like age, sex, height, and weight of the operating user. They guide the users with daily food intake and nutritional information. The internal mechanism of the YAZIO app functions by using a combination of user-submitted information, a comprehensive food database, integrated activity tracking, and scientific formulas to calculate and analyze your nutritional data. (Fang S *et al.*,2025).

Process involved

Initially setup a goal in app setting. Then create a user profile with personal details. Proceeds Image capture. Tracks the progress. provides Monitoring & feedback.

Fatsecret

Fatsecret app was founded by Lenny Moses and Rodney Moses Founded in year 2006 in Melbourne, Australia. It is a Calorie counting and meal tracking application. 45 million users are accommodated through this application. It's a paid application that costs around 6.49 dollars per month. The app is extremely user-friendly. If you can use your phone, you can use the app. (Baranowski *et al.*,2025).

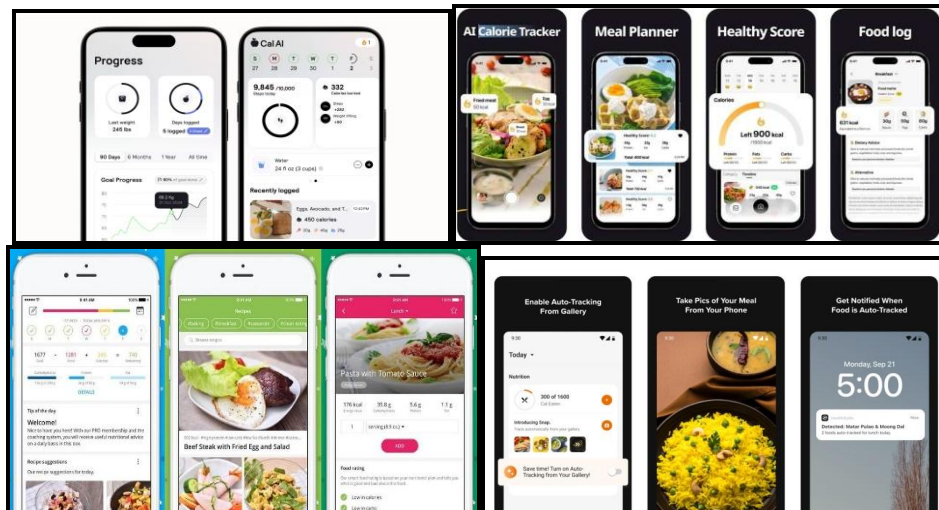


Figure 1. The outlook of Snapcalorie, Cal AI, Myfitnesspal, Yazio apps.

Process involved

At first search the fatsecret app. Then install the fastsecret app. Upload the meals photos and sit back to display tracking progress.

Lifusum food

Lifusum food was founded by Henrick Tostenson. It was established in 2013. Tove Westlund (co-founder). Provides Free use with limited features. Upgraded to premium for full access of features. Food tracking. Provides free barcode scanners (Hossein Esfahani *et al.*, 2025). The Lifusum app is a data-driven, personalized system that combines multiple technologies to help users achieve health and wellness goals through positive behavioral changes (Avancha.S., and A. Baxi *et al.*, 2012). Instead of simply tracking calories, the app's internal functions analyze user input to provide nutrition education, enhance mindful eating, and balance macronutrients. (Zhang W *et al.*, 2025).

Process involved

First Install application from a downloadable source. Provide basic information's like age, sex, height and weight. Complete the registration process and payments

Cronometer

Cronometer is founded by Aaron Davinson. Established in the year 2005. Offers a free barcode scanner and focus on detailed nutritional information. It is majorly used for diet maintenance. It is a free app without any payment. Nutrition tracker that tracks macros, micronutrients, exercise, and more. Free and ad-free gold version with fasting tracking and custom reports and charts. Monthly or annual payments for Cronometer Gold. Access to community through social media and forum for questions and answers. Can sync with compatible fitness trackers. The Cronometer application involves a complete data flow, from user input to final analysis, relying on a verified

nutrition database. The user interface, API integrations, and backend architecture all work together to provide a comprehensive tracking experience (Pannucci E *et al.*, 2025).

Process involved

Initially setup a goal in app settings. Then create a user profile with personal details. Nutrient tracking. Goal setting, Track progress and Monitoring & feedback.

My net diary

My net diary was Founded by Sergey Oreshko. Founded in the year 2007. It is a Free use with limited features. Upgraded to premium for full access of features. My Net Diary provides several features to the users in tracks their food nutrition. The mechanism combines user input, AI-based food recognition, nutrient analysis, goal-driven algorithms, and behavioral feedback to create a personalized and adaptive nutrition tracking system (Pouladzadeh P *et al.*, 2025) It involves User data collection, food recognition and nutrient analysis, personalized goals setting and feedback, Behavioral support and data analytics, Integration and tracking.

Process involved

The first step is Food Logging: Users can manually log their meals or use the barcode scanner to quickly add items. AI Meal Scan: This feature allows users to take a photo of their meal, and the app uses artificial intelligence to recognize the food items and estimate portion sizes. It then calculates up to 107 nutrients using My Net Diary extensive food database. Nutrient Tracking: The app tracks over 30 nutrients, including calories, macronutrients, vitamins, and minerals, helping users monitor their dietary intake my net diary. Customizable Goals: Users can set personalized goals for weight loss, maintenance and the app provides feedback and recommendations to help to achieve above goals.

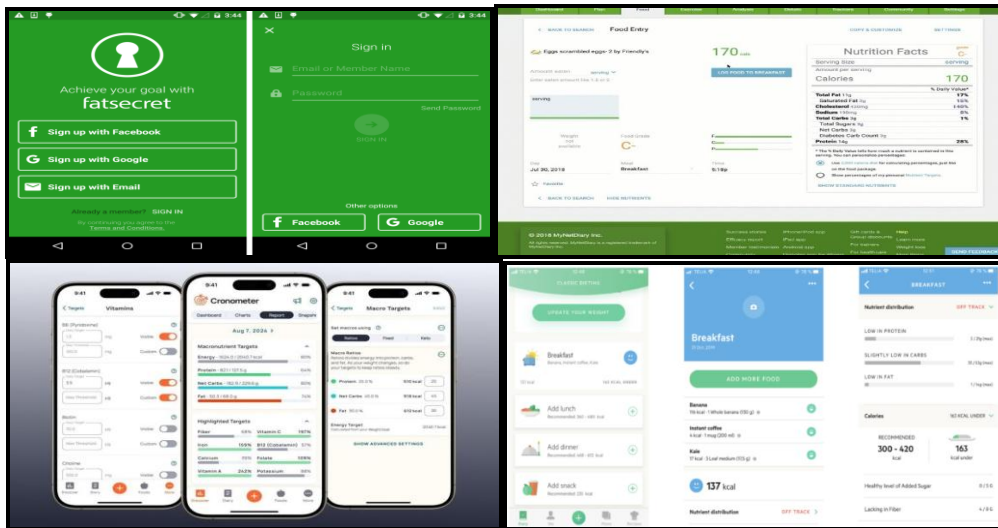


Figure 2. The outlook of Fatsecret, Lifesum food, Cronometer, Mynetdairy apps.

Caloriemama AI

Developed by Azumio In company. Free with some basic features. Upgraded to premium for additional features. Deep Learning Algorithms: These algorithms are trained to recognize a wide variety of foods from images, improving accuracy over time. Image Recognition: The app uses computer vision techniques to analyze food photos and match them with items. Nutritional Database: Once a food item is identified, the app shows its nutritional information from its database to provide users with detailed inside data (Schoeller D *et al.*,2025).

Process involved

Calorie Mama AI App shows deep learning and image recognition technologies to identify food items from photographs. Users can place a picture of their meal, and the app analyzes the image to estimate the nutritional content, including calories, macronutrients and other applicable data. This process simplifies the traditional dull to the task of manual food logging. The Fig.11 Indicates the outlook of caloriemama AI app.

Bitesnap

Bitesnap was founded by Vinay Anantharaman and Michal Wolski. Founded in the year 2016. The launch of bitesnap happened in 2017. It is free to download and have some free features. Subscription for unlimited photo scans, advanced features. BiteSnap is a nutrition tracking app that uses AI and image recognition technology to simplify meal logging. Instead of entering each food item manually, users can take a photo of their meal using their mobile. This app uses a combination of image-recognition, machine learning, nutrition-databases, and a food-logging interface to simplify how users track what they eat.

Process involved

Once the image is captured, the app’s computer vision system analyzes the image to recognize different foods present on our plate. It shows deep learning algorithms which are trained on large image datasets to accurately identify various food items. After identifying the food items, BiteSnap estimates portion sizes and connects this information to a nutritional database that contains values for calories, proteins, fats, carbohydrates, and other nutrients. The app then records the meal in the user’s digital food diary, making it easy to monitor daily intake. BiteSnap learns from the user’s habits and improves its recognition accuracy, allowing faster and more personalized logging. This process combines AI-based image recognition, machine learning, and nutrition data analysis to provide accurate dietary insights and promote healthier eating habits without requiring extensive manual input.

Foodzee

Foodzee was founded by Pofkario Holdings Limited. It is a nutritionist app. Free to download. Subscription for pro features. User onboarding: User sets their goals (e.g., lose weight, maintain), their preferences (dietary restrictions/allergies) and possibly their baseline metrics (weight, height, activity level). Meal logging / input: The user either takes a photo of their meal and/or enters what they ate. The app uses the input to determine what food was eaten, portion size, cooking method etc. AI machine-learning model: The app uses algorithms to identify food items, estimate portion size, calculate nutritional values (calories, macros). Many recent nutrition apps use image recognition and pre-built food-composition databases. For example, academic work shows convolutional neural networks to detect food items from a single picture.

Personalized meal plan generation: Based on the user's profile and goals, the app suggests meals and tracks progress over time. Tracking & feedback loop: The app tracks meals entered over days and weeks, visualizes progress (weight change, calories consumed vs goal, macros achieved, micros achieved), and may adjust future recommendations accordingly. Subscription unlocking features: The paid tier gives full access (unlimited meal entries, AI chat, custom meal plans, more frequent tracking). The free version likely limits number of entries or features (Trigo A *et al.*,2021).

Process involved

Upload the log meals (likely by using photo or manual input). Get nutritional breakdowns (calories, macros, micronutrients). Personalized meal plans (based on preferences, goals). An AI chat assistant to ask nutrition-questions (e.g., about calories, substitutions).

Healthifyme

Healthifyme app is founded by Tushar Vashist. founded in January 2012,13 years ago. Calorie tracking, Advice on nutrition, Advice on fitness. Frontend: it is the basic frontal information tablet were the application register the basic

information of the user. Backend: it is the overall programmed information tagging of users on which the application works. Database: it is the preserved and installed information of every photo, food and its nutritional which provided when it is searched. AI and Machine learning: the basic software involved in the application which provides needed information according to the users. (Sommerville Ian *et al.*,2025).

Process involved

Food Logging: Users can manually log their meals or use the barcode scanner to quickly add items. AI Meal Scan: This feature allows users to take a photo of their meal, and the app uses artificial intelligence to recognize the food items and estimate portion sizes. It then calculates up to 107 nutrients using My Net Diary extensive food database. Nutrient Tracking: The app tracks over 30 nutrients, including calories, macronutrients, vitamins, and minerals, helping users monitor their dietary intake my net diary. Customizable Goals: Users can set personalized goals for weight loss, maintenance and the app provides feedback and recommendations to help to achieve above goals.

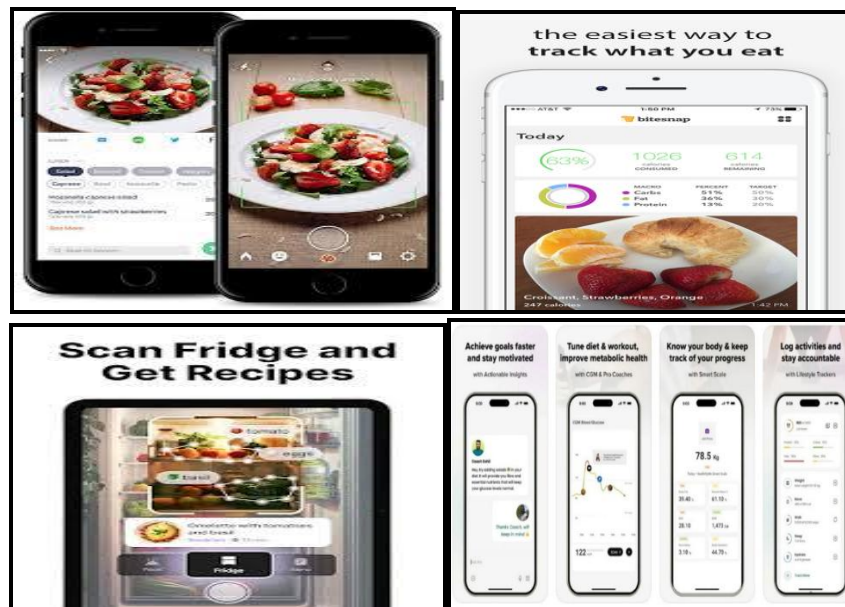


Figure 3. The out of Caloriemama AI, Bitesnap, Foodzee, Healthifyme apps.

Carb manager

Carb manager app was founded by Mandy devis. Food tracker, Keto calculator, Macro calculator, Calorie counter, Nutrition tracker, Exercise logging these advantages are provided. Cross platform: It is mainly used for its framework of the application and the outer designing of the application. Node.js/nuxt.js: Backend and they server- side

rendering of the complete application. Programming languages: Dart included with java script and java. Provided with Kotlin shift.

Process involved

The first step is Account setup. Setting dietary goals. Tracking food intake. Logging water intake. Activity & Exercise tracking. Monitoring progress

Foodvisor

Foodvisor was founded by Charles Boes in 2015. This app uses AI to recognize food from photos and track nutrition. Foodvisor is free to download on ios and android. To unlock full features, need a subscription. AI powered food recognitions. Tech stack: HTMLS, view port meta, cross platform access.

Process involved

The first step Download and create account. Set personal targets. Photo recognition and barcodes. Manual entry. Monitor and feedback.

Macrofactor

It was founded by Greg nuckols and cory davis in the year 2021. Macrofactor is only premium with 7 days free trail. It logs meals and set custom macros. Generate a diet plan. Can keep nutrient balance. Food database and Platforms are IOS and android. It mainly dynamic algorithms.

Process involved

First Download and open the app. Basic information of users should be provided. The App estimates TDEE

calculations. Logging food i.e. photo AI and barcode scanners. Adjust portion sizes and add custom food and Algorithm adjustment. Tracking the calories.

Nutriscan

Nutriscan was founded by INDIA TECH COMPANY, 2022. It recognizes calories macros and micronutrients. Provides 7 days free trail and then subscription every 28 days. Software involves in nutriscan are AI based meal recognition, multi modal input, health “nutriscon” rating, AI assistant, progress tracking & analytics.

Process involved

First download the app and install. Onboarding set up profile, health goals, preferences. Use meal logging via photo, voice or manual entry to log meals. View instant nutrition breakdown and “NutriScore” for each meal. Optionally (if subscribed): Get a personalized diet plan, get AI-nutritionist support, and get meal suggestions based on goals and conditions. Track progress over time and see nutrition history, analyse patterns, adjust diet as needed.

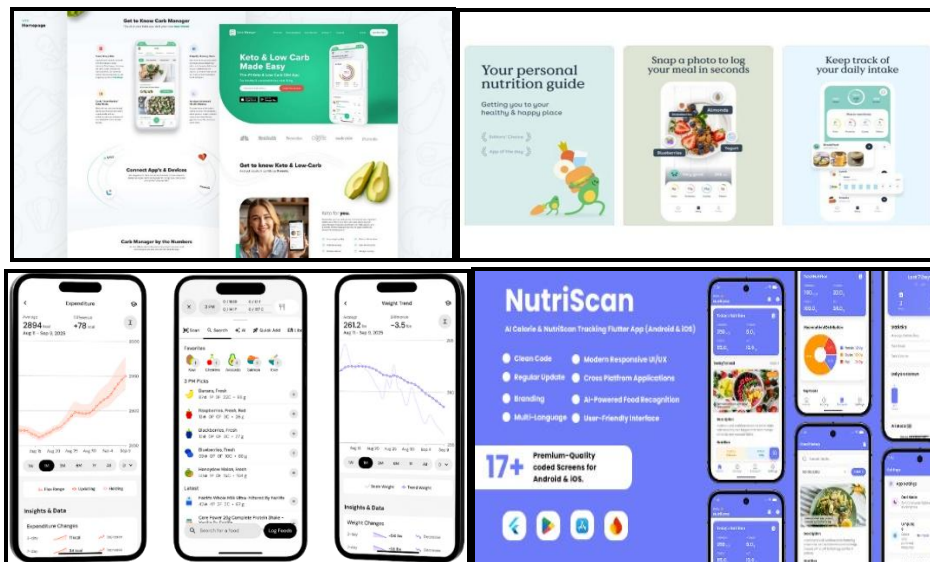


Figure 4. The outlook of Carbmanager, Foodvisor, Macrofactor, Nutriscan apps.

Calnotes

Calnotes was founded by Kyle Orin in the year 2025 November 8 which shows version 1.0. Calnotes is a food diary/calorie-tracking app i.e. it estimates calories, macros and more. Calnotes is a free app which means can download and use the app for free but some features especially advanced or premium ones are unlocked only if pay/subscribe. Software involved in calnotes are AI computer vision, nutrition estimation models, language

meal logging. Calnotes was self-built by the developer to simplify calorie tracking. Calnotes is used to track meals and calorie intake easily. (Orin *et al.*,2025). It can track nutrition like macronutrients and micronutrients. It supports health goals like weight loss, maintenance or muscle gain by letting log the food and showing calorie intake. It simplifies and streamlines food by just type or optionally photograph meals.

Process involved

Firstly, upload the photo of the meal by searching a food database. Estimates nutrition instantly by breakdown calories and macronutrients like proteins, carbs, fats. Personalised nutrition goals. Tracking nutrients.

Macrobalance

Macrobalance was founded by Sharath chenna in the year 2025 april 02. Macrobalance app is a calorie & macro nutrient tracker. The users can track calories, proteins, carbs, fats and overall nutrition using the app. The mission of macrobalance is to produce evidence based on health education content-plain language articles, decision aids. Software involved in the app are AI powered food recognition and analysis, barcode scanning, nutrition label scanning, smart meal logging, progress tracking with charts/graphs. The app is used to emphasizes privacy and simplicity - according to the developer. Macrobalance is

listed as free in app purchases but according to its app description the app offers a 14day free trial after that a subscription is needed. Several subscription options are shown so it's a freemium or subscription-based app rather than fully free. Microbalance app often uses AI estimation and ingredient databases, the nutrition breakdown may not always be 100% precise-especially for mixed dishes, large meals, or traditional/regional recipes where database info may be limited. It can find manual food logging tedious-quick logging via photo, barcode or label scanning reduces friction and makes tracking more sustainable.

Process involved

At first create a profile. Set daily nutrition goals. Log meals by take a photo of the meal and scan a barcode. search and add manually AI calculates intake. Track progress over time. Adjust goals anytime and optional settings.

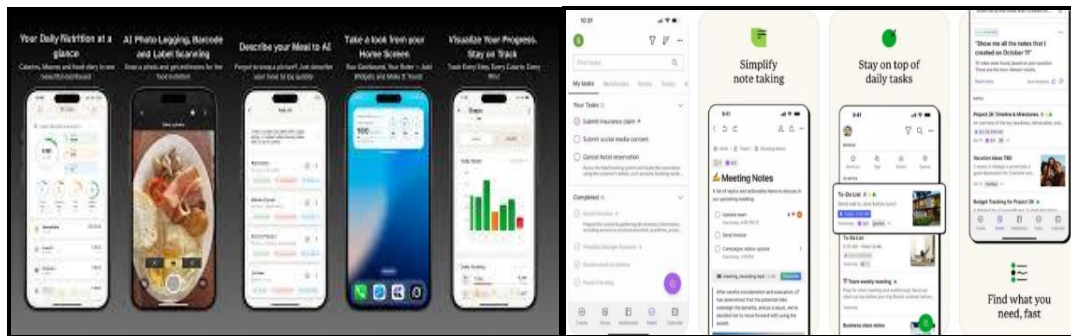


Figure 5. The outlook of Macrobalance, Calnotes.

Table 2. A comparative analysis of food calorific values.

S. No	Name of the app	Pricing	No. of users	Accuracy
1.	Snap calorie	Free	200k	More
2.	Cal ai	30\$	140k	More
3.	My fitness pal	25\$	114k	Stable
4.	Yazio	Free	100k	Stable
5.	Fatsecret	25\$	89k	Stable
6.	Cronometer	19\$	40k	Medium
7.	Lifesum	17\$	25k	Medium
8.	Mynetdairy	Free	10k	Medium
9.	Caloriemama	15\$	18k	Stable
10.	Bitesnap	20\$	20k	Medium
11.	Foodzee	13\$	15k	Medium
12.	Healthifyme	16\$	19k	Stable
13.	Carb manager	18\$	10k	Medium
14.	Food visor	13\$	12k	Stable
15.	Macrofactor	15\$	18k	Stable
16.	Foodnoms	12\$	20k	Medium
17.	Nutriscan	Free	25\$	Medium
18.	Calnotes	15\$	30k	Stable
19.	Mymacros+	13\$	10k	Medium
20.	Macrobalance	10\$	5k	Stable

CONCLUSION

The identification of calorific value and the comprehensive analysis of nutrient content in food materials by the help of mobile computer-based applications provides essential insights into the energy and nutritional profiles of various food types. This study highlights the importance of accurate measurements of energy content, like carbohydrates, proteins, and fats, as well as the detailed evaluation of essential micronutrients such as vitamins, minerals, and fiber. Understanding these parameters is crucial for balanced diets and making dietary choices that promote health and prevent malnutrition-related diseases. The application of advanced techniques like snapcalories, my fitness pal, cal AI complements and provides data to both food scientists and consumers. By comparing the study on food and nutritional dietary applications we concluded that Snapcalories is the best free and user-friendly application. Healthifyme and caloriemama are the accurate and highly informative applications as per our study in food and nutritional dietary applications. The findings from this study can aid in the development of healthier food products by guiding the optimization of food formulations to meet specific energy and nutrient requirements. Additionally, it helps to improve nutritional labeling, allowing consumers to make more informed decisions about their food intake. These are applications which are helpful to get information about the food materials we consume in our daily life. This enhances the dietary and health concertation of our food intake and helps in leading healthier life.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

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