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## An overview of smartphone applications for simplified communication of nutritional information and implications in the fight against metabolic and non-communicable diseases

### Introduction

The provision of accurate nutritional information about food products is a consumer right, guaranteed by the EU Regulation 1169/11 through the nutritional table on the label. However, the information displayed on food labels is not always clear and understandable for consumers, not only for social categories with lower education levels, or facing economic difficulties.

Over the years, various methods have been developed to allow consumers to make informed choices when purchasing food items, either by directly displaying the information on labels through Front-Of-Pack Nutrition Labelling (FOPNL) or through smartphone applications.

Such applications operate based on algorithms that use different factors to calculate a final score, which is then communicated to the consumer. However, the lack of consideration for certain factors in these algorithms, such as portion size, specific dietary needs, age, physical activity, health status, ultra-processing degree, and beneficial properties present in the product, can be problematic.

Non-communicable diseases such as obesity, cardiovascular diseases and diabetes are linked to a healthy lifestyle, including factors such as physical activity, the consumer's age and health status, excessive food intake, and consumption of ultra-processed products. To effectively address these NCD-related risks, such applications should therefore also consider these factors in their algorithms.

### A critical examination of the various applications for nutritional information.

The present report examines smartphone applications that are commonly available for download. The focus is on the algorithmic foundation of these applications, the information derived from them, their popularity and usage, and the possibility of accessing free or paid information.

### **YUKA**

The app evaluates the nutritional quality of food items, which constitutes 60% of the overall score. This assessment is based on the Nutri-Score system, which considers various nutritional factors such as calories, sugar, sodium, saturated fat, protein, fibre, fruits, and vegetables.

The app also analyses the presence of additives in food products, accounting for 30% of the total score. It assesses the risk level of additives by referencing the guidelines and recommendations of authoritative bodies like the European Food Safety Authority (EFSA) and the International Agency for Research on Cancer (IARC), as well as various independent studies.

Additionally, the app includes an organic dimension that represents 10% of the score. Products receive a bonus if they carry an official national or international organic label. This bonus reflects the app's recognition of the benefits of organic products, which typically avoid the use of chemical pesticides that can pose health risks.

The app ranks the products with positives and negatives. The positives are represented by an excellent amount of protein, low calories, low saturates, low sugar, low salt in grams.

The negatives are linked with additives, too fatty, too much sodium, too much sugar.

Beyond scoring, Yuka provides users with healthier alternatives to products with lower scores. By suggesting options with better nutritional profiles or fewer additives, the app guides users towards making healthier choices.

Yuka has a user base of 50 million individuals. The platform maintains its independence and refrains from engaging in any form of advertising. Its funding sources include the app's premium version, the sale of a book titled "Le guide de l'alimentation saine", available exclusively in French, and a calendar detailing seasonal fruits and vegetables, in both French and Spanish versions.

## **OPEN FOOD FACTS**

Open Food Facts uses the Nutri-Score system to provide detailed insights into the nutritional quality of food products. It displays nutrient levels such as fat, sugar and salt, indicating whether they are in low, moderate, or high quantities, and uses traffic light colours for visual guidance. Additionally, there is a link to the NHS website for more information.

The app presents nutrition facts, showing the nutritional values in grams for fats, proteins, sugar, etc., and offers a comparison with similar products. Users have the option to adjust the product quantity to see corresponding nutritional values. A list of ingredients is also provided.

The processing level of the food items is categorized according to the NOVA classification, and there's a comprehensive list of additives with links to Wikipedia for further details.

Lastly, the ingredient analysis includes information on whether the product is palm oil-free, non-vegan, and other such attributes.

The app has been downloaded over 1 million times. It is available at no cost. Funding is acquired through various means, including public subsidy grants from partnerships with organizations like Santé Publique France and ADEME. Support also comes from philanthropic entities such as the Google.org

Foundation and the Mozilla Foundation, as well as involvement in European projects. Additionally, the app benefits from donations made by the public during annual fundraising campaigns.

## **FOODUCATE**

Fooducate offers features such as barcode scanning and manual search to help users identify healthy food options. It flags added sugars, trans fats, Monosodium glutamate (MSGs), High Fructose Corn Syrup (HFCS), GMOs, additives, and preservatives in food items.

The app enables users to track water consumption and log food intake to monitor meals, including macronutrients like protein, carbs, and fat, as well as cholesterol, salt, fibre, sugar, vitamin A, C, calcium, iron, with the daily value expressed in percentages. It provides a list of ingredients and an average food grade for each product.

Fooducate also considers the psychological-behavioural dimension by allowing users to add details about their mood, sleep, hunger, and activity levels, which can be synchronized with Apple Health.

The app fosters a community where users can share their personal health journeys and find inspiration from others. It offers health and fitness podcasts and recipes for additional support.

Moreover, Fooducate addresses women's health issues, including pregnancy, lactation, and Polycystic Ovary Syndrome (PCOS), providing tailored information and guidance.

Fooducate has been downloaded over 2 million times and primarily features American products. The app is supported by two institutional investors: Kima Ventures and ACLVP.

Users are required to create an account to access the app's features. While Fooducate is free, it offers in-app purchase upgrades. These upgrades include access to various diet-specific databases through Fooducate Pro, available via an annual or monthly subscription, or a one-time purchase.

The app also generates revenue through advertising. It has achieved a high level of visibility, having been featured in notable publications such as the LA Times and on networks like ABC. Fooducate is owned by Maple Media LLC.

## **PURECHECK**

The app includes a barcode scan and manual search function for product information. It features an Ask AI tool, serving as a nutritionist adviser to users.

Each food item is given a score out of 100, incorporating both the Nutri-Score and the Nova score. The nutritional content is detailed, listing sugar, salt, total fat, saturated fat, fibre, carbs, protein, and calories.

The ingredients are listed along with additives, which are explained in detail with scientific sources and color-coded based on risk level. Allergens present in the food are also identified.

Food tags provide quick insights, such as whether a product is non-vegan or contains palm oil.

A community feature allows consumers to ask questions, recommend products, give warnings, and share their thoughts about products.

The app has achieved over 10,000 downloads and is owned by Nature Way Health Canada, a brand known for natural health products. It is available for free, with options for in-app purchases such as PureCheck Pro Monthly and PureCheck Pro to access additional features.

## **FOOD CHECK: PRODUCT SCANNER**

The app rates food products using the Nova and Nutri-Score systems, each scored out of 10.

It fosters a community exchange, where users can interact and share insights.

Users have access to educational articles that provide valuable information on nutrition and health.

The app displays the levels of sugar, salt, or fat in products, using colors to indicate whether the levels are high, medium, or low.

Additives are also color-coded to show their risk level.

The app offers healthier recommendations and caters to various nutrition preferences, including vegan, vegetarian, gluten-free, or lactose-free options.

Additionally, there are over 5000 recipes available, designed to suit a variety of diets.

The application has been downloaded over 50,000 times. Users are required to create an account to utilize the app's services. It is owned by Bytes & Pixels GmbH and can be used for free. However, there are in-app purchases available, to obtain detailed food check scores and enjoy unlimited scanning for example. This includes a Yearly Plan and a Weekly Plan for those who wish to upgrade their experience.

## **GOCOCO**

The app allows users to scan products, providing a food score from 0 to 10. This score is based on criteria from the World Health Organization (WHO) and dietitians, the NOVA system, and the Warning system that includes a black label. These allow the user to know if the product is high in saturated fat or high in sugar, for example.

A list of ingredients is available for each product, helping users make informed choices.

Users can access healthy lists featuring recommended products that align with nutritional guidelines.

The app includes a feature to log habits, such as the consumption of vegetables, ultra-processed food, and exercise routines.

It offers healthy Mediterranean recipes that are low in sugar and suit different dietary preferences, including vegetarian and vegan options.

As an educational tool, it incorporates gamification and a psychological-behavioral dimension with lessons, quizzes, and exercises designed to help users curb sugar addiction, avoid cravings, and prevent overeating.

The app has been downloaded more than 700,000 times. To use the app, users are required to create an account. It is managed by COCO POSITIVO SL and offers a free version with the option for in-app purchases, including Gococo PLUS subscriptions for 1, 6, or 12 months. The app enjoys visibility on social media platforms like Instagram and TikTok and has established partnerships with influencers.

## **SHUTTERBITE**

The app's psychological/behavioural dimension is designed to enhance the user's relationship with food. It encourages users to keep track of their feelings over time and measure their relationship with food through a no restrictions approach and mindfulness practices.

Users can add meals to a journal and utilize predefined tracking options, such as monitoring hunger/fullness levels, using a meal timer, noting reasons for eating, assessing feelings after eating, and a mood tracker. These features provide valuable statistics on eating habits.

Additionally, users can set personal goals like stopping eating when full and eating only when hungry, supporting a healthier and more mindful approach to food consumption.

The app has been downloaded over 5,000 times and requires users to create an account for access. Shutterbite, along with its competitors, has secured over \$4.27 million in funding through five funding rounds with the participation of six investors.

It is free to download and use and remains ad-free. For in-app purchases, the app offers a premium upgrade. Once users reach a threshold, they will be prompted to subscribe to continue saving additional data. Subscription options include Premium monthly, 6 months, or annual plans.

## Conclusions

There has been a notable increase in the attention paid to dietary choices by European citizens, in part due to the numerous policy actions undertaken by the European Commission. As a result, the development of simple applications to assist consumers in making informed dietary choices has made significant progress in recent years.

The nutritional information provided on food packaging can be challenging for consumers to interpret. Considering this, simpler and more immediate indicators such as front-of-packaging nutritional labels (FOPNL) have been introduced. In the United Kingdom, the so-called traffic light system has been developed. In Italy, a battery system has been implemented, while in other countries has been introduced Nutri-score.

While the presence of FOPNL on some food product packaging has contributed to a heightened level of consumer curiosity, prompting them to pay closer attention to their purchases, the concurrent proliferation of IT applications for nutritional information is indicative of the fact that FOPNL did not fully meet consumers' information needs.

The findings presented in this report suggest that consumers are in search of a diverse range of supplementary information. These requirements surpass the scope covered by existing Front-of-Pack Nutrition Labelling (FOPNL) systems. Our observations indicate that consumers are specifically seeking enhanced clarity on labels regarding the appropriateness of nutritional properties concerning their individual health status and activity levels. Additionally, they express a desire to understand the processing methods employed and the quantity of additives present. It is evident that these pieces of information are closely associated with metabolic disorders like obesity, cardiovascular diseases, and diabetes.

We would like to emphasize this last aspect. From numerous studies conducted by the Commission economic resources have a significant influence on the quality of purchased food. Those with limited purchasing power are compelled to purchase low-quality products, which may have reduced sugar content but are often rich in additives or are ultra-processed. It is precisely in these population groups where the highest rates of metabolic and cardiac diseases are observed.

In conclusion, these observations demonstrate that European consumers, by downloading these kinds of applications, are expressing additional information needs that should be considered by the European Commission in its next legislative proposal on simplified systems for communicating nutritional information. This will facilitate a more accurate understanding of the actual needs of European citizens and promote the fight against metabolic and non-communicable diseases.

## **About SAFE - Safe Food Advocacy Europe**

SAFE – Safe Food Advocacy Europe was created with the aim of ensuring that consumers' health and concerns remain at the core of the EU's food legislation, while working actively towards the protection of most vulnerable consumers and households. SAFE is currently the only Brussels-based NGO specialized in the protection and representation of EU consumers in the food sector. SAFE strives to ensure safer food standards and make them accessible to all. In doing so, SAFE is monitoring the EU food legislation process and cooperating with EU stakeholders to draft comprehensive food regulations. SAFE notably supports the development of policies and awareness-raising actions which jointly address health, environment, food safety and inclusion, all-the-while being involved in several projects aimed at protecting disadvantaged households and providing access to quality and healthy food for all, such as the [FOOD4INCLUSION](#) grant.