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RESEARCH ARTICLE

GIZIPRO AS AN APPLICATION TOOL PROVIDING INDONESIAN SMALL INDUSTRY (UMKM) FOR CALCULATING A NUTRITION VALUE OF FOOD PRODUCT

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ABSTRACT

One of the marketing strategies for UMKM (Usaha Mikro Kecil Menengah) food products is information of the its nutritional value. A food packaging are required to inform the product name, weight of package, list of constituent materials, & the nutritional value. Calculation of nutritional value can be carried out in the laboratory and manually using the Indonesian Food Composition Table by considering the number of constituent ingredients. The Indonesian Food Composition Table is arrangeabout nutritional content of food ingredients which are analyzed based on standard analytical methods. The data set on the composition of food nutrients in Indonesia in its table were comes from research reports by nutritionists at the Center for Nutrition and Food Development Research, data from the Food Security Agency (Ministry of Agriculture) and can be accessed from the Ministry of Health website. The calculation of the nutritional value in the GiziPro Application is calculated based on the weight of the constituent ingredients, therefore the nutritional value of the food might compared with the Nutrient Adequacy Number from the Ministry of Health. Through information technology, all stages and formulas are compiled into simple applications that make it easier for food business actors to calculate the nutritional content of their products. The GiziPro application can be downloaded from the Playstore via an Android phone.

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INTRODUCTION

Small industry (UMKM) in Indonesia is an important part of the national economic system, because it plays a role in accelerating the distribution of economic growth through the mission of providing business and employment opportunities, increasing people's income, contributing to increasing foreign exchange earnings and strengthening the structure of the national industry. UMKM is the backbone of the national economy. This sector is able to move the community's economy and absorb a large number of workers. The government through the National Entrepreneurship Movement since 2014 has increasingly increased guidance for UMKM, especially helping to overcome the problems faced by UMKM. One of the UMKM in the community is UMKM in the food sector. In terms of taste and appearance, food product from UMKM are not inferior to products from industry, but in terms of packaging and marketing are still unable to compete with industry products.

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One of their problem is their food packaging only fulfilled by labels and simple designs. Packaging has a very important role for packaged products because it is the first appearance before consumers feel the contents. Packaging is also a marketing image of a product in the community because people know and remember the product from its packaging. One of the important factors UMKM is the information on the packaging labels for the products they produce. Labels and packaging are one of the keys for UMKM to further increase the selling value of their products. According to BPOM (2011) Business actors who produce food domestically for trade, including Food UMKM and IRTPs are required to include labels inside and/or on Food Packaging, either written or printed using Indonesian language and contain at least information regarding the name of the product, list of ingredients and composition of nutrients, packaging weight and so on (BPOM, 2011). Each food & beverage packaging should include nutritional value information on the packaging label which provides information on the nutritional content and other substances contained in the food. Labeling in each food and beverage packaging aims to provide information about the content of food in the packaging so that we can measure the food we eat

according to the recommended nutritional needs and avoid food products from products made from hazardous materials. However, not many UMKM have listed the composition of nutrients on their packaging labels because of the difficulty in finding a place for nutritional analysis, not having sufficient knowledge to calculate the nutritional content of products and so on. This encourages the author to create an easy way to calculate the nutritional content of food products. Therefore, the purpose of developing this application is to calcula te the nutritional value of packaged food and beverage products and include it on packaging labels in the form of information on the nutritional value of packaged foods and make it easier for UMKM to include information on the nutritional value of food on packaging labels.

MATERIALS AND METHODS

Materials

The instrumen that used in this study are:

1. Indonesian Food Composition Table 2017 accessed from www.panganku.org
2. Indonesian Nutritional Adequacy Rate (Regulation of Minister's Health No. 28 of 2019).
3. Formula for calculating nutritional content of Food Products.
4. The formula for calculating the daily nutritional adequacy rate based on Recommended Dietary Allowances (RDA) for adult aged 16-18 years.
5. Formula for RDA percentage of serving weight of the one packed of food product.

GiziPro Application: GiziPro is an application to provide a food producers to calculate the food nutrition value. There are two program data set allowed through accesed GiziPro which by website and google playstrore.

1. GiziPro on website:
   CALCULATE NUTRITION OF FOOD & BEVERAGE PRODUCTS (http://gizipro.dgeomart.com/)

2. GiziPro on google playstore
   GiziPro – Calculate Prodcut Nutrition

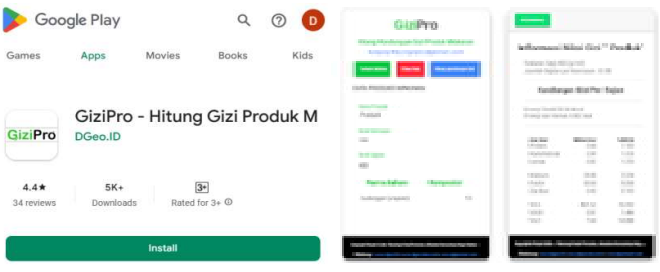

Fig. 1. GiziPro application on google playstore

The GiziPro application analyze the data by read the each composition ingredient of food products that inputed on the calculation system. Those food composition would inputed by:

1. Fill the name of food product on the template
2. Fill the packaging weight of food product
3. Fill the serving weight of food product
4. Fill the all the ingredients and its weight for each package of food product
5. Calculate the nutritional value

RESULT AND DISCUSSION

Food Packaging Labels: According to BPOM (2011), a food label is any information regarding food in the form of pictures, writing, a combination of both, or other forms that are attached to food, put in, affixed to, or are part of food packaging (PP no. 69 of 1999). Business Actors who produce Food domestically for trade, including UMKM and IRTP are required to include labels inside and/or on Food Packaging, either written or printed using Indonesian language and contain at least information regarding (PerKa Badan POM RI no. HK 03.1.5.12.11.09955, 2011): product name, list of ingredients used/composition of macro and micro nutrients, net weight, name and address of producer, halal for those required, production date & code, expiration date, distribution permit number, and so on.

Fig 2. The label of nutritional value information on food package

The nutritional content is calculated from the constituent ingredients displayed based on the serving size of the product. Information on nutritional values includes total energy, energy from fat, protein, carbohydrates, fat, calcium, phosphorus, iron, vitamin A, vitamin B and vitamin C.

Table of Indonesian Food Composition (2017): The data in the Indonesian Food Composition Table (2017) is a table containing data on the nutritional content of food ingredients and processed food products, which is a development of the Indonesian Food Composition Table in 2009. Efforts to develop data are carried out by imputing nutritional values that do not yet have a value. or still empty, using imputed values and borrowed values. The contents of Indonesian Food Composition Table (2017) is a collection of data on the composition of food nutrients in Indonesia, which comes from reports or research papers on the composition of food nutrients conducted at the Center for Research and Development of Nutrition and Food and there is the addition of new food ingredients sourced from Data from the Food Security Agency,

Ministry of Agriculture. The formula of calculating the nutritional content of food is:

Nutrient content = (weight of food ingredients assessed: 100 grams of BDD) x nutrients in Indonesian Food Composition

The Indonesian Food Composition Table is containing nutritition content of foodstuffs which are analyzed based on the standard analytical methods as shown in the table 1.

Table 1. Methods of analysis of the nutritional content of indonesian food (Mien, 2001)

Nutrients	Analysis Method
Water	Drying in the oven and gravimetric
Protein	Kjeldahl
Fat	Soxhlet
Carbohydrate	Calculation
Food fiber	Enzymatic and Gravimetry
Ash	Glow
Calcium	AAS
Phosphor	AAS
Iron	AAS
Sodium	AAS
Potassium	AAS
Copper	AAS
Zinc	AAS
Retinol	HPLC
Carotene	HPLC
Thiamine	Spectrophotometry
Riboflavin	Microbiology
Niacin	Spectrophotometry

Indonesia's Nutritional Adequacy Rate: The Recommended Dietary Allowances (RDA) is the amount of nutrients that should be consumed every day for a certain period of time as part of the normal diet of the average healthy person (Almatsier, 2010). RDA is presented in the form of a table containing the division of age groups, gender, weight, height, needs for macronutrients (energy, carbohydrates, protein, fat) and micronutrients (vitamins, minerals, omega 3. Omega6), fiber and water. There is attention to the factors that affect the absorption of nutrients or the efficiency of their use in the body, for example the needs in different conditions of pregnancy and lactation. For some nutrients, some of their needs can be met by consuming a substance which after being in the body can then be converted into essential nutrients. For example, carotenoids are precursors of vitamin A, because some or all of the adequacy of vitamin A can be met from carotenoids from food, the efficiency of converting these precursors to vitamin A needs to be considered. The RDA for protein is different for each person depending on the period of growth, pregnancy, and breastfeeding. Certain types of amino acids are present in different proportions in different types of food. In most nutrients, digestion or absorption is not perfect, such as heme and non-heme iron, the absorption is different depending on other ingredients in food that need to be considered in determining the RDA for iron.

$$Nutritional\ Adequacy\ Number\ = \frac{Body\ weight\ sample\ x\ Nutritional\ Adequacy\ Rate}{Body\ weight\ on\ RDA\ Table}$$

The benefits of the AKG table are planning and providing food supply for the population, interpreting individual/group food consumption data, planning for institutional food improvement, applying food aid standards for disaster conditions, assessing the adequacy of food supplies, planning nutrition education programs, developing new food products in the industry, and establish guidelines for food nutrition labeling. How to Calculate the Level of Nutritional Adequacy of Packaged Foods Packaged food and beverage products consumed contribute a few percent of the total nutritional needs recommended in the 2013 RDA table. The percentage of RDA written on food packaging is the contribution of nutrients from packaged products which is calculated by serving so that consumers can estimate excess nutrients that enter the body.

The Calculating Nutrient Value of Food Product using GiziPro: The information written in the Nutrition Information output of the GiziPro application is based on the regulations of the Food and Drug Supervisory Agency. There are some information available to provide the calculation system, such as:

Nutritional Value Information: List of nutritional and non-nutrient content of processed food as processed food products are sold (as sold) in accordance with standardized formats

Serving Size: The serving size is a reasonable amount of Processed Food consumed in one meal, expressed in Metric units or Metric units and Household Sizes that are appropriate for the Food Products.

Recommended Dietary Allowances (RDA): RDA is an average daily nutritional adequacy for all people according to age group, gender, body size, body activity to achieve optimal health status.

Number of servings per pack: Number of servings from the packaging weight.

Nutrients: Compounds found in food consisting of carbohydrates, proteins, fats, vitamins, minerals, fiber, water, and other components that are beneficial for human growth and health. The types of nutrients listed are total energy, carbohydrate, protein, fat, calcium, phosphor, iron, vitamin A, vitamin B1, and vitamin C.

Vutritional Value per serving: The results of the calculation of the nutritional content contained in food for the size of one serving.

Percentage of RDA: Calculated based on the Nutrition Adequacy Number in accordance with the provisions of the legislation. Gizipro could facilitate the calculation of the nutritional value content of food products by the ingredients information of food product that might inputed on the system. How to calculate nutrition using the website or the play store android application is firstly, open the nutrition pro android web or app. Secondly, filled product name, packaging weight, and serving weight.

Third, filled all the ingredients and the weight of each serving on the food. After all the ingredients have been added then press calculate nutritional content. Lastly, record the constituent food ingredients and their weight on the product packaging size.

After conducting the analysis, the results of the nutritional content value can be written on the food packaging label as Figure 5.

Fig. 3. The appearance of GiziPro Website analysis on food product of "keripik pisang" of nutrition value

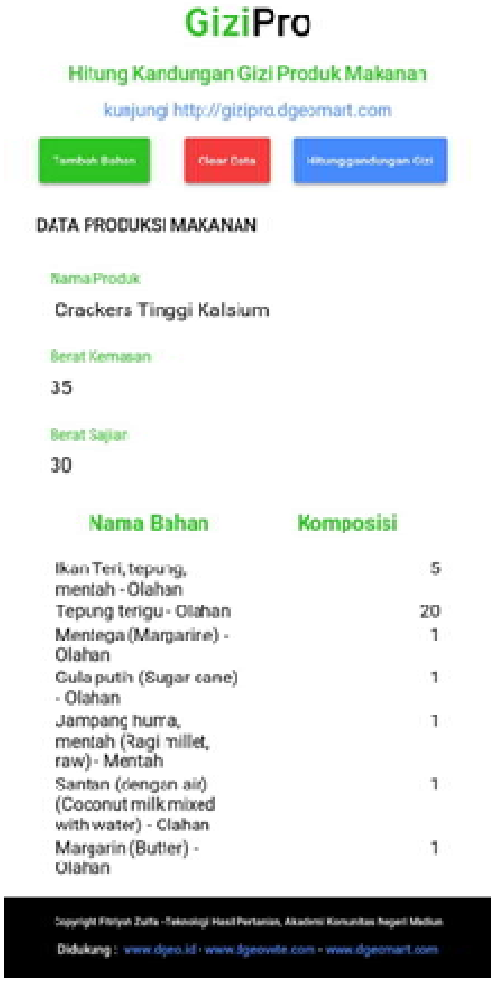

Fig 4. The appearance of GiziPro Application analysis on food product of "Crackers" of nutrition value

Composition Cassava, cooking oil, seasoning		
Nutritional Value Information		
Serving size 30 g Number of servings per pack: 8		
Quantity per serving Total energy: 1434 kcal Energy from fat: 6.21 kcal		
Nutrients	Nutritional value per serving	%AKG
Protein	0.27 g	0.45%
Fat	6.21 g	9.26%
Carbohydrate	21.6 g	7.85%
Calcium	56.7 mg	4.72%
Phosphor	30.3 mg	2.25%
Fe	0.48 mg	2.4%
Vitamin A	0	0
Vitamin B	0.072 mg	7.2
Vitamin C	0	0

Fig. 5. The display of nutrition value on the food product package

CONCLUSION

Gizipro an novel application can be used independently by UMKM to calculate the nutritional value of food products with the input of their constituent materials. Therefore the results from the GiziPro application can be used as the information of nutritional value of the food product on its package.

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