



## Research Article

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## **Meat analog based necklace crickets and fruit (Jackfruit and Pumpkin) as an alternative source of animal protein ingredients food in Gunung Kidul**

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### **Abstract**

Artificial meat analog form is a product made from vegetable protein material is not meat, but similar right to the properties of real meat. The sources of vegetable protein which can be used very much with several requirements must be met, such as having the fibers resembling meat and kenyal. Penggunaan crickets and fruit (jackfruit and pumpkins) should be blend into the meat analog chewy and rich protein. Jangkrik is an insect that is found in abundance around kita. Keberadaannya usually only used as bird feed pets only, so the selling price is very cheap. The study compared the content of protein and carbohydrates between nuggets, meat analogue (crickets and jackfruit) and meat analog (crickets and pumpkin). Based on the study found that levels of carbohydrate and protein in the nugget is 10:05% and 10:51%. Levels of carbohydrates and protein in meat analog (crickets and jackfruit) are 65.347% and 0.04432%, and the protein content in meat analog (cricket and squash) is 0.2587%. Meat processing analog crickets and fruit (jackfruit and pumpkins) is processing by mixing crickets that have been fried; boiled jackfruit along with additional materials lainnya. Perebusan jackfruit aim to inactivate the enzyme causes the decrease in quality during storage and to soften the texture of the fruit in the blend nangka. Sehingga crickets and jackfruit will produce analog meat rich in protein, carbohydrates and certainly chewy meat resembles the original.

**Keywords:** Meat analog, Crickets, Pumpkin, Jack.

### **INTRODUCTION**

The main nutritional problem in Indonesia is less energiprotein (PEM), vitamin A deficiency (VAD), anemia due to iron deficiency and iodine deficiency disorders (GAKI) [1]. In 2007, the Ministry of Health reported there are 1.7 million children under five severe malnutrition spread all over Indonesia. A total of 1,506 infants in the Special Province of Yogyakarta (DIY) malnutrition. Children under five suffering from severe malnutrition in several areas, among others in Gunung Kidul (531 infants), Sleman (287 infants), Bantul (273 infants), Yogyakarta (225 infants), and Kulonprogo (190 infants) [1]. In addition, the results of monitoring the nutritional status of children in the District of Wirobrajan, Yogyakarta in 2005-2007 in Pakaya (2008) showed that the case toddler KEP from year to year has increased.

Protein Energy Deficiency (KEP) is a state of malnutrition caused by low consumption of energy and protein in a daily diet or disorders caused by certain diseases, so it does not meet the nutritional adequacy rate. The immediate cause of PEM is a deficiency of calories and protein with various symptom [2]. This is what's driving the movement of nutrition, especially protein for people Indonesia. Sumber protein can be obtained either by eating meat as a protein source has many hewani. Meat benefits, one of them as a source of calories for tubuh. daging have essential amino acids can not be synthesized by the body directly but comes from outside the body. Various types of food (processed) derived from meats such as corned beef, sausage, and steak. This encourages people to be wise in choosing their consumption patterns, boosting the popularity of artificial meat is considered to have some added value that contains no calories, and low in saturated fatty acids than meat from animals [3].

Insects have a nutrient content varies depending on the species. One insect that can be used as food was locusts. Grasshopper has a protein content as well as high iron so that it can be used as a food product that can help improve the nutritional value of food, especially as a source of animal protein [2].

Migratory locust has a protein content of 1328 g / 100 g (b). Meat contains 6 mg iron per 100 g dry weight. Locusts (migratory locust) have an iron content equal to or even higher than meat which varies between 820 mg per 100 g dry basis depending on the diet. Besides migratory locust has a total energy content of 598-816 kJ per 100 grams dry weight. Meat crickets that have been processed by frying based on research in protein approximately 10.465% of the bk. Hal push to make animal protein sources are very cheap if viewed in terms of biaya. Biasanya crickets is only used as bird feed saja. Keberadaannya was also very abundant and easily obtained in natural. Jackfruit is the fruit crops that are always available throughout the season and mimiliki texture similar to meat. According in 100 g edible part of the jackfruit contains 0.2 g of fat. Audit Board of Food and Drugs (2005) states that if the food product contains less than 0.5 g fat, can be categorized as a fat-free food. Pumpkin is a fruit that began appreciated by the public because it has the privilege than any other fruit that is the content of provitamin A, which is high enough that the 3400 SI <sup>[4]</sup>. In addition it also has an attractive aroma and color, as well as quite resistant disimpanSelain that, in pumpkin also contains 34 calories, 0.8 fat, 45 mg calcium, and mineral 0.8 so that the pumpkin is best eaten by children and the elderly, because the nutrients contained in it is very good for health. In children it can be used to increase appetite and as a cure intestinal worms. Artificial meat is a product made from vegetable protein made from materials not to the flesh but according or similar right to the properties of real meat. Artificial meat has no cholesterol and low saturated fatty acid content that can be consumed by people who can not consume beef because of the disease, as well as for "veganer".

Therefore, the manufacture of meat-based analog of crickets and jackfruit to embody a food technology products as a form of utilization of abundant insects keberadaannya. Selain that, combined with jackfruit also aims to produce meat analogue texture similar to the texture of real meat of jackfruit tersebut. Pengolahan locusts into the form of mock meat is one form of food processing technology to improve the acceptance of grasshoppers as food in the community, especially outside the region Gunung Kidul considering meat Analog as Gunung Kidul typical food that can be enjoyed by all the people of Indonesia.

## MATERIALS AND METHODS

### Tools and materials

The tools used include scales, blenders, knives and raw wadah. Bahan used in the manufacture of meat analogue Jackcrick and jackfruit. While the additive used is water, cornstarch, flour, salt, pepper powder, ice, skim milk, bread flour.

### Method for making meat Analog

1: The process of making meat analogue with the following steps: crickets deep fried until golden brown.

2: The crickets that have been fried and then milled. The milling process occurs in two stages, namely:

- The first is the addition of ice grinding 7% of the weight of the crickets, the addition of salt 2% of the weight of the crickets.
- Then the dough is rolled back with the addition of seasoning is pepper powder, flavoring, garlic and cornstarch. Pepper powder are added 0.2% by weight of the crickets, flavor 0.15% The weight of the crickets, garlic 0.5% of the weight of the crickets and cornstarch 1.5% of the weight of the crickets.

- Once the dough is formed, jackfruit and pumpkins that have been boiled as much as 700 grams of mixed up evenly.
- The surface of the dough and covered with flour.
- Then do the batter to coat adonan. Pembuatan manufacture which mixing flour batter 100 grams, 12.5 ml of skim milk, cornstarch 50 grams, 0.75 grams of CMC and 350 ml water.
- The dough is dipped in batter then coated with bread crumbs.
- Phase frying is done after the dough has been breaded until golden brown. After that, the final product ready to be packed with a weight of 200 grams per pack.

### Determination of Levels of Protein with Biuret method

- If the sample is solid, take 10 grams, puree and dilute it with distilled water up to the volume of 100 mL, filtered and the filtrate grab.
- Take a sample of 1 mL and then added 4 mL reagent biuret, add 5 ml of distilled water
- Mute 10 minutes until a purple solution.
- Measure the absorbance using a spectrophotometer at 520 nm.

### Determination of carbohydrates

- Take 1 gram samples diluted with distilled water to 100 mL, filter the filtrate.
- Take 5 mL of the filtrate, add 7.5 mL of distilled water and 12.5 ml of Luff Schoorl. Heating to a boil, cool under running water.
- Add 5 mL of KI 20%, and 12.5 mL of 25% H<sub>2</sub>SO<sub>4</sub> slowly through the tube wall.
- Titrate with 0.1 N Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> using starch indicator to white milk.

## RESULTS AND DISCUSSION

Artificial meat is a product made from vegetable protein made from materials not to the flesh but according or similar right to the properties of real meat. Artificial meat has several features, among others, better nutritional value, more homogeneous and more durable stored, can be set up not contain animal fats and cheaper <sup>[4]</sup>. Jackcrick meat analogue is an innovative art-ificial meat products made from meat cicada necklace and jackfruit as utamanya. Jackcrick material is 2 blend of word meaning jackfruit jackfruit and cricket, which means it has the power simpann jangkrik. Produk long as it uses vacuum packaging is of course ready to eat or ready makan. Using jackfruit ingredient in meat analog Jackcrick jackfruit is because the content is free of fat, but it is also the fiber contained by the current jackfruit meat processed into meat analog Jackcrick would mimic flesh asli. Sumber of Jackcrick meat protein derived from meat analogue crickets kalung. Sehingga with the appropriate technology Jackcrick meat analog formed by the combination of these materials to improve the products processed protein source sufficient nutritional value.

**Table 1:** Analysis of Carbohydrates and Protein

Sample	Protein (%)	Carbohydrates (%)
Nugget	10.51	10.05
Meat analog (crickets and jackfruit)	0.0443	65.347
Meat analog (crickets and pumpkins)	0.2587	-

Accordingly it can be concluded that meat analog have low protein and high carbohydrate value.



**Figure 1:** Meat analog from a) cricket and pumpkin, b) cricket and jackfruit

## CONCLUSION

Appropriate food processing technology can create products based meat analog and crickets and fruit (jackfruit and pumpkins) are likely to be developed as well as increase the added value cicada necklace that can be used as food sources of animal protein.

## Suggestion

Suggestions to the author to convey, namely the need for further development of appropriate technology for meat processing analog and support from the government, business and future masyarakat. Sehingga Jackrick meat analog expected to be useful in overcoming problems of protein-energy malnutrition (PEM).

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