International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

The Development of Cookies from Modified Cassava Flour with Soy Isolate Protein (ISP) Substitution as an Alternative Supplementary Food for Pregnant Women with CED

Harna Harna[1], Prita Dhyani Swamilaksita[2], Mertien Sa'pang[3], Andi Muh Asrul Irawan[4]
[1,2,3] Universitas Esa Unggul, Jakarta
[4] Al-azhar University of Indonesia, Jakarta

ABSTRACT: Chronic Energy Deficiency (CED) in pregnant women can be caused by direct and indirect factors. The lack of energy and protein intake during pregnancy has been proven to increase the risk of CED in pregnant women. The purpose of this study was to analyze the differences in the acceptability and organoleptic properties of panelists, as well as the nutritional content of cookies based on Modified Cassava Flour with soy protein isolate substitution. The study was conducted as experimental research and a Completely Randomized Design was used. The research was conducted from June to December 2022. This study, which involved the production of Modified Cassava Flour cookies with the substitution of isolated soy protein flour and hedonic testing, was conducted at the Culinary Laboratory of Universitas Esa Unggul. The statistical test used to see the difference in nutrient content between the treatment levels of Cookies was Anova test and Ducan's advanced test. The research results showed that there was a significant difference in hedonic quality in terms of taste and texture ($p<0.05$). There was a significant difference in hedonic among formulas in terms of taste, color, aroma, and texture ($p<0.05$). There was a significant difference in the content of carbohydrates, fats, and proteins among formulas ($p<0.05$). The conclusion of this study was that the best formula is F3, which can contribute to the energy and protein needed by pregnant women with CED.

KEYWORDS: Chronic Energy Deficiency (CED), Cookies, Modified Cassava Flour, Protein, Pregnant women

INTRODUCTION

The issue of maternal health during pregnancy continues to be a priority health concern in Indonesia. This is due to the persistently high maternal mortality rate (MMR) caused by specific medical factors. The Sustainable Development Goals (SDGs) aim to reduce the MMR to below 70 per 100,000 live births by 2030. According to data from the Basic Health Research Report in 2018, the MMR has decreased from 4,999 to 4,295. However, this figure still exceeds the SDGs target. Therefore, special attention needs to be given to the issue of MMR (Kemenkes, 2018).

According to the National Medium-Term Development Plan (RPJMN) for the period 2020-2024, one of the main targets is to improve the nutritional health status of mothers and children (Republik Indonesia, 2019). The nutritional status of a mother during pregnancy plays a crucial role in the success and continuation of the pregnancy. During pregnancy, there are changes in the body's functions, and there is an increase in metabolism, which leads to an increased need for energy and other nutrients. The nutrients in food are absorbed by the fetus for growth and development while in the uterus. The role of adequate nutrient intake is vital for pregnant mothers, from the first trimester to the third trimester. Inadequate nutrient intake is related to malnutrition problems in pregnant women. One of the malnutrition problems in pregnant women is Chronic Energy Deficiency (CED) (Fitrianingtyas, Pertiwi and Rachmania, 2018). CED is one of the malnutrition problems caused by an imbalanced nutrient intake that leads to a lack of energy for a long time (Ernawati, 2017)(Izzati and Mutalazimah, 2022). The World Health Organization (WHO) reports that the global prevalence of CED during pregnancy ranges from 35% - 75% and 40% of maternal deaths in developing countries are associated with CED. Based on data from the Basic Health Research Report in 2018, the prevalence of CED in pregnant women in Indonesia was 17.3%, with the age group of 15-19 years having the highest prevalence at 33.5%, and the age group of 20-24 years having a prevalence of 23.3% (Kemenkes, 2018).

Chronic Energy Deficiency (CED) in pregnant women can be caused by direct and indirect factors. Direct causes are inadequate nutrient intake and infectious diseases. The lack of energy and protein intake during pregnancy has been proven to increase the risk

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

of CED in pregnant women (Husna, Andika and Rahmi, 2020). Pregnant women who are at risk of CED can be identified by measuring their Upper Arm Circumference (UAC), which should be less than 23.5 cm. Pregnant women with CED are at risk of delivering Low Birth Weight (LBW) babies and increasing the risk of maternal mortality during the perinatal period. The impact of CED on pregnant women includes anemia, bleeding, delivery complications, and fatigue. Inadequate nutrient intake in the first trimester may lead to premature birth, fetal death, and central nervous system abnormalities. Energy deficiency in the second and third trimesters may inhibit fetal growth in the uterus. In addition, CED can also impact the delivery process, such as difficult and prolonged labor, preterm delivery, postpartum hemorrhage, and increased risk of cesarean delivery (Oktadianingsih *et al.*, 2019; Mukkadas and Salma, 2021).

The provision of Supplementary Feeding (PMT) is currently being produced on a large scale by the food industry in collaboration with the government and distributed to targeted individuals. However, the distribution of PMT has not been fully optimized, and therefore alternative methods of producing PMT independently or in groups through the utilization of various local food sources are needed. One effort to create local PMT is by utilizing cassava as a raw material for making cookies. Cookies are a popular type of baked goods that is widely enjoyed. Cassava can be processed into mocaf flour, making it a beneficial local food source for pregnant women in the region. In addition, cassava is a source of carbohydrates that function as a source of energy. Soybeans are one type of legume that is high in protein, with the Protein Efficiency Ratio (PER) value in soybeans equivalent to that of animal protein. The protein content of soybeans can be increased by isolating the protein. Soy protein isolate is the highest concentration of protein in soybeans, reaching up to 95%. Substituting soy protein isolate (SPI) flour is a solution for increasing the protein content of the cookies being developed (Koshy *et al.*, 2015; Ramadhani and Anggraeni, 2018; Harna, Rahmawati and Hosizah, 2022; Haura, Martunis and Fahrizal, 2022). In order to increase the protein content of cookies, substitution with soy protein isolate flour is necessary. High energy and protein content in cookies can be a solution to address Malnutrition in pregnant women. Currently, there is no innovation in the development of cookies from Modified Cassava Flour with soy protein isolate flour substitution. Therefore, the development of these cookies can be an alternative as supplementary food for pregnant women experiencing Malnutrition.

METHOD

Design of the study

The study was conducted as experimental research and a Completely Randomized Design was used. The aim of the study was to determine the formulation of Cookies that could be used as supplementary food for pregnant women with malnutrition. Proximate, organoleptic, and acceptability tests of Cookies for supplementary food for pregnant women with malnutrition were conducted. An experimental approach was employed in the research design using the Completely Randomized Design method with 4 treatment levels. The formulation of Cookies using Modified Cassava Flour with the substitution of isolated soy protein flour was presented in the table below.

Table I. Formulation of Modified Cassava Flour Cookies with Soy Isolate Protein Substitution

Ingredients	Control (F0)	Research Group		
		(F1)	(F2)	(F3)
Modified Cassava Flour (g)	80	50	30	10
Soy Isolate Protein Flour (g)	0	30	50	70
Margarine (g)	50	50	50	50
Dark Cooking Chocolate	80	80	80	80
Powdered Sugar (g)	90	90	90	90
Egg (g)	50	50	50	50
Corn Starch (g)	10	10	10	10
Milk Powder (g)	10	10	10	10

Source: Modification (Setyowati & Nisa, 2014)

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

This study, which involved the production of Modified Cassava Flour cookies with the substitution of isolated soy protein flour and hedonic testing, was conducted at the Culinary Laboratory of Universitas Esa Unggul. Nutrient analysis was carried out at the PT. Saraswati Indo Genetech laboratory. The research was conducted from June to December 2022.

Materials and Research Equipment

The tools used for making Modified Cassava Flour cookies with isolated soy protein flour substitution were digital scales (Krischef brand), teaspoon, tablespoon, sieve (Rostifrei), mixer (Cosmos brand), cutting board, plastic wrap, rolling pin, cookie cutter (Kuki Fun brand), oven (National Mega brand). The tools used for analyzing the nutritional content were beakers, ovens, desiccators, scales, furnaces, filter paper, and pipettes. The ingredients needed for Modified Cassava Flour cookies with isolated soy protein flour substitution were Modified Cassava Flour, isolated soy protein flour, margarine, powdered sugar, chicken eggs, dark cooking chocolate, cornstarch, and powdered milk.

The combination of Modified Cassava Flour and isolated soy protein flour based on the formula ratios were then added with additional ingredients, namely margarine, powdered sugar, eggs, dark cooking chocolate, cornstarch, and powdered milk. Before starting the Cookies making process, the production of Modified Cassava Flour was carried out by following the steps from a previous study conducted (Suswanto *et al.*, 2023). The instructions were as follows: (1) Melt the margarine and dark chocolate using a double boiler; (2) Beat the powdered sugar and eggs until fluffy, using a mixer if needed; (3) Mix the melted margarine and chocolate into the beaten sugar and eggs; (4) Add the Modified Cassava Flour, ISP flour, cornstarch, and powdered milk, and stir until well combined; (5) Use a piping bag to shape the mixture onto a baking sheet; (6) Bake using both upper and lower heat, at 150ºC for 25 minutes; (7) Serve.

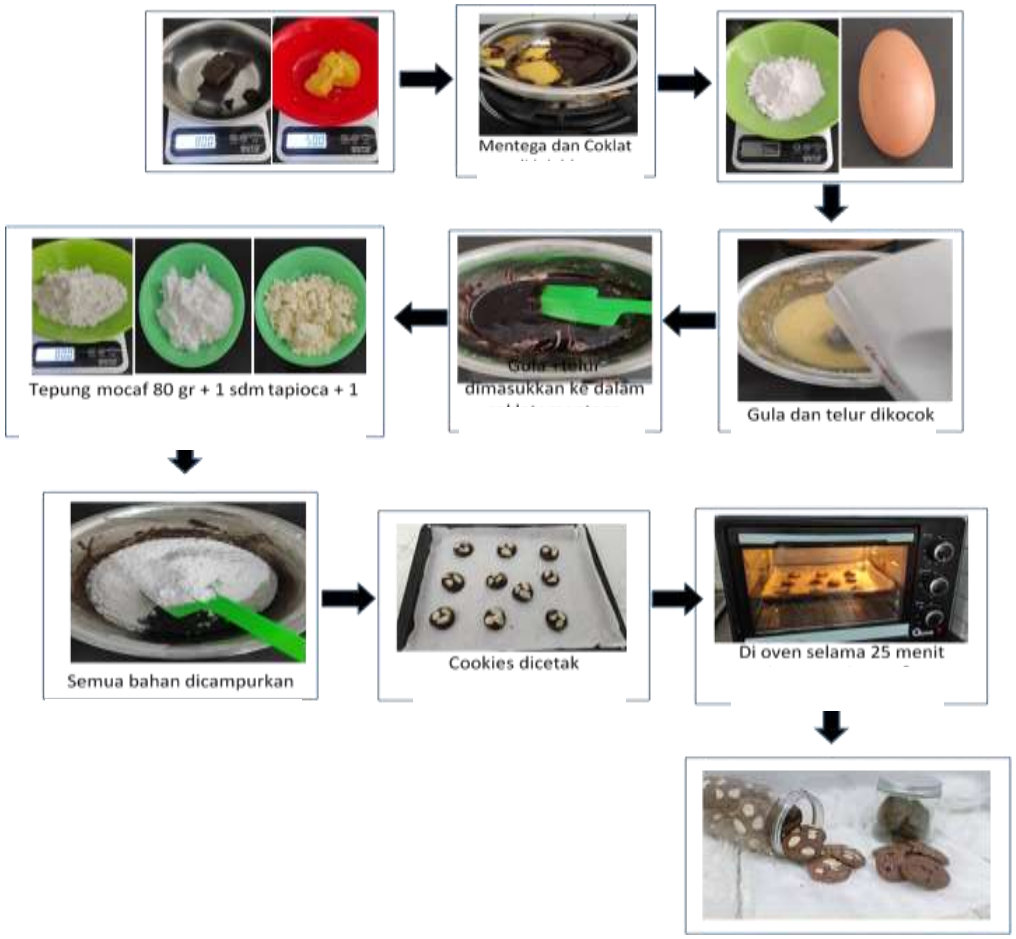

Figure I. The Process of Making Modified Cassava Flour Cookies with ISP Substitution

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

Sampling technique and data analysis

To determine the acceptability of the Cookies product, an organoleptic test was conducted. Sampling for the organoleptic test was carried out through sampling. The panelists used were semi-trained panelists. In the organoleptic test, the panelists received a questionnaire and used the human senses as a tool to evaluate the quality of the food product. Hedonic and hedonic quality tests were conducted on 25 people.

There were several requirements that had to be met to become a panelist, namely (1) Willingness and availability to participate in the organoleptic assessment; (2) Not feeling sick, hungry, or full; (3) Not eating spicy food during lunchtime, if the test was conducted during the day; (4) Not color blind; (5) Prospective panelists do not smoke (or have not smoked 20 minutes before the organoleptic testing time) and are not under the influence of alcoholic beverages; (6) For semi-trained panelist candidates, they are nutrition science students at Universitas Esa Unggul who have studied food technology courses; (7) Not allergic or unaccustomed to consuming the ingredients used in making Cookies. The statistical test used to see the difference in nutrient content between the treatment levels of Cookies was One Way Anova test and Duncan's post-hoc test.

RESULTS AND DISCUSSION

The CED problem was one of the malnutrition problems caused by an unbalanced intake of nutrients, resulting in an energy deficiency over a prolonged period. Pregnant women who suffer from CED have a greater risk of illness, so they require special attention during this time. Pregnant women need nutritious and balanced food, including additional energy and protein. Currently, there are supplementary feeding products provided by the government, but many pregnant women do not like the taste and texture, so alternative supplementary feeding production using various local foods is necessary (Nurdin *et al.*, 2018; Harna *et al.*, 2020; Prameswari, Marliyati and Dewi, 2020; Ghiffari *et al.*, 2021). One effort in making local supplementary feeding is by utilizing cassava to make cookies. Cassava is a type of tuber that is easily obtained and is one of the local foods that has the potential to be developed. In addition, cassava can be processed into flour and starch to make the tuber-based products durable and easy to store. Flour and starch are two different products, both in terms of production methods and utilization. However, society often assumes that flour and starch are the same. Essentially, the production of flour involves converting fresh tubers into fine dry grains, while the production of starch involves extracting the sap from the tubers. Therefore, the production of flour does not leave solid waste, whereas the production of starch leaves solid waste or pulp (Darmawati, Mardjan and Khumaida, 2020).

Cookies are dry foods that are baked to cook. Cookies usually have a savory aroma, which is caused by the addition of margarine and eggs in the process of making them. Another characteristic of cookies is their high-fat content. Good cookies have a compact texture and structure, and have fine grains. The crispiness of cookies is influenced by the type of flour used, eggs, sugar, butter or margarine, and salt. The crispiness or texture of cookies is also related to the moisture content of the dough. Sufficient moisture content will produce the desired crispiness (Ramadhani and Anggraeni, 2018; Soni, Kulkarni and Patel, 2018). Cookies are popular among many people because they have a delicious taste and are easy to make. Therefore, cookies can be an alternative food for pregnant women with CED.

Organoleptic testing was a way of evaluating the taste, color, aroma, and texture of food, beverages, and drugs. Organoleptic testing also played an important role in product development. In order to determine the acceptability of cookies by the general public, organoleptic testing was conducted by 25 consumer panelists and 25 semi-trained panelists. The parameters tested in the hedonic quality test and hedonic test were taste, color, aroma, and texture. The organoleptic testing was conducted using a Likert scale. Organoleptic testing was divided into two categories: hedonic quality and hedonic.

Table II. The hedonic quality results of Cookies made with Modified Cassava Flour as a substitution with ISP

Variable	Mean ± SD				*p-value*[a]
	F0	F1	F2	F3	
Taste	3.29±0.71[a]	2.95±0.74 [b]	3.57±0.87[a]	3.52±0.75 [a]	0.044*
Color	3.38±0.97 [a]	3.43±1.12 [a]	3.24±0.95 [a]	3.48±1.07 [a]	0.893
Aroma	3.14±0.79 [a]	3.10±0.62 [a]	3.19±0.98 [a]	3.48±0.87 [a]	0.447
Texture	3.33±0.85 [a]	1.90±0.83 [b]	2.48±0.98 [a]	3.29±0.78 [a]	0.000*

*Significant ANOVA test; [a, b, c, d] Duncan's post-hoc test.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

The results of the hedonic quality test based on the One Way Anova showed that there was a significant difference in the taste and texture parameters of Cookies products with the addition of ISP Flour to hedonic quality (0<0.05). Meanwhile, there was no significant difference in the color and aroma parameters between formulas (p>0.05). Further analysis was conducted using the Duncan test to see differences between formulas F0, F1, F2, and F3. After the Duncan test was conducted, it was found that all treatments differed from each other. The average value of the taste parameter between F0, F2, and F3 showed the same result statistically. Meanwhile, the texture parameter showed that the average value of F0, F2, and F3 was statistically the same. Based on the trend of the values for all parameters, the average value of Formula 3 tended to be higher than the other formulas.

Table III. The hedonic results of Cookies made with Modified Cassava Flour as a substitution with ISP

Variables	Mean ± SD				*p-value*[a]
	F0	F1	F2	F3	
Taste	3.81±0.40[a]	2.90±0.53[b]	2.90±0.70[b]	3.34±0.51[a]	0.000
Color	3.62±0.49[a]	3.33±0.57[a b]	3.10±0.53[a]	3.32±0.51[a]	0.011
Aroma	3.62±0.59[a]	3.48±0.60[a]	2.90±0.62[b]	3.52±0.51[a]	0.001
Texture	3.71±0.46[a]	3.19±0.51[b]	2.95±0.43[b]	3.24±0.43[b]	0.000

*Significant ANOVA test; [a, b, c, d] Duncan's post-hoc test.

The results of the hedonic test on the taste, color, and aroma parameters showed differences in the acceptability of the four formulas (p<0.05). Meanwhile, the texture parameter showed differences in the acceptability of the four formulas. The average color of the formula based on the highest mean value of the hedonic test was Formula F0, while the lowest formulation was Formula F2. Further analysis was conducted using the Duncan test to see differences between formulas F0, F1, F2, and F3. After the Duncan test was conducted, it was found that all treatments did not differ from each other (Table III).

Table IV. Nutritional Content of Cookies

Variable	Mean ± SD				*p-value*[a]
	F0	F1	F2	F3	
Energy (kcal)	497.6±3.53[a]	500.1±1.58[a]	503.2±3.18[ab]	509.5±3.38[b]	0.061
Carbohydrates (gr)	67.5±0.49[a]	61.7±0.29[b]	57.8±0.33[c]	53.9±0.24[d]	0.001*
Fat (gr)	211.8±5.85[a]	225.9±3.31[b]	236.1±5.41[b]	251.2±5.28[c]	0.006*
Protein (gr)	3.89±0.84[a]	6.78±0.14[b]	8.92±0.23[c]	10.66±0.23[d]	0.001*
Water content (%)	3.78±0.05[a]	4.77±0.04[b]	5.22±0.08[c]	5.36±0.06[c]	0.001*
Ash Content (%)	1.24±0.01[a]	1.59±0.01[b]	2.14±0.04[c]	1.68±0.35[d]	0.001*

*Significant ANOVA test; [a, b, c, d] Duncan's post-hoc test.

Table IV showed that there were no significant differences in energy content among the formulas (p>0.05). However, there were significant differences in the content of carbohydrates, fats, proteins, moisture, and ash among the formulas (p<0.05). Based on further analysis using Duncan's test, it was found that F0 had the highest carbohydrate content compared to the other formulas. The highest fat and protein contents were found in F3, with a fat content of 251.2 grams and protein a content of 10.66 grams. This indicates that F3 could provide additional energy and protein for pregnant women experiencing malnutrition. This is due to F3 having the highest amount of ISP in its composition. Soy protein isolate is the purest form of soy protein, with a minimum protein content of 95% by dry weight (Meinlschmidt *et al.*, 2016; Ramadhani and Anggraeni, 2018).

Pregnant women who suffered from CED had a risk of giving birth to a Low Birth Weight (LBW) baby and an increased risk of maternal death during the perinatal period. The impact of malnutrition on pregnant women can cause complications such as anemia, bleeding, delivery problems, and easy fatigue. Inadequate nutrient intake in the first trimester can risk premature birth, fetal death, and central nervous system disorders. Lack of energy in the second and third trimesters will inhibit fetal growth in the womb. In addition, malnutrition also affects the delivery process such as difficult and long delivery, premature delivery, bleeding after delivery, and the risk of giving birth by surgery (Oktadianingsih *et al.*, 2019; Mukkadas and Salma, 2021). Pregnant women who suffer from

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

malnutrition have a higher risk of illness, therefore they need special attention during this time. Pregnant women need nutritious and balanced food. If the nutritional status of pregnant women before and during pregnancy is normal, they are more likely to give birth to a healthy, full-term, and normal-weight baby. The quality of the baby produced depends on the nutritional status of the pregnant woman.

CONCLUSION

Cookies made from Modified Cassava Flour with substituted ISP flour could contribute to the energy and protein intake of pregnant women with CED. Based on the results of the hedonic quality test, the best formula was significantly obtained, which was F3 in terms of taste and texture. Based on the results of the hedonic or consumer acceptance test, the best formula was significantly obtained, which was F3 in terms of taste, aroma, color, and texture. The F3 formula was significantly found to be the best in terms of energy and protein content.

REFERENCES

1. Darmawati, E., Mardjan, S. S. and Khumaida, N. (2020) 'Komposisi Fisikokimia Tepung Ubi Kayu dan Mocaf dari Tiga Genotipe Ubi Kayu Hasil Pemuliaan', *Jurnal Keteknikan Pertanian*, 8(3), pp. 97–104.
2. Kemenkes, Dasar, R. (2018) 'Laporan Hasil Riset Kesehatan Dasar (Riskesdas) Nasional 2007', *Jakarta: Badan Litbangkes, Depkes RI*.
3. Ernawati, A. (2017) 'Masalah gizi pada ibu hamil', *Jurnal Litbang: Media Informasi Penelitian, Pengembangan Dan IPTEK*, 13(1), pp. 60–69.
4. Fitrianingtyas, I., Pertiwi, F. D. and Rachmania, W. (2018) 'Faktor-Faktor yang Berhubungan dengan Kejadian Kurang Energi Kronis (KEK) pada Ibu Hamil di Puskesmas Warung Jambu Kota Bogor', *HEARTY: Jurnal Kesehatan Masyarakat*, 6(2).
5. Ghiffari, E. M. *et al.* (2021) 'Kecukupan Gizi, Pengetahuan, dan Anemia Ibu Hamil', *Ghidza: Jurnal Gizi dan Kesehatan*, 5(1), pp. 10–23.
6. Harna, H. *et al.* (2020) 'Prevalensi dan Determinan Kejadian Anemia Ibu Hamil', *JIK (JURNAL ILMU KESEHATAN)*, 4(2), pp. 78–83.
7. Harna, H., Rahmawati, R. and Hosizah, H. (2022) 'Pelatihan Pembuatan Makanan Tambahan Ibu Hamil Kek Berbasis Pangan Lokal Singkong Di Puskesmas Parung Panjang, Kabupaten Bogor', *E-Amal: Jurnal Pengabdian Kepada Masyarakat*, 2(3), pp. 1637–1644.
8. Haura, H., Martunis, M. and Fahrizal, F. (2022) 'Karakteristik Organoleptik Biskuit Substitusi Tepung Uwi Ungu (Dioscorea alata) dan Isolat Protein Kedelai', *Jurnal Ilmiah Mahasiswa Pertanian*, 7(1), pp. 374–381.
9. Husna, A., Andika, F. and Rahmi, N. (2020) 'Determinan Kejadian Kekurangan Energi Kronik (KEK) pada Ibu Hamil di Pustu Lam Hasan Kecamatan Peukan Bada Kabupaten Aceh Besar', *Journal of Healthcare Technology and Medicine*, 6(1), pp. 608–615.
10. Izzati, R. F. and Mutalazimah, M. (2022) 'Energy, protein intake, and chronic energy deficiency in pregnant women: a critical review', in *International Conference on Health and Well-Being (ICHWB 2021)*. Atlantis Press, pp. 70–77.
11. Koshy, R. R. *et al.* (2015) 'Environment friendly green composites based on soy protein isolate–A review', *Food Hydrocolloids*, 50, pp. 174–192.
12. Meinlschmidt, P. *et al.* (2016) 'Immunoreactivity, sensory and physicochemical properties of fermented soy protein isolate', *Food chemistry*, 205, pp. 229–238.
13. Mukkadas, H. and Salma, W. O. (2021) 'Analysis of the Characteristics of Chronic Energy Deficiency in Pregnant Women during the Covid 19 Pandemic', *Jurnal Kesehatan Komunitas*, 7(2), pp. 170–175.
14. Nurdin, M. S. *et al.* (2018) 'Determinants of chronic energy deficiency among pregnant women in Jeneponto regency', *Soc Determinants Health*, 4(1), pp. 3–11.
15. Oktadianingsih, D. *et al.* (2019) 'Penambahan berat badan ibu hamil terhadap berat bayi lahir di kota mataram', *Jurnal Gizi Prima (Prime Nutrition Journal)*, 2(2), pp. 76–85.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-95, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

16. Prameswari, F. S. P., Marliyati, S. A. and Dewi, M. (2020) 'A supplementary protein food for pregnant women with chronic energy deficiency to improve fetal growth', *Jurnal Gizi dan Pangan*, 15(1), pp. 1–10.
17. Ramadhani, L. and Anggraeni, A. A. (2018) 'PENGEMBANGAN BUTTER COOKIES DARI TEPUNG TALAS DAN ISOLAT PROTEIN KEDELAI', *Prosiding Pendidikan Teknik Boga Busana*, 13(1).
18. Republik Indonesia, B. (2019) 'Peraturan Menteri Perencanaan Pembangunan Nasional/Kepala Badan Perencanaan Pembangunan Nasional Republik Indonesia Nomor 5 Tahun 2019 Tentang Tata Cara Penyusunan Rencana Strategis Kementerian/Lembaga Tahun 2020-2024'.
19. Soni, N., Kulkarni, A. S. and Patel, L. (2018) 'Studies on development of high protein cookies', *Int. J. Chem. Stud*, 6, pp. 439–444.
20. Suswanto, W. *et al.* (2023) 'PKM Kelompok Bidan dalam mengatasi Kurang Energi Kronis Berbasis Edupad Di Puskesmas Parung Panjang', *Piramida: Jurnal Pengabdian Kepada Masyarakat*, 2(2), pp. 27–34.

Cite this Article: Harna Harna, Prita Dhyani Swamilaksita, Mertien Sa'pang, Andi Muh Asrul Irawan (2023). The Development of Cookies from Modified Cassava Flour with Soy Isolate Protein (ISP) Substitution as an Alternative Supplementary Food for Pregnant Women with CED. International Journal of Current Science Research and Review, 6(2), 1752-1758