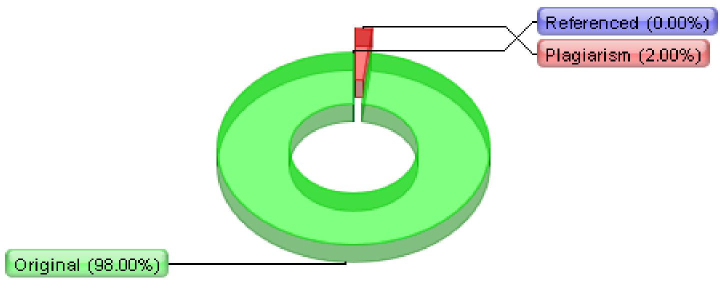
Plagiarism Detector v. 1092 - Originality Report:

Analyzed document: 12/23/2019 10:21:56 PM

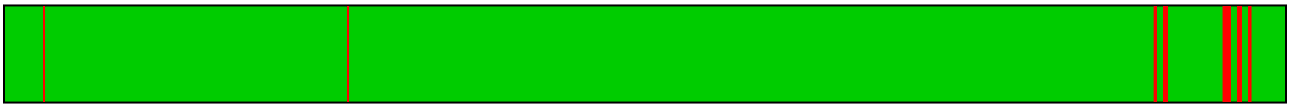
"PG-CJ1829.docx"

Licensed to: **[temporary-NA] [temporary-NA]**

Relation chart:



Distribution graph:



Comparison Preset: Word-to-Word. Detected language: English

Top sources of plagiarism:

% 1	wrds: 27	https://jurnalteknologi.utm.my/index.php/jurnalteknologi/article/view/11017
% 0.6	wrds: 18	https://repository.ipb.ac.id/bitstream/handle/123456789/53048/Daftar%20Pustaka.pdf?sequenc...
% 0.4	wrds: 17	https://www.researchgate.net/publication/311001478_PENGARUH_PENAMBAHAN_NATRIUM_METABISULFI...

[Show other Sources:]

Processed resources details:

96 - Ok / 24 - Failed

[Show other Sources:]

Important notes:

Wikipedia:	Google Books:	Ghostwriting services:	Anti-cheating:
[not detected]	**GoogleBooks Detected!**	[not detected]	[not detected]

Excluded Urls:

Included Urls:

Detailed document analysis:

T
he Characteristics of White Corn Rice in Edible Packaging with Different Film ThicknessA
stri Yaniansah1 and Rahmawati Rahmawati1 1
Food Technology Program Studi, Sahid University, Jl Prof. Supomo no. 84 Jakarta,
Indonesia.astri.yaniansah@kino.co.id
, rahmafarasara@usahid.ac.idKeywords:
Edible packaging, white corn, rice, thickness.Abstract:
Carbohydrate is the main food needs of the community, especially in Indonesia. Nowadays people want to

consume carbohydrates but have a low glycemic index. White corn contains higher starch than rice, but lower glycemic index and higher fiber.

In addition, the white color of

corn makes it similar to rice when it made grits. The aim was to study the characteristics of white corn rice in edible packaging with various thicknesses (0.7, 0.9, 1.1, 1.3 and 1.5 mm). Corn rice was packed in sizes for 1 serving of adults. Edible packaging was made from a mixture of tapioca flour and sodium alginate. The study showed that edible packaging thickness influenced tenderness, moisture, protein, fat, and carbohydrate content, color, taste, and texture quality of corn rice significantly (α = 0.05). The best corn rice was produced on coated grits with edible packaging of 1.5 mm thickness and the characteristics were stickiness 18.17 g / mm2, water content 11.39%, ash 0.21% db, protein 15.23% db, fat 0.53 % db, carbohydrate 72.64%, and crude fiber content 2.11 % db, yellowish color (score 1.1), rather specific of corn rice smell (score 2.5), slightly fluffier texture (score 3.4), and rather strong sweet taste (score 2.8).1

INTRODUCTIONThe staple food of most Indonesian people is rice. This causes the need for rice is quite high. Meanwhile, rice supplies are limited. To overcome this, efforts to diversify food are needed, especially using local raw materials. The local raw material that is being developed by the Agricultural Research and Development Center is white corn. The advantages of white corn include high starch, attractive white color, and higher productivity than yellow corn and are more resistant to drought (Qanytah and Prastuti, 2008).Nowadays people like food that is easily and quickly served. In order to provide staple food to replace rice, corn rice products are made in sizes per one meal (per serving) that are easily processed and served. To facilitate processing, corn rice products are packaged in edible plastic sheets (edible film). Edible film packaging is made with the main ingredients tapioca and sodium alginate. Tapioca contains high amylopectin, where amylopectin is expected to improve the texture / fluffier of corn rice.

The quality of corn rice in edible film packaging, is influenced by the thickness of the packaging. The thickness of the edible film affects its ease of forming. A thicker packaging will make it more rigid and difficult to form, but will provide better mechanical protection against the packed material (Buckle , 2009). In addition, the use of edible films can extend the shelf life and maintain the quality of various food products (Hui, 2006). The purpose of this study was to determine the effect of different film thicknesses on the quality of white corn rice. 2

MaTERIALS and methods The main ingredient in this research is Anoman white corn variety from the Maros, Cereals Center in Makasar, Sulawesi, Indonesia. In addition, other ingredients used are drinking water, tapioca starch (food grade), sodium alginate (food grade), sorbitol (food grade), instant yeast. The tools used in this research are processing

equipment, glassware, thermohygrometer test equipment, UV-VIS spectrophotometer, micrometer couplers and Brookfield texture analyzer.The process of making corn rice in edible film packaging refers to the research of Sugiyono et al. (2004), Richana and Suarni (2005) and Wijaya (2013). The flowchart of the process of making corn rice in edible packaging can be seen in Figure 1.The quality of corn rice in the edible film packaging studied are the texture / stickiness of corn rice in the edible film package that has been cooked (Suyatma, 2010); the chemical qualities (water , ash, protein, fat, carbohydrate (AOAC, 2006); and crude fiber content based on SNI 01-2891-1992 (Badan Standarisasi Nasional, 1992) of corn rice in dry edible film packaging and hedonic quality (color, aroma, taste and texture / fluffier) of corn rice in edible film packaging that has been cooked (Meilgaard, 2015).The research design used a factorial Complete Randomized Design (CRD) with five levels (0.7 mm; 0.9 mm; 1.1 mm; 1.3 mm; and 1.5 mm) and three repetitions. Data were analyzed with Analysis of Variance (ANOVA) using SPSS version 20 program. If the treatment significantly affected the quality, then proceed with further tests Duncan Multiple Range Test (DMRT).3

results and discussion 3.1

The stickiness of white corn rice in edible film packagingThe stickiness of corn rice in edible film packaging were 9

.80 ± 2.24, 11.25 ± 1.04, 12.76 ± 2.74, 15.75 ± 2.78, and 18.17 ± 1.06 g/mm2 for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the stickiness of corn rice in edible film packaging tend to increase with the increasing of

thickness of edible film (Figure 2

). Figure 2. The stickiness (g/mm2) of white corn rice in edible film packagingFigure 1. The flowchart of the process in making corn rice in edible film packaging (modification from Sugiyono et al. (2004), Richana and Suarni (2005) and Wijaya (2013))Anova test results showed that the thickness of edible film packaging influenced the stickiness of corn rice in edible film packaging significantly (α = 0.05). While, the DMRT test showed that the stikiness of corn rice were significantly different (α = 0.05) for each different film thickness (0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, 1.5 mm).The stickiness of corn rice in edible film packaging increased with the increasing of the thickness of edible film packaging. Because the edible films consisting of tapioca starch that contains 83% amylopectin which caused the paste when the corn rice cooked (BeMiller and Wistler, 2009). In addition, the sodium alginate which functions as a thickener and gelling agent gives a more chewy effect on corn rice in edible film packaging (Codex Standard, 2002).3.2

The water content of white corn rice in edible film packaging The water content of corn rice in edible film packaging were 9.60 ± 0,64 %, 10.13 ± 0.03, 10.81 ± 0.05 %, 11.27 ± 0.26 %, and 11.39 ± 0.04 % for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the water content of corn rice in edible film packaging tend to increase with the increasing of thickness of edible film (Figure 3).Figure 3.

The water content (%) of white corn rice in edible film packagingAnova test results showed that the thickness of edible film packaging influenced the water content of corn rice in edible film packaging significantly (α = 0.05). While, the DMRT test showed that the water content of corn rice were not significantly different (α = 0.05) for 0.7 mm, 0.9 mm, 1.1 mm film thickness, but they were significantly different (α = 0.05) for 1.3 mm, 1.5 mm film thickness.When the layer of film packaging was thicker, the water content was higher. This was caused by the diminishing evaporation process
(Bourtoom, 2007). 3.3
The ash content of white corn rice in edible film packagingThe ash content of corn rice in edible film packaging were 0.20
± 0.05, 0.14 ± 0.02, 0.15 ± 0.01, 0.20 ± 0.06, and 0.21 ± 0.01% for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the ash content of corn rice in edible film packaging relatively stable with the increasing of thickness of edible film packaging (Figure 4).Anova test results showed that the thickness of edible film packaging did not influence the ash content of corn rice in edible film packaging significantly (α = 0.05).Figure 4. The ash content (%) of white corn rice in edible film packaging3.4
The protein content of white corn rice in edible film packagingThe protein content of corn rice in edible film packaging were 15.86
± 0.48, 15.68 ± 0.03, 15.53 ± 0.23, 15.37 ± 0.22, and 15.23 ± 0.03% for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the protein content of corn rice in edible film packaging relatively decreased with the increased of thickness of edible film packaging (Figure. 5).Figure 5. The protein content (%) of white corn rice in edible film packagingAnova test results showed that the thickness of edible film packaging influenced the protein content of corn rice in edible film packaging significantly (α = 0.05). While, the DMRT test showed that the protein content of corn rice were significantly different (α = 0.05) for 0.9 mm with 1.1 mm film thickness. Decreased of protein content in corn rice was caused by the protein content in tapioca and na alginate is lower than corn, so when the edible packaging layer was thicker, the protein content will be lower.3.5
The protein content of white corn rice in edible film packagingThe fat content of corn rice in edible film packaging were 0.71
± 0.01, 0.71 ± 0.05, 0.72 ± 0.13, 0.61 ± 0.05, and 0.53 ± 0.08 % db for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the fat content of corn rice in edible film packaging relatively decreased with the increasing of thickness of edible film packaging (Figure 6).Figure 6. The fat content (%) of white corn rice in edible film packagingAnova test results showed that the thickness of edible film packaging influenced the fat content of corn rice in edible film packaging significantly (α = 0.05). While, the DMRT test showed that the fat content of corn rice were not significantly different (α = 0.05) for 0.7, 0.9 mm and 1.1 mm film thickness, but significantly different with 1.5 mm film thickness. Decreased of fat content in corn rice was caused by the fat content in tapioca and na alginate is lower than corn, so when the edible packaging layer was thicker, the fat content will be lower.3.6
The carbohydrate content of white corn rice in edible film packagingThe carbohydrate content of corn rice in edible film packaging were 73.63
± 0.78, 73.34 ± 0.21, 72.79 ± 0.22, 72.55 ± 0.25, and 72.64 ± 0.73 % db for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the carbohydrate content of corn rice in edible film packaging relatively decreased with the increasing of thickness of edible film packaging (Figure 7).Figure 7. The carbohydrate content (%) of white corn rice in edible film packagingAnova test results showed that the thickness of edible film packaging influenced the carbohydrate content of corn rice in edible film packaging significantly (α = 0.05). While, the DMRT test showed that the carbohydrate content of corn rice were not significantly different (α = 0.05) for 0.7, 0.9 mm and 1.1 mm film thickness, but significantly different with 1.5 mm film thickness. The condition was as the same as the protein and fat content in corn rice in edible film packaging.3.7
The crude fiber content of white corn rice in edible film packagingThe crude fiber content of corn rice in edible film packaging were 2.21 ± 0.04, 2.19 ± 0.04, 2.16 ± 0.03, 2.14 ± 0.15, and 2.11 ± 0.14 % db for 0.7 mm, 0.9 mm, 1.1 mm, 1.3 mm, and 1.5 mm thickness respectively. The result showed that the crude fiber content of corn rice in edible film packaging relatively stable with the increasing of thickness of edible film packaging (Figure 8).Anova test results showed that the thickness of edible film packaging did not influence the crude fiber content of corn rice in edible film packaging significantly (α = 0.05). Figure 8. The crude fiber content (%) of white corn rice in edible film packaging3.8
Sensory analysis content of white corn rice in edible film packagingSensory analysis was carried out for the hedonic quality ofcolor, aroma, texture, and taste parameters and rank test. The data can be seen in Table 1.Table 1.
The average value of hedonic quality test of corn rice in edible film packagingSamples means with different superscripts in the same column are significantly different (p 0.05) by Duncan's multiple range test.Note : Color : score 5 (very white), score 4 (white), score 3 (slightly white), score 2 (yellowish white), score 1 (yellowish); Aroma : score 5 (very specific of corn rice), score 4 (specific of corn rice), score 3 (rather specific of corn rice), score 2 (not specific of corn rice), score 1 (very not specific of corn rice); Texture : score 5 (very fluffier), score 4 (fluffier), score 3 (slightly fluffier), score 2 (slightly not fluffy), score 1 (very not fluffy); Taste : score 5 (very strong sweet), score 4 (strong sweet), score 3 (rather strong sweet), score 2 (weak sweet), score 1 (very weak sweet).The corn rice color were between yellowish - slightly white (score 1.1-2.5). The data showed that the color tended to be yellowish with the greater thickness of the edible film packaging. Anova results showed that the thickness of the packaging layer significantly affected the color quality of corn rice (α = 0.05). While, the DMRT test results showed that the thickness level of the packaging layer significantly affected the color quality (Table 1). This was due to the presence of reducing sugars and amino acids in corn rice and edible packaging layers and heating process when drying caused a maillard reaction. Maillard reaction produced melanoidin compounds

that are brown (Lund and Ray, 2017). When thickness of the edible packaging layer was greater, it caused a greater browning reaction, so that the color of corn rice is more yellowish.The corn rice aroma were between not specific of corn rice - rather specific of corn rice aroma (score 2.5 - 2.9), where the distinctive aroma of corn decreased with greater thickness of the packaging film layer. Anova results showed that the thickness of the packaging layer did not significantly affect the quality of the aroma of corn rice (α = 0.05) (Table 1).The texture of corn rice ranges from very not fluffy - slightly fluffier (score 1.4 - 3.4), where the texture of corn rice is getting fluffier with the greater thickness of the film packaging layer. Anova results showed that the thickness of the packaging layer significantly affected the quality of the corn rice texture (α = 0.05). The DMRT test results showed that the thickness of the packaging of 0.7 mm and 0.9 have the same effect, but different from the thickness of 1.5 mm (Table 1).The corn rice taste were between very weak sweet - rather strong sweet (score 1.3 - 2.8), where the taste of corn rice was sweeter with the greater thickness of the film packaging layer. Anova results showed that the thickness of the packaging layer significantly influenced the quality of corn rice (α = 0.05). The DMRT test results showed that the thickness of the packaging of 0.7 mm to 1.1 mm have the same effect, but different from the thickness of 1.5 mm (Table 1). When heating, starch will be broken into simple sugars. This caused starchy products to be sweeter after being processed (BeMiller and Wistler , 2009). Likewise with corn rice. The greater of the thickness of the packaging layer, the starch content will be more. This caused the taste of corn rice to become sweeter.To find out the quality of corn rice which was most preferred by panelists, a ranking test was conducted. Table 1 showed that the most preferred of corn rice was corn rice in edible film packaging with a thickness of 1.5 mm. Anova results showed that the thickness of the packaging layer significantly influenced the rank test (α = 0.05). Duncan test results showed that the thickness of the packaging of 0.7 mm and 0.9 has the same effected, but different from other thicknesses.4
ConclusionsThe study showed that edible packaging thickness influenced stickiness, moisture, protein, fat, and carbohydrate content, color, taste, and texture quality of corn rice significantly (α = 0.05). The corn rice stikiness were between 9.80-18.17 g/mm2; the water content were between 9.60 - 11.39 %; the ash content were between 0.14 - 0.21 %; the protein content were between 15.23 - 15.86 %; the fat content were between 0.53 - 0.71 %; the carbohydrate content were between 72.64 - 73.63 %; the crude fiber content were 2.11-2.21 %. The sensory analysis showed that the corn rice color were between yellowish - slightly white (score 1.1-2.5); the aroma were between not specific of corn rice - rather specific of corn rice aroma (score 2.5 - 2.9); the texture ranges from very not fluffy - slightly fluffier (score 1.4 - 3.4); and the corn rice taste were between very weak sweet - rather strong sweet (score 1.3 - 2.8). Rank test showed that the thickness 1.5 mm of the edible packaging was the best preferred by the panelist.The best corn rice in edible packaging was produced on coated grits with edible packaging of 1.5 mm thickness (rank 1). The best quality characteristics of white corn rice were stickiness 18.17 g / mm2, water content 11.39%, ash 0.21% db, protein 15.23% db, fat 0.53 % db, carbohydrate 72.64%, and crude fiber content 2.11 % db, yellowish color (score 1.1), rather specific of corn rice smell (score 2.5), slightly fluffier texture (score 3.4), and rather strong sweet taste (score 2.8).References

AOAC.
2006.

Plagiarism detected: **0.29%** https://repository.ipb.ac.id/bitstr... id: **3**

Official Methods of Analysis of The Association of Official Analytical

Chemist. AOAC Inc., Washington.Badan Standarisasi Nasional.
1992.

Plagiarism detected: **0.29%** https://www.researchgate.net/public... + 2 more resources! id: **4**

Cara Uji Makanan dan Minuman (SNI 01-2891-1992). Badan Standarisasi Nasional,

Jakarta. BeMiller J. and Wistler R. 2009. Starch: Chemistry and Technology. 3rd edition. Elsevier.Bourtoom, T. 2008. Factors Affecting the Properties of Edible Film Prepared from Mung Bean Proteins. International Food Research Journal 15(2): 167-180.Buckle K. A., Edward R. A, Fleet G. H.
, and Wootton M. 2009. Ilmu Pangan. Penerjemah: H. Purnomo dan Adiono, UI-Press: Jakarta.Codex Standard. 2002. Codex Standard for Sorbitol. FAO United Nations, London.Hui, Y. H.
2006. Handbook of Food Science, Technology, and, Engineering Volume I. CRC Press, USA.Lund
, M.N. and Ray, C.A. 2017. Control of Maillard Reactions in Foods: Strategies and Chemical Mechanisms. J. Agric. Food Chem. 65: 4537−4552.Meilgaard
M., Civille G. V., and Carr B. T. 2015. Sensory evaluation techniques. 5th ed. CRC Press.Qanytah
and Prastuti T. R.

Plagiarism detected: **0.46%** https://jurnalteknologi.utm.my/inde... id: **5**

2008. Penerapan Teknologi Pascapanen Jagung di Desa Kedawung Kecamatan Bojong Kabupaten Tegal. Prosiding Seminar Nasional Teknik

Pertanian. Jogjakarta.Richana, N and Suarni. 2005. Teknologi Pengolahan Jagung.

Plagiarism detected: **0.32%** https://jurnalteknologi.utm.my/inde... id: **6**

Prosiding Seminar dan Lokakarya Nasional Makasar 2005. Pusat Penelitian dan Pengembangan

Tanaman Pangan: 391-393, 396.Sugiyono, Soekarto S. T., Hariyadi P., and Supriadi A.

Plagiarism detected: **0.17%** http://lampung.litbang.pertanian.go... id: **7**

2004. Kajian Optimasi Teknologi Pengolahan Beras

jagung. IPB, Bogor. Jurnal Teknologi dan Industri Pangan 15 (2): 119-128.Suyatma, N. E.
2010. Analisis Sifat Fisik-Texture Analysis. Departemen Ilmu dan Teknologi Pangan Institut Pertanian Bogor,

Bogor.Wijaya, D. R.
2013. Pencirian Edible film Pati Tapioka Terplastisasi Sorbitol dengan Penambahan Natrium Alginat [skripsi]. Bogor (ID): Institut Pertanian Bogor. 2
Chapter Error! No text of specified style in document.Error! No text of specified style in document.
. Authors' Instructions3