

**GLUCOSINOLATES CONTENT, TEXTURE, AND COLOUR OF WHITE
CABBAGE (*Brassica oleracea* L. Var. *Capitata*) DURING STEAMING**

**KADAR GLUKOSINOLAT, TEKSTUR, DAN WARNA KUBIS PUTIH (*Brassica
oleracea* L. Var. *Capitata*) SELAMA PENGUKUSAN**

BACHELOR THESIS

Submitted to the Faculty of Agricultural Technology
in partial fulfillment of requirements for obtaining the bachelor degree



**DEPARTMENT OF FOOD TECHNOLOGY
FACULTY OF AGRICULTURAL TECHNOLOGY
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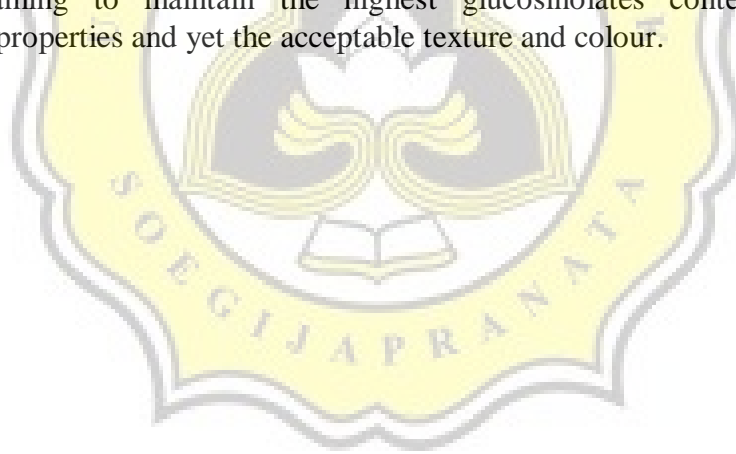
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SUMMARY

In Indonesia, white cabbage (*Brassica oleracea* L. Var. *Capitata*) is one of *Brassica* vegetables that is commonly consumed, daily available, and affordable. White cabbage can be eaten as raw food or cooked by boiling and steaming. Steamed white cabbage roll is usually found as a complement of *siomay* dishes. During long term steaming, the content of health promoting compound which has an anticarcinogenic property, called glucosinolates, are expected to change. Other physical properties such as texture and colour are also affected. In this study, white cabbage was cooked by mimicking a local processing method commonly employed. Sample was boiled for 3 minutes, rolled, and followed by 180 minutes of steaming. The glucosinolates content, texture, and colour were measured at fresh, 0', 5', 10', 15', 30', 45', 60', 90', 120', 150', and 180' of steaming to determine the optimal processing condition. The measurement of glucosinolates content, texture, and colour were done by using HPLC, texture analyzer, and chromameter, respectively. In this study, identified glucosinolates of white cabbage are glucoiberin, progoitrin, sinigrin, glucoraphanin (classified as aliphatic glucosinolates), glucobrassicin, and 4-methoxyglucobrassicin (classified as indole glucosinolates). The result shows that indole glucosinolates (92-97%) have higher decline rate than aliphatic glucosinolates (30-60%). During first 15 minutes of steaming, aliphatic glucosinolates content and greenness of sample shows an increasing pattern and decrease afterwards. Indole glucosinolates content, brightness, yellowness, and texture decrease as steaming proceeded. Rolled cabbage in *siomay* dishes is best served by 15 minutes of steaming to maintain the highest glucosinolates content related to its anticarcinogenic properties and yet the acceptable texture and colour.



RINGKASAN

Kubis putih (*Brassica oleracea* L. Var. *Capitata*) adalah salah satu contoh sayuran *Brassica* yang sering dikonsumsi, tingkat produksinya tinggi, dan harganya murah. Kubis putih biasa dikonsumsi dalam bentuk mentah atau diproses terlebih dahulu (direbus atau dikukus). Salah satu contoh olahan kubis dengan cara pengukusan dalam jangka waktu tertentu adalah kubis gulung yang disajikan sebagai pelengkap siomay. Selama pengukusan, diduga akan terjadi perubahan kadar glukosinolat. Glukosinolat adalah senyawa yang memiliki aktivitas antikanker yang membedakan sayuran *Brassica* dari sayuran lain. Karakter fisik seperti tekstur dan warna juga akan berubah selama pengukusan. Pada penelitian ini, kubis putih direbus selama 3 menit, digulung, dan dikukus selama 3 jam. Untuk mengetahui kondisi pemrosesan yang optimal agar sifat fungsional dari kubis putih tetap terjaga, maka dilakukan pengukuran kadar glukosinolat, tekstur, dan warna pada kubis saat segar, direbus 3 menit, dikukus menit ke-5, 10, 15, 30, 45, 60, 90, 120, 150, dan 180. Pengukuran kadar glukosinolat, tekstur, dan warna secara berturut-turut dilakukan dengan HPLC, *texture analyzer*, dan kromameter. Glukosinolat yang teridentifikasi di kubis putih pada studi ini tergolong menjadi 2 kelompok, yakni glukosinolat alifatik (glucoiberin, progoitrin, sinigrin, glucoraphanin) dan glukosinolat indol (glucobrassicin dan 4-methoxyglucobrassicin). Hasil penelitian menunjukkan bahwa glukosinolat indol (92-97%) memiliki laju penurunan yang lebih besar dibandingkan glukosinolat alifatik (30-60%). Selama 15 menit pertama pengukusan, kadar glukosinolat alifatik dan warna hijau pada kubis meningkat dan menurun setelahnya. Semakin lama waktu pengukusan, kadar glukosinolat alifatik dan indol, kecerahan, dan tekstur kubis putih semakin berkurang. Untuk mendapatkan efek antikanker maksimal dari glukosinolat dan karakteristik fisik (tekstur dan warna) yang masih dapat diterima, waktu pengukusan optimal terhadap kubis putih dalam pembuatan siomay adalah 15 menit.



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Jurita P. Sari

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