

RINGKASAN

Keju merupakan salah satu produk olahan pangan yang dihasilkan dari koagulasi protein susu. Umumnya pembuatan keju melibatkan koagulasi susu secara enzimatik menggunakan rennet atau enzim renin. Namun penggunaan rennet pada keju masih diperdebatkan status kehalalannya karena pada faktor ketersediaannya. Penggunaan rennet sebagai sumber protease dapat digantikan menggunakan bahan lain salah satunya berasal dari tumbuhan. Beberapa tumbuhan seperti jahe, jeruk purut, carica dan nanas diketahui memiliki enzim protease dan kandungan asam yang tinggi untuk membantu koagulasi protein pada susu. Pada pemeraman keju keberadaan bakteri asam laktat memiliki peranan yang penting karena dapat membantu menghasilkan asam laktat yang dapat membantu mengawetkan keju selama pemeraman. Disisi lain, kehadiran senyawa fenol yang bersifat antioksidan dari *milk coagulant agent* yang digunakan dapat memengaruhi pertumbuhan dan aktivitas bakteri asam laktat selama pemeraman. Oleh karena itu, tujuan penelitian ini adalah untuk 1) Mengetahui pengaruh variasi jenis *milk coagulant agent* terhadap aktivitas antioksidan dan bakteri asam laktat pada keju peram 2) Mengetahui pengaruh lama waktu pemeraman terhadap aktivitas antioksidan dan bakteri asam laktat pada keju peram 3) Menentukan kombinasi perlakuan terbaik dari variasi jenis *milk coagulant agent* dan lama waktu pemeraman pada keju peram.

Rancangan percobaan yang digunakan berupa Rancangan Acak Kelompok (RAK) yang terdiri dari 2 faktor yaitu variasi jenis *milk coagulant agent* (K0 = rennet; K1 = carica; K2 = jeruk purut; K3 = jahe; K4 = nanas, dan lama waktu pemeraman (P1 = 0 hari; P2 = 15 hari; P3 = 30 hari). Perlakuan tersebut dibuat rancangan perlakuan faktorial sehingga diperoleh 15 kombinasi perlakuan dan tiap perlakuan diulang 3 kali sehingga diperoleh 45 unit percobaan. Analisis yang dilakukan meliputi analisis total fenol, aktivitas antioksidan dan total bakteri asam laktat (BAL). Data hasil pengamatan yang diperoleh dianalisis menggunakan analisis ragam (ANOVA) pada tingkat kepercayaan 95%, apabila terdapat pengaruh yang nyata maka dilanjutkan dengan uji DMRT (*Duncan's Multiple Range Test*).

Hasil penelitian menunjukkan bahwa perbedaan jenis *milk coagulant agent* dan lama waktu pemeraman terhadap total fenol, aktivitas antioksidan dan total bakteri asam laktat (BAL) memiliki pengaruh terhadap setiap parameter yang diuji. Semakin besar nilai total fenol yang dihasilkan, maka semakin tinggi aktivitas antioksidannya. Semakin lama pemeraman, maka hasil dari setiap parameter uji cenderung mengalami penurunan seiring lamanya waktu pemeraman. Berdasarkan uji indeks efektivitas didapatkan perlakuan terbaik yakni kombinasi perlakuan jenis *milk coagulant agent* nanas dengan lama waktu pemeraman 0 hari, menghasilkan total fenol sebesar 5,62%, aktivitas antioksidan 10,17% dan total bakteri asam laktat 7,57 log CFU/mL.

SUMMARY

Cheese is one of the processed food products produced from the coagulation of milk protein. Generally, cheese making involves enzymatic coagulation of milk using rennet or renin enzyme. However, the use of rennet in cheese is still debated regarding its halal status due to its availability. The use of rennet as a source of protease can be replaced using other ingredients, one of which comes from plants. Several plants such as ginger, kaffir lime, carica and pineapple are known to have protease enzymes and high acid content to help coagulate milk proteins. In cheese ripening, the presence of lactic acid bacteria plays an important role because it can help produce lactic acid which can help preserve cheese during ripening. On the other hand, the presence of phenol compounds which are antioxidants from the milk coagulant agent used can affect the growth and activity of lactic acid bacteria during ripening. Therefore, the objectives of this study were to 1) Determine the effect of variations in the type of milk coagulant agent on the activity of antioxidants and lactic acid bacteria in ripened cheese 2) Determine the effect of the length of ripening time on the activity of antioxidants and lactic acid bacteria in ripened cheese 3) Determine the best combination of treatments from variations in the type of milk coagulant agent and the length of ripening time in ripened cheese.

This research is experimental research using a Randomized Group Design (RAK) consisting of 2 factors, namely variations in the type of milk coagulant agent (K0 = rennet; K1 = carica; K2 = kaffir lime; K3 = ginger; K4 = pineapple, and the length of fermentation time (P1 = 0 days; P2 = 15 days; P3 = 30 days). The treatment was designed as a factorial treatment design so that 15 treatment combinations were obtained and each treatment was repeated 3 times so that 45 experimental units were obtained. The analysis carried out included analysis of total phenol, antioxidant activity and total lactic acid bacteria (LAB). The observation data obtained were analyzed using analysis of variance (ANOVA) at a 95% confidence level, if there was a significant effect, it was continued with the DMRT (Duncan's Multiple Range Test).

The results of the study showed that differences in the type of milk coagulant agent and the length of fermentation time on total phenol, antioxidant activity and total lactic acid bacteria (LAB) had an effect on each parameter tested. The greater the total phenol value produced, the higher the antioxidant activity. The longer the fermentation, the results of each test parameter tend to decrease along with the length of fermentation time. Based on the effectiveness index test, the best treatment was obtained, namely a combination of pineapple milk coagulant agent treatment with a fermentation time of 0 days, producing a total phenol of 5.62%, antioxidant activity of 10.17% and a total lactic acid bacteria of 7.57 log CFU/mL.