

ABSTRAK

Kacang komak merupakan sumber protein nabati potensial yang banyak dibudidayakan di Lombok. Namun tekstur bijinya yang keras menyebabkan waktu perendaman pada proses pembuatan tempe menjadi lama, yaitu mencapai 72 jam dengan penggantian air setiap 12 jam. Penelitian ini bertujuan untuk 1) mengetahui karakteristik fisik dan kimia pada kacang komak yang berasal dari Pulau Lombok; 2) mempelajari perubahan tekstur kacang komak yang diberi perlakuan perebusan bertekanan; 3) mempelajari perubahan pH dan mikrobiologis kacang komak selama perendaman dengan penambahan bakteri asam laktat untuk mempersingkat waktu perendaman pada pembuatan tempe; dan 4) mempelajari pengaruh perebusan bertekanan dan penambahan bakteri asam laktat pada tahap pra fermentasi terhadap karakteristik fisik, kimia dan mikrobiologis tempe komak. Penelitian dilakukan pada dua varietas kacang komak, yaitu kacang komak dengan warna kulit krem (komak jamak putek) dan yang berwarna kulit hitam (komak jamak). Hasil penelitian menunjukkan bahwa kedua varietas kacang komak merupakan sumber protein, karbohidrat, serta mineral. Komak jamak putek memiliki kadar asam fitat dan tanin lebih rendah serta lebih sedikit senyawa penyusun aroma *beany* dibandingkan komak jamak, sehingga dipilih sebagai bahan baku tempe. Dalam pembuatan tempe komak, perebusan bertekanan dan dilanjutkan dengan penambahan bakteri asam laktat dapat menurunkan pH kacang. Perebusan bertekanan selama 15 menit dapat melunakkan kacang komak (34,47 N), setara dengan kekerasan kedelai setelah perebusan kedua, serta menurunkan kadar senyawa anti gizi, yaitu asam fitat sebesar 50,9%, tripsin inhibitor 92,5%, dan tanin 61,7%. Selanjutnya kacang komak yang telah direbus bertekanan kemudian direndam selama 16 jam dengan penambahan bakteri asam laktat *Lactiplantibacillus plantarum* WGK4 sebanyak 10^6 CFU/mL pada awal perendaman. Selama perendaman, WGK4 mampu tumbuh hingga 9,5 log CFU/mL dan menghasilkan asam. Fermentasi asam ini mempersingkat waktu perendaman dari 72 jam menjadi 16 jam. Setelah perendaman, fermentasi jamur selama 48 jam menghasilkan tempe komak segar dengan miselia yang tumbuh merata dan tekstur kompak. Selama fermentasi, kadar protein terlarut meningkat dari 1,23% menjadi 6,55%, sementara kadar asam fitat menurun dari 4,96% menjadi 3,02%. Selain itu, pertumbuhan *Enterobacteriaceae* lebih rendah pada proses modifikasi dibandingkan metode tradisional. Proses modifikasi melalui perebusan bertekanan dan penambahan bakteri asam laktat pada perendaman mempercepat proses pembuatan tempe komak sebesar 46,63% serta mengurangi penggunaan air hingga seperenam dibandingkan proses tradisional.

Kata kunci: bakteri asam laktat, perebusan bertekanan, perendaman, tekstur, tempe

ABSTRACT

Komak bean is a potential source of plant-based protein that is widely cultivated in Lombok. However, the hard texture of its seeds requires a long soaking time of up to 72 h with the water changed every 12 h during tempe production. This study aimed to 1) determine the physical and chemical characteristics of komak beans from Lombok Island; 2) investigate changes in the texture of komak beans treated with pressure cooking; 3) investigate changes in the pH and microbiology of komak beans during soaking with the addition of lactic acid bacteria to shorten the soaking time for tempe production; and 4) investigate the effect of pressure cooking and the addition of lactic acid bacteria in the pre-fermentation stage on the physical, chemical, and microbiological characteristics of komak tempe. This study was conducted on two komak beans varieties: komak jamak putek with cream-colored seed coats and komak jamak with black seed coats. The results showed that both varieties of komak beans are good sources of protein, carbohydrates, and minerals. Komak jamak putek had lower phytic acid and tannin contents and fewer beany compounds compared to komak jamak, making it the preferred material for tempe production. In making komak tempe, pressure cooking followed by the addition of lactic acid bacteria can reduce the pH of the beans. Pressure cooking the komak beans for 15 min made them softer (34.47 N), similar to the softness of soybeans after boiling them twice, and it also lowered the levels of anti-nutritional compounds, namely phytic acid by 50.9%, trypsin inhibitor by 92.5%, and tannin by 61.7%. Subsequently, the pressure-cooked komak beans were soaked for 16 h with the addition of lactic acid bacteria *Lactiplantibacillus plantarum* WGK4 at a concentration of 10^6 CFU/mL at the beginning of soaking. During soaking, WGK4 grew to 9.5 log CFU/mL and produced acid. This acid fermentation shortened the soaking time from 72 h to 16 h. Following the soaking process, fungal fermentation for 48 h resulted in fresh komak tempe with uniformly distributed mycelial growth and a compact texture. During fermentation, the soluble protein levels increased from 1.23% to 6.55%, while phytic acid levels decreased from 4.96% to 3.02%. Additionally, the growth of *Enterobacteriaceae* was lower in the modified process than in the traditional method. Modification through pressure cooking and the addition of lactic acid bacteria during the soaking accelerates the process of making komak tempe by 46.63% and reduces water to one-sixth compared to the traditional process.

Keywords: lactic acid bacteria, pressure cooking, soaking, texture, tempe