PENINGKATAN STABILITAS OKSIDATIF MINYAK GORENG DENGAN PENAMBAHAN EKSTRAK DAUN JERUK PURUT (*Citrus hystrix*), DAUN JERUK NIPIS (*Citrus aurantifolia*), DAN DAUN JERUK LEMON (*Citrus limon*) PADA PENGGORENGAN RENDAM

INTISARI

Minyak goreng merupakan bahan pokok yang sering digunakan karena banyaknya masyarakat Indonesia yang menyukai produk hasil penggorengan. Namun, minyak dapat mengalami kerusakan oksidatif akibat pemakaian di suhu tinggi dan berulang. Oleh karena itu, industri pangan biasanya menambahkan antioksidan sintetis seperti TBHQ untuk mencegah kerusakan minyak. Akan tetapi, karena dampak buruknya untuk manusia, maka digunakan antioksidan alami yang bisa diperoleh dari daun tanaman citrus. Tanaman citrus dikenal dengan kandungan antioksidan tinggi yang tersebar di seluruh bagian tanaman.

Sebelum penelitian tahap satu dan dua, dilakukan analisa karakteristik fisik daun. Pada penelitian tahap pertama dilakukan analisa kapasitas antioksidan pada daun jeruk purut, daun jeruk nipis, dan daun jeruk lemon. Penelitian kemudian dilanjutkan ke tahap dua, yaitu dilakukan pemanasan minyak goreng sawit, minyak goreng penambahan 200 ppm ekstrak dengan antioksidan tertinggi, dan minyak goreng beraditif 100 ppm TBHQ yang ditambah ekstrak dengan antioksidan tertinggi selama 50 jam. Selanjutnya dilakukan uji fisiko kimia untuk mengetahui kualitas minyak. Semua data dianalisis menggunakan ANOVA (α<5%) dan dilanjutkan dengan Uji Duncan apabila diketahui ada perbedaan hasil pada antar perlakuan.

Pada pengujian karakteristik fisik daun, diketahui daun dengan LSM (*leaf specific mass*) dan massa jenis tertinggi adalah daun jeruk purut bagian dekat tankai (131,52 µg/mm^2 dan 542,81 µg/mm^3). Kapasitas antioksidan tertinggi adalah ekstrak daun jeruk lemon dengan total fenolik 9.452 µg GAE/g berat kering, total flavonoid 2.547 µg QE/g berat kering, %SA 51,34%, dan FRAP 4.905 µg AAE/g berat kering. Setelah pemanasan 50 jam, nilai angka asam terbaik adalah minyak beraditif 100 ppm TBHQ dan ekstrak daun jeruk lemon 200 ppm (0,85 mg KOH/g), angka peroksida terbaik yaitu minyak goreng sawit (3,86 mEq O2/kg), angka anisidin terbaik yaitu minyak dengan 200 ppm ekstrak daun jeruk lemon (69,03 mEq/kg), nilai TOTOX terbaik yaitu minyak dengan 200 ppm ekstrak daun jeruk lemon (82,37 mEq/kg), nilai L* terbaik yaitu minyak goreng sawit (56,73), nilai a* terbaik minyak dengan 100 ppm TBHQ dan 200 ppm ekstrak daun jeruk lemon (-3,12), dan nilai b* terbaik yaitu minyak dengan 100 ppm TBHQ dan 200 ppm ekstrak daun jeruk lemon (9,74).

Kata kunci: daun jeruk purut, daun jeruk nipis, daun jeruk lemon, minyak goreng, stabilitas oksidatif

IMPROVEMENTS OF PALM OLEIN OXIDATIVE STABILITY BY EXTRACT ADDITION OF KAFFIR LIME (*Citrus hystrix*), KEY LIME (*Citrus aurantifolia*), AND LEMON LEAVES (*Citrus limon*) DURING DEEP FRYING

ABSTRACT

Frying oil is used by many of Indonesian as they consume the frying product the most. However, oil can undergo an oxidative degradation trough repeated heating process. The food industry generally uses synthetic antioxidant such as TBHQ to prevent the oxidative degradation. Nevertheless, due to its bad effect on health, people tend to use the natural antioxidant which can be found in the entire body of citrus plants.

Before the first and second stage of the research, the sample was determined the physical characteristic. The first stage of the research aims to determine the antioxidant capacity of the extract of kaffir lime leaves, key lime leaves, and lemon leaves. Extract with the highest antioxidant capacity will be added to frying oil to improve the oxidative stability. The frying oil without antioxidant, frying oil with 200 ppm extract of the leaves with the highest antioxidant capacity, and frying oil with 100 ppm TBHQ and 100 ppm extract extract of the leaves with the highest antioxidant capacity was heated in a deep fryer for 50 hours. On the second stages on the research, the heated frying oil with was examined to perceive its oxidative stability. Subsequently, all of the data were analyzed using ANOVA (α<5%) and continued with the Duncan test if there was a difference between the treatments.

From the physical characteristic analysis, leaf with the highest LSM (leaf specific mass) and density was kaffir lime leaves which is the nearest to the stem (131.52 µg/mm^2 dan 542.81 µg/mm^3). The highest antioxidant capacity was lemon leaves extract with the total phenolic 9,452 µg GAE/g dry mass, total flavonoid 2,547 µg QE/g dry mass, %SA 51.34%, and FRAP 4.905 µg AAE/g dry mass. After the heating process of 50 hours, the best FFA was frying oil with the addition of 100 ppm TBHQ and 100 ppm lemon leaves extract (0.85 mg KOH/g), the best peroxide values was frying oil without antioxidant (3.86 mEq O2/kg), the best anisidin value was frying oil with the addition of 200 ppm lemon leaves extract (69.03 mEq/kg), the best TOTOX value was frying oil with the addition of 200 ppm lemon leaves extract (82.37 mEq/kg), the best value of L* was frying oil without antioxidant (56.73), the best value of a* frying oil with the addition of 100 ppm TBHQ and 100 ppm lemon leaves extract lemon (-3.12), and the best value of b* frying oil with the addition of 100 ppm TBHQ and 100 ppm lemon leaves extract (9.74).

Keywords: kaffir lime leaf, key lime leaf, lemon leave, palm cooking oil, oxidative stability