

RINGKASAN

Perubahan pola hidup masyarakat modern, yang ditandai dengan meningkatnya konsumsi makanan cepat saji dan tingginya paparan polusi udara, berkontribusi terhadap akumulasi radikal bebas yang dapat memicu stres oksidatif. Kondisi ini berperan dalam timbulnya berbagai penyakit degeneratif seperti jantung koroner, diabetes, kanker, alzheimer, dan -arkinson. Pencegahan dapat dilakukan melalui peningkatan asupan antioksidan, salah satunya dengan mengembangkan produk pangan fungsional seperti *cookies* kaya antioksidan. Penelitian ini bertujuan mengevaluasi pengaruh substitusi tepung ubi jalar kuning dan penambahan bubuk daun pegagan (*Centella asiatica*) terhadap sifat kimia dan sensoris *cookies*, serta menentukan kombinasi perlakuan terbaik. Ubi jalar kuning mengandung pati, serat, dan beta-karoten, sedangkan daun pegagan mengandung triterpenoid dan saponin; keduanya memiliki aktivitas antioksidan tinggi. Variasi konsentrasi kedua bahan tersebut diduga memengaruhi karakteristik akhir *cookies* secara kimia dan sensoris.

Rancangan percobaan yang digunakan adalah Rancangan Acak Lengkap (RAL) dengan tiga kali ulangan. Faktor perlakuan yang diteliti berupa substitusi tepung ubi jalar kuning (T) pada konsentrasi 25% (T1), 50% (T2), dan 75% (T3) serta faktor penambahan bubuk daun pegagan (P) pada konsentrasi 0% (P1), 3,5% (P2), dan 7% (P3). Pada penelitian ini dilakukan pengamatan variabel kimia berupa analisis kadar air, kadar serat kasar, dan aktivitas antioksidan (% inhibisi). Selain itu, pada variabel sensori diamati warna, aroma, rasa, tekstur, dan kesukaan keseluruhan. Penentuan *cookies* dengan perlakuan terbaik dilakukan menggunakan metode indeks efektivitas. Selanjutnya, dilakukan analisis proksimat yang meliputi kadar air, protein total, lemak, abu, dan karbohidrat, serta analisis aktivitas antioksidan (IC₅₀). Hasil yang diperoleh kemudian dibandingkan dengan standar mutu berdasarkan SNI 01-2973-2022.

Hasil penelitian menunjukkan bahwa substitusi tepung ubi jalar kuning berpengaruh nyata terhadap aktivitas antioksidan, kadar serat kasar, dan kadar air *cookies*. Terdapat interaksi signifikan antara substitusi tepung ubi jalar kuning dan penambahan bubuk daun pegagan terhadap peningkatan aktivitas antioksidan dan kadar serat kasar. Peningkatan konsentrasi bubuk daun pegagan juga berpengaruh nyata terhadap peningkatan aktivitas antioksidan. Perlakuan terbaik diperoleh pada substitusi tepung ubi jalar kuning 75% dengan penambahan bubuk daun pegagan 3,5%, menghasilkan kadar air 3,24%, kadar abu 2,99%, kadar lemak 31,80%, protein total 4,35%, karbohidrat 57,62%, dan aktivitas antioksidan 75,14 ppm (kategori kuat). Secara sensori *cookies* tersebut memiliki warna coklat (4,3), aroma agak khas (3,4), rasa agak pahit (2,9), tekstur agak remah (3,5), dan tingkat kesukaan rendah (2,4).

SUMMARY

Modern lifestyle changes, characterized by increased consumption of fast food and high exposure to air pollution, contribute to the accumulation of free radicals that can trigger oxidative stress. This condition plays a role in the development of various degenerative diseases such as coronary heart disease, diabetes, cancer, Alzheimer's disease, and Parkinson's disease. Prevention can be achieved by increasing antioxidant intake, one approach being the development of functional food products such as antioxidant-rich cookies. This study aims to evaluate the effects of substituting yellow sweet potato flour and adding gotu kola (*Centella asiatica*) powder on the chemical and sensory properties of cookies, as well as to determine the optimal treatment combination. Yellow sweet potatoes contain starch, fiber, and beta-carotene, while gotu kola contains triterpenoids and saponins; both possess high antioxidant activity. Variations in the concentrations of these two ingredients are presumed to influence the final chemical and sensory characteristics of the cookies.

The experimental design used was a completely randomized design (CRD) with three replications. The treatment factors studied were the substitution of yellow sweet potato flour (T) at a concentration of 25% (T1), 50% (T2), and 75% (T3) and the addition of gotu kola leaf powder (P) at a concentration of 0% (P1), 3.5% (P2), and 7% (P3). In this study, chemical variables were observed in the form of analysis of water content, crude fiber content, and antioxidant activity (% inhibition). In addition, the sensory variables were observed for color, aroma, taste, texture, and overall liking. Determination of the sample with the best treatment was done using the effectiveness index method. Furthermore, proximate analysis including moisture content, total protein, fat, ash, and carbohydrate, and antioxidant activity analysis (IC_{50}) were conducted. The results obtained were then compared with the quality standard based on SNI 01-2973-2022.

The results showed that the substitution of yellow sweet potato flour had a significant effect on the antioxidant activity, crude fiber content, and moisture content of the cookies. A significant interaction was observed between the substitution of yellow sweet potato flour and the addition of gotu kola (*Centella asiatica*) powder in enhancing antioxidant activity and crude fiber content. Increasing the concentration of gotu kola powder also had a significant effect on increasing antioxidant activity. The best treatment was obtained with 75% substitution of yellow sweet potato flour and 3.5% addition of gotu kola powder, resulting in a moisture content of 3.24%, ash content of 2.99%, fat content of 31.80%, total protein of 4.35%, carbohydrate content of 57.62%, and antioxidant activity of 75.14 ppm (strong category). Sensory evaluation indicated that the cookies had a brown color (score 4.3), slightly distinctive aroma (3.4), slightly bitter taste (2.9), slightly crumbly texture (3.5), and low overall acceptability (2.4).