

RINGKASAN

Penurunan kualitas hidup akibat paparan polusi udara, radiasi, dan zat kimia berbahaya dapat memicu terjadinya stres oksidatif. Untuk mencegah hal tersebut, dibutuhkan pangan fungsional seperti *cookies* yang kaya akan antioksidan. Penelitian ini bertujuan untuk: (1) menentukan *cookies* terbaik kombinasi perlakuan penambahan tepung kacang merah dan *puree rosemary*; (2) menentukan karakteristik *cookies* terbaik pada kombinasi perlakuan penambahan tepung kacang merah dan *puree rosemary*; dan (3) menentukan pengaruh pemberian *cookies* terbaik terhadap berat badan, tekanan darah, dan karakteristik antioksidatif pada tikus.

Tahap pertama penelitian menggunakan Rancangan Acak Kelompok (RAK) faktorial dengan dua faktor: penambahan tepung kacang merah (10%, 20%, dan 30%) dan *puree rosemary* (0,1%, 0,15%, dan 0,2%). Tahap kedua menggunakan desain *post-test only control group* dengan enam kelompok tikus (n=24). Data dianalisa menggunakan ANOVA dan dilanjutkan dengan uji DMRT pada taraf signifikansi 95% jika terdapat perbedaan yang nyata.

Hasil menunjukkan bahwa *cookies* terbaik diperoleh dari kombinasi 30% tepung kacang merah dan 0,2% *puree rosemary*, dengan karakteristik sebagai berikut: aktivitas antioksidan 62,57 ppm; kadar air 5,48%; abu 0,58%; protein 5,86%; lemak 29,44%; karbohidrat 59,72%; serat pangan 3,87%; total energi 527,90 kkal/100 g; *lightness* 53,16; *redness* 7,93; *yellowness* 24,45; *hardness* 95,88 N; *fracture* 8,53; dan *cohesiveness* 0,44.

Pemberian *cookies* terbaik pada tikus menghasilkan peningkatan berat badan sebesar 30 g. *Cookies* terbaik juga efektif menurunkan tekanan darah sebesar 17,25 mm/Hg. Selain itu, terjadi penurunan kadar MDA sebesar 1,09 nmol dan penurunan aktivitas enzim SOD sebesar 9,14%, hasil tersebut menunjukkan efektivitas *cookies* dalam mengurangi stres oksidatif. Jika dibandingkan antara kelompok kontrol yang tidak dipapar asap rokok dengan kelompok yang diberi pakan *cookies* terbaik, menunjukkan hasil yang berbeda pada tekanan darah dan MDA, namun tidak berbeda pada berat badan dan SOD.

SUMMARY

A decline in quality of life caused by air pollution, radiation exposure, and harmful chemicals can lead to oxidative stress. To help prevent this, antioxidant-rich functional foods such as cookies are needed. This study aimed to: (1) determine the best cookies formulation based on combination of red bean flour and puree rosemary; (2) to identify the characteristics of the best cookies formulation containing red bean flour and puree rosemary; and (3) to evaluate effect of the best cookies formulation on body weight, blood pressure and antioxidant characteristics in rats.

The first phase of the study used a factorial randomized block design with two factors: red kidney bean flour (10%, 20%, and 30%) and rosemary puree (0.1%, 0.15%, and 0.2%). The second phase used a post-test only control group design involving six groups of rats ($n = 24$). Data were analyzed using ANOVA, followed by the DMRT test at a 95% confidence level when significant differences were found.

The results showed that the best cookies were obtained from a combination of 30% red bean flour and 0.2% rosemary puree. These cookies had the following characteristics: antioxidant activity of 62.57 ppm; moisture content of 5.48%; ash content of 0.58%; protein content of 5.86%; fat content of 29.44%; carbohydrate content of 59.72%; dietary fiber content of 3.87%; total energy of 527.90 kcal/100 g; lightness (L^*) of 53.16; redness (a^*) of 7.93; yellowness (b^*) of 24.45; hardness of 95.88 N; fracture of 8.53; and cohesiveness of 0.44.

Feeding the best cookies to mice resulted in a weight gain of 30 g. The cookies were also effective in lowering blood pressure by 17.25 mmHg, decreasing MDA levels by 1.09 nmol, and reducing SOD enzyme activity by 9.14%, indicating their potential in mitigating oxidative stress. When compared to the control group not exposed to cigarette smoke, the group fed with the best cookies showed differences in blood pressure and MDA levels, but no significant differences in body weight and SOD activity.