RINGKASAN

Perubahan pola makan, pola hidup, dan obesitas menyebabkan gangguan metabolisme pada individu yang menjadi salah satu penyebab diabetes melitus tipe 2. Untuk mencegah dan mengatasi kejadian diabetes melitus tipe 2 diperlukan pangan yang kaya akan serat pangan dan antioksidan. Penelitian ini bertujuan untuk mengembangkan formula sereal sarapan dengan kandungan tinggi komponen bioaktif antosianin dan serat pangan, serta rendah indeks glikemik dari bahan pangan lokal yang dapat diterima secara sensori dan mengkaji pengaruhnya terhadap respon glukosa darah tikus normal dan diabetik. Penelitian ini dilakukan di Laboratorium Teknologi Pertanian UNSOED dan Laboratorium Penelitian dan Pengujian Terpadu UGM pada Juli-November 2022. Penelitian tahap satu dilakukan secara eksperimental dengan rancangan acak lengkap faktorial terdiri 2 faktor: 1) proporsi beras hitam:porang:koro pedang (60:30:10; 60:20:20, dan 60:30:10); 2) suplementasi konsentrat buah naga merah (15%, 25%, dan 35%). Penelitian tahap dua dilakukan secara eksperimental dengan rancangan *post test design* pada 2 kelompok hewan coba yaitu kelompok tikus normal dan diabetik (n=15). Data yang diperoleh dianalisis dengan menggunakan program excel dan SPSS. Hasil dari penelitian tahap 1 menunjukkan bahwa sereal sarapan dengan formulasi tepung komposit beras hitam : porang : koro pedang (60:30:10) dan penambahan konsentrat buah naga sebanyak 35% (T1B3) adalah hasil terbaik dari aspek kimia dan sensori dengan kandungan kadar abu, kadar air, protein, lemak, karbohidrat (*by difference*), energi, antosianin, serat pangan total, dan gula total masing-masing sebesar 4,98%, 5,41%, 9,51%, 0,37%, 79,72%, 362,44 kkal, 35,2 mg/100 g, 33,98%, dan 13,72%. Serta karakteristik sensori warna hitam keunguan (3,87), aroma agak langu (4,19), konsistensi amat sangat kental (1,77), agak sulit ditelan (3,74), rasa agak manis (4,35), *after taste* pahit tidak nyata (4,16), dan kurang disukai (2,42). Sereal sarapan hasil terbaik menunjukkan respon glukosa darah tikus yang lebih rendah dengan menghambat peningkatan kadar glukosa darah pada kelompok tikus normal maupun diabetik dibandingkan dengan sereal sarapan pembanding dengan Δ respon glukosa darah di menit ke 15, 30, 60, 90, 120 pada kelompok tikus normal berturut-turut adalah 5,41 mg/dL, 5,77 mg/dL, 4,21 mg/dL, -3,83 mg/dL, dan -5,41 mg/dL, serta pada kelompok tikus diabetik berturut-turut adalah 3,73 mg/dL, 2,41 mg/dL, -5,66 mg/dL, -7,34 mg/dL, dan -7,94 mg/dL. Formula sereal sarapan hasil terbaik mempunyai nilai indeks glikemik 49,75 sedangkan sereal sarapan pembanding havermout, oriflakes, dan energen varian jagung mempunyai nilai indeks glikemik sebesar 58,65, 58,96, dan 60,51. Sereal sarapan hasil terbaik termasuk dalam kelompok pangan dengan nilai indeks glikemik rendah dan semua sereal sarapan pembanding termasuk dalam kelompok pangan dengan nilai indeks glikemik sedang.

Kata kunci : beras hitam sirampog, buah naga merah, diabetes melitus, indeks glikemik, koro pedang, porang, sarapan

SUMMARY

Changes in diet, lifestyle, and obesity cause metabolic disorders in individuals which are one of the causes of type 2 diabetes mellitus. This study aims to develop a breakfast cereal formula with a high content of bioactive components anthocyanin and dietary fiber, as well as a low glycemic index from local foods that are sensory acceptable and to examine its effect on the blood glucose response of normal and diabetic rats. This research was conducted at the UNSOED Agricultural Technology Laboratory and the UGM Integrated Research and Testing Laboratory in July-November 2022. The first phase of this research was carried out experimentally with a completely randomized factorial design consisting of 2 factors: 1) the proportion of composite flour black rice:porang:koro sword (60:30 :10; 60:20:20, and 60:30:10); 2) supplementation of red dragon fruit concentrate (15%, 25%, and 35%) of composite flour. The second phase of the study was carried out experimentally with a post-test design on 2 groups of test animals, normal and diabetic rats (n = 15). The data obtained were analyzed using excel and SPSS programs. The results of the first phase of the study showed that breakfast cereal with the composite black rice flour formulation: porang: koro sword (60:30:10) and the addition of 35% dragon fruit concentrate was the best result from chemical and sensory aspects with ash content, moisture content, protein, fat, carbohydrates (by difference), energy, anthocyanin, total dietary fiber, and total sugar respectively 4.98%, 5.41%, 9.51%, 0.37%, 79.72%, 362.44 kcal, 35.2 mg/100 g, 33.98% and 13.72%. As well as the sensory characteristics of purplish-black color (3.87), rather unpleasant aroma (4.19), very very thick consistency (1.77), rather difficult to swallow (3.74), slightly sweet taste (4.35), after bitter taste is not noticeable (4.16), and less preferred (2.42).The best breakfast cereal showed a lower rat blood glucose response by inhibiting the increase in blood glucose levels in the normal and diabetic rat groups compared to the comparison breakfast cereal with Δ blood glucose response at 15, 30, 60, 90, 120 minutes in the normal rat group respectively are 5.41 mg/dL, 5.77 mg/dL, 4.21 mg/dL, -3.83 mg /dL, and -5.41 mg/dL, and in the diabetic rat group are 3.73 mg/dL, 2.41 mg/dL, -5.66 mg/dL, -7.34 mg/dL respectively , and -7.94 mg/dL. Glycemic index of the best breakfast cereal is 49.75 while glycemic index of the commercial breakfast cereals (havermout, oriflakes, and corn variants of energen) are 58.65, 58.96 and 60.51, respectively. The breakfast cereals (T1B3) were classified into the food with low glycemic index value group meanwhile all the commercial breakfast cereals were classified into the food with moderate glycemic index value group..

Keyword : *breakfast, diabetes mellitus, glycemic index, jackbean, porang, red dragon fruit, sirampog black rice*