

DEVELOPMENT OF A HIGH-PROTEIN ENTERAL FORMULA BASED ON EGG WHITE POWDER AND ORANGE JUICE WITH ANTIOXIDANT ACTIVITY

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ABSTRACT

Background: Cancer patients often suffer from malnutrition due to reduced food intake and metabolic disorders. High-protein enteral formulas (HPEF) can serve as a nutritional intervention. Egg white powder is a high-quality protein source, while orange juice provides natural antioxidants beneficial during cancer therapy.

Objective: This study aims to develop a High-Protein Enteral Formula (HPEF) based on egg white powder and orange juice and to evaluate its nutritional value, viscosity, osmolality, organoleptic properties, production cost, and antioxidant activity.

Method: A quasi-experimental study was conducted using a Completely Randomized Design (CRD) with three HPEF variations and one commercial formula as control. Nutritional values were analyzed using Nutrisurvey software. Organoleptic testing was conducted by 25 semi-trained panelists. Viscosity and osmolality were measured instrumentally. Antioxidant activity was tested using the DPPH method. Cost analysis was based on ingredient prices in the local market.

Results: The developed HPEF provided $\geq 20\%$ of energy from protein, had acceptable viscosity (9–20 cP), and osmolality within the recommended range (300–500 mOsm/L). Organoleptic tests showed favorable acceptance in color, texture, taste, and especially aroma, enhanced by the addition of orange juice. The antioxidant activity increased due to orange juice content. Production costs were significantly lower than commercial enteral formulas.

Conclusion: The HPEF formulated with egg white powder and orange juice is a promising, affordable, and nutritionally appropriate alternative for cancer patients requiring enteral nutrition support.

Keywords: enteral formula, high-protein, egg white powder, orange juice, antioxidant.

PENGEMBANGAN FORMULA ENTERAL TINGGI PROTEIN BERBAHAN DASAR TEPUNG PUTIH TELUR DAN SARI BUAH JERUK SERTA AKTIVITAS ANTIOKSIDAN

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ABSTRAK

Latar Belakang: Pasien kanker sering mengalami malnutrisi akibat penurunan asupan makan dan gangguan metabolisme. Formula enteral tinggi protein (FETP) dapat menjadi solusi untuk menunjang kebutuhan nutrisi mereka. Tepung putih telur merupakan sumber protein berkualitas tinggi, sedangkan sari buah jeruk mengandung antioksidan alami.

Tujuan: Penelitian ini bertujuan mengembangkan FETP berbahan dasar tepung putih telur dan sari buah jeruk serta mengevaluasi nilai gizi, viskositas, osmolaritas, sifat organoleptik, biaya pembuatan, dan aktivitas antioksidannya.

Metode: Penelitian ini merupakan quasi eksperimental dengan Rancangan Acak Lengkap (RAL) menggunakan tiga variasi FETP dan satu kontrol (formula enteral komersial). Pengujian meliputi analisis gizi (Nutrisurvey), uji organoleptik oleh 25 panelis agak terlatih, pengukuran viskositas dan osmolaritas, uji aktivitas antioksidan metode DPPH, serta analisis biaya produksi.

Hasil: FETP memiliki kandungan protein $\geq 20\%$ dari total energi, viskositas 9–20 cP, dan osmolaritas dalam rentang aman (300–500 mOsm/L). Uji organoleptik menunjukkan bahwa panelis menyukai warna, rasa, kekentalan, dan aroma, terutama setelah penambahan sari buah jeruk. Aktivitas antioksidan formula juga meningkat. Biaya pembuatan lebih rendah dibandingkan formula komersial.

Kesimpulan: FETP berbahan dasar tepung putih telur dan sari buah jeruk memiliki potensi sebagai formula enteral alternatif yang aman, terjangkau, bergizi tinggi, dan sesuai dengan prinsip diet pasien kanker.

Kata Kunci: formula enteral, tinggi protein, tepung putih telur, sari buah jeruk, antioksidan