

ABSTRACT

A research on the formulation of banana instant porridge with sweetener of sucrose, isomaltose-oligosaccharide (IMO) and *fibercreme* had been conducted. This study aimed to evaluate the effects of replacement of sucrose with IMO and *fibercreme* on (i) the sensoric and physical properties of the porridge and (ii) the blood glucose reduction of STZ-NA induced diabetic rat fed with banana instant porridge (iii) to evaluate the mechanism of blood glucose reduction an *in vitro* study on the inhibition of glucose absorption.

Replacement of sucrose with IMO and *fibercreme* in the banana instant porridge based on its sweetness similarity of the product. The hypoglycemic effect of the porridges were evaluated *in vivo* using STZ-NA induced diabetic rats. Twentyfive healthy male rats weight of 170-190 gram were divided into 5 groups of 5 rats. Five rats were used as the healthy control group fed with standard diet (AIN 93M). Twenty rats were induced diabetic with injection of STZ-NA and fed with 4 different diets including standard diet (sick control group), and three banana porridge diets with different sweetener including sucrose (BPS group), IMO (BPIMO) and *fibercreme* (BPFC). Formula of the porridge diets referred to AIN 93 M with substitution of banana porridge by 30% energy. Blood glucose level was measured weekly for 4 weeks and digesta characteristics were observed at the end of the experiment. Inhibition of glucose absorption was evaluated *in vitro*.

The results showed that replacement of sucrose with IMO have no effect on the overall sensoric properties and water holding capacity but increase the viscosity and reduce rehydration time of the banana porridge. Replacement of sucrose with *fibercreme* did not change the sensoric properties, decrease the water holding capacity and viscosity but increase the rehydration time of the banana porridge. Banana porridge with IMO sweetener has the greatest ability to lower blood glucose (54,04%) compared to banana porridge with fibercrème (47.82%) and sucrose sweetener (38.24%). The *in vitro* study revealed that glucose reduction effect of the banana porridge were caused by inhibition of glucose absorption.

Keywords : banana, resistant starch, diabetic, dietary fiber

INTISARI

Telah dilakukan penelitian formulasi bubur instan berbasis tepung pisang uter dengan variasi pemanis berupa sukrosa, isomaltosa-oligosakarida (IMO) dan *fibercreme*. Penelitian ini bertujuan untuk (i) mengevaluasi sifat sensoris dan sifat fisik bubur pisang uter instan dengan pemanis sukrosa, IMO dan *fibercreme* (ii) mengevaluasi pengaruh formulasi bubur pisang uter instan dengan pemanis sukrosa, IMO dan *fibercreme* terhadap penurunan kadar gula darah tikus diabetes induksi STZ-NA, dan (iii) mengetahui daya penghambatan absorpsi glukosa secara *in vitro* pakan yang disubstitusi bubur pisang uter dengan pemanis sukrosa, IMO dan *fibercreme*.

Variasi formula bubur pisang uter instan didasarkan pada kesetaraan tingkat kemanisan. Terhadap ketiga jenis bubur tersebut dilakukan uji sifat sensoris, sifat fisik dan efeknya terhadap kadar glukosa tikus diabetes induksi STZ-NA secara *in vivo*. Dua puluh lima ekor tikus jantan dengan berat 170-190 gram dibagi menjadi 5 kelompok masing-masing 5 ekor. Lima kelompok tikus yaitu kontrol sehat, kontrol sakit, diet bubur pisang dengan pemanis sukrosa (BPS), pemanis IMO (BPIMO) dan pemanis fiber crème (BPFC). Formula pakan mengacu AIN⁹³M dengan substitusi bubur pisang sebesar 30% energi total. Kadar glukosa darah dipantau tiap minggu selama 4 minggu dan karakteristik digesta diamati pada akhir percobaan.

Hasil penelitian menunjukkan bahwa penggantian sukrosa dengan IMO tidak memberikan pengaruh pada sifat sensoris dan *water holding capacity* (WHC) namun meningkatkan viskositas dan mengurangi waktu seduh dari bubur pisang uter instan. Penggantian sukrosa dengan *fibercreme* tidak mengubah sifat sensoris, tetapi menurunkan WHC dan viskositas namun meningkatkan waktu seduh bubur pisang uter. Bubur pisang uter dengan pemanis IMO memiliki kemampuan tertinggi untuk menurunkan gula darah (54,04%) dibandingkan dengan bubur pisang uter dengan pemanis *fibercreme* (47,82%) dan pemanis sukrosa (38,24%). Penelitian secara *in vitro* menunjukkan bahwa efek penurunan glukosa dari bubur pisang disebabkan oleh penghambatan absorpsi glukosa.

Kata kunci : pisang, pati resisten, serat pangan, diabetes