ANTIOXIDANT ACTIVITY OF DIFFERENT MICROPARTICULATE SIZES OF EDIBLE BIRD NEST INCORPORATED INTO YOGURT

Farahniza, Z., E.U. Engku Hanisah, S. Norhasidah and B. Abdul Salam*

School of Chemical Sciences and Food Technology, Faculty of Science & Technology, Universiti Kebangsaan Malaysia, 43600 Bangi Selangor, Malaysia
*daging@ukm.edu.my

Introduction

Yogurt is a fermented dairy product, formed during the slow lactic fermentation lactose from milk by thermophilic lactic acid bacteria [1]that has gained in popularity in the United States. It is consumed in developed countries as dessert,snacks, complete lunch and diet food. It is widely consumed as functional food because of the good taste and nutritional properties being rich in potassium, calcium, protein and vitamins [1].

Material & Method

Preparation of Yogurt

Different microparticulate sizes of EBN were pre-treated by soaking followed by double boiling. Yogurts were prepared using standard procedure with slight modification[2]. The product was prepared in triplicates..

Antioxidant Analysis

Antioxidant activity was determined using 2,2-diphenyl-1-picrylhydrazyl (DPPH) [3]and 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) [4] radical scavenging and ferric reducing power (FRAP) [5]assays with slightly modified.

Statistical Analysis

The experiment was repeatedthree times and all data were analyzed using SAS version 9.1, whereas one-way Analysis of Variance (ANOVA) test was used to recognized the significant different of the samples [6].

Result & Discussion

Different mechanism involved exhibit different antioxidant activity of EBN-yogurt samples. Addition of EBN into yogurt significantly increase ($p<0.05$) the antioxidant activity, measured by DPPH and ABTS radical scavenging and ferric reducing power assay.There is no significant different ($p>0.05$) on antioxidant activity of yogurt incorporated with EBN raw, 710µm and 300µm.The functionality of yogurt is enhanced by the release of bioactive peptides during lactic fermentation. These peptides are encrypted in the milk proteins were released during fermentation due to proteolytic activities of the organism used [8]. Proteolysis is important to breakdown of large and complex protein into smaller and simple peptides, which dependents on pH and strain. However, by reducing microparticulate sizes of EBN to 38µm, the antioxidant activities become lower.The greater surface area of EBN powder, accelerated the oxidation process, resulting in lower antioxidant activity, which decreased significantly ($p<0.05$) [7].

Addition of microparticulates sizes of EBN in yogurt without any pre-treatment did not cause significant changes to antioxidant activity. The pretreatment (soaking and heating) cause the unfolding the alpha-helix of EBN structure, and allowing H_2O to swell up and increase the exposure to the polar and non-polar amino acid. This reaction was increase the strength of scavenging reactive oxygen species (ROS).

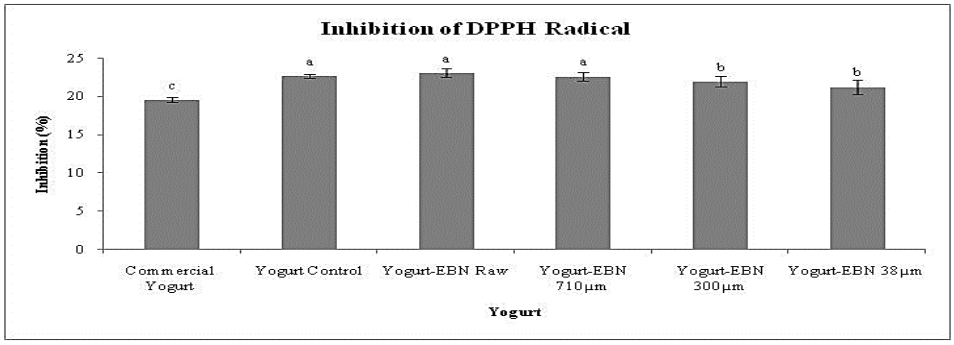

Figure 1 Antioxidant activity in yogurt, incorporated with different microparticulate sizes of EBN (raw, 710µm, 300µm and 38µm) was compared to control (without EBN) and commercial yogurt using DPPH radical scavenging assay
The results are expressed as mean values±standard deviation. [a-c]Mean with difference alphabets showed significant differences ($p<0.05$)

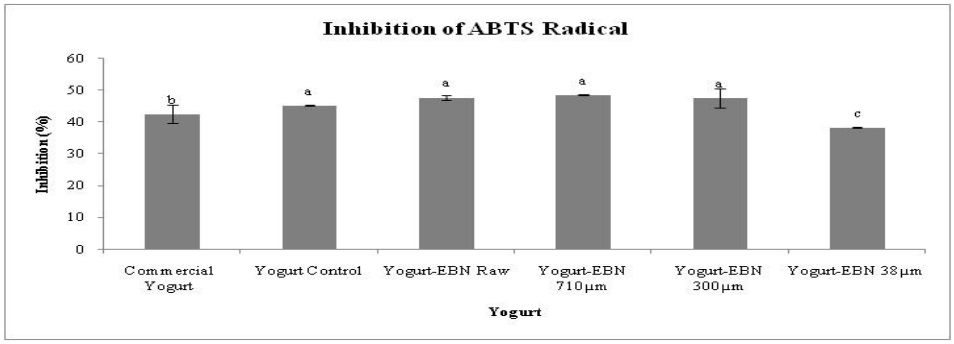

Figure 2 Antioxidant activity in yogurt, incorporated with different microparticulate sizes of EBN (raw, 710µm, 300µm and 38µm) compared to control (without EBN) and commercial yogurt using ABTS radical scavenging assay
The results are expressed as mean values±standard deviation. [a-c]Mean with difference alphabets showed significant differences ($p<0.05$)

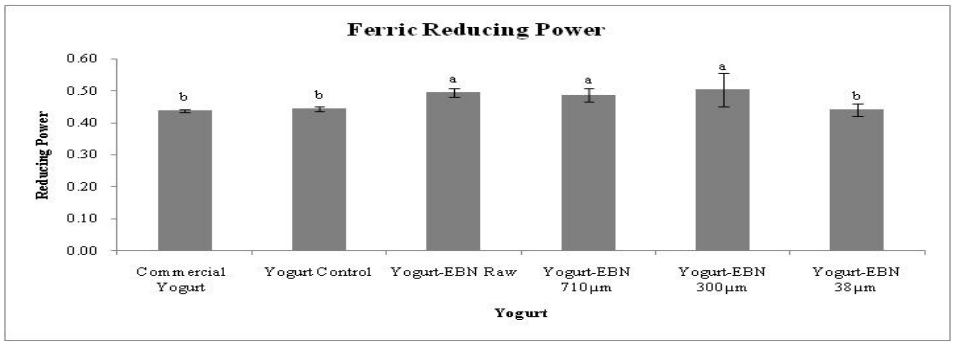

Figure 3 Antioxidant activity in yogurt, incorporated with different microparticulate sizes of EBN (raw, 710µm, 300µm and 38µm) compared to control (without EBN) and commercial yogurt using ferric reducing power assay
The results are expressed as mean values±standard deviation. [a-b]Mean with difference alphabets showed significant differences ($p<0.05$)

Conclusion

In conclusion, EBN was found to exhibit high antioxidant properties that can be incorporated into yogurt. Addition of different microparticulates sizes of EBN in yogurt without any pre-treatment did not cause significant changes to antioxidant activity.

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