

CHOCOLATE CAKES PREFERENCE USING RANKING FUZZY NUMBERS

(Keutamaan Kek Coklat Menggunakan Pemangkatan Nombor Kabur)

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ABSTRACT

Ranking is one of the widely used evaluation methods in deciding the best food that is available in today's competitive market. However, ranking is not always a straight forward process especially when dealing with fuzzy linguistic of multi-attributes evaluation. This paper presents a method of ranking fuzzy numbers to ranking of four selected chocolate cakes according to five attributes. Data in the form of linguistic terms from a sensory experiment were collected from thirty judges in Terengganu. Judges evaluate the chocolate cakes according to five major sensory attributes, i.e. colour, sweetness, texture, humidity and flavour on a 5-point linguistic terms. Sensory data were transformed into fuzzy numbers using linguistic values. Decisions are made based on the centroid point $(\bar{x}(A), \bar{y}(A))$, where $\bar{x}(A)$ and $\bar{y}(A)$ indicate the distance values from the centroid point to original point on horizontal axis and vertical axis for a fuzzy number. These points permit to characterise the evaluation behaviour of the attributes of chocolate cakes. It is found that no single cake was dominating the first ranking in all the five attributes. The analyses of sensory evaluation using a method of ranking fuzzy numbers successfully ranked the chocolate cakes with multi-attributes.

Keywords: Fuzzy numbers; centroid; decision making; food preference; sensory evaluation

ABSTRAK

Pemangkatan adalah satu daripada kaedah penilaian yang digunakan secara meluas dalam menentukan makanan terbaik di pasaran kompetitif hari ini. Walau bagaimanapun pemangkatan bukanlah suatu proses yang selalunya mudah terutamanya apabila mengendalikan penilaian multiatribut linguistik kabur. Dalam makalah ini dibentangkan satu kaedah pemangkatan nombor kabur untuk memangkatkan empat buah kek coklat terpilih berdasarkan lima atribut. Data dalam bentuk sebutan linguistik daripada suatu uji kaji deria diambil daripada tiga puluh orang penilai di Terengganu. Penilai membuat penilaian ke atas kek coklat berdasarkan lima atribut, iaitu warna, kemanisan, tekstur, kelembapan dan rasa dalam sebutan linguistik lima titik. Ketidakpastian data deria diubah kepada nombor kabur menggunakan nilai linguistik. Keputusan dibuat berdasarkan pengiraan titik sentroid $(\bar{x}(A), \bar{y}(A))$, yang $\bar{x}(A)$ dan $\bar{y}(A)$ mewakili jarak dari titik sentroid ke titik asalan pada paksi mendatar dan paksi menegak nombor kabur. Titik-titik ini mencirikan perlakuan penilaian atribut kek coklat. Didapati tidak terdapat satu kek yang dominan bagi semua atribut. Analisis penilaian deria menggunakan pemangkatan nombor kabur berjaya memberi pemangkatan bagi kek coklat dengan pelbagai atribut.

Kata kunci: Nombor kabur; sentroid; pembuatan keputusan; keutamaan makanan; penilaian deria

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