

INTISARI

Gummy candy banyak diminati masyarakat namun memiliki nilai nutrisi yang rendah, sehingga dilakukan pengembangan formulasi *gummy candy* fungsional dengan menambahkan kolagen tripeptida yang berkhasiat untuk menjaga kesehatan kulit. Pengembangan formulasi *gummy candy* fungsional juga dapat dilakukan melalui penggantian gelatin dengan karagenan yang relatif lebih aman dikonsumsi serta tidak memiliki konflik agama dan etika. Karagenan sebagai *gelling agent* terdiri dari kappa karagenan dan iota karagenan. Kappa karagenan menghasilkan gel yang keras, kaku, dan rapuh, sedangkan iota karagenan menghasilkan gel yang lunak dan elastis. Penelitian ini bertujuan untuk mengevaluasi pengaruh variasi komposisi kappa karagenan dan iota karagenan sebagai *gelling agent* terhadap karakteristik fisik dan atribut sensoris *gummy candy* kolagen tripeptida, serta menentukan komposisi optimum dari kappa karagenan dan iota karagenan yang diperlukan sebagai *gelling agent* pada *gummy candy* kolagen tripeptida.

Optimasi komposisi kappa karagenan dan iota karagenan dilakukan dengan metode *simplex lattice design (SLD)* menggunakan *software Design Expert versi 13*. Pengujian yang dilakukan meliputi uji karakteristik fisik yaitu pH, organoleptik, kadar air, karakteristik tekstur, dan sineresis, serta uji hedonik. Verifikasi formula optimum dilakukan menggunakan *one sample t-test* menggunakan *software IBM SPSS versi 25*. *Gummy candy* dengan formula optimum kemudian diuji pelepasan kolagen tripeptida dan ditetapkan kadarnya dengan *Bicinchoninic Acid (BCA) Protein Assay*.

Hasil penelitian menunjukkan bahwa variasi komposisi kappa karagenan dan iota karagenan mempengaruhi karakteristik fisik dan atribut sensoris *gummy candy* kolagen tripeptida. Formula optimum *gummy candy* kolagen tripeptida didapatkan dari kombinasi 0,632% kappa karagenan dan 0,368% iota karagenan sebagai *gelling agent*. Formula ini memberikan karakteristik fisik dan penerimaan sensoris terbaik, sehingga dapat dijadikan dasar dalam pengembangan produk *gummy candy* kolagen tripeptida. Kadar kolagen tripeptida yang terdeteksi dalam *gummy candy* dengan formula optimum adalah sebesar $3,541 \pm 0,033$ % dan sebanyak $88,516 \pm 0,823$ % kolagen tripeptida dapat dilepaskan dari matriks *gummy candy* dalam waktu 120 menit.

Kata kunci: *gummy candy*, kolagen tripeptida, kappa karagenan, iota karagenan, *simplex lattice design*

ABSTRACT

Gummy candy is widely in demand by the public but has low nutritional value, so the development of functional gummy candy formulations is carried out by adding collagen tripeptide which is efficacious in maintaining skin health. The development of functional gummy candy formulations can also be done by replacing gelatin with carrageenan which is relatively safer to consume and has no conflict regarding its halal status. Carrageenan as a gelling agent consists of kappa carrageenan and iota carrageenan. Kappa carrageenan produces a hard, stiff, and brittle gel, while iota carrageenan produces a soft and elastic gel. This study aims to evaluate the effect of variations in the composition of kappa carrageenan and iota carrageenan as gelling agents on the physical characteristics and sensory attributes of collagen tripeptide gummy candy, as well as to determine the optimum composition of kappa carrageenan and iota carrageenan needed as gelling agents in collagen tripeptide gummy candy.

Optimization of kappa carrageenan and iota carrageenan composition was carried out using the simplex lattice design (SLD) method using Design Expert software version 13. Tests carried out included physical characteristics tests, namely pH, organoleptic, water content, texture characteristics, and syneresis, as well as hedonic tests. Verification of the optimum formula was carried out using a one sample t-test using IBM SPSS software version 25. Gummy candy with the optimum formula was then tested for the release of collagen tripeptide and its levels were determined using the Bicinchoninic Acid (BCA) Protein Assay.

The results showed that variations in the composition of kappa carrageenan and iota carrageenan affected the physical characteristics and sensory attributes of collagen tripeptide gummy candy. The optimum formula for collagen tripeptide gummy candy was obtained from a combination of 0.632% kappa carrageenan and 0.368% iota carrageenan as a gelling agent. This formula provides the best physical characteristics and sensory acceptance, so it can be used as a basis for developing collagen tripeptide gummy candy products. The level of collagen tripeptide detected in gummy candy with optimum formula was $3.541 \pm 0.033\%$ and as much as $88.516 \pm 0.823\%$ of collagen tripeptide could be released from the gummy candy matrix within 120 minutes.

Keywords: *gummy candy, collagen tripeptide, kappa carrageenan, iota carrageenan, simplex lattice design*