

## Development of Carrot Puree with Algae for the Elderly with Dysphagia

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**Abstract :** The study was conducted to explore the methods and tools to improve texture and preserve the total phenolic and antioxidant compounds of dysphagia foods produced from carrot-based puree with decolourised *Chlorella* algae. Textural properties (Texture profile analysis [TPA]; the International Dysphagia Diet Standardization Initiative, particle size test [PST]) and rheological properties (viscosity and viscoelastic properties) of carrot puree defrosted by different treatments (microwave, steamer, oven), were characterised using hydrocolloids (guar gum, k. carrageenan, and xanthan gum), and the results were compared to a level 4 commercial sample. DPPH (2,2-diphenyl-1-picrylhydrazyl) antiradical scavenging radicals and total phenolic contents were employed to evaluate the total phenolics, and radical scavenging properties of defrosted carrot puree sonicated carrot puree (20 Hz, 30 min, 60 °C), and vacuum-dried carrot powder with the addition of algae. Results show that the viscosity, viscoelasticity test, TPA, and PST of the commercial sample were comparable to those of guar gum and xanthan gum containing puree, suggesting that they could be used as dysphagia diets. There was no noticeable decolourisation of the *Chlorella* pigment. Additionally, the use of the microwave, steamer, and oven for defrosting treatment had an impact on the textural characteristics of the moulded samples upon cooling and also contributed to the reduction in the total phenolic and antioxidant properties of the samples. Sonication treatments of algae exposure reduced the cloudiness of the green pigment and lightened the colour of the samples containing algae, and they also reduced the drying time from 2.5 to 1.5 hours during the preliminary work. The low-temperature vacuum- and freeze-dried samples increased the concentration of the powder and resulted in an increase in the total phenolic content of the dry samples. The dried products may therefore have the potential to become more nutrient-dense to benefit the health of individuals with dysphagia.

**Keywords :** dysphagia, elderly, hydrocolloids, carrot puree

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