Effect of carboxymethyl cellulose, aquafaba, and Wolffia on the qualities of vegan salad dressing

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Abstract

The key ingredient commonly used as an emulsifier in most salad dressings is egg yolk. Vegan foods have gained significant momentum worldwide. To develop vegan salad dressings, aquafaba has been used as an egg replacer. Carboxymethyl cellulose (CMC) has also been used as a stabilizer to improve the stability of vegan salad dressings. Reduced-fat vegan salad dressings were formulated by replacing oil with chickpea aquafaba to create a healthier alternative with fewer calories. Furthermore, *Wolffia globosa* was added to the vegan salad dressing to increase its nutritional content. The effect of CMC, aquafaba, and Wolffia concentration on the qualities of vegan salad dressing was investigated. The control salad dressing (made from egg yolk) and the vegan salad dressing containing 0.2-0.3 wt% (% w/w) CMC were highly stable, with an emulsion stability index (ESI) of more than 90%. The fat content of the vegan salad dressing was reduced from 60 to 45 wt% without significantly affecting its ESI (analyzed via analysis of variance and Duncan's new multiple range test at 95% confidence level). The droplet diameter of full-fat vegan salad dressing with 60 wt% oil was significantly larger than that of reduced-fat vegan salad dressing with 45 wt% oil. Fortification with Wolffia significantly reduced the lightness, redness, and ESI of the vegan salad dressing. The research findings could benefit further studies aimed at develop an alternative healthy product.

Keywords: *chickpea, egg replacement, plant-based salad dressing, superfood, Wolffia globosa.*