Development of Flavored Air-frying Oil Sprays Infused with Spice Oleoresins: Formulation, Physicochemical Characterization and Sensory Evaluation

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This study aimed to develop flavored air-frying oil sprays infused with spice oleoresins for potato chips and fish fillets, introducing a novel concept of flavoring air-fried food. The initial selection of base oil for the formulation was carried out among virgin coconut oil, sunflower oil and olive oil by evaluating their smoke point, oxidative stability, volatility, viscosity and spray ability. According to the physicochemical characterization, sunflower oil exhibited the highest smoke point (223.44 ± 3.36ºC) and olive oil and virgin coconut oil possessed relatively lower smoke points (185 ± 3.77ºC and 187.11 ± 3.86ºC respectively). Virgin coconut oil had the highest oxidative stability with the lowest peroxidase value (0.8156 ± 0.2354) based on iodometric titration compared to sunflower oil (9.228 ± 0.301) and olive oil (9.720 ± 0.568). Organoleptically accepted different formulations of oleoresins extracted from garlic, onion, and red chili were infused into virgin coconut oil, which was chosen as the optimal base oil. Infused oils were separately sprayed (0.65g of oil/100g of potato chips) onto potato chips and air-fried for 13 min at 180ºC. The development of flavored air frying oil sprays for fish fillets was done by infusing virgin coconut oil with different combinations of oleoresins of garlic, rosemary, red chili and black pepper. Fresh fish fillets of Sphyraena barracuda were separately sprayed with oil formulations and air-fried for 10 min at 160ºC. Based on sensory-evaluation studies conducted with 30 untrained consumer panelists, formulations of oleoresin-infused air-frying oils for potato chips 1.5%(v/v), at the ratio of 3:3:4 and (onion: garlic: red chili) and fish fillets 4.0%(v/v) at the ratio 4:2:2:1 (garlic: rosemary: chili: black pepper) respectively received the highest acceptance for their flavor, color, texture, and overall mouthfeel, highlighting their potential as marketable products. This innovative flavoring technique for air-fried food products is likely to capture the interest of food processors, caterers and household consumers, due to its convenience, consistent flavoring, and cost-effectiveness.

Keywords: Air-frying, oleoresins, flavored oil, sensory evaluation