Abstract

Project Code: MRG6080261

Project Title: Development of electrostatic food powder system and its application in flavoring baked potato chips (การพัฒนาเครื่องเคลือบอาหารด้วยระบบไฟฟ้าสถิตและการนำไปใช้ประโยชน์ในการเคลือบผงปรุงรสมันฝรั่งอบกรอบ)

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Abstract

Powder coating is an important process in the food industry, especially for snack foods such as potato chips, cakes, donuts, shredded cheese, crackers, and pretzels. Powder coating creates variety in food, producing different flavors and appearance. Electrostatic coating has been adopted in order to provide better efficiency and lower the dust produced during coating. The efficiency of electrostatic coating is affected by characteristics of the powder, including particle size, density, resistivity, and flowability. An understanding of these factors can be used to predict the coating performance in food production and help the processor choose the best system for coating food products. Some studies have been done on the application of electrostatic coating to food processing; however, an appropriate electrostatic powder coating system with conveyor belt for consumer testing is still needed to be studied and developed in order to make it applicable in food coating industry. The objectives of this research are developing a proper electrostatic powder coating system and studying of its application in baked potato chip production. There were two main parts in this research. In the first part, different types of NaCl (refined and table salts) were coated on baked potato chips at 0, 30, 40, 50, 60, and 70 kV. After coating with either refined or table salt, transfer efficiency, adhesion after coating, coating evenness and texture of samples were

determined. Higher transfer efficiency, adhesion and coating evenness were observed when electrostatic coating was conducted at 30 – 50 kV. Most samples with higher transfer efficiency, adhesion and evenness were obtained after electrostatic coating. However, it did not significantly affect hardness of baked potato chips. In the second part, refined and table salts were coated with/without electrostatics (30 kV) on baked potato chips at different conveyor belt speeds (0-22.72 cm/s). Electrostatic coating of table salt at every speed produced higher transfer efficiency than nonelectrostatic coating while electrostatic coating of refined salt at 0-8.6 cm/s produced higher transfer efficiency than nonelectrostatic coating. Better adhesion was obtained during electrostatic coating of both refined and table salts. At high speeds, electrostatic coating with refined salt tended to produce lower coating evenness while electrostatic coating with table salt slightly increased hardness of products coated.

Keywords: Electrostatic food powder coating; sodium chloride; adhesion; transfer efficiency; baked snack food