Evaluating non-stick properties of different surface materials for contact frying

The paper describes, characterises and validates the construction of an experimental rig for making contact frying experiments under controlled conditions. The construction enables a controlled fouling of different coatings on steel and aluminium plate under realistic frying conditions, in order to evaluate non-stick and cleaning properties of the coatings. In accordance with industry standards pancake was selected as the food model for the non-stick properties. The performance of different frying surfaces (stainless steel, aluminium, PTFE (polytetrafluoroethylene) and three ceramic coatings with two different levels of smoothness) were tested at different frying temperatures and rated by a standardised rating procedure. The subjective rating assessment was validated by measuring the force of adhesion. The performances of the surfaces were reproducible and significantly different to be used for screening of new surface coatings for contact frying tested in frying experiments at the same temperature. In contrast, conventional testing in a convection oven could not distinguish between these surfaces. Comparative tests of the ceramic coatings showed that surface roughness had a distinct effect on their non-stick properties, so that the smoother surfaces gave a higher force of adhesion between pancake and surface.

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