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Cassava is one of current and future alternative staple foods in Indonesia. However, cassava lacks micronutrients, e.g. iron. Iron deficiency remains a nutritional problem in Indonesia. Fortification of food is a common strategy for fighting against iron deficiency worldwide, including in Indonesia. However, the use of free iron as a fortificant may induce some undesirable effects, such as potential interaction with other beneficial food components, some food darkening, and metal taste in the final food products. Microencapsulation technique may solve the problems by protecting iron from environmental conditions. The objectives of this study were then to investigate the sensory effect and bioaccessibility of microencapsulated iron-fortified cassava flour and flakes in comparison to the supply of free iron.

Iron was microencapsulated using a combination of maltodextrin and whey. Cassava flour and flakes were fortified by microencapsulated iron following an internationally recommended dosage. Sensory evaluation involved 70 untrained panelists. An *in vitro* digestion experiment mimicking human gastrointestinal tract conditions was conducted to determine bioaccessibility of free iron and microencapsulated iron in cassava flakes.

The results showed that moisture content and particle size of microencapsulated iron met general characteristics of spray dried microcapsules. Fortification of microencapsulated iron increased iron content, without influencing moisture content, color, and whiteness index of the original cassava flour. Cassava flakes fortified with microencapsulated iron was brighter than those fortified with free iron. Bioaccessibility of iron from cassava flakes fortified with microencapsulated iron was higher than that of fortified with free iron with 49.7% and 34.4%, respectively. Cassava flakes fortified with microencapsulated iron was preferred by untrained panelists. The results imply that the microencapsulation technique could reduce potential interaction of iron with other food components, reduce its exposure to environment, and hence improve its bioaccessibility with acceptable sensory characteristics, which in turn, may enhance its bioavailability and thus efficiency.

Keywords: cassava, iron, fortification, microencapsulation, sensory, bioaccessibility