

## ABSTRACT

Turmeric (*Curcuma longa*) is an herbal plant utilized in various fields, including health and research. Its main active compound, curcumin, offers multiple benefits such as anti-inflammatory, antioxidant, antimicrobial, and anticancer properties. However, the utilization of turmeric remains suboptimal due to the low bioavailability of curcumin. Its hydrophobic nature leads to poor water solubility, resulting in inefficient absorption in the body. To overcome this limitation, microencapsulation technology using the spray drying method is employed as a solution to enhance curcumin's stability and effectiveness in the body. This study aims to determine the most effective formulation to improve curcumin bioavailability by designing three microcapsule variations (F1, F2, F3), using cassava starch and maltodextrin as the primary components. The bioavailability of curcumin was examined through in vitro testing using a calibrated dissolution method. The results showed that the curcumin extract contained 2.30% moisture and 12.40% curcumin. Physical evaluation using Scanning Electron Microscopy (SEM) revealed that the microcapsules had a particle size ranging from 3.715 to 13.79  $\mu\text{m}$ . Formula 3 demonstrated the best results, as it had the smallest particle size and the highest bioavailability values, 1.04% in gastric conditions and 4.40% in intestinal conditions.

**Keywords:** Microencapsulation, Spray Drying, Bioavailability, Curcumin, Turmeric