

Abstract

Indonesia's pharmaceutical industry depends a lot on imported active ingredients, including riboflavin, even though it can produce riboflavin locally. This study looks into spray drying as an effective and scalable way to microencapsulate riboflavin using maltodextrin, gelatin, and a mix of both as wall materials. Three formulas were tested: RM4 (maltodextrin), RG4 (gelatin), and RMG4 (combination). They were evaluated based on yield, moisture content, particle size, flowability, and how well they encapsulated riboflavin. The results showed that RM4 had the highest powder recovery (68.60%) and worked best in terms of flow. Meanwhile, RMG4 had the highest encapsulation efficiency (99.75%) and the least riboflavin on its surface (0.25%), which means it protects against degradation better. However, RMG4 also had the worst flowability and a moderate yield because of higher viscosity and clogging issues with the atomizer. These findings suggest a balancing act between encapsulation efficiency and ease of processing. Using both maltodextrin and gelatin may improve protection, but can make manufacturing more complicated. Future research should look into long-term stability and how to optimize the process for industry use.

Keywords: Riboflavin, Encapsulation efficiency, Spray drying, Maltodextrin, Gelatin