SURVIVAL OF ENCAPSULATED PROBIOTIC USING EXTRUSION TECHNIQUE IN BILE
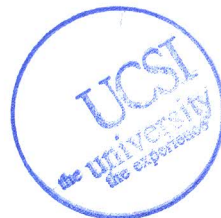
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ABSTRACT

Some studies have shown that probiotic bacteria cannot reach the gastrointestinal tract with enough viable cell count to be able to exert various health benefits to the host. Therefore it has to be encapsulated to help it endure the harsh environment in the body. This research is to determine the survival of encapsulated probiotic bacteria in bile. The encapsulating materials consist of alginate (2-4%), inulin (1-3%) and glycerol (0.5-1.5%). The viability of free cells was from 6.95 to 12.99 log cfu/ml before exposure to simulated bile conditions and viability was 0 log cfu/ml after exposure. The viability of encapsulated cells was from 4.96 to 8.93 log cfu/ml before exposure to simulated bile conditions and viability was 3.01 to 7.3 log cfu/ml after exposure. This shows that encapsulating probiotic cells has an impact on its survivability. The data was fed into the Design-Expert software using Response Surface Methodology (RSM) and no significant models was given from the data as the probability was set to a limit of 0.05 while the values obtained had exceeded that value. Even though there was no significant model, but the software generated an optimized encapsulation concentration based on the given data. It consisted of inulin (0.72%), glycerol (2.59%) and alginate (2.94%) with a value of 6.28 log cfu/ml. Upon verification of the optimized concentration, it was found that the experimental values obtained from a mean of 3 measuments resulted in 6.24±0.07 which is quite close to the predicted value. This shows that the result generated by the software is quite accurate even though there were no significant models given. Further studies can be conducted by increasing the concentrations of the encapsulating materials or by using other materials such as k-carrageenan, Hi-maize starch or chitosan in order to obtain a significant model.