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ABE 30400

Bioencapsulation Pre-Lab

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1. What is the purpose of encapsulating the bacteria in this paper?

The purpose of encapsulating the bacteria is to create a medium to allow delivery of selected bacterial strains to the human body orally using yogurt as a medium. In order to do so, the capsule must protect the bacteria from the acidic environments of the yogurt and the stomach to allow for delivery to the large intestine, the target destination (Sun & Griffiths, 2000).

2. Why did the authors choose a combination of xanthan gum / gellan gum to encapsulate the bacteria?

While other encapsulation methods used in previous studies are not resistant to acidic environments, a literature study found that the gellan-xanthan gum combination and k-Carrageenan-Locust bean gum are two materials which can easily protect the contents of the capsule in the yogurt and stomach acidity. Gellan-xanthan gum was ultimately chosen over the k-Carrageenan-Locust bean gum because the latter requires potassium ions for stability, which affects the body's electrolyte balance when ingested in large quantities. Gellan-xanthan gum, however, uses calcium ions which does not affect the body's electrolyte balance, and thus is more ideal for the purpose of the study (Sun & Griffiths, 2000).

3. What questions did the authors want to answer by conducting the study?

The authors wanted to evaluate the gellan-xanthan gum combination in its ability to protect the bacterial cells from a variety of conditions, specifically pHs, that would be faced in the process of the delivery of the bacteria to the large intestine. These conditions included being exposed to peptone water, an environment of pH 4, pasteurized yogurt, and a simulated stomach acid (Sun & Griffiths, 2000).

### References

Sun, W., & Griffiths, M. W. (2000). Survival of bifidobacteria in yogurt and simulated gastric juice following immobilization in gellan-xanthan beads. *International Journal of Food Microbiology*, 61(1), 17-25. doi:10.1016/s0168-1605(00)00327-5