



**DIL Deutsches Institut für
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Opportunity for a Master's or Bachelor's Thesis

Topic

Encapsulation of vitamin A using emulsification and cold extrusion

Background and motivation

Vitamin A has key physiological functions, including immunity and reproduction but is susceptible to degradation by oxygen, light, and heat. To enhance stability, encapsulation technologies can be used to enclose sensitive compounds within a protective coating or matrix. These encapsulations are particularly well-suited for use in animal feed to ensure the animal's vitamin intake.

Combinations of techniques or multi-step approaches can enhance the overall efficiency of encapsulation and achieve more reliable protection and release properties. One efficient is cold extrusion which is a gentle process with low temperatures and low shear forces. Conventional encapsulation processes using cold extrusion typically incorporate vitamin A into a carrier material solely in its oil-dissolved form. However, the stability of vitamin A in an oil-based formulation is limited. The process engineering department at DIL is currently developing an optimized method. Here, vitamin A is incorporated into an emulsion for better protection.

Aim of the study

The aim of this study is to develop an optimized cold extrusion process for encapsulation. A systematic investigation will be conducted to identify the factors that most effectively improve process stability.

Tentative start of the study

01.12.2026 or upon agreement

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German Institute of Food Technologies

Dr. Volker Lammers / Maja Wilkens

Verfahrenstechnik / Process Engineering