# Dry Fractionation for Production of Functional Pea Protein Concentrates


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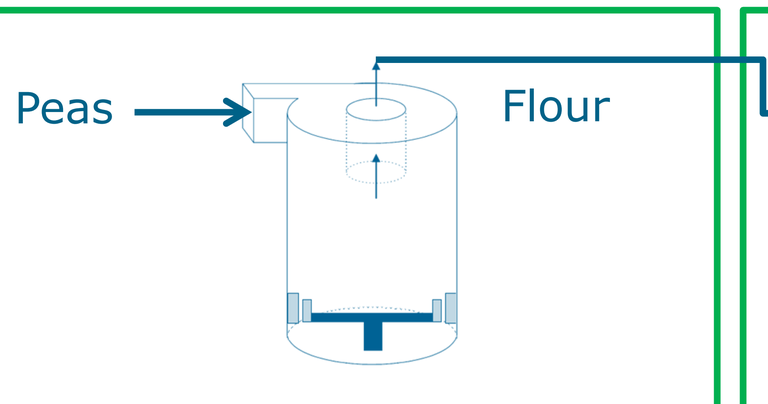
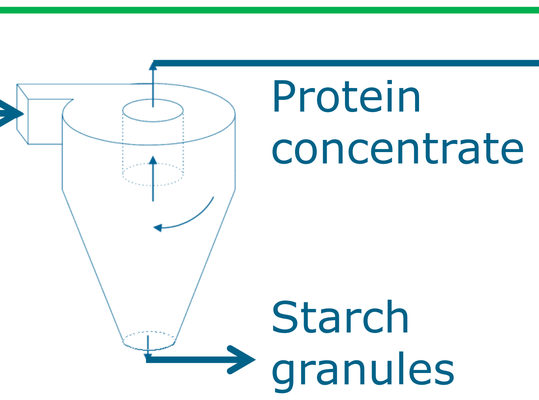
## Motivation

This study explores the possibilities of using dry fractionation to produce pea protein concentrates. The advantages over more commonly used wet fractionation are: lower energy and water use and retention of native protein functionality. The maximum protein purity of dry fractionation is 55% compared to 90% for wet fractionation.

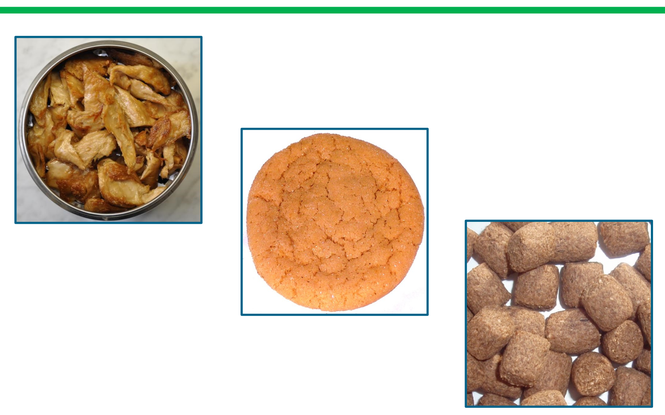
## Methods & Results



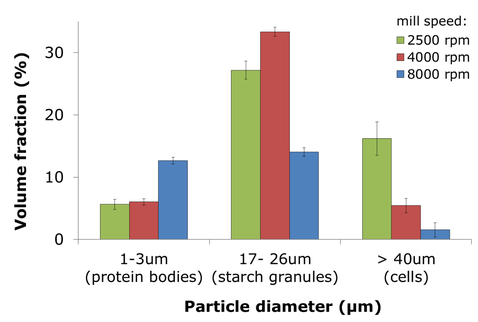

Disentangle protein bodies from starch granules with milling



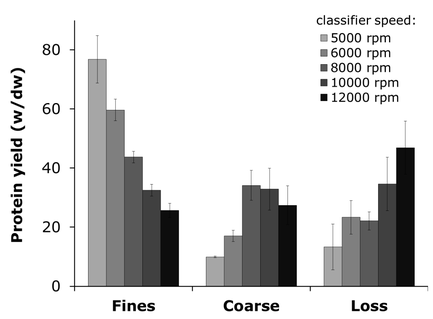

Separate the small protein bodies (1-3 µm) from the larger starch granules (22 µm) with an air flow



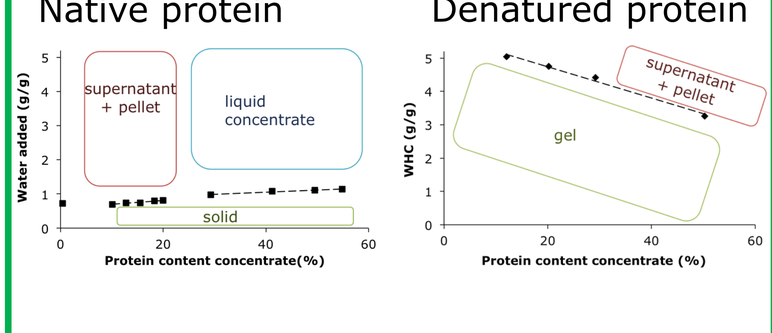
Applications in meat replacers, egg protein replacer and fish feed




2500 rpm: no complete disentanglement
4000 rpm: loose protein bodies and starch granules → optimal
8000 rpm: damage to starch granules




Lower classifier speed decreased loss and cohesiveness due to fouling.




Native: protein contents >30% → concentrated liquid, due to high solubility
Denatured: high WHC, due to gelatinized starch

## Highlights

- Milling was used to disentangle protein bodies and starch granules. Further air classification gave protein concentrates with protein contents between 51% and 55% (w/dw) and a maximum protein recovery of 77%.
- Dry fractionation yielded enriched fractions with functional properties:
  - Pea protein concentrate yielded a concentrated liquid with 26% (w/w) protein.
  - A high water holding capacity was obtained for pea flour after heat treatment.