

Course : Food Biochemistry

Chapter 02 : Proteins in food

Speciality: Agronomy

Exercises on food proteins

Exercise 01 : Basic concepts

You work in a quality control laboratory and need to identify the protein source in different food samples.

1. For each food, indicate the main protein present:

Milk: _____ Egg (white): _____ Beef: _____ Wheat
(flour): _____ Soy: _____

2. Name one important functional property for each of these proteins.

Exercise 02 : Technological Problem

In a cheese factory, the cheese yield (amount of cheese obtained from a liter of milk) has suddenly decreased. The curd formed is too soft and retains water poorly.

1. What is the key step in cheese making that involves milk proteins?
2. In your opinion, which parameter related to milk proteins could be causing this problem of a too-soft curd?
3. Propose one possible cause and one solution to remedy it.

Exercise 03 : Product reformulation

A company wants to develop a pea-based plant-based drink to replace cow's milk. The prototype has a pronounced "beany" taste (legume flavor) and a watery, non-creamy texture.

1. Briefly explain why the legume flavor can be a defect.
2. The "watery" texture is linked to a functional property of the proteins. Which one?
3. Propose two technological solutions (without adding synthetic thickeners) to improve the texture and mask the undesirable taste by working with the pea proteins.

Exercise 04 : Development of a new ingredient

An agricultural cooperative produces rapeseed meal (solid residue after oil extraction), which is rich in protein but underutilized. They want to use it to create a protein concentrate for human consumption. However, rapeseed proteins have low solubility and a dark color.

1. Why is low solubility a problem for use in human food?
2. Propose a simple scheme for extracting and purifying proteins from rapeseed meal.
3. What technique could be used to improve the solubility of these proteins after extraction?