Proteins from macroalgae
- Extraction and characterization

Louise Juul Pedersen¹, Annette Bruhn², Søren Krogh Jensen³, Trine Kastrup Dalsgaard¹
¹Aarhus University, Department of Food Science, Blichers Allé 20, 8830 Tjele, ²Aarhus University, Department of Bioscience, Vejløvej 25, 8600 Silkeborg, ³Aarhus University, Department of Animal Science, Blichers Allé 20, 8830 Tjele, Denmark

Project objective
- Optimize extraction and purification of high quality protein from different types of macroalgae.
- Characterize proteins in macroalgae across seasons

Obstacles
- Cell wall mucilages and polysaccharides reduce extractability.
- Process-modifications that reduce protein quality.

Species and season variation
Protein content, composition and quality are tested in Ulva sp. and Saccharina sp. across seasons.

Uptake of nutrients → Harvest (improved water quality) → Screw pressing → Pulp (Macroalgae) → Juice (Feed) → Food ingredient → Protein extraction

Protein digestibility
Digestibility of precipitated proteins and proteins in extracts is tested in vitro by peptic and pancreatic digests, and later in rats.

Protein characterization
Proteins are characterized by e.g. SDS-PAGE, size exclusion chromatography, and mass spectrometry. Moreover, analysis of amino acid composition will be performed and digestibility of proteins will be tested.

Extraction and precipitation optimization
Optimization of extraction and purification techniques, e.g. by finding optimal pH for protein precipitation according to both protein yield and protein quality.

Process-induced modifications
Process-modifications such as enzymatic browning upon cell disruption can be avoided by addition of sulfite (antioxidant).