

New products from wood

Our Nordic consortium has developed new methods to utilize cellulose and hemicelluloses in products, such as food and packaging materials.



The goal of our Nordic consortium was to develop new methods to utilize wood cellulose and hemicelluloses in products, including food and packaging materials.

Developing sustainable use of natural resources is more relevant today than ever. Due to depleting fossil-based raw materials, concerns over availability of resources, and problems arising from environmental pollution, we need to use our renewable biomass in a more economic and efficient way than before. New bio-based products and processes are needed to replace petroleum-based polymers in everyday applications including food, cosmetics, pharmaceuticals and chemicals.

Nordic countries are rich in forests. Wood is composed of valuable renewable components, including cellulose and hemicelluloses. However, some parts of wood are currently often burnt for energy, which is a low-value use for these natural resources. This is why we need new ways to use wood components in products. Nordic countries also have a long history and extensive know-how on using their forests, which is an excellent basis for new innovations.



We refined wood cellulose to nanofibrils and formed strong composite materials that could be used as bio-based packaging materials. We studied hemicelluloses that were extracted from wood by an environmentally friendly method using pressurized hot water. We used hemicelluloses to stabilize emulsions, i.e. dispersions of oil droplets in water. Emulsions are widely applied in a number of industrial products. Hemicellulose-stabilized emulsions could be an interesting Nordic alternative in food and beverages, or in

The picture shows doctoral student Ragnhild Aaen, from RISE PFI, during her research visit at the University of Helsinki. Ragnhild prepared new products from wood combining the best properties of cellulose and hemicelluloses. *Photo: Kirsi Mikkonen*

cosmetic creams and lotions. We also combined nanocelluloses and hemicelluloses to form emulsions and composite aerogels with improved stability and strength. Active packaging materials produced from nanocelluloses and hemicelluloses can preserve fresh fruit and vegetables longer than conventional packaging, thereby reduce food waste.