

'Aerogels as Future Packaging Concept' Case on the Spotlight at the PackAge Design Project

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PackAge is an interdisciplinary packaging design study module organized by Aalto University (15 credits, March–May 2016). This year the PackAge module had four clients with packaging development cases, three of which were industrial, and one was an experimental and futuristic concept case from the University of Helsinki. A group of students from various backgrounds, skills and competencies worked with each client on their cases following problem-based learning with real client briefs.

Abdul Ghafar and Kirsi Mikkonen represented the University of Helsinki at PackAge. Kirsi was one of the six responsible teachers at the course and gave lectures on food packaging. Abdul acted as client, and briefed the case to the student group and supervised their work in the laboratory. The student group, entitled the MindPack Team, worked on the case: “(Edible) Aerogels: Future packaging concept”.

Aerogels are advanced, light-weight, and highly porous solid materials having large surface area. Aerogels are prepared by replacing the liquid from a gel with air, which preserves the gel's three-dimensional structure. Our research focuses on the formation of sustainable aerogels from polysaccharides.

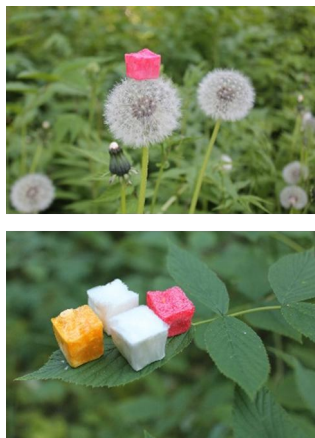


Figure 1: Polysaccharide aerogels: highly porous and light-weight materials.

The MindPack Team developed a prototype for active food packaging using polysaccharide aerogels to control the shelf life of avocados. Aerogels containing encapsulated active ingredient, for which limonene was used as a model, were developed. The students prepared a mold with a designed shape and size. The prototype was displayed at the Designing Cellulose for Future exhibition, 16–20 May, 2016 at Aalto Arts, Helsinki. The final outcome of the project was displayed during the Pack-Age Gala held on Friday 27.5.2016 (<http://aaltofestival.fi/2016/fi/pack-age/>).

At the beginning of the project, the MindPack students came up with various ideas, and during the project, the ideas greatly evolved to become the novel packaging prototype. For Abdul and Kirsi, it was an excellent teaching experience and a good learning opportunity. During the course, it was challenging to explain the process, phenomena and terminology related of aerogels development

to the students, especially because they have various study backgrounds: industrial design, arts, and economics in addition to technology and, for the first time this year, food sciences.

Polysaccharide aerogels – bio-based, biodegradable, and non-toxic – can find various future applications for absorption, active packaging, and encapsulation of active food ingredients. The result of the PackAge collaboration is an attractive new type of fruit packaging.

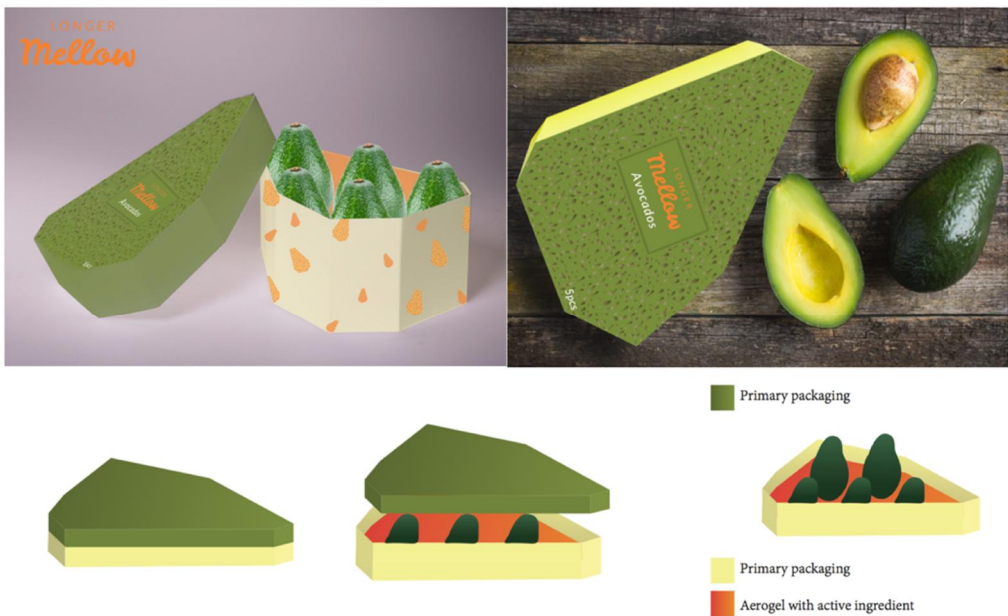


Figure 2: A prototype design for polysaccharide aerogels for active food packaging concept. Designed by student team: Tomi Jeskanen, Pamela Mauricio, Susann Nurmi and Yan Wang.



Figure 3: PackAge student project (Polysaccharide aerogels: future active food packaging concept) and other aerogel samples displayed at Designing Cellulose for Future exhibition.



Figure 4: A final prototype of polysaccharide aerogels as future packaging concept, displayed during the Pack-Age gala.