
Non-linear learning to design responsible food packaging

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The COVID-19 pandemic has forced us to intensify our connections, exchanges, and learning via WEB platforms. These solutions could help solve today's complex technological and environmental problems. The two consecutive ERASMUS+ projects, FitNESS for "Food packaging open courseware for higher education and staff of companies" and funded by the European Commission, were designed to imagine future responsible food packaging and supply chain. There is a certain honesty in recognizing that we may not have the right solution now and that the lack of material, chemical, and toxicological sciences in food engineering curricula has contributed to river littering, microplastics, chemical food contamination, and increased consumer exposure to endocrine disruptors... In the same vein, the sudden awareness of consumers and the encouragement to recycle and reuse materials create new emerging chemical and microbiological risks.

The FitNESS project does not take sides but details the different technical and scientific aspects of food packaging: concepts of food shelf life, materials, their chemistry, properties (barrier, mechanical, optical), hazards and risks, impacts and their assessment, safe and eco-responsible design techniques, industrialization... The corpus content (already 90 lectures, 6,000 slides, 60 videos, 20 case studies, books, and more) is continuously enriched by ten universities, research centers, and national reference laboratories across Europe.

The open-source platform is available as a client-side web application offering web conversion, deployment, mirroring, and local cloning. It works on any screen, online or offline, with/without presenter mode. A Google-like search engine understands more than 7,000 concepts to facilitate content reuse and non-linear learning. Web plugins offer online computations and interactive case studies to evaluate shelf-life and packaging compliance and optimize packaging. The presentation shows how independent syllabi and tests can be built and distributed. The AI-assisted content is the most promising feature, as it adapts the shown content based on the trainee's preferences and test results. As a result, chemists, materials scientists, food engineers, and retailers will experience seamlessly different content. Recent research results are distilled throughout the course to stimulate innovation and responsible decision-making. The platform could be used to teach and tackle other food engineering problems.