

International Conference on

# Sustainable Bioplastics

November 10-11, 2016 Alicante, Spain

## Biodegradable and compostable materials for packaging applications

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Biodegradable plastic materials can be considered as the main breakthrough of the last two decades in plastics technology. Its use has broadened too many applications as its properties have been improved to meet more demanding requirements. Biodegradable materials are being established as an alternative to conventional thermoplastic materials in a number of applications such as packaging, biomedical, agriculture, etc. However, most of the biodegradable plastics need physical and/or chemical modifications to achieve the requirements for each case of study. Related to this, AIMPLAS is working in different European projects, where new materials have been developed suitable to obtain biodegradable packaging by extrusion technologies directly applicable to conventional industrial processes. Two examples are BIOBOTTLE and BIO4MAP projects.

**BIOBOTTLE Project:** New biodegradable bottles and pouches have been developed for packaging different types of dairy products (fresh milk, pasteurized mild and UHT dairy products), maintaining their shelf life in comparison with traditional packages. The packages developed in the project, fulfill the different characteristics based on thermal, mechanical, microbiological and organoleptic properties depending on the type of dairy product. One of the main challenges of this project was to fulfill the thermal properties to support the sterilization and pasteurization conditions.

**BIO4MAP Project:** The aim of this project was to develop innovative fully biodegradable and recyclable, multilayer, flexible and transparent structures for packaging fresh pasta and different types of cheese that requires customized modified atmosphere (MAP). Different biodegradable thermoplastic materials have been combined, mainly polylactic acid (PLA) and polyvinyl alcohol (PVOH). Packages have been obtained by co-extrusion and thermoforming technologies. With the aim of increasing the barrier against moisture, a biodegradable coating based on natural waxes has been applied to the inner layer of the multilayer structure.

### Biography

Pilar Villanueva has a Bachelor's degree in Chemical Engineering and has finished her PhD in 2009 within the program "Technological innovation projects and process and product engineering" from the Universitat Jaume I of Castellón. Her thesis was focused on basic research in the development of nanocomposites made of polyethylene and clay nanofillers. She works at AIMPLAS as a Researcher and Extrusion Technician since 2009. She has participated in several national and European projects involved in the development of new biodegradable and compostable plastics for packaging, agricultural applications and household appliances. She is the author of more than 20 contributions to conferences and journals, including an international patent.

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