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**Active packaging: Incorporation of polyphenols in polyhydroxyalkanoate (PHA): Thermal stabilization and antioxidant properties**

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**Introduction**: Pollution of the environment by plastic is a worldwide issue. Today, packaging is mainly produced from conventional petroleum-based plastics especially in the food industry. Plastic is everywhere, that is why ongoing research are attempting to develop biobased and biodegradable polymers. Polyhydroxyalkanoates (PHA) seem to be good candidates. The aim of this study is to enhance their thermal properties and confer antioxidant properties to PHA by adding polyphenols.

**Polyhydroxyalkanoate (PHA)**

Polymer under study: Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) = PHBV

Biobased polymer produced by bacterial fermentation

Biodegradable [1]

Processability window very tight (175°C < Tprocess < 210°C)

**Polyphenols**

Family of organic molecules mainly coming from plants

Interesting properties:

- Antioxidant properties
- Improvement of thermal stability of materials

**Properties expected**:

- Better thermal stability → Possibility to consider mechanical recycling
- Wider processability window
- Antioxidant effect in contact with food

**Underlying issues**:

- Effect of the polyphenols on the biodegradability of the polymers
- Ability to food contact?

**Conclusion**: We expect that this PhD research will lead to a new formulation of PHA derivatives with enhanced thermal stability. Polyphenols could be the answer to these issues and furthermore, they could confer interesting properties as antioxidant ones to polymers dedicated for food industry’s applications.

**References**:
