# ACTIVE PACKAGING USING ETHYLENE ABSORBER TO EXTEND SHELF LIFE

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In recent years, new food-packaging systems have been developed as a response to trends in consumer preferences towards mildly preserved, fresh, tasty and convenient food products with a prolonged shelf-life. Active packaging changes the condition of the packaged food to extend shelf-life or improve food safety or sensory properties, while maintaining the quality of the packaged food.[1,2]

Ethylene gas, which acts as a plant hormone, is produced by fruits and vegetables during ripening and is also found in the environment. It plays a role in normal ripening, but excessive exposure can radically reduce the shelf life of produce, in some cases inducing undesirable reactions such as development of bitter flavors and loss of chlorophyll (yellowing of greens).

The objectives of our work were (**1**) to test an active packaging of cassava starch for papaya stored at 9°C; (**2**) to test the effect of ethylene absorber agent to reduce decay of fresh-cut papaya; (3) study the influence of radiation on the barrier properties [water vapour permeability (WVP)] and mechanical properties (tensile strength and elongation) of edible films made of starch and (**4**) to study the solubility, water vapor permeability and the mechanical properties of edible films.

The packaging consisted of polypropylene pots sealed with biodegradable starch films containing potassium permanganate as an ethylene absorber. Films without this chemical served as the control. The fruits were analysed for pH value, weight loss and sensory analysis.

The films produced by casting process are transparent enough, with good mechanical properties and potential application for food packaging. Their mechanical characteristics, which are similar to those of synthetic films used in supermarkets (poly vinylcloride (PVC)) are influenced by irradiation dose: an increase in radiation dose resulted in a considerable increase in the puncture force of the films, whereas WVP can be significantly reduced by low doses of gamma radiation. The active packaged fruits presented higher acceptance, lower microbiological growth, showed less alterations in acidity, lower weight loss rate during the storage time and an extended shelf life, as compared to the control fruits.

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[2] Cuq, B.; Gontard, N.; S.Guilbert, S., *Cereal Chem*., 1998, 75, 1.