

Supplementary Materials

Table: Commercially Available Film

Polysaccharide film	Source	Commercial Organization	Quality Parameter	Applications	Ref.
Chitosan Film	Shrimp and Crab Shells	BioPack (US)	Biodegradable Antimicrobial Transparent Breathable	Fresh produce packaging Meat packaging Wound dressings	1
Whey Protein	Whey protein is a byproduct of cheese production.	Bluelab Whey, Foodstrong (US)	Good gas barrier properties, film-forming tendency.	Food packaging, especially for perishable products.	2
Carboxymethyl Cellulose	Derived from cellulose, often from wood pulp.	Celsol, Nouryon	Water solubility, film flexibility, and mechanical strength.	Edible packaging, encapsulation of bioactive compounds.	3
Gum Arabic	Extracted from the Acacia tree.	Iscgums, Agrigum	Excellent emulsifying properties, stability in aqueous solutions.	Encapsulation, flavor masking, and film-forming agent.	3
Octenyl Succinic Anhydride Starch	Modified starch obtained from various sources (e.g., corn, potato).	Cleargum Cargill (US)	Improved water resistance, film flexibility.	Coating for fruits, vegetables, and bakery products.	3
Water-Soluble Soy Polysaccharides	Derived from soybeans.	ALFA Chemistry	Good film-forming ability, biodegradability.	Edible coatings for fruits, vegetables, and meats.	3
Xylan Film	Hemicellulose from various plants	XYLAB (France)	Biodegradable Good oxygen barrier Can be blended for specific properties	Food packaging Mulch films Agricultural applications	4
Curdlan Film	Alcaligenes faecalis	Nagase ChemTex	Water-insoluble Heat-resistant	Heat-resistant food	5

	bacteria	(Japan)	Good oil barrier	packaging Oil and fat containers Industrial applications	
Gellan Gum Film	Sphingomonas paucimobilis bacteria	Kelcogel (US)	Thermoreversible gelling properties Film-forming ability Adjustable texture	Controlled- release capsules Food texturizing agent Edible coatings	6

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