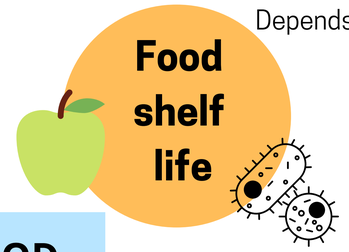
UAB Universitat Autònoma de Barcelona

WHAT IS BEING WORKED ON TO INCREASE THE FOOD SHELF LIFE?

Bruna López Rovira
Febrer 2023

Objective: To review the most recent studies being carried out to increase the shelf life of foods as an alternative or complement to those conventionally used.



Depends on

1) **Intrinsic factors**
2) **Extrinsic factors**
3) **Packaging properties**

Conclusions:

Technology trends: increase food shelf life, products with a complete nutritional profile, environmentally friendly technologies

More research is needed: many factors affect food shelf life

ADVANCES TO EXTEND THE USEFUL LIFE OF FOOD

NON-THERMAL TECHNOLOGIES

	DEFINITION	ADVANTATGES	INCONVENIENTS	APPLICATION	ACTION METHOD	FOOD
Essential oils	Secondary metabolits	GRAS, eco-friendly and readily biodegradable	Highly reactive, intense aroma and hydrophobic. Large quantity to achieve effects.	Direct application as spices and microencapsulation .	Natural biochemistry	Fruits and vegetables, juices, meat and meat products, dairy products
Chitosan	Polymer derived from chitin	Chemical stability, non-toxicity and excellent film-forming ability	Low thermal and mechanical stability High sensitivity to moisture	Packaging material	Change in cell permeability	Bread, eggs, fruit and vegetables, fruit juices, mayonnaise, meat, dairy products, seafood, tofu, gelatine and vinegar.
Biocontrol agents	Antimicrobial peptidess	GRAS, constant production of bacteriocins	Maintain viability during processing	Bioactive packaging	Cell membrane depolarisation	Fish, meat, fruit, and bakery products
Cold plasma	Weakly ionised gas	Inability to penetrate samples	May decrease concentration of bioactive molecules	Surface decontamination of solid foodstuffs	DNA oxidation and protein denaturation	Chicken, eggs, fruits, vegetables, nuts, rice and apple juice.
Pulsed electric field	High voltage pulses	Preserving and even increasing the content of bioactive compounds	Microbiological inactivation depends on processing parameters	Protection of food against spoilage	Electroporation cell membranes	Fruit juices, beef, milk and seafood
Supercritical CO2	Fluid exists between liquid and gas	Environmentally friendly, GRAS, cheap, recyclable and soluble	High cost of equipment	Inactivation of spores and micro-organisms	Increased cell permeability	Fruit, fruit juices, milk and milk products
Ozone	$O + O_2 = O_3$	Effective at low concentrations, sustainable.	Unstable in aqueous solution, not collected, short half-life, corrosive to equipment and lethal to humans (↑ [ ])	Antimicrobial agent in liquids	Cell membrane oxidation	Fruits, vegetables, fish, poultry, fruit juices, dairy products and meat.
High hydrostatic pressure	Pressure / Product	Minimal effect on taste	Does not allow inactivation of spores, discontinuous process	Pasteurisation of solids and liquids	Irreversible destruction of the cell membrane	Seafood, meat and meat products, eggs, dairy products and beverages, ready-to-eat products and fruit juices
UHPH Ultra High Pressure Homogenisation	↑↑ P	Allows continuous processing of liquids	Can only inactivate spores with the combination of elevated temperatures	Pasteurisation of liquids	Physical phenomena cause cell disruption	Vegetable milks, sucs de verdures i fruites, llet, dairy products and liquid eggs