VALORISING BIOPOLYMERS FROM ANIMAL WASTE: COLLAGEN, ELASTIN AND KERATIN

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OBJECTIVES

Science

• Recovery of the structural fibrous proteins collagen, elastin and keratin, and respective hydrolysates and small peptides from animal waste, and
• Application in biomaterials, pharmaceutics, cosmetics and food

Impact

• Add commercial value to a waste material currently underutilized in fine chemistry
• Contribute to the sustainability of the agro-food sector
• Reduce impact of waste on the environment

COLLAGEN, ELASTIN, KERATIN from animal waste – A promising panel of functional and bioactive molecules

• Respective protopeptide in the form of α-helix and spontaneous self-assembly into tridimensional networks:

Collagen from bovine bone
Elastin from bovine ligaments
Keratin from poultry feathers

• They are functional biopolymers which allow conceiving formulations for the bio-based industry (medicine, pharmaceutics, cosmetics, and food):

Scaffolds
Grafts
Wound Healing
Drugs encapsulation
Skin hydration
Anti-wrinkle
Low-fat food emulsion
Edible casing

• The hydrolysis through enzymes, chemicals or thermal treatment, gives rise to biologically active peptides (2-30 amino acids residues) which can modulate numerous physiological pathways:

Animal waste – A resource to valorise!

On average, 1/3 of food is currently wasted worldwide

COLLAGEN – Up-to-date results

Old (7 y) and Young (4 y) Femur and Tibia

METHODOLODY
Bone milling
Acid extraction
Spray-drying

RESULTS

...among others

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