

# New biodegradable packaging could help slash global plastic consumption

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Scientists at Deakin University's Institute for Frontier Materials are turning by-products of wood and wool into biodegradable packaging to help slash global plastic consumption.

Dr Nishar Hameed says humans consume more than 100 million tons of plastics annually.

"We're using cellulose from wood pulp as well as wool, silk, and nano-composites from bone material to produce [biodegradable materials](#) for potential application in packaging and clothing," Dr Hameed says.

"Natural polymers are a [renewable resource](#) compared to synthetic plastics which are derived from finite fossil fuel reserves. They are also often biodegradable – aiding eventual disposal," Dr Hameed says.

Wood pulp cellulose, wool and silk fibres are dissolved in liquefied salt to form solid materials such as films and fibres.

"A 10:1 ratio of organic material is dissolved at 100 degrees Celsius. The dissolved polymers are regenerated into films, composites and fibres by coagulating in a water bath," he says.

"The films are made into thin sheets of desirable thickness suitable for durable packaging, using glass plates."

The biodegradable films resemble plastic – their opacity and strength

varies depending on the composition of the organic ingredients.

"The key to producing useful biodegradable, multicomponent materials is environmentally friendly processing from completely renewable resources. Other solvents are shown to be more toxic and can't be recycled."

The research team aims to develop a base stock of natural materials which Dr Hameed says are abundant in volume and renewable.

"Australia is a leading producer of wool – the principal natural polymer used and cellulose accounts for half of all plant biomass," Dr Hameed says.

"Cellulose based blends and composites could also have potential application in the biomedical, electronics, automotive, aerospace and photonics sectors and spawn a self-sustaining, green polymer industry."

Deakin University's Institute for Frontier Materials was established to address some of the major challenges facing society through innovations in [materials](#) design and performance.

Provided by Deakin University

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