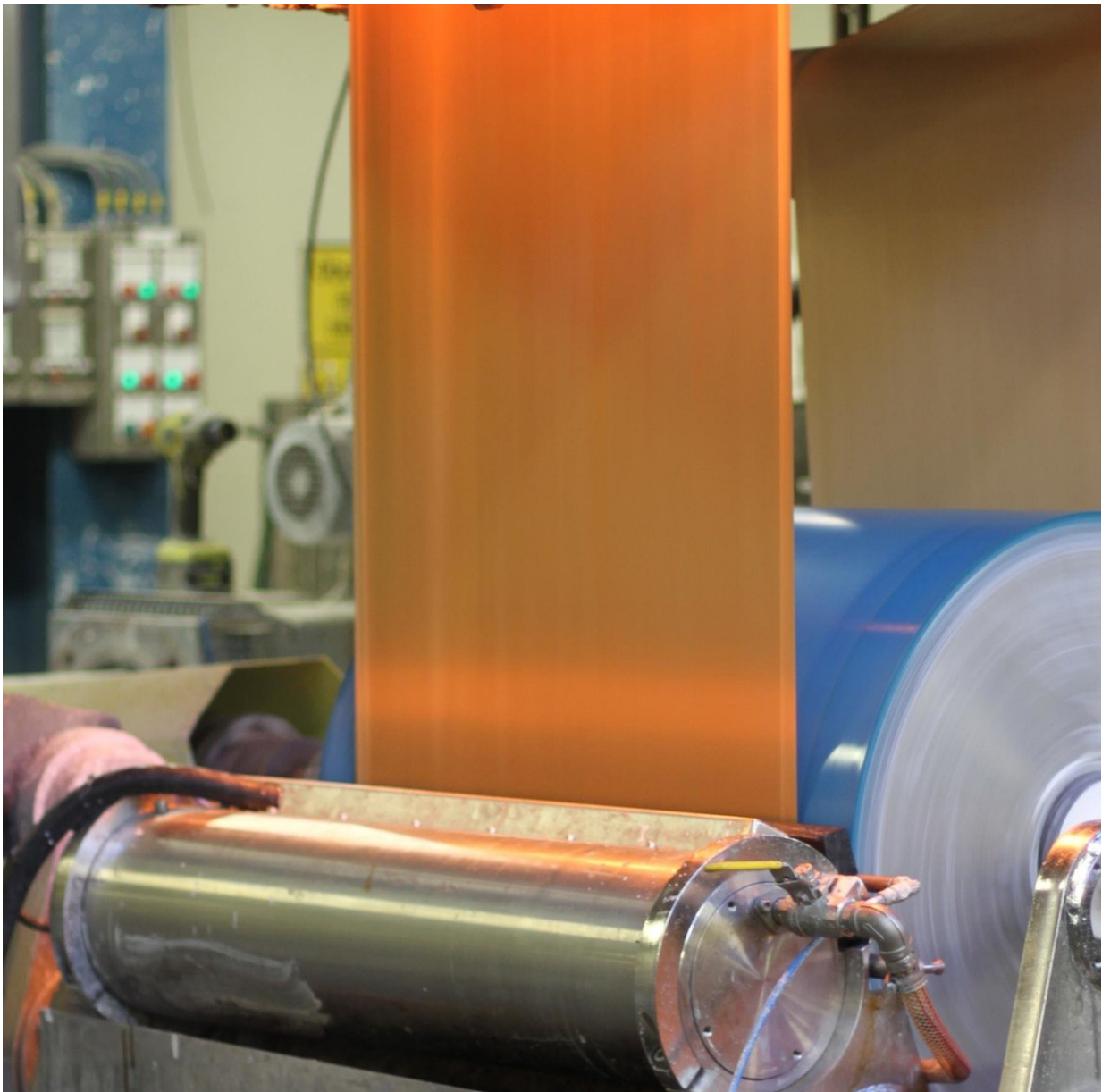


Starch can replace normal plastic in food packaging

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Credit: Karlstad University

Eventually all petroleum-based material in food packaging will have to be replaced with bio-based material. Research done at Karlstad University shows that a mixture of starch and other polymers forms an equally effective protective barrier.

"Food packaging has to protect and extend the [shelf life](#) of food, and should also work during transport," says Asif Javed, doctor in Chemical Engineering at Karlstad University. "To meet these demands, a protective barrier is needed in paper-based packing such as those used for juice or dairy."

A protective barrier against water and oxygen

Paper-based [food packaging](#) needs a coating to prevent water or oxygen from penetrating the packaging and spoiling the foodstuff inside. Usually this protective coating is manufactured from petroleum-based plastic. For several decades, researchers have been trying to find a good bio-based material to replace fossil-based raw [materials](#). Research done at Karlstad University shows that a mixture of lignin from wood and starch from for example potatoes or maize potentially can fulfil this function just as well as plastic.

"In my research, we used a mixture of starch and lignin to create a protective [barrier](#) that is up to scratch," says Asif Javed. "If new materials are to be used, they have to be at least as good as or better than petroleum-based material – regarding extending the shelf life of food, as well as the cost and effectivity of manufacture and transport. I have also worked with biodegradable mixtures of starch and some petroleum-based macromolecules. Although such material is not 100% based on

renewable resources, it has the important advantage of naturally degrading without leaving behind dangerous microplastics, should it end up in forests, lakes or oceans."

Today different bio-based alternatives are already being used in [food packaging](#), but more research is needed to replace petroleum-based materials completely in the long term.

"I hope that we will be able to do more research in this area," says Asif Javed. "In our region, there are good prospects for research on fibre-based processes and products in partnership with the industry."

Provided by Karlstad University

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