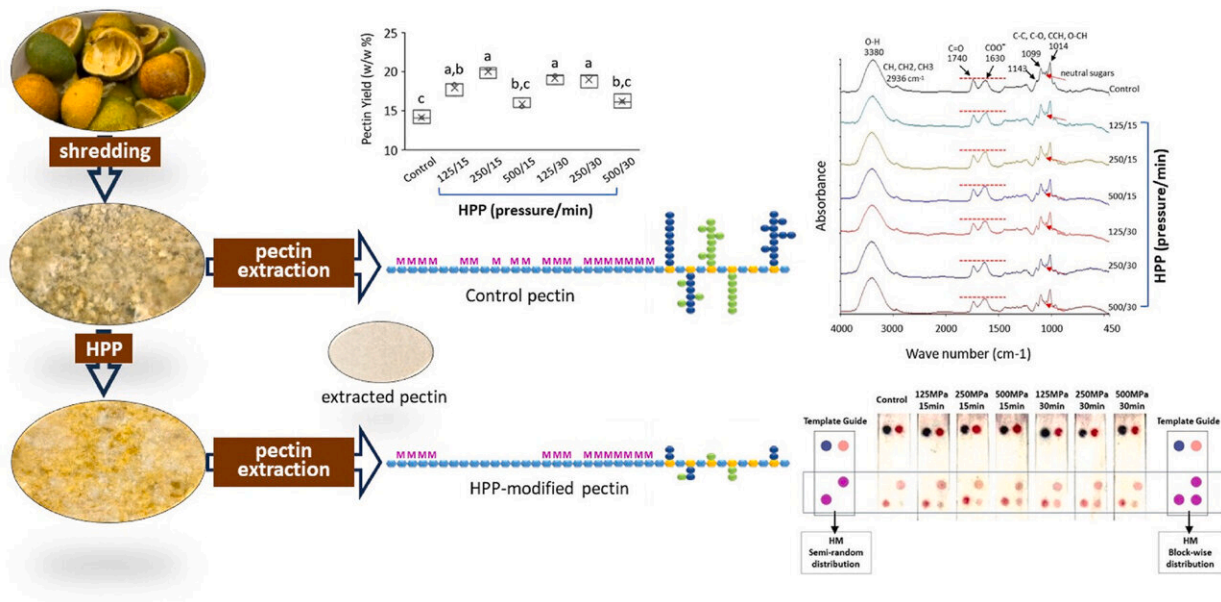


A high-quality pectin that 'gels with' low sugar products

July 16 2024, by Jessica Ryan



Graphical abstract. Credit: *Food Hydrocolloids* (2023). DOI: 10.1016/j.foodhyd.2023.109516

U.S. Department of Agriculture (USDA)'s Agricultural Research Service (ARS) scientists developed a high quality and inexpensive pectin that can successfully gel in low sugar products and still be scalable for commercial production.

Pectin, a soluble fiber used mainly for gelling food products like jams

and jellies, is naturally found in fruits and vegetables. Most commercial pectins are from citrus fruit peels and are extracted into a powder to act as a gelling agent in foods.

"Most commercially-available pectins successfully gel only when combined with high sugar products and acid," said Wei Zhao, a research chemist from the U.S. Horticultural Research Laboratory in Fort Pierce, Florida.

"For people seeking low sugar foods, most commercial pectins will not gel properly since a lot of sugar is needed for the gelling process. There are some commercial pectins that can gel in low sugar foods, but these alternatives tend to be low quality, are quite expensive to produce, and may contain undesirable residues."

In a recent study, Zhao and other ARS researchers found that they can pre-treat a fresh orange peel in a simple high-pressure processing (HPP) treatment and then extract [pectin](#) from that orange peel using a standard commercial method. The extracted pectin has desirable structural properties needed for gelling low sugar products without leaving undesirable residues.

According to Zhao, the [global market](#) for pectin recently surpassed one billion dollars per year and is expected to reach over two billion dollars by 2025. The increasing demand for low [sugar](#) food products makes Zhao and her team's pectin a desirable option for consumers.

"Our research findings reveal the great potential of producing low-cost, high-quality pectins with increased gelling capacity by adding a simple HPP pre-treatment of fresh source material for pectin extraction," said Zhao.

The research findings were published in two journal papers in *Food*

Hydrocolloids.

In addition to the U.S. Horticultural Research Laboratory, researchers from the ARS Western Regional Research Center in Albany, California, and ARS Eastern Regional Research Center in Wyndmoor, Pennsylvania, collaborated in the study.

"This work catalyzes research engagement and demonstrates the first-class teamwork and [collaborative partnership](#) between ARS researchers," said Jonn Foulk, an ARS National Program Leader for Nutrition, Food Safety, and Quality.

"This work expanded and leveraged multidisciplinary expertise and resources between multiple geographically diverse (Florida, California, and Pennsylvania) locations to maximize research impact and expedite development of biobased innovations to address the evolving needs of the agricultural industry."

More information: Wei Zhao et al, Modification of pectin with high-pressure processing treatment of fresh orange peel before pectin extraction: Part I. The effects on pectin extraction and structural properties, *Food Hydrocolloids* (2023). [DOI: 10.1016/j.foodhyd.2023.109516](#)

Wei Zhao et al, Modification of pectin with high-pressure processing treatment of fresh orange peel before pectin extraction: Part II. The effects on gelling capacity and emulsifying properties of pectin, *Food Hydrocolloids* (2023). [DOI: 10.1016/j.foodhyd.2023.109536](#)

Provided by Agricultural Research Service

Citation: A high-quality pectin that 'gels with' low sugar products (2024, July 16) retrieved 16 July 2024 from <https://phys.org/news/2024-07-high-quality-pectin-gels-sugar.html>

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