

## Healthier white bread could be in stores by 2025, after genes controlling wheat fiber content identified

An international group of scientists led by Rothamsted Research and the John Innes Centre have opened the door to healthier white bread, after they pinpointed genes responsible for the dietary fiber content of flour.

They say this new white flour is otherwise identical and makes a good quality white loaf – but with all the added health benefits that come from eating wholemeal bread, including reduced cancer, diabetes and obesity risks.

The high fibre white flour they produced has as much as twice the fiber of traditional white flour.

Writing in the journal [PLOS ONE](#), lead author Dr Alison Lovegrove, Rothamsted Research, said the team had achieved the breakthrough by exploiting the results of an earlier genetic screen of over 150 different wheat varieties from around the world.

“We knew that the white flour made from one particular Chinese wheat variety, Yumai 34, was unusually high in fiber, but it’s not well suited for growing in the European climate,” she said.

“Using conventional breeding techniques, we crossed this high fiber trait into several other varieties. This allowed us to narrow down where in its genome the genes for high fiber are.”

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“We’ve developed genetic markers that can easily be used by plant breeders to identify which individual wheat plants have the high fiber genes,” said Dr Lovegrove.

That will allow them to incorporate the high fibre into elite wheat lines – and opens the possibility of significant increases in dietary fiber intake for everyone, she added.

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The effort behind the study was no simple matter, however, as the wheat genome is much bigger than the human genome – containing six copies of every chromosome rather than the two copies humans possess.

This means wheat has in the region of 150,000 genes, compared to about 25,000 genes in humans. By looking for sections of genetic code shared by plants with the high fiber trait, the team were able to home in on the likely spots where high fiber genes reside.

The researchers found two sites in particular – on chromosomes 1B and 6B – that were strongly linked with high fibre in flour.

The conventional breeding of a new wheat variety is a slow process with breeders having to select wheat

lines with high yield and disease resistance, but the team are hopeful high fiber bread and other products made from white flour will be a staple within just five years now that breeders have a new tool with which to screen wheat lines.

Dietary fiber describes those carbohydrates we get from plant-based foods that aren't digested in the small intestine and has been shown to have a number of health benefits, including lowering blood pressure, improving insulin sensitivity and reducing the incidence of certain types of cancer.

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Most of the fiber found in wheat grain is in the bran – the part that is removed when producing white flour, and what differentiates it from wholemeal flour. A slice of typical white bread has about 1g of fiber, whereas wholemeal has about 3g. A slice from a high fiber white loaf could contain up to 2g.

Whilst wholemeal is widely regarded as being much better for us, white bread still outsells it .... Taste, appearance, shelf life and price are the main reasons why consumers favor white bread ....

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