

FINAL REPORT



CWQ00002

Gluten structure and modification for ingredient use

PROJECT DETAILS

PROJECT CODE: CWQ00002

PROJECT TITLE: GLUTEN STRUCTURE AND MODIFICATION FOR INGREDIENT USE

START DATE: 01.03.2002

END DATE: 30.06.2005

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ORGANISATION: VALUE ADDED WHEAT CRC

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Summary

Lipid is a major cause of both undesirable colour and flavour in wheat gluten and modified products made from it. Removal or reduction of the lipid content improves the products.

Lipid can be removed from the flour used for preparing gluten by extraction with solvents. The gluten thus prepared has greatly improved colour and flavour. Enzymatic digests of this defatted gluten also had a lighter colour than digests of the normal gluten.

As solvent extraction of lipid on an industrial scale would require special equipment, alternative approaches were considered. One successful approach was to use salt in the water used to separate starch and gluten. Inclusion of 2% salt resulted in gluten with a greatly improved colour, and lower lipid content. This salt concentration could be reduced while retaining most of the reduction in lipid content.

An additional advantage of including salt in the wash water was that the gluten product was found to have improved rheological properties. For gluten produced from high quality flour, the improvement in rheological properties was only marginal. However, when applied to poor quality flour, there was a marked improvement in the quality of the gluten produced. In many instances, it would have been possible to have produced gluten for a very discerning market using a poorer grade of flour with salt in the extraction solution.

The possibility of patenting this method is being considered by the Value Added Wheat Cooperative Research Centre (CRC) and a provisional application has been lodged.

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Outcomes

Long-term research expertise for the Australian wheat industry.

A broader knowledge base for ongoing wheat research on protein-function relationships.

New products based on wheat protein for novel ingredients in food and industrial processes.

Intellectual property summary

Intellectual Property (IP) is being managed by the Value Added Wheat CRC. A process to prepare lipid-reduced gluten has potential for commercialisation, and negotiations with a potential commercial partner (Manildra Milling Corp) are underway. A provisional patent has been filed.

Patent:

Novel method for treating flour or a fraction thereof

Filed February 2005

Inventors: Day, L., Batey, I.L., Wrigley, C.W., and Augustin, M.A.

Refiled November 2005

Status: Filed

Additional information

Papers published:

Day, L, Udabage, S., Augustin, M., Batey, I.L., and Wrigley, C.W. (2002). Gluten structure and modification for food ingredient use. 'Cereals 2002. Proc. 52nd RACI Cereal Chemistry Conference'. Eds, Black, C.K., Panozzo, J.F., Wrigley, C.W., Batey, I.L., and Larsen, N. Royal Aust. Chem. Inst., Melbourne. Pages 132-134.

Day, L., Augustin, M., Batey, I.L., and Wrigley, C.W. (2004). Association of non-protein components in wheat gluten with its quality. Proc. 8th International Gluten Workshop, Tuscia, Italy. Lafiandra, D., Masci, S. and D'Ovidio, R.(eds), The Royal Society of Chemistry, Cambridge, UK., pages 337-340.

Day, L. and Vu, T. (2004). Lipids in wheat flour and breadmaking. *Lipid Technology* 16, 275-279.

Day, L., Augustin, M.A., Batey, I.L. and Wrigley, C.W. (2006). Wheat-gluten uses and industry needs. *Trends in Food Science and Technology*. 17, 82-90.

CRC Reports:

Day, L., Batey, I.L., Wrigley, C.W., and Augustin, M.A. Gluten uses and food industry needs. Report No 44 of the Value Added Wheat CRC, North Ryde, NSW, Australia.

Day, L., Batey, I.L., Wrigley, C.W., and Augustin, M.A. Improving gluten quality: Development of a new salt-washing process. VAW CRC Project Report No 50. Value Added Wheat CRC, North Ryde.