

Discovery of novel genes for bread making quality by meta-QTL analysis of digital images of crumb structure

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It has been particularly difficult to breed UK winter wheat varieties of consistent excellent end-use quality. A large project, FSQ23³, linking millers, bakers, breeders and geneticists was therefore initiated to map new and novel genes to give breeders clear targets for MAS. Three new recombinant doubled haploid populations were developed and comprehensive genetic maps developed for each using SSR and DArT markers. Grain was produced from these populations from large trials over two growing seasons (2005 and 2006) and fully characterised in each year in terms of milling and baking performance. Four bakery products were made from each recombinant line: Chorleywood Bread Process (CBP) white bread, CBP wholemeal bread, no time dough (Spiral) white bread and puff pastry. New methods to objectively analyse the characteristics of these products were developed, particularly using digital imaging (C-Cell), allowing ranking of samples to be achieved using common and transferable techniques. Data on the range of bread characteristics were subjected to QTL analysis and novel loci identified for specific aspects of processing quality such as milling texture, protein content, milling yield, loaf volume, loaf shape, crumb colour, crumb structure, and softness. These QTL are now the targets of MAS by plant breeders to generate varieties with better and more consistent processing quality than those currently available.

³**FQS23 Consortium**

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