



HEALTHGRAIN

## EXPLOITING BIOACTIVITY OF EUROPEAN CEREAL GRAINS FOR IMPROVED NUTRITION AND HEALTH BENEFITS

1 (2)

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### **Health benefits of wheat can be improved by plant breeding**

Wheat products, and in particular, wholegrain products, are important sources of dietary fibre, vitamins, minerals and other components which are beneficial for human health. Analysis of a diverse range of wheat varieties within the HEALTHGRAIN project of the European Union has shown substantial variation (up to four-fold) in the content and composition of these components. Furthermore, a significant proportion of this variation, particularly for dietary fibre content, is highly heritable and hence can be exploited by plant breeders to produce new types of wheat with enhanced health benefits.

Genomics tools developed enabled to identify markers for dietary fibres, tocopherols and sterols. These markers can be used in breeding programmes to cumulate genes for enrichment of bioactive compounds, particularly those present in exotic, unadapted germplasm, for adaptation in lines or varieties useful in practical agriculture. Molecular marker assisted selection was used to develop f.ex. wheat varieties with high amylose content.

A major limitation to exploiting this variation is the lack of rapid and affordable analytical systems. New tools (including NIR calibrations, antibodies and molecular markers) are therefore being developed which are appropriate for use by plant breeders, grain traders and processors and the food industry. The programme is therefore providing benefits to consumers, plant breeders and the wheat processing chain.

#### **The EU Integrated Project HEALTHGRAIN**

The HEALTHGRAIN project has substantially strengthened the scientific basis for a new generation of cereal based products with enhanced health benefits. The project also has formed a network of research organizations, industries and organizations communicating to consumers that will continue as the HEALTHGRAIN Forum.

*Results of the project will be presented in  
the HEALTHGRAIN Conference on May 5-7 in Lund, Sweden:  
[www.healthgrain.org](http://www.healthgrain.org)*

#### **Rothamsted Research**

Rothamsted Research is centred in Harpenden Hertfordshire and is the largest agricultural research institute in the country. The mission of Rothamsted Research is to be recognised internationally as a primary source of first-class scientific research and new knowledge that addresses stakeholder requirements for innovative policies, products and practices to enhance the economic, environmental and societal value of agricultural land. The Applied Crop Science department is based at Broom's Barn, Higham, Bury St. Edmunds. North Wyke Research is located near Okehampton in Devon. See <http://www.rothamsted.bbsrc.ac.uk/>

#### **BBSRC**

BBSRC is the UK funding agency for research in the life sciences. Sponsored by Government, BBSRC annually invests around £450 million in a wide range of research that makes a significant contribution to the quality of life in the UK and beyond and supports a number of important industrial stakeholders, including the agriculture, food, chemical, healthcare and pharmaceutical sectors. For more information see: <http://www.bbsrc.ac.uk>



### **INRA Clermont-Ferrand**

INRA-University joint unit research of Clermont-Ferrand is the core laboratory for Genetics and Genomics research on wheat in France and coordinates the public research network, with strong links with private companies associated in the “Cereal valley” competitiveness Cluster. It is currently co-chairing the International wheat sequencing consortium and International Triticeae Mapping Initiative. It develops researches on structural genomics (evolution of gene space, polymorphism and management of genetic resources), functional genomics (identification of key genes controlling target traits such as yield, stress tolerance and grain composition) and integration of knowledges into an applied breeding programme for sustainable agriculture.

See <http://www1.clermont.inra.fr/umr1095/>

### **Agricultural Research Institute (ARI) of HAS, Martonvasar, Hungary**

The Institute covers a wide spectrum of crop science research. It became a regional research centre in the frame of the EU FP7 AGRISAFE project. The Martonvasar phytotron, the largest in Europe is an excellent tool for studying genotype x environment interactions, the effects of climate change on agricultural crops. The aims of the cereal gene bank research are the preservation and improvement of genetic variability, genotyping and phenotyping germplasm endemic in this region, thereby contributing to cereal breeding research for different nutritional quality traits and for different growing environments including high-, low input and organic production.

See <http://www.mgki.hu>

### **Key references:**

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