

Cereals-based foods – untapped nutritional potential?

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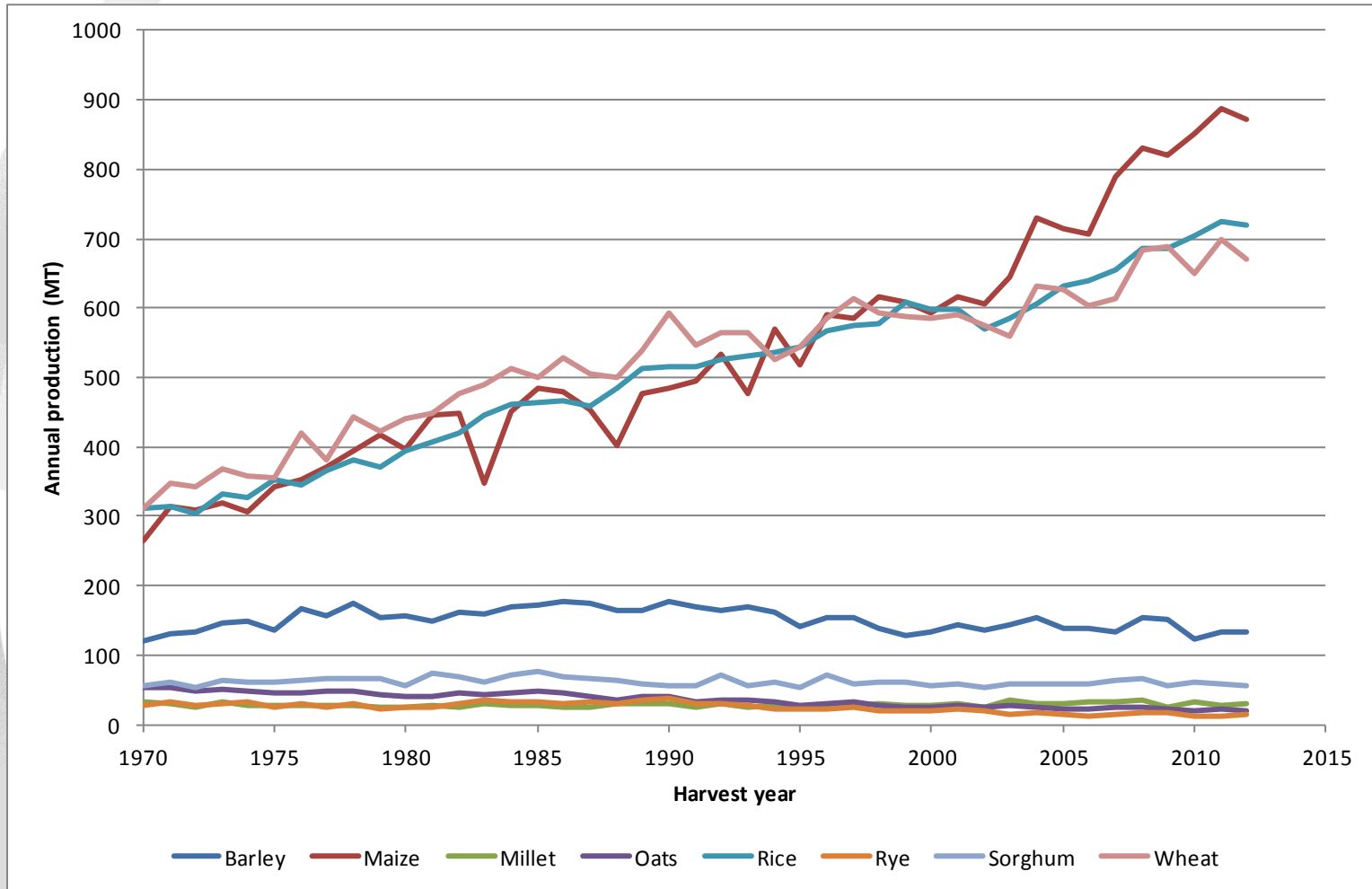
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‘Practical application of technical excellence for the food and drink supply chain’



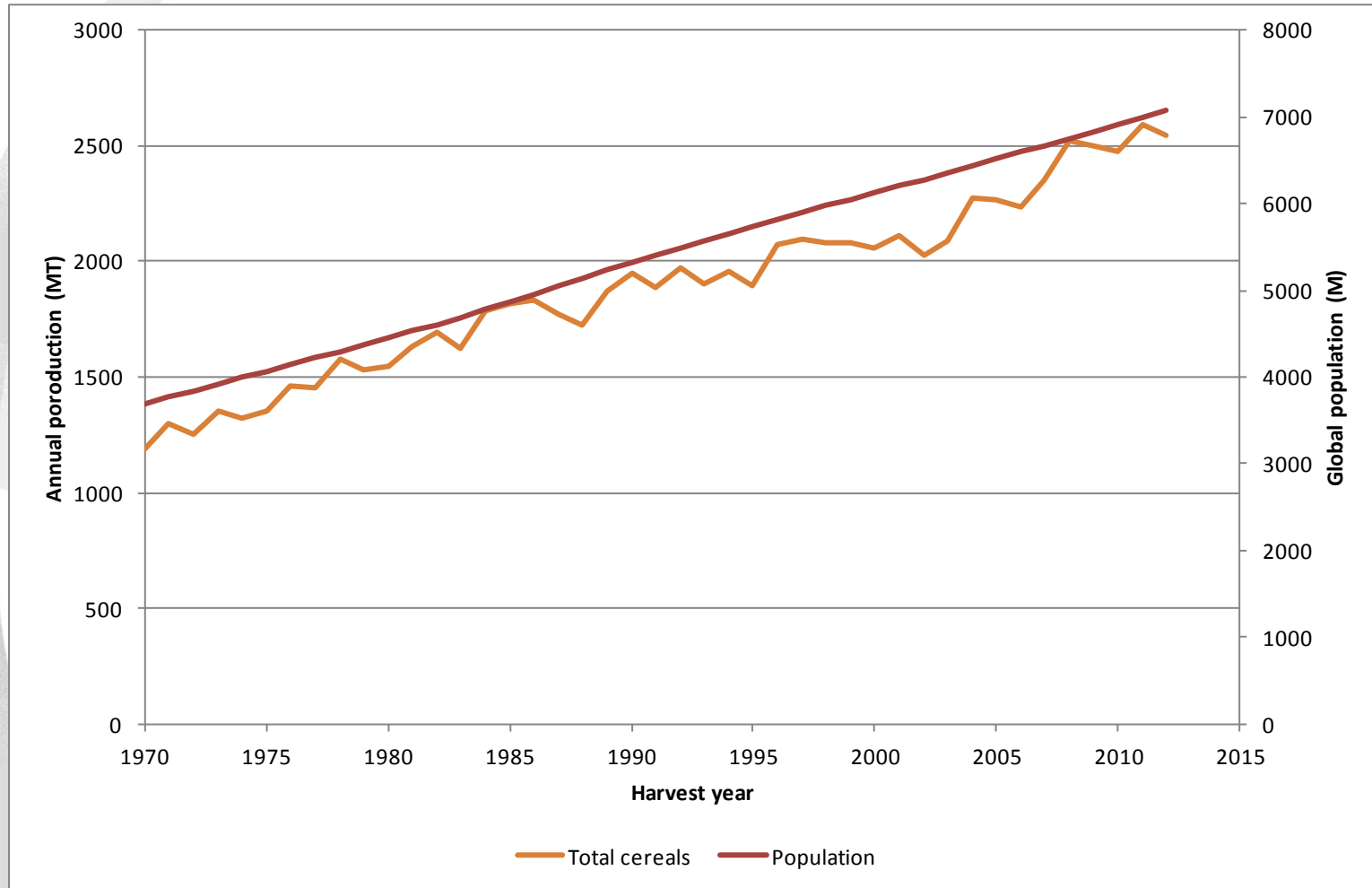
- Serve whole food chain
- Established 1919
- >2000 member companies in >70 countries
- 370 staff
- 3000 m² laboratories
- 3500 m² process halls
- 800 m² training rooms

Cereals – the global context



Source: FAOSTAT

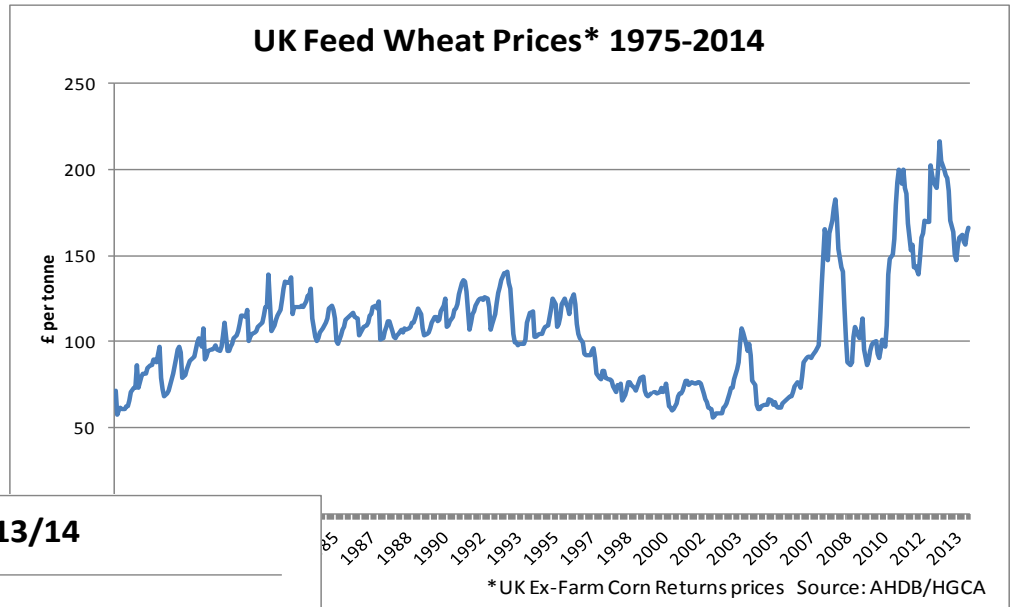
Cereals – the global context



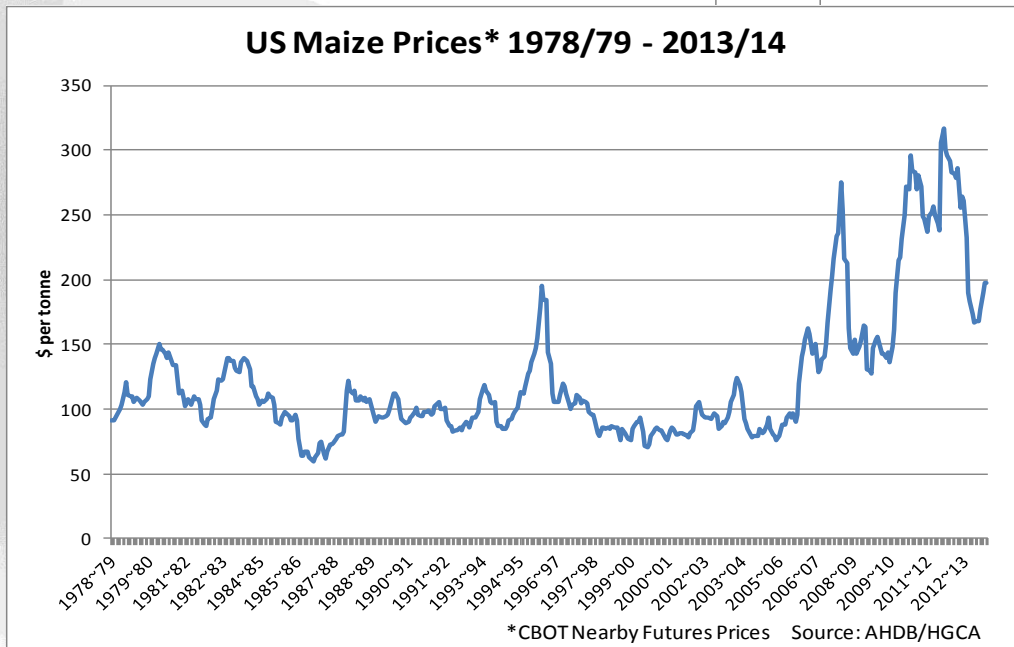
Source: FAOSTAT

Cereals – global trade

UK Feed Wheat Prices* 1975-2014



US Maize Prices* 1978/79 - 2013/14



The nutritional significance of cereals

- More than half of the world's food energy comes from rice, wheat and maize (IRDC)
- Wheat is the staple food for 35% of the world's population (IRDC)
- 3B people depend on rice for survival (IRC)
- Developing countries will become more dependent on imports – an extra 1BT of cereals will be needed by 2030 (FAO)

Cereal-based diets under scrutiny

- ‘Wheat Belly’ by William Davis
 - Promotes a grain-free diet for weight loss
 - Asserts that wheat consumption is addictive
- Non-carb, non-gluten ‘celebrity’ dietary advice
 - Gwyneth Paltrow, Novak Djokovic...
- High protein, low carb diets widely promoted

Positive role for cereals in government dietary advice

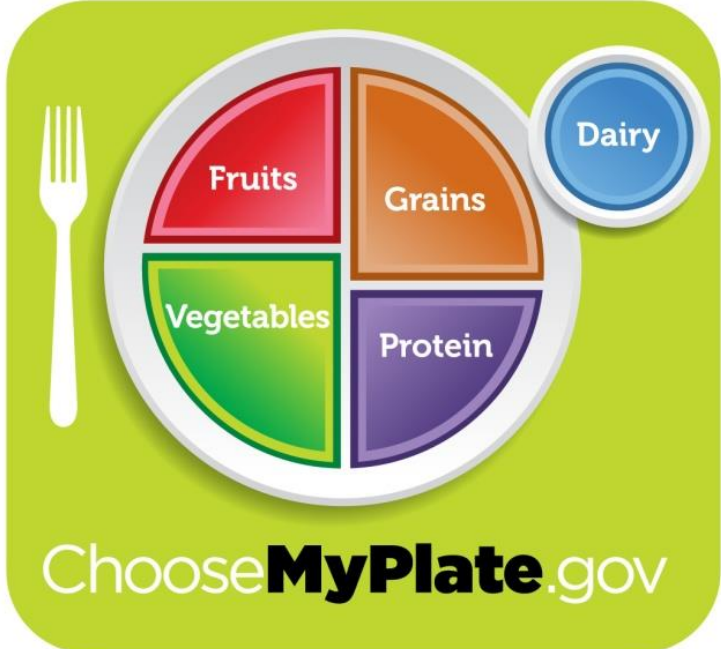
The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.

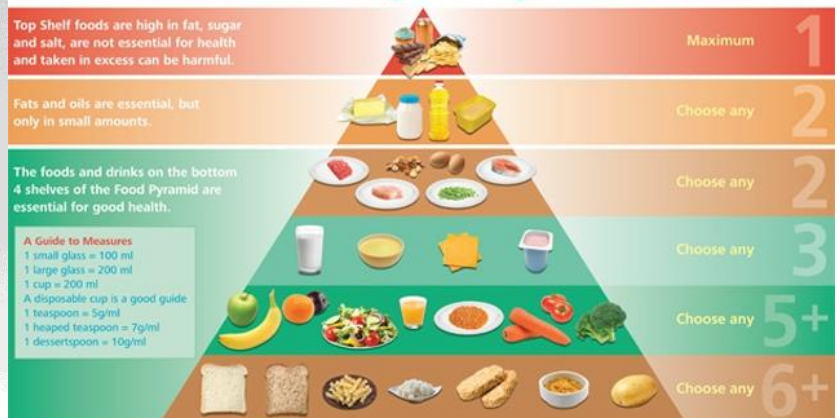


Public Health England in association with the Welsh Government, the Scottish Government and the Food Standards Agency in Northern Ireland

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Understanding the Food Pyramid



Cereal foods as a source of dietary fibre

- Fibre describes carbohydrate components not digested in the human small intestine
- Cereal cell wall material is a rich source of fibre
- Greatest quantities found in the outer part of the grain
- Increased consumption of whole grain foods is widely recommended by Governments

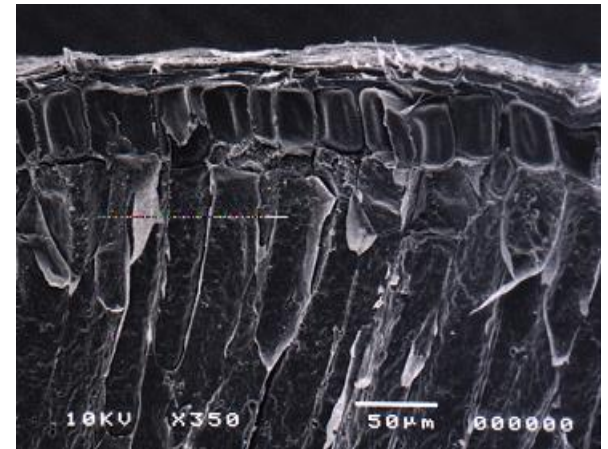


Image courtesy of Satake UK Ltd

Authorised health claims for cereal fibre on EU register

- *Beta*-glucans contribute to the maintenance of normal blood cholesterol levels (Article 13.1).
- Consumption of *beta*-glucans from oats or barley as part of a meal contributes to the reduction of the blood glucose rise after that meal (Article 13.1).
- Barley *beta*-glucans has been shown to lower/reduce blood cholesterol. High cholesterol is a risk factor in the development of coronary heart disease (Article 14.1a).
- Oat *beta*-glucan has been shown to lower/reduce blood cholesterol. High cholesterol is a risk factor in the development of coronary heart disease (Article 14.1a).
- Consumption of arabinoxylan as part of a meal contributes to a reduction of the blood glucose rise after that meal (Article 13.1).
- Replacing digestible starches with resistant starch in a meal contributes to a reduction in the blood glucose rise after that meal (Article 13.1).

Cereal foods as a source of vitamins, minerals and phytochemicals

- Cereals generally good source of B vitamins, particularly thiamin and niacin
- Mineral content (Fe, Mg, P, Cu, Mn, Se) generally high in cereal grains
- Phytochemicals in grains thought to have positive health effects include phytosterols, phenolic compounds, choline and betaine
- Highest concentration of micronutrients found in the outer part of the grain

Cereal foods as a vehicle for nutrient delivery

- The D2-D3 study led by Professor Susan Lanham-New, Department of Nutrition and Metabolism, University of Surrey and funded by BBSRC DRINC
- Comparing the efficiency of ergocalciferol vs. cholecalciferol fortification
- Determining which vehicle for fortification (i.e. a SOLID vs. FLUID food) is more effective



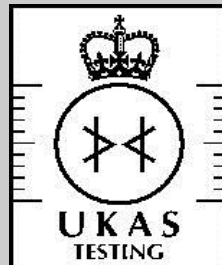
Conclusions

- Cereals are fundamental in world nutrition and form the staple diet for billions
- Diets based on a significant cereals-based component are recommended by many governments
- Increased consumption of foods containing the outer parts of cereals grains is likely to be beneficial to health

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