Key message: Develop further understanding of primary and secondary processing and the effect on: sensory and nutritional values; fortification and modification; and the impact on the environment and food security.

Objectives

- Investigate how the processing affects the sensory properties and nutritional properties of flour.
- Investigate the fortification and modification of bread and other grain products, explaining their role in a balanced diet.
- Explore ways in which wheat farmers help protect the environment.
- Investigate the Red Tractor Farm Assurance Scheme and the benefits to the farmer and consumer.

Resources

- Bread samples (white, brown and wholemeal), chopping board and knife
- Sensory and nutrition worksheet
- Nutritional analysis software, such as http://explorefood.foodafactoflife.org.uk
- Wheat farming in UK presentation
- nabim http://www.nabim.org.uk/wheat/

Introduction

- Arrange a sensory test using three different types of bread – white, brown and wholemeal. Challenge pupils to focus on the appearance, odour, taste and texture of the bread samples.  
  (Flavour is produced through odour and taste working together.)
- Encourage pupils to write descriptive word on the whiteboard – sharing their findings with the class.

Activity ideas

- Following on from the sensory test, explore the way in which the bread samples have been processed have affected their sensory and nutritional properties. Use the Sensory and nutrition worksheet to help structure the activity.
Cereal and cereal products play an important role in the diet and are a major source of many nutrients for both children and adults, due in part to the mandatory fortification of all wheat flour (apart from wholemeal) with iron, thiamin and niacin, and all flours (except wholemeal and some self-raising varieties) with calcium. Ask pupils to write a report on the fortification of flour, specifically focusing on why certain nutrients are added.

Dishes and food products are often modified to help support people achieving (and maintaining) a healthy, varied diet. Ask pupils to consider what modifications could be made to dishes/products made from flour (and other grains) to support healthy eating targets. For example, reducing fat, sugar and/or salt, increasing fibre and/or fruit and vegetables, and reducing portion size. Pupils could look through the recipes on www.grainchain.com to support their work.

Based on the modification activity, pupils could cook a range of dishes with the changes they suggest. Ensure they evidence their work by calculating the nutrition information (before and after).

Research the ways in which UK wheat farmers support the environment through different environmental practices, often supported by Farm Assurance schemes. To kick-start the research, go to: http://www.nabim.org.uk/wheat/wheat-assurance-schemes/ and http://www.redtractor.org.uk/farmers/james-price-red-tractor-wheat-farmer

Round up
Recap the learning by questioning the pupils:
- How did the processing of the flour affect the sensory and nutritional properties of the three bread samples?
- What is fortification? What nutrients are added to flour?
- How can flour based dishes be modified to support a healthy, varied diet?
- What is the Red Tractor scheme?

Extension ideas
- Complete the activity sheet Bread: a staple of our diet.

Fact file
Analysis of the UK Government’s National Diet and Nutrition Survey (NDNS) in 2014 suggests that bread still contributes more than 10% of an adult’s daily intake of protein, thiamine, niacin, folate, iron, zinc, copper and magnesium; 20% of fibre and calcium intake; and more than 25% of manganese intake.