

Global
Food Security



Sustainable, healthy food for all



FROM FIELD TO FORK

The Global Food Security Programme (GFS) brings together the UK's major research funders of food and farming related research to coordinate their efforts. The partners fund a wide variety of research from understanding basic plant biology and how diet affects health to analysing regulation, global markets and the complex links between food security, agriculture and climate change.

PRODUCING FOOD



■ *The global population is growing and becoming richer. Richer people eat more food, this together with increasing numbers of people, means we need more food.*

■ *There is little new land for agriculture, unless we convert land we want to protect, like rainforests. What's more, urbanisation is taking away farmland.*

■ *Intensive agriculture today relies heavily on fertilizers, insecticides, water and other inputs. Large-scale production and use of inputs can contribute to climate and other environmental change.*



■ *If there's no new land and if intensive agriculture is harming the environment we need to find new ways of increasing yields while reducing impacts.*



RESEARCHERS ARE...



... understanding how legumes like peas and beans are able to source their own nitrogen fertilizer by entering a mutually beneficial relationship with bacteria. The hope is that one day this ability could be transferred to other crops such as wheat or rice.

... using mathematical modelling to combat disease. By predicting how crop and animal diseases will spread, researchers are able to advise on the best actions to take to stop or reduce a disease outbreak.



... helping to improve harvests by producing and distributing localised weather bulletins. These help farms in developing countries tailor their crop planning and management to local climate conditions.

... developing ways of managing non-cropped land to provide habitats for beneficial insects, such as pollinators like bees.



HEALTHY AND SAFE FOOD



In developing countries an unhealthy diet is often a direct result of high or rising food prices. The most nutritious foods, such as meat, fish, fruit and vegetables, are cut out in favour of cereals and grain which are more affordable but offer fewer nutrients.

Even when we have access to healthy diets we sometimes choose not to eat well. This can be because of consumer choice, convenience or we're just not used to a good diet.



What we eat can affect our health, for instance: cholesterol-high diets lead to heart problems whereas diets high in fibre have recently been shown to reduce the risk of bowel cancer.



RESEARCHERS ARE...

... looking at how a pregnant woman's diet can affect the health of their child. For instance, poor maternal diets can increase the risk of diabetes in the child. However, we don't yet know why this happens. By studying this researchers hope to understand what diets mothers-to-be should follow for the health of their babies and develop new therapeutic strategies to improve health throughout our lives.



... exploring innovative ways of reducing fats in everyday foods such as mayonnaise. By understanding how fats and their interactions with other ingredients affect food texture, researchers are mimicking these effects to produce low-fat products.



... fortifying food crops with vitamins and minerals to help tackle malnutrition. People in developing countries can therefore eat the same diet and benefit from extra nutrients in the food.

GETTING HOLD OF FOOD



International bodies, like the World Bank and the UN, have shown that the world currently produces enough calories for everyone, although with a rising population this may not be the case in the future. The problem is getting the food to where it is needed without waste and, once there, ensuring that individual people can get hold of the food.

The price of food changes over time. In developing countries these price changes can sometimes be sudden and unexpected and it can be difficult for poorer households to be able to cope with increases in price.

Having a 'food system' that works well and is fair depends on a whole range of factors such as: global and local markets, regulation and supply chains.

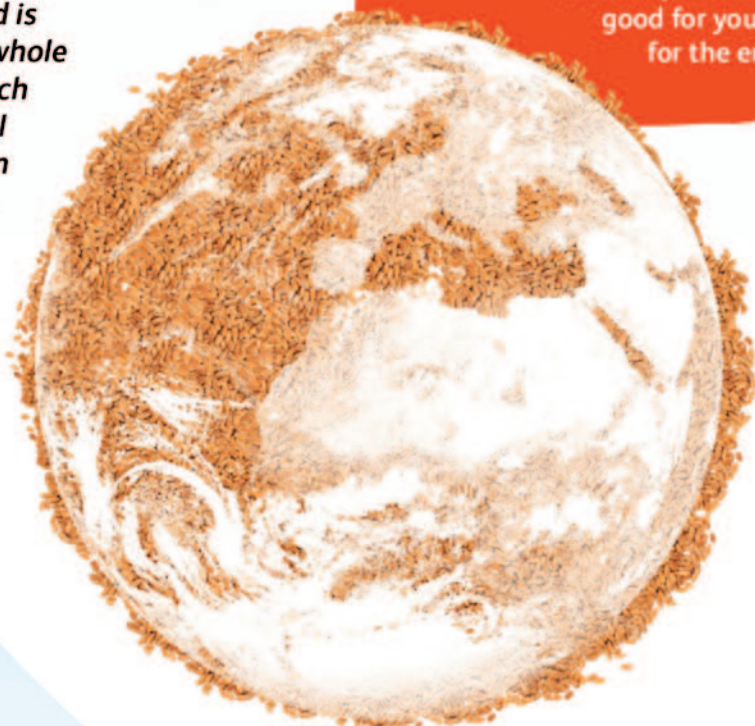


RESEARCHERS ARE...

... working to understand how changes in food price can have different effects in different countries. For instance, in low-income countries increasing food prices can cause demonstrations, riots and civil conflict. By contrast, richer countries cope much better with high prices.


... investigating how UK consumers think about food security and how this affects their behaviour, for instance when do we panic buy and who do we think is responsible for food security?

... finding ways for us to eat healthily and in a way that is environmentally sustainable. By analysing the environmental impact of different foods, researchers have created a 'Livewell' plate which is good for you and better for the environment.





FOOD, FARMING AND THE ENVIRONMENT



■ *Farmland, like any landscape, provides not just food, but also a range of ecosystem services.*

■ *Ecosystem services include things such as food and fuel but also other benefits we get from the natural environment, like climate regulation, clean water and the biological breakdown of waste. Wildlife and biodiversity underpin many ecosystem services.*

■ *Providing more food from the available land could threaten biodiversity and ecosystem services unless carefully managed.*



RESEARCHERS ARE...

... growing crops with other plants to manage insect pests. By growing plants which repel insects among the crop and plants that attract insects away from the crop, researchers have been able to drastically reduce insect pests and so improve productivity and reduce pesticide use.

... breeding new disease resistant crop varieties. As our climate changes new crop diseases may become more of a problem. Disease resistant crops require less pesticides.

... uncovering how agricultural productivity can be increased in Sub-Saharan Africa. By improving the management of ecosystem services and irrigation, researchers hope to sustain higher levels of food production and so alleviate poverty.

EXCESS, SCARCITY AND WASTE



In some developing countries 30-40% of perishable crops are lost after they have been harvested. In the UK, between 2006 and 2009, 19% of food and drink brought into the home was thrown away.

Growing and producing food uses a lot of energy – from agricultural machinery and fertilizer use to storage and preparation for sale. Using this energy produces green-house gases and the price of oil is likely to keep increasing, which will make food more and more expensive.



During 2000-2002, an average person in the UK consumed 3400 calories per day, while in many African countries, such as Tanzania or Zambia, the average was under 2000 calories.

This uneven balance can be seen as unfair and is not good for the health of either those who consume too much or those who consume too little.



RESEARCHERS ARE...

... looking into ways to reduce losses both before harvest and after harvest. Losses are often the result of deterioration caused by poor conditions or pests and diseases. These losses can happen for many reasons. For instance, it may not be financially worth reducing them, food is spoilt before it can be sold or there aren't the right technologies in place.

... reducing the waste that domestic ruminants, such as cattle and sheep, produce. This has a double benefit of reducing pollution while increasing animal production efficiency. The researchers are doing this by improving the ruminant diets and/or their guts micro-organisms.



... researchers are exploring using electric currents to separate fine-grain solids from water and so purify it for reuse. This should reduce the amount of water wasted in food manufacture.



The partners of The Global Food Security Programme:

