

## Modern biotechnology in food: Milestones in food development

06 August 2006

500,000 BC

Humans first created a permanent cooking place in the form of a hearth. Initially, food was cooked by dropping it onto hot embers; later stone grills, spit roasting and stewing over hot ashes were used.

18,000 BC

Animals were domesticated and bred for food in the Middle East; early successes were with deer, antelope and sheep.

8,000 BC

Stone rollers were first used in Ancient Egypt to grind grain into meal and flour.

7,000 BC

Farmers in the Middle East began to cultivate the soil with sticks.

6,000 BC

Stone sickles were used to harvest grain, and techniques for drying and smoking were developed in Europe and elsewhere.

5,000 BC

Pigs were domesticated by the Chinese, Romans and Greeks.

4,000 BC

Dairy farming developed into a major enterprise in the Middle East, the Sumerians began making butter by churning milk, and the Egyptians started growing vines and making wines.

3,000 BC

Irrigation was invented by the Egyptians, who redirected water from the River Nile into their fields. Peruvians started to grow potatoes on a large scale.

2,500 BC



Geese were domesticated by the Egyptians

2,000 BC

Fermentation, baking, brewing and cheese making were learned by the Egyptians and Sumerians. The use of domesticated goats, cattle, horses, geese, chickens and ducks gradually replaced hunting.

500 BC

Marinating was developed by people in the Mediterranean. Salting, and later curing and pickling, were learned by people across Europe.

300 BC

Grafting techniques were first used in Greece, resulting in the creation of orchards and groves.

1000 AD

Oxen were first used to pull ploughs in Europe, giving more efficient tillage of the land.

1276

The first whiskey distillery was set up in Ireland.

1400

The first confectionery was made in Europe by dipping fruits and berries into melted sugar.

1500s

Acidic cooking techniques - fermenting foods, then spicing or salting them - became increasingly popular. Early products were sauerkraut and yoghurt.

1776

The steam-driven mill was invented in London, making flour milling the first modern food industry.

1830

The modern distillery was invented, advancing brandy production



1850s

The first soft drinks were produced in the US, made by mixing fruit juice with sugar, carbonated water and citric acid. In London, the Perkins steam-heated oven was unveiled, giving bakers greater control over oven temperature. This revolutionised commercial baking.

1859

Charles Darwin's *On the Origin of Species*, describing his theory on evolution, was published in London.

1861

Louis Pasteur developed a technique - now known as pasteurisation - of preserving food by heating, removing air and sealing it into a container.

1865

Gregor Mendel described his laws of heredity at a meeting of the Natural Science Society in Brunn, Austria.

1878

The components of yeast cells which cause fermentation were identified and the term "enzyme" was first used, derived from the Greek term meaning "in yeast".

1878

The components of yeast cells which cause fermentation were identified and the term "enzyme" was first used, derived from the Greek term meaning "in yeast".

1906

Modern freeze-drying techniques were mastered in France.

1913

Home refrigerators were invented in the US.

1920

American Clarence Birdseye invented deep-freezing for foods.

1926



Enzymes were first shown to be proteins.

1937

Instant coffee was invented in Switzerland, leading to the development of powdered foods.

1940

Microwave technology was invented, using microwaves to make food molecules vibrate, create friction and heat.

1962

Planting of high-yield wheat varieties (later known as Green Revolution grains) started in Mexico.

1964

New strains of rice were developed by the International Rice Research Institute in the Philippines. These gave double the yield of earlier strains if enough fertiliser was used.

1973

Stanley Cohen of Stanford University and Herbert Boyer of the University of California at San Francisco successfully recombined ends of bacterial DNA after splicing a foreign gene in between. Modern biotechnology was born.

1981

Chinese scientists were the first to clone a fish, the golden carp.

1982

The first food application of a product of gene technology, alpha- amylase, took place.

1983

The first transgenic plant - tobacco - was produced in the laboratory.

1988

Another product of gene technology, recombinant chymosin, was approved for food use in Switzerland.



1990

Two food processing aids made using gene technology were approved: an enzyme for use in cheese-making in the US, and a yeast used in baking in the UK.

1990-92

The first transgenic maize and wheat plants produced; genetic modification of cereals becomes a reality.

1994

Flavr Savr improved tomato approved in the US.

1995

Oils from genetically modified varieties of oilseed rape and soya beans, and tomato paste produced from genetically modified tomatoes approved in the UK.