

THE HISTORY OF GRAIN



Since people left Africa for West Asia, they have probably always eaten wheat, which not only tastes good but is a good source of carbohydrate. However, for hundreds of thousands of years, people did not cultivate wheat. They merely picked it wild, wherever it happened to grow.

About 10,000 BC, though, the area round Mesopotamia and Egypt became so crowded, and the climate so hot, that there was no longer enough food to go round just by picking it. Therefore people had to begin growing it on purpose, weeding out all the plants they couldn't eat (like pine trees) and



planting ones that people could eat, like wheat.

Gradually people also made the wheat easier to grow and eat, by choosing seeds of the best plants for the following years' planting. They chose wheat with big heavy heads (the part you eat), and whose berries were easy to separate from the inedible chaff and straw.

Diets began to be wheat dominated and people did not have the variety of food they had previously. They learned different ways of cooking the wheat.

Sometimes they put it in a skin or a pot with water and boiled it into porridge (like oatmeal).

This was filling and easy to cook - it also uses very little fuel to cook it.

At other times, they made bread with it. This is harder to cook and requires more fuel to do so but has the benefit of being easily portable. It will keep better than porridge and tastes better. In the main, they made flat breads, like focaccia, pita bread, pancakes, or pizza for these require less fuel to cook than others.

By around 1500 BC, people were growing wheat – even in China. They ate porridge in China but there they did not make wheat into bread but into noodles.

Thus bread, in one form or another, has been one of man's principal forms of food from earliest times. The baker is one of the oldest trades in the world.

In the Stone Age, people had made solid cakes from stone-crushed barley and wheat. A millstone thought to be 7,500 years old has been found. It was used for grinding corn.

The ability to sow and reap cereals may be one of the main factors which led people to live in communities - rather than continuous wandering to hunt and herd cattle.

According to botanists, wheat, oats, barley and other grains belong to the order of Grasses; nobody has yet found the wild form of grass from which wheat, as we know it, has developed. Like most of the wild grasses, cereal blossoms bear both male and female elements. The young plants are provided with a store of food to ensure their support during the period of germination, and it is in this store of reserve substance that man finds an abundant supply of food.

Grain in Ancient Egypt 1300 BC



Loaves and rolls have been found in ancient Egyptian tombs. In the British Museum's Egyptian galleries actual loaves can be seen which were made and baked over 5,000 years ago!

Also on display are grains of wheat which ripened in ancient summers under the Pharaohs. Wheat has been found in pits where human settlements flourished 8,000 years ago.

The plentiful wheat that Egyptians grew was made into about 40 different sorts of bread, pastry, cakes and biscuits.

Grinding the grain was very hard work and was usually done by women using two stones. As it was done in the open air, grit and other foreign bodies found their way into the flour. These impurities caused extensive wear on the teeth, and Egyptians often suffered from both tooth infections and abscesses.

The Egyptians' bread dough was made from flour and water – but without yeast, so the bread did not rise. It was cooked as flat loaves or in moulds and different flavourings could be added such as honey, milk, eggs, fruit, butter and herbs.

Barley was the other major grain crop, and Ancient Egyptians used it to make the beer that every one drank everyday. The brew had an alcohol content of about 8%.

To make it, the Egyptians first moistened barley with water, and left it to stand. Then they mixed the moist grains with lightly baked barley loaves in a large jar, poured on more water and let the mixture ferment. When the beer was ready it was very thick and had to be strained before drinking.



*Harvesting grain in Ancient Egypt
- from a bas-relief, c 2,650 B.C.*

Bread, both leavened and unleavened, is mentioned in the Bible many times. The ancient Greeks and Romans recognised bread as a staple food. Even in those days people argued about whether white or brown bread was best!

A Bakers' Guild was formed in Rome round about 168 B.C. From then on the industry began as a separate profession. The Guild or College, called Collegium Pistorum did not allow the bakers or their children to withdraw from it and take up other trades. The bakers in Rome at this period enjoyed special privileges: they were the only craftsmen who were freemen of the city, all other trades being conducted by slaves.

The members of the Guild were forbidden to mix with 'comedians and gladiators' and from attending performances at the amphitheatre, so that they would not be contaminated by the vices of the ordinary people! Did the bakers feel honoured by the strict regulations, or deprived by them?

The Greeks and Romans liked their bread white; colour was one of the main tests for quality at the time of Pliny (A.D. 70). Pliny wrote:

'The wheat of Cyprus is swarthy and produces a dark bread, for which reason it is generally mixed with the white wheat of Alexandria'.

Plato (c. 400 B.C.) pictured the ideal state where men lived to a healthy old age on wholemeal bread ground from a local wheat.

Socrates, however, suggested that this proposal meant the whole population would be living on pig-food. In those days, there were certain mean bakers who kneaded the meal with sea-water to save the price of salt. Pliny did not approve of this.

The Romans enjoyed several kinds of bread, with interesting names. There was oyster bread (to be eaten with oysters); 'artolaganus' or cakebread; 'speusticus' or 'hurry bread'. There was oven bread, tin bread, Parthian bread. There were rich breads made with milk, eggs and butter, but these of course, were only for the wealthy and privileged people. The Egyptian grammarian and philosopher Athenaeus, who lived in the 3rd century A.D., has handed down to us considerable knowledge about bread and baking in those days.

He wrote that the best bakers were from Phoenicia or Lydia, and the best bread-makers from Cappadocia. He gives us a list of the sorts of bread common in his time - leavened and unleavened loaves; loaves made from the best wheat flour; loaves made from groats, or rye, and some from acorns and millet. There were lovely crusty loaves too, and loaves baked on a hearth. Bakers made a bread mixed with cheese, but the favourite of the rich was always white bread made from wheat.

In ancient Greece, keen rivalry existed between cities as to which produced the best bread. Athens claimed the laurel wreath, and the name of its greatest baker, Thearion, has been handed down through the ages in the writings of various authors. During the friendly rivalry between the towns, Lynceus sang the praises of Rhodian rolls. 'The Athenians', he says,

'talk a great deal about their bread, which can be got in the market, but the Rhodians put loaves on the table which are not inferior to all of them. When our guests are given over to eating and are satisfied, a most agreeable dish is produced called the "hearth loaf", which is made of sweet things and compounded so as to be very soft, and it is made up with such an admirable harmony of all the ingredients as to have a most excellent effect, so that often a man who is drunk becomes sober again, and in the same way, a man who has just eaten is made hungry by eating of it.'

The island of Cyprus had a reputation for good bread. Another old writer, Eubulus, says,

"Tis a hard thing, beholding Cyprian loaves, to ride carelessly by, for like a magnet, they do attract the hungry passengers.'

All through the ancient days, bread and bakers were held in the highest respect.

In early English historical times, there were constantly recurring periods of famine, due to not enough, or too much rain, or frosts, and other natural causes.

The ruling classes, knowing that rebellion often followed famine, did their utmost to keep the price of bread from rising too high. Laws regulating its price were passed during the reign of King John (1202). Not only did the law fix the price, but it strictly allocated that price between cost of material and an allowance for necessary charges to the baker.

In 1266, the law allowed the baker twelve pence for each quarter of wheat he made into bread, split as follows:

For three servants,	4½d.	* The reason for this ½d.
For two boys	1d.	for sieving was, that in
For salt	½d.	those days, the baker -
For <u>yeast</u> ,	½d.	not the miller as now -
For candle	¼d.	separated out the wheat
For wood,	2d.	flour into its white and
		brown categories. This
		does not add up to twelve
		pence - apparently the
		baker was allowed a
		quantity of bread and
		bran to make up the
For sieving,	½d.	difference. The amounts
		seem tiny, but this is due
		to the greater value of
		money in those days.



For instance, a master carpenter would be paid only 2d. per day, ordinary woodworkers receiving only 1½d. Bakers earned less than this, but they were not dependent on the weather and could always be at work, unlike the carpenters. All through English history, great efforts were made to keep the price of bread low, to maintain good quality, and to prevent corruption and dishonesty.

The bakers liked to keep the 'mystery' of the trade to themselves and to prevent unlicensed people from starting up. If a young man wanted to become a baker, he had to serve an apprenticeship of seven years. The law supported the bakers in preserving their craft to themselves, and there were statutes published with various penalties for infringement. In those days there were certain dishonest persons in the trade. We read that in 1298 heavy fines were inflicted on bakers for selling short weight bread. There are the most stringent regulations about the weight of bread today. No baker would wittingly sell underweight. Bakers are sometimes, it is true, prosecuted for so doing but this is invariably due to mischance in machinery or sometimes lack of proper supervision. The fines are pretty stiff.

Bakers at their work during the Middle Ages in England. Until Modern mechanisation, the tools of the baker changed but little over the centuries. (From an old print.)



In 1310, a number of female bakers at Stratford were arrested for sending short weight bread to London in their long carts. As the bread was stale, however, they were let off with a reprimand, but were forced to sell their stale ½d. loaves at three for 1d. In 1327 a fraud was discovered at a public bakehouse where the citizens used to take their dough to have it baked. The bakers who ran the place had secret openings made in the moulding boards, and when the people's dough was placed on the boards, one of the bakers would secretly pinch off piece after piece from the uncooked loaves for their own benefit.

The Rascally Bakers in the Pillory



They were exposed and caught, the men placed in the pillory with slabs of dough round their necks, while the women were sent to the Newgate prison. You can imagine that the angry populace took full advantage of the pilloried thieves, and pelted them with any foul thing that came to hand. In the time of James the First, there are records of bakers slicing their stale bread into fingers, soaking it well in water, and mixing it with the new dough, 'to the great abuse and scandall of their Myserie, and the wrong of his Majesties' subjects'.

Some used tricks to deceive the Bread Examiner about weight by inserting copper coins into light-weight bread, or by having correct weight loaves in the shop, and keeping light-weight goods in an inner room. But it must be said, in fairness, that the majority of bakers were, and always had been honest, and proud of their products.

THE MIDDLE AGES:

Grain prices fluctuated dependent on the distance between the fields where the grain was grown and the ports from which it was shipped. The cost of transportation had to be absorbed in its cost.

In Italy, the grain trade was hindered by poor roads between Apulia and Naples.

Yet grain was shipped everywhere, and merchants, middlemen and entrepreneurs made money. It was cheaper and easier to send grain by sea than by land.

Little ports near to grain growing areas acted as chief markets. Lentini in Sicily is an example of a little port which grew wealthy as it benefited from grain-laden ships from Italy preferring to cross to Spain from Sicily – rather than from Tuscany. This was due to the shorter distance involved. Thus, cities with direct sea links, grew.

The main concern of the Spanish viceroys of Sicily was the grain trade. Sicily, with its huge supplies, was a grain supplier since antiquity almost without interruption. In the Middle Ages, Sicilian grain was stored in enormous “caricatori” or warehouses, near the ports. Throughout the 16th century, Sicily exported around 150,000 to 200,000 salme (33,000 to 44,000 tons) a year, with Genoa taking a huge proportion of that.

However, the latter part of the 16th century saw a dramatic drop from 144,000 salme in 1572 to 41,000 in 1603. This marked the rise of Sicilian pauperism which is still evident today.

This decrease in production was caused by plagues, government regulation, taxes, and the climate.

The West and the Barbary coast needed Sicilian grain. They found it in the longstanding commercial center of Palermo, which didn't handle transport or loading but rather the negozio frumentario (the wheat deal). The landowners lived in Palermo and so did the agents for the wealthy Genoese and Florentine merchants. If you were hungry, you were at their mercy. The famous chronicler Leo Africanus (Hasan al-Wazan, c. 1465-1550) relates that the Arabs handed over their children as pledges to obtain Sicilian wheat during times of famine.

Grain merchants took huge risks, and the whole enterprise was speculative.

Rains could affect the harvest, gales at sea could sink a ship, and there was always the risk of pirates, not to mention a world of rapacious middlemen. A grain merchant usually had multiple occupations. For example, the Florentine merchants Jacopo and Bardo Corsi were not only lending money to Galileo and selling silk and pepper on credit but also handling massive wheat purchases at Palermo on behalf of the grand duke of Tuscany. The Mediterranean grain trade was so important that the 19th century Italian historian Lodovico Bianchini claimed that grain was responsible for more espionage than the Inquisition.

The grain trade had been important as far back as the classical era. Egypt had been a granary to Rome and its merchants still supplied the Hijaz in Arabia a thousand years later.

In Egypt, the Nile carried huge quantities of wheat, rice, beans, and chickpeas. Egyptian grain showed up as far away as Valencia.

Indeed, wheeling and dealing in grain was a pan-Mediterranean activity. The marauding light Greek vessels called caramusalis brought black-market grain from the mainland to Venetian islands like Crete and Corfu. Besides the inherent risks of marauding, there were the Turkish galleys patrolling the sea.

The lessons of the grain trade illustrate the political economy of the Mediterranean: grain was cheap in the East and expensive in the West.

When scarcity appeared in one place, the price of grain rose. Merchants rushed to this area with their cargoes of grain, and the influx brought prices down again. And so it went on.

(Right: Venetian galley)



Merchants could not always meet the needs of the population though, as shown by Italy's terrible famine in 1554.

Toward the end of the 16th century, the food scarcity grew steadily more alarming as wars, plagues, and political machinations interfered with daily life. This, of course, affected the agricultural workers - the peasants who abandoned their farms and flocked to the cities, creating conditions ripe for future plagues and famine. Famine has always been a part of the Mediterranean landscape, however.

The economic historian Carlo Cipolla expressed the dilemma for the poor in the maxim, "The lower the disposable income, the higher the proportion spent on food."

He argued that people cannot cut down on their food consumption when their income drops, nor can they increase their eating beyond a certain point when their income grows.

The poorer the country, the greater the proportionate expenditure on food.

A similar argument can be made for the expenditure on bread as a proportion of total expenditure for food. That is, the lower one's income, the more bread and other starchy foods are bought. The French historian Fernand Braudel's assessment was that bread is the "least expensive foodstuff in relation to its caloric content."

Grain in the form of bread was the basis of Mediterranean life.

The invention of the steam-engine changed the industries and the lives of the people in Britain, except, strangely enough, the milling of flour. One miller in London who used a steam-engine to drive his machinery, found the mill destroyed by fire one day; this apparently discouraged him from attempting to use the new steam machinery again.

Millers everywhere continued to use the ancient methods of wind and watermills, except for a few progressive men who strove to free themselves from the restraints of waiting on the wind and water to drive the mill machinery.

In the middle of the nineteenth century, a Swiss engineer invented a new type of mill; abandoning the use of the stone mill-wheels, he designed rollers made of steel which operated one above the other. It was called the reduction roller-milling system, and these machines soon became accepted all over Europe and in Britain. They were driven by steam-engines, which had by now much improved, and the new method proved a great success. So popular did they become, that within about thirty years from their introduction into Britain in 1880, more than three-quarters of the windmills and watermills which had served so faithfully (if sometimes erratically) for hundreds of years, were demolished, or left to rot.

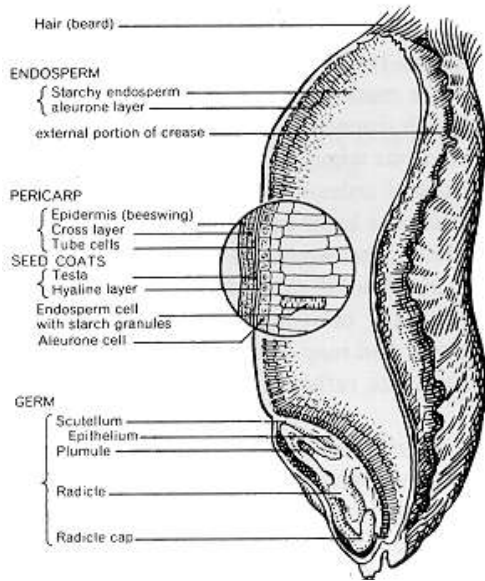
Meanwhile, the development of the North American prairies, ideally suited to grow wheat, provided ample grain for the fast-growing population of Great Britain at the time of the Industrial Revolution (which in turn reduced the farm acreage here). This, together with the invention of the roller-milling system, meant that for the first time in history, whiter flour (and therefore bread) could be produced at a price which brought it within the reach of everyone - not just the rich.

As noted, during periods of famine or other calamities during history, the governments of the time were quick to protect the people's bread. For instance, in the First World War, many regulations were passed controlling the bread trade.

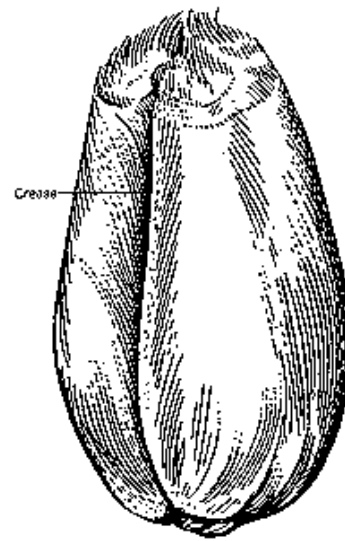
Experiments began to solve problems, like keeping bread fresh for troops in the trenches, the conservation of supplies and the stoppage of waste. Substitutes for wheat, such as mixtures of peas, arrowroot, parsnips, beans, lentils, maize, rice, barley and oats were used in bread experiments. By 1917 food-ships were being sunk by submarines to such an extent that the nation was in dire peril of starvation. As well as using some of the substitutes mentioned, the government fixed a maximum price for bread and issued rules for reducing waste. Bakers were forbidden to sell bread until it was twelve hours old; no stale bread could be exchanged; only 'regulation' flour could be used, the millers preparing flour from such grains as the authorities provided, and under their control. Even the shape of loaves was controlled, and all fancy pastries were forbidden. Another order was made in 1918, that bakers should use a proportion of up to 20 per cent of potatoes in their bread. In the Second World War, regulations were again imposed on the baking industry. The 'standard' loaf was then a grey colour, not very appetising to look at, but not at all unpleasant to eat. When you see the beautiful loaves on sale today in all their variety of shape, texture, and flavour, still at a comparative low price, and available to all, think for a moment of the days, a few hundred years ago, when it was thought that 'poor and common people should eat poor and common bread', and only the rich should be able to enjoy the real white wheaten loaf.



A grain of wheat cut lengthwise (through crease)



Whole grain of wheat



A SEED

The wheat grain as a seed is fitted for reproducing the plant from which it came. The germ is an embryo plant, with a radicle which can grow into a root system and a plumule which can develop into stems, leaves and ears. The pericarp is a tough skin which protects the inner seed from soil organisms which may attack it. The inner seed coats control the intake of water by the seed. The endosperm is the food reserve on which the young plant lives until it has developed a root system.

WHICH IS MILLED

The purpose of milling is to reduce the wheat grain to a fine powdery flour. A single grain makes about 20,000 particles of flour. In wholemeal flour all parts of the grain are included, but in producing white flour the seed coats and the embryo are not used. Instead, they are flattened and removed as small flakes, by sifting over nylon or silk mesh. These flakes are referred to collectively as wheatfeed.

If you look at wheat grains they appear as seeds, but a closer examination shows them to be true fruits. Each grain consists of a fruit-leaf with its edges rolled over and grown together, the furrow which runs the length of the grain being the line of joint.

We show a diagram of a wheat grain that has been cut in half length-wise through the furrow. The drawing shows the grain magnified over 200 times.

A grain of wheat cut across the middle

