While the *paysans boulangers* have been baking nutritious bread from old varieties of wheat in France (*see* page 12), a company in the north of England has been producing bread using recipes gathered from various parts of Europe. The Village Bakery was founded in 1976 by Andrew Whitley. Here he traces the history and diagnoses the ills of the industrialised bread produced in the United Kingdom.

The bread we eat

ANDREW WHITLEY

“What an odd way” said the visitor, “to get your daily bread. First of all, you pay a miller to strip most of the good bits from wheat to make fine white flour. The bran and the wheat germ, you tell me, are full of vitamins and minerals, so the miller sells them to feed animals, because farmers know exactly what they should give their stock to keep them healthy. Your very white bread doesn’t have many of these good things in it any more, so you buy them back as pills in a little bottle from a ‘health food’ shop at many times their original cost.

“There are some people who don’t have much money and they eat a lot of this white bread, so your government tells the miller to put back some of the good bits, just to be on the safe side. He does this, not by using the original grain but by adding some chalk, some iron and two ‘synthetic’ vitamins. This doesn’t replace everything the animals have been given, but, as you say, it’s better than nothing.

“The miller sells his flour to the factory baker who adds some other things – flour treatment agents, emulsifiers, oxidants, preservatives and enzymes – not because they are good to eat, but to make his job easier, or to make the loaves bigger, whiter and lighter, or to make them stay soft after they’ve been baked. How odd to put things in your daily food which aren’t meant to nourish you!

Andrew Whitley is the author of Bread Matters: the state of modern bread and a definitive guide to baking your own, *London: Fourth Estate, 2006. Available worldwide from http://www.breadmatters.com*

“Your bakers certainly make bread fast. You said that, in the old days, it might take the best part of a day from start to finish. But now bread can go from raw flour to baked loaf in 90 minutes. The bakers put in loads more yeast to get it to rise quickly, because in your culture ‘time is money’. In the TV adverts bread always seems to make people healthy and happy, but lots of people now seem to be ‘intolerant’ to yeast and some can’t eat this bread at all because it gives them indigestion.

“So you give the best part of the flour to animals, you put all sorts of things in the bread not to nourish but to deceive, and you make it so fast that lots of people feel unwell when they eat it. And yet you call this ‘the staff of life’.”

It would be easy to dismiss this view of modern mass-produced bread as an oversimplification. Most people in the industrialised world are happy with the bread they buy, aren’t they? Well, not exactly.

Whenever anyone questions the nutritional or other qualities of standard (white sliced) bread, the industrial millers and bakers respond with well-practised affront. White bread is what people want, they recite, it’s cheap, all bread is good for you and, anyway, we make “healthy eating” breads, too. Bread consumption has been falling heavily in Europe and North America. Long before fads like the Atkins diet (which severely limits the intake of carbohydrates), people were abandoning bread, and not only because they were better off and could afford other things. “Cotton wool” bread may have started as the butt of foodie ridicule but the joke turned sour for those who fell prey to bloating, irritable bowel syndrome, wheat and yeast

intolerance, candida infections and a whole host of previously unheard-of conditions whose only remedy was to stop eating ordinary bread. Bakers responded not with self-criticism but with civil war. Small bakers were driven out or swallowed up by large chains, and the newly powerful supermarkets accelerated the downward pressure on prices and quality.

Despite product innovation, some of which has attempted to address health issues, modern bread still commands little respect. The ingredients – most of them – are listed on the packaging by law in some countries. But in the case of some of these substances, who knows what they are or what they do? To whom, for instance, do the words "mono- and di-glycerides of fatty acids" say anything meaningful about food? Using such terms (compliant with current UK legislation though they may be) is rather like chanting the Latin mass: it communicates little beyond some generalised portentousness while keeping all the key information in the hands of the priesthood.

Static sales and murky marketing are one thing; but the bread industry's malaise is systemic. Through a combination of greed, ignorance, misplaced technological zeal, manipulation and inverted snobbery, modern bread is no longer fit to feed us. How come?

- intensive breeding of wheat to produce higher yields with heavy applications of chemical fertilisers, herbicides and pesticides has made our bread less nutritious

- plant breeders select wheat varieties to produce, among other things, lighter loaves, but nutritional quality isn't on their agenda; older wheat varieties contain significantly higher amounts of key micro-nutrients

- modern milling removes many important nutrients from white flour, of which only four are replaced – in synthetic form; even "wholemeal" flour from modern roller mills is robbed of its vital vitamin E

- modern bread is made ultra-fast, with several times as much yeast as in earlier times

- additives and processing aids are widely used to make loaves bigger and stay softer for longer. Some of these chemicals are not declared on the label and some may be derived from animal parts. New research suggests that one such undeclared additive can actually generate the protein that triggers coeliac disease in susceptible people

- making bread very fast prevents the development in the dough of certain naturally occurring bacteria that help to make nutrients more available and the bread more digestible.

Each one of these changes may seem insignificant, especially for people who have a varied diet. But they add up to a major deterioration in the quality of bread. Ironically, just as technology finds ever more ingenious ways to adulterate our bread, so science is revealing the havoc this may be causing to public health.

This is your loaf

Exhibit "A" is a loaf of white (or brown) sliced bread. Place of origin: Chorleywood, England. This modest township not far from London hardly qualifies in the European super-league of gastronomic indications – Parma, Champagne, Stilton, Bordeaux, Roquefort and so on. But it has given its name to a process that has affected the quality of mass-produced bread in Britain and many other countries for more than 40 years. In 1961, the British Baking Industries Research Association in Chorleywood introduced a bread-making method, using lower-protein (and largely UK-grown) wheat, intense energy, an assortment of additives and no time for a first rise. A massive involuntary dietary experiment on the British public began. Over 80 per cent of all UK bread is made using this method and most of the rest uses a process called "Activated Dough Development" which uses a similar range of additives.

The Chorleywood Bread Process (CBP) produces bread of phenomenal volume and lightness, with great labour efficiency and at low apparent cost. It isn't promoted with the cachet of an *appellation contrôlée*. You won't see it mentioned on any bread labels. But you can't miss it. From the clammy sides of a chilled wedge sandwich to the flabby roll astride every franchised burger, the CBP is there. If bread forms a ball that sticks to the roof of your mouth as you chew, thank the CBP – but don't dwell on what it will shortly be doing to your insides. The CBP produces a soft squishy texture which lasts for many days until the preservatives can hold back the mould no longer.

This is industrial bread: a technological marvel combining production efficiency with a compelling appeal to the lowest common denominator of taste. It is the very embodiment of the modern age.

"How do they do it?" is the crowd's ambivalent question. To which one might add: "Why do they do it?"

Here is a breakdown of a typical CBP loaf.[1] Not all CBP loaves and rolls will contain all the ingredients and additives listed below, but most will contain a fair number. To put the CBP in context, only the first four ingredients in the table – flour, water, yeast and salt – are essential to make bread in traditional systems. In fact, even yeast (as an added industrial ingredient) is unnecessary for breads made with natural leavens or sourdoughs. There are bakers who find a ready market for bread made with flour, water and salt – and nothing else. So it is not unreasonable to ask: is everything else, in fact, unnecessary? And if so, why is it in our bread?

Read on and judge for yourself. The ingredients are as follows:

Flour Source of carbohydrate, protein, fat, minerals, vitamins and other micro-nutrients.

Water Necessary to make flour into dough.

Salt Adds flavour; strengthens gluten network in the dough; helps to stop the bread going mouldy (as a water-attractant and a partial mould inhibitor).

Yeast Aerates bread; makes it light in texture; and may contribute to bread flavour.

Fat Hard fats improve loaf volume, crumb softness and keeping quality. Not essential in traditional bread-making, though often used. Hard to do without some fat in CBP.

Flour treatment agent L-ascorbic acid (E300). Can be added to flour by the miller or at the baking stage. Acts as an oxidant which helps retain gas in the dough, making the loaf rise more. Not permitted in wholemeal flour, but permitted in wholemeal bread.

Bleach Chlorine dioxide gas to make flour whiter, used by millers for decades until banned in the UK in 1999. Still allowed in some countries, such as the USA. Chlorine is a potent biocide and greenhouse gas.

Reducing agent L-cysteine hydrochloride (E920). Cysteine is a naturally occurring amino-acid. Used in baking to create more stretchy doughs, especially for burger buns and French sticks. May be derived from animal hair and feathers.

Soya flour Widely used in bread "improvers". Has a bleaching effect on flour, assists "machinability" of dough and volume and softness of bread. Enables more water to be added to the dough mix. Increasingly likely to be derived from genetically modified soya beans.

Emulsifiers Widely used in bread "improvers" to control the size of gas bubbles, to enable the dough to hold more gas and therefore grow bigger, to make the crumb softer and to reduce the rate of staling. These are the main emulsifiers used:

Diacetylated tartaric acid esters of mono- and diglycerides of fatty acids (DATEM, DATA esters)

Sodium steoryl-2-lactylate (SSL)

Glycerol mono-stearate (GMS)

Lecithins

Preservatives Calcium propionate (CP) widely used. Vinegar (acetic acid) is also used, though less effective. Added preservatives are only necessary for prolonged shelf-life. CP may be a carcinogen.

Enzymes Came to the rescue of industrial bread-makers when additives like azodicarbonamide and potassium bromate were banned. No requirement to be included on ingredient declarations, because they are currently treated as "processing aids". Even if European Union law is amended, the single word "enzymes" will be all that is required on labels, leaving consumers in the dark about the origin of the particular enzymes used. They are often produced by genetic engineering, though this is unlikely to be stated on consumer product labels. Some enzymes are potential allergens, notably alpha-amylase. Bakery workers can become sensitised to enzymes from bread improvers.

Bread enzymes fall into various categories. The main ones are: amylase, maltogenic amylase (usually made from a genetically modified bacterial source), oxidase, protease, peptidase, lipase, phospholipase (may be derived from the pancreas of pigs, which would make it unacceptable to vegans, Muslims and Jews), hemicellulase, xylanase and transglutaminase.[2]

Assured, but not reassured

Readers unnerved by all the ominous chemical names may be assured that the ingredients and additives listed above have received appropriate regulatory approval. But they are not reassured.

1 Constituents of Chorleywood Bread Process loaf: S. Cauvain and L. Young, *Baking Problems Solved*, Cambridge: Woodhead, 2000. National Association of Master Bakers, *The Master Bakers' Book of Breadmaking*, Ware: NAMB, 1996.

2 For information on enzymes in Bread, see: R. Rastall (ed.), *LFRA Ingredients Handbook: Enzymes*, Leatherhead: Leatherhead Food Research Association, 1999, pp. 41–77. Some general concerns about the use of enzymes, especially novel ones being developed by genetic engineering, are mentioned in G.A. Tucker and L.F.J. Woods, *Enzymes in Food Processing*, London: Blackie Academic and Professional, 1995.

The same could have been said twenty or fifty years ago, when the list would have contained chemicals that have subsequently been banned. Safety assurance has, it seems, a fairly short shelf-life. Indeed the development of modern emulsifiers and especially of the newer bakery enzymes was given considerable impetus by the withdrawal of the oxidising "improver" potassium bromate, which after many years' use was discovered to have carcinogenic potential. (It is still used in some countries.)

Moreover, there is a wider concern that makes it hard to accept today's scientific consensus on food additives. New chemicals are evaluated on a primarily toxicological basis: feed a great deal of your chosen substance to laboratory rats for a limited period, and if they don't keel over and die it can be presumed safe for humans. However valuable such procedures can be – and I don't deny their role in protecting us from many hazards – they clearly do not catch the effects of long-term low-level exposure to novel compounds or altered processes, not to mention the "cocktail" effect of combinations of active agents that may be too numerous or unpredictable to model in the laboratory.

Much of this would be irrelevant if we were all enjoying our daily bread. But many of us in the UK and the US are not. To put it bluntly, quite a few people find that eating ordinary bread makes them unwell. If this were just a faddy minority, we might be tempted to dismiss their claims and look elsewhere than at our daily bread for the causes of bloating, indigestion, inflammatory bowel disease, constipation, diverticulitis and so on. But, though both the statistics and the diagnoses are contentious issues, there is no doubt that something is going on. Why else would hundreds of thousands of people stop eating bread and eliminate wheat from their diet?

The UK's leading allergy expert, Jonathan Brostoff, estimates that between 10 and 25 per cent of people show signs of adverse or allergic reactions to food.[3] A recent US study which measured sensitivity to wheat in a relatively large unselected population of volunteer blood donors found antibodies in 3.6 per cent of cases.[4]

How our bread has changed

When it hit the baking industry in the 1960s, the CBP was both the culmination of a long process of change and a radical departure from all previous ways of making bread. It was not so much that additives (or even adulterants) hadn't been used before, but rather that a particular confluence of economic pressure and technological innovation enabled bakers to transcend limits that had hitherto seemed to be ordained by nature.

The political–economic context in which the CBP emerged was one where millers' and bakers' margins were squeezed by residual post-Second World War price controls on bread and import tariffs on the North American wheat that was preferred by the industry. In the aftermath of wartime food shortages, European countries were determined to become more self-sufficient, and price support was one way of protecting cereal farmers from lower-cost producers in Canada, the USA, Argentina and Australia. The import duty on high-protein wheat made it economically attractive for millers to use more of the European crop. But bakers struggled to make it into the kind of bread to which the public had become accustomed. The solution – the CBP – involved changes to every aspect of the way bread was made: the wheat, the yeast, the additives and the speed of production.

Forty years on, we are beginning to realise – not for the first time in the history of technology – that long-term consequences may follow from a process of change that seems, at first, to offer nothing but benefit. After all, who could deny the economic logic of using more home-grown wheat, of speeding up the baking process and of making bread stay "fresh" for longer? True, only the latter point could be presented as a direct benefit to consumers, but if the millers and bakers also gained by cutting costs, the net result would be cheaper, whiter bread – and wasn't that what the public had always demanded?

But to make this cheap white bread, every aspect of the baking process had to be changed:

- wheat was bred to make flour that suited industrial baking methods
- millers separated the whole wheat more completely into its constituent parts and added enzymes to make it more consistent
- bakers massively increased the amount of yeast to make the dough rise quickly
- time was squeezed out of the baking process, and with it flavour and vital nutritional benefits
- freshness was redefined and artificially induced by means of undeclared additives

3 J. Brostoff and L. Gamlin, *The Complete Guide to Food Allergy & Intolerance*, London: Bloomsbury, 1998, pp. 19, 91.

4 US wheat sensitivity study: R.E. Biagini, B.A. MacKenzie, D.L. Sammons, J.P. Smith, C.A. Striley, S.K. Robertson and J.E. Snawder, "Evaluation of the prevalence of anti-wheat, anti-flour dust, and anti-alpha-amylase specific IgE antibodies in US blood donors", *Ann Allergy Asthma Immunol.*, 92 (6): 649–53, June 2004.

A technological and commercial triumph turned into a nutritional disaster.

Wheat

Ever since early wheat species emerged from North West India and Ethiopia over 10,000 years ago, the nature of the plant has been evolving. Climate and soil were the main determinants, and for most of history farmers could do little more than choose from variations that occurred through environmental pressure and chance mutations. Mendelian genetics and industrialisation eventually changed plant breeding in two respects.

First, breeders developed more aggressive methods to force mutations or create crosses and hybrids. Second, wheat varieties were selected according to radically new criteria – to fit an agriculture that relied increasingly on chemical rather than biological fertilisation and plant protection.

At the end of the Second World War, explosives manufacturers experienced a distinct decline in sales but found a ready outlet for their chemicals in the intensive agriculture that was seen as the only way to feed rapidly growing urban populations.[5] Wheat and maize varieties were bred to respond to heavy applications of soluble nitrogen, potash and phosphorus fertilisers. But such a regime produces flabby straw that falls over in wind or rain. So wheats with short straw were developed.

Once hooked on soluble chemicals, the new varieties showed signs of succumbing more than previously to fungal and pest attack. So new strains were bred for built-in resistance. Shorter stem length means less canopy to suppress weeds, so the new varieties also had to be able to thrive in the presence of herbicides. The millers wanted their say, too, so the breeding programme was adjusted to produce wheats with more and better protein for bread baking. And each year, yields must go on rising.

Yield, short straw, disease resistance, milling quality – the plant breeders have obliged. They have done so, to date, without recourse to GM technology, though that is in the wings.

What is striking in all of this – for those of us who think that farming has something to do with feeding healthy people – is that nutritional quality doesn't get a look in. No one seems to be asking whether, as variety succeeds variety with bewildering speed, wheat is getting better or worse to eat, more or less nutritious, more or less digestible.

Golden oldies

It is known that the precursors to modern bread wheats – einkorn, emmer and spelt – all contain more nutrients than their commercial successors.[6] Research at the International Maize and Wheat Improvement Center (CIMMYT) in Mexico revealed that the best traditional wheat varieties had about twice the iron and zinc of popular modern varieties; and their wild relatives had another half as much again. In Europe, the French National Institute for Agricultural Research (INRA) has shown that the mineral content of current French wheats is 30–40 per cent below that of older varieties.[7]

Milling methods

Until the invention of roller milling, all flour was produced by crushing wheat between revolving stones. All parts of the wheat – bran, germ and starchy endosperm – were pulverised and mixed together into what we know as wholemeal or whole wheat flour. If you wanted whiter flour, you had to sift the wholemeal through wire sieves or "bolting cloths" made from cotton, linen or silk. The roller milling system was quite different. It passed the wheat between pairs of steel cylinders which gradually stripped the layers off the grain, sifting the material thus produced into a series of streams, each containing a different fraction of the flour. These could be taken off and bagged separately or recombined to make "patent" flours for various baking purposes.

One of the consequences of the roller milling was to remove the wheat-germ oil that the stones had formerly dispersed throughout the flour. This contained virtually all the valuable vitamin E of the wheat. Its removal, though a nutritional disaster, was a great benefit to the millers. The wheat germ oil tended to oxidise and go rancid within a few weeks. Without it, white flour could last for several months – exactly what was needed as milling companies became larger and more concentrated, with ever longer distribution chains along expanding networks of railways and roads. Not for the last time, nutritional integrity was a casualty of the commercial need for "shelf life".

The advantages of stone-milling

A recent French study[8] set out to quantify the differences in the nutritional content of wheat milled between stones and rollers. The researchers took the opportunity to run their tests with samples of three varieties of wheat, each from

5 Development of chemical agriculture: see C. Tudge, *So Shall We Reap*, London: Allen Lane, 2003, pp. 266–8.

6 Nutrients in older varieties of wheat: R.D. Graham, R.M. Welch and H.E. Bouis, "Addressing micronutrient malnutrition through enhancing the nutritional quality of staple foods: principles, perspectives and knowledge gaps", *Advances in Agronomy*, 70: 77–142, 2001.

7 Mineral content of French wheats: INRA, *The nutritional value of bread can be much improved*, 2002. http://tinyurl.com/2lvmsc

8 French comparison of organic/conventional and stone-ground/roller-milled flours: M. Chaurand *et al.*, "Influence du type de mouture (cylindres vs meules) sur les teneurs en minéraux des différentes fractions du grain de blé en cultures conventionelles et biologiques", *Industries des Céréales*, 142, 2005.

conventional and organic agriculture. The results are fascinating. The organic wheat, before milling, had larger amounts of calcium, magnesium, zinc and potassium, though there was slightly less iron in the organic samples for reasons that were not explained. Stoneground flour produced higher values than roller-milled flour for both organic and conventional wheats. Milling organic wheat through stones rather than rollers compounded the effects in a remarkable way, so that stoneground organic flour was shown to have 50 per cent more magnesium and 46 per cent more zinc than the roller-milled conventional flour. This effect, it should be emphasised, was observed not in wholemeal but in flours that appear to have been milled to a finer extraction rate of around 80–85 per cent. Magnesium is deficient in many diets, and the role of zinc in good health is well established. It would not be unreasonable to expect the same benefits from organic growing and stone milling to apply to other important micronutrients in flour.

So here we have clear evidence of the nutritional advantages of organic growing and stone milling.

Cheesebread

Photo: Jeff Cottenden

Yeast

Ever since our ancestors, thousands of years ago, noticed that a flour and water paste, if left for some hours, begins to aerate, people in wheat- and rye-growing areas have eaten leavened bread. During fermentation, enzymes break carbohydrates down into sugars on which yeasts feed, producing carbon dioxide (the gas which raises the bread) and alcohol. This process was fully understood only after Pasteur's discovery in 1857 of the micro-organisms involved. It eventually became possible to identify and culture pure strains of yeast which gave fast and predictable results for bread-makers. Of the 160 or so known strains of yeast, the one commonly used for baker's yeast is *Saccharomyces cerevisiae*. Other strains are involved in natural leavens and sourdoughs.

Before the development of commercial yeast in the late 19th century, bakers had to make their own, either with a "wild" sourdough culture or by making a "barm" which may have been seeded with yeast residue from a brewery. Either way, the process took time because the number of viable yeast cells in a sourdough or barm was relatively small. When commercial yeast became available, it contained much larger populations of cells and worked quickly. But it was expensive, and the thrifty baker could make it go further by using a small quantity in a preliminary "sponge" consisting of a proportion of the flour and water to be used in the bread. This was allowed to ferment for 12–24 hours, multiplying the yeast cells in the congenial conditions of warmth, water and food. On the following day, fresh flour and water (and occasionally some fat) would be added to make the final dough.

Even when, in the 20th century, commercial yeast became accessible to all bakers, the "sponge-and-dough" method remained a favoured way of breadmaking. In a typical overnight recipe from a famous 1907 manual, the yeast quantity is less than 0.1 per cent of the final dough weight.[9] By the second half of the 20th century, yeast amounts had gone through the roof. The CBP uses over 23 times as much initial yeast as Kirkland's and Banfield's sponge-and-dough systems.[10] As this rather staggering statistic sinks in, two points should be made. First, yeast is, in theory, destroyed by the heat of baking; and second, yeast is anyway a good source of B vitamins. There should therefore be little cause for concern. And yet, if, after several decades in which most bread has been made with increased amounts of yeast, significant numbers of people develop an intolerance or allergy to yeast, it seems quite reasonable to wonder whether there is any link.

And there is another thing. Yeast, like the other raw materials of baking, has not remained the same. It,

9 Yeast dosage in traditional breads: J. Kirkland, *The Modern Baker, Confectioner and Caterer. New & Revised Edition*, London: The Gresham Publishing Company, 1927 (1907) Vol. I, pp. 115–16; W. Banfield, *Manna: a comprehensive treatise on bread manufacture*, London: Maclaren, 1947, pp. 227–33.

10 Yeast dosage in CBP bread: National Association of Master Bakers, *The Master Bakers' Book of Breadmaking*, Ware: NAMB, 1996, pp. 145, 147, 169.

too, needed a makeover if it was to be fit for the brave new world of Chorleywood. The old strain was simply not up to the job.

About time too

Throughout almost all of baking history, bread had taken a long time to rise. Bakers' barms or sourdoughs contained relatively sparse populations of mixed strains of "wild" yeasts. Whatever they were and wherever they came from, the one thing they had in common was that they worked slowly. Starting with a piece of dough from the previous day's baking, or a scoop of froth if you were within reach of a brewery, it took many hours and additions of fresh flour and water to build up sufficient yeast cells to raise a loaf of bread. The whole process from starter dough to finished product could take 24 hours or more.

As the price of yeast came down and productivity pressures grew, fermentation times shortened. With the invention of the CBP, the goal of "instant" dough was now attainable. With new machinery, ingenious chemistry and a terrific blast of (ever so slightly modified) yeast, bread needed no fermentation at all. Three or four minutes of violent mixing in a high-speed mixer and your dough was ready. Straight into the divider to cut it into equal pieces. Ten minutes for the gluten in the dough to relax before being moulded and dropped into tins. Forty to sixty minutes in a warm, humid proving room and into the oven for less than thirty minutes. From flour to bread in about an hour and a half. Chorleywood had conquered time.

It was good for business, of course, and costs to the manufacturer could be contained or reduced. Everyone could now afford the whitest, softest bread they had ever known, though curiously consumption kept on falling. "No-time" bread-making spread from the large automated factories to medium-sized independent bakers and out across the world: a very modern fairy tale, complete with advanced technology, improved productivity and good news on the export front.

Messing with time has had consequences, of course. Here is just one example from the field of food safety. In 2002, Swedish scientists reported unexpectedly high levels of the carcinogen acrylamide in foods such as crisps, chips, coffee, biscuits and bread. Acrylamide appears to form when foods, especially those high in carbohydrate and low in protein, are subjected to high temperatures during cooking, baking or roasting. A recent study revealed that fermenting dough made with wholemeal wheat or rye flour for 6 hours as opposed to 30 minutes reduced acrylamide levels by 87 per cent and 77 per cent.[11] The reason is that, as it ferments, yeast uses up free sources of the amino acid asparagines, which is the precursor to acrylamide formation. To perform this unexpected but vital task, yeast needs time.

Good times, bad times

Traditional bakers know that the longer you ferment dough, the better the bread keeps. Time invested in the making is repaid in the eating. Modern bakers and retailers have destroyed this elegant balance. They have stolen time from the production process, a theft which they try to disguise in contradictory ways. In the case of standard sliced and wrapped bread, they use additives to keep the crumb soft (or "fresh", as they would say) for a week or more. With the unwrapped bread, on the other hand, time is distorted in a rather different way

The baskets of apparently fresh, crusty loaves that issue from the supermarket's in-store "bakery" are very likely to have been part-baked in a distant factory to be warmed up at the point of sale. This interruption in processing has more to do with the economies of large-scale centralised production and the de-skilling of the baker's job than any real benefit to the consumer. The claimed advantages of "hot bread", whose name implies absolute freshness, are exposed in all their dubiousness when your twice-baked loaf turns to dusty crumbs within hours.

Supermarkets and their suppliers have to resort to a variety of technical fixes, some of them very ingenious, to slow down the natural process of aging which affects all living things. The more elaborate their strategies for "preserving freshness" (an oxymoron straight from the Peter Pan school of language), the shriller their claims. Perhaps they fear that if they stop telling us just how fresh everything is, we might wake up to the fact that a lot of it is actually rather old. In this way, freshness itself is turned into a commodity. Instead of being simply the end result of a short food-supply chain, it is now engineered with food additives and temperature control. And, in the twinkling of an eye, someone is "adding value" and selling us a bogus freshness, beguilingly decked out in the trappings of that other presumed benefit – convenience.

11 H. Fredriksson *et al.*, "Fermentation reduces free asparagine in dough and acrylamide content in bread", *Cereal Chem.* 81 (5): 650–53, 2004.