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3 The pasteurisation of England: the science, culture and health implications of milk processing, 1900–1950

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The risk theorist, Ulrich Beck, is reported to have called the carnivorous part of the British diet 'an experiment inflicted upon us by the beef industry'.[1] He was referring to the scare connecting Mad Cow Disease (Bovine Spongiform Encephalopathy) to new-variant CJD (Creutzfeldt–Jacob Disease), a debilitating and fatal human brain disease. He might equally well have been thinking of *E. coli* 0157, Brucellosis, Crohn's Disease, or any of the other health hazards that have been associated with animal products recently.

This chapter seeks to build upon the recent heightened interest in our food environment, by demonstrating that one of the most controversial present day issues about food standards, whether milk should or should not be compulsorily pasteurised, had a prehistory before the Second World War. This was part of a debate about the role of the state in food systems, when central and local government was becoming actively involved in regulating food production and sale, and in setting standards of hygiene, composition and purity. The state's activity at that time was uneven and depended upon the foodstuff concerned and the pressure exerted by interest groups. As Anthony Giddens has noted, assessing and coping with risk is a highly political activity, due to the assignment of values and prioritisation of responses, and the history of food regulation in the twentieth century provides many examples of this.[2]

Our focus will be upon the milk industry, particularly on the struggle to eliminate bacterial danger using the heat treatment technology known as pasteurisation. There was a passionate public debate about pasteurisation from about 1900 to 1945, which we will examine through an account of the views of the two camps, the pro- and the anti-pasteurisation lobbies. It will be argued that this was essentially a clash between discourses that were opposed in their views on the desirability of the modernisation of food systems.

Our point of departure will be the contention that throughout the century it was mainly the relationship between science and the state that constituted the shape of food regulation. A naive model might assume that the discovery of 'facts' about food hygiene provided the raw material for policy action, and such a history would be a simple matter of matching laboratory research

results with legislation. In reality, neither the science, nor the policy-making was straightforward. Almost every aspect of the scientific knowledge was contested, with some issues the subject of angry controversy. As regards the need for pasteurisation and the best technology for achieving it, the confusion afforded space on the battlefield to two main anti-pasteurisation groups. The first consisted of dairy farmers and small milk retailers, for whom the *status quo* was the cheapest and most profitable option. The second was a group of activists who for philosophical and ethical reasons opposed modern technological solutions to problems of disease in the food system.

The solidification of science and technology

The year 1901 was a turning point for the role of science in the milk food system. As described by Peter Koolmees in Chapter 4, this was when Robert Koch publicly challenged the view that tuberculosis could spread from animals to humans. In doing so Koch created a reactive wave of research by scientists who wished to prove him wrong.[3] But the Sale of Milk Regulations were also made in 1901, and for the first time the state legally defined and enforced a minimum level of fat in milk. The aim was to control adulteration, previously a common fraud,[4] but the effect was far reaching, because here was a government becoming embroiled in a debate about what should be considered 'natural'. The proportions of fat, solids-non-fat, and water in a cow's milk varied with many factors, such as feed, stage of lactation, and breed, but now there would be penalties if minimum standards of composition were not met. Farmers were to be presumed dishonest if the level of water in their milk was too high.[5]

Such state surveillance was facilitated by the use of scientific instruments for measuring the specific gravity of milk and the initiation of advanced biochemical investigations. These, along with new bacteriological methods, made it possible from the turn of the century for local authority laboratories to pass judgement upon the integrity and hygienic quality of milk.

One of the infectious diseases discovered to be common in the milk of the day was bovine tuberculosis.[6] Despite Koch's views, most public health and medical professionals continued to believe it was a significant threat to human health and solutions were sought. The one arousing greatest enthusiasm was pasteurisation, a method of heating milk until most pathogens are killed. But there was also much opposition. As noted in *A Dictionary of Dairying*, published in 1950: 'Probably no subject outside religion and politics has been the cause of more prolonged and bitter controversies than the proposal compulsorily to pasteurize all milk'.[7] Much of the fuel for this controversy was uncertainty concerning the science and technology of both bovine tuberculosis and pasteurisation.[8] Successive generations of politicians cited this as a reason for inaction, and until 1950 they also ruled out, on the grounds of cost, the only effective alternative intervention to pasteurisation,

which was the area-based slaughter of the 40 per cent of the dairy herd infected.

The first issue to be clarified was the aetiology and epidemiology of bovine tuberculosis. Koch's speech at the 1901 International Congress on Tuberculosis in London led to the establishment of a Royal Commission on Tuberculosis. This was unusual in being research-based and the reports issued in 1907 and 1911 assumed an aura of scientific confidence in identifying infected milk as the main cause of non-pulmonary human tuberculosis. Nevertheless, Koch's allies mounted a rearguard action that lasted for decades, and many members of the milk trade and most of the public continued to believe that the danger of catching tuberculosis from milk was insignificant.

The adoption of pasteurisation was slow at first. The first commercial equipment was manufactured in Germany in 1880, and by 1885 milk was regularly pasteurised in Copenhagen and Stockholm, but little happened in Britain for a further twenty years.[9] Only 1.5 per cent of Britain's supply was pasteurised in 1926.[10] The majority of retail milk was still raw in 1939 and this remained true in many small towns and rural areas well into the 1950s. One reason was that the early machinery was unreliable. In the so-called 'flash' process, for instance, milk was heated quickly to a high temperature in batches and then cooled, but the technology was primitive and was incapable of ensuring that the milk was treated evenly. The method was banned by the Milk (Special Designations) Order (1923), but continued in use unofficially for a time for milk that was not declared heat-treated. It was superseded, for the next two decades, by low temperature machines (63–71°C for 30 minutes) which heated the milk as it passed through a succession of large vessels. Finally HTST (High Temperature Short Time) methods were introduced in Britain in the 1940s, involving heating for 12–20 seconds at 75–6°C, giving a more effective result.[11]

In 1923 the technology then in use was considered to be 'from the consumers' point of view, absolutely useless'.[12] This was because heated milk, if not fully pasteurised, was a dangerous medium for the growth of bacteria. Table

Table 3.1 Proportion of pasteurised milk failing the phosphatase test[13]

Where the pasteurised milk was sold	*Percentage of samples failing to pass the phosphatase test*	
	1935 survey	*1937 survey*
To public in London	44	32
To public in towns over 20,000 population	34	17
To school children in London	46	14
To school children outside London	58	22
Total percentage	47	22

3.1 suggests that matters were still unsatisfactory a decade later. The data are based on the phosphatase test, an indicator of whether pasteurisation had been carried out properly, developed by Graham (later Sir Graham) Selby Wilson, professor of bacteriology at the London School of Hygiene and Tropical Medicine. Surveys in 1935 and 1937 showed that many samples still contained viable mycobacteria. It is hardly surprising, therefore, that the public remained sceptical until the general adoption of the perfected technology after the Second World War.

The public health debate about pasteurisation

In the light of the technological and theoretical uncertainties, how was it that a network of pro-pasteurisation lobbyists came into existence? The answer lies in the respective strength and political mobilisation of the two sides, for and against pasteurisation. From 1900 to about 1930 the anti-pasteurisation campaigners held the field. Under a broad banner opposing state intervention in dairy farming or the dairy trade, they were able to forestall or dilute the legislation that came forward. This was achieved by skilful parliamentary manoeuvring and by a fortuitous combination of events that saw Westminster's attention focused on a series of other major issues.

By 1930, it was obvious that the limited measures which had been introduced (the Milk and Dairies Act which came into operation in 1925, followed by the Milk and Dairies Order, 1926), were not having much impact. The pro-pasteurisation activists therefore began to regroup.

First, a highly motivated group of eminent doctors and scientists became involved in calling for pasteurisation. Wilson and Viscount Dawson of Penn, the King's physician, seem to have been the co-ordinators. They wrote letters to *The Lancet*, the *British Medical Journal* and *The Times* that were widely quoted.[14] By 1933 the government's own medical advisers were willing to state that 'it is clear that the only way of ensuring a safe general milk supply is pasteurisation'.[15] Wilson's book *The Pasteurization of Milk* (1942) was also a major landmark, and appeared in the same year as a Medical Research Council report warning of the increase of tuberculosis during the War.[16] Second, the British Medical Association (BMA) and other societies attempted an institutional route for expressing their concerns about milk. The BMA sponsored several delegations to the government but received most publicity for its 1938 poster and advertisement campaign warning of the dangers of unpasteurised milk. This caused controversy to such an extent that several newspapers refused BMA copy, presumably fearing the response of the milk trade.[17] Third, several weighty reports were published, giving statistical data on bovine tuberculosis and arguing for legislation on pasteurisation, which would at least allow individual local authorities to adopt schemes. The reports from the People's League of Health (1932), discussed by Margaret Barnett in Chapter 5, and a committee appointed by the Economic Advisory Council (1932), were especially pertinent. The more

limited pronouncements of the Milk Reorganisation Commissions of 1933 and 1935 had gravitas, and, more importantly, gained the imprimatur of government for certain policy shifts.[18]

It is worth noting that the public health politics of the 1930s and 1940s were not overwhelmingly pro-pasteurisation. Even within the medical profession there were many opponents and one can detect the exasperation this caused in editorials in the medical press:

> Pasteurisation is one of those subjects that tend to generate more heat than light. It is a great pity that medical men who oppose pasteurisation support their case by misstatements of fact, or by ignoring those facts which are available to anyone who will take the trouble to spend an hour or two in a medical library. It is a pity, because their misstatements and ill-informed views are given much prominence in a press often enough, unfortunately, more anxious to please certain interests than to get at the truth of the matter.[19]

The opposition, although in a small minority by 1930, provided policy makers with a loophole. Thus Earl de la Warr, parliamentary secretary to the Ministry of Agriculture, in 1931 issued a call for unanimity before the state could be expected to intervene:

> The medical profession ... would also help the government if they would make up their minds as to what they really felt about milk. Before the medical profession come down on the farming industry for not taking certain steps about milk, they should really make up their minds what they wanted the farmers to do.[20]

Capitalism and germs

From the turn of the century heat treatment of milk started in Britain in a small way.[21] It was introduced in London by Wiltshire United Dairies, Express Dairies and other large companies as a means of delaying souring and increasing shelf-life.[22] There was no initial concern about disease *per se* and retailers did not declare the intervention to their customers, who would then have realised that freshness was not always guaranteed. The cynical interpretation of one writer in the *British Medical Journal* was not far from the truth:

> If it had not been essential for the dairy trade of today (a series of large combines collecting milk of various ages over a wide area) to find some system whereby they could ensure delivery to the consumer in a sweet condition, it would appear doubtful that general pasteurisation of milk would ever have come to the fore.[23]

Producer-retailers, however, were responsible for about 20 per cent of milk sold and they opposed pasteurisation.[24] They offered 'milk from the cow' and, since many could not afford their own pasteurising and bottling plant, compulsory pasteurisation would have meant taking their own milk to a depot and receiving an anonymous product in return.[25] The direct link

with the land, upon which their goodwill depended, would be destroyed. They opposed the move towards compulsory pasteurisation implicit in the Milk Industry Bill of 1938 and, partly because of MPs representing their interests, it did not reach the statute book.[26] The large dairy companies, ever anxious to eliminate smaller competitors, were in favour of compulsory pasteurisation and supported war-time efforts to rationalise delivery rounds, to the detriment of the producer-retailers.

Resistance from neo-romanticism and anti-modernism

In considering perceptions of the pros and cons of pasteurisation, it is worth investigating the intellectual roots of the ideas deployed. Starting with the environmentalism of the early twentieth century, we can trace its origins to the dirt and disease-obsessed hygienist discourse of the Victorian era. But it also had a new element of what Frank Trentmann calls 'neo-romanticism', a bourgeois cultural movement that had offshoots in various countries.[27] The fresh air, hiking and healthy body ideas of the popular German youth movements of the 1920s and 1930s had their parallels in Britain and inspired broad-spectrum responses across the class and political divides. The Boy Scouts, Girl Guides, Ramblers' Association, Youth Hostel Association and Kibbo Kift Kin all represented a muscular interpretation of leisure in the open countryside, and a new and institutionalised experience of nature.

Complementary to such action-based and lifestyle philosophies was the flood of writing about rural England that peaked in 1930–45.[28] H. J. Massingham is an example of one author who helped create an interpretation of the countryside as a repository of precious traditional values. Together these ideas and the fresh air activities forged what for David Matless is 'a particular landscaped version of English citizenship', a new set of identities which were mediated through the relationship between humans and nature.[29] Several strands of the critique of modernism and other neo-romanticist expressions were related to the anti-pasteurisation position.

The first cluster of criticisms arose out of ideas concerning organic farming and clean milk. There was much scepticism about modern farming methods such as the use of fertilisers and other chemicals, and also about mechanised cultivation and machine milking. On the one hand these techniques were seen as displacing jobs in the countryside and encouraging migration to urban areas. On the other, modern farming was accused of degrading soil fertility and leading to soil erosion.[30]

In response, figures such as Lady Eve Balfour attempted to popularise organic farming, drawing inspiration from techniques of recycling organic matter that had been developed in colonial India.[31] A common aim was the re-establishment of mixed farming, considered to be the optimum type of enterprise for English ecological conditions. It comprised a holistic system in which waste products were swapped between the arable and livestock sides, reducing the need for artificial inputs. The greatest possible self-sufficiency

also had the merit of minimising the risk of introducing disease with new stock.

Pasteurisation was criticised by organic farmers as proof of the failure of modern farming. It treated the symptoms and not the cause of the problem, the over-intensification of production in conditions of dirt and disease, coupled with a disregard for traditional principles of good husbandry. Lady Balfour was especially critical of pasteurised milk. In her view, it was in the interests only of dirty producers and large dairy companies. Pasteurisation allowed the former to 'get away with' dirty milk that would otherwise go sour, while the latter were enabled 'to sell milk several days old without the customer being aware of the fact'. For Lady Balfour,

> ... pasteurisation can never be a good thing in itself. It should be regarded even by its advocates as the lesser of two evils. The necessity for it, where it exists, is a confession of failure. The aim should be to abandon the practice just as soon as the need for it – unhealthy cows and dirty methods – can be eliminated.[32]

This version of the argument saw pasteurisation as both unnecessary and counter-productive. What was needed was a revolution in farm hygiene that would guarantee a dirt- and germ-free product. In order to begin the task of changing attitudes, Wilfred Buckley and Waldorf Astor founded a National Clean Milk Society in 1916.[33] Their campaign lasted for over a decade and involved a wide range of activities. They sponsored National Milk Conferences in the 1920s, at which the issues were formally debated, but their most important contribution was the encouragement of research on the best methods of clean milk production.[34] This was undertaken from 1920 onwards at the Research Institute in Dairying at Reading (later the National Institute for Research in Dairying), and was inspired by the leadership of Robert Stenhouse Williams.[35]

A second major strand of anti-modernist thinking was concerned with the effect of the perceived unwholesomeness of food on the long-term future of the 'British race'. The origins of the depressed tone of much of the literature lay in the turn of the century 'physical deterioration' debate that erupted after many army recruits were found unfit to fight the Boers.[36] Such fears were rekindled by inter-war reports using rather a different rhetoric and methods of data collection, such as John Boyd Orr's *Food, Health and Income* (1936), which claimed that half of the population was undernourished.[37] Although many politicians played down such statistics, others argued that the modernisation of British society had been a failure in terms of the living standards and health of the majority of the people. Viscount Lymington, for example, commented:

> For all our medical work in reducing certain contagious diseases and prolonging the expectation of life, a man full of vigorous health is almost a museum piece in this country. Subnormality in health and degenerative disease in mild or acute form are the average in this country, so much so that we take it for granted.[38]

One explanation adduced was that these weak and unhealthy bodies were the result of poor childhood nutrition and the debilitating effects of urban

living, but worries were also expressed about the effect of poor quality food upon the population generally. By the 1930s a link was asserted between declining fertility of the soil and the health of the race, with interesting echoes of the blood and soil rhetoric that was to take hold in Germany. Viscount Lymington, a Conservative MP 1929–34 (later the Earl of Portsmouth), was one advocate of this view of deterioration.[39] For him whole foods, including milk, unmodified by processing, were an essential part of national salvation.

It was the lot of milk to bear much ideological baggage, including notions about racial health and vigour. Those concerned with such issues, including some eugenicists whose usual focus was upon hereditary factors, claimed that the strength and fertility of the nation would be threatened by making milk unnatural by pasteurisation. One correspondent to the *British Medical Journal*, for example, claimed in 1938 that as a result of pasteurisation, 'the shadow of depopulation and national decline is looming in the near future'.[40]

Concerns about poor diets and their consequences had encouraged activists to demand a government-sponsored system of school milk provision, in the hope that well-nourished children would contribute to renewed national virility. The first feeding trials, financed by the National Milk Publicity Council, were started in Birmingham in 1922–3.[41] By 1930, 35,000 children received free milk, subsidised by Local Education Authorities and a further 48,000 paid for a daily supply. The National Milk Publicity Council reached an additional 500,000 with their own scheme of school milk provided in one-third pint bottles for 1d.[42] In 1934 this activity was replaced when the government's own nation-wide milk-in-schools scheme was introduced, which reduced the price to 1/2d. The main objective of this, however, was to help a beleaguered dairy industry find a new outlet. Most of the milk supplied to schools was not pasteurised and, ironically, more children than ever were exposed to the dangers of raw milk.[43]

One final point should be mentioned on the theme of the health of the race. Another argument against pasteurisation was the suggestion that milk infected with bovine tuberculosis could help build immunity in the population against the human form of the disease. The principle of inoculation was well understood in the early century but, despite experiments and false dawns, no reliable anti-tuberculosis vaccine was developed. The BCG vaccine was not commonly used in Britain until the 1950s. In this light, the consumption of raw milk was proposed by some as the only practical mechanism of mass-inoculation. In truth, there is evidence that long term exposure to bovine tuberculosis does indeed reduce morbidity and mortality from the human form. However, the dose of bacteria administered by contaminated milk was uncontrollable and estimates indicate that over 200,000 deaths were caused by transmission of tuberculosis from animals to humans in England and Wales during 1900–50.[44]

A third, important group of anti-modernist themes was coupled with right wing opposition to state intervention. Lymington, for instance, asserted that successive governments were to blame for the inter-war agricultural depres-

sion because of their 'interference' in farming. He thought the Milk and Dairies Order (1926) had 'made cowshed costs fantastic at the instance of theorists in the Ministry of Health'. He deplored, as 'state socialism', the establishment by the National Government of the Milk Marketing Boards in 1933 and resigned from parliament soon afterwards.[45] He argued that pasteurisation lessened the incentive to produce clean milk and guaranteed only the consumption of 'bulked cemeteries of cooked germs'. He thought compulsory pasteurisation a 'supreme folly'.[46]

Lymington had early sympathies with fascism: he visited Hitler and Mussolini and he narrowly avoided internment in 1939.[47] He was also drawn into William Sanderson's 'English Mistery', a society stressing the need for a revival of pre-industrial traditions and Anglo-Saxon identity. Membership included Reginald Dorman-Smith, who became Minister of Agriculture (1939–40) and Rolf Gardiner, an organic farmer and opponent of processed foods. Gardiner had been a member of the Social Credit movement as an undergraduate and built strong links with the German youth movements in the 1920s.[48] When he took up farming in Wiltshire he formed the 'Springhead Ring' of enthusiasts in youth work, folk dance, forestry and farming, and his estate became a meeting place for German visitors and British Germanophiles. Gardiner wrote about his desire for closer links across the North Sea and this crystallised after 1933 into an admiration for Nazism.[49] He later claimed that National Socialism had betrayed the principles of blood and soil, and called for the replacement of centralised planning by local, organic reconstruction according to traditional yeoman values. His vision was always hierarchical, however, with landowners such as himself providing the lead socially and economically.[50]

Lymington, Gardiner, and other prominent conservative thinkers were critical of the power of capital in modern society. They regretted its role in industrialisation and urbanisation, and the associated social problems. The separation of consumers from farmers by corporate intermediaries such as food companies or marketing boards was another negative consequence that encouraged processing and preservation of perishable foodstuffs. They were nostalgic for the roots of English civilisation, and proposed a modified version of rural society that would be yeoman-dominated and centred on small-scale communities.

This was not new. There had been a widespread call for a movement 'back to the land' in the first two decades of the century. Lloyd George had been captivated by the idea and had devoted much energy to this and other rural matters, such as land tenure reform. The neo-romantics had an idealised vision of hardy, self-reliant farmers, and organisations such as the Rural Reconstruction Association (founded 1925) and the Kinship of Husbandry took up these ideas.[51] The latter was established by Lymington and included Gardiner, writers Massingham and Edmund Blunden, and historian Arthur Bryant. They were in close touch with German 'green' ideas.

A fourth strand of environmental neo-romanticism was its spiritual dimen-

sion, or what David Matless calls nature-mysticism.[52] This entailed a reverence for the sublimity and wholeness of nature which extended from the transcendental contemplation of landscape, through what nowadays would be called 'deep ecology', to a desire for 'whole' and 'natural' foods. D. H. Lawrence was an inspiration to many with his self-confident Nietzschian individualism, and a strong bio-mysticism derived from Haeckel and Emerson.[53] Lawrence's philosophy was vitalistic and based upon a belief in the restless energy of the universe. His novels stand for the preference of many of his contemporaries for the life force of the organic over the cold calculation of a mechanistic modern civilisation.[54] He is reported to have written to Gardiner supporting the latter's connections with the German youth movement and commenting: 'the Germans take their shirts off and work in the hay: they are still physical: the English are so woefully disembodied'.[55]

Further ideological input came from the theosophical teaching of Rudolf Steiner (1861–1925) on biodynamic farming. The immediate source for this was Ehrenfried Pfeiffer, a disciple of Steiner, whose farm in Holland became a place of pilgrimage for the British ecological élite in the 1930s.[56] Steiner's lectures on agriculture, delivered in 1924, stressed the spiritual cosmic features of the environment rather than the materialist interpretation of chemists.[57] The Kinship of Husbandry was well aware of Steiner's work and it is no surprise that the writings of Lymington and Gardiner have vitalistic overtones. Much anti-pasteurisation rhetoric absorbed the notion of hidden energies and unknown qualities. Such ideas also derived momentum from the mythic appeal of mother's milk.[58] As breast-feeding declined amongst certain groups of women, some of this respect was transferred to the obvious substitute, cow's milk.

Our fifth and final element of anti-modernism drew strength from the new scientific knowledge of nutrition, which was embraced by some who might otherwise have based their anti-pasteurisation arguments on vitalism. Immediately after the First World War, just when pasteurisation was becoming common in large cities such as London and Glasgow, new scientific findings appeared to confirm the idea that milk (and other foods) might contain important but unknown substances which were threatened by pasteurisation and other forms of processing. This was the so-called 'newer knowledge of nutrition' which demonstrated the presence in milk and other foods of micronutrients that became known as 'accessory food factors' or 'vitamines' (later 'vitamins'). F. G. Hopkins had worked on this topic from 1906 to 1912 but it was the further research of others that established the detailed implications.[59] By 1920 vitamins were more widely known and after this, milk drinkers became gradually aware of the micronutrients they were consuming.[60] Concerns were raised about the effect of pasteurisation upon the vitamin content of milk and questions were even asked in the House of Commons about the matter.[61]

Arguments about the alleged effects of pasteurisation upon the vitamin content of milk were related to those based on vitalism and anti-modernist

sentiments. During the 1930s the research of E. C. V. Mattick and J. Golding showed that rats fed on a diet of sterilised milk were unable to reproduce, and that those fed solely on pasteurised milk suffered from vitamin B deficiencies.[62] These findings formed part of the basis of the arguments about racial vigour mentioned earlier. Another example, linking anti-modernism, notions of 'dead' milk and the 'newer knowledge of nutrition' is provided in a contribution by L. J. Picton, Hon. Secretary of the Cheshire Medical Committees, to the *British Medical Journal* in 1938:

> Much of modern food is processed, preserved, refined, sterilised, dead ... Contrast the insipid pasteurised fluid of today to the milk of our forefathers ... We are constantly told there is 'no significant difference' between the processed milk and the fresh, as if the loss of ascorbic acid (vitamin C) and the insolubility of lime and phosphorus caused by heating were of no account.[63]

Post-war debates

At the end of the Second World War, Ben Davies, a spokesman for the milk trade, confidently asserted that 'the old debates on pasteurisation were over'.[64] The official historian of the food system during World War Two saw wartime government control as a turning point. The balance of power had shifted decisively in the favour of those who advocated pasteurisation and 'the "milk enthusiasts" had entered into their kingdom at long last'.[65] Gradually, pasteurisation spread in the 1950s from the large cities to smaller towns and rural areas. Tuberculosis was becoming less of a threat and the Tuberculin Tested grade of milk was finally abolished in 1964 as no longer necessary.

The anti-pasteurisation movement may have hoped to be left in peace as a niche market among consenting consumers aware of the risks, but they came under periodic attack during the last twenty years of the century. Pasteurisation was made compulsory in Scotland in 1983 and there were moves to extend this to England and Wales in 1989 and again in 1997–98 as a result of the international regulatory drive of the Codex Alimentarius Commission of the United Nations. The latest debate gained much publicity, mainly due to lobby groups such as the Campaign for Real Milk and the Association of Unpasteurized Milk Producers and Consumers, founded in 1989 and headed by Sir Julian Rose. These groups deploy several arguments but the most powerful one concerns freedom of choice.[66] The quality press was supportive of this and was particularly scathing about the efforts of the 'health police' and the 'nanny state' in attempting to impose pasteurisation.[67]

After a lengthy consultation process about the possible compulsory enforcement of pasteurisation in England and Wales, the Ministry of Agriculture in January 1999 renewed its approval of 'green top' milk but at the same time increased the stringency of the hygiene tests it has to pass. This will squeeze

the remaining producers by increasing their costs, but the debate continues because the issues underlying the state-inspired enforcement of food safety are so fundamental to the relationship between human consumers and their food environment.

Conclusion

During the period 1900–50 the pasteurisation and anti-pasteurisation camps were starkly opposed, with relatively little neutral ground between. The conclusion of this chapter is that there were understandable reasons for this that can be traced to the different ontological and discursive underpinnings of the two sides of the debate. The opposing activists were unable and unwilling to see each other's point of view. The mystical and qualitative arguments of many anti-pasteurisation lobbyists particularly irritated food scientists such as Magnus Pyke. He called them irrational, unsupported by evidence, misleading and untrue.[68] He wanted them to be judged according to the criteria of the modern science establishment and not according to their own bio-mystical agenda. Graham Wilson was of a similar mind to Pyke but he did at least devote a large section of his textbook to the anti-pasteurisation arguments.

In a sense milk pasteurisation was a chosen battleground. It seems that those who found modern trends in the food system unacceptable selected the issue for a rearguard action since milk was newsworthy both through its connection with infants and because tuberculosis was such a feared disease.

After 1950 the threat of TB declined and many aspects of the anti-modernist discourse changed. New anti-pasteurisation arguments have come forward. The latest worries are the increased likelihood of atopic allergic reactions and the destruction of anti-microbial proteins and other anti-infective agents. In addition, the anti-pasteurisation case today is partly based on comparisons with other foods. It is pointed out that there are far fewer cases of contamination in raw milk than in eggs, poultry meat or even water. Further research is required for this post-1950 period and one suspects that both the intellectual currents and approaches to campaigning were different in important ways to those of the early twentieth century.

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