FOOD MATTERS: FOOD SAFETY RESEARCH IN THE UK PUBLIC SECTOR, 1917-1990

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There can be little doubt that food safety is now the most contested public policy domain in the UK. The current outbreak of foot-and-mouth disease is only the latest in a series of food safety 'crises', beginning with the food poisoning episodes at the end of the 1980s, and going on to include BSE, GMOs and swine fever. However, as recently as the mid-1970s, the safety or otherwise of food attracted little attention, whether from the media, government or public. A consensus existed that food as eaten was generally safe, and that, if there were risks, these were so low as to be negligible. Perhaps partly as a consequence, scholars in the humanities and social sciences have evinced little interest in the question of food safety, tending to focus instead on themes such as media representation, social policy and regulation, and the globalisation of food markets. In particular, with regard to food safety, scant attention has been directed at the perceptions and activity of public sector scientists, and how these have changed over time. Historical and social science researchers have, as yet, failed to address the fundamental question of how and why, over the last 25 years, food safety has emerged to attain the high levels of public and political attention that it currently commands.

This article presents the findings of a project entitled *Good Food: food safety awareness and interventions in the UK since World War II*, undertaken by the Wellcome Unit for the History of Medicine at the University of East Anglia. For this project, a series of extended, semi-structured interviews was carried out with senior public sector scientists and administrators selected

on the basis of their past or ongoing involvement in public sector food research. As such, the primary focus of the Good Food project was on food safety as researched, administered and organised in the public sector, rather than on food safety research and praxis in the private sector. In so far as the majority of the interviewees were retired, the period over which the largest number were simultaneously active was broadly that from 1960 to 1990. It was therefore on these decades – the 1960s, '70s and '80s – that the project focused, imposing a cut-off date to all intents and purposes pre-BSE and pre-GM, so that it was not possible to give these two issues the attention they merit. The story of public sector food research is closely interwoven with that of the Low Temperature Station for Research in Biochemistry and Biophysics (LTRS), given that, over the period in question, it was in this institution and its subsequent incarnations that publicly funded research into food was largely concentrated. Moreover, it was here that most of the interviewees spent the greater part of their working lives.

Food first gained its own home as a subject for research with the establishment of the LTRS in Cambridge in 1922, under the aegis of the Department of Scientific and Industrial Research (DSIR). For most of the interwar years, research at the LTRS was geared primarily to the preservation of food by means of refrigerated storage and controlled-atmosphere cool storage. By the mid-1930s the principles underlying these practices had largely been established, and, although the LTRS had made a major contribution in both areas, as an institution it was losing momentum. However, the advent of World War Two changed this situation. In the mid-1930s, it was realised that weight and volume were important factors when foodstuffs had to be stored and transported on a large scale, and, furthermore, that under emergency conditions, these might easily become limiting factors in the Government's attempts to maintain adequate food supplies. From 1937 onwards, therefore, work on refrigerated preservation was gradually displaced by research in a novel field, namely the dehydration of food.

It was not until 1956, in response to the contamination of egg products by *Salmonella*, that the safety of food emerged as a focus of research at LTRS. Although *Salmonella* had been a concern during the war in

connection with the import of dried eggs from the United States, LTRS had done little or no research in this area as it was, at the time, occupied in developing techniques for the dehydration of food. Alongside *Salmonella* in egg products, an emerging concern in the late 1950s was the hygiene conditions in poultry packing plants, as it was over this period, the late '50s and early '60s, that the poultry sector began to be transformed by the introduction of freezing techniques and the establishment of intensive methods of production.

Nevertheless, during the 1960s, research into questions of safety accounted for only a relatively small proportion of research at LTRS. The emphasis was squarely on improving the quality of foodstuffs, as the LTRS Director made clear in the 1959 Annual Report: 'While the problems of gross spoilage of refrigerated cargoes can be regarded as for the most part solved, innumerable problems still remain concerned with the loss of fresh quality of both home-produced and imported foodstuffs during storage and transport, and it is these problems that are now being tackled in all food research laboratories' (1). Also in 1959, responsibility for food research had passed from DSIR to the Agricultural Research Council (ARC), a development that triggered considerable reorganisation of the LTRS and its sister laboratory at Ditton in Kent.

The decision to close down both LTRS and Ditton was taken in the early 1960s. In their place, two new research institutes were created – the Meat Research Institute (MRI) at Langford, near Bristol, and the Food Research Institute (FRI) at Colney, just outside Norwich. Although some safety work was done at FRI, particularly in the areas of *Salmonella* in poultry and the bacterial contamination of packaged foods, the research emphasis continued to be primarily on food quality, particularly in terms of taste, texture and acceptability. There was further continuity in the way that research activity retained its focus on the post-harvest or post-slaughter behaviour of primary agricultural products.

This commodity-centred approach, pursued throughout the lifetime of the LTRS, had been reiterated by the ARC taking over responsibility for food research, in so far as the ARC perceived its research remit as extending to the farm gate and no further. Over most of the LTRS' time, and certainly until

the early 1950s, commodity-led research was unproblematic and was, as it were, the natural way to go. This was as much due to the absence of any recognisable food processing industry as to the fact that public sector food research had been, until this time, linked closely to maintaining domestic food supplies and, in the period after the war, to enhancing the productivity of UK agriculture. However, from the mid-1950s, as the food processing industry became progressively larger, more diverse and more economically important, a focus on primary production appeared ever more anachronistic. Moreover, an emphasis on commodities had particular implications for food safety research, so that a microbiologist working on *Clostridium botulinum* in sausage meat, for example, would not collaborate, or necessarily even communicate with, a microbiologist working on the same organism in cheese products. Commodity restrictions thus made little sense at a time when food components, such as lipids, proteins and carbohydrates, were becoming more important than their biological sources. By the start of the 1970s, therefore, considerable uncertainty surrounded the question of what the FRI's relationship should be to the food processing industry.

The MRI had been set up with the aid of meat industry funding, via the offices of the Meat and Livestock Commission, and as such it worked closely with that industry. Food processing companies looked at the close relationship between the meat industry and the MRI, and began to question the value of their own rather nebulous relationship with the FRI. Of the research undertaken at the FRI during the 1960s, a relatively limited proportion was of any direct use to the food processing industry. Research was predominantly fundamental rather than applied, and moreover tended to consist of disparate projects which, rather than forming a coherent programme of research, generally reflected the interests of individual scientists. The relatively close links between food research and industry that had existed during the LTRS/DSIR era became, to an extent, diluted in the 1960s, although there remained considerable contact with the poultry sector. An explanation may be found in the changing composition of the food industry, which by the 1960s had far more to do with processing than with primary production, and also in the linear model of technical

innovation that held sway within the ARC and its institutes (2). According to this model, pure research was the best way of ensuring that practical applications would emerge from scientific endeavour, so that pure and applied research were parts of a continuum, and fundamental research could be legitimised as no less practical than applied.

The FRI's commodity-led research agenda, as well as the demarcation of the ARC's sphere of interest as no further than the farm gate, were both seen to militate against the FRI adopting a more integrated approach to the investigation of food as eaten. Moreover, there was a perception from within the food processing industry that, whilst the meat and dairy industries each had a public research institute undertaking work on its behalf (the MRI and National Institute for Research into Dairying (NIRD), respectively), there was no comparable arrangement for the processing industry. In the early 1970s, this led the food processing industry to start lobbying MAFF for the FRI to be made more responsive to the industry's research requirements. It was argued that the ARC's research agenda had become too divorced from the needs of its clients, namely farmers, agricultural suppliers, food processors and MAFF. As such, MAFF should be given a much larger say over the disbursement of funds for agricultural, and hence food, research. Following a parliamentary review of government funding for R&D in 1971, MAFF did indeed increase its role in this area. The Rothschild Report recommended the introduction of a 'customer-contractor' principle across the range of government-funded R&D, whereby research should be oriented to the needs of the government department that commissioned it. As such, MAFF gained a degree of control over food research expenditure from 1971 onwards, after which it sought, albeit with a light touch, to rebalance ARC research activity in favour of more applied work.

As indicated already, these early years of the 1970s were a time of uncertainty for the FRI in terms of its purpose and direction. Perhaps the most serious consequence of this atmosphere of uncertainty was that the replacement of a number of FRI project leaders whose retirement fell due in the early '70s was deferred, with a resulting loss of impetus in research at the Institute. At the same time, the whole *modus operandi* of research at the FRI was being assailed in the wake of Rothschild. As part of this process,

Directors' Advisory Boards were set up in 1976 and assigned to the Directors of ARC institutes. Industrial and research association interests were strongly represented, so that the remit of the Advisory Board at the FRI was 'to assist on matters relating to the research programme and other aspects of the Institute's activities' – that is, to reorient the FRI's research programme to bring it more into line with industrial requirements.

In 1978, an ARC Visiting Group came to the FRI, the first since 1969 (these visits were the means whereby the ARC monitored the work being done at its various research institutes). Significantly, this Visiting Group commented on the external relevance of the science being undertaken at the Institute, rather than focusing exclusively on the quality of the science, as had historically been the case. Following the publication of its report, two overall objectives for the Institute were agreed, namely 'to carry out medium and long term research (i) to support the broad national interests of consumers in the quality, i.e. safety, nutritive value and acceptability, of the food supply in the UK, and (ii) to assist the food manufacturing industry, in collaboration with the research associations, to maximise its efficiency and effectiveness'. The years at the end of the 1970s saw considerable organisational and administrative change within the FRI to reflect and implement this reorientation. All the heads of scientific divisions changed within a period of two years, new divisions were created, there was much regrouping of research teams, and a complete change of work for several support staff. A particular example was the setting up of a Nutrition and Food Quality Division, so that for the first time the FRI, in conjunction with the MRC's Dunn Laboratory in Cambridge, began to carry out research into the nutritional adequacy of the UK food supply. Previously, such work had been seen as the exclusive responsibility of the MRC, and indeed the ARC had been and remained unofficially forbidden to recruit medically qualified staff. In addition, a new Liaison and Information Services Division was established, charged specifically with strengthening the Institute's interaction with outside interests. 1978 can thus be seen to mark a sea change in the orientation of public sector food research in the UK, essentially involving a shift of emphasis away from a commodity-led

approach centred on post-harvest storage and in favour of greater engagement with the research requirements of the food processing industry.

At the same time, the food processing industry was becoming more organised and hence more effective at lobbying government. Indeed, the Food and Drink Federation played an important role in the setting up of the government Advisory Committee on Applied Research and Development (ACARD) in 1981. The Committee reported the following year, and an important outcome of its work was for the ARC, much against its will, to be renamed the Agriculture and Food Research Council (AFRC). Subsequently, a Food Division and a Food Research Committee were set up within the AFRC, where previously there had only been 'animals' and 'plants'.

The fact that, prior to 1982, the funding council for food research in the UK had neither a Food Division nor a Food Research Committee testifies eloquently to the general orientation of food research in the preceding period, when research on food had tended to mean research on primary agricultural products – eggs, milk, meat and plants – and, certainly in the case of the FRI, largely fundamental research at that. As one interviewee recalled: 'There was (in the ARC) this terrible snobbery, the snobbery of the pure – anything that had applied after it was a drawing in of breath and a pulling back of skirts'. It was not until the late '70s and early '80s that public sector food research began to reorient itself more towards processed food and to adopt a more applied approach. Indeed, the change from ARC to AFRC would seem to constitute *post facto* recognition of this reorientation. Arguably, therefore, it was not until the start of the 1980s that anything like a concerted effort on the part of government to begin creating a 'food research programme' as such became discernible. As one interviewee stated, food research in the ARC during the '60s and '70s had 'virtually no priority at all, and actually when food was put into the AFRC [it] still tended to be [seen as] not very scientific, not quite the thing'.

In the early 1980s, a coherent programme of food research began to emerge within the FRI, as well as across the various AFRC food institutes. Food safety was an integral part of this nascent food research programme; indeed, it was also at this time that food safety concerns were beginning to attract attention in the public arena. So one could say that scientists didn't

really begin to train their gaze on 'food safety' as a discrete area of research until around that same time, the early to mid-1980s. Of course, as we have seen, throughout the 1970s and, indeed, the '50s and '60s, scientific research was being undertaken into questions of food safety, but it was as an adjunct to food research rather than as an area of research in itself. As one interviewee put it: 'Safety was always implicit in all the developments that were going on, but it was the safety implications of ... project[s], rather than ... project[s[on safety matter[s]'.

The 1982 ACARD report on the food industry and food technology thus resulted in the AFRC taking a greater interest in the food research carried out in its institutes, albeit grudgingly and, at least initially, without a significant transfer of resources. The opposition to change had a cultural basis, largely related to the persistence and strength of the plant science and animal science communities within the ARC. However, the Council did begin to adopt a more integrated and programmatic approach to the management of food research, so that, in April 1985, the FRI became FRI Norwich, the MRI became FRI Bristol and the NIRD became FRI Reading. In November 1985, all three institutes were brought together to form the AFRC Institute of Food Research, this being composed of IFR Norwich Laboratory, IFR Bristol Laboratory *et cetera*, each having its own Head of Laboratory who worked to a single AFRC Director of Food Research. This effective 'corporatisation' of food research marked the introduction of an institute-wide programme of research, conducted and controlled under three main headings: food safety, food quality and food processing. For the first time, food safety began to take shape as a distinct and meaningful area of research effort in the public sector.

The timing of this evolution in food safety research was not arbitrary, in that it was in the mid-1980s that food safety began to assert itself as a major public concern, catalysed by rising concern over chemical additives in food. These were the years when the British public began to mobilise around food safety concerns. In terms of food safety research at Norwich in the early and mid-1980s there was ongoing interest in naturally occurring toxicants, which by 1986 included work on saponins in soya and other legumes, as well as aflatoxin in nuts. In 1980, the FRI Microbiology Division

had increased its volume of research into *Clostridium botulinum*, and this subsequently expanded so that Norwich became a main centre for this type of work in the UK. Research was carried out on preservatives regarding their effect in preventing growth and toxin production by *botulinum* and in relation to the growth of food poisoning organisms in chilled salads. Overall, however, within the Microbiology Division food safety research still formed only around 20% of the total workload, the main emphasis related to recent developments in biotechnology focusing on the use of microorganisms and their products in the food industry.

As the decade progressed, however, issues of food safety became increasingly publicised and hence politicised, so that food safety became a progressively more important component of research at the three IFR laboratories. Significant increases in the numbers of reported cases of, in particular, *Salmonella enteritidis* and *Campylobacter* led to a considerable expansion of microbiological food safety research at the IFR institutes. The research programme exploited developments in computing to generate models for predicting the growth responses of bacteria associated with foodborne illness to enable food safety to be designed into product formulation and storage conditions. An additional focus, based on recent advances in biophysics and, in particular, molecular biology, was the development of methods for the rapid detection and enumeration of bacteria in foods.

Against a backdrop of spiralling food poisoning notifications, the last years of the 1980s saw a number of food safety scares, notably the Government's gross mismanagement of the *Salmonella* in eggs episode; so-called '*Listeria* hysteria' following outbreaks of listeriosis related to soft cheese and cook-chilled meals, and an outbreak of botulism linked to incorrect processing of hazelnut purée. The result was that considerable government funds were channelled into food safety research. For example, the Microbiology Department at IFR Reading, which one of our interviewees had in fact been hired to close down in 1988, grew from 15 researchers in 1988 to 45 in 1990. Indeed, the government stance regarding funding for food safety research *per se* has typically been reactive, so that particularly serious outbreaks or events have tended to release public funds that

otherwise would not have been forthcoming. As one interviewee stated: 'Over the years, there've been several [crises], and by and large they've been good for research funding'. However, given the severity of the food safety problem at the end of the 1980s, and in implicit recognition of its political salience, in 1989 the Government set up a committee to investigate the microbiological safety of the UK food supply.

The ensuing Richmond Report, published in 1990, effectively said: 'We don't really know what the causes of food poisoning are', and pointed to considerable gaps in knowledge. In addition, the report identified a range of structural and institutional weaknesses, in particular the paucity of communication and interaction between the Public Health Laboratory Service (PHLS) and the State Veterinary Service (SVS), calling for closer co-ordination between the PHLS' Communicable Disease Surveillance Centre and its human database and the SVS and its animal databases. In December 1990, the Government set up its Advisory Committee on the Microbiological Safety of Food – arguably the first official body with specific responsibility for microbial food safety. After the Richmond Report, it was no longer possible to deny that food safety was a serious problem, and in the same year that it was published, the new Food Safety Act passed into law. Pre-Richmond, therefore, food safety tended to be mobilised as a party political issue, whereas post-Richmond the political significance of food safety began to be recognised in terms of consumer confidence, and also, in the longer term, in terms of consumer health, in particular nutritional health.

Between 1960 and 1990, the safety of food thus emerged as an issue of high public and political salience in the UK. At one level, the rise to prominence of food safety can be accounted for by reference to the spiralling incidence of food poisoning events over the period, with notifications increasing especially dramatically over the 1980s. Legislation such as the Food Act (1984) and the Food Safety Act (1990) perhaps reflect the concern raised by this phenomenon and, more especially, that raised by a series of high-profile food poisoning episodes over the course of the 1980s. This explanation, however, is inadequate in that it fails to take into account the deeper political and cultural processes in which such accounting is embedded. The rise to prominence of food safety in the public

science domain may be explained, rather, by the emergence over the 1960s and '70s of a range of disparate social and economic factors, and their convergence towards the end of the 1980s. Principal among these factors were the agricultural surpluses of the late 1970s and early '80s; concerns over the environmental and landscape implications of industrial agricultural production; a growing preoccupation with the 'authenticity' of food; the increasing sophistication and professionalisation of the non-governmental organisation sector; the institutionalisation of free-market ideology under Margaret Thatcher and the implications that this had for the food sector; and, not unrelated, institutional change and rationalisation within the public science sector itself. Further research is required to assess the ways in which these various processes interacted over time to create the conditions necessary for the emergence of food safety as an issue of pressing public and political concern by the end of the 1980s.

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