

## Introduction

If the 1980s may have been the high point of food additives—with Coca-Cola able to double the sales of ‘Tab’ in test markets by fortifying the fizzy diet drink with calcium<sup>1</sup>—one of the more recent food trends has been not of additions but subtraction. We have all seen it on our supermarket shelves. A whole range of foods, from soy milk to sausages, are advertised as ‘additive-free’. This conveys a positive and healthy image to a public interested in health and wellbeing but anxious and suspicious about the nature of food additives. The expression has taken the place of abused terms like ‘natural’ or ‘all-natural’ on product packaging. It also makes it easier to rationalize the consumption of less healthy foods, which are at least perceived to be free from added artificial ingredients. Why not have another sausage; after all, it has ‘no synthetic preservatives’ and ‘no artificial flavours’? Additives we are understood not to like or approve of are thus removed (even whilst being simultaneously replaced with others).<sup>2</sup>

But the process of subtraction goes still further. We increasingly shop for products whose key ‘natural’ components have been removed, now perceived as unhealthy. Lactose-free dairy products have spread from the lactose-intolerant to those who believe they are and to those who believe that the products are in any case healthier and more digestible, with a global market in excess of four billion U.S. dollars.<sup>3</sup> Similarly, gluten is seen as such a threat to health by some that foods that have never contained gluten are advertised as being ‘gluten-free’. In a range of popular health books and blogs, gluten—associated with newer, high-yielding varieties of wheat, increased fertiliser and pesticide use, as well as modern bread-making processes—has been linked to autism, depression, Alzheimer’s, multiple sclerosis, diabetes and some skin diseases. Better to avoid gluten altogether, it is argued. The quite real intolerance of a small minority (coeliac disease, affecting one percent of the population), has

not only spawned a whole new clinical entity, ‘non-coeliac gluten sensitivity’ (NCGS);<sup>4</sup> it has become the latest health-related ‘lifestyle’ trend, fuelling a worldwide gluten-free industry valued at 15 billion US dollars per year.<sup>5</sup> This, despite the fact that products labelled gluten-free often turn out to be higher in fats, sugars and salt (in order to mimic the properties of gluten),<sup>6</sup> thus not only negating some of the health benefits in the process, but also countering subtraction with addition. Confused?

The link between dietary innovation and change, on the one hand, and health and disease, on the other, is nothing new. Up until the mid-nineteenth century, dietary innovation has primarily consisted of the introduction of novel foods and cooking techniques from different parts of the world as a result of imperial expansion, urbanization or the development of new trade routes. From at least the time of the Roman empire, established tastes and traditions battled with the prestige value of the new and exotic.<sup>7</sup> In a recent article on food and identity, Stephen Shapin has described how Ancient Greek and Roman medical traditions emphasised that such exotic foods could put bodies at risk.<sup>8</sup> Although novel foods imported from afar could impart some ‘magical’ benefits, it was considered wiser to opt for traditional and ‘natural’ foods and cooking methods. Such thinking continued to be influential throughout the early modern period in Europe, especially as many new foods and drinks, including many items that became dietary staples—for example, potato, maize and tomato—were introduced via the Columbian exchange with the New World.<sup>9</sup> This way of thinking about traditional or natural foods, rooted in the Galenic humoral tradition, was based upon an understanding that it was the qualities of foods, rather than their constituents, that mattered.<sup>10</sup> In other words, it was the cold, wet nature of a cucumber or the hot, dry nature of a chilli pepper that influenced one’s health, not the chemicals that combined to form a cucumber or a chilli pepper.

The rise of chemical and mechanical medicine from the seventeenth century brought substantial changes in the way people thought about foods, physiology and digestion. Medical authors began to look at foods in new ways, measuring quantities and investigating their constituent elements, making use of a new language. This was a transitional phase away from the Galenic focus on the qualities of food. For Shapin, real change came during the nineteenth and twentieth centuries, with the shift towards a materialistic emphasis on the chemical constituents of food—specifically, proteins, carbohydrates, vitamins and other components. Food became ‘understood as a bag of chemicals; you are a bag of chemicals, organized into physiological systems; eat the right chemicals and you will enjoy good health; eat the wrong ones, and you will suffer disease and shortened life’.<sup>11</sup> Gyorgy Scrinis has described this reductionist approach to understanding nutrition as ‘nutritionism’, short for ‘nutritional reductionism’, whereby food is not only perceived in terms of its component parts, but nutrients (whether they be vitamins, proteins, fats, carbohydrates or whatever) are firmly linked with specific states of health and disease.<sup>12</sup> As a number of the chapters in this volume demonstrate, the dominance of nutritionism in the twentieth century has led to many protracted debates about the health benefits or dangers of particular foodstuffs, sometimes even pitting one nutrient against another.

The transition from perceiving food in terms of its qualities, based largely on sensory perceptions, to thinking about it as an admixture of chemical constituents, was precipitated in part by the emergence of technologies that allowed scientists to analyse and experiment with the components of various foods in new ways. Similar technologies allowed the food industry to transform how food could be processed (for instance, milling techniques that allowed corn to separate it into its protein, oil, fibre and carbohydrate components and permitted the creation of pearly-white rice) and facilitated the introduction of a vast array of chemicals into the food supply (in some cases, food really was no more than ‘a bag of chemicals’). While

some of these developments, such as the introduction of new food preservation techniques and the fortification of foods, could be seen as reducing the risk of disease, the propensity for food processing to increase the profit margins of food manufacturers raised suspicions.<sup>13</sup>

At the same time, there were significant changes in agriculture that transformed the diets of millions of people. For example, the rise in maize cultivation, with its very high yields, seemed full of promise, but when consumed in the form of polenta and corn meal, in Europe and the USA, brought with it the debilitating disease pellagra.<sup>14</sup> Even when the cause of pellagra was identified, concerns emerged about the use of corn in food processing, with high fructose corn syrup only the most recent by-product to be targeted. Similarly, when new milling techniques to produce white rice were introduced in Japan the result was ‘the fearful national disease’ of beriberi.<sup>15</sup> Finally, technological developments in transportation, refrigeration and food preservation (ranging from pasteurisation to canning) allowed food to become an ever more global commodity.<sup>16</sup> The combination of these factors during the late-nineteenth and twentieth centuries—the shift to emphasising the constituents (rather than the qualities) of food and the increasing variety of foods available—complicated the relationship between diet and disease. In addition to creating or bringing new foods to Western consumers, many of these dietary innovations in manufacturing and production processes, new food additives and evolving agricultural practices initially came with the promise of improved diet and health, only to become ultimately associated with ill health—either real or imagined.

Central to concerns about dietary innovation and health are fundamental questions about the ideal human diet. Is it possible to perfect our diet through technological innovation, looking forever forwards? Fortifying foods with added nutrients was justified as a necessary and effective process in countering nutritional deficiency diseases, such as iodine in salt, vitamin D in milk, and niacin in flour.<sup>17</sup> And today we have the promise of ‘nutriceuticals’

and ‘functional foods’ (even if their promise seems to be held back by a consumer preference for foods that are ‘natural’—that word again!—at least in Europe).<sup>18</sup> Or should we instead look backwards, aiming to consume a local, ‘natural’, pre-agricultural diet? The assumption here is that modern Western diets are themselves pathogenetic, figuring amongst the causes of certain chronic illnesses: ‘diseases of civilization’. The question here is a bit like the restoration of period properties: how far back do you go, stripping away the different layers in search of the building’s ‘real’ essence? The ‘paleolithic diet’ encourages us to return to the eating habits of our pre-agricultural, hunter-gatherer ancestors.<sup>19</sup> Supporters of gluten-free argue that the rot set in 10,000 years ago when we (I mean humankind) started eating wheat, when for the previous 2.5 million we had been doing well enough without it. Or is it enough simply to go ‘pre-modern’, returning (as has been suggested) to an idealized diet sometime before the onset of industrialization and urbanization, when people supposedly enjoyed their food and were all the healthier for it.<sup>20</sup> Perhaps the solution is geographical rather than chronological, ordering the ‘Mediterranean option’ instead, which at least bears the imprimatur of UNESCO.<sup>21</sup>

What does it say about our changing relationship with expertise, as both consumers and patients? In their scepticism of professional expertise, non-coeliacs self-diagnosing a gluten sensitivity upset the doctor-patient relationship, in which food intolerance appears to exemplify a distinct form of contested illness experience.<sup>22</sup> And what are the economics of dietary change? For example, the expansion of the lactose-free has been exponential, but far from catching the dairy industry off-guard, it has reacted with glee.<sup>23</sup> Who are the historical actors (political, medical, technological) involved in innovation and what are the social responses to it? What should be the role of government? Today, the food industry is amongst the most vociferous lobbyists in the new trade deals being negotiated in an on-again-off-again way by the world’s governments, despite popular protests about the secretive nature of the

negotiations and the food industry's lack of concern for issues of public health.<sup>24</sup> And indeed to what extent is dietary health itself a cultural construct, a product of history? Far from being neutral, the emerging nutritional science of the early twentieth century came wrapped in a moralising packaging, where dietary health was linked to self-control, work and the avoidance of excess.<sup>25</sup>

As the chapters in this volume demonstrate, dietary theories of health and disease have proliferated during the past century or so, often fuelled by broader political, social, cultural, philosophical and economic factors that were, at times, far removed from nutrition science and, at others, intrinsic to the development of the science itself. The historiography and other literature related to dietary innovation and disease that has emerged over the past thirty years has similarly revealed how nutrition science and food policy has been highly contingent upon such factors. Building on the earlier work of the late social historian James Harvey Young's work on the United States Pure Food and Drug Act (1906), sociologist James Haydu has emphasized the vital role of progressive women's groups in changing the way 'pure food' was understood by the American public, thus spurring further the need for legislation.<sup>26</sup> The Pure Food Movement emerged during the 1870s as a response to the development of industrialized food production in the U.S. Many pure food advocates, including government chemist Harvey Wiley, saw pure food as essentially a consumer issue: when processors adulterated or disguised beef, for example, they took advantage of trusting, innocent consumers (and, to a lesser extent, farmers who wanted a fair market for their product). Representatives of women's groups, such as the General Federation of Women's Clubs, however, were concerned about the health implications of adulterated food. As Haydu describes:

although unscrupulous urban bakers, dairy operators, and distillers had been putting harmful additives in their cheapest products for a long

time, modern food production prompted new anxieties over safety.

How could consumers judge the hazards of novel products like margarine, unfamiliar techniques like factory canning, or untested preservatives like benzoate of soda?<sup>27</sup>

The Pure Food Act of 1906, therefore, was made possible by ‘political consumerism’ and ‘maternalist politics’ working in tandem, along with the publication of Upton Sinclair’s *The Jungle*—which was written to flag up the abysmal working conditions in Chicago’s meatpacking industry, not to send Americans into a panic about processed food.<sup>28</sup>

Historians have explored the political aspects of dietary change in other contexts. The organic food movement may be primarily associated with left-wing politics today, but many (though not all) British proponents of organic farming during the 1930s came from the opposite side of the political spectrum, including Jorian Jenks and Henry Williamson, both of whom were members of the British Union of Fascists.<sup>29</sup> For Jenks, organic approaches were seen not only to produce improved food quality and, therefore, better health, but were also part and parcel of a reactionary return to the land and to the ‘natural’ order.<sup>30</sup> By the 1960s, the organic movement had shifted left and food became a central platform in the counterculture movement.<sup>31</sup> Recent research has further complicated the story. Ian Mosby’s analysis of ‘Chinese Restaurant Syndrome’, for example, has revealed how racist attitudes imbued the debates about the risks about monosodium glutamate (MSG) that began in the late 1960s.<sup>32</sup> Such findings echo the nativist sentiments of some of the founders of organic farming in the United Kingdom. Others, including Michael Mikulak, have highlighted how, despite its counter-culture connections, organic food production in the U.S. is dominated by massive food corporations more concerned with profits than producing healthier or more environmentally friendly food.<sup>33</sup>

The politics of breastfeeding, brought about by the introduction of formula milk in the late nineteenth century, have been similarly intricate. Formula milk has been seen as indicative of how mothers were expected to secede authority over motherhood to male scientists during the first half of the twentieth century, but can also be interpreted as a tool that liberated mothers and allowed them to return to work whenever they desired during the post-war period.<sup>34</sup> Debates about infant feeding have highlighted conflicting scientific advice about which approach is healthiest for babies. While the World Health Organization advocates exclusive breastfeeding for at least the first six months of an infant's life and continued breastfeeding until the age of two, others have argued that the consistency of infant formula (notwithstanding any scandals about adulteration) may make it a healthier option for some children when their mother's breastmilk might be compromised by various factors.<sup>35</sup> Related advice about whether mothers should or should not eat peanuts during pregnancy and lactation has similarly been contentious and has vacillated in recent years.<sup>36</sup>

Establishing clear causal connections between changing dietary practices or novel foods and specific disease states has long flummoxed scientists and policy makers, let alone the consumers who ultimately decide what is to go on the table. Although the increasing amount of sugar in western diets has been blamed for rising rates of type-2 diabetes, linking other foods with chronic diseases is not straight forward, as a number of historians have shown with respect to cancer and heart disease, and as we shall further in Part I of this book.<sup>37</sup> When the disease state itself is highly contentious and caused by multiple factors, as in the case of Attention Deficit Hyperactivity Disorder, it becomes even trickier to establish a connection.<sup>38</sup> During the early 1970s, for instance, San Francisco allergist Ben Feingold developed a food additive-free diet for the treatment of hyperactivity in children. Although many trials were designed to test the Feingold diet, most were undermined by the difficulty in controlling for the many other factors believed to influence child behaviour, as well as the

difficulty in diagnosing the disorder itself.<sup>39</sup> Moreover, the food industry, under the vestige of a lobby group called the Nutrition Foundation, took an active role in the trials, funding some and publishing a summative report that downplayed Feingold's hypothesis.<sup>40</sup> Amidst all of this confusion, families tended to resort to their own observations and the experiences of others.

The power of corporations and other vested interests in shaping the debates about dietary innovation and disease is difficult to underestimate. When micronutrients began to be identified in the early twentieth century, it did not take long for food and pharmaceutical companies to market vitamins and vitamin-enriched products, quickly creating a billion-dollar industry.<sup>41</sup> Although diseases such as rickets, scurvy, pellagra and beriberi provide ample evidence of the deadly potential of vitamin deficiency, by the second half of the twentieth century millions of western consumers—often middle-class individuals with access to vitamin-rich diets—became convinced that they and their children's health rested on taking a daily multi-vitamin or 'Flintstone's' vitamin (a subconscious plug for a 'Paleo Diet' or just a moment of marketing genius?). In the 1980s and 1990s, the food industry similarly took advantage of (now contested) scientific claims about the dangers of high-fat and high-cholesterol foods.<sup>42</sup>

Perhaps looming over everything in the debates about dietary innovation disease are two separate, but related, factors. The first is that food fads, fears and fantasies all make a great story. We are routinely fed a diet of news stories and popular literature dealing with the health implications of diet, resulting in an overload of advice about what we should eat. In spite of this, as David Smith and Jim Phillips have described, 'everyone thinks that they are an expert on their own diet'.<sup>43</sup> Despite the onslaught of information, we still ignore some of the most established nutrition advice. Michael Pollan's suggestion to 'Eat food. Not too

much. Mostly plants.’ may be all the advice most of us need, but that does not make it any easier to follow.<sup>44</sup>

*Proteins, Pathologies and Politics* aims to unpack these current concerns by historicizing and contextualizing the relationship between dietary innovation and health in the past. We have divided the book into three parts, each with a different underlying theme, although the themes themselves are closely interconnected. Part I explores the interplay between chronic disease and diet, focusing on cancer, diabetes and allergies. Diet has been seen as both the cause and, possibly, the cure (or at least treatment) of chronic disease. In a precursor to modern notions of the Palaeolithic diet, Agnes Arnold-Forster looks at how the cancer ‘epidemic’ was viewed in late-nineteenth-century Britain as a direct consequence of dietary change brought about by social and economic progress. Investigators wondered why ‘Negro’ communities (in nineteenth-century parlance) appeared to be immune to the disease, whereas the ‘Anglo-Saxon’ races seemed particularly prone. Might the answer lie in their food? Perhaps the broad chronological sweep of civilization, from hunter-gatherer to Western industrialization, had made certain races more susceptible to cancer. At the same time, more short-term shifts in diet also appeared dramatically to affect the cancer incidence of certain countries. In fact, Arnold-Forster suggests, by arguing that differentials in disease propensity were bound up with diet, Victorian medical writers were putting forward a more labile and less inherent concept of racial difference than we might expect.

Dietary shifts were also perceived to have a role in increasing rates of food allergies during the twentieth century. In his chapter, Matt Smith shows how industrial food production and the emergence of a global food economy provided possible explanations for food allergy sufferers and their doctors. Some allergists suspected that a few of the ingredients used in modern food processing—in particular, maize and synthetic food dyes—were also potent allergens. At the same time, the production of food was becoming further

removed geographically from consumers, so that it became more difficult for food allergy sufferers to identify harmful allergens, thus making accidental exposure more likely. These explanations were just as controversial as those linked with the rise of cancer a century earlier. Yet they mirrored deeper concerns about escalating rates of auto-immune disease, which merit further analysis, Smith suggests, for what they might be able to tell us about why such diseases are on the rise.

If food and dietary changes have been historically linked to some chronic diseases, food and diet might also provide the answer to others. Around the same time as medical writers in Britain were seeking to explain cancer, doctors in the United States were developing the idea of the ‘American diet’. This foundation for dietary recommendations based on food composition and nutritive measurement fed directly into diets recommended for diabetics, as recounted by Kirsten Gardner. In the era before insulin, diabetic diets tended towards restrictive models that frequently limited carbohydrates and calories, the most extreme of which being Frederick Allen’s so-called ‘starvation diet’. It promised to extend life, but at great cost. With the advent of insulin in 1921, diabetic diets, and the practice of measuring food, became a foundational recommendation in diabetic treatment, as Gardner shows. Works on the subject devoted much space to nutritive information, and insulin dosing was frequently based on a prescribed diet, often perceived as the closest thing to a cure.

In Part II we return to the study of how changing diets have brought about disease from the second half of the nineteenth century, but shift the focus to the scientific controversies that erupted over the nature of the relationship. Once the problem has been identified—whether it be chronic diseases in the 1950s or deficiency diseases like pellagra in the late nineteenth and early twentieth centuries—more often than not, the bone of contention concerned causation. Thus, by the mid-nineteenth century all the medical actors studying pellagra in Italy agreed on the link between maize and the epidemic. As David Gentilcore

points out in his chapter, what they disagreed on was the exact causal nature of that link, propounding two divergent, indeed mutually exclusive, explanatory models. Gentilcore's chapter seeks to understand how cultural dominance of one explanatory model (Cesare Lombroso's toxic maize theory), at the expense of another (Carlo Lussana and Clodomiro Bonfigli's deficiency theory), came about; what this dominance can tell us about the nature of Italian medical science in the last few decades of the nineteenth century; and what it meant for the pellagra victims themselves.

When it came to pellagra, a change in approach ushered in by a growing understanding of the role of vitamins in the second and third decades of the twentieth century ought to have led to a complete overturn of the dominant paradigm. And yet, as Lucian Scrob demonstrates in his chapter, it did not quite turn out this way. Scrob's analysis of the writings of Romanian, Italian and U.S. medical researchers on pellagra and the early research on vitamins demonstrates how technological, methodological and/or empirical developments do not automatically lead to a re-evaluation of pre-existing knowledge. Indeed, as in this case, a process of 'sedimentation' can occur, in which knowledge produced under different paradigms can co-exist.

Even where the scientists do agree, as Maiko Rafael Spiess demonstrates in his chapter, economic interests and lobbies, scientists' reputations and politics are frequently as important as the scientific method and evidence. His focus is on the Framingham Heart Study, an ongoing cardiovascular epidemiological investigation begun in 1948, and its role in contributing to the risk-factor approach to diet taken in official government guidelines. Spiess describes how large population studies on cardiovascular diseases helped to establish the 'diet-heart hypothesis' and U.S. government intervention on dietary habits, especially regarding fat and cholesterol. His conclusion is that, in this case, scientific methods, large-scale studies, and new conceptual frameworks helped to blur other societal influences and

interests, and at the same time, foster the ideal of neutrality and rationality of dietary recommendations.

Today, sugar seems to have replaced fat as the main culprit, at least when it comes to obesity and diet-related disease, such as Type 2 diabetes. However, as Rachel Meach argues in her chapter, the argument is not a new one. And an argument it certainly was, pitting American nutritionist Ancel Keys (fat) against the British nutritionist John Yudkin (sweet) during the 1950s. In an outcome that is strangely redolent of the Italian pellagra debates reconstructed by Gentilcore, Keys and his critique of fat won the debate (evident in the dominance of ‘low-fat’ dietary recommendations that followed), whereas Yudkin’s warnings about sugar lay dormant until revived in recent years. Meach explores the factors that shaped Yudkin’s ideas about sugar and how he propagated these to the public. In the process, she traces the rise of nutrition science, the emergence of the state as a nutritional authority, the role of gender and cultural ideals in prescribing dietary advice and the influence of commercial and professional interests in shaping public information concerning diet.

The role of politics on both diet and health, evident in several of the above-mentioned chapters, becomes the focus for Part III. By ‘politics’, we mean the State and national governments, political movements and ideologies. War marks the twentieth century and it could not but have significant effects on the changing relationships between food/diet and health/disease. In the case of the First World War, the food shortages that resulted not only impacted on ideas concerning the nature of food itself but on the way that food was served to the public. In his chapter, Peter Scholliers explores how food shortages boosted the popularization of the still new concept of ‘calorie’, to which recurring media attention actively contributed. Mixing quantitative and qualitative analysis, Scholliers traces the way ‘calorie’ appeared in Belgian newspaper and magazine articles during the war, as a way of understanding how the general public was exposed to new notions about healthy food. If,

prior to 1914, 'calorie' needed to be clarified for a lay audience, during the war definitions became rare. And if some newspapers criticised the concept, it none the less easily permeated different levels of society, to judge from the nature and readership of the various publications. In particular, food aid was increasingly expressed in calories, especially when the press called upon the Belgian authorities to improve the supply.

In Britain, the authorities took an active and surprisingly public role in food provision. Bryce Evans discusses the nutritional and cultural effects of a short-lived experiment in public dining. With warfare disrupting food imports, in 1917 the government opened a network of centrally funded public cafeterias known as 'national kitchens' serving cheap yet nutritious food. Part of a wider European drive towards communal dining in wartime, these state canteens 'for all' mushroomed in popularity, eventually surpassing 1,000. Evans demonstrates how anxieties soon emerged, however, centred on the revolutionary potential of large numbers of people gathering all at once in the same place and with an influential trade lobby opposed to national kitchens as antithetical to British patriotic values.

The link between political regimes and food culture is taken in a different direction by Francesco Buscemi, in his study of how three different dictatorships constructed meat-eating as a moral disease, and abstention from it as a means of achieving sacred purity. Whereas the vegetarianisms already widespread in the West were linked to physical and spiritual health, food security or animal care, what Buscemi terms the 'sacred' vegetarianism of the Italian Regency of Fiume (1919-20), Italian Fascism and German Nazism went hand-in-glove with political ideology. From the propagandistic representation of vegetarians as more ascetic during the Fiume Regency; to the use of meat abstention to historically and religiously legitimate Benito Mussolini's regime; and culminating in the Nazi transformation of pre-existing vegetarian philosophies and cults linked to purity and primordial naturism into racist

theories, sacred vegetarianism transformed a food practice into a food ideology in support of the three regimes.

With the massive disruption, privation and widespread hunger in Europe following the Second World War, national governments found themselves pressed to intervene in different ways. One of these is examined by Silvia Inaudi in her chapter, in the context food programmes promoted in Italy in the long aftermath of World War II for the alleviation of malnutrition and the improvement of child health. In its public policies, the Amministrazione per gli Aiuti Internazionali (Administration for International Aid), a government body, sought to combine social solidarity with the promotion of the science of nutrition and food education. Inaudi focuses on measures and programmes taken to encourage milk-drinking amongst Italian schoolchildren. Due to the low and segmented levels of consumption and linked to scientific beliefs as well as material factors, the emphasis on milk remained a central part of food assistance to children for a long time. As Inaudi demonstrates, the case of milk is emblematic of both the potentialities and the limitations of nutrition policies, in the way it mixed the motives of child health and welfare with economic and political interests.

At the same time as the Italian government was seeking to promulgate milk-drinking amongst schoolchildren, the entire way of eating in the United States was being radically transformed. Clare Gordon-Bettencourt examines the role of the U.S. Food and Drug Administration and its policy response to the proliferation of food additives in the marketplace, from the 1940s and through the post-war period, by means of food identity standards provision. From milk, the focus here shifts to bread, and in particular the use of chemical emulsifiers in bread, as a means of investigating the health implications of these ingredients and the broader cultural significance of processed convenience foods. In the process, Gordon-Bettencourt surveys the forces that shaped the framing of bread standards as a case study for the industrialization of America's food, outlines the proliferation of food

additives in food standards following the adoption of emulsifiers in the bread standards, and analyses the long-term health effects of additives and consumer relationships to processed foods.

What would an Italian peasant, a Scottish crofter or a New England farmer from the 1850s have made of a modern supermarket? The aisles upon aisles of choice and abundance would undoubtedly mesmerise and entice. So, what would they say then if we informed them that such a cornucopia was also thought to spawn disease and death? From consisting of staples and seasonal fare to encompassing the marvels of chemistry and the delicacies of every corner of the globe, the diet of the average North American and European has undergone unprecedented change during the last century and a half. Concurrently, chronic diseases mediated by lifestyle factors (not least of all diet) have come to replace the infectious diseases that once dominated mortality statistics. But while politicians, health policy experts and the media are quick to point out the links between dietary change and diseases such as type-2 diabetes, cancer and heart disease, the chapters in this volume also highlight how contested and politicised ideas about food and health have been. None of our contributors question that some dietary changes have been pathological, but they all assert, however, how both diet and disease exist in a complex context that is marinated in history, ideology, economic imperatives and cultural traditions. When we forget this, we are bound to over-emphasise both the dangers and the benefits of some foods and downplay the effect of other factors. Although this may be the first volume to address the history of the tangled relationship between dietary innovation and disease in Europe and North America, we certainly hope that it is not the last. As twenty-first century consumers come to contemplate cloned meat, edible water bottles, 3-D printed cheese and – possibly - the Star Trek promise of a meal in a pill, the need to ask such questions will be no less pressing.

## Acknowledgements

The chapters in this volume represent the selected output from a conference held in the Island of San Servolo, Venice in June 2016, organised as part of the Economic and Social Research Council-funded project ‘Rough Skin: Maize, Pellagra and Society in Italy, 1750-1930’ (PI David Gentilcore). The editors would like to thank all of the conference participants for making it such an exciting event, in particular those who took the additional step to turn their conference papers into book chapters; Egidio Priani for his unflagging enthusiasm and organisational expertise; the ESRC for funding the conference; and the Society for the Social History of Medicine, which provided travel bursaries.

---

<sup>1</sup> David Bishai and Ritu Nalubola, ‘The History of Food Fortification in the United States: Its Relevance for Current Fortification Efforts in Developing Countries’, *Economic Development and Cultural Change*, 51:1 (2002), pp. 37-53, at p. 45.

<sup>2</sup> Mee Ryoung Song and Meeja Im, ‘Moderating effects of food type and consumers’ attitude on the evaluation of food items labeled “additive- free”’. *Journal of Consumer Behaviour*, 17 (2018), pp. e1–e12: <https://doi.org/10.1002/cb.1671>.

<sup>3</sup> On current (2015) sales, see: ‘Rising Levels of Lactose Intolerance Predicted to Propel the Global Lactose Free Food Market Until 2020’, *Business Wire*, 4 May 2016: <https://www.businesswire.com/news/home/20160504005106/en/Rising-Levels-Lactose-Intolerance-Predicted-Propel-Global>.

<sup>4</sup> Imran Aziz, Federica Branchi, David Sanders, ‘The rise and fall of gluten!’, *Proceedings of the Nutrition Society*, 74 (2015), 221-6.

---

<sup>5</sup> *Gluten-Free Products Market Size & Share, Industry Report, 2014-2025*, Grandview Research, May 2017, <https://www.grandviewresearch.com/industry-analysis/gluten-free-products-market> .

<sup>6</sup> Nicoletta Pellegrini and Carlo Agostoni, ‘Nutritional aspects of gluten-free products’, *Journal of the Science of Food and Agriculture*, 95 (2015), 2380–85.

<sup>7</sup> Alexandra Livarda and Marijke van der Veen, ‘Social Access and Dispersal of Condiments in North-West Europe from the Roman to the Medieval Period’, *Vegetation History and Archaeobotany*, 17: Suppl 1 (2008), 201-9.

<sup>8</sup> Steven Shapin, ‘“You Are What You Eat”: Historical Changes in Ideas about Food and Identity’, *Historical Research* 87 (2014), 380.

<sup>9</sup> The key reference remains Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, CT: Praeger, 2003 [1973]). For a survey of Italian reactions, see David Gentilcore, ‘The Impact of New World Plants, 1500-1800: The Americans in Italy’, in E. Horodowich and Lia Markey, eds. *The New World in Early Modern Italy, 1492-1750* (Cambridge: Cambridge University Press, 2017), 190-205. For the problematic Italian reception of two foods in particular, see David Gentilcore, *Pomodoro! A History of the Tomato in Italy* (New York: Columbia University Press, 2010) and David Gentilcore, *Italy and the Potato: A History* (London: Continuum, 2012).

<sup>10</sup> On changing medical and scientific ideas towards food and foods from the Middle Ages, see: Ken Albala, *Eating Right in the Renaissance* (Berkeley: University of California Press, 2002); Marilyn Nicoud, *Les régimes de santé au moyen âge* (Rome: École Française de Rome, 2007); Heikki Mikkeli, *Hygiene in the Early Modern Medical Tradition* (Helsinki: Academia Scientiarum Fennica, 1999); Emma C. Spary, *Eating the Enlightenment: Food and the Sciences in Paris, 1670-1760* (Chicago: University of Chicago Press, 2012); and David

---

Gentilcore, *Food and Health in Early Modern Europe: Diet, Medicine and Society, 1450-1800* (London: Bloomsbury, 2016).

<sup>11</sup> Shapin, 'You are What You Eat', 378.

<sup>12</sup> Gyorgy Scrinis, *Nutritionism: The Science and Politics of Dietary Advice* (New York: Columbia University Press, 2013).

<sup>13</sup> Harvey Levenstein, *Paradox of Plenty* (Oxford: OUP, 1993); Harvey Levenstein, *Fear of Food: A History of Why We Worry about What We Eat* (Chicago: Chicago University Press, 2012)

<sup>14</sup> Alberto De Bernardi, *Il mal della rosa. Denutrizione e pellagra nelle campagne italiane fra '800 e '900* (Milan: Franco Angeli, 1984); Arturo Warman, *Corn and Capitalism: How a Botanical Bastard Grew to Global Dominance*. Trans. N. Westrate (Chapel Hill, NC: University of North Carolina Press, 2003); Mary Katherine Crabb, 'An Epidemic of Pride: Pellagra and the Culture of the American South', *Anthropologica*, 34 (1992), 89-103.

<sup>15</sup> Alexander Bay, *Beriberi in Modern Japan: The Making of a National Disease* (Rochester, NY: University of Rochester Press, 2012); K. Codell Carter, 'The germ theory, beriberi, and the deficiency theory of disease', *Medical History*, 21 (1977), 119-36; Anne Hardy, 'Beriberi, Vitamin B1 and World Food Policy, 1925-1970', *Medical History*, 39 (1995) 61-77.

<sup>16</sup> Although most critiques of the global food economy emphasise the environmental costs of importing food thousands of miles (for instance, in order to have seasonal produce, such as asparagus, out of season), some compelling arguments about the health benefits of a local diet have been made. Richard A. Cone and Emily Martin, 'Corporeal Flows: The Immune System, Global Economies of Food, and Implications for Health', *The Ecologist* (27 (1997), 107-11; Michael Mikulak, *The Politics of the Pantry: Stories, Food, and Social Change* (Montreal: McGill-Queen's University Press, 2013).

---

<sup>17</sup> David Bishai and Ritu Nalubola, 'The History of Food Fortification in the United States: Its Relevance for Current Fortification Efforts in Developing Countries', *Economic Development and Cultural Change*, 51:1 (2002), pp. 37-53; Y. Park, C. Sempos, C. Barton, J. Vanderveen, E. Yetley, 'Effectiveness of Food Fortification in the United States: The Case of Pellagra', *American Journal of Public Health*, 90:5 (2000), pp. 727-38.

<sup>18</sup> Klaus Grunert, 'European consumers' acceptance of functional foods', *Annals of the New York Academy of Sciences*, no. 1190 (2010), pp. 166-73. See also, Navdeep Kaur and Devinder Pal Singh, 'Deciphering the consumer behaviour facets of functional foods: A literature review', *Appetite*, no. 112 (2017), pp. 167-87.

<sup>19</sup> For the article that started it all, see: S. Boyd Eaton and Melvin Konner, 'Paleolithic nutrition. A consideration of its nature and current implications', *New England Journal of Medicine*, 312:5 (1985), 283-9.

<sup>20</sup> Charlotte Biltekoff, 'Consumer response: the paradoxes of food and health', *Annals of the New York Academy of Sciences*, no. 1190 (2010), pp. 174-8.

<sup>21</sup> Surinder Phull, 'The Mediterranean Diet: Socio-cultural Relevance for Contemporary Health Promotion', *The Open Public Health Journal*, 8 (2015), 35-40

<sup>22</sup> Lauren Renée Moore, "'But we're not hypochondriacs": the changing shape of gluten-free dieting and the contested illness experience', *Social Science and Medicine*, 105 (2014), 76-83.

<sup>23</sup> As one industry spokesperson put it: 'There are few markets where you can win "a customer for life", and who is willing to pay a big premium for the right product. But this is one of them'. 'Lactose-free gains ground globally', *Dairy Industries International*, 77:6 (2012), p. 8.

---

<sup>24</sup> Sharon Friel, et al., ‘Shaping the discourse: What has the food industry been lobbying for in the Trans Pacific Partnership trade agreement and what are the implications for dietary health?’, *Critical Public Health*, 26:5 (2016), pp. 518-29.

<sup>25</sup> Deborah Lupton, *Food, the Body and the Self* (London: Sage, 1996), pp. 72-3.

<sup>26</sup> James Harvey Young, ‘The Pig that Fell into the Privy: Upton Sinclair’s *The Jungle* and the Meat Inspection Amendments of 1906’, *Bulletin of the History of Medicine*, 59 (1985), 467-80 James Harvey Young, *Pure Food, Securing the Federal Pure Food and Drug Act of 1906* (Princeton: Princeton University Press, 1989); Jeffrey Haydu, ‘Frame Brokerage in the Pure Food Movement, 1879-1906’, *Social Movement Studies*, 11 (2012), pp. 97-112

<sup>27</sup> Haydu, ‘Frame Brokerage’, p. 101.

<sup>28</sup> *Ibid.*, 104-5; Upton Sinclair, *The Jungle* (New York: Doubleday, 1906). Sinclair famously declared that ‘I aimed at the public’s heart and by accident hit its stomach.’ For more on how the relationship between meat and human health has been understood, see David Cantor, Christian Bonah and Matthias Dörries (eds), *Meat, Medicine and Human Health in the Twentieth Century* (London: Pickering and Chatto, 2010).

<sup>29</sup> Philip Conford, *The Origins of the Organic Movement* (Edinburgh: Floris Books, 2001); Richard Moore-Colyer, ‘Towards “Mother Earth”: Jorian Jenks, Organicism, the Right and the British Union of Fascists’, *Journal of Contemporary History*, 39 (2004), 353-71.

<sup>30</sup> Moore-Colyer, ‘Towards “Mother Earth”’.365-66.

<sup>31</sup> Warren Belasco, *Appetite for Change: How the Counterculture Took on the Food Industry* (Ithaca, NY: Cornell, [1989] 2007).

<sup>32</sup> Ian Mosby, ‘“That Won-Ton Soup Headache”: The Chinese Restaurant Syndrome, MSG and the Making of American Food, 1968-1980’, *Social History of Medicine*, 22 (2009), 133-

51

<sup>33</sup> Mikulak, *Politics of the Pantry*.

---

<sup>34</sup> Rima Apple, *Mothers and Medicine: A Social History of Infant Feeding* (Madison: University of Wisconsin Press, 1987); Jacqueline H. Wolf, *Don't Kill Your Baby: Public Health and the Decline of Breastfeeding in the Nineteenth and Twentieth Centuries* (Columbus: Ohio State University Press, 2001) Rima Apple, *Perfect Motherhood: Science and Childrearing in America* (New Brunswick, NJ: Rutgers University Press, 2006).

<sup>35</sup> Maia Boswell-Penc has put arguments about the purity of breastmilk versus the artificiality of formula in context by highlighting the issue of 'breastmilk toxicity', caused by environmental contamination. Maia Boswel-Penc, *Tainted Milk: Breastmilk, Feminisms, and the Politics of Environmental Degradation* (New York: University of New York Press, 2006).

<sup>36</sup> C. West, 'Introduction of Complementary Foods to Infants', *Annals of Nutrition and Metabolism* 70 (2017), 47-54

<sup>37</sup> Karin Garrety, 'Social Worlds, Actor-Networks and Controversy: The Case of Cholesterol, Dietary Fat and Heart Disease', *Social Studies of Science*, 27 (1995), 727-73; Mark W. Bufton and Virginia Berridge, 'Post-War Nutrition Science and Policy Making in Britain c. 1945-1994: The Case of Diet and Heart Disease', in *Food, Science, Policy and Regulation in the Twentieth Century*, edited by David F. Smith and Jim Phillips (London: Routledge, 2000), 207-221; Frances Steel, 'A Source of Our Wealth, Yet Adverse to Our Health? Butter and the Heart Link in New Zealand to c. 1990', *Social History of Medicine*, 18 (2005), 475-93; David Cantor, 'Confused Messages: Meat, Civilization and Cancer Education in the Early Twentieth Century', in *Meat, Medicine and Human Health in the Twentieth Century*, edited by David Cantor, Christian Bonah and Matthias Dorries (London: Pickering and Chatto, 2010), 111-26; Élodie Giroux, 'The Framingham Study and the Constitution of a Restrictive Concept of Risk Factor', *Social History of Medicine*, 26 (2013), 94-113.

<sup>38</sup> Matthew Smith, *Hyperactive: The Controversial History of ADHD* (London: Reaktion, 2012).

---

<sup>39</sup> Matthew Smith, *An Alternative History of Hyperactivity: Food Additives and the Feingold Diet* (New Brunswick, NJ: Rutgers University Press, 2011).

<sup>40</sup> National Advisory Committee on Hyperkinesis and Food Additives, *Final Report to the Nutrition Foundation* (New York: Nutrition Foundation, 1980).

<sup>41</sup> Rima Apple, *Vitmania: Vitamins in American Culture* (New Brunswick, NJ: Rutgers University Press, 1996); Harmke Kamminga, “‘Axes to Grind’: Popularising the Science of Vitamins, 1920s and 1930s’, in *Food, Science, Policy and Regulation in the Twentieth Century*, edited by David F. Smith and Jim Phillips (London: Routledge, 2000), 83-100.

<sup>42</sup> Ann F. La Berge, ‘How the Ideology of Low Fat Conquered America’, *Journal of the History of Medicine and the Allied Sciences*, 62 (2008), 139-77.

<sup>43</sup> David F. Smith and Jim Phillips, ‘Food Policy and Regulation: A Multiplicity of Actors and Experts’ in David F. Smith and Jim Phillips (eds.) *Food, Science, Policy and Regulation in the Twentieth Century*, (London: Routledge, 2000), 1.

<sup>44</sup> Michael Pollan, *In Defence of Food: The Myth of Nutrition and the Pleasures of Eating* (London: Allen Lane, 2008).