



The online genetically modified food debate: Digital food activism, science and alternative knowledges

Catherine Price

Department of Sociology, University of Warwick, Coventry CV4 7AL, UK

ARTICLE INFO

Keywords:

Genetically modified food
Digital food activism
Below the line comments
Scientific expertise
Alternative knowledges
Trust

ABSTRACT

The aim of this paper is to fill a research gap to show how 'below the line' comments can be used for digital food activism. As the study focuses on genetically modified (GM) crops and foods, the study also reveals the narratives deployed by commenters in this particular debate. This paper attempts to provide an answer through a qualitative data analysis using a grounded theory approach and a discourse analysis. The findings reveal a lack of trust in science and political authority, and the use of alternative knowledges by digital food activists. The paper concludes by discussing how this study adds to the understanding of digital food activism. Whilst the below the line comments as a form of digital food activism may not connect to action in the non-virtual world, they do offer an opportunity for debate.

1. Introduction

Although there has been much research into various food scares concerning risk, there has been little attention to food consumption and its relationship to public engagement with science. Blue (2010: 148) contends that the definition of public engagement with science needs to be extended to 'include everyday consumer practices such as shopping and eating'. As Michael (1998) argues, science can be thought of as a 'consumable' when it is applied to everyday life as scientific knowledge can be used to inform decisions about purchasing particular products. This is especially true with food, as citizens have to negotiate risk every time they decide what to eat. Where citizens are concerned about the safety of a product, rather than making a direct challenge to the organisation involved, they are more likely to alter their consumption habits (Blue, 2010). By doing so, they may purchase a completely different product. When thinking about food, consideration also needs to be given to the influence of the media. As well as news coverage of food, celebrity chefs have their own television programmes, recipe books and Twitter accounts. There are many ways food is celebrated and refuted in the media (see Rousseau, 2012), in addition to the many sources of information citizens have access to. As Rousseau (2012: xiii) argues, when thinking about food in the media, we need to consider the 'representations of food and eating, and the politics of media interference into how we feed ourselves and into how we think about feeding ourselves, particularly as media both generate and shift existing sites of authority and expertise. It is about the intersections (and, often enough, the gulfs)

between the real and the represented when it comes to food'. This statement has become more pertinent, as the use of the internet and social media platforms means those who wish to find information about food often start and finish their search in digital media (see Schneider, Eli, Dolan, & Ulijaszek, 2018).

2. Literature review

2.1. Digital activism

The internet and platforms such as blogs, Facebook, and Twitter 'provide a forum in which issues that matter to people, but which pass the mainstream media by, can be kept alive. They also create a space in which ideas can grow and participants can acquire the confidence to step outside their comfort zone to campaign and complain' (Henderson, 2012: 120). Being online enables those with similar interests to find one another and enables them to spread the message they wish to promote.

Digital networks enable activism because of the reliability, speed, scale and low cost of technology (Joyce, 2010). This provides activism with great scope and reach. To encapsulate digitally networked campaigning activities and practices, the term *digital activism* is used because it 'is both exhaustive and exclusive. Exhaustive in that it encompasses all social and political campaigning practices that use digital network infrastructure; exclusive in that it excludes practices that are not examples of this type of practice' (Joyce, 2010: viii, emphasis in original). Here, the use of different digital platforms are actively shaping and

E-mail address: catherine.price@warwickgrad.net.

<https://doi.org/10.1016/j.diggeo.2021.100017>

Received 16 July 2020; Received in revised form 5 August 2021; Accepted 5 August 2021

Available online 8 August 2021

2666-3783/© 2021 The Author.

Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

creating publics and society (Marres, Guggenheim, & Wilkie, 2018).

Studies which have investigated local and global social movements which rely on digital technologies include the Arab Spring and Occupy Wall Street (Bennett & Segerberg, 2012; Tufekci & Wilson, 2012). There has also been a focus on the use of digital technologies for political consumerism where citizens have been able to express their opinions about products (Gil de Zúñiga, Copeland, & Bimber, 2014; Humphery & Jordan, 2018). This also includes food boycotts and buycotts where digital technology has been used to share information about food products, food producers and sustainability (Lewis, 2018a; Schneider et al., 2019).

Food activism is a worldwide movement taking place in the Global North and the Global South, and there are diverse forms of dissent and resistance by farmers, producers, consumers, political activists and restaurateurs (Siniscalchi & Counihan, 2014). Concerns about food mean that citizens can take on an activist role. Siniscalchi and Counihan (2014: 3) define food activism as 'efforts by people to change the food system across the globe by modifying the way they produce, distribute, and/or consume food. These endeavours include 'people's discourses and actions to make the food system or parts of it more democratic, sustainable, healthy, ethical, culturally appropriate, and better in quality' (Siniscalchi & Counihan, 2014: 6). Offline food activism can take many diverse forms including community supported agriculture (Cox et al., 2008; Mares, 2014), the anti-GMO movement (Carro-Ripalda & Astier, 2014; Fitting, 2006, 2014), local food movements (Böhm, 2019; Gross, 2014), food waste (Lang, 2021; Little, 2019) and commodity chains (Reichman, 2014).

By using and drawing upon their knowledge and experiences, food activists are able to mobilise narratives around the issues they are concerned with in relation to food and to the food system. Digital activism has now made this simpler and easier to do. Schneider et al. (2018: 8, emphasis in original) define digital food activism as '*an Internet-based, organised effort to change the food system or parts thereof in which civic initiators or supporters use digital media*'. What digital food activism offers is a new approach to asking questions and yielding insights concerning the food system.

Digital food activism takes many forms. An ethnographic case study by Lyon (2018) examines the role of digital technologies for producers in agri-food networks and the disruption caused in the coffee supply chain. With another ethnographic study, Lewis (2018b) argues that the internet is required for local food activism in order to bring people together. Her study of urban food production activists in Melbourne, Australia, highlights the importance of digital connectivity for food activism. Using case studies of a wiki platform, a mobile app, and an online-centric activist organisation, Eli, Schneider, Dolan, and Ulijaszek (2018) suggest that the interactions between these platforms and the activists who use them, can create new knowledges.

What offline and digital food activism have in common, is the focus on increased social, environmental and economic justice in relation to food production, distribution and consumption practices (Siniscalchi & Counihan, 2014). There are multiple forms of food activism which critique, challenge and attempt to change the current food system.

2.2. Previous UK 'food scares'

UK food policies have been inclined to favour production interests as opposed to consumer and citizen interests (Lang, 1999). However, public confidence has been weakened following various controversies. These have included salmonella in eggs (1988), the crisis surrounding bovine spongiform encephalopathy (BSE) in cattle and the link to variant CJD in humans during the 1990s, and more recently, the horsemeat scandal (2013). Government inquiries following food scares have described the "British food and farming system as 'dysfunctional', calling for a re-connection of all elements in the food supply chain" (Jackson, 2010: 151).

With the BSE crisis, the public perceived a failure in risk protection

by the Government, the scientific community and the food industry (Shaw, 2002). For Jasanoff (1997), some of the fault of BSE in Britain lay with the then Ministry of Agriculture, Fisheries and Food (MAFF). She suggests this organisation considered the concerns of the agricultural industry to be more important than those of consumers and the issue of public health. The UK beef industry was concerned about the effect on sales caused by the food scare, whilst UK officials were anxious about other European countries introducing a ban on beef exports. Consumer concerns were addressed and diluted in order to protect the agricultural industry. Here, science was used by the UK Government to dismiss any elements of uncertainty surrounding the consumption of British beef, and it was deemed a safe product to consume. Irwin (2009: 5) describes the use of science in the BSE crisis as 'a rhetorical weapon aimed at closing down discussion'. Whilst there was concern amongst citizens about the existence of risk with BSE, this was seen as irrational by the UK Government. The BSE crisis raised issues of a lack of trust in food provision and in an attempt to address these concerns, the Food Standards Agency was created in 2000 (Wales, Harvey, & Warde, 2006).

Along with the creation of the Food Standards Agency, Wales et al. (2006) argue that following the BSE crisis, the UK experienced a reorganisation in food provisioning. They state that the integration and globalisation of food supply chains led to the domination of supermarket retailers and out of town shopping, whilst more people purchased prepared meals and ingredients, and ate out more. This was setting up the perfect storm for a further food scare.

In 2013, processed beef products sold in the UK and other parts of Europe were found to contain horsemeat. Routine testing and inspection by the Food Standards Authority of Ireland identified the contaminated beef products, and retailers and those further up the supply chain recalled products and imposed import and export bans to minimise risks (Abbots & Coles, 2013; Ibrahim & Howarth, 2017). The National Farmers Union (NFU), supermarkets, celebrity chefs, and alternative food markets all used the horsemeat scandal to draw attention to problems in the food system (Abbots & Coles, 2013). The horsemeat scandal was problematic for consumers because of the adulteration and fraudulent practices involving meat, the loss of control over the type of meat being consumed, and the loss of trust in the food system (Ibrahim & Howarth, 2017). Confidence in the food system is undermined when consumers are made aware that the food they have purchased, is different to what they believe they are purchasing (Regan et al., 2015).

Any food safety incident can adversely impact consumer trust in the food system (Hobbs & Goddard, 2015). For consumers, a food scare disrupts what is known and experienced by them through everyday living. The disturbance created by the food scare remains until the situation is over, and the abatement of disturbance usually occurs when new understandings are created, and a consensus is established (Jackson, 2015). Food scares undermine consumer trust because risks are 'put onto the consumer without prior informed consent' (Lang & Heasman, 2015: 148). Here, consumers are unaware of risks to their food until a problem arises. The risk has been shrouded and is suddenly unveiled. When this happens, it can be difficult for food producers and retailers to re-establish consumer trust in the food system (Jackson, 2010). Individuals or organisations viewed as being responsible or contributing to a food scare, are likely to be held responsible by consumers (Regan et al., 2015). Consumers are likely to feel they have been exposed to an unnecessary risk. When responding to, and addressing the risk, consumers expect action to be taken by those responsible for food scares including apologies, penalties or sanctions (Regan et al., 2015). These are not the only actions that are required. Transparency, honesty and communication are all important when rebuilding trust in issues relating to food (Hobbs & Goddard, 2015).

2.3. Situating food and digital platforms

The genetic modification (GM) of food and crops have featured in numerous studies of news coverage. These studies have focused on news

coverage and reporting by journalists of GM food and crops in the UK and from other countries around the world (Augoustinos, Crabb, & Shepherd, 2010; Bauer, 2002; Cook, Robbins, & Pieri, 2006; Flipse & Osseweijer, 2012; Hornig-Priest & Ten Eyck, 2003; Maesele, 2015; Marks, Kalaitzandonakes, Wilkins, & Zakharova, 2007). Since some of these studies have been published, the mass media landscape has altered significantly with digital spaces becoming more prevalent. Twitter, Facebook, Instagram, blogs and websites are places where food is important, where people look to see what to buy, cook and eat (Goodman & Jaworska, 2020). Food has always been 'more-than-food' (Goodman, 2016: 258) because of its social, political, economic and environmental relationships. However, digital platforms are bringing the complexities associated with food production, distribution and consumption to the fore (Schneider et al., 2018).

Scholars have examined digital platforms to illustrate the importance of digital connectivity for contemporary food politics and activism (Lewis, 2018b), and the values and expertise associated with digital food activism (Eli et al., 2018). However, it is Twitter which has come under close scrutiny by scholars. Studies include the use of Twitter by users who have diabetes and their use of the platform to understand their condition (McLennan, Ulijaszek, & Beguerisse-Diaz, 2018), hashtag food activism on Twitter (Mann, 2018) and the use of Twitter in urban agriculture activism (Reed & Keech, 2017). Twitter has also been used by contributors to share expertise and create knowledge on a diverse range of themes associated with food such as soil, insects and urban agriculture (Reed, 2020), whilst farmers have participated in knowledge exchange about sustainable soil management through the use of hashtags on Twitter (Mills, Reed, Skaalsveen, & Ingram, 2019). What all of these studies have in common is the coming together of diverse groups. Additionally, whilst the average user of a digital platform such as Twitter, Facebook, Instagram or blogs will never have the same power as the food industry (Goodman, Johnston, & Cairns, 2017), it should be acknowledged that these platforms enable users to voice and express their opinions.

2.4. Below the line comments and participation

Whilst the genetic modification of crops and food have featured in previous studies of news coverage, there is a dearth of literature surrounding the discussion of GM crops and food in the below the line comments sections of online news organisations. 'Below the line' is 'industry parlance for the comment, and debate spaces opened up underneath news articles and blogs' (Graham & Wright, 2015: 319). Below the line comments enable participatory journalism and can improve citizen participation and involvement in news making activities. Canter (2013: 604) has observed that 'comment threads in particular have grown exponentially in recent years as readers have embraced the opportunity to bypass the Letters' Editor and publish their opinions directly to a newspaper website'. This enables citizens' opinions to reach a wide audience. Debate opens up as commenters can post their opinions about the news article as well as other audience members' comments. There is an opportunity to participate in a discussion about current events as well as offering competing headlines and interpretations to the news article (Ksiazek, 2018). Importantly, each comment is 'anchored in somebody's present in the sense that it signifies a more or less immediate reaction to the reading of an article and/or preceding comments to this article' (Bødker, 2017: 60). Therefore, comments provide an opportunity for engagement and self-expression. However, the view expressed in comments can be opposite to the official consensus provided by experts in news articles (Turner, 2013).

Whilst news organisations have always informed the audience of what is new, commenters are also able to do this now, along with contesting the ideas presented by journalists. Digital journalism is a combination of traditional journalism with user-generated content and user-user interactions (Ksiazek & Peer, 2017). By its very nature, digital journalism requires a level of interaction, and there is a two-way

relationship between producers and consumers. By posting comments, scientists, NGOs, activists, and citizens can now actively contribute to news. Rather than just being a member of the audience, citizens are able to provide their own contributions and connect with other users (Marres, 2017).

Digital spaces do come with a caveat. The below the line comments appear to be an 'equitable' space which offer an opportunity to share information and engage with debate. The comments are a participatory space where those encountering their content are informed through shared exchanges (Beer & Burrows, 2010; Lupton, 2020; Tufte, 2017). An event may also be made visible or a debate initiated (Tufte, 2017). However, it is important to acknowledge that there is still a digital divide. The marginalised and the disadvantaged lack access to digital technologies (Lupton, 2016; Lupton, 2018). This is a problem because it limits who has access to information and knowledge. Halford and Savage (2010) actually go farther than acknowledging a digital divide, and instead focus on the social inequalities created or further deepened by digital technologies. It can be these social inequalities that prevent participation in digital spaces. Stemming from social inequalities can be a lack of access to devices or Wi-Fi; a lack of digital skills, experience or knowledge; a lack of interest or anxiety about using digital technologies; and a lack of service support when using digital technologies (Lupton, 2018; van Dijk & Hacker, 2003). Because of the digital divide and social inequalities, a scepticism is needed when engaging with below the line comments. Therefore, it is vital to recognise that there will be voices missing and excluded from the debate. It is also important to remember that digital technologies and the spaces created by these can create distance and alienation between people (Caldwell, 2018).

Whilst acknowledging the challenges associated with digital platforms such as the below the line comments, these spaces still offer significant opportunities. The digital sphere has enabled increased participation in knowledge exchange (Marres, 2017) and the below the line comments facilitate this. Here, knowledge production becomes more participatory and widely distributed. For Noortje Marres (2015: 2, *emphasis in original*), material participation occurs when 'everyday things, devices and environments ... acquire the capacity to engage and to mediate involvement with public affairs'. The everyday act of reading a news article turns into material participation when a person posts a comment in response to it. These everyday acts can enable citizens to acquire the capacity to engage and become involved with debate, discussion and deliberation (Marres, 2015). Activism can take place in a setting such as the below the line comments when everyday aspects of life are considered forms of engagement and participation (Marres, 2015). This is possible because digital platforms enable easy participation of engaging with a debate just by clicking and inserting a comment (Marres, 2017). Below the line comments offer this opportunity and can be easily accessed.

It is important to acknowledge that this type of informal engagement process should not be ignored or discounted (Stilgoe, Lock, & Wilsdon, 2014). Whilst Reed and Keech (2017) found users of Twitter in urban agriculture activism tended to focus on reinforcing and building their networks as opposed to providing a counter-narrative to debates, I would argue that below the line comments are different. Below the line comments present an opportunity for users to provide alternative commentary. Participating in the below the line comments section enables audience members to interact with others about the food choices they make or share knowledge with others. However, we should not forget that commenters may not see themselves as activists. Posting a comment may be an act of a mundane everyday activity for some people. But whilst this is an everyday activity it still creates disruption. As Gross (2014: 21) argues, 'any challenge to the food system is a form of activism, even at the level of individual choice and even if people don't consider themselves activists'. I agree with this statement and I would argue that small acts of disruption such as posting a below the line comment is activism.

The best way to consider posting a below the line comment is as a

type of quiet activism. Horton and Krafl (2009: 16) argue that whilst activism is often viewed as ‘dramatic, iconic, totemic, glamorous and heroic’, we should not ignore the ‘banal, day-to-day practices’ of our everyday lives. Quiet activism ‘involves the ways in which everyday decision-making by individuals and communities can gradually, episodically, change dominant hegemonic norms and understandings, providing new opportunities for social change’ (Hankins, 2017: 503). However, it is the small, everyday actions, which tend to be overlooked (Pottinger, 2017). These modest contributions calling for change are quiet activism. Pottinger (2017: 217) defines quiet activism as ‘a form of engagement that emphasises embodied, practical, tactile and creative ways of acting, resisting, reworking and subverting’. Actions and activities that may be considered as insignificant but which can create progressive change are also viewed as quiet activism by Martin, Hanson, and Fontaine (2007). Research examining quiet activism includes care work (Hall, 2020; Horton & Krafl, 2009), hobby crafts (Hackney, 2013), seed swapping (Pottinger, 2017) and climate change (Lobo et al., 2021).

Quiet activism means ‘we are not talking about picket lines or placards. Quiet in that we are talking about decision-making, which is inaudible but can have important consequences’ (Hankins, 2017: 504). Expressing a point of view via a comment may be inaudible to the large players in the food system, but it is still an opportunity to express an opinion to audience members. As Lobo et al. (2021: 15) argue, a ‘chorus of whispers can gain an energy that is more forceful than a shout’. A number of voices arguing the same point is likely to attract other audience members’ attention. Whilst quiet activism is not associated with a particular political movement or cause, it can contribute to social and environmental aims and aspirations (Pottinger, 2017). The below the line comments enable audience members to coalesce around food issues. By posting a comment, an individual can be quietly active around a food issue when drawing on their own life experience, or from information accessed from offline and online sources (Hackney, 2013). This quiet activism can give “voice to hidden or silenced experiences, connecting up everyday practices to show the ‘bigger’ or ‘broader’ political picture” (Hall, 2020: 243). Quiet activism through the lived experiences of everyday food practice is an area which should not be ignored.

The study reported here aims to fill a research gap to show how below the line comments can be used for digital food activism. As the study focuses on genetically modified crops and foods, the study also reveals the narratives deployed by commenters in this particular debate.

3. Methods

A note on the methods: this article is based on a broader research project (Price, 2018). The methods described here are for the research project as a whole and this article forms one part of the findings. The research project ran from September 2014 to September 2018.

3.1. Data collection and selection

A qualitative study was undertaken which included online news articles and the associated below the line comments from UK online news organisations. The news organisations included in the sample were The Guardian; The Telegraph; The Times; The Daily Mail; and The Mirror. These also included the Sunday editions. The sample included what have traditionally been seen as the broadsheets (The Guardian; The Telegraph; and The Times), and the tabloids (The Daily Mail and The Mirror). The news organisations included in the sample were chosen because of their diversity of content. The broadsheets generally are assumed to provide more in depth content, whilst the tabloids tend to be more concise and simplistic. The sampling time frame ran from 1 January 2015 until 31 December 2015, enabling a sufficient data set to be collected. It also enabled the journalistic constructions of GM food along with the below the line comments to be followed for a period of a year. The sample gathered 78 articles and 9279 below the line comments.

Google Advanced Search was used to locate the news articles. The search was not meant to be exhaustive but was instead intended to return enough news articles and below the line comments for analysis. *GM food* and *genetically modified food* were both used as key word search terms. These were searched for using the ‘all these words’ option. The website address for each news organisation was put in the ‘site or domain’ option. The past year (from 1 January 2015) was selected for the ‘last update’ option. Once all this information was completed, the searches were conducted. However, searching for the articles in this way meant each news article had to be individually checked. This was to ensure it fit within the sampling time frame. In total, 104 articles were returned in the search. The articles were also screened for relevance. Some articles which appeared in the search were not appropriate for this project. These included articles concerning business news in connection with companies such as Monsanto and Bayer. Therefore, these were omitted, and the total number of articles relevant to the project was 78. In respect of the comments, those used in the study were those which were associated with the articles. Therefore, these did not have to be searched for separately. The number of comments included in the sample was dependent on the number of audience members who decided to post a comment.

An important consideration which has to be taken into account in respect of this study, is that those who post comments may be those who are particularly interested in the subject of GM foods. In this respect, the views of those commenting are seen as being representative for this study and may not be characteristic of the population as a whole. Analysing the comments provides an approach for understanding the reception of the articles concerning GM foods by audience members. The data for reception analysis is often collected using methods such as interviewing, observation or focus groups. In contrast to these approaches, where participants have to be recruited and who often have to recall information, this study uses the actual responses of commenters. Therefore, this data is first hand from the audience who are interested in commenting about GM foods. Their views, feelings, understandings, and beliefs are revealed in the comments they post.

3.2. Data analysis

To examine the data in detail, the qualitative data analysis combined the use of two methods. Firstly, the use of a grounded theory approach as advocated by Charmaz (2014), which employs the techniques of coding and memo writing. Secondly, a discourse analysis drawing on theoretical concerns including science and technology studies, risk and sociology of food. This enabled connections to be drawn between the preliminary grounded theory results and the important theoretical concepts.

3.3. Grounded theory

The first part of the analysis for this study comprised the use of grounded theory and is an approach advocated by Charmaz (2014). The first step in data analysis is to carry out the initial coding. This step is achieved by carrying out line by line coding. These initial codes were just used as labels and no theoretical interpretation was placed upon them.

Once the initial coding was conducted, the analysis moved to focused coding. This involved studying and assessing the initial codes to establish which were more conducive to the analysis. By doing so, initial codes and data could be assessed and this enabled those codes with the greater analytic strength to be identified. Full details of all the initial codes and focused codes are available in Price (2018).

The final stage of the process concerned memo writing. Memo writing is described by Charmaz (2014) as a method to enable researchers to stop and consider ideas and thoughts about codes and any developing categories. Time can be devoted to thinking about ideas concerning the data, codes or analysis. It is also possible to write memos

throughout the research process in order to develop lines of enquiry. Memo writing enables constant comparisons to be made with the data. There is the potential to identify and develop a key category that may otherwise be overlooked.

3.4. Discourse analysis

The preliminary results obtained from the coding process indicated potential connections between the data and social theory. Phillips (2000) contends that sociological theories can act as prompts for the discourse analysis and therefore, provoke questioning of the data which is of greater relevance to the study. This approach enabled me to search the literature for theoretical concepts and broader social trends which were relevant to the data. To ensure clarity in the above description, it is the coding of the data which led me to the important theoretical concepts used in the project.

Whilst there are many types of discourse analysis, the version used in this study is that developed by Gee (2011). By conducting discourse analysis, questions are effectively asked of the text being examined. According to Gee (2011), there are seven different building tasks used in the construction of language whenever we speak or write and for each, it is possible to ask a discourse analysis question. These seven building tasks are significance; practices (activities); identities; relationships; politics; connections; and sign systems and knowledge. The seven building tasks are fundamentally interlinked with each other (Gee, 2011). Many of the same words and phrases can be used to address the building tasks and answer the related discourse analysis questions. Gee also argues that if the building tasks or discourse analysis questions are not relevant to a particular piece of data, this is not an issue. There is flexibility in this approach.

In respect of selecting samples to analyse, a strategy Fairclough (1992) proposes is to focus on those elements of the discourse where there is an indication and evidence that something is amiss and is going wrong. He also suggests focusing on areas of discourse which are pivotal, indicate something which is vital, or are puzzling. It is these elements of the discourse which yield the most insights into the topic under investigation. These suggestions were followed and those extracts which best represented a pattern in the data were selected. The extracts which appear in the Results section are those which were identified as relating to trust in the food industry and trust in food policy when the discourse analysis was conducted. The questions described above for Gee's (2011) seven building tasks were applied to the text extracts which had been previously coded as risk (social) trust. An example of how the seven building tasks and the related discourse analysis questions were applied to the data are available in Price (2018).

In the findings which follow, any spelling mistakes or grammatical errors are left unchanged in the extracts taken from the below the line comments.

4. Results

The results described here are part of a much wider study concerning scientific expertise and alternative knowledges (Price, 2018). The results that follow illustrate how the below the line comments are a site of quiet activism and material participation because citizens can just click and insert a comment. These results also offer an insight into public attitudes surrounding trust in the food industry and trust in food policy in relation to GM crops and foods.

4.1. Trust in the food industry

One of the patterns which emerged from the discourse analysis was trust or distrust in the food industry and this was associated with the risk (social) trust code when conducting the Grounded Theory analysis. The extracts in this section do not relate to one event. Instead, the commonality are anxieties surrounding food, and issues of trust with the

food industry. These extracts were selected because they show how trust in the food system can be undermined by actions that not only occur in the present but also from the past.

This commenter describes how Waitrose is the only UK supermarket which insists on animals being fed non-GM feed. They claim Waitrose meats are not 'contaminated'. For the commenter, this means Waitrose meat is unpolluted and clean. As they are the 'only supermarket' who insist on animals being fed non-GM feed, remaining supermarkets are constructed as selling contaminated meat because the animals have consumed GM animal feed. The commenter is drawing attention to the everyday practice of food consumption, and what they perceive as the edible and inedible. By explaining what food is edible to the audience, there is the potential to influence food choices. The ideas surrounding what is edible are open to debate, contestation, and alteration. These possible acts of influence form part of quiet activism.

The commenter also blames GM animal feed for contaminating meat. When consumers have something to blame, they can join around the cause they claim to be a danger to try to prevent it from occurring. The below the line comments enable those who are concerned to coalesce. Here, the commenter takes the opportunity to share knowledge about a particular supermarket with other audience members. Participating in below the line comments enables audience members to interact with others about the food choices they make or share knowledge with others.

In this extract, the commenter uses the terms 'we' and 'our', thereby describing citizens as a collective. The commenter claims the food system is poisoned by corporate interests, and that everyone is at risk from this pollution. However, they also claim governments are influenced by corporate interests. The discourse in the comment indicates a lack of trust in the protection of the food system, as the food system for this commenter appears to be suffering abuse from members of the food industry. This comment appears to be a rallying cry to other audience members especially in relation to considering how to vote in elections. A comment such as this is important because governments are responsible for food policy. Whilst this comment may not disrupt the food system or change how people vote, it may make other audience members stop and consider how their food is produced and who is controlling food production. The intention of quiet activism is to make people stop and think.

Previous food scares and the handling of these can influence consumer trust in the food system. Extracts 3, 4, and 5 are by commenters who refer to earlier food scares which occurred in the UK.

The commenter claims the trust between consumers and the food industry was broken following the horsemeat scandal food scare by using the statement 'We, the British public, do not like being lied to'. This illustrates how deception can undermine trust. Just as with Extract 2, it is a rallying cry to other audience members, although on this occasion they are asked to consider where they spend their money. The commenter focuses their attention on the food industry and suggests the industry is at fault for allowing GM ingredients to be found in food. I would argue this type of comment can play a part in disrupting the food system, albeit on a very small scale. This quiet activism is a form of resistance against the food industry. The comment may only be about the everyday act of spending money on food in a supermarket, but it is the sentiment of being lied to which is important. Small acts can amount to significant changes at a later date if enough people challenge existing norms. As is evident here, commenters can use their knowledge of previous food scares to highlight to others potential problems with the food system. The below the line comments enable this sharing of information to occur.

In this extract, the commenter refers to the BSE crisis and draws on their knowledge and experience from this previous food scare. In the early 1990s, bovine spongiform encephalopathy (BSE) in cattle was viewed as an animal health problem. However, by the end of the 1990s, the growing number of deaths of humans from new variant Creutzfeldt-Jakob disease (nvCJD) were linked to BSE (Irwin, 2009). Referring to the

It is worth noting that there were no reports on Waitrose meats being contaminated. They are the only UK supermarket to not feed their animals GM feed, which has been linked to all kinds of health problems, not least due to the high levels of glyphosate herbicide on the crops, which are designed to tolerate it.

Extract 1 Comment relating to the article 'Could these piglets become Britain's first commercially viable GM animals?' ([The Guardian, 2015a](#)).

WE are all at risk because cattle feed and the food industry are using these poisons and OUR entire food chain is contaminated. WE must stop it with OUR votes to get the corporate-owned-operatives out of OUR governments.

Extract 2 Comment relating to the article 'Pesticides in paradise: Hawaii's spike in birth defects puts focus on GM crops' ([The Guardian, 2015b](#)).

Didn't the food industry learn anything from the horsemeat scandal?? We, the British public, do not like being lied to..... And we have lots of options on where we spend our cash....

Extract 3 Comment relating to the article "Now 'GM-free' Domino's is selling Frankenfood Pizzas: Takeaway chain among number of big names using modified foods" ([The Daily Mail, 2015a](#)).

Consumers don't want gm crops. Scientific evidence to their benefits or safety is irrelevant if people don't want to risk eating them. Personally, after the BSE scandal, I don't see why consumers should be expected to want to eat anything created unnaturally by big agro-tech.

Extract 4 Comment relating to the article 'Science bodies urge Scottish government to rethink GM crops ban' ([The Guardian, 2015c](#)).

BSE crisis, the commenter claims that even if the scientific evidence proves GM crops and foods to be safe, this does not matter if people do not wish to consume them. A person will use their own judgement to decide whether an item is safe to eat.

This commenter draws on their lived experience as a consumer but refers to scientific evidence when constructing their comment. They appear to favour their expertise of lived experience as a consumer over science. In relating back to the BSE crisis, the commenter draws attention to the risks associated with food when science is involved. With BSE, science failed citizens. As this comment illustrates, the way in which BSE was handled as a food scare could potentially impact the way in which GM crops and foods are perceived.

Once again, the commenter draws on their knowledge and experience of the BSE food scare. The spelling mistakes of 'unforeseen' and 'culmulative' are made by the commenter and these should be 'unforeseen' and 'cumulative'. For this commenter, BSE and the associated vCJD was caused by the food industry and farming practices. The focus for this commenter is on health and the risks associated with eating food that may be treated with chemicals. The commenter highlights some of the potential problems they claim are evident with GM crops. This commenter's claim of their experience of the previous food scare enables them to participate in a discussion about health implications. They perceive BSE and vCJD having occurred due to practices 'motivated purely by greed'. This experience provides the commenter with the

agency to participate in the discussion about GM crops and food, and the below the line comments provides the space to do so.

4.2. Trust in food policy

The UK Parliament's Science and Technology Select Committee released a report on 26 February 2015 entitled, *Science and Technology Committee – Fifth Report; Advanced genetic techniques for crop improvement: regulation, risk and precaution* ([House of Commons Science and Technology Committee, 2015](#)). In this report, a suggestion was put forward to rename GM foods. This report is referred to by commenters after it featured in news articles. Extracts 6, 7 and 8 relate to the risk (social) trust code. These extracts examine how trust can be undermined when citizens believe they are being deceived and lied to.

The following three extracts are comments which were posted in response to "Call GM food something else to ease public fears, say MPs: Report says label is 'lightning rod' for fears of designer crops" ([The Daily Mail, 2015b](#)).

The grammatical errors are made by the commenter in this extract. Firstly, it is possible to establish the names of the MPs sitting on the Science and Technology Select Committee. These are listed on the webpage for the Science and Technology Select Committee on the UK Parliament website ([UK Parliament, 2018](#)). Requesting the names of the MPs on the comments section requires less effort on the part of the

Because CJD was a completely unforeseen consequence of a farming / food processing practice that offered no benefit to the consumer and was motivated purely by greed.

If we introduce lots of new chemicals into our diet (or increase the quantity of existing chemicals), sooner or later we will discover that we have been eating something that causes culmulative or delayed damage to our bodies.

Extract 5 Comment relating to the article 'GM crop vote was just the beginning of Europe's biotech battle' ([The Guardian, 2015d](#)).

Let's have the names of these MP's on this select committee. If they see deceiving the voters is ok, then let us show them it's not ok, get rid of them in May. The US a leading Country in GM farming is reported as having second thoughts on their use. Just yesterday Hershey the famous US chocolate manufacturer have declared not to use GM ingredients in their products. These MP's are clearly 'FRIENDS' GM laboratories. Why are they afraid to label their products, If they are as safe as they say, no problem. Let me exercise my right of choice and not be lied to.

Extract 6 Comment relating to the article "Call GM food something else to ease public fears, say MPs: Report says label is 'lightning rod' for fears of designer crops" ([The Daily Mail, 2015b](#)).

commenter than if they were to seek out this information directly. This commenter is calling out and asking other commenters to list the names of the MPs. By doing so, they are drawing attention to what they perceive as deception, as well as attempting to get other people involved. The key words used by this commenter are 'deceiving' and 'lied to'. Both these words indicate how the commenter perceives those with political authority are misleading citizens. This perceived deception echoes what happened with previous food scares including BSE and the horsemeat scandal. It is politicians who are perceived as being responsible for creating a potential food risk.

For this commenter, it appears MPs need to be trustworthy in order to serve in Parliament, and the commenter relates the matter of trust to the safety of GM products. If GM ingredients are not safe, then MPs should not be allowing the introduction of GM crops. The only reason the commenter could see this happening is due to the relationship between scientists and MPs, and this enables the integrity of science and scientists to be questioned. In this part of the comment, it is the scientists who are perceived as being responsible for creating a potential food risk. For this commenter, trust in the food system appears to be important, and the perceived actions taken by different food actors are problematic. Consumers do not like being exposed to unnecessary food risks.

The grammatical error is made by the commenter in this extract. In this extract, the commenter is focusing on how the truth is hidden. The comment is in response to the Daily Mail article, so this suggests those 'who promoted it' are politicians. However, the commenter is not explicit, so this could be scientists too. This commenter appears to believe politicians are promoting GM foods, whilst lying to the public at the same time.

This illustrates a point made by [Lewis, Inthorn, and Wahl-Jorgensen \(2005\)](#), whereby the active agencies in the news are governments or industry, whilst citizens are not active, only reactive. Citizens are not able to be active agents in science news. By using the comments section and expressing an opinion, this may be an opportunity for citizens to become active agents especially in quiet activism.

In this extract, the commenter focuses on how the truth is hidden, as with Extracts 6 and 7. If the truth is hidden, the commenter suggests this is because there is a problem with GM foods. They imply that because politicians believe it necessary to lie about the name of GM foods, they must be harmful. As this comment is a response to the Daily Mail article, 'lie to the public' appears to refer to the politicians lying to the public by changing the terminology from genetic modification. All three extracts (Extracts 6, 7, and 8) show the commenters as believing they have not been told the truth. This reflects the contested nature of the GM debate, especially with the provision of below the line comments which enables all of those who wish to speak, the opportunity to express their opinion. The three commenters (Extracts 6, 7, and 8) all draw attention to lies and deception which they perceive to exist. These extracts illustrate one

aspect of why science becomes contested.

Extract 9 illustrates how a commenter views the decision taken by the Scottish Government. Through their devolved powers, the Scottish Government intended to prohibit the cultivation of GM crops. The comment is in response to the article entitled 'Scotland to issue formal ban on genetically modified crops' ([The Guardian, 2015e](#)). In Extract 9, the commenter refers to the moral and ethical implications of introducing GM crops to Scotland.

The spelling mistake of 'public heath' is made by the commenter in this extract. It should be 'public health'. This commenter is calling out and asking other commenters about Scotland. As with Extracts 2 and 3, they are attempting to get other people involved. The commenter questions whether Scotland is 'backward' if they do not cultivate GM crops. Scotland may appear 'backward' if England is progressing with scientific developments, but the commenter suggests that by considering safety aspects, Scotland will be in a better position. Consumers are not demanding GM food products in supermarkets so there is no need for them to be grown. It is better for Scotland to be free of GM crops if they are not wanted by consumers. The commenter goes on to suggest that if GM foods are unsafe, then it is correct for the Scottish Government to apply the precautionary principle. They state no epidemiological studies (epidemiology is the study of how often diseases occur in different groups of people and why), have found GM foods safe to consume, and laboratory studies have found them unsafe. Here, the commenter is focusing on the risk to human health.

The use of the phrase 'hype and the spin' indicates the commenter perceives GM foods to be subjected to propaganda and bias by those who stand to gain from their introduction. The use of the word 'bravo' by the commenter, suggest they are pleased with the stance being taken by the Scottish Government in the use of the precautionary principle. Here, the commenter uses the below the line comments section to share their understandings and beliefs about the different stances taken by England and Scotland in relation to GM crops and foods.

All of the comments presented here illustrate that food is 'more-than-food' ([Goodman, 2016: 258](#)). Food is a powerful tool in which to engage with the world because we can never separate ourselves from it. By posting comments, audience members are willing to speak out about GM crops and foods as opposed to being passive consumers of food. This is a small act of digital activism, and that which falls into the category of quiet activism.

5. Discussion and conclusion

The study reported here aims to fill a research gap to show how 'below the line' comments can be used for digital food activism. The research suggests that in respect of GM crops and foods, the below the line comments enable social interaction and provide the opportunity for

In other words try and hide the truth. These foods are pure evil. When that is realised, those who promoted it no doubt will not be held to account!

Extract 7 Comment relating to the article "Call GM food something else to ease public fears, say MPs: Report says label is 'lightning rod' for fears of designer crops" ([The Daily Mail, 2015b](#)).

So, in other words, just lie to the public. So you just know it is bad/harmful when they have to lie.

Extract 8 Comment relating to the article “Call GM food something else to ease public fears, say MPs: Report says label is ‘lightning rod’ for fears of designer crops” ([The Daily Mail, 2015b](#)).

Somehow Scotland is deemed to be “backward” because it fails to be fooled by the hype and the spin of the GMO industry? Who wants GMOs anyway? Has anybody ever asked for a GMO product in a supermarket? There is no market demand – so it is perfectly sensible to try and keep Scotland free of GMOs. And just a reminder. There is still not a single epidemiological study showing that GMOs are safe to consume – and many laboratory studies that suggest otherwise. In making this move, the Scottish Govt is properly applying the Precautionary Principle and seeking, at the same time, to gain a competitive advantage over England. It also has concerns about public health. Bravo!

Extract 9 Comment relating to the article ‘Scotland to issue formal ban on genetically modified crops’ ([The Guardian, 2015e](#)).

collective action and advocacy to be discussed. However, it is not a site where action and advocacy is organised and coordinated. It may be that Twitter is a more useful platform for organisation and coordination of collective action ([Mann, 2018](#); [McLennan et al., 2018](#); [Reed & Keech, 2017](#)). This suggests that further research is needed to compare and contrast the discussion and debate of GM crops and foods on different platforms such as the below the line comments and Twitter. Further research is also needed to ascertain if the boundaries between these different online spheres blur.

The results show that the below the line comments are a site of material participation enabling the discussion of GM crops and foods. Commenters challenged and provided alternative media discourses by putting forward different ideas and sources. These discourses were not always based on science, but instead focused on previous food scares and the potential political motivations for allowing GM crops to be grown. Sharing knowledge and experiences from previous food scares were also evident in the below the line comments. This capacity to engage and become involved with the debate, discussion, and deliberation ([Marres, 2015](#)) of GM crops and foods occurs because the below the line comments can be seen as a site of material participation.

I would argue that below the line comments enable digital activism because it is a digital platform which is easily accessible. As the results illustrate, easy participation of engaging with the GM crops and food debate is enabled just by clicking and inserting a comment ([Marres, 2017](#)). Whilst [McLennan et al. \(2018\)](#) and [van Dijck \(2009\)](#) question whether digital platforms do disrupt society and democratise power and knowledge, [Marres \(2015\)](#) argues that we should consider the efforts people go to in order to engage with public affairs. This research shows that audience members are willing to participate as those posting comments do so of their own volition. The comments presented in this study are the actual responses of audience members, so their feelings, understandings and beliefs about GM crops and foods are revealed in what they post. Instead of thinking about whether digital platforms disrupt society and democratise power and knowledge on a large scale, perhaps we should turn our attention to these smaller acts. The below the line comments discussed in this study illustrate acts of quiet activism in the GM food debate. Commenters are able to express their opinions to other audience members about their everyday experiences relating to GM foods and previous food scares. Even if this is carried out quietly, expressing an opinion is one form of resistance against the larger players in the food system.

What this research does not tell us, is how audience members have benefited or feel challenged by the comments they read which are posted by commenters. Here, it would be necessary to conduct interviews with those who post comments about GM crops and food to establish if they gain knowledge from reading other audience members' comments, or if they feel they are sources of misinformation. This is an area where further research is needed.

The findings outlined in this study come with a caveat. As [Graham and Wright \(2015\)](#) contend, ‘people who comment are atypical and comment debates are not, thus necessarily reflective of the broader readership’. As stated in the Methods section, the views of those commenting are seen as being representative for this study and may not be characteristic of the population as a whole. It is important to note that those who post comments may be particularly interested in the subject of GM crops and food. Overall, it was difficult to ascertain information about those who were commenting, such as age, gender, and occupation. The majority of those commenting used pseudonyms, enabling those commenting to do so anonymously. This anonymity with comments means that it is impossible to establish the motivations for those who chose to comment ([Canter, 2013](#); [Graham & Wright, 2015](#)). In order to understand the motivations and the reasons as to why the audience post comments, it would be necessary to conduct interviews with those who do so. This is an area where further research is needed.

Whilst the below the line comments are not a digital platform where action and advocacy is organised and coordinated, nor does action and advocacy necessarily connect to the offline world, it is not a site which should be overlooked. For those wishing to post their values, beliefs, and understandings of the debate surrounding GM crops and foods, the below the line comments are an easy and accessible way to do so. Here, the below the line comments offer a window into commenters' understandings of the complexities of the food system.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The author declares that there is no conflict of interest.

Acknowledgements

The author would like to thank the anonymous referees for their helpful feedback and advice.

References

- Abbots, E. J., & Coles, B. (2013). Horsemeat-gate: The discursive production of a neoliberal food scandal. *Food, Culture and Society*, 16(4), 535–550.
- Augoustinos, M., Crabb, S., & Shepherd, R. (2010). Genetically modified food in the news: media representations of the GM debate in the UK. *Public Understanding of Science*, 19(1), 98–114.
- Bauer, M. W. (2002). Controversial medical and agri-food biotechnology: A cultivation analysis. *Public Understanding of Science*, 11, 93–111.
- Beer, D., & Burrows, R. (2010). Consumption, presumption and participatory web cultures: An introduction. *Journal of Consumer Culture*, 10(1), 3–12.

- Bennett, W. L., & Segerberg, A. (2012). The Logic of Connective Action: The Personalization of Contentious Politics. *Information, Communication & Society*, 15(5), 739–768.
- Blue, G. (2010). Food, publics, science. *Public Understanding of Science*, 19(2), 147–154.
- Bødker, H. (2017). The time(s) of news websites. In B. Franklin, & S. A. Eldridge, II (Eds.), *The Routledge Companion to Digital Journalism Studies* (pp. 55–63). Abingdon: Routledge.
- Böhm, K. (2019). The rural is not remote. In C. Flood, & M. Rosenthal Sloan (Eds.), *Food: Bigger Than The Plate* (pp. 64–69). London: V & A Publishing.
- Caldwell, M. L. (2018). Hacking the food system: re-making technologies of food justice. In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 25–42). Abingdon: Routledge.
- Canter, L. (2013). The misconception of online comment threads: Content and control on local newspaper websites. *Journalism Practice*, 7(5), 604–619.
- Carro-Ripalda, S., & Astier, M. (2014). Silenced voices, vital arguments: smallholder farmers in the Mexican GM maize controversy. *Agriculture and Human Values*, 31, 655–663.
- Charmaz, K. (2014). *Constructing Grounded Theory* (2nd ed.). London: Sage Publications Ltd.
- Cook, G., Robbins, P. T., & Pieri, E. (2006). “Words of mass destruction”: British newspaper coverage of the genetically modified food debate, expert and non-expert reactions. *Public Understanding of Science*, 15(1), 5–29.
- Cox, R., Holloway, L., Venn, L., Dowler, L., Hein, J. R., Kneafsey, M., & Tuomainen, H. (2008). Common ground? Motivations for participation in a community-supported agriculture scheme. *Local Environment*, 13(3), 203–218.
- van Dijk, J. (2009). Users like you? Theorizing agency in user-generated content. *Media, Culture and Society*, 31(1), 41–58.
- van Dijk, J., & Hacker, K. (2003). The Digital Divide as a Complex and Dynamic Phenomenon. *The Information Society*, 19(4), 315–326.
- Eli, K., Schneider, T., Dolan, C., & Ulijaszek, S. (2018). Digital food activism: values, expertise and modes of action. In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 203–219). Abingdon: Routledge.
- Fairclough, N. (1992). *Discourse and Social Change*. Cambridge: Polity Press.
- Fitting, E. (2006). The political uses of culture: Maize production and the GM corn debates in Mexico. *Focaal—European Journal of Anthropology*, 48, 17–34.
- Fitting, E. (2014). Cultures of Corn and Anti-GMO Activism in Mexico and Colombia. In C. Counihan, & V. Siniscalchi (Eds.), *Food Activism* (pp. 175–192). London: Bloomsbury Academic.
- Flipse, S. M., & Osseweijer, P. (2012). Media attention to GM food cases: An innovation perspective. *Public Understanding of Science*, 22(2), 185–202.
- Gee, J. P. (2011). *An Introduction to Discourse Analysis: Theory and Method* (3rd ed.). Abingdon: Routledge.
- Gil de Zúñiga, H., Copeland, L., & Bimber, B. (2014). Political consumerism: Civic engagement and the social media connection. *New Media & Society*, 16(3), 488–506.
- Goodman, M. K. (2016). Food geographies I: Relational foodscapes and the busy-ness of being more-than-food. *Progress in Human Geography*, 40(2), 257–266.
- Goodman, M. K., & Jaworska, S. (2020). Mapping digital foodscapes: Digital food influencers and the grammars of good food. *Geoforum*, 117, 183–193.
- Goodman, M. K., Johnston, J., & Cairns, K. (2017). Food, media and space: The mediated biopolitics of eating. *Geoforum*, 84, 161–168.
- Graham, T., & Wright, S. (2015). A Tale of Two Stories from “Below the Line”: Comment Fields at the Guardian. *The International Journal of Press/Politics*, 20(3), 317–338.
- Gross, J. (2014). Food Activism in Western Oregon. In C. Counihan, & V. Siniscalchi (Eds.), *Food Activism* (pp. 15–30). London: Bloomsbury Academic.
- Hackney, F. (2013). Quiet activism and the new amateur: The power of home and hobby crafts. *Design and Culture*, 5(2), 169–193.
- Halford, S., & Savage, M. (2010). Reconceptualising digital social inequality. *Information, Communication & Society*, 13(7), 937–955.
- Hall, S. M. (2020). The personal is political: Feminist geographies of/in austerity. *Geoforum*, 110, 242–251.
- Hankins, K. (2017). Creative democracy and the quiet politics of the everyday. *Urban Geography*, 38(4), 502–506.
- Henderson, M. (2012). *The Geek Manifesto*. London: Corgi Books.
- Hobbs, J. E., & Goddard, E. (2015). Consumers and trust. *Food Policy*, 52, 71–74.
- Hornig-Priest, S., & Ten Eyck, T. (2003). News Coverage of Biotechnology Debates. *Society*, 29–34.
- Horton, J., & Kraftl, P. (2009). Small acts, kind words and ‘not too much fuss’: Implicit activism. *Emotion, Space and Society*, 2, 14–23.
- House of Commons Science and Technology Committee. (2015). *Advanced genetic techniques for crop improvement: regulation, risk and precaution: Fifth Report of Session 2014–15* [Online]. Available at <https://publications.parliament.uk/pa/cm201415/cmselect/cmstech/328/328.pdf>.
- Humphery, K., & Jordan, T. (2018). Mobile moralities: Ethical consumption in the digital realm. *Journal of Consumer Culture*, 18(4), 520–538.
- Ibrahim, Y., & Howarth, A. (2017). Contamination, Deception and ‘Othering’: The Media Framing of the Horsemeat Scandal. *Social Identities*, 23(2), 212–231.
- Irwin, A. (2009). Moving forwards or in circles? Science communication and scientific governance in an age of innovation. In R. Holliman, E. Whitelegg, E. Scanlon, S. Smidt, & J. Thomas (Eds.), *Investigating Science Communication in the Information Age* (pp. 3–17). Oxford: Oxford University Press.
- Jackson, P. (2010). Food stories: consumption in an age of anxiety. *Cultural Geographies*, 17(2), 147–165.
- Jackson, P. (2015). *Anxious Appetites*. London: Bloomsbury Academic.
- Jasanoff, S. (1997). Civilization and madness: The great BSE scare of 1996. *Public Understanding of Science*, 6, 221–232.
- Joyce, M. (2010). Preface. In M. Joyce (Ed.), *Digital Activism Decoded: The New Mechanics of Change* (pp. vii–xi). New York: International Debate Education Association.
- Ksiazek, T. B. (2018). Commenting on the News: Explaining the degree and quality of user comments on news websites. *Journalism Studies*, 19(5), 650–673.
- Ksiazek, T. B., & Peer, L. (2017). User comments and civility on YouTube. In B. Franklin, & S. A. Eldridge, II (Eds.), *The Routledge Companion to Digital Journalism Studies* (pp. 244–252). Abingdon: Routledge.
- Lang, T. (1999). The complexities of globalization: The UK as a case study of tensions within the food system and the challenge to food policy. *Agriculture and Human Values*, 16(2), 169–185.
- Lang, T. (2021). *Feeding Britain: Our Food Problems and How to Fix Them*. London: Penguin.
- Lang, T., & Heasman, M. (2015). *Food Wars: The global battle for mouths, minds and markets* (2nd ed.). Abingdon: Routledge.
- Lewis, J., Inthorn, S., & Wahl-Jorgensen, K. (2005). *Citizens or Consumers? What the Media Tell Us about Political Participation*. Maidenhead: Open University Press.
- Lewis, T. (2018a). Digital food: from paddock to platform. *Communication Research and Practice*, 4(3), 212–228.
- Lewis, T. (2018b). Food politics in a digital era. In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 185–202). Abingdon: Routledge.
- Little, A. (2019). *The Fate of Food: What We’ll Eat in a Bigger, Hotter Smarter World*. London: OneWorld.
- Lobo, M., Bedford, L., Bellingham, R. A., Davies, K., Halafoff, A., Mayes, E., ... Lucas, C. (2021). *Earth unbound: Climate change, activism and justice*. Educational Philosophy and Theory.
- Lupton, D. (2016). *The Quantified Self*. Cambridge: Polity Press.
- Lupton, D. (2018). *Digital Health: Critical and Cross-Disciplinary Perspectives*. Abingdon: Routledge.
- Lupton, D. (2020). *Data Selves*. Cambridge: Polity.
- Lyon, S. (2018). Digital connections: coffee, agency, and unequal platforms. In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 70–88). Abingdon: Routledge.
- Maesele, P. (2015). Risk conflicts, critical discourse analysis and media discourses on GM crops and food. *Journalism*, 16(2), 278–297.
- Mann, A. (2018). Hashtag activism and the right to food in Australia. In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 168–184). Abingdon: Routledge.
- Mares, T. M. (2014). Engaging Latino immigrants in Seattle food activism through urban agriculture. In C. Counihan, & V. Siniscalchi (Eds.), *Food Activism* (pp. 31–46). London: Bloomsbury Academic.
- Marks, L. A., Kalaitzandonakes, N., Wilkins, L., & Zakharaova, L. (2007). Mass media framing of biotechnology news. *Public Understanding of Science*, 16, 183–203.
- Marres, N. (2015). *Material Participation: Technology, the Environment and Everyday Publics*. Basingstoke: Palgrave Macmillan.
- Marres, N. (2017). *Digital Sociology*. Cambridge: Polity Press.
- Marres, N., Guggenheim, M., & Wilkie, A. (2018). Introduction: From Performance to Inventing the Social. In N. Marres, M. Guggenheim, & A. Wilkie (Eds.), *Inventing the Social* (pp. 17–37). Manchester: Mattering Press.
- Martin, D. G., Hanson, S., & Fontaine, D. (2007). What Counts as Activism?: The Role of Individuals in Creating Change. *Women’s Studies Quarterly*, 35(3/4), 78–94.
- McLennan, A., Ulijaszek, S., & Beguerisse-Diaz, M. (2018). Diabetes on Twitter: influence, activism and what we can learn from all the food jokes. In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 43–69). Abingdon: Routledge.
- Michael, M. (1998). Between citizen and consumer: multiplying the meanings of the “public understanding of science”. *Public Understanding of Science*, 7(4), 313–327.
- Mills, J., Reed, M., Skaalsveen, K., & Ingram, J. (2019). The use of Twitter for knowledge exchange on sustainable soil management. *Soil Use and Management*, 35, 195–203.
- Phillips, L. (2000). Risk, Reflexivity and Democracy: Mediating Expert Knowledge in the News. *Nordicom Review*, 21(2), 115–135.
- Pottinger, L. (2017). Planting the seeds of a quiet activism. *Area*, 49(2), 215–222.
- Price, C. (2018). *The online genetically modified food debate: Scientific expertise and alternative knowledges*. University of Warwick. Unpublished, PhD Thesis.
- Reed, M. (2020). Scientific citizens, smartphones and social media - reshaping the socio-spatial networks of participation: Insects, soil and food. *Moravian Geographical Reports*, 28(1), 61–67.
- Reed, M., & Keech, D. (2017). The “Hungry Gap”: Twitter, local press reporting and urban agriculture activism. *Renewable Agriculture and Food Systems*, 33(6), 558–568.
- Regan, Á., Marcu, A., Shan, L. C., Wall, P., Barnett, J., & McConnon, Á. (2015). Conceptualising responsibility in the aftermath of the horsemeat adulteration incident: an online study with Irish and UK consumers. *Health, Risk & Society*, 17(2), 149–167.
- Reichman, D. (2014). Information and democracy in the global coffee trade. In C. Counihan, & V. Siniscalchi (Eds.), *Food Activism* (pp. 159–173). London: Bloomsbury Academic.
- Rousseau, S. (2012). *Food Media*. London: Bloomsbury Academic.
- Schneider, T., Eli, K., Dolan, C., & Ulijaszek, S. (2018). Introduction: digital food activism - food transparency one byte/bite at a time? In T. Schneider, K. Eli, C. Dolan, & S. Ulijaszek (Eds.), *Digital Food Activism* (pp. 1–24). Abingdon: Routledge.
- Schneider, T., Eli, K., McLennan, A., Dolan, C., Lezaun, J., & Ulijaszek, S. (2019). Governance by campaign: the co-constitution of food issues, publics and expertise through new information and communication technologies. *Information, Communication & Society*, 22(2), 172–192.
- Shaw, A. (2002). “It just goes against the grain.” Public understandings of genetically modified (GM) food in the UK. *Public Understanding of Science*, 11(3), 273–291.

- Siniscalchi, V., & Counihan, C. (2014). Ethnography of Food Activism. In C. Counihan, & V. Siniscalchi (Eds.), *Food Activism* (pp. 3–12). London: Bloomsbury Academic.
- Stilgoe, J., Lock, S. J., & Wilsdon, J. (2014). Why should we promote public engagement with science? *Public Understanding of Science*, 23(1), 4–15.
- The Daily Mail. (2015a). Now 'GM-free' Domino's is selling Frankenfood Pizzas: Takeaway chain among number of big names using modified foods. In *The Daily Mail*. 21 March 2015 [Online]. Available at <http://www.dailymail.co.uk/news/article-3005088/Now-GM-free-Domino-s-selling-Frankenfood-Pizzas-Takeaway-chain-number-big-names-using-modified-foods.html> (Accessed 9 August 2015).
- The Daily Mail. (2015b). Call GM food something else to ease public fears, say MPs: Report says label is 'lightning rod' for fears of designer crops. In *The Daily Mail*. 26 February 2015 [Online]. Available at <http://www.dailymail.co.uk/news/article-2969566/Call-GM-food-ease-public-fears-say-MPs-Report-says-label-lightning-rod-fears-designer-crops.html> (Accessed 9 August 2015).
- The Guardian. (2015a). Could these piglets become Britain's first commercially viable GM animals?. In *The Guardian*. 23 June 2015 [Online]. Available at <https://www.theguardian.com/science/2015/jun/23/could-these-piglets-become-britains-first-commercially-viable-gm-animals> (Accessed 9 August 2015).
- The Guardian. (2015b). Pesticides in paradise: Hawaii's spike in birth defects puts focus on GM crops. In *The Guardian*. 23 August 2015 [Online]. Available at <https://www.theguardian.com/us-news/2015/aug/23/hawaii-birth-defects-pesticides-gmo> (Accessed 23 August 2015).
- The Guardian. (2015c). Science bodies urge Scottish government to rethink GM crops ban. In *The Guardian*. 18 August 2015 [Online]. Available at <https://www.theguardian.com/environment/2015/aug/18/science-bodies-urge-scottish-government-to-rethink-gm-crops-ban> (Accessed 18 August 2015).
- The Guardian. (2015d). GM crop vote was just the beginning of Europe's biotech battle. In *The Guardian*. 19 January 2015 [Online]. Available at <https://www.theguardian.com/environment/2015/jan/19/gm-crop-vote-was-just-the-beginning-of-europes-biotech-battle> (Accessed 9 August 2015).
- The Guardian. (2015e). Scotland to issue formal ban on genetically modified crops. In *The Guardian*. 9 August 2015 [Online]. Available at <https://www.theguardian.com/environment/2015/aug/09/scotland-to-issue-formal-ban-on-genetically-modified-crops> (Accessed 9 August 2015).
- Tufekci, Z., & Wilson, C. (2012). Social Media and the Decision to Participate in Political Protest: Observations From Tahrir Square. *Journal of Communication*, 62, 363–379.
- Tufte, T. (2017). *Communication and Social Change*. Cambridge: Polity Press.
- Turner, S. (2013). The blogosphere and its enemies: the case of oophorectomy. In A. T. T. Smith, & J. Holmwood (Eds.), *Sociologies of Moderation: Problems of democracy, expertise and the media* (pp. 160–179). Chichester: John Wiley & Sons Ltd.
- UK Parliament. (2018). Commons Select Committee: Membership – Science and Technology Committee. [Online]. Available at <https://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/membership/> (Accessed 7 August 2018).
- Wales, C., Harvey, M., & Warde, A. (2006). Recuperating from BSE: The shifting UK institutional basis for trust in food. *Appetite*, 47, 187–195.