FRC Food Brexit Policy Briefing

Will the British public accept chlorine-washed turkey for Christmas dinner, after Brexit?

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Summary

- The UK public currently eats chicken and turkey meat that complies with EU hygiene and other standards.
- The UK Government is talking with the USA about a trade deal that could mean that US food safety standards, which are weaker than EU standards, would apply in the UK after Brexit.
- If the UK makes a trade deal with the USA on US terms, US disinfectant-washed poultry could be on sale in the UK.
- This briefing reviews the science, the risks and the debates about the use of 'pathogen reduction treatments' (PRTs).
- US-approved PRTs are not just used on poultry but also fruit, vegetables and fish.
- UK consumers would be safer to keep EU standards, and not to accept US disinfectant-washed-but-still-dirty poultry. UK standards should be stricter, not weaker.
- UK public health, environmental, animal welfare and consumer bodies should argue against the sale of PRT-washed poultry in the UK and the extension of PRT use to foods important for health such as fruit and vegetables.
- EU trade negotiators and consumer and health bodies should be alert to the possibilities of a post-Brexit UK being a 'soft' route for sub-standard US meat into EU markets.

Recommendations

1. UK government should make an explicit and enduring commit to maintaining food safety and quality standards at least at current levels. If there are post-Brexit changes, standards should only rise, not fall.
2. Consumers should reject US disinfectant-washed-but-still-dirty poultry, and the use of PRTs on all other foods. There must not be a 'slippery slope' to accepting the use of chemical disinfectant on fish, fruit and vegetables.
3. UK public health, environmental, animal welfare and consumer organisations should collaborate to prevent the sale of poultry, fish, fruit and vegetables washed with chemical disinfectants in the UK.
4. UK government should ensure that, in the Brexit negotiations, UK food safety and quality standards will not fall below EU standards or be weakened in, or for, future trade deals.

Why chlorinated poultry is a Food Brexit issue: the USA and PRTs

The issue of the (un)acceptability of disinfectant-washed food emerged in the UK in late July 2017 phrased in terms of a debate about the 'chlorine-washed chicken' that the USA wants to export to the UK, post-Brexit. The debate erupted in large part in response to the publication of the report Food Brexit: time to get real: a Brexit Briefing.[1] This briefing looks more broadly at what the US authorities and poultry industry like to call 'pathogen reductions treatments' or PRTs of which chlorinated water is just one type.[2]

The disinfectants that are lawfully used to wash chicken and turkeys in the USA include solutions containing chlorine, such as chlorinated water and acidified sodium chlorite (also known as ASC), as well as peroxyacetic acid (also known as peracetic acid - a mixture of acetic acid and hydrogen peroxide), cetylpyridium chloride, lactic acid, and trisodium phosphate.[3]

A joint WHO and FAO working party explained in 2008 that globally:

> "[S]odium hypochlorite is the most widely used disinfectant, in particular in the production and processing of poultry meat, leafy greens, sprouts, hydroponics and seafood, whereas its use in red meat processing is less common. Acidified sodium chlorite solutions are commonly used as an alternative to sodium hypochlorite in specific poultry processing steps. The use of chlorine-containing compounds in the fish and fishery products industry is focused mainly on disinfection prior to distribution, and the use on edible portions of fish and shellfish is limited. Non-chlorine-based chemical alternatives included peroxyacetic acid in poultry production and organic acids in meat production."[4]

Why food standards are a trade issue

In early November, media interest grew about the potential for a post Brexit UK-USA Free Trade Agreement.[5, 6, 7] Politicians began to be interviewed and quoted, indicating how they viewed the prospect. For example, according to one article covering the possibility, US Commerce Secretary Wilbur Ross, Donald Trump's most senior business representative:

> "...warned [the UK] that any post-Brexit deal between London and Washington will hinge on Britain scrapping rules set by Brussels, including regulations governing imports of chlorinated chicken. Wilbur Ross [...] suggested European regulations governing the safety of imports such as chlorine-washed chicken ignored US scientific research. His comments underline the potential difficulties in Britain striking a post-Brexit free trade deal with the US."[8]

Wilbur Ross' suggestion that accepting chlorinated chicken in the UK will be condition for a UK-USA free trade deal after Brexit is worrying. His speech had included a recommendation that the UK should not let itself be 'bullied by the EU'. His implicit advice was rather that the UK should accept US conditions. Ross' claim that EU regulators are ignoring scientific evidence is seriously misleading, as this Briefing explains. One thing we can be sure of is that if, after Brexit, the UK accepts chlorine-washed poultry from the USA, UK producers will also demand the right to use that treatment, in the name of a 'level competitive playing field'. There is also the possibility that, if the use of chemicals disinfectants is allowed for poultry, the UK might slide further down a slippery slope and permit the use of such disinfectants on other foods such as fruit, vegetables and fish. The USA already does this. Thus, this matter of what level of standards are applied and who sets them will be a key issue for British consumers.

UK policy context

On the 8th December 2017 the UK and EU authorities announced an agreement, which represented sufficient progress to allow the negotiators to start discussing a possible post-Brexit UK-EU trade deal.[9] The text of that agreement, and its likely consequences, have been interpreted in a range of conflicting ways. Some have focussed on the last sentence of paragraph 49, which says:

"In the absence of agreed solutions, *the United Kingdom will maintain full alignment with those rules of the Internal Market and the Customs Union* which, now or in the future, support North-South cooperation, the all-island economy and the protection of the 1998 Agreement." (emphasis added).

Some commentators suggest it provides clear evidence that the UK government has eventually acknowledged that any economically viable Brexit must be 'soft' rather than 'hard'. Others, including committed and conspicuous Brexiteers, have said in effect, don't worry, this text does not commit the UK to anything specific, and everything about trade remains up for negotiation, and subsequently agreements can be re-negotiated.[10] Given the contested interpretations of the most recent agreement, it would be premature to assume that the UK will indefinitely and comprehensively comply with EU food safety rules.

There is no guarantee that the UK and EU will succeed in agreeing a trade deal, least of all one covering both goods and services. And even if there is an agreement on offer, it may not be deemed acceptable by, for example a majority of the Cabinet or the House of Commons. Many EU Member States and institutions are determined to ensure that the UK will be worse off, as an ex-member of the EU, than it would have been if the UK has remained in the EU. It can be assumed therefore that pressure will continue from the USA on the UK to accept chemically-disinfected poultry.

By implications, if the UK wants to trade with the EU, the UK might become a route for undermining EU higher standards. Is this what the UK and EU really want?

The arguments for and against the use of PRTs to reduce infectivity on poultry deserve proper scrutiny.

Who defines food safety and risks?

The US Food and Drug Administration (FDA) says washes containing compounds like peroxyacetic acid are safe.[11] They are used to diminish amounts of filth on the meat, especially faecal contamination (which in the USA is spelt 'fecal' and means 'excrement').[12] A representative of the European Consumer Organisation (BEUC[13]), Monique Goyens, has explained that:

> "For years, in the US, instead of preventing that chickens get infected with pathogens during all stages of rearing and slaughter, the poultry industry has resorted to chemicals to eliminate bacteria at the end of the meat production chain. In other words, chemical washes aim to make up for inadequate hygiene on farms and abattoirs."[14]

In practice, the use of disinfectant washes on US poultry does not eliminate the bacterial contamination. It is only reduced – a bit. An EU regulation, introduced in 2004, specified that, unless otherwise explicitly authorised, food business operators must not wash contamination from the surface of products of animal origin with any liquid other than clean potable water.[15] But, as the US Congressional Research Service has explained:

> "In 2002, the United States asked the EU to approve the use of four PRTs on poultry destined for export there. These included chlorine dioxide, acidified sodium chlorate,

> trisodium phosphate, and peroxyacids. Each is approved for use in poultry processing by both USDA [US Department of Agriculture] and the U.S. Food and Drug Administration (FDA)." [16]

At the conclusion of 289-page report published jointly by the World Health Organisation and UN Food and Agriculture Organisation in 2008, an expert panel that had been asked to provide an assessment comparing the benefits and risks of the use of chlorine-containing disinfectants in food production and food processing, acknowledged that:

> "The meeting identified important gaps in the available data. These data gaps constrained the scope of the risk–benefit assessments. Consequently, the meeting agreed on a number of recommendations for further scientific studies and the development of standardized practices. The meeting emphasized that disinfectant treatment of water used in food processing must not be used to mask poor hygienic practices."[17]

In other words the gaps in the available scientific knowledge were so great that they were unable to provide reliable judgements concerning the balance between the risks and benefits of applying chlorine-based disinfectant to foodstuffs. So while the USA might deem their use acceptable, they do not do so on the basis of sound science. US Commerce Secretary, Wilbur Ross, was just indulging in wishful thinking. The EU, by contrast, chose to exercise precaution.

Given that the group of 17 experts who produced the report included three from the US FDA, one from the USDA and one from the UK's Food Standards Agency, and that they all acknowledged that the available data were far too incomplete for robust assessments of the balance between benefits and risks to be completed, it is remarkable that the USDA and US FDA both endorse the authorisation of the extensive use of PRTs in the USA.

A critical perspective on the policies of the USDA and the FDA has been articulated by Paul Shapiro, writing on behalf of the Humane Society of the United States, who has explained that:

> "To understand why U.S. poultry companies would rather risk export markets than stop dipping birds in chlorine, it's helpful to understand how bad the fecal contamination is. A 2014 Consumer Reports exposé[18] revealed that virtually all - 97 percent - of chicken breasts in the United States harbor dangerous pathogens like *Salmonella* and *E. coli*, transmitted via feces, and clearly not fully eliminated by the chlorine…When producers bring a new flock of birds into a shed, standard practice is to leave the manure-laden litter from past flocks on the ground. So every couple months, new birds are living on top of prior generations' waste…Those animals end up in 'defeathering tanks', essentially vats of scalding-hot water, while fully conscious. As a first order of business in those tanks, the birds let loose all their waste. It's the same water that countless other birds will then be put through, spreading feces from bird to bird like a wildfire on a dry day… It's clear that the chlorine is simply an attempt to put lipstick on a pig — or decontaminant on a chicken."[19]

UK consumers currently benefit from EU standards that are higher than those in the USA

The position currently in the EU, and therefore in the UK, is that none of those treatments have been authorised. By contrast the USA permits numerous chemical PRTs for use on both carcasses and cut

meat, as well as for fish and horticultural products. The only chemical disinfectant that can lawfully be used on meat offered for sale in the EU is lactic acid, and its use is only permitted on beef.[20]

The US Congressional Research Service also explained in January 2017 that in April 2008 the European Food Safety Authority (EFSA) published a:

> "...scientific opinion which found that 'there are currently no published data to conclude in whatever way' that these substances, when applied on poultry carcasses, cause 'acquired reduced susceptibility' (a build-up in resistance to the PRTs), or cause resistance to therapeutic antimicrobialsd[1]. Around the same time, two other scientific committees under the auspices of the Health and Consumer Protection Directorate-General of the European Commission (EC) issued a joint opinion suggesting that there appeared to be low environmental risk associated with residues on carcasses, but that *there was not enough data for it to make a comprehensive assessment,* particularly with regard to post-processing environmental risk."[2] (emphasis added)

In the absence of sufficient data, those technological options have not been approved in the EU. As Monique Goyens, head of the Bureau of European Union of Consumers, has explained:

> "In contrast, the EU has chosen another strategy to fight meat-borne bacteria. The philosophy of the 'farm to fork' approach is essentially based on the wise proverb prevention is better than cure. The farm to fork approach requires a series of steps all along the production chain to ensure food sold to consumers ultimately is safe. In the case of poultry, hygiene stipulations at farm level include the use of dedicated clothing and footwear by farm workers to avoid bringing bacteria into poultry houses. This must be complemented with proper transportation conditions as well as hygienic slaughtering and processing practices. EFSA, the European Food Safety Authority, recognises that "*(the) public health benefits of controlling [zoonotic pathogens] in primary broiler production are expected to be greater than control later in the chain as the bacteria may also spread from farms to humans by other pathways than broiler meat".*"[21]

In other words, the EU's approach is to require the poultry trade to deliver carcasses and cuts of meat that are sufficiently clean that they do not require washing in disinfectant. Before Spain joined the EU in 1986 Spanish legislation required chicken carcasses to be washed in disinfectant, but that practice had to cease before Spain's accession.

In February 2014, however, the UK Food Standards Agency issued advice to UK households not to wash raw chicken carcasses or meat.[22] The FSA issued that advice because of the high levels of campylobacter contamination on chickens offered for sale in the UK.[23] The FSA argued that washing chicken in domestic and commercial settings risks dispersing dangerously infective material over food preparation equipment, not to mention the hands of the people handling the chicken. Those facts imply that higher standards of hygiene are required in poultry production in the UK and other EU countries that supply the UK with chickens, not that the UK should follow US policy of trying to rely on chemical disinfectants.

1 *citing 'Scientific Option of the Panel on Biological Hazards on a Request from DG SANCO on the assessment of the possible effect of the four antimicrobial treatment substances on the emergence of antimicrobial resistance', EFSA Journal (2008) 659, pp 1-26*

2 *citing 'Scientific Committee on Health and Environmental Risks and Scientific Committee on Emerging and Newly Identified Health Risks, scientific opinion on the environmental impact and effect on antimicrobial resistance of four substances used for the removal of microbial surface contamination of poultry carcasses', April 2008. http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_015.pdf [accessed 12 November 2017]*

For reasons that also remain unexplained, the Department for Food Environment and Rural Affairs (or DEFRA), which has responsibility for the UK's food labelling policies, does not require that all packaged chicken should be labelled with advice against washing. In practice only a modest minority of consumers know of the FSA's advice. But in this context the focus is on possible risks from chemical treatments of poultry that are used to reduce the risks of food poisoning, of the sort that campylobacter and other microbes can cause.

Safety concern 1: consumers and public health risks from PRT use

A report in 2008 on chlorine-washing of chicken prepared by the New Zealand Institute of Environmental Science & Research acknowledged that while:

> "Chlorine has a long history of use for the microbial disinfection of …water for food processing…in addition to its biocidal activity, chlorine is known to form disinfection by-products (DBPs) of public health concern during the chlorination process."[24]

In the context of a discussion of the possible risks that those by-products might cause, the report also acknowledged that:

> "Considering the importance of chlorinated disinfectants to the food industry and the relatively long history of use, *there is relatively little information available on the formation of potentially toxic chlorinated compounds due to the reaction of disinfectants with food components…*There is little information on the identity of chlorinated compounds formed from aqueous chlorine treatment of chicken. *Formation of semicarbazide, a chemical belonging to a family of chemicals (hydrazines) known to cause cancer in animals, has been demonstrated following exposure of chicken flesh to aqueous chlorine.* However, semicarbazide formation only occurred at chlorine concentrations well in excess of those used in the poultry industry. A recent assessment [by the Scientific Panel on Food Additives Flavourings Processing Aids and Materials in Contact with Food of the European Food Safety Authority] concluded that semicarbazide is a weak non-genotoxic carcinogen for which a threshold mechanism can be assumed…Likely human exposure is several orders of magnitude less than doses causing tumours in laboratory animals."[25] (Emphases added)

While the European Food Safety Authority's Scientific Panel on Food Additives Flavourings Processing Aids and Materials in Contact with Food was prepared to assume an exposure threshold for the carcinogenicity of semicarbazide, that assumption was a value judgement that favoured the food industry rather than the protection of public health; it was not a scientific judgement. The assumption that there might not be a threshold below which risks could arise would be no less scientific. The report from the EFSA Panel in effect portrayed the absence of evidence of risks, due to ignorance, as if it provided substantive empirical evidence of the absence of risks; but any such portrayal is an unscientific misrepresentation. It has not only been Wilbur Ross that has misrepresented the state of scientific knowledge.

In 2017 a US-based organisation called Physicians Committee for Responsible Medicine drew attention to the fact that:

> "The Food and Drug Administration recently found that 74 percent of bacterially tainted

> chicken products harbored germs that were resistant to one or more types of antibiotics. The report also noted that 30.3 million pounds of antibiotics were sold and used in livestock feed in 2011, a 2.1 percent increase from 2010…A 2013 study from the [US Washington DC-based] Center for Science in the Public Interest (CSPI) declared chicken as the most unsafe meat in terms of bacterial content. CSPI researchers examined 12 years of CDC data and determined that more reported foodborne illness outbreaks were linked to chicken than any other meat or poultry product."[26]

Moreover in November 2017 Sustain, the UK civil society alliance for better food and farming, reported that the sales of antibiotics to livestock farmers had risen by 27% in the USA since 2009,[27] whereas UK farmers had reported a 26% drop.[28]

It is therefore evident that, even though US poultry carcasses and meat are routinely washed with PRTs, those treatments are not sufficient to remove the high levels of bacterial contamination and that the bacteria that remain in chicken meat are too often resistant to antibiotics, as a consequence of the serious overuse of antibiotics in US livestock production. Both those facts constitute good reasons why the EU's policy of refusing to accept imports of poultry from the USA that have been treated with PRTs, is sound and protects public health. Moreover, as the Bureau of European Union of Consumers has argued, the manner in which poultry production is managed in the USA has not only provoked the evolution of antibiotic-resistant bacteria, it is also likely to provoke the development of disinfectant-resistant bacteria.[29]

Those facts also collectively refute US Secretary of Commerce Wilbur Ross' allegation that the EU ignores scientific evidence. Just because the US authorities choose to ignore or discount evidence of risks, and of crucial uncertainties and gaps in the available scientific knowledge, that is not a sufficient reason for the EU or the UK to follow suit. If anything, the EU's approach is more scientifically robust than that of the USA; turning blind eyes to uncertainties is hardly a scientific tactic.

Safety concern 2: occupational health risks in abattoirs and meat-cutting plants

The most commonly cited occupational risks in the USA from PRTs refer to adverse effects from peracetic acid. According to Marquand et al:

> "…peracetic acid is a strong oxidizing agent and a primary irritant. Exposure to peracetic acid can cause irritation to the skin, eyes and respiratory system and higher or long-term exposure can cause permanent lung damage. In addition, there have been cases of occupational asthma caused by peracetic acid.[30]

A USA-based organisation called Physicians Committee for Responsible Medicine issued a report in 2013 entitled The Five Worst Contaminants in Chicken Products, which reported that poultry industry employees and government inspectors working for the US Department of Agriculture: "… have…suffered from asthma, burns, rashes, irritated eyes, and sinus problems that they attribute to [PRT] chemical exposure."[31] That report also drew attention to the fact that:

> "Chlorine and peracetic acid are used to treat chicken at the processing plant where a federal poultry inspector died after coughing up blood and his lungs and kidneys failed."[32]

Conclusions

There are good scientific grounds for concluding that several of the 'pathogen reduction treatments' (PRTs) deemed acceptable in the USA have been shown to pose public health, occupational and consumer risks. As the 2008 joint WHO-FAO Expert meeting acknowledged, significant uncertainties remain concerning the likely consequences of their use.[33] Doubtless, in response, the US authorities would argue that the risks of not using them far exceed the risks of using them, but the more basic problem is that their poultry supply chain is very heavily contaminated, especially with faecal material containing bacteria that are responsible for outbreaks of food poisoning. The approach in the EU, by contrast, requires that poultry carcasses and meat should be clean enough that they do not require those chemical treatments.

Given that the FSA recommends that in the UK chicken carcasses and chicken meat should not be washed in domestic or commercial kitchens, there is a strong argument for saying that hygiene standards in chicken sheds, abattoirs and meat-cutting plants are not sufficiently high. UK standards should be higher, and high enough for it to be safe to wash chicken before cooking it. Moreover, given that the FSA has issued that advice, the Department for the Environment, Food and Rural Affairs (DEFRA), which has responsibility for food labelling, should be requiring all packaged chicken carcasses and meat that are offered for sale in the UK to be labelled with advice not to wash the contents, and to cook them thoroughly before they are eaten, as well as advice about how they should be stored and handled. DEFRA's failure to introduce such a labelling requirement has never been explained.

The response of the UK authorities, when and if the UK is no longer in the EU, to pressure from the US authorities to accept imports of US poultry, and other meats as well as fish, fruits and vegetables, treated with PRTs remains to be seen. But as the information provided in this briefing becomes more widely available, it is unlikely that British consumers will enthusiastically accept those imports. At the very least UK consumers are likely to demand clear labelling, to reveal that disinfectant washes have been applied, which will discourage supermarkets from stocking such products. Unless restaurant menus are also labelled, imported US poultry and other chemically-disinfected foods will end up being served in pubs, cafes and restaurants, if that is what the catering trade buys. We do not believe this confusion is in the interests of British consumers. It would not be 'taking back control'.

If the UK were to complete a post-Brexit free trade agreement with the USA which included food products, not merely would US producers be able to sell their products in the UK, but UK producers would demand the right to use the same technologies, invoking arguments for a 'level playing field'.

EU trade negotiators and consumer and health bodies should be alert to the possibilities of a post-Brexit UK being a 'soft' route for sub-standard US meat, fish, fruits and vegetables into EU markets. Our view is that US, UK and EU consumers all deserve even higher food safety standards. Public health should take priority over trade interests.

In summary, we recommend that:

- UK government should make an explicit and enduring commit to maintaining food safety and quality standards at least at current levels. If there are post-Brexit changes, standards should only rise, not fall.

- Consumers should reject US disinfectant-washed-but-still-dirty poultry, and the use of PRTs on all other foods. There must not be a 'slippery slope' to accepting the use of chemical disinfectant on fish, fruit and vegetables.

- UK public health, environmental, animal welfare and consumer organisations should collaborate to prevent the sale of poultry, fish, fruit and vegetables washed with chemical disinfectants in the UK.

- UK government should ensure that, in the Brexit negotiations, UK food safety and quality standards will not fall below EU standards or be weakened in, or for, future trade deals.

References

1 T Lang, E Millstone & T Marsden, A Food Brexit: time to get real, SPRU University of Sussex, 17 July 2017. https://www.sussex.ac.uk/webteam/gateway/file.php?name=foodbrexitreport-langmillstonemarsden-july2017pdf.pdf&site=25

2 US Congressional Research Service, U.S.-EU Poultry Dispute on the Use of Pathogen Reduction Treatments (PRTs) 5 January 2017. https://www.everycrsreport.com/files/20170105_R40199_96ceabd87fa5764d8ccb7375a3b7b765e54d840f.pdf [accessed 11 Nov 2017]

3 Kerry Kavanaugh, 'WSB-TV: Chicken Plant Workers Say Chemicals Sprayed on Carcasses Making Them Sick', April 24, 2014. http://www.wsbtv.com/news/chicken-plant-workers-say-chemicals-sprayed-carcas/137104697

4 Benefits and risks of the use of chlorine-containing disinfectants in food production and
food processing: report of a joint FAO/WHO expert meeting, Ann Arbor, Michigan, USA, 27–30 May 2008, available as http://www.fao.org/docrep/012/i1357e/i1357e.pdf [accessed 23 Nov 2017]

5 for example, Sara Gordon, ' Wilbur Ross outlines US terms for post-Brexit trade deal', Financial Times, November 6, 2017. https://www.ft.com/content/92ad2ee0-c309-11e7-a1d2-6786f39ef675

6 Richard Partington, 'US Eat chlorinated chicken or you goose is cooked, says trade secretary', The Guardian, 6 November 2017, p. 1

7 Matt Oliver, 'We will be your number one trading partner, top US official tells UK', Mail Online, 7 November 2017. http://www.dailymail.co.uk/news/article-5054687/Vital-UKs-Brexit-deal-U-S-interests-says-commerce-chief-Ross.html

8 Richard Partington, 'US Eat chlorinated chicken or you goose is cooked, says trade secretary', The Guardian, 7 November 2017, p. 1

9 HM Government and European Commission, Joint report from the negotiators of the European Union and the United Kingdom Government on progress during phase 1 of negotiations under Article 50 TEU on the United Kingdom's orderly withdrawal from the European Union, TF50 (2017) 19 – Commission to EU 27, Brussels, 8 December 2017 https://ec.europa.eu/commission/sites/beta-political/files/joint_report.pdf

10 Michael Gove, 'The British people will be in control if they dislike the Brexit deal', Daily Telegraph, 9 December 2017. http://www.telegraph.co.uk/news/2017/12/08/british-people-will-control-dislike-brexit-deal/

11 Kerry Kavanaugh, WSB-TV: Chicken Plant Workers Say Chemicals Sprayed on Carcasses Making Them Sick, April 24, 2014. https://www.whistleblower.org/multimedia/wsb-tv-chicken-plant-workers-say-chemicals-sprayed-carcasses-making-them-sick

12 The Physicians Committee for Responsible Medicine, Fecal Contamination in Retail Chicken Products, http://pcrm.org/health/reports/fecal-contamination-in-retail-chicken-products, accessed 6 Nov 2017

13 See http://www.beuc.eu/

14 Monique Goyens, 'What is wrong with chlorinated chicken', July 14, 2014. http://www.beuc.eu/blog/what-is-wrong-with-chlorinated-chicken/

15 EC Reg. No. 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for on the hygiene of foodstuffs. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:139:0055:0205:EN:PDF

16 US Congressional Research Service, U.S.-EU Poultry Dispute on the Use of Pathogen Reduction Treatments (PRTs) 5 January 2017. https://www.everycrsreport.com/files/20170105_R40199_96ceabd87fa5764d8ccb7375a3b7b765e54d840f.pdf [accessed 11 Nov 2017]

17 Benefits and risks of the use of chlorine-containing disinfectants in food production and
food processing: report of a joint FAO/WHO expert meeting, Ann Arbor, Michigan, USA, 27–30 May 2008, p XI. http://www.fao.org/docrep/012/i1357e/i1357e.pdf [accessed 23 Nov 2017]

18 Available at https://www.consumerreports.org/cro/magazine/2014/02/the-high-cost-of-cheap-chicken/index.html

19 Paul Shapiro, Got Chlorine? Your Chicken Might, The Humane Society of the United States, 18 July 2014. http://www.livescience.com/46864-chlorine-cleaned-factory-chickens.html; see also 'Safety and efficacy of peroxyacids for decontamination of poultry carcasses' http://www.efsa.europa.eu/en/efsajournal/pub/3599

20 Commission Regulation (EU) No 101/2013 of 4 February 2013 Concerning the use of lactic acid to reduce microbiological surface contamination on bovine carcases,

Official Journal of the European Union L 34/1-3, 5 February 2013

21 Monique Goyens, 'What is wrong with chlorinated chicken', July 14, 2014. http://www.beuc.eu/blog/what-is-wrong-with-chlorinated-chicken/]

22 See https://www.food.gov.uk/news-updates/campaigns/campylobacter/fsw-2014 and the leaflet as https://www.food.gov.uk/sites/default/files/multimedia/pdfs/publication/dont-wash-raw-chicken-leaflet.pdf [accessed 14 November 2017]

23 Campylobacter is a type of bacteria that contaminates some types of foods and causes many outbreaks of food poisoning. The World Health Organisation explains that: "Campylobacter is 1 of 4 key global causes of diarrhoeal diseases. It is considered to be the most common bacterial cause of human gastroenteritis in the world." http://who.int/mediacentre/factsheets/fs255/en/ [accessed 23 November 2017]

24 P Cressey et al, Chlorinated Compounds Formed During Chlorine Wash Of Chicken Meat , Aug 2008, , Christchurch NZ, Institute of Environmental Science & Research Limited, p. 1. http://www.foodsafety.govt.nz/elibrary/industry/chlorinated-compounds-formed-research-projects/FW0883_Chlorinated_compounds_in_chicken_meat.pdf [accessed 11 Nov2017]

25 Op cit p. 1, citing the Scientific Panel on Food Additives Flavourings Processing Aids and Materials in Contact with Food. 'Opinion of the Scientific Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from the Commission related to semicarbazide in food'. EFSA Journal; 219: 1-36

26 Physicians Committee for Responsible Medicine, The Five Worst Contaminants in Chicken Products' available at http://www.pcrm.org/health/reports/the-five-worst-contaminants-in-chicken-products, [accessed 30 Oct 2017]; citing Telesca J. 'A Closer Look at the FDA Antibiotic Retail Meat Report', Supermarket News. March 28, 2013 http://supermarketnews.com/blog/closer-look-fda-antibiotic-retail-meat-report; and Risky Meat: A CSPI Field Guide to Meat & Poultry Safety, Center for Science in the Public Interest, http://cspinet.org/foodsafety/riskymeat.html

27 See 2015 Summary Report on Antimicrobials Sold or Distributed for Use in Food-Producing Animals; US Food and Drug Administration Department of Health and Human Services, December 2016: available as https://www.fda.gov/downloads/ForIndustry/UserFees/AnimalDrugUserFeeActADUFA/UCM534243 .pdf, cited by Sustain at https://www.sustainweb.org/news/nov17_us_farms_use_twice_antibiotics_of_uk_farms/

28 Press release: Record low for sales of antibiotics for use in animals, from: Department for Environment, Food & Rural Affairs, Veterinary Medicines Directorate, and Department of Health. Published 27 October 2017: https://www.gov.uk/government/news/record-low-for-sales-of-antibiotics-for-use-in-animals cited at https://www.sustainweb.org/news/nov17_us_farms_use_twice_antibiotics_of_uk_farms/

29 S Poulter, http://www.dailymail.co.uk/news/article-2990014/EU-lift-ban-U-S-chickens-washed-controversial-disinfectant.html

30 E C Marquand et al. (2007). 'Asthma Caused by Peracetic Acid-Hydrogen Peroxide Mixture', Journal of Occupational Health, Vol 49 No 2, pp 155–158.

31 Physicians Committee for Responsible Medicine, The Five Worst Contaminants in Chicken Products, 2013. http://www.pcrm.org/health/reports/the-five-worst-contaminants-in-chicken-products

32 Op cit, citing K Kindy, 'At chicken plants, chemicals blamed for health ailments are poised to proliferate', The Washington Post. April 25, 2013. http://articles.washingtonpost.com/2013-04-25/politics/38803667_1_poultry-plants-amanda-hitt-chemicals; see also Kerry Kavanaugh, WSB-TV: Chicken Plant Workers Say Chemicals Sprayed on Carcasses Making Them Sick, April 24, 2014

33 Benefits and risks of the use of chlorine-containing disinfectants in food production and
food processing: report of a joint FAO/WHO expert meeting, Ann Arbor, Michigan, USA, 27–30 May 2008, p. XI. http://www.fao.org/docrep/012/i1357e/i1357e.pdf [accessed 23 Nov 2017]

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