



The Consumer Voice in Europe

Peroxyacetic acid rinses on poultry meat: the consumer perspective

BEUC Position Paper

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Summary

Foodborne pathogens are a significant public health problem. **Poultry**, in particular, is frequently incriminated in diseases caused by **food poisoning bacteria** *Salmonella* and *Campylobacter*. As these pathogens can spread to humans by handling, preparing or consuming contaminated poultry meat but also as a result of direct contact with infected live chickens, their **successful control requires an integrated approach “from the farm to the fork”** as is currently in place in the EU. Whilst it could be further improved, overall this approach has helped achieve a high level of food safety in the EU.

By contrast, **in the US**, interventions to control meat-borne pathogens largely take place at the abattoir level. **Wide use is being made of chemical decontamination treatments** such as chlorine or peroxyacids solutions at different steps in the slaughter line. Following an application from the US, the EU is set to consider whether to authorise peroxyacetic acid (PAA) solutions for use on poultry carcasses and meat.

EFSA, whose opinion was sought on the safety and efficacy of PAA, did not identify any major toxicity concerns but noted **uncertainties on the safety of HEDP, a component of PAA solutions**. Moreover, risk of antimicrobial resistance as a result of PAA use could not be fully excluded.

As for occupational health risks, they were not considered by EFSA, although PAA is a known skin, eye and lung irritant. **Evidence of PAA efficacy was equally not conclusive** in that it either mostly rested on effects on non-pathogenic bacteria and/or on low to medium strength of evidence studies.

BEUC is concerned that PAA washes will not deliver any “extra safety net”. Rather, we see the risk they might be seen as a **convenient substitute for good slaughter hygiene**. The availability of such treatment – be it of little efficacy – might lead slaughterhouse staff to be less vigilant on preventing carcass contamination to happen in the first place, hence putting consumers’ health at risk.

In our opinion, **efforts should focus on preventing and controlling contamination with food poisoning bacteria at the earliest possible stage** in the food chain (biosecurity measures, control of feed and drinking water quality, etc.) as it is expected to deliver the greatest public health benefits. If decontamination treatments are at all to be considered, their safety and efficacy shall be unequivocally established. Moreover, their use shall never substitute for good husbandry and hygiene practices on farm and at the abattoir.

It is also **vital to hear European consumers’ preference for meat that has not undergone any kind of chemical treatment**, meaning that the use of such treatments, if at all permitted, should be transparent for consumers through labelling. Finally, the EU decision on whether or not to allow PAA or any other meat treatment should be made in the best interest of food safety and consumer protection, and not under pressure from trade partners.

I. Introduction

Foodborne zoonotic illnesses are caused by consuming food or drinking water contaminated by disease-causing micro-organisms, for instance bacteria such as *Salmonella* or *Campylobacter*. They are a major global public health threat and, in the EU, they affect over 320,000 people each year. A variety of foods (e.g. dairy products, fruits and vegetables) can convey these diseases but meat and meat products are particularly at risk.

Indeed many of the pathogenic micro-organisms causing these diseases are commonly found in the intestines of healthy food-producing animals. To efficiently protect consumers, the EU has adopted an integrated approach to food safety “from the farm to the fork”, whereby preventive actions, good hygiene and controls must be applied throughout the food chain to minimise risks of contamination and ultimately ensure consumers can enjoy safe food. When it comes to meat, this translates as on-farm biosecurity measures, good husbandry practices, interventions at animal transport level as well as good slaughter hygiene.

In the EU, the ‘farm to fork’ approach aims to ensure meat safety at all production stages.

In the US, chemical decontamination of meat in the abattoir is the common practice.

Some of EU’s trade partners have opted for a different approach. In the US, for instance, there are no legal requirements for farm-level control measures that would help reduce *Salmonella* contamination in chickens before they arrive at slaughter facilities¹, whilst, at the abattoir level, the use of chemical decontamination treatments of meat is common practice. It was only very recently – and after an official US request – that EU legislation allowed the use of lactic acid to decontaminate beef carcasses², whilst only water³ had been previously accepted to remove surface contamination from products of animal origin, under certain conditions. Other treatments, including peroxyacids and chlorine for poultry, have not been approved in the EU to date due to insufficient evidence of their efficacy and/or due to a lack of conclusive evidence allowing to exclude the risk of antimicrobial resistance as a result of their use^{4,5}.

¹ The Pew Charitable Trusts. Weaknesses in FSIS’s Salmonella Regulation: How two recent outbreaks illustrate a failure to protect public health. December 2013.

² EU Regulation (EU) No 101/2013 concerning the use of lactic acid to reduce microbiological surface contamination on bovine carcasses.

³ See Art. 3(2) of Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin.

⁴ SCHER and SCENIHR (2008). Opinions on the “Environmental impact and effect on antimicrobial resistance of four substances used for the removal of microbial surface contamination of poultry carcasses”.

⁵ EFSA (2008). [Opinion](#) of the Scientific Panel on Biological Hazards on the Assessment of the possible effect of the four antimicrobial treatment substances on the emergence of antimicrobial resistance.

In May 2013, the US Department of Agriculture (USDA) re-submitted an authorisation request for the use of peroxyacetic acid (hereafter PAA), one of the most commonly used peroxyacids on poultry carcasses and meat. The EFSA Opinion⁶ assessing the safety and efficacy of PAA was released on 26 March 2014. Based on the advice from EFSA, EU risk managers are now set to decide whether or not to permit the use of PAA solutions as a decontamination treatment of poultry carcasses and meat.

BEUC firmly supports the EU's "farm to fork" approach. As a general stance, as long as good hygienic practices are complied with and Hazard Analysis and Critical Control Point (HACCP)⁷ systems are well managed by food business operators - as required by EU law - we believe there should be no need for additional treatments of meat. Rather, we are concerned such treatments may result in a lowering of EU hygiene standards as less scrupulous operators might see them as a convenient substitute for good husbandry and hygienic practices on the farm or in the slaughterhouse. Eventually, this may lead to a "race to the bottom".

If good hygiene practices are applied across the chain, end-of-pipe treatments are not needed.

As it comes to PAA, the EFSA Opinion does in our view deserve careful consideration to avoid jumping to hasty conclusions about its safety and efficacy. It is also vital that, if and when contemplating authorising PAA, EU policy makers take due account of European consumers' acceptance of chemical treatments of meat.

Safety and consumer protection should be the EU's top priority in the TTIP talks.

Finally, recent developments have exemplified the increasing prominence of trade aspects in food safety-related decisions (e.g. EU approval of lactic acid washes on beef carcasses as a "confidence building" move towards the US⁸; EU discussions on the authorisation of recycled hot water in slaughterhouses further to a request from Canada⁹). As the EU and the US are engaged into talks for a free trade agreement (TTIP), we look to EU authorities not to let their decision driven solely by trade considerations but to put food

safety and consumer protection first.

⁶ EFSA (2014). Scientific [Opinion](#) on the evaluation of the safety and efficacy of peroxyacetic acid solutions for reduction of pathogens on poultry carcasses and meat.

⁷ A food safety management system based on the principles of HACCP aims to enable hazards to be identified and controlled before they threaten the safety of food.

⁸ November 2012 [speech](#) by EU Trade Commissioner Karel De Gucht, p. 4.

⁹ Summary record of SCoFAH meeting of 17 June 2013: "*The Commission informed the Member States that the discussion on the use of recycled hot water in slaughterhouses could be reopened due to a strong political interest from certain third countries (Canada). The reopening of the discussion could have a very positive outcome in the commercial relationship with Canada, especially in the trade of meat and meat products from the EU*".

II. Q&As on PAA and other meat decontamination treatments

- **Is PAA safe for use on poultry in slaughterhouses?**

- ✓ *Food safety aspects*

Commercial solutions of PAA evaluated by EFSA typically consist of a mixture of peroxyacetic acid, peroxyoctanoic acid, hydrogen peroxide and HEDP¹⁰. Upon application to the poultry carcasses, whereas HEDP remains stable, other components rapidly break down to acetic acid, octanoic acid, water and oxygen.

According to EFSA, acetic acid, which is a natural component of vinegar, is not expected to raise any safety concern. EFSA also considers octanoic acid not to be of safety concern at the anticipated residual amounts but appears to essentially base its assessment on the 'GRAS' (Generally Recognised As Safe) status granted to this substance in the US. In the EU, octanoic acid was recently assessed and approved for use in food and feed area disinfectants¹¹; however, food disinfectants containing octanoic acid shall not be incorporated in materials and articles intended to come into contact with food pending the setting by the European Commission of specific limits on the migration of this substance into food (or pending proof that such limits are not necessary).

With respect to HEDP, EFSA did not have access to the original studies from which the toxicity data (i.e. HEDP intake levels at which no adverse effects are observed) provided by the applicant were derived. **With this important caveat and the resulting uncertainty**, EFSA said no safety concerns were identified in relation to HEDP. EFSA stressed however that these conclusions are only valid at the conditions of use for the PAA solutions described by the applicant. Moreover, EFSA recommended that a **method for measuring HEDP in poultry meat should be developed** to allow for a more complete risk assessment.

- ✓ *Antimicrobial resistance (AMR) risk*

EFSA was not provided with any studies directly investigating the potential for PAA use on poultry to make bacteria become less susceptible to biocides and/or resistant to therapeutic antimicrobials. Rather, the applicant sought approval of PAA based on its "*history of apparent safe use*"¹². On this basis, EFSA concludes that PAA use is unlikely to result in reduced susceptibility to biocides and/or resistance to therapeutic antimicrobials.

¹⁰1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) is a chemical added as a stabiliser to prevent the breakdown of peroxyacetic acid and hydrogen peroxide by chelating metal ions.

¹¹ Commission Implementing Regulation (EU) No 93/2014.

¹²See 2010 EFSA [Guidelines](#) on the submission of data for the evaluation of the safety and efficacy of substances for the removal of microbial surface contamination of foods of animal origin intended for human consumption.

In 2008, EFSA was already tasked to assess the AMR risk of the use of four chemical meat treatments, including peroxyacids¹³. At the time, EFSA had similarly concluded that despite a long history of use, no published data was available to conclude that the application of these treatments would lead to reduced susceptibility to biocides and/or AMR. However, EFSA had also clearly pointed to **uncertainties** originating from the facts that acquired reduced susceptibility to some biocides other than those in question was found followed improper use of biocides and that most of this evidence was derived from laboratory-based experiments.

EFSA says further lab studies are needed before AMR risk of PAA use can be fully ruled out.

In other words, **it cannot be concluded from the EFSA Opinion that there effectively is no resistance phenomenon** resulting from PAA use in poultry facilities but **rather that published data demonstrating resistance cannot be found**. As recommended by EFSA, **further research at laboratory level is warranted** before the emergence of reduced susceptibility to biocides and/or AMR following PAA use can be fully excluded.

✓ *Environmental risks*

Most components of PAA commercial solutions are readily degradable in a sewage water treatment system of the poultry plant according to EFSA. However, this is not the case of HEDP which can be emitted into the freshwater environment at **levels that cannot be considered safe a priori**. EFSA notes that the environmental risk of HEDP emission via poultry plant effluents must be assessed on a case-by-case basis after a site-specific assessment.

✓ *Occupational safety aspects*

Although not addressed by EFSA, the issue of occupational health and safety is one of importance for workers in poultry slaughterhouses. **Peroxyacids are known irritants**^{14,15} and can increase the risk of respiratory symptoms (e.g. asthma) in case of inhalation. The suspect death of a poultry inspector made the headlines in the US¹⁶ last year and raised questions about the health risks associated with the use of chemical decontamination treatments of meat such as PAA.

Poultry abattoir staff could run more risk of respiratory problems.

¹³EFSA (2008). [Assessment](#) of the possible effect of the four antimicrobial treatment substances on the emergence of antimicrobial resistance.

¹⁴Scientific Committee on Veterinary Measures relating to Public Health (2003). Opinion on the evaluation of antimicrobial treatments for poultry carcasses.

¹⁵Meat & Livestock Australia (2010). [Data sheet](#) on peroxyacids.

¹⁶At chicken plants, chemicals blamed for health ailments are poised to proliferate. [Article](#) published in The Washington Post on 25 April 2013.

- **Is PAA effective to reduce microbial contamination on poultry?**

PAA efficacy was evaluated by EFSA for different conditions of use reflecting the common practice in US plants, namely spray treatment of warm carcasses, dip treatment of warm carcasses or parts, use in chiller bath and dip treatment of chilled carcasses or parts.

Poultry samples treated with PAA were compared with water treated samples or untreated controls, focusing on *Campylobacter* spp., *Salmonella* spp. and *Escherichia coli*, which are the most relevant biological hazards associated with poultry meat. Peer-reviewed published papers as well as data from in-house trials were provided by the applicant to EFSA. Studies retained by EFSA for the assessment were weighed according to whether they were done in the laboratory, under pilot plant conditions or in a slaughterhouse (industrial scale), and whether they used inoculated or naturally-contaminated poultry samples.

Evidence of PAA efficacy on food-poisoning bacteria is equivocal.

Whilst several studies provided to EFSA compared PAA efficacy on clean versus dirty carcasses, only those results reporting on PAA effect on visibly clean poultry carcasses were considered in the assessment since EU law¹⁷ clearly provides that any substance approved shall by no means be seen as a substitute for good slaughter hygiene.

According to EFSA, dip treatment of warm carcasses with PAA **appeared to have an effect** in reducing counts of *E. coli* and coliforms (these bacteria, which are not pathogenic to humans, are used as an indicator of contamination with faecal material), but **few data were available for actual pathogens** (*Salmonella* and *Campylobacter*). Spraying of warm carcasses with PAA appeared to be less effective. When used on chilled carcasses, dip treatment with PAA seemed to have an effect in reducing both indicator organisms and pathogens but evidence of that effect was only available from **low or medium strength of evidence studies**. For chiller bath application, **little data was available** on reduction of pathogens. Figure 1 below attempts to summarise EFSA's conclusions on PAA efficacy.

The variable statistical quality of the studies was underlined by EFSA as well as the wide range of experimental designs that differed in relation to e.g. products, settings, method of application, PAA concentration applied, temperature of application, PAA exposure times, types of controls used, microorganisms studied, storage time after application, etc. Moreover and although such evidence is required by the 2010 EFSA Guidelines¹², **no clear evidence was provided that efficacy of PAA remains after storage** of treated carcasses: according to EFSA, further studies are needed to check whether contamination levels are not on the rise at the end of poultry meat products' shelf life. This is all the more crucial as concerns have been raised in the US that pathogen reduction treatments used in chicken slaughterhouses may be **masking the presence of Salmonella and other pathogens** by giving false results when chicken are tested as they move down the slaughter line¹⁸.

There is no clear evidence that efficacy of PAA remains after storage of treated carcasses.

¹⁷Art. 3(2) of Regulation (EC) No 853/2004 on hygiene rules for food of animal origin.

¹⁸USDA reviews whether bacteria-killing chemicals are masking salmonella. [Article](#) published in The Washington Post on 2 August 2013.

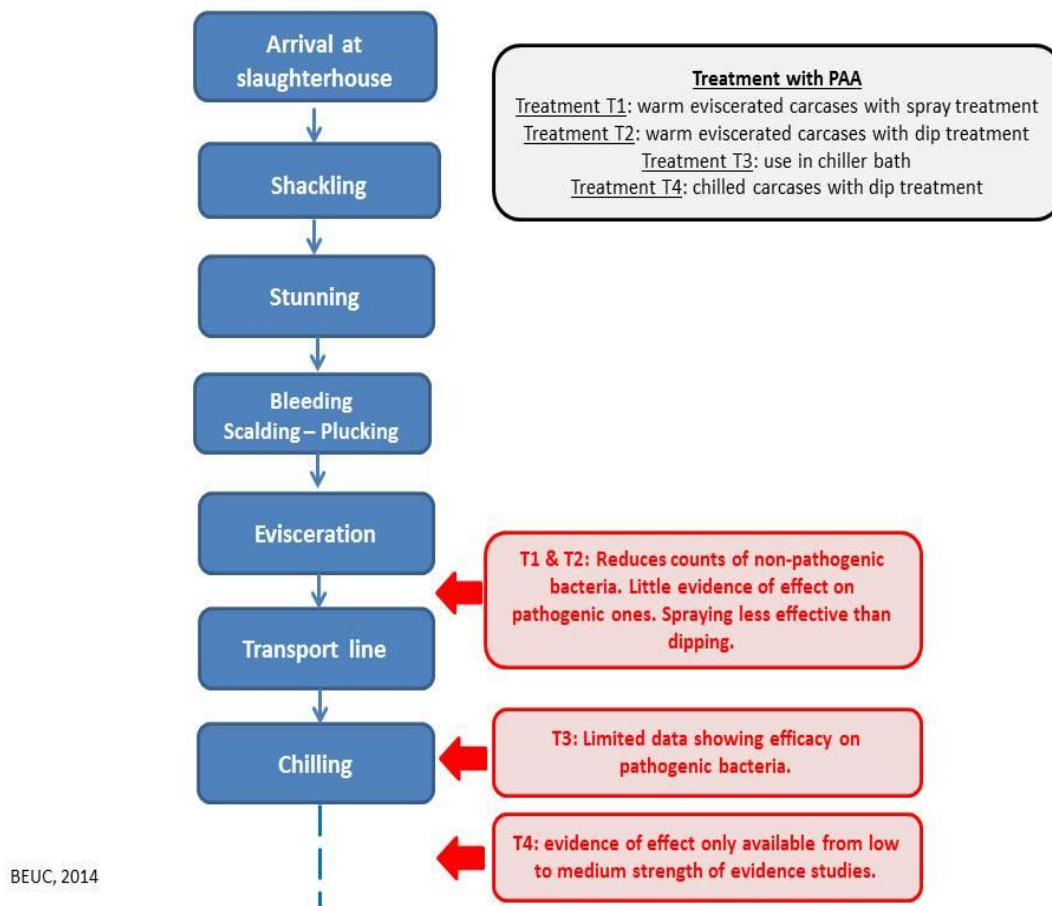


Figure 1: Efficacy of PAA treatment at different steps in the poultry slaughter line

- **How do current EU rules on meat hygiene and safety work?**

The EU’s approach to food hygiene and safety “**from the farm to the fork**” requires a series of steps to be taken all along the production chain to ensure that food sold to the consumer is ultimately safe. As it comes to poultry, interventions at the farm level (e.g. biosecurity measures, insects control, quality of chicken’s drinking water, etc.) must be complemented with proper transportation conditions and, finally, with hygienic slaughtering and processing practices (e.g. prevention of spillage of intestinal contents at evisceration, slaughtering of birds testing positive to certain pathogens at the end of the working day so equipment can be cleaned afterwards, etc.).

EFSA recognises public health value of early pathogens prevention over controls only later in the food chain.

The value of an approach that favours prevention over cure has been recognised by EFSA, who stated 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**”¹⁹.*

¹⁹EFSA (2011). BIOHAZ panel Scientific [Opinion](#) on Campylobacter in broiler meat production: control options and performance objectives and/or targets at different stages of the food chain.

As long as good hygiene measures are complied with and HACCP systems are well managed by poultry plants - as required by EU law – there should be no need for additional treatments of meat.

- **Could PAA help make chicken meat “safer”?**

PAA has been presented as an “extra safety net” to reduce further microbial contamination on poultry carcasses and meat. However, as we have seen above, evidence of PAA efficacy is equivocal: it either largely rests on effects on *non*-pathogenic bacteria and/or on low to medium strength of evidence studies. Moreover, having in mind the lack of convincing evidence demonstrating the efficacy of PAA treatment after storage of the meat, we do not believe that allowing PAA to be used on poultry carcasses and meat will deliver any “extra safety net”.

Rather, we see the risk that **PAA washes might be seen as a convenient substitute for good slaughter hygiene** and that the availability of such treatment – be it of little efficacy – might lead slaughterhouse staff to be less vigilant on preventing contamination of carcasses to happen in the first place, hence putting consumers’ health at risk. This is all the more worrisome as the **efficacy of any decontamination treatment (physical or chemical) critically depends on the initial microbial load of the carcasses** (as it can at best result in a relative reduction, not a complete elimination of pathogens).

EU law says chemical meat washes, if at all approved, shall by no means substitute for proper slaughter hygiene.

If, in spite of all these concerns and limitations, PAA approval were nevertheless to be contemplated in the EU, it would therefore be essential to ensure it can in no way be used to make up for “dirty”, contaminated carcasses, as required by EU law³. For so doing, the official veterinarian or meat inspector should be able to properly control that abattoirs are effectively meeting their duty – i.e. are working under hygienic conditions. This means eviscerated chicken carcasses **shall never be washed (be it with PAA solutions or even water) before post-mortem inspection** has taken place. Another important indicator of slaughter hygiene is the *Salmonella* microbiological criterion laid down under Regulation (EC) No 2073/2005²⁰. As such, poultry carcasses **shall also never be washed before sampling for *Salmonella* testing** has taken place (Regulation (EU) No 1086/2011²¹ provides such sampling shall take place at random after chilling).

Poor hygiene performers can learn from better performing poultry plants through best practice exchange.

But most importantly, what we need is to **enforce current EU requirements more strictly** as there is room for improvement. A recent report²² by the Dutch Institute for Public Health and the Environment found “*considerable differences between slaughterhouses*” in terms of hygiene performance. Whilst 89% of the chicken produced by best performing poultry plants would meet a limit of 1,000

²⁰ Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs.

²¹ Regulation (EU) No 1086/2011 amending Annex I to Commission Regulation (EC) No 2073/2005 as regards salmonella in fresh poultry meat.

²² RIVM (2014) Microbiological criteria as a decision tool for controlling *Campylobacter* in the broiler meat chain.

Campylobacter bacteria per gram, that figure would fall to 43% only for the poorest performing plants. What we need is to **identify best hygiene practices and make sure these are adopted by all.**

- **What is consumers' acceptance of poultry meat washed with decontamination treatments?**

European consumers' acceptance of chemical decontamination treatments of meat is **low**. Research by the consumer organisation Which?²³ showed that most consumers would not be willing to buy chicken meat that has been treated chemically. By contrast, people were more accepting of steam treatment. In another study²⁴ in Finland, nearly 90% of respondents were of the opinion that they would not choose chemically treated poultry meat. Likewise, in Denmark, a 2007 survey found chlorine washes on meat to be "**totally unacceptable**" to 85% of respondents²⁵. Moreover, PAA can affect poultry meat's sensory quality: broiler carcasses treated with PAA have been reported to have a rather unpleasant vinegar-like odour²⁶.

Research from the UK, Finland and Denmark match: most consumers have no appetite for chicken washed in chemicals.

European consumers' preference for meat that has not undergone any kind of chemical treatment should be **recognised and respected**. The EU legal framework for food additives can be a valuable source of inspiration in that respect. Indeed Article 6 of Regulation (EC) No 1333/2008 provides that a food additive may only be included in the EU list of approved food additives if: (a) it is safe at the proposed use level; (b) there is a "*reasonable technological need that cannot be achieved by other economically and technologically practicable means*"; and (c) "*its use does not mislead the consumer*".

Stricter enforcement of current rules should be favoured over techniques consumers reject.

Similar criteria should in our view guide any decision to authorise pathogens reduction treatments on meat. As long as a high level of meat safety can be achieved by means that are acceptable to consumers (notably through a stricter enforcement of current requirements)²⁷, those should be favoured over techniques that consumers widely disapprove of. At the very least, the use of any decontamination treatment – if at all permitted after proof of its safety and efficacy

has been made – should be transparent via labelling in order to allow for **informed consumer choice**.

²³Which? online survey of 1,406 UK adults (aged 16+) conducted between 10 Feb-14Feb 2011. 60% of respondents were unlikely to buy chicken that had been sprayed or washed with a mild acid such as lactic acid, and 67% were unlikely to buy chicken that had been treated with chlorine.

²⁴Heikkilä, J., Pouta, E., Forsman-Hugg, S., Mäkelä, J. (2011) Consumer risk perceptions of zoonotic, chemical and gm risks: the case of poultry purchase intentions in Finland. Paper prepared for presentation at the EAAC 2011 Congress Change and Uncertainty.

²⁵Sara Korzen, Peter Sandøe, Jesper Lassen (2011) "Don't wash my meat: public perceptions of decontamination in meat production", *British Food Journal*, Vol. 113 Iss: 5, pp.598 – 612.

²⁶Scientific Committee on Veterinary Measures relating to Public Health (2003). Opinion on the evaluation of antimicrobial treatments for poultry carcasses.

²⁷RIVM (2014) Microbiological criteria as a decision tool for controlling *Campylobacter* in the broiler meat chain.

III. BEUC recommendations on PAA and other meat washes

- ✓ The “**farm to fork**” **approach**, which has been key to achieving the high level of food safety we currently have in the EU, should be **preserved and favoured** over reliance on end-of-line decontamination treatments.
- ✓ Preventing and controlling contamination with pathogenic bacteria **at the earliest possible stage** in the food production chain is expected to deliver greater public health benefits than corrective action at the abattoir level.
- ✓ A **range of actions** (incl. on-farm biosecurity, control of feed and drinking water quality, stricter slaughter hygiene, etc.) that can contribute to further improving food safety should be **contemplated before considering decontamination treatments**.
- ✓ Only treatments for which **convincing evidence of safety and efficacy** is available should (possibly) be contemplated. In the case of peroxyacetic acid, we do not believe such conclusive evidence was provided to EFSA.
- ✓ If at all considered, decontamination treatments shall **never substitute for good husbandry and hygiene practices** on farm and at the abattoir. As such, their use could only be contemplated after final inspection of the poultry carcasses by or under the direct supervision of the official veterinarian in order to make sure it cannot serve to mask poor slaughter hygiene.
- ✓ European **consumers’ preference for meat that has not undergone any kind of chemical treatment** should be respected. Physical decontamination treatments may receive better acceptance than “chemical washes” provided they do not negatively affect the organoleptic quality of meat.
- ✓ If at all permitted, the use of chemical meat treatments should be transparent for consumers, meaning that proper **labelling should be in place** to let them know whether or not their meat has been treated.
- ✓ The decision on whether or not to allow PAA (or any other) washes on poultry should be made **in the best interest of food safety and consumer protection**, which should take priority over trade interests.