



**EFSA Opinion  
on Peroxyacetic acid (PAA)  
March 2014**

**DG Agri Civil Dialogue group on  
Poultry and eggs**

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## Introduction on Decontamination

### Legislation

Art 3(2) of Regulation (EC) No 853/2004: legal basis to approve /authorise the use of substances other than potable water to remove surface contamination from products of animal origin

- Before risk management decision, a risk analysis should be carried out taking into account the results of a risk assessment

#### Article 3

##### General obligations

1. Food business operators shall comply with the relevant provisions of Annexes II and III.
2. Food business operators shall not use any substance other than potable water — or, when Regulation (EC) No 852/2004 or this Regulation permits its use, clean water — to remove surface contamination from products of animal origin, unless use of the substance has been approved in accordance with the procedure referred to in Article 12(2). Food business operators shall also comply with any conditions for use that may be adopted under the same procedure. The use of an approved substance shall not affect the food business operator's duty to comply with the requirements of this Regulation.

## Past EFSA activities

- **Recycling hot water as a decontamination technique for meat carcasses (Sept. 2010)**
- **Lactic acid for the removal of microbial surface contamination of beef carcasses, cuts and trimmings (July 2011) [Reg. (EU) No 101/2013]**
- **Cecure® for the removal of microbial surface contamination of raw poultry products (Dec. 2011)**
- **Listex™ P100 for the removal of *Listeria monocytogenes* surface contamination of raw fish (March 2012)**

## The PAA mandate

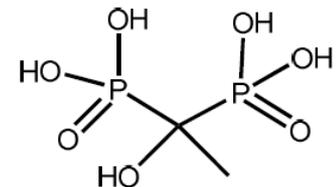
- **On 15 May 2013, the EC received an application dossier from USDA for the approval of peroxyacetic acid solution (PAA) for use during processing for the reduction of pathogens on poultry carcasses and meat**
- **Mandate was allocated to 2 panels - BIOHAZ (leading) and CEF Panel**

## The PAA mandate

EFSA was requested to evaluate the safety and efficacy of PAA intended to be used by FBOs during processing for the reduction of pathogens on poultry carcasses and meat, considering:

- the **toxicological safety** of the substance;
- the **efficacy**, i.e. does the use of the substance significantly reduce the level of contamination of pathogens on poultry carcasses and meat;
- the potential emergence of **reduced susceptibility to biocides and/or resistance to therapeutic antimicrobials** linked to the use of the substance;
- the risk related to the release of the processing plant effluents, linked to the use of the substance, into the **environment**

# PAA: The substance



- Active ingredient is peroxyacetic acid
- Produced by mixing acetic acid, hydrogen peroxide, (sometimes also octanoic acid, as surfactant) and HEDP (stabiliser)
- Composition PAA solution

**Table 1:** Composition by weight (%) of peroxyacid mixtures, as provided by the Applicant

Component	Formula 1	Formula 2	Formula 3
Acetic acid	40.6	45	35
Peroxyacetic acid	12.0	20	15
Hydrogen peroxide	6.2	6.0	10
Water	36.6	29	39
1-hydroxyethylidene-1,1-diphosphonic acid (HEDP)	0.8	0.1	< 1.0
Octanoic acid	3.2		
Peroxyoctanoic acid	1.4		

## The treatment

- **Spray treatment of warm carcasses**  
PAA concentration: 400-700 ppm  
Duration: < 10 sec
- **Short duration dip treatment of warm carcasses**  
PAA concentration : 2000 ppm  
Duration: 3 min

## *The treatment (cntd)*

- **Treatment of warm carcasses in chiller baths**

Application either during an entire chill or in one or more stages of multi-stage chiller baths

PAA concentration: 230 ppm

Duration: 1-2 h at lower concentrations.

- **Short duration dip treatment of chilled carcasses or parts**

PAA concentration: 2000 ppm

Duration: 3 min

## *Main Conclusions on Toxicity*

- There are no toxicity concerns with regard to residues of **peroxyacids** as these compounds are unstable and break down into acetic acid and water. Similarly there are no concerns in relation to residues of **acetic acid and octanoic acid**.
- There are no toxicity concerns for **HEDP** (dip treatment), referring to the margin of safety of 43103 as calculated from European intake scenario.

## Efficacy: Definition and objective

- **Efficacious when reduction**
  - of prevalence and/or numbers of pathogenic target microorganisms is statistically significant as compared to control (e.g. water)
  - has positive impact on reduction of human illness cases
- **Objective**
  - To reduce the incidence of foodborne illness by decreasing the numbers (and prevalence) of human pathogens on poultry carcasses or parts provided to consumers
  - When used, may also reduce the numbers of spoilage organisms and may increase the storage life of chilled poultry carcasses and parts

## *Conclusions on Efficacy*

- **Short duration dip treatment of chilled carcasses or parts**

consistent evidence for a relevant reduction (0.5-2 log-units) of indicator organisms and *Salmonella* and *Campylobacter* (low or medium SOE studies)

- **Treatment of warm carcasses in chiller baths**

consistent evidence for a relevant impact on *E. coli* (0.5-2 log-units). Less consistent effects on coliforms; few data on reduction of the number of *Salmonella* and *Campylobacter*  
evidence for stat. sign. *Salmonella* and *Campylobacter* prevalence reduction

## *Conclusions on reduced susceptibility/ resistance*

- **On the basis of the safe usage information provided by the applicant, the emergence of acquired reduced susceptibility to biocides and/or resistance to therapeutic antimicrobials following the use of PAA is considered unlikely.**

## *Conclusions related to environment*

- **Acetic acid, peroxyacetic acid, octanoic acid, peroxyoctanoic acid and hydrogen peroxide are effectively neutralized before discharge of wastewater => no concern about environmental toxicity.**
- **On the basis of a conservative preliminary guideline for surface water quality from a literature review, the emission of **HEDP** from a poultry plant including via a wastewater treatment system into the freshwater environment cannot be considered safe *a priori*.**

## *Conclusions related to Environment*

- **Site-specific considerations related to dilution factors and improved efficiency of wastewater treatment plants, can mitigate the possible environmental risk associated with the emission of HEDP from individual poultry plants using PAA solutions for decontamination treatment.**

## *Recommendations*

- **A method for the determination of HEDP residues on poultry carcasses, poultry meat and poultry meat products should be developed and validated.**
- **Further high SOE studies with pathogens should be undertaken, in particular with *Campylobacter*.**
- **Monitoring of the concentration of the decontaminating substance in the working PAA solution should be considered in HACCP plans.**

## *Recommendations*

- **Treated carcasses should be examined at the end of shelf life to ensure that the level of contamination remains low.**
- **Laboratory studies should be undertaken to confirm that reduced susceptibility to biocides and/or resistance to therapeutic antimicrobials following the use of PAA does not occur.**
- **Post-marketing surveillance for resistance in pathogenic and commensal bacteria should be considered in HACCP plans should PAA be applied.**

## *Summary*

- **No human toxicity concern using PAA solutions to reduce contamination from pathogens on poultry carcasses and meat**
- **Some treatment applications are more effective than others, for example dipping in baths is more effective than spraying**
- **It is unlikely that the use of PAA would lead to the emergence of resistance to antimicrobials and reduced susceptibility to biocides**
- **There are no concerns for environmental risks of all the components of the solution except for HEDP. Its release from a poultry plant into the environment is not always considered safe**

## Next steps

- A informative note to the new Commissioner on the ways to proceed
- In house ongoing reflection still at this stage
- A broader approach on Campylobacter

*Thank you for your information*

*Additional information on  
EFSA website: [www.efsa.europa.eu](http://www.efsa.europa.eu)*

*EFSA Opinion on PAA:  
<http://www.efsa.europa.eu/en/efsajournal/pub/3599.htm>*