



Each year the IAFP hosts a meeting which provides attendees with information on current and emerging food safety issues, the latest science, innovative solutions to new and recurring problems, and the opportunity to network with thousands of food safety professionals. Held in various locations throughout North America, this meeting has grown over the years to become the leading food safety conference worldwide.

*The 2021 Annual Meeting of the International Association for Food Protection (IAFP) took place in Phoenix, Arizona, USA from 18-21st July. International Food & Meat Topics takes a look at some of the current research being undertaken.*

## Livestock grazing of cover-cropped fields may enhance soil health benefits

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The objective of this study is to evaluate generic *E. coli* (gEc) and non-O157 Shiga toxin-producing *E. coli* (STEC) prevalence and persistence in sheep grazing winter cover-cropped fields. Two-year (2019-2020) randomised complete block design study was performed on USDA-NOP certified organic research field, with four replicates of three treatment types (winter cover-crop, grazed with sheep (WG) or tilled (WT), fallow (WF)).

Grazing was conducted once in 2019, and twice in 2020 before planting vegetables. Faeces were tested for foodborne pathogens before each grazing. Prevalence of gEc and STEC in soil samples were evaluated pre- and post-grazing (four samplings after the last grazing day (D-0)) each year.

Descriptive statistics and ANOVA were used to determine pathogen prevalence and compare gEc Most

Probable Number (MPN) in soil among treatments each sampling.

In 2019, gEc prevalence in WG (71.7% (43/60)) was higher than in WT (26.7% (16/60)) or WF (40% (24/60)). A significant difference in gEc MPN (log MPN/g) among treatments was observed until D-82 ( $P < 0.001$ ). In 2020, gEc prevalence was also higher in WG (62.5% (90/144)) than in WT (35.4% (51/144)) or WF (34.7% (50/144)), with a significant difference observed until D-46 ( $P = 0.05$ ).

STEC was detected once in WF in 2019 (0.5% (1/188)) and 2020 (0.2% (1/432)), and its prevalence in faeces pre-grazing was 30% (6/20) in 2019 and 23% (11/48) in 2020. These results will aid the sustainability of food systems through valuable science-based knowledge and tools to enhance food safety of produce in integrated crop-livestock systems. ■

## Salmonella and campylobacter in raw poultry products, leading to illnesses and recalls

Robert Ames and Garrett McCoy, Corbion, Kansas, USA.

This study aimed to determine reductions of *Salmonella enterica* or *Campylobacter* spp. following sequential or individual dip application of common antimicrobials.

Chicken breasts were trimmed to 5cm<sup>2</sup> surface area with even thickness and inoculated with a cocktail containing *Salmonella enterica* subsp. enteritidis (ATCC 13076 and 31194), typhimurium (ATCC 13311 and 14028), and heidelberg (ATCC 8326), or a cocktail containing *Campylobacter jejuni* (ATCC 33560) and *Campylobacter coli* (ATCC 43483) to achieve a starting population of ca. 5 log CFU/g.

Cells were permitted to attach for 30 minutes post-inoculation in a biosafety cabinet. Post-attachment, samples were dipped (30 second dip with agitation by forceps) in one of the following treatments: 5% buffered lactic acid (BLA; pH 3.5) alone, 200ppm lauric arginate ethyl ester (LAE) alone, BLA followed by LAE, or LAE followed by BLA (15

second each application). Samples were placed on a clean wire rack to dry in a biosafety cabinet for 10 minutes.

Samples were then transferred to sterile bags, diluted 1:1 in Dey-Engley neutralising buffer, and stomached (230rpm; 30 seconds). Dilutions were performed in Butterfield's buffer and plated on xylose-lysine-tergitol 4 agar (XLT-4; 35°C for 24 hours) or Campy-Cefex agar (41°C for 48 hours). Samples were enumerated and reductions compared to control.

For salmonella and campylobacter, application order of BLA and LAE was not significant ( $P > 0.05$ ); however, the co-application of antimicrobials resulted in lower ( $P < 0.05$ ) counts than untreated control (average 1.3 and 2.3 log CFU/g reduction compared to control in salmonella and campylobacter, respectively).

Application sequence of two common antimicrobials may not impact destruction of salmonella and campylobacter. ■

## Antimicrobial interventions to control salmonella in raw poultry carcasses

Sarah McMillan and Lesley Good, United States Department of Agriculture, Food Safety and Inspection Service.

FSIS evaluated the presence of salmonella in poultry carcass samples (35,590) collected between 2016-2019 as part of FSIS HACCP verification sampling programmes.

Data show establishments increased the use and changed the type of chemical interventions on poultry carcasses when FSIS implemented the use of a neutralising buffered peptone water (nBPW) in July 2016 as sample transport media. As of 2019, 79% (6675/8431) of raw poultry samples originated from establishments that use chemical interventions to control salmonella, compared to 67% (3868/5755) of samples in 2016. In response to the nBPW implementation and FSIS posting of establishment categories, establishments changed the type of antimicrobial intervention used.

Increased peroxyacetic acid (PAA) application in 2019 was noted (87%; 7602/8762) compared to 2016 (64%; 5190/8074) and

decreased use of cetylpyridinium chloride (CPC; 25% in 2016 and 9% by 2019). In the three years following implementation of nBPW, percent positive salmonella samples increased from 1.8% to 4.3% (310/7292) at establishments using PAA and from 1.5% (32/2081) to 8.8% (63/716) at establishments using CPC. Overall, salmonella percent positive for poultry carcasses did not change significantly from 2016 to 2019.

These data support the hypothesis that nBPW is effective in preventing carryover effect for specific types of chemical antimicrobial interventions. These data also suggest that FSIS-collected sampling results provide an important tool to evaluate the effectiveness of interventions and assess continued intervention use. These results can help improve food safety measures by guiding establishments to consider chemical interventions to control pathogens. ■



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31st July - 3rd August,  
Pittsburgh, Pennsylvania, USA.  
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