



Guidance Document

Campylobacter Troubleshooting Guidance

9 June 2016

Title

Guidance Document: Campylobacter Troubleshooting Guidance

About this document

This guidance document is issued by the Animal Products Team, Regulation & Assurance Branch of the Ministry for Primary Industries.

Related Requirements

- (1) This document should be read in conjunction with the current edition of:
- a) Animal Products (National Microbiological Database Specifications) Notice; and
 - b) Animal Products (Specifications for Products Intended for Human Consumption) Notice.

Document history

Previous Version Date	Current Version Date	Section Changed	Change(s) Description
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1 Purpose

- (1) This *Campylobacter* Troubleshooting Guidance (the guidance document) is intended to provide a framework to assist a poultry primary processing premises review current processing procedures and operation of specific control measures for *Campylobacter*. The guidance may be applied by either a standard throughput or very low throughput operator unless otherwise stated:
 - at start-up of a new or significantly amended poultry processing operation that is subject to National Microbiological Database testing requirements; or
 - in response to any first non-compliant window (Enumeration Failure or Detection Failure) against the *Campylobacter* performance target; or
 - for a standard throughput premises in the event that the prevalence performance target is exceeded to inform the written initial report and the implementation plan that is submitted to the MPI verifier.
- (2) The guidance document can be used where processing practices have changed or have differed, or where further investigation could result in improvements. It is intended to assist the operator to investigate and review the processing practices and identify actions that can improve any process step or specific control measures for *Campylobacter*. The possible investigation and resulting actions to control *Campylobacter* at any particular point are not limited to those outlined in this document.

2 Background

- (1) The guidance document is intended to assist poultry operators to identify control measures for *Campylobacter* during primary processing of chickens. For example, in the event of exceeding the *Campylobacter* Performance Target or the Prevalence Performance Target or for new primary poultry processors specified in the Animal Products (National Microbiological Database Specifications) Notices. It has been developed in consultation with the Poultry Industry of New Zealand (PIANZ) to support the implementation of the Prevalence Performance Target introduced into the National Microbiological Database (NMD) poultry programme.
- (2) The guidance document is divided into two key areas the:
 - a) first provides a framework that a primary processor of poultry can use to review production and processing procedures and the operation of control measures specific for *Campylobacter spp.* This is not an exhaustive list but is intended to provide assistance to the operator.
 - b) second area addresses those process steps that the poultry industry has identified as being the key process steps to review first in the event of breaching either the:
 - i) component of the *Campylobacter* Performance Target (Enumeration Failure or Detection Failure); or
 - ii) Prevalence Performance Target.

3 Review of production and processing procedures

- (1) The following table provides a series of prompts and questions to assist the operator to review the production and processing procedures and the operation of control measures specific for *Campylobacter* spp.

No.	Process step
1	Poultry supply: - Has there been an increase in the number of free-range and/or organic flocks? - Are the birds dirtier than normal on receipt? - If there is an increase in the percentage of chickens that are first cut positives: - take into account the season and recent weather; and - compare the results with those from the corresponding period from the previous 2 years to determine whether similar results have occurred previously.
2	Feed withdrawal: - Feed withdrawal practices should be adequately investigated e.g. has the company feed withdrawal times been verified? - Consider whether the intestines were ribbon-like when examined after evisceration. - Was there any feed present in the crop? - Investigate environmental management practices that impact on feed withdrawal e.g. water / light and are company procedures being followed? - What is the steady state feeding prior to slaughter? - Are any non-conformances identified with the feeding regime followed up with the farming division/growers?
3	Catching: Consider: - Whether the scheduling of the catching of birds between different farms and sheds enables the sheds with first cut birds to be caught before other sheds with older birds (second and later cuts)? - How biosecurity is managed when catchers operate at different farms each day? - Whether the equipment, including personal equipment, going into sheds is clean? - Investigating biosecurity routines on farm including personal hygiene (i.e. personnel and equipment including of catchers).
4	Transport: Consider the: - Cleanliness of crates and modules - Dryness of crates and modules - Cleanliness of truck beds.
5	Stress management of birds during: Consider: - Lairage (including temperature control) - Hanging (including dim lighting, gentle handling) - Slaughter (including proper stunning).
6	Kill line: - Is the line speed appropriate for the size / weight of birds? Consider the weight range of the live birds and the line speed. - Is the line running at a speed within the design capacity of the equipment? - Are the weights within the design range of the equipment? - Do the birds finish bleeding out before reaching the scald tank?
7	Scalding: - Are the scalding tanks are emptied of water completely daily? - Does the water in the scalding tank move by counter flow to the direction of the birds and overflow? - Is the organic material in water is minimized by the water replacement rate? - Scald temperature is: _____ °C - Scald time is: _____ seconds

No.	Process step
	Has an additional antimicrobial intervention (e.g. high pH) been considered?
8	Bird washing (at every stage): - Are the washers achieving full coverage of birds and appropriate volume of water? - Are there washers located at all relevant points along the chain to address potential contamination?
9	Plucking set up: - Investigate plucker efficiency (birds should not be either excessively plucked or have feathers remaining) - Consider the type of plucker and whether it is being operated according to the manufacturer's instructions or limit cross contamination - Consider whether the plucker fingers are damaged (micro cracks) or worn due to age and are working effectively.
10	Post-pluck bird rinse(s): - Full coverage - Sufficient pressure - Antimicrobial type (if any) _____ - Antimicrobial concentration (if any) _____
11	Plucker equipment rinse (during operation): - Does the rinse provide full coverage of the equipment? - Does the water operate under sufficient pressure? - Antimicrobial type (if any) _____ - Antimicrobial concentration (if any) _____ - Is the rinse sufficient to avoid buildup of gunge?
12	Manual processing is hygienic (may be multiple locations to consider): - Are hand rinse/wash stations close to all manual handling points? - Is the frequency of hand rinsing / washing acceptable? - Are knife rinsing / washing / sanitising stations close to manual handling points? - Is the frequency of knife rinsing / washing / sanitising acceptable?
13	Evisceration equipment set up: - Is each piece of equipment set up to the manufacturer's operating specifications at all times? - Is the equipment adjusted appropriate to the bird size? - How old is the equipment? _____ Consider whether the equipment is damaged or worn and is not working effectively - Is there a servicing and maintenance programme for the evisceration equipment? - When was equipment last serviced / maintained? _____ - Is the equipment capable of operating to the required standard? - Has the advice of an independent equipment specialist been sought and if so, have all recommendations been followed?
14	Vent cut: - Is the vent drill and opener operating correctly? - Has the vent opener been set up in line the manufacturer's instructions? - Is the knife breaking guts? - Breakage of guts after vent cut: _____ % (Is there an increase of gut breakage from the norm?) - Is there a maintenance schedule? Is this aligned with the manufacturer's guidance for the frequency of maintenance and servicing?
15	Evisceration (including manual): - Are the guts undamaged and removed cleanly from the birds? - Investigate gut breakage to assess equipment performance? - Is the proportion of missed or burst gut packs exceeding the norm?
16	Post evisceration bird rinse(s) after each flock: - Is there full coverage of each carcass? - Is the water at a sufficient pressure? - Antimicrobial type (if any) _____

No.	Process step
	Antimicrobial concentration (if any) _____
17	Evisceration equipment rinse(s) on each flock: - Is there full coverage of the evisceration equipment? - Is the wash of sufficient pressure? - Antimicrobial type (if any) _____ - Antimicrobial concentration (if any) _____
18	Gut removal: - Effectiveness - Hygienic handling - Monitor and investigate any incomplete / faecal contamination when this is above the norm?
19	Post mortem examination: Ensure that the levels of contamination, or damage to the viscera, are not above the industry norm and investigate if not acceptable: - Faecal contamination: _____ % - Damage to the viscera _____ % - Other issues: _____
20	Extremities: Where head and / or feet are left on ensure that these are rinsed to the extent practicable.
21	Inside-outside wash: - Does the inside-outside wash achieve a full coverage of the carcass? - Is the wash at a sufficient pressure? - Is any antimicrobial added to the inside-outside wash? - What concentration of antimicrobial (if any) is applied _____
22	Pre-immersion chill with addition of antimicrobial (wash/spray with the application of an antimicrobial): - Contact time: _____ - pH: _____ - Antimicrobial type (if any) _____ - Antimicrobial concentration (if any) _____
23	Immersion chill (NB: If using air chill refer to line 25): - Check that the immersion chillers are not overloaded - Check that the water is flowing counter to the direction of the birds - Water volume per bird is at least to the Processing of Poultry Operational Code, approx. 2L per bird requirement: _____ - Have the measuring equipment for pH, water temperature and antimicrobial concentration been maintained and calibrated according to the manufacturer's instructions? - Retention time and water replacement rate has been investigated and is appropriate and effective: _____ - Antimicrobial type (if any) _____ - Is the pH monitored and appropriate for maximum effectiveness of antimicrobial: _____ - Confirm that the antimicrobial concentration is monitored and within the correct parameters (if any) _____ - Is the anti-microbial concentration activity uniformly distributed throughout the tank? - Are sufficient checks been done to provide good process assurance? - Is the antimicrobial dosing system working as intended? - Are the birds sufficiently agitated in the tank to ensure that they are well dispersed and have adequate exposure to the chilled water and antimicrobial (where used)? - Temperature of birds at exit: _____ °C - How often are checks done _____ - Is the ratio of birds to water known and in line with the manufacturer's recommendations? Check that the immersion chiller is not overloaded

No.	Process step
	- Where the active ingredient is chlorine, the residual chlorine should be in free available form. - What is the retention time of the birds in the immersion chiller? Can this be increased?
24	Post-chill antimicrobial: - Contact time: _____ - pH: _____ - Antimicrobial type (if any) _____ - Antimicrobial concentration (if any) _____
25	Air chilling - Are the air chillers operating according to the manufacturer's instructions? - Has any measuring equipment been maintained and calibrated according to the manufacturer's instructions? - What is the temperature of the birds on exit?
26	Process capability: - Have any additional samples been taken to establish process capability and effectiveness of control measures along the process? - Have these results been analysed and actions implemented? What has occurred – results from this implementation of these actions – have these been incorporated into the RMP / HACCP?
27	Changes: - Have those results that have fallen outside the limits of the <i>Campylobacter</i> performance target (CPT) and Performance Prevalence Target (PPT) been investigated and followed-up? For example, investigate whether failed results tend to occur at the same time of day, on birds from certain growers, on a particular processing line, etc. If so what? - When? _____ - Has anything changed since the last period of good performance (e.g. supervision, operators, equipment, speed of processing, volumes of water, concentration or supplier of chemicals)? - It is strongly recommended that each premises conducts a longitudinal study incorporating each major processing step (e.g. pre-scald, post scald, post pluck, post eviseration, post cropper, pre spin chill, post spin chill, after post chill intervention). This study provides a benchmark to use at different times of the year to understand the loading of <i>Campylobacter</i> entering the plant and the impact of processing interventions through the process. This information may provide some insight at times of CPT and/or PPT non-compliance.

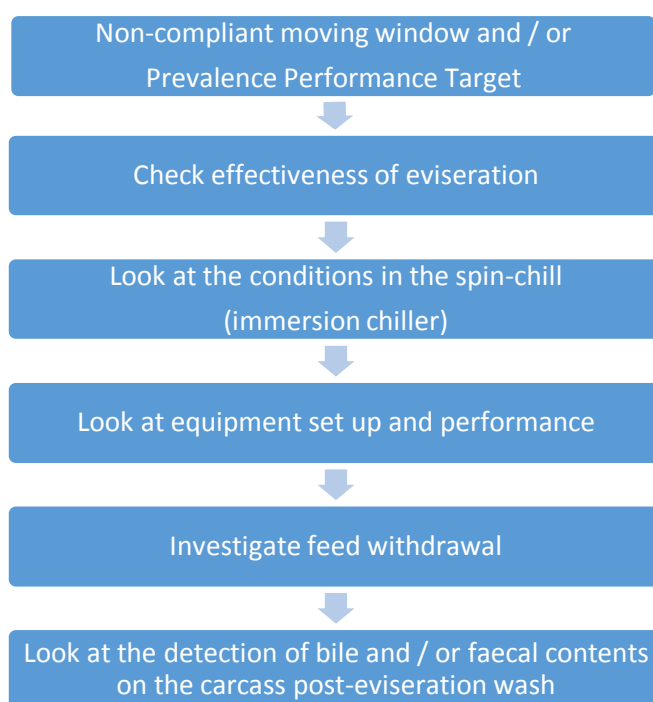
28	Other:
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4 Responding when the *Campylobacter* limits in the NMD are exceeded

4.1 General actions

- (1) Initial actions to consider in the event of a non-compliance with the National Microbiological Database poultry programme *Campylobacter* Targets (*Campylobacter* Performance Target and/or Prevalence Performance Target) (Figure 1).

Figure 1: Initial actions in the event that the NMD *Campylobacter* limits are exceeded



4.2 Specific Actions

- (1) Consider more specific targeted actions in the event that either the *Campylobacter* Performance Target (Enumeration Failure and Detection Failure) and/or Prevalence Performance Target is exceeded.

4.2.1 Enumeration Failure

- (1) Be on alert for an enumeration failure. This occurs where there is a non-compliant moving window due to the exceedance of the Enumeration Limit. The enumeration limit is defined as when the *Campylobacter* colony count is great than $\log_{10}$ 3.78 cfu/whole carcass.
- (2) Figure 2 provides actions that could be considered when responding to an enumeration failure.

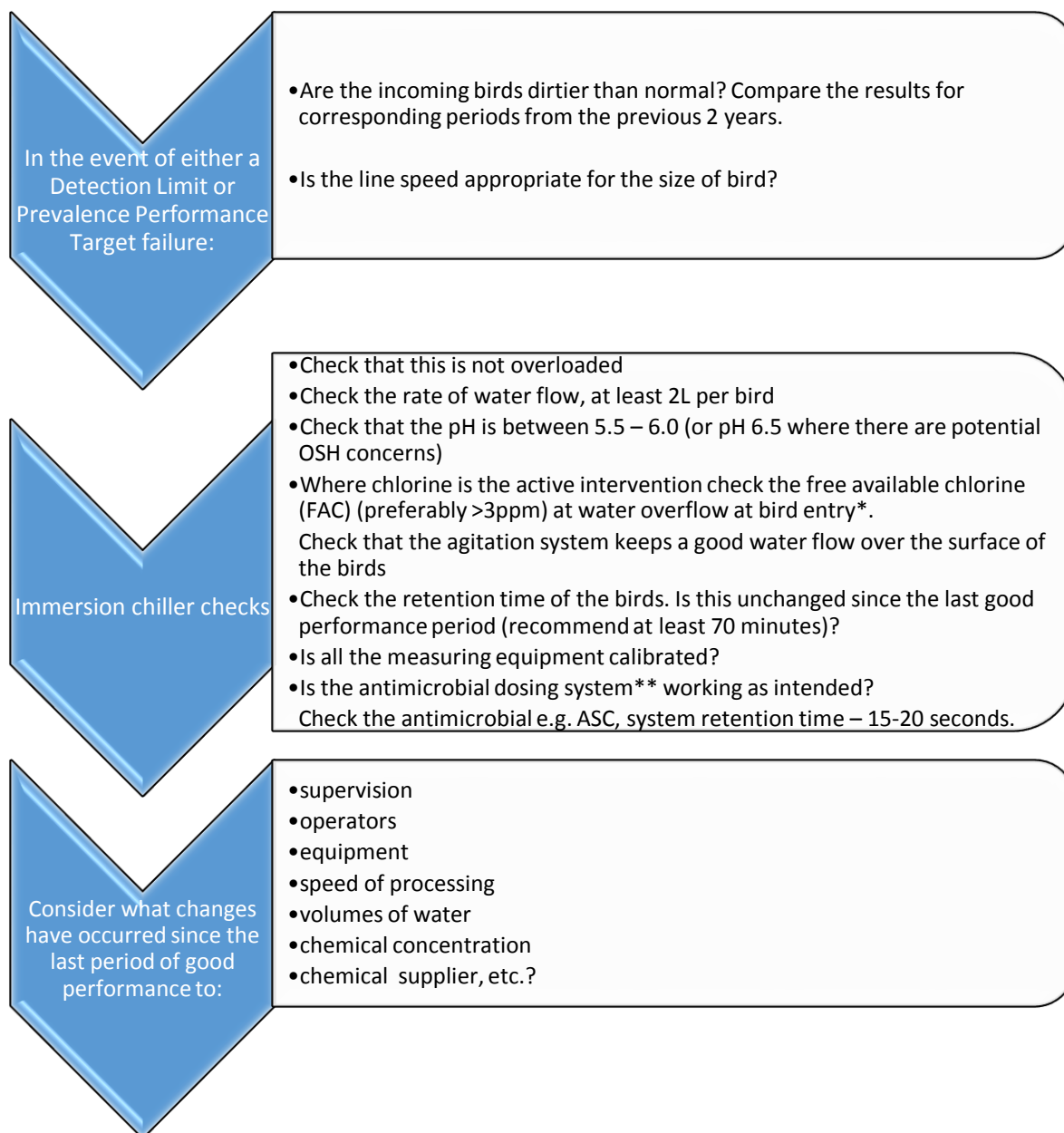
Figure 2: Actions to consider at specific process steps in the event that an enumeration failure occurs

Process step	Specific actions to consider when responding to an enumeration failure							
Vent drill and opener	1	Investigate whether the equipment is operating correctly	Note:	The number of broken guts can help to indicate whether the problem is severe				
Vent opener and evisceration equipment	1	Is the equipment set according to the manufacturer's requirements?	2	Is the cropper working effectively?	3	Is the maintenance and servicing in line or more frequent than the manufacturers guidance?	4	Is the eviscerator set up and operating correctly? Does the number of missed or burst gut packs exceed the norm?

4.2.2 Detection Failure or Prevalence Performance Target

- (1) Be on alert for a detection failure. This occurs when there is a non-compliant moving window due to the exceedance of the detection limit. The detection limit is defined as a *Campylobacter* colony count > log₁₀ 2.30 cfu/carcass. The performance prevalence target applies at the close of a quarter to operators of a standard throughput premises that processes broiler chickens if *Campylobacter* is detected in more than 30% of samples from broiler chickens.
- (2) Figure 3 provides examples of the process steps and questions to address following a detection failure or exceeding the prevalence performance target.

Figure 3: Processing steps to review in the event of failing to meet the detection limit of prevalence performance target



*Consider adding more chlorine to bring the concentration at the water overflow to 5ppm

**Where acidified sodium chlorite (ASC) is used. Check both the pH 2.5 ± 0.05 and the ASC concentration in the tank. Consider increasing the concentration of ASC to reduce levels of *Campylobacter* detected. For example, increase to 800 ppm in tank (c. 900 ppm at generator).