Canadian Grain Commission | Commission canadienne des grains

Implementing a Critical Control Point into a HACCP Plan

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PURPOSE

The Canadian Grain Commission (CGC) HACCP-based programs, CIPRS+ HACCP and CGC HACCP require that grain companies develop and implement a food safety system that includes prerequisite programs and a HACCP plan based on a generic HACCP plan developed and reviewed by the CGC and its Technical Expert Advisory Committee (TEAC). The generic HACCP plan does not include critical control points. The generic plan was designed to include the inputs and processes most common to the grain industry and the hazards present in many grain handling facilities are controlled through the good operating practices (GOPs) based on the CGC's prerequisite program requirements.

Some grain companies may find that certain process steps unique to their facilities are essential to preventing, reducing or eliminating an identified food safety hazard. These process steps would be identified as critical control points (CCPs). Companies that identify CCPs in their HACCP plans must properly document the CCP and determine critical limits for the CCP that are measurable, specific and are supported by scientific data. Once critical limits are established, procedures are required for monitoring, deviation and verification activities.

This guidance document is intended to be used to assist company HACCP teams in determining whether their system contains controls that are essential in reducing, preventing or eliminating hazards to an acceptable level. If a company determines that a CCP does indeed exist, this guidance document will provide information on how to implement it into the HACCP plan. Together, with the generic HACCP plan developed by the CGC, individual companies can use these guidance tools to develop a HACCP plan that is compliant with CGC HACCP and CIPRS+ HACCP.

1.0 INTRODUCTION

According to Codex Alimentarius, determining if there are critical control points is the second principle of the development of a HACCP-based food safety system. **A critical control point (CCP) is the process step where a control can be applied and is essential to prevent, reduce or eliminate a food safety hazard to an acceptable level.** Use and location of CCPs is specific to each facility, depending on the plant layout, equipment, and the type of processing conducted. Because of the differences between facilities, a site-specific hazard analysis and an assessment of control measures, such as prerequisite programs, must occur before determining if CCPs are present or are required.

When you conduct your hazard analysis you may find that the hazards associated with your product or processes are controlled through prerequisite programs or by processes further up the supply chain, and a CCP is not required. HACCP plans are not required to have CCPs, and often grain handling facilities do not identify a CCP. When CCPs are identified in grain handling facilities, metal detection is the process step that is most commonly identified as a CCP.

2.0 DETERMINING CRITIAL CONTROL POINTS

Form 5 – Hazard Description and CCP Identification in the CGC Generic HACCP Plan for Grains, Oilseeds and Pulses provides a template for determining if CCPs are present in your product or processes. Form 5 is presented in two parts: Incoming Ingredients and Materials, and Process Flowcharts. Each Form 5 Summary contains 8 columns and asks 5 questions to identify CCPs. An example of Form 5 identifying a CCP is located in Appendix 1 of this document.

Figure 1: Form 5 Summary – Hazard Description and CCP Identification

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Process Step	**Type of Hazard**	**Hazard Description**	**1. Is hazard controlled by a pre-requisite program?**	**2. Is hazard likely to exceed acceptable levels?**	**3. Could a control measure be used at any step?**	**4. Is this control measure designed to eliminate/ reduce this hazard?**	**5. Will this hazard be eliminated /reduced to acceptable level later?**

Column 1: Process Step – list the process step, as identified in Form #3 (e.g. receiving, storage, metal detection.)

Column 2: Type – list the type of hazards, biological (B), chemical (C) and physical (P), that you identified with the process step. Each hazard identified must have its own row. You do not need to describe what the hazard is in this column, just what type of hazard is present.

Column 3: Hazard Description – For each biological (B), chemical (C) or physical (P) hazard that you listed in column 2, write a brief, but specific, description that accurately describes the hazard, as this information will help when assessing control measures for the hazard. Although hazards may be similar (e.g. metal in grain) the means to control the hazards can differ greatly (e.g. pieces of metal from equipment falling into product versus metal in incoming grain due to sieve failure).

Column 4: Question 1. Is hazard controlled by a prerequisite program? – If the identified hazard can be controlled through one or more of the prerequisite programs, list all the applicable prerequisite programs in this section. If the hazard is controlled by one or more prerequisite programs, do not proceed to the next question as the hazard is controlled. If the hazard is not controlled by a prerequisite program, answer "No" and continue to the next question.

Column 5: Question 2. Is hazard likely to exceed acceptable levels? For hazards that are not controlled by prerequisite programs, the Generic HACCP plan has indicated which hazards are likely to exceed acceptable limits. This assessment was conducted by the CGC Technical Expert Advisory Committee and is based on current regulatory requirements, scientific literature and industry best practices. If you are assessing a hazard that has not been identified in the Generic HACCP Plan, you need to conduct a similar determination of what is an acceptable level or limit for the hazard, and how likely is that hazard to exceed that level or limit. When evaluating the likelihood of a hazard exceeding acceptable levels, refer to data from past recalls and outbreaks, scientific literature, regulatory requirements, customer complaints and the results of your own monitoring. If you determine that the hazard is not likely to exceed acceptable levels, answer "No" and do not proceed to the next question. Ensure that there is data or information to justify your decision. If you answer "Yes", continue to the next question.

Column 6: Question 3. Could a control measure be used at any step? – If there is any action or activity that can be implemented to prevent, eliminate or reduce the hazard to an acceptable level, answer "Yes" and proceed to the next question. If you answer "No", this indicates that the hazard is an Uncontrolled Hazard and it must be listed in Form 6. An Uncontrolled Hazard is one that cannot be controlled at the facility and must be controlled elsewhere in the food chain. For example, pesticide residues in excess of regulatory MRLs occurs on the farm and can only be controlled through proper pesticide withdrawal times and good agronomic practices by the producer.

Column 7: Question 4. Is this control measure designed to eliminate/reduce this hazard? –If your answer to this question is "Yes", then the control identified in Question 3 may be a Critical Control Point (CCP). Continue to the next question.

Column 8: Question 5. Will this hazard be eliminated/reduced to an acceptable level later? – If you answer "No" to this question, the process step is a CCP. If the answer to this question is "Yes", then the subsequent process step is a CCP. List the process step and ensure to transfer this information once you reach that process step on the form.

3.0 DETERMINING CRITIAL LIMITS FOR CRITICAL CONTROL POINTS

If you have determined that a CCP exists in your process, you need to define critical limits for that CCP. A critical limit is the maximum or minimum value that a CCP must meet to ensure an identified food safety hazard is controlled. Critical limits may be quantitative (for example, measureable values such as temperature, time, or weight) or qualitative (for example, can be confirmed by a visual inspection, such as a metal detector check), but they must also be clearly defined, objective and

measurable. Critical limits may be defined through detection equipment manufacturer's recommendations (e.g. amount and type of metal that a metal detector can detect), through scientific data (e.g. a process study to determine if cleaning equipment can effectively remove a contaminant) or through regulatory requirements (e.g. pasteurization of fluid milk at 63°C for 30 minutes).

For example, a CCP that may be identified in a grain facility's HACCP plan is the metal detector for ensuring no metal contamination in finished product. To say that the critical limit for the metal detector is no metal in finished product is insufficient, as this is not clearly defined. A more accurate critical limit would identify the type of metal and the minimum size of metal contamination that is controlled by the CCP (e.g. all ferrous and non-ferrous metal and stainless steel greater or equal to 1.5 mm in size).

4.0 MONITORING PROCEDURES

CCPs must be monitored at predetermined intervals to ensure that critical limits are being met as defined. The results of monitoring must be recorded and corrective actions must be taken if monitoring activities indicate that critical limits are not being met.

Documented monitoring procedures must include the following information:

- **Who** is responsible for performing the CCP procedure?
- **What** is measured or evaluated during monitoring?
- **How** will the monitoring activity be conducted?
- **When** will the monitoring occur?
- **Where** will the results of monitoring be recorded?

The results of monitoring can be used not only to identify if critical limits are not being met, but if there is any trending in the results that may indicate an eventual loss of control. Monitoring must be conducted at a frequency that is realistic but also sufficient to ensure the safety of the product. If monitoring indicates that critical limits have not been met, you must be able to regain control of all product that was handled since the last acceptable monitoring check and re-evaluate it for safety.

5.0 CORRECTIVE ACTIONS

If monitoring indicates that critical limits have not been met, you need to take corrective actions to regain control of the product. Corrective action procedures are documented procedures that ensure that affected product is not released to customers, and determine the cause of the deviation and prevent future reoccurrence.

Your documented corrective action procedure must include:

- Who is responsible for determining when a corrective action is required, and implementing the procedure if it is warranted;
- What needs to be done to re-establish control;
- Measures to assess the safety and determine the disposition of affected product (e.g. rework, destroy); and
- Steps to investigate the root cause of the issue to prevent recurrence.

Corrective actions should be taken as soon as possible to prevent potentially unsafe

product from being released to the customer or consumer. Keep records of corrective actions taken, the results of the root cause analysis and any control measures that must be taken to prevent recurrence.

6.0 VERIFICATION PROCEDURES

Verification procedures confirm that your procedures for monitoring your CCP and implementing corrective actions are being conducted as outlined in your HACCP plan. Verification activities are often referred to as "monitoring the monitor"; they ensure that personnel responsible for monitoring the CCP are conducting activities as documented, that records of activities are being kept, and deviations are handled appropriately. Verification must be conducted by someone other than personnel responsible for monitoring activities, such as the HACCP Coordinator or Supervisor.

Verification activities can take many forms. Verification may include directly observing staff conducting monitoring and corrective action procedures to ensure they are being conducted as documented, reviewing records to ensure they are complete and filled out correctly, end product sampling and testing for the hazard, or verifying the calibration of equipment. You should use multiple methods of verification to ensure compliance. A documented procedure must be in place to describe who is responsible for verification activities, what verification activities need to take place, how these activities are conducted and the frequency they need to be conducted. Any corrective actions taken as a result of verification activities must be recorded.

7.0 KEEPING RECORDS

Record keeping is an essential part of any HACCP plan. Records show evidence of the due diligence taken to ensure hazards are controlled and that your HACCP plan is functioning as documented.

8.0 THE HACCP MATRIX

Form 7 of the CGC Generic HACCP Plan for Grains, Oilseeds and Pulses contains the HACCP Matrix of the HACCP Plan. If no CCP is identified, the form is left blank. However, if you identify a CCP, this form outlines key information, procedures and records required monitoring, verification and corrective actions. An example of a completed HACCP matrix is found in Appendix 1 of this document.

Appendix 1: Form 5 Process Flowcharts – Identification of a CCP

Example: A primary elevator sells various varieties of edible beans in 22 kg bags. In the step prior to bagged product storage before shipping, the company runs all product through a metal detector as a final check to ensure the sieves and sorters removed foreign material and that no pieces of metal from equipment fell off into the clean product. This table outlines how Form 5 – Process Flowcharts may look if you have a metal detector that is a CCP.

Process	Type	Hazard Description	1. Is hazard controlled by a pre-requisite program?	2. Is hazard likely to exceed acceptable levels?	3. Could a control measure be used at any step? (If no, go to Form 6)	4. Is this control measure designed to eliminate/ reduce this hazard?	5. Will this hazard be eliminated/ reduced to acceptable level later?
5. Bulk Storage	P	Metal from bin (bolts, nuts) falling into product	No	Yes	Yes	Yes	Yes 9. Metal detection CCP-1P

IMPORTANT: Do not forget to label **Form 3** Metal Detection process step, with the CCP number!

The grain is stored in bulk bins after sorting and sieving. Loose bolts and nuts from bins could fall in the stored grain

There is a risk of metal falling into the product, and any amount of metal is in excess of acceptable levels

The metal detector is the last step before the grain is stored and shipped. It will detect extraneous metal

Naming convention for CCPs – your number the CCP and identify the type of hazard (B, C or P)

Appendix 2: Form #7 - HACCP Matrix

Example: A primary elevator sells various varieties of edible beans in 22 kg bags. The Food Safety team has identified their metal detector as their CCP for metal on all finished product leaving the elevator. This HACCP matrix outlines what Form 7 of your HACCP plan may look like if you had a metal detector as a CCP:

ITEM	INSTRUCTION	COMPLETE FOR EACH CCP
Process Step	Number as indicated on Form #3.	9 – Metal detection
CCP Hazard Number	Number sequentially.	CCP-1P
Hazard Description	Identify whether the hazard is biological, chemical or physical. Describe hazard.	Physical - Metal from bulk storage and packaging equipment falling into product
Critical Limits	Define the value(s) that are acceptable to maintain the CCP under control	Ferrous and non-ferrous metal ≤ 1.5 mm; stainless steel ≤ 2.0 mm
Monitoring Procedures	Identify the following: • Who is responsible for the task; • What procedure is to be followed; • What observation is to be made or what measurement is to be taken; • How often the task is to be performed; and • Where the observations are to be recorded.	Conducted by bagger operator at the start of each shift As per SOP XYZ, run metal detector test strips through the detector [*one at a time inside a sample bag*] to see if the detector will reject the minimum amount of metal. Operator must ensure [*alarm sounds/bag is kicked out/line shuts down*] for proper functioning of CCP Operator records results on Form XYZ Monitoring Records including initials, date and time
Deviation Procedures and Corrective Actions	If monitoring indicates a deviation, describe: • Who takes the corrective actions; • What procedures are to be followed; • Where the actions are to be recorded.	1. If the metal detector is not functioning properly [*alarm not sounding/bag not kicked out/line not shutting down*] repeat the monitoring procedure as outlined in SOP XYZ. If metal detector still isn't functioning properly, notify plant supervisor immediately. Plant supervisor places all affected product on hold from last effective check to deviation until the safety of the product can be reassessed

		as per SOP CCP 1P 2. If during production the metal detector indicates that there is metal in a product, run suspect product through the detector 2 more times. If metal is still detected in product, contact plant supervisor immediately. Assess where metal came from and begin root cause analysis. 3. A root cause analysis is conducted by QA manager to assess if this is an isolated incident or if corrective measures must be taken as per SOP XYZ 4. Record deviation and corrective action procedures in Form XYZ Deviation Records
Verification Procedures	Identify the following: • Who is responsible for the task; • What procedure is to be followed; • What observation is to be made or what measurement is to be taken; • How often the task is to be performed; • Where the observations are to be recorded. If verification indicates a deviation, describe: • Who takes the corrective actions; • What procedures are to be followed • Where the actions are to be recorded.	1. Every X months, the QA manager observes the bagger operator monitoring function to ensure the written procedures are being followed. Signs and dates the Form XYZ Monitoring Record and records "observation" to indicate it was a procedure check. 2. Every Y months the QA Manager reviews Z number of Monitoring Records and associated corrective actions and Deviation Records completed since the last verification for completeness and compliance. Signs and dates. 3. If deviations are found for any of the above procedures, the QA Manager initiates corrective actions. Signs and dates.
HACCP Records	List records to be used.	Form XYZ Monitoring Records Form XYZ Deviation Records Corrective Action Request Form