Food Manufacturing

ESSENTIAL SKILLS PROFILE

QUALITY CONTROL MANAGER

Funded By:

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Contents

QUALITY CONTROL MANAGER

Quality Control (QC) Manager Definition

This profile has been contextualized for Quality Control Managers working within the food processing sector. Quality Control Managers are responsible for ensuring that the food and/or beverages produced in their facilities consistently meet internal and external food safety and quality requirements. Sometimes referred to as Quality Assurance Managers, they coordinate the activities required to meet quality standards and ensure compliance. They are required to monitor and advise on the performance of their facilities' quality management systems; they compile and review extensive amounts of qualitative and quantitative data regarding processes to measure against set standards and regulations.

The Quality Control Manager in food manufacturing essential skills profile was based on essential skills profile for Manufacturing Managers (NOC 0911) developed by the Government of Canada department of Employment and Social Development Canada.

The most important Essential Skills for QC Managers are:

- Document Use
- Working with Others
- Thinking Skills (Problem Solving)

Keys to Understanding Essential Skills Profiles

The profiles are organized by essential skill. Each essential skill section contains the following key elements:

- **Example tasks:** a list of essential skills-related tasks. This list describes the different types of tasks workers may be expected to do for each essential skill in an occupation.

- **Complexity ratings:** the number found in brackets beside each example task. These estimated numbers range from Level 1 (basic) to Level 5 (advanced), depending on how difficult the task is. The complexity levels may vary based on the requirements of the workplace.

- **Essential skill function overviews:** describe the purpose and/or use of each essential skill (except for Thinking). This section, usually presented in a table format, is omitted from short versions of the profiles.

- **Impact of digital technology:** updated profiles include new information on the effect digital technology has on the essential skills-related tasks required in an occupation.

    o In long versions of the updated profiles, this information is found after the list of example tasks for each essential skill.

    o In short versions of the updated profiles, this information is summarized at the end of the profile in an "Impact of Digital Technology" summary.

The following icons are used to identify the 9 components of the Essential Skills Profiles:

READING		DOCUMENT USE		WRITING	
NUMERACY		ORAL COMMUNICATION		THINKING SKILLS	
DIGITAL TECHNOLOGY		WORKING WITH OTHERS		CONTINUOUS LEARNING	

Definitions & Complexity Levels

Reading

Definition
Reading refers to the skills needed to understand and apply information found in sentences and paragraphs.

At work, people use reading skills to locate and use information from memos, emails, manuals, reports, proposals and other written material.

Complexity Level

The level of difficulty of reading tasks ranges between being able to read short texts to find a single piece of information (complexity Level 1), to being able to understand and use long and complicated texts, like contracts or reports (complexity Level 5).

The ability to read at a complexity Level 3 is essential for most jobs - even for those that do not require a college diploma, university degree or specialized training. For example, this level of reading is needed for workers to succeed in job-specific training and read safety-related information.

Document Use

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Definition

Document use refers to the skills needed to find, enter and use letters, numbers, symbols and images in electronic and paper formats.

At work, people use document use skills to find and enter information in electronic and paper visual displays, such as forms, lists, tables, graphs, maps and drawings.

Complexity Level

The document use complexity scale ranges from Level 1 to Level 5 based on the number, type and structure of documents; how information is found and entered (and whether or not the information is modified in order to be used); and the worker's thought process and their previous knowledge of the content.
In some cases, tasks that require document use skills may also require other essential skills. For example, reading skills might also be required for a document that includes a paragraph of text (e.g. on a label). In a similar way, writing skills might be needed when a document requires the entry of words, phrases, sentences and paragraphs.

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Writing

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Definition

Writing refers to the skills needed to compose handwritten or typed text to communicate information and ideas.

At work, people use writing skills to compose texts, such as notes, memos, bulletins, email messages, instructions, procedures and reports.

Complexity Level

The writing complexity scale is organized into themes, which explain the complexity requirements of writing tasks:
- *length and purpose,*
- *style and structure, and*
- *content*

Writing tasks may range from writing short and informal notes (complexity Level 1) to writing longer, technical documents based on many different sources of information and adapted to a specific audience (complexity Level 5).

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Numeracy

Definition
Numeracy refers to the skills needed to make sense of and apply mathematical concepts and information.

At work, people use numeracy skills to tally costs, create budgets, calculate lengths and volumes, analyze data, estimate times and manage the other mathematical demands of different situations.

Complexity Level

The level of difficulty of a numeracy task is determined by the math task performed, as well as the knowledge needed to perform the task properly. There is a difference between a worker's ability to work with numbers and their understanding of when they should use certain types of math. For example, a worker can take a number from a computer printout and put it in a report without knowing how it was calculated. Also, some numeracy tasks require workers to make sense of mathematical information found in text or media and not just simply perform mathematical operations.

Numeracy example tasks are assessed across four (estimation) to five (calculation) levels of difficulty and depend on many factors, such as:

- *the number, type and difficulty of mathematical operations needed to find a solution to a problem;*
- *the amount of information available and the level of accuracy required; and,*
- *the consequence of making a mistake.*

Oral communication

Definition
Oral communication refers to the skills needed to exchange thoughts and information with other people by speaking, listening and using non-verbal cues, such as body language.

At work, people use oral communication skills to talk to customers, discuss products with suppliers, explain work procedures to co-workers, participate in virtual sales meetings with clients, and other activities that involve verbal exchanges.

Complexity Level

The level of difficulty related to oral communication tasks is based on four factors:
- *the range and complexity of oral communication required from giving basic instructions (Level 1) to carrying out complicated negotiations (Level 4);*
- *the range and complexity of information communicated from a familiar, simple topic (Level 1) to complex, highly detailed technical information (Level 4);*
- *the range and complexity of the communication context from communicating with one person at a time in an everyday situation (Level 1) to communicating with a new and challenging audience in an unfamiliar setting (Level 4); and,*
- *the risks involved with not being able to communicate properly from minor inefficiencies (Level 1) to the loss of life or serious injury (Level 4).*

Thinking Skills

Definition
Thinking refers to the skills needed to solve problems, make decisions, think critically, plan, remember details, and find information.

At work, people use thinking skills to do tasks, such as solving electronic equipment problems, assessing the safety of a jobsite, deciding who to hire, planning meetings, memorizing passwords, and finding the information needed to estimate the cost of a project.

Complexity Level

The four levels of complexity for various thinking-related activities are based on these factors:

- *the steps involved in problem solving, from identifying a problem to finding and assessing a solution;*
- *what is involved in decision making, i.e. the consequence of making a mistake, the extent to which information is available, procedures are explained, similar examples exist and judgment is needed to make a decision;*
- *the criteria, assessment and effects of critical thinking processes;*
- *to what extent workers need to plan and organize their own tasks and the impact this might have on the total efficiency of a project; and*
- *the difficulty of finding, selecting, understanding and processing information.*

Digital Technology

Definition
Digital technology refers to the skills needed to understand and use digital systems, tools and applications, and to process digital information.

At work, people use digital technology skills to input, access, analyze, organize, create and communicate information and ideas using computers, software, point-of-sale equipment, email, podcasts, web applications, smart phones and other digital devices.

Complexity Level

Digital skills are currently being assessed against levels defined for computer use. As complexity levels are defined through digital skills research, both the methodology and the profiles will be updated as needed.

Working with Others

Definition
Working with others refers to the skills needed to interact with other people (one or more).

At work, people work with others in pairs and in small and large groups to coordinate tasks, share resources, plan, make decisions, negotiate, solve conflicts and complete other activities that involve teamwork.

Complexity Level

Complexity levels are not assigned to this essential skill.

Continuous Learning

Definition
Continuous learning refers to the skills needed to continually develop and improve one's skills and knowledge in order to work effectively and adapt to changes.

At work, people use continuous learning skills to identify and develop the knowledge and skills they need to perform well, build careers, prepare for and adapt to changes in processes, technology, regulations, employer demands, etc.

Complexity Level

Complexity levels are not assigned to this essential skill.

Additional Information

Definition
The additional information section provides a summary of information collected during interviews with workers. It may contain the following main sub-sections: working with others, continuous learning, digital skill requirements, physical aspects and attitudes.

Digital skills requirements describe the extent to which workers rely on specific types of digital skills to do their work. It may include both current and projected requirements.

Physical aspects explain the physical requirements of an occupation: the psychomotor (i.e. the link between mental activity and the physical movement of the body) and sensory aspects of a job. Physical

Attitudes summarize answers to the question, "What attitudes should someone have to do this job well?"

Food Manufacturing
ESSENTIAL SKILLS PROFILE

QUALITY CONTROL MANAGER

Quality Control (QC) Manager
Food Processing Facility

1. Reading Text

The typical text reading tasks of QC Managers are at Complexity Levels 2 and 3. Their most complex text reading tasks are at Complexity Level 3.

QC Managers:

- Read e-mail messages from customers that describe problems/issues with a product or that request information about the uses or storage requirements their products. (2)

- Read labels on finished products to verify that all labelling components, from nutritional information to font size, are in compliance with CFIA labelling requirements. (2)

- Read Standard Operating Procedures (SOPs) that outline the processes/steps required to complete various tasks within the facility to ensure that they are in compliance with the most recent regulatory requirements. They will update the SOPs as required. (2)

- Read articles and case studies in food safety and quality assurance journals to stay abreast of industry trends and innovations. (2)

- Read and interpret manuals for certification programs, such as HACCP, BRC and SQF to identify requirements, processes and parameters related to food safety and quality control. (3)

- Read and interpret CFIA regulations pertaining to all aspects of the food processing cycle to ensure that their internal processes are within compliance with the most current regulations. (3)

- Read inspection reports from CFIA and other third-party inspectors to determine if their products and processes are meeting requirements and regulations or if changes are required to address deficits or deviations noted by inspectors. (3)

- Read third-party audit reports that verify food safety system documentation and implementation and suggest areas requiring corrective action. They will modify their food safety and quality control programs as a result of findings presented in the audit report. (3)

Reading Profile

	Purpose for Reading			
Type of Text	To scan for specific information/To locate information.	To skim for overall meaning, to get the 'gist'.	To read the full text to understand or to learn.	To read the full text to critique or to evaluate.
Forms	✓	✓		
Labels				✓
Notes, Letters, Memos	✓	✓		
Manuals, Specifications, Regulations			✓	
Reports, Books, Journals			✓	

2. Document Use

The typical document use tasks of QC Managers are at Complexity Levels 2 and 3. Their most complex document use tasks are at Complexity Level 3.

QC Managers:

- Scan various quality assurance checklists, such as sanitation and maintenance checklists, to verify that processes are being followed. (2)

- Enter quantitative and qualitative data into quality assurance checklists when completing inspections and audits. (2)

- Interpret information plotted on graphs or charts, such as temperatures over time, to verify that the levels are within established quality control parameters to ensure food safety. (2)

- Review training records to verify that employees have completed their required food safety training or to identify employees requiring recertification. (2)

- Scan facility blueprints to locate sinks and water points when facilitating water testing. (2)

- Review pest control program maps to identify the locations and types of traps and devices in and around the food processing facility. (2)

- Review schematic drawings of the facility to gain a thorough understanding of process and product flow, identify potential cross-contamination points or determine critical control points. (3)

Other Document Use Tasks

QC Managers:

- Create HACCP process flow diagrams to provide an outline of the steps involved in their facilities' food processing cycle.

- Create various quality assurance and food safety checklists, such as GMP checklists, sanitation and maintenance checklists, inspection forms, and more, to be used by various department personnel. They are then responsible for reviewing completed forms to ensure compliance.

- Create quality control audit schedules to outline activities requiring completion at various frequencies, such as daily, weekly, monthly, quarterly and annually.

- Create product labels in compliance with CFIA labelling requirements.

- Develop graphs, such as line diagrams and scatter plots, to trend quality assurance parameters, like temperatures or microbial growth, over specific periods of time.

- Create certificates of analysis to confirm that a regulated product meets its product specification.

Document Use Profile

QC Managers:

- Read signs, labels or lists.

- Complete forms by marking check boxes, recording numerical information or entering words, phrases, sentences or texts of a paragraph or more.

- Read completed forms containing check boxes, numerical entries, phrases, addresses, sentences or texts of a paragraph or more.

- Read tables, schedules or other table-like text.

- Create tables, schedules or other table-like text.

- Enter information on tables, schedules or other table-like text.

- Plot information on graphs (e.g., line, pie, and bar).

- Obtain specific information from graphs or charts.

- Interpret information on graphs or charts.

- Construct or draw graphs or charts.

- Interpret scale drawings (e.g., blueprints or maps).

- Read schematic drawings (e.g., electrical schematics).

- Obtain information from sketches, pictures or icons.

3. Writing

The typical writing tasks of QC Managers are at Complexity Levels 2 to 4. Their most complex writing tasks are at Complexity Levels 3 and 4.

QC Managers:

- Write e-mail messages to customers in response to questions or complaints about their products. (2)

- Write memos and bulletins to be posted throughout their facilities to alert personnel about safety/quality issues and how to prevent issues from recurring. (2)

- Write periodic (e.g. weekly or monthly), quality assurance activity summaries to outline what activities are happening in the laboratory, identify quality or food safety issues encountered during the reporting period and outline corrective actions taken. These summaries are often submitted to upper management to keep them informed of departmental activity. (2)

- Write Standard Operating Procedures (SOPs) for various tasks within the food processing cycle by outlining the steps involved in completing the task and providing detailed instructions for each step. They ensure that the SOPs developed are in compliance with food safety regulations. (3)

- Write training materials for onboarding and refresher training related to GMPs, food safety and quality control processes. They review and consolidate information from various regulations, procedures and manuals to develop training material that reflects the skill level of their learners. (3)

- Write various reports. For example, they write corrective action reports outlining strategies implemented to address issues noted in audits. They write deviation reports in response to customer complaints outlining their investigative activities, issues found and changes made to rectify the issue. They prepare detailed recall reports to describe all aspects of the recall process such as reason for the recall, product lots and codes impacted, corrective actions, etc. Any reports written by QC Managers can be used as legal documents; therefore, due diligence, accuracy and transparency are crucial. (4)

Writing Profile					
	Purpose for Writing				
Length	To keep a record/to document	To inform/ to request information	To persuade/ to justify a request	To present an analysis or comparison	To present an evaluation or critique
Texts requiring less than one paragraph of new text	✓			✓	✓
Texts rarely requiring more than one paragraph		✓	✓	✓	✓
Longer texts		✓		✓	

4. Numeracy

The Numerical Calculation Rating Scale ranges from Level 1 (least complex) to Level 5 (most complex). The numeracy tasks of QC Managers involve:

- Money Math at Complexity Level 2.

- Scheduling or Budgeting and Accounting Math at Complexity Levels 1 to 3.

- Measurement and Calculation Math at Complexity Level 2 and 3.

- Data Analysis Math at Complexity Level 2 and 3.

QC Managers:

- Prepare purchase orders for supplies and equipment required within their laboratories to conduct quality control testing. (Money Math) (2)

- Schedule facility quality control inspections with CFIA and audits with third-party auditors. (Scheduling or Budgeting and Accounting Math) (1)

- Create schedules for quality assurance testing, equipment maintenance and cleaning and sanitization. These schedules are created in compliance with food safety program requirements, such as HACCP. They then monitor records of these tests and activities to ensure departmental compliance with the schedule. (Scheduling or Budgeting and Accounting Math) (2)

- May monitor, manage and allocate funds from laboratory supply budgets and funding grants. (Scheduling or Budgeting and Accounting Math) (3)

- Measure the sizes, such as diameters, and weights, of products when completing final inspections to verify product specifications prior to releasing the product for shipment. (Measurement and Calculation Math) (2)

- Measure the colour of a sample, such as apple juice, from multiple angles using spectrophotometers, calculate the average of readings and compare the average to established parameters to determine quality. (Measurement and Calculation Math) (3)

- Calculate labelling values by determining the mean (average) nutrient content from the analyzed nutrient values, calculating the standard deviation and converting the mean and standard deviation from a per 100 g basis to the label serving size. (Measurement and Calculation Math) (3)

- Analyze statistical data directly from the production line to identify quality problems and recommend changes to production processes and controls to eliminate the issues. (Data Analysis) (2)

- Analyze data of various tests, such as shelf-life studies, microbial tests and ATP swabs, to determine if the results are within acceptable parameters or if further investigation and/or corrective action is required. (Data Analysis) (3)

Numerical Estimation

The Numerical Estimation Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex).
The numerical estimation tasks of QC Managers are at Complexity Levels x and x.

QC Managers:

- Estimate the amount of time and money required to complete quality control activities when applying for supplemental funding and grants. (2)

- Estimate the probability of identified risks occurring when developing risk management plans. (3)

Math Skills Profile

a. Mathematical Foundations Used

	QC Managers:
Number Concepts	
Whole Numbers	read and write, count, round off, add or subtract, multiply or divide whole numbers. For example, reading and writing product lot numbers on traceability forms; reading and writing number of products affected, stocked and shipped on reconciliation forms; counting colonies of bacteria on plates when conducting standard plate counts; writing expected batch yields in kg on product formulations.
Integers	read and write, add or subtract, multiply or divide integers. For example, reading and writing holding, cooking and cooling temperatures on manufacturing/processing procedures.
Rational Numbers - Fractions	read and write, add or subtract fractions, multiply or divide by a fraction, multiply or divide fractions. For example, writing specifications for thicknesses of final products in fractions of inches, e.g. 3/8 or 5/8 inch chunks.
Rational Numbers - Decimals	read and write, round off, add or subtract decimals, multiply or divide by a decimal, multiply or divide decimals. Use decimals mainly to refer to dollars and cents. For example, itemizing costs of lab supplies within budgets and purchase orders; reading pH levels to two decimal places and rounding up to one decimal place.
Rational Numbers - Percent	read and write percents, calculate the percent one number is of another, calculate a percent of a number. For example, reading the acceptable threshold of defects within a line of products as a percentage, e.g. 2% minor defect threshold; writing percent daily values for product labels; identifying ingredients as percentages of the total recipe/formula on product formulation sheets.
Other Real Numbers	Use powers and roots, scientific notation, significant digits .For example, recording the growth rate of a microbe as a logarithmic function; writing the number of colony forming units, i.e. CFU/ml or gm in scientific notation, for example – 6000 CFU/ml as 6×10^3 CFU/ml.
Patterns and Relations	
Equations and Formulae	solve problems by constructing and solving equations with one unknown, use formulae by inserting quantities for variables and solving, write, simplify and solve two variable algebraic problems, write simplify and solve quadratic equations. For example, determining bacterial generation times using exponential formulae and logarithms; calculating compound ratios and sample outputs.
Use of Rate, Ratio and Proportion	use a rate showing comparison between two quantities with different units, use a ratio showing comparison between two quantities with the same units, use a proportion showing comparison between two ratios or rates in order to solve problems. For example, writing nutritional values per 100 g for nutritional labels; identifying the presence of a particular additive or nutrient within a control sample as ppm (parts per million).
Shape and Spatial Sense	
Measurement Conversions	perform measurement conversions. For example, converting from per 100 g to per serving size for nutritional labels; converting weights from lb to kg and vice versa.
Statistics and Probability	
Inferential Statistics	Use inferential statistics (e.g. using mathematical theories of probability, making conclusions about a population or about how

	likely it is that some event will happen). For example, using probability theories to draw conclusions about the accuracy of chemical analyses; calculating means, medians and variances to determine consistency of test results.
Summary Calculations	calculate averages, calculate rates other than percentage, calculate proportions or ratios. For example, calculating bacterial growth per unit of time or average product weight per unit of time.
See Use of Documents for information on:	- using tables, schedules or other table-like text. - using graphical presentations.

b. How Calculations Are Performed

QC Managers make calculations:

- In their head

- Using a pen and paper

- Using a calculator

- Using a computer

c. Measurement Instruments Used

QC Managers measure:

- Time. For example, using a clock or watch.

- Weight or mass. For example, using a digital scale.

- Distance or dimension. For example, using calipers, measuring tapes or rulers.

- Temperature. For example, using digital thermometers, temperature probes, gauges and infrared guns.

- Colour. For example, using spectrophotometers.

- Bacteria counts. For example, using bacteria growth plates.

- Nitrates/nitrates. For example, using test strip kits.

They use:
- The metric measurement system.

- The imperial measurement system.

5. Oral Communication

The typical oral communication tasks of QC Managers are at Complexity Levels 2 to 4. Their most complex oral communication tasks are at Complexity Level 3.

QC Managers:

- Provide direction and guidance to the quality control personnel, including quality control technologists, on a daily basis. (2)

- Communicate with managers of other organizational departments. For example, they speak with maintenance managers to facilitate the servicing of equipment causing quality issues on the production line. They speak with sanitation managers to coordinate the cleaning and sanitizing of new equipment prior to first use. They speak with warehouse managers to discuss the proper storage and handling procedures for a new incoming product. (2)

- Participate in daily management meetings and food safety committee meetings, such as HACCP committee, to discuss quality control processes, issues encountered and corrective actions taken. (2)

- Communicate with customers experiencing issues with their products to collect as much information as possible about the issue and provide them with options for how to deal with the issue depending on the nature and severity of the claim. In some cases, the customer may be upset and have to be placated. (2)

- Communicate with suppliers to obtain required product specifications and certificates of analysis. (2)

- Communicate with members of the research and development team when developing new products or modifying existing products to ensure that quality control processes, procedures and regulations are being met throughout the development process. (2)

- Communicate with CFIA personnel and third-party auditors conducting onsite inspections. They describe their quality control processes and procedures in detail and respond to questions posed by the inspectors/auditors throughout the inspection. (3)

- Provide onboarding training to new employees and refresher training to existing employees on the topics of food safety, quality control processes, SOPs and GMPs. (3)

- May serve as a media spokesperson in the event of a major recall or quality control issue. In this case, they must exhibit diplomacy and professionalism, keeping in mind that their statements may be used as testimony in legal proceedings, should the situation arise. (4)

Modes of Communication Used

QC Managers communicate**:**
- in person

- using the telephone

- using a two-way radio or a cellular phone

Oral Communication Profile

	Purpose for Oral Communication					
Type	To provide/ receive information, explanation, direction	To seek, obtain information	To co-ordinate work with that of others	To discuss (exchange information, opinions)	To instruct, instill understanding, knowledge	To negotiate, resolve conflict
Interact with co-workers	✓	✓	✓	✓		
Interact with those you supervise or direct					✓	
Interact with supervisor/ manager	✓	✓		✓		
Interact with customers/ clients/ public	✓	✓		✓		✓
Interact with suppliers, servicers	✓					✓
Participate in group discussion	✓	✓		✓		
Present information to a small group					✓	

6. Thinking Skills

6.1 Problem Solving:

Involves problems that require solutions; most problems concern mechanical challenges, people or situations.

The Problem Solving Complexity Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex). The typical problem solving tasks of QC Managers are at Complexity Levels 2 and 3. Their most complex problem solving tasks are at Complexity Level 3.

QC Managers:

- Receive complaints from customers about their products, such as products spoiling prior to their best by dates. They gather as much information as possible from the customer to fully understand the complaint. They then investigate potential causes for the issue by reviewing QC data for the particular lot code, such as ingredients, process parameters and maintenance records, to determine if there were any issues or deficiencies during the processing of the product. If the root cause is not found, they consider other potential factors, like how the product was stored in a third-party warehouse, how and when the product was transported and how the product was stored once in the

hands of the customer. Once the root cause is found, they take the necessary measures to mitigate the issue and prevent it from happening again. They will record their process in corrective action reports. (2)

- Find that a random sample taken from the processing line is not within parameters for specific process parameters, such as temperature. They will test a second sample extracted at the same time to validate the findings. If the second sample is within the acceptable parameters, they allow the processing to continue. If the second sample reveals that same deviation as the first sample, they notify the production floor of required actions, such as modifications to process controls or line stoppage and determine how to deal with impacted product. (3)

- Find that an allergen, such as nuts or dairy, is present on a dedicated allergen free production run. They first request an additional test be conducted to confirm the presence of the allergen. They then communicate with maintenance to ensure that the equipment components (such as pumps and valves) have been maintained according to preventative maintenance schedules and to determine if any recent maintenance has been completed. They then speak with the lead hand of the sanitation crew responsible for the cleaning and sanitizing of the equipment to determine if there were issues experienced with the wash program from the previous night shift. They may find that the issue is one of training, where a new sanitation crew member requires additional instruction in the proper preparation of chemicals and cleaning procedures to prevent the issue from happening again. They will follow-up by arranging for cleaning of the production line and for training of the personnel. (3)

6.2 Decision Making:

1. Refers to making a choice among options.

The Decision Making Complexity Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex). The typical decision making tasks of QC Managers are at Complexity Levels 2 and 3. Their most complex decision making tasks are at Complexity Level 3.

QC Managers:

- Decide which packaging and modes of transportation to use when shipping products to customers to ensure product quality and safety. They must consider various factors such as travel times, temperatures, weight and amount of movement in the storage container when choosing the best option. (2)

- Decide whether or not to accept a shipment of ingredients that has a rating of 3.89 for mechanical damage when the upper tolerance level is 4.0. They must take into consideration the type and severity of damage and determine if the ingredients can still be used safely and efficiently. (2)

- With the production supervisor, decide how to manage product that was affected by a deviation in process controls and parameters. They base their decision on the nature of the deviation, the potential effects that the deviation could have on the final product, and how far into the production process the deviation occurred. (3)

- When a deviation from process parameters occurs that compromises the quality and safety of the finished product, such as a high-temperature alarm, they decide how much product has been affected by the deviation and determine how to proceed with the product, which may include a hold, rework or disposal depending on the severity of the deviation and the risk to food safety. (3)

6.3 Critical Thinking:

Refers to the process of evaluating ideas or information, using a rational, logical thought process, and referring to objective criteria, to reach a rational judgment about value, or to identify strengths and weaknesses.

The Critical Thinking Complexity Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex). The typical critical thinking tasks of QC Managers are at Complexity Levels 3 and 4. Their most complex critical thinking tasks are at Complexity Level 4.

QC Managers:

- Evaluate final products prior to release into the market. They verify all quality control parameters related to production, labelling and packaging and conduct visual, organoleptic and physico-chemical tests and inspections to ensure that the products meet all internal and external quality and food safety parameters and regulations. (3)

- Audit their organizations' quality control program components. For each department, they review the existing processes and procedures in place; evaluate how successfully these processes have been implemented, by reviewing QC forms and checklists; judge effectiveness of achieving target quality control levels or parameters; and evaluate quantitative data and statistics to confirm the reduction or elimination of problem areas or hazards. The audits allow QC Managers to highlight areas of good practice and identify areas requiring improvement. (3)

- Analyze risks and hazards to develop a Hazard Analysis Critical Control Point (HACCP) system within their facilities. With a HACCP committee, they identify hazards (such as contamination, growth or survival of microorganisms) associated with growing, harvesting, processing, distributing, preparing and/or using a raw material or food product and assess the likelihood/risk of occurrence. They then determine critical control points (CCPs) required to control the hazard and implement monitoring procedures to ensure that each CCP is under control and minimizing the risk of hazards occurring. Constant evaluation and assessment of the HACCP plan are required to ensure food safety. (4)

- Evaluate the severity of a product issue to determine the classification of the recall, such as Class I, Class II or Class III. They assess the number of products impacted, the issue presented, the probability of use or exposure to the affected product causing adverse health consequences and the severity of the health consequences that could be experienced by consumers. The probability and criticality (e.g. extreme illness or death) of use or exposure to the affected product will then dictate the action required for the recall. (4)

6.4 Job Task Planning and Organizing:

Refers to the extent to which QC Managers plan and organize their own tasks.

The Job Task Planning and Organizing Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex). QC Managers plan and organize their job tasks at Complexity Level 3.

Description:
Quality Control Managers are responsible for monitoring their organization's quality control programs which includes regular review and verification of processes and documentation. While this aspect of their jobs is fairly consistent and regimented, they have to routinely modify their daily and weekly plans

to appropriately respond to issues pertaining to quality control that may arise internally, such as production issues, or externally, such as dealing with customer complaints. They must be able to adapt their work activities in response to changing priorities that may involve collaboration with personnel from various organizational departments.

In addition to their own work schedules, QC Managers are responsible for assigning work tasks and activities to staff that they directly supervise, including routine testing and analysis and other non-routine tasks as issues present themselves.

6.5 Significant Use of Memory

QC Managers may:

- Remember critical control points within their organizations' quality control programs.

- Remember key regulations pertaining to the food or beverage being processed, such as sampling and testing protocols or labelling requirements.

- Remember processes or steps required for tests or inspections that they routinely perform.

6.6 Finding Information

QC Managers perform tasks that involve finding information at Complexity Level 2.

QC Managers:

- Find information about product recalls on the CFIA website. (2)

- Find information about revisions or updates to food safety regulations by reviewing the latest interpretation manuals. (2)

- Find information about trends and innovations regarding food safety and quality control at tradeshows and conferences. (2)

7. Working with Others

The Working with Others Complexity Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex). QC Managers work with others at Complexity Level 3.

Description:
Quality Control Managers lead a team of technologists and personnel dedicated to ensuring food quality and safety within their facilities. To ensure compliance with all regulations, policies and procedures, QC Managers must collaborate with all organizational departments to instill the concept that quality control is everyone's concern. To be effective, they must develop positive working relationships with all levels of the organization, from upper management to operations. Interviewees noted that Quality Control Managers can be regarded as the 'police' of the organization, so developing respect and rapport among all personnel is a necessity to ensure compliance.

Participation in Supervisory or Leadership Activities

QC Managers:

- Participate in formal discussions about work processes or product improvement.

- Have opportunities to make suggestions on improving work processes.

- Monitor the work performance of others

- Inform other workers or demonstrate to them how tasks are performed.

- Orient new employees.

- Make hiring recommendations.

- Make hiring decisions.

- Select contractors and suppliers.

- Assign routine tasks to other workers.

- Assign new or unusual tasks to other workers.

- Identify training that is required by, or would be useful for, other workers.

- Deal with other workers' grievances or complaints.

8. Digital Technology

The Digital Technology Rating Scale ranges from Level 1 (least complex) to Level 5 (most complex). The Digital Technology tasks of QC Managers are at Complexity Levels 2 and 3.

QC Managers:

- Use word processing software. For example, they use MS Word to develop various reports, including inspection and audit reports, deviation reports and corrective action reports. They may include tables and charts in addition to text. (2)

- Database software. For example, they access and input information from their facilities ERP (enterprise resource planning) and/or MRP (materials requirements planning) databases. (2)

- Spreadsheet software. For example, they use MS Excel to compile test result data and to create schedules for QA activities on a daily, weekly, monthly basis. (2)

- May use statistical analysis software. For example, they may use programs such as Minitab to analyze process improvement data and statistics. (2)

- May computer-assisted design, manufacturing and machining. For example, they may use AutoCAD to view schematic plant drawings when locating processing equipment or sinks and water points within their facilities. (3)

- Communications software. For example, they Outlook for sending and receiving e-mail messages from internal and external personnel. (2)

- Internet. For example, they search for new product recalls on CFIA and regulatory websites. They search suppliers of ingredients and equipment to gather information about new products and services. (2)

- Other computer and software applications. For example, they use process planning software, like Visio, to create process flow diagrams. They use MS PPT to develop presentations for training sessions. (3)

9. Continuous Learning

The Continuous Learning Complexity Rating Scale ranges from Level 1 (least complex) to Level 4 (most complex). QC Managers perform Continuous Learning tasks at Level 3.

Description: As regulations related to food safety continue to evolve, Quality Control Managers are required to participate in formalized and self-directed learning activities to stay abreast of changes to ensure compliance. They may participate in courses related to CFIA regulations as well as third-party food management system programs, such as British Retail Consortium (BRC), Safe Quality Food (SQF) and Hazard Analysis Critical Control Point (HACCP), to remain informed of the most recent program requirements. Their understanding of food safety initiatives is critical as they are often tasked with training organizational personnel on these topic areas. They may also participate in self-directed learning activities by participating in webinars, reading industry journals and networking with their peers.

How the Learning Occurs

Learning may be acquired:

- As part of regular work activity.

- From co-workers.

- Through training offered in the workplace.

- through reading and other forms of self-study:

  - At work.
  - On the workers own time.
  - Using materials available through work.
  - Using materials obtained through a professional association.
  - Using materials obtained on worker's own initiative.

- through off-site training:

  - During working hours at no cost to the worker.
  - Partially subsidized.

Other Information

In addition to collecting information for this Essential Skills Profile, our interviews with job incumbents also asked about the following topics

I.   Physical Aspects

Quality Control Managers typically split their days between their offices where they complete and review documentation and manage the administrative activities associated with their roles and the production floor where they converse with personnel, monitor and inspect operations and respond to issues. Minimal strength requirements are presented throughout the course of the work day.

II.   Attitudes

Quality Control Managers must be self-motivated. They must be able to handle stress as they are required to deal with difficult situations inclusive of customer complaints, recalls and food safety issues. They must be level-headed and remain positive in difficult situations. Interviewees noted that QC Managers are often viewed as organizational antagonists who are constantly finding faults and areas requiring improvement. They must work hard within their facilities to instill the importance of quality control in all workers and illustrate that food safety is everyone's responsibility.

III.   Future Trends Affecting Essential Skills

Regulations relating to food safety and quality control are constantly changing and evolving. Quality Control Managers will continue to rely on astute utilize continuous learning, reading interpretation and critical thinking skills to ensure compliance with all required regulations.

Other Essential Skills Profiles:

Front Line Worker

Import/Export Clerk

Industrial Meat Cutter

Production Lead Hand

Material Handler

Millwright

Quality Control Manager

Process Control & Machine Operator

Food Science Technologist

Production Supervisor

Shipper/Receiver

Sanitation

HACCP

Food Processing Human Resources Council

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