



Australian Government

AMPMGT609 Manage effective operation of meat workplace cold chain and refrigeration systems

Release: 1

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Modification History

Release	Comments
Release 1	This version released with AMP Australian Meat Processing Training Package Version 8.0.

Application

This unit describes the skills and knowledge required to plan and oversee the effective operation of workplace cold chain and refrigeration systems, ensuring product quality and food safety. It also describes ways to manage and reduce the costs of cold chain operations. Cold chain systems and operations are critical to the quality and food safety of workplace products. Managing them efficiently minimises production costs and facilitates regulatory compliance.

This unit is applicable to production managers, plant engineers, and quality assurance (QA), maintenance and chiller managers or coordinators.

At this level, individuals exercise considerable responsibility and accountability within workplace structures and are required to make primary contributions to the values, goals and operations of the workplace. They typically have responsibility for establishing and reviewing systems for their site or department. They may work with the assistance of external experts to develop plans and strategies.

All work must be carried out to comply with workplace procedures, according to state/territory health and safety regulations, legislation and standards that apply to the workplace.

No licensing, legislative or certification requirements are known to apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Unit Sector

Management (MGT)

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Assess workplace cold chain system requirements	1.1 Analyse workplace goals, directions and forecasts, and determine the implications for cold chain requirements 1.2 Document workplace refrigeration systems, cold chain, operations and technical support team activities 1.3 Identify regulatory and customer requirements regarding operating and maintaining refrigeration systems 1.4 Determine workplace requirements for accessing specialised refrigeration advice and expertise 1.5 Determine optimum refrigeration requirements to maintain quality and safety of products 1.6 Establish performance standards and targets, including those relating to food safety, cost, quality and waste
2. Manage and control cold chain systems	2.1 Develop procedures for safely and hygienically operating and maintaining refrigeration or cold chain systems according to quality, food safety and manufacturer specifications, and customer and workplace requirements 2.2 Prepare contingency plans and procedures for systems failure or overload, and convey to relevant personnel 2.3 Prepare emergency procedures and plans, and incorporate into health and safety systems, procedures, training and work instructions 2.4 Prepare strategies for communicating and resolving system problems and failures with stakeholders
3. Monitor refrigeration and cold chain system performance	3.1 Determine and develop performance information requirements and data collection strategies 3.2 Establish and maintain monitoring procedures for operating refrigeration or cold chain systems 3.3 Investigate and report non-conformances, and implement corrective action 3.4 Develop and implement preventative and control procedures to prevent future non-conformance
4. Improve refrigeration system performance	4.1 Analyse and measure performance data against relevant performance standards, including product quality and cost requirements

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	4.2 Calculate and monitor energy costs of refrigeration systems 4.3 Develop and implement strategies to improve performance and minimise costs 4.4 Include refrigeration system requirements in budgets and plans

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.

Skill	Description
Writing	- Plan, draft, review and proofread documents - Use Plain English and industry specific terminology - Use workplace software programs and systems to generate documents
Numeracy	- Use software programs to model outcomes - Recognise trends in graphs

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AMPMGT609 Manage effective operation of meat workplace cold chain and refrigeration systems	AMPMGT604 Manage effective operation of meat enterprise cold chain and refrigeration systems	Title updated Foundation Skills added Minor changes to unit Application, Performance Evidence and Assessment Conditions for clarity	Equivalent

Links

Companion Volumes, including Implementation Guides, are available at VETNet: -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5e2e56b7-698f-4822-84bb-25adbb8443a7>

Assessment Requirements for AMPMGT609 Manage effective operation of meat workplace cold chain and refrigeration systems

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Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.

There must be evidence that the individual has managed effective operation of meat workplace cold chain and refrigeration systems, for at least one plant, including:

- assessed requirements for workplace refrigeration or cold chain systems in terms of workplace goals, directions and forecasts, detailed product knowledge and regulatory requirements
- analysed and presented complex concepts, technical information, mathematical information and other data in simple or complex formats
- completed hypothetical technical and financial modelling, calculations, interpretation or analysis
- developed and maintained the operating system
- prepared manuals and procedures for operating refrigeration systems, chillers and freezers according to hygiene, safety, quality and customer requirements, and determined corrective actions for systems variations and non-conformances
- identified key personnel for the resolution and communication of systems problems and failures
- maintained currency of knowledge through independent research or professional development
- maintained the quality of products in the cold chain by monitoring chillers or freezers and interpreting refrigeration data to maintain appropriate temperature or humidity for product types and quantities
- managed maintenance of workplace refrigeration systems, including the negotiation and preparation of maintenance schedules; monitoring repairs; conformance with regulatory and quality requirements; and replacement requirements
- managed refrigeration costs by monitoring the costs of refrigeration, including internal or external service models, maintenance costs, lost time costs, product losses and energy costs

- monitored and reported system performance, including setting performance standards and measures for refrigeration system that are consistent with workplace goals and products; analysing performance information; and making recommendations for systems improvement to include in workplace forward planning
- operated refrigeration or cold chain systems efficiently, including identifying and implementing strategies for reducing heat load in workplace chiller or freezer; minimising energy costs; maximising availability and minimising down time; maintaining temperatures according to quality and food safety requirements
- prepared safety procedures for chillers or refrigeration systems, including emergency plans and procedures for incidents and accidents associated with refrigerants (leaks and spills); and procedures for the safe and efficient operation of equipment, including forklifts and lights, in chillers and freezers
- utilised information and communications technology, including statistical and modelling software for research, data collection and analysis, and reporting.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- refrigeration concepts and terms, including:
 - ambient temperature
 - Biot number: ratio of conductive (internal) resistance to heat transfer to the convective (external) resistance
 - half cooling time
 - surface heat transfer
 - thermal properties of meat, including conductivity
- strategies for reducing heat loads, including:
 - air curtains
 - automatic door closers
 - improved insulation to prevent heat filtration through wall
 - no lights, people, machinery inside
 - plastic strips
 - removal of heat load caused by fans
- impact of high and low humidity on eating quality, production and storage of meat and meat products
- impact of moisture transfer during chilling and freezing on quality, production and storage of meat and meat products
- impact of packaging on chilling and freezing rates of meat and meat product
- concept of heat load and the implications for product quality and energy requirements for refrigeration system
- methods of chilling and freezing meat and meat products, including:
 - air (including natural convection, forced convection and spray chilling)
 - air freezing

- contact freezing
- cryogenic (including gaseous, solid and liquid – liquid nitrogen and solid carbon dioxide)
- cryogenic freezing
- direct contact (including plate freezing and conduction)
- direct freezing systems
- liquid immersion (including chilled water or glycol solution)
- the impact of chilling, chilling rates, freezing and freezing rates on quality, production and storage of meat and meat products
- qualities of humidity, including changes in evaporation, pH levels, saturation humidity, saturation vapour pressure.

Assessment Conditions

Assessment of the skills in this unit of competency must take place under the following conditions:

- physical conditions:
 - skills must be demonstrated in a meat industry workplace or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - access to appropriate technology
- specifications:
 - access to workplace documents such as policies, procedures, processes, forms
 - access to specific legislation/codes of practice relevant to workplace operations.

Assessment for this unit must include at least three forms of evidence.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

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