



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MTMP401A Utilise refrigeration index**

**Release: 1**

## MTMP401A Utilise refrigeration index

### Modification History

Not Applicable

### Unit Descriptor

|                        |                                                                                                                                                                                                                                                                                                      |
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| <b>Unit descriptor</b> | <p>This unit covers the skills and knowledge required to use the Refrigeration Index (RI) to validate compliance of a chilling and freezing process.</p> <p>The Export Control Orders (ECO), which came into effect in July 2005, require the validation of all chilling processes using the RI.</p> |
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### Application of the Unit

|                                |                                                                                                                                                            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Application of the unit</b> | <p>This unit is applicable to Quality Assurance (QA) staff and regulators who utilise the RI to validate compliance of a chilling or freezing process.</p> |
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### Licensing/Regulatory Information

Not Applicable

### Pre-Requisites

|                           |  |  |
|---------------------------|--|--|
| <b>Prerequisite units</b> |  |  |
|                           |  |  |
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## Employability Skills Information

|                             |                                          |
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| <b>Employability skills</b> | This unit contains employability skills. |
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## Elements and Performance Criteria Pre-Content

|                                                                   |                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Elements describe the essential outcomes of a unit of competency. | Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide. |
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## Elements and Performance Criteria

| ELEMENT                                       | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Define the RI                              | 1.1. RI measure and the uses of predictive microbiological model are explained.<br>1.2. Regulatory requirements for process compliance using the RI are identified.<br>1.3. <b>Factors affecting microbial growth</b> are identified.<br>1.4. RI model parameters are identified.               |
| 2. Collect <b>temperature data</b> for RI     | 2.1. Data logger is set up correctly.<br>2.2. Temperature sensor is placed in <b>product</b> , taking into account the point of microbiological concern and recommended placement.<br>2.3. Time-temperature data is processed into correct format for RI calculator.                            |
| 3. Select and define process to be validated  | 3.1. Process is defined in terms of the output.<br>3.2. Production lot is defined.<br>3.3. Variables in the process are identified.<br>3.4. Number of measurements to be taken is identified.<br>3.5. When and where data is to be collected is identified.<br>3.6. RI criteria are identified. |
| 4. Calculate RI index                         | 4.1. Software is loaded and opened.<br>4.2. Correct calculator options for process being validated are selected.<br>4.3. RI for process to be validated is calculated.                                                                                                                          |
| 5. Utilise RI to validate process             | 5.1. RI is compared with ECO requirements.<br>5.2. Appropriateness of the data is assessed where RI does not comply.<br>5.3. Action is taken on a non-conforming process.<br>5.4. Decisions are made on production disposition for a refrigeration breakdown.                                   |
| 6. Document a validation process using the RI | 6.1. Purpose, process and arrangements for the validation are described.<br>6.2. Data collection methods and calculation options used are described and data collected is summarised.<br>6.3. Validation decision is stated.                                                                    |

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

**REQUIRED SKILLS AND KNOWLEDGE****Required skills**

Ability to:

- define a process and the relevant variables
- plan and manage the collection of data for a validation exercise
- arrange and document the validation of a chilling process using the RI
- input data into the RI index
- identify and resolve data inconsistencies
- process data into the correct format for the RI calculator
- review RI calculated and make decisions on process validation or product disposition
- apply relevant **communication** and **mathematical skills**
- maintain currency of knowledge and techniques through informal learning and personal research utilising such things as the web, industry journals, Australian Quarantine Inspection Service (AQIS) notices and conference workshops
- work effectively as an individual and as a team member when gathering data
- identify and apply relevant **Occupational Health and Safety (OH&S)**, **regulatory** and **workplace requirements**
- take action to improve own work performance as a result of self-evaluation, feedback from others, or in response to changed work practices or technology

**Required knowledge**

Knowledge of:

- growth phases of microbes
- purpose of predictive microbiological models
- how and why RI is used
- the parameters of the RI model
- product disposition using the RI
- ECO criteria for RI
- requirements for data collection
- different RI calculator options
- documentation requirements for process validation using RI
- factors affecting the growth of microbes
- meaning of log values

## Evidence Guide

### EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

#### Overview of assessment

The meat industry has specific and clear requirements for evidence. A minimum of three forms of evidence is required to demonstrate competency in the meat industry. This is specifically designed to provide evidence that covers the demonstration in the workplace of all aspects of competency over time.

These requirements are in addition to the requirements for valid, current, authentic and sufficient evidence.

Three forms of evidence means three different kinds of evidence - not three pieces of the same kind. In practice it will mean that most of the unit is covered twice. This increases the legitimacy of the evidence.

All assessment must be conducted against Australian meat industry standards and regulations.

#### Critical aspects for assessment and evidence required to demonstrate competency in this unit

Competency must be demonstrated utilising the RI calculator.

#### Context of and specific resources for assessment

Assessment may involve processing real or simulated data.

#### Method of assessment

Recommended methods of assessment include:

- assignment
- quiz of underpinning knowledge
- simulation
- workplace demonstration
- workplace project
- workplace referee report of performance over time.

Assessment practices should take into account any relevant language or cultural issues related to Aboriginality or Torres Strait Islander, gender, or language backgrounds other than English. Language and literacy demands of the assessment task should not be higher than those of the work role.

**EVIDENCE GUIDE****Guidance information for assessment**

A current list of resources for this unit of competency is available from MINTRAC [www.mintrac.com.au](http://www.mintrac.com.au) or telephone 1800 817 462.

**Range Statement****RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

***Factors affecting microbial growth*** include:

- lactic acid levels
- lag phase
- pH
- temperature
- time
- water activity.

***Temperature data*** includes:

- air flow
- locating and siting sensors
- nature and type of freezers/chillers
- product being refrigerated
- sites of microbial concern
- time of chilling operation
- worst case scenarios.

***Product*** may include:

- beef (e.g. brisket and tongue)
- game meat
- lamb (e.g. legs and tongue)
- mutton
- other meat species or products
- pork (e.g. ham and spring)
- veal.

***Communication skills*** may include:

- speaking clearly and directly
- listening and understanding
- communicating with people from a range of cultural, social and ethnic backgrounds

| RANGE STATEMENT |                                                                                                                                                                                                                                                                                                        |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <ul style="list-style-type: none"><li>• reading and interpreting workplace documentation</li><li>• the preparation of documentation for a specified audience</li><li>• the use of negotiation and persuasion skills, and being appropriately assertive</li><li>• the sharing of information.</li></ul> |

| <b>RANGE STATEMENT</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mathematical skills</b> may include:     | <ul style="list-style-type: none"> <li>• collection, estimation, calculation and interpretation of deviations within cycle, internal temperature, humidity, ambient temperature and weights</li> <li>• graphs of microbial growth</li> <li>• logarithm growth rates</li> <li>• model parameters</li> <li>• percentiles</li> <li>• predictive models.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>OH&amp;S requirements</b> may include:   | <ul style="list-style-type: none"> <li>• enterprise OH&amp;S policies, procedures and programs</li> <li>• OH&amp;S legal requirements</li> <li>• Personal Protective Equipment (PPE) which may include:               <ul style="list-style-type: none"> <li>• coats and aprons</li> <li>• ear plugs or muffs</li> <li>• eye and facial protection</li> <li>• head-wear</li> <li>• lifting assistance</li> <li>• mesh aprons</li> <li>• protective boot covers</li> <li>• protective hand and arm covering</li> <li>• protective head and hair covering</li> <li>• uniforms</li> <li>• waterproof clothing</li> <li>• work, safety or waterproof footwear</li> </ul> </li> <li>• requirements set out in standards and codes of practice.</li> </ul> |
| <b>Regulatory requirements</b> may include: | <ul style="list-style-type: none"> <li>• Export Control Act</li> <li>• ECO</li> <li>• hygiene and sanitation requirements</li> <li>• relevant regulations and Australian Standards</li> <li>• requirements set out in AS 4696:2007 Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption</li> <li>• state and territory regulations regarding meat processing.</li> </ul>                                                                                                                                                                                                                                                                                                               |
| <b>Workplace requirements</b> may include:  | <ul style="list-style-type: none"> <li>• enterprise-specific requirements</li> <li>• OH&amp;S requirements</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**RANGE STATEMENT**

|  |                                                                                                                                                                                                                    |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"><li>• QA requirements</li><li>• Standard Operating Procedures (SOPs)</li><li>• the ability to perform the task to production requirements</li><li>• work instructions.</li></ul> |
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**Unit Sector(s)**

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| <b>Unit sector</b> |  |
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**Co-requisite units**

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|---------------------------|--|--|
| <b>Co-requisite units</b> |  |  |
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**Competency field**

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|-------------------------|--|
| <b>Competency field</b> |  |
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