



Australian Government

Department of Education, Employment and Workplace Relations

MTMP404A Apply meat science

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers the skills and knowledge required to apply meat science to the eating quality of meat and to interpret scientific data to predict probable impacts on meat eating quality. It is a Meat Standards Australia (MSA) requirement that enterprises with a licence Level 1(b) have a MSA Coordinator who has completed this unit or a MSA approved equivalent unit.
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Application of the Unit

Application of the unit	The skill and knowledge gained from this unit will enable a person to interpret meat processing data and to recommend improvements to management to control and enhance the eating quality of meat products. This unit is suitable for people working in the red meat industry in a Quality Assurance (QA) or management role. MSA requirements include adherence to the MSA Standards Manual for Grading, the MSA Standards Manual for Saleyard Consignment and the MSA Standards Manual for Trade Mark Usage.
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	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. Apply knowledge of muscle structure and biochemistry to meat quality and the factors that affect it	1.1. Biological mechanisms (both pre and post slaughter) that affect meat quality in beef are explained. 1.2. Pattern of tissue development in the body and the pattern of deposition within the muscle and fat depots within the body are identified including the composition of fat in depots and the extent it can be manipulated by production factors. 1.3. Structure of skeletal muscles in terms of the myofibre and connective tissue components and the effect that these structures have on eating quality is identified. 1.4. Biochemical events that occur in muscle early post-mortem and their significance in subsequent meat quality are identified.
2. Identify the <i>production and pre-slaughter factors that affect meat quality</i>	2.1. Impacts of production factors on meat quality are identified. 2.2. Pre-slaughter factors are explained.
3. Identify the <i>processing factors that impact on eating quality</i>	3.1. pH/temperature window and how it impacts on palatability is explained. 3.2. Role of electrical stimulation in controlling the rate of glycolysis in the carcass is described. 3.3. Impact of stretching the muscles pre-rigor on palatability is explained. 3.4. Process of ageing, its impact on tenderness and methods for extending the storage life of fresh meat including the application of packaging technologies is described. 3.5. Impact of cooking on the palatability of meat is described.
4. Describe quality attributes of meat	4.1. Factors that control the changes in colour in fresh meat are identified. 4.2. Development of marbling fat and its impact on palatability in the carcass is described. 4.3. Impact of drip on both the appearance and palatability of meat is explained.
5. Identify and evaluate the MSA cuts based grading scheme	5.1. Palatability Analysis Critical Control Points (PACCP) approach to meat grading is explained. 5.2. Principles behind the development of the MSA carcass pathways system, including tasting protocols, are described.

ELEMENT	PERFORMANCE CRITERIA
	5.3. Impact of the various production, processing and value-adding inputs on the palatability of beef using the MSA model are established. 5.4. Potential benefits of a cuts-based grading system to the various sectors of the industry are evaluated. 5.5. Alternative grading schemes and their various grade attributes are analysed.
6. Interpret and analyse data to predict probable impacts on meat eating quality	6.1. Probable impacts of production and processing on meat quality are predicted. 6.2. Potential solutions for eating quality problems are identified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to:

- apply relevant **communication skills**
- collate and analyse eating quality **data**
- maintain currency of knowledge through independent research or professional development
- identify and apply relevant **OH&S, regulatory** and **workplace requirements**
- identify and recommend improvements that could be made to improve meat eating quality to management
- 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:

- consumer taste testing protocols and how they have been used to set grade standards and develop the cuts-based grading system
- factors that control the changes in colour in fresh meat and other quality factors including drip and marbling which impact on both appearance and palatability
- factors that occur between the knocking box and chiller assessment and their impact on meat palatability
- visual and palatability attributes of meat quality that are important to customers

REQUIRED SKILLS AND KNOWLEDGE

- physical and chemical changes that occur in the cooking of meat
- anatomical and biochemical determinants of meat palatability
- factors in animal husbandry, transport, lairage, slaughter, carcase storage, packaging, further processing and cooking that will impact on tenderness and palatability
- *minimum standards of performance*

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 over time and under typical operating and production conditions for the enterprise.

Context of and specific resources for assessment

Competency must be assessed in the workplace or under simulated conditions. Assessment is to occur under standard and authorised work practices, safety requirements and regulatory requirements.

Method of assessment

Recommended methods of assessment are:

- evidence log book
- observation of the applicant working
- workplace referee or third party report of performance over time
- written tests and/or questioning.

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 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.

Production and pre-slaughter factors that affect meat quality may include:

- breed
- growth path
- glycogen depletion
- high pH
- Hormonal Growth Promotants (HGP)
- stress and stress reduction techniques.

Processing factors that affect meat eating quality may include:

- ageing
- anatomical factors
- biochemical factors
- cooking methods
- electrical stimulation
- fat distribution
- grain feeding
- growth rate or path
- hanging method
- hormonal growth promotants
- marbling
- packaging methods
- Pale Soft Exudative (PSE)
- pH
- post mortem shortening
- social regrouping of cattle
- starvation
- stress

RANGE STATEMENT	
	• temperature • time and temperature of cooking process • transport • tropical breed content.

RANGE STATEMENT	
Communication skills may include:	• applying numeracy skills to workplace requirements • being appropriately assertive • interpreting the needs of internal or external customers • listening and understanding • reading and interpreting workplace-related documentation • sharing information • speaking clearly and directly • working with diverse individuals and groups • writing to audience needs.
Data includes:	• ageing requirements • AUS-MEAT chiller assessment results, transport times • chiller cycles • lairage duration and conditions • MSA grading results • processing conditions, such as stimulation and other electrical inputs • time across the slaughter floor.
OH&S requirements may include:	• enterprise OH&S policies, procedures and programs • OH&S legal requirements • Personal Protective Equipment (PPE) which may include: • coat and apron • ear plugs or muffs • eye and facial protection • head-wear • lifting assistance • mesh apron • protective boot covers • protective hand and arm covering • protective head and hair covering • uniforms • waterproof clothing • work, safety or waterproof footwear • requirements set out in standards and codes of practice.

RANGE STATEMENT	
Regulatory requirements may include:	• Export Control Act • relevant Australian Standards • relevant regulations • AS 4696:2007 Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption • state and territory regulations regarding meat processing.
Workplace requirements may include:	• enterprise-specific requirements • OH&S requirements • QA requirements • Standard Operating Procedures (SOPs) • the ability to perform the task to production requirements • work instructions.
Minimum standards of performance include:	• ability to identify areas where changes in management could potentially improve eating quality • analysis of data to present management with possible solutions.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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