Australian Government

Department of Education, Employment and Workplace Relations

FDFAU4007B Audit a heat treatment process

Release: 1

FDFAU4007B Audit a heat treatment process

Modification History

This unit supersedes and is equivalent to FDFAU4007A Audit a heat treatment process. November 2011: update to Evidence Guide.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to support a food safety audit that includes heat treatment processes designed to bring about a defined logarithmic reduction of the target organism to ensure safe food. This may include pasteurised product with a nominated refrigerated shelf life and commercially sterile, shelf-stable product.

Application of the Unit

Application of the unit	This unit applies to the role of a food safety auditor responsible for auditing heat treatment processes. Audit processes would typically occur within the context of auditing a HACCP-based food safety program that defines related prerequisite program requirements. This unit applies to auditing aspects of the process that directly relate to delivering the prescribed heat treatment. It covers related factors, such as raw materials receival, pre- and post-process storage and packaging methods and materials only to the extent that impact on or are controlled by the heat treatment process. It supports relevant legislation such as food standards contained in the Food Standards Code and industry codes of practice relating to the validation and verification of a HACCP-based food safety program, and should be read in conjunction with these documents. Both regulatory and commercial audit system owners may specify additional certification requirements of auditors eligible to audit food safety programs within their system. Where an auditor is responsible for auditing heat treatment as part of a cook chill process, they will also need to achieve competence in FDFAU4006A Audit a cook chill process.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	FDFAU4002A	Communicate and negotiate to conduct food safety audits
	FDFAU4003A	Conduct food safety audits
	FDFAU4004A	Identify, evaluate and control food safety hazards

Employability Skills Information

Employability skills	This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify and assess food safety hazards and related control options for heat treatment processes	1.1. Microbiological food safety hazards that could present a risk in the food at the point of consumption are identified by type, origin and food association level and assessed to determine the significance of the hazard 1.2. Heat treatment processes, control requirements and methods are identified to ensure that finished, heat-treated products meet food safety objectives
2. Confirm that appropriate evidence supports validation of the heat treatment process	2.1. Validation evidence and records are reviewed to confirm that an appropriate level of validation has been applied 2.2. Evidence used by the business to validate the process is identified and assessed to confirm that it is credible and adequate to achieve the food safety objective
3. Confirm verification of the food safety program for a heat treatment process	3.1. System records required to support verification are identified, collected and reviewed 3.2. Business documentation is reviewed and inspections are conducted to confirm that facilities and equipment design and components comply with regulatory and business standards 3.3. Business documentation is reviewed and inspections are conducted to confirm that operational monitoring and testing procedures and frequency meet regulatory requirements, and industry and business standards

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to:

- interpret and apply relevant legislation, standards, codes of practice and technical specifications relating to heat treatment of foods
- identify microbiological food safety hazards that can occur in heat-treated food products
- inspect heat treatment plant and equipment to confirm that regulatory, industry and business standards are met
- apply principles of heat treatment to assess the suitability of thermal processes and related packaging and storage to achieve the food safety objective and minimise the risk of post-processing contamination
- review workplace records and other documentation to verify that the food safety program relating to heat treatment and related processes is being implemented according to the prescribed process
- review evidence used by the business to validate the food safety control process
- confirm methods and evidence used to evaluate the capacity of equipment, processing method and packaging form to deliver heat distribution and heat penetration requirements

Required knowledge

Knowledge of:

- regulations, codes of practice, guidelines, technical specifications and where appropriate, specific product heat treatment requirements and Australian standards relating to heat treatment of foods
- target organisms that can occur in heat-treated foods and related survival and growth characteristics
- principles of heat treatment and application of heat-processing methods to product types
- criteria used to specify and evaluate heat treatment for each heat processing method
- factors that impact on heat distribution and heat penetration according to heat-processing method
- principles of operation of commercial heat-processing equipment, including equipment features required to meet regulatory requirements and critical factors to be controlled to ensure delivery of prescribed heat treatment and related processes
- procedural safeguards used to track processing of product
- principles of packaging to form a suitable seal and impact of packaging system and heat treatment methods and equipment on process effectiveness and packaging integrity

REQUIRED SKILLS AND KNOWLEDGE
• characteristics of raw materials and pre-processing requirements that impact on the microbiological profile and need to be considered in determining the thermal process • post-processing packaging and handling that impact on the ability to maintain the food safety objective following thermal processing, and related prerequisite programs required to support effectiveness of heat treatment processes • food safety risks and controls to avoid post-process contamination of heat-treated product • principles of sampling requirements and test methods to confirm equipment integrity, effectiveness of heat treatment, packaging system and seal integrity and post-processing conditions to meet regulatory, industry and business standards

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	A person who demonstrates competency in this unit must be able to provide evidence that they can verify food safety programs involving heat treatment processes to meet regulatory, industry and business standards. They must also demonstrate capacity to confirm that appropriate validation has occurred. Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed. Competency in this unit must be achieved in accordance with food safety standards and regulations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessment must confirm that the candidate can: • identify product-specific risks and typical processing methods for a range of products, including sources of information on heat treatment requirements • participate in audits of HACCP-based food safety programs to demonstrate ability and knowledge of technical aspects of heat treatment processes. Assessment must include the demonstration of appropriate methods, including the use of time temperature indicators (TTIs) to measure the effectiveness of a range of heat treatment. Related processes, such as evaluation of raw materials, sterilisation of packaging and equipment (relevant to aseptic systems) and post-process handling, will be considered where they directly impact on the effectiveness of heat treatment. Assessment requires participation in at least two audits of different heat treatment processes. For given scenarios where prescribed processing requirements are not met, assess adequacy of evidence used to determine response procedures.
Context of and specific resources for assessment	Competency may be assessed in an actual workplace or simulated environment that provides access to the required resources. At least one of the audit scenarios should be assessed in an actual workplace context. Assessment is to occur under standard and authorised work practices, safety requirements and environmental

EVIDENCE GUIDE	
	constraints. The following resources must be available: • food safety plans covering heat treatment processes • food safety-related documentation typical of commercial manufacturing businesses and used for the purpose of verification • evidence and documentation relevant to heat treatment processes that would typically be used by commercial manufacturing businesses to support validation processes • plant and equipment that would typically be used in a commercial manufacturing business.
Method of assessment	This unit only covers the technical skills and knowledge related to the specific area of risk. Generic food safety auditing skills and knowledge are covered in prerequisite units. While participation in audit processes should follow good auditing practice as specified by prerequisite units, formal assessment of generic food safety auditing competence does not need to be repeated when assessing this unit. The following assessment methods should be considered to gather sufficient and valid evidence of competency: • observation and a report covering the audits specified in this Evidence Guide • oral and written questioning to test the level and application of underpinning knowledge • demonstration of appropriate methods, including the use of time temperature indicators (TTIs) to measure the effectiveness of a range of heat treatment. The audits conducted for the purpose of assessment must be witnessed by an auditor competent to audit a heat treatment process. Assessment methods must satisfy the endorsed Assessment Guidelines of FDF10 Food Processing Industry Training Package.
Guidance information for assessment	To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.

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.	
Heat treatment processes	Heat treatment processes may include: • retorting systems • pasteurisation systems • aseptic processing and packaging systems • hot fill systems
Validation	Validation refers to obtaining evidence to confirm that a HACCP-based food safety program is complete and effective and will deliver the expected food safety outcomes
Validation evidence	Validation evidence confirms that control measures are capable of being consistently effective and may include the application of: • existing Australian legislative requirements • challenge tests • peer reviewed scientific papers • targeted scientific reports • validation already carried out in other jurisdictions and recognised by the responsible authority • mathematical modelling (e.g. predictive microbiology models) • industry codes of practice (where implementation by food business is verified during audits)
Verification	Verification refers to methods and procedures used to carry out monitoring, including sampling and testing to provide evidence that the specifications set by relevant legislation and codes of practice continue to be met
Business standards	Business standards refer to standards or technical specifications set by the system owner based on

RANGE STATEMENT	
	and in addition to regulatory requirements that relate specifically to food safety
Relevant legislation, **standards**, **codes of practice and technical specifications**	Relevant legislation, standards, codes of practice and technical specifications relating to heat treatment requirements may include: • relevant sections of the Australia New Zealand Food Standards Code • Validation and Verification of Heat Treatment Equipment and Processes (ANZDAC - draft) • international protocols, such as Codex Alimentarius Vol 1B - 1995 Section 2, Recommended International Code of Hygienic Practice for Low-acid and Acidified Low-acid Canned Foods, CAC/RCP, 23-1979, Rev 2 1993, App III • Australian Standard for Equipment for the Pasteurization of Milk and Other Liquid Dairy Products - Continuous-flow systems (AS 3993:2003) • AQIS Export Control (Milk and Milk Products) Orders, 2005 • code of practice for the manufacture of egg products • state and territory regulations, codes of practice and guidelines

Factors that affect heat distribution and heat penetration	Factors that affect heat distribution and heat penetration may include:
	• raw material characteristics, such as:
	  • rheology and density
	  • particulates and position within container
	  • pH
	• heat treatment method and related equipment (process holding times and temperatures)
	• heating systems
	• packaging design

Commercial heat processing equipment	Commercial heat processing equipment may include: • pre-processing equipment • methods to achieve sterilisation of plant and packaging material (for aseptic systems)

RANGE STATEMENT	
	• filling equipment • heat treatment systems using both direct and indirect heating methods • packaging systems
Packaging	Packaging may include: • cans • glass containers • aluminium and plastic semi-rigid and flexible containers • bags • composite packaging • bulk packaging
Product sealing processes	Product sealing processes may include hermetic sealing in processes, such as canning, or sealing pasteurised products in cartons and other sealed containers
Prerequisite programs	Prerequisite programs are also referred to as support programs, such as Good Manufacturing Practice (GMP), Good Agricultural Practice (GAP) and Good Hygienic Practice (GHP). Pre-requisite programs can be divided into two categories: **Infrastructure and maintenance programs**. These may include: • layout, design, construction and amenities of buildings and facilities • supplies of air, water, energy and other utilities • equipment, including sanitary design, preventative maintenance, calibration and cleaning and sanitation • support services, including waste and sewage disposal • pest control **Operational prerequisite programs**. These may include: • personal hygiene • measures for the prevention of cross-contamination • packaging and labelling procedures

RANGE STATEMENT	
	• supplier assurance • chemical storage • employee training • document control • internal audit programs • traceability programs • product integrity and security • cold chain management • inspecting and testing regimes, including analytical and microbiological testing • control of non-conforming product, processes and recall programs
Test methods	Test methods include: • conducting studies of process evaluation • conducting studies of equipment performance
Additional reference material	Additional reference material includes: • US Food and Drug Administration Guides to Inspections • US Food and Drug Administration Code of Federal Regulations. Requirements for Establishment Registration, Thermal Process Filling, and Good Manufacturing Practices for Low-Acid Canned Foods and Acidified Foods • Campden & Chorleywood Food Research Association Publications

Unit Sector(s)

Unit sector	Food safety auditing

Competency field

Competency field	

Co-requisite units

Co-requisite units		