Modification history

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| Release | Comments |
| Release 1 | This version released with FBP Food, Beverage and Pharmaceutical Training Package version 3.0. |

| FBPFST5006 | Identify the microbiological and chemical properties of fermented foods |
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| Application | This unit of competency describes the skills and knowledge required to  identify the microbiological and chemical properties of fermented food and/or beverages including the identification of food spoilage.  The individual is required to demonstrate deep knowledge in a specific technical area and to design and communicate solutions to sometimes complex problems.  This unit applies to individuals who are responsible for analysing the microbiology and biochemistry of fermented food in food and beverage processing operations. They typically and undertake roles in overseeing the production process.  No occupational licensing or certification requirements apply to this unit at the time of publication. However, legislative and regulatory requirements for food processing exist so local requirements must be checked. All work must comply with Australian food safety standards and relevant codes of practice. |
| Prerequisite Unit | Nil |
| Unit Sector | Food science and technology (FST) |

| Elements | Performance Criteria |
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| Elements describe the essential outcomes. | Performance criteria describe the performance needed to demonstrate achievement of the element. |
| 1. Identify the microbiology that underpins the process of fermenting food | 1.1 Identify the types and characteristics of microorganisms used for fermentation within the food industry  1.2 Identify specific fermented product and the types and characteristics of microorganisms used in its processing  1.3 Use standard microbiological techniques to isolate and identify yeasts and bacteria in given fermented food samples |
| 2. Identify the chemistry that underpins the process of fermenting food | 2.1 Identify the significance of pH in fermenting food or beverages  2.2 Track the reactions and properties of sugars and starches through a fermentation process  2.3 Identify commonly occurring chemical reactions, factors required to cause a reaction, and the effects of reactions  2.4 Review safe work procedures for processes that involve chemical reactions or the handling of chemicals |
| 3. Apply the principles of microbiological quality control | 3.1 Determine the spoilage patterns of fermented foods at different temperatures  3.2 Determine the relationship between spoilage patterns and the growth cycle of the specific food spoilage and poisoning organisms  3.3 Identify and evaluate a microbiological quality control program for a specific fermented food in terms of the Food Standards Code and the critical control points (CCPs) |
| 4. Identify food poisoning and spoilage bacteria, including methods of control | 4.1 Identify the major bacteria responsible for food poisoning and spoilage  4.2 Evaluate the types of processes used in the control of microbial growth in food products  4.3 Determine the effect of fermentation over a range of pH on the growth patterns of microbes |
| 5. Perform microbiological techniques for the identification of food borne disease | 5.1 Use standard microbiological techniques to identify and enumerate food poisoning and spoilage organisms from a food sample  5.2 Identify the type of toxins produced by the major food pathogens  5.3 Determine the ramifications of product contamination in terms of public health and product shelf-life quality  5.4 Handle specimens and waste to comply with workplace health and safety guidelines |
| 6. Communicate and interpret technical information | 6.1 Use appropriate technical terms to communicate information about the properties of commonly used foods and materials  6.2 Interpret and apply test results and reporting formats to communicate information on composition, properties and reactions |

| 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. | |
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| Skill | Description |
| Reading | * Interprets food safety guidelines, standards and regulations * Interprets documented processes for control of microbial growth in food products |
| Numeracy | * Maintains and analyses data resulted from microbiological tests * Determines calibration procedures and schedule for test equipment |

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| Unit Mapping Information | | | |
| Code and title current version | Code and title previous version | Comments | Equivalence status |
| FBPFST5XX1 Identify the microbiological and chemical properties of fermented foods |  | New unit | No equivalent unit |

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| Links | Companion Volumes, including Implementation Guides, are available at VETNet: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=78b15323-cd38-483e-aad7-1159b570a5c4 |

| TITLE | Assessment requirements for FBPFST5XX1 Identify the microbiological and chemical properties of fermented food |
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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 identified and analysed microbiological and chemical effects that take place in the fermentation of two different food and/or beverage products, including:   * identifying the types and effects of microbiological hazards (for each) * identifying examples of spoilage in fermented food and/or beverages and how they could be avoided * determining the ramifications of product contamination in terms of public health and product shelf-life. | |

| Knowledge Evidence |
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| 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:   * processes used in the control of microbial growth in food products * major bacteria responsible for food poisoning and spoilage * processes used in the control of microbial growth in food products * Food Standards Code * standard microbiological techniques to identify food poisoning and spoilage organisms * the importance of plant hygiene and how it can affect the finished product * microbiological toxins and aflatoxins * typical spoilage patterns in fermented foods caused by chemical and microbiological issues * the relationship between spoilage patterns and the growth cycle of the specific food spoilage/poisoning organisms * microbiological quality control programs * plant hygiene, including sanitation checks – rinse, swab, contact and rapid methods * rapid microbiological techniques: * accelerated culture techniques * rapid biochemical tests * measurement of total bacteria metabolism * measurement of spoilage * non-traditional methods * automated and mechanised methods * the relevance of rapid microbiological technology, as related to control of plant hygiene * potential microbiological hazards, including: * Salmonella * Saccharomyces spp. * Streptococcus spp. * Listeria monocytogenes * chemical hazards * standard microbiological techniques to isolate and identify yeasts and bacteria in given food samples * critical control limits and microbiological processes and species in fermented food and beverage production * analysis of microbiological data by comparison with food safety and production standards * work health and safety hazards and controls relating to work processes * characteristics and phenomena that occur during fermentation, including: * heat and temperature * relative humidity * work and energy input * viscosity * particle size * melting points, boiling points, freezing points * dew and condensation points * common chemical reactions that occur in food processing, including both spontaneous and controlled reactions, including: * the role of enzymes in generating biological reactions * tests commonly used to measure phenomena, and related units of measurement * transition phases applicable to a given production process * the role of temperature and pressure in the transition process * pH and its impact on food processes, including: * differences between a strong acid and a concentrated acid * units of measurement * classification of commonly used materials, ingredients and indicators according to pH * the typical strengths and concentration levels required for commonly used acids and bases * the significance of pH for processing, food safety and cleaning applications * safety hazards and required control methods when handling chemicals and working with processes involving chemical reactions * basic research skills required for technical information to describe food properties and reactions, including recognising and applying appropriate units of measurement and terms. |

| Assessment Conditions |
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| Assessment of skills must take place under the following conditions:   * physical conditions: * skills must be demonstrated in a workplace setting or an environment that accurately represents a real workplace * resources, equipment and materials: * laboratory and related equipment, manufacturers’ advice and operating procedures * specifications: * tests used to report relevant product/process information and recorded results.   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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