Modification history

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

| FBPTEC4XX10 | Control and monitor fermentation |
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| Application | This unit of competency describes the skills and knowledge required to produce fermented foods or beverages.  This unit applies to those workers who have responsibility for overseeing the production of fermented food and/or beverages and the quality assurance requirements associated with those products.  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 | Technical (TEC) |

| 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. Prepare for fermentation | 1.1 Identify and address requirements of Food Standards Code and local health department, for product  1.2 Identify hazards in the fermentation process and manage risks  1.3 Clean and sanitise equipment and environment  1.4 Confirm availability of raw materials and starter, as required  1.5 Check quality of raw materials meets specification for end product |
| 2. Ferment food or beverage | 2.1 Inoculate food or beverage product with starter, as required and mix  2.2 Add ingredients and adjuncts, specific to product  2.3 Set time, temperature and humidity for fermentation  2.4 Control temperature and humidity to facilitate fermentation  2.5 Conduct standard in production tests to monitor quality of product  2.6 Analyse test results and adjust process as required  2.7 Stop fermentation process when food or beverage reaches target food safety parameters, and desired texture, taste and appearance  2.8 Record details of process for traceability, in line with organisational and regulatory requirements  2.9 Cool product ready for packaging, where required |
| 3. Conduct final product testing | 3.1 Conduct microbiological tests to check final product is safe for market  3.2 Conduct physical tests to check final product is safe for market  3.3 Conduct chemical tests to check final product is safe for market  3.4 Record results of tests in line with regulatory requirements |
| 4. Conduct housekeeping activities | 4.1 Clean equipment and work area in line with workplace procedures  4.2 Conduct routine maintenance activities  4.3 Dispose of waste in line with regulatory requirements |

| 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 |
| Numeracy skills | * Convert units involving multiples and submultiples * Use fractions, decimals, proportions and percentages to determine responses to results * Use volumes (ml, L) and weights (mg, g, kg) to describe product quantities * Calculate dose (mg), average mass, mass percentage, density, moisture, relative and absolute humidity * Determine ratios, such as mass to mass, mass to volume and volume to volume percentages * Calculate concentration, such as g/100mL, mg/L and dilution ml/L * Calculate salinity |
| Get the work done | * Think through options to identify and respond to atypical results of tests * Trace and source obvious cause of artefact or malfunction |

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| Unit Mapping Information | | | |
| Code and title current version | Code and title previous version | Comments | Equivalence status |
| FBPTEC4XX10 Control and monitor fermentation |  | 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 FBPTEC4XX10 Control and monitor fermentation |
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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 controlled and monitored the fermentation of six different products, utilising three different fermentation categories from the following list:   * yeast * bacteria * fungi * yeast and bacteria * bacteria and fungi * yeast, bacteria and fungi   For each category utilised, there should be two products that show consistent colour, smell, texture, taste and appearance.  There must also be evidence that the individual can identify contamination or spoilage in each of the three categories chosen. | |
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| 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:   * different starter organisms for fermentation * licensing requirements for the production and sale of fermented food and beverage products * products that are fermented with: * yeast, including beer, cider, wine, microbially assisted baked goods * bacteria (lactic acid fermentation which does not always require a starter), including sauerkraut, kimchi, olives, vinegar, fermented vegetables, chilli sauce, cultured butter, water kefir * fungi, including koji, miso, soy sauce, tempeh, natto * yeast and bacteria, including kombucha * bacteria and fungi, including cheese * yeast, bacteria and fungi, including milk kefir, sake * ideal temperature to promote successful fermentation, relevant to product * specific starters used for different products, including symbiotic culture of bacteria and yeast (SCOBY) for kombucha * natural starters versus commercial starters, and which are allowed under the Food Standards Code * typical adjuncts added to the fermentation process * essential ingredients for fermentation, including salt and sugar * typical microbiological, chemical and physical tests carried out in production and on end products * acceptable parameters for typical test results * interpretation of test results, including simple calculations * risks of pathogens, fungi, parasites and bacteria associated with fermentation processes * instruments and measurements used for typical tests including thermometer probe, pH meter, hygrometer * calibration requirements of measuring and testing equipment * aerobic/anaerobic requirements for specific fermentation processes * how to sanitise equipment and where necessary, ingredients * how changes in pH indicate success or otherwise of the fermentation process * air circulation requirements of specific products * possible effects of temperature fluctuations, relative humidity and air circulation on product * methods for controlling atypical outcomes of tests, relevant to process * Food Standards Code and local health department requirements in relation to production and sale of fermented food and beverages, including licensing requirements * tensions between the Food Standards Code and the fermentation process * waste handling and disposal requirements * record keeping requirements for traceability of product. |

| 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 fermented food or beverage production environment * resources, equipment and materials: * raw materials and equipment to ferment food and/or beverage * testing equipment * specifications * specification for product.   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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