

**Modification history**

Release	Comments
Release 1	This version released with FBP Food, Beverage and Pharmaceutical Training Package Version 6.0

FBPOPR3XX4	Operate and monitor an extrusion process
<b>Application</b>	<p>This unit of competency describes the skills and knowledge required to set up, operate, monitor, adjust and shut down an extrusion process.</p> <p>This unit applies to individuals who work in a food or feed processing environment. It typically applies to the production worker responsible for applying operating principles to the operation and monitoring of an extrusion process and associated equipment.</p> <p>All work must be carried out to comply with workplace procedures according to state/territory health and safety, environmental and food safety regulations, legislation and standards that apply to the workplace.</p> <p>No licensing, legislative or certification requirements apply to this unit at the time of publication.</p>
<b>Prerequisite Unit</b>	Nil
<b>Unit Sector</b>	Operational (OPR)

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare for work in extrusion processing area	1.1 Confirm materials are available to meet product specification requirements 1.2 Identify and confirm cleaning and maintenance requirements have been met according to health, safety and food safety requirements 1.3 Select, fit and use appropriate personal protective clothing and ensure correct fit
2. Prepare the extrusion equipment and process for operation	2.1 Enter processing and operating parameters as required to meet safety and production requirements 2.2 Check equipment performance and adjust according to production requirements 2.3 Carry out pre-start checks according to health and safety and operating procedures
3. Operate and monitor extrusion equipment	3.1 Deliver ingredients and additives to the extrusion process in the required quantities and sequence 3.2 Monitor preparation of the mass to confirm that specifications are met and mass is suitable for extrusion 3.3 Start, operate and monitor the extrusion process to ensure optimal operations 3.4 Take samples and test to ensure product meets specifications 3.5 Identify, rectify and report out-of-specification equipment, product or process outcomes according to workplace requirements 3.6 Follow and apply workplace housekeeping and environmental procedures
4. Shut down the extrusion process	4.1 Identify the appropriate shutdown procedure 4.2 Shut down the process according to safe operating procedures 4.3 Identify and report maintenance requirements according to workplace procedures 4.4 Ensure waste is disposed of in line with environmental requirements 4.5 Maintain workplace records according to workplace procedures

<b>Foundation Skills</b>	
<i>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.</i>	
<b>Skill</b>	<b>Description</b>
Reading	<ul style="list-style-type: none"> <li>Interpret workplace and standard operating procedures relevant to job task</li> <li>Interpret production requirements</li> </ul>
Writing	<ul style="list-style-type: none"> <li>Record processing information and data in digital and/or paper-based formats</li> </ul>
Numeracy	<ul style="list-style-type: none"> <li>Measure product and ingredients using weight (g, kg, T) and volume (ml, L), to two decimal points</li> <li>Monitor and interpret production and process control indicators and parameters, including load/work input as measured by rpm (revolutions per minute), kilowatts, amps and/or Hz (hertz) at each stage of the process</li> <li>Monitor supply and flow of materials to and from the process</li> </ul>

<b>Unit Mapping Information</b>			
<b>Code and title current version</b>	<b>Code and title previous version</b>	<b>Comments</b>	<b>Equivalence status</b>
FBPOPR3XX4 Operate and monitor an extrusion process	FBPOPR2036 Operate an extrusion process	Unit title and code updated to better match work task  Minor changes to Performance Criteria to clarify intent  Foundation skills refined  Performance Evidence clarified  Minor changes to Knowledge Evidence and Assessment Conditions	Equivalent

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

<b>TITLE</b>	<b>Assessment requirements for FBPOPR3XX4 Operate and monitor an extrusion process</b>
<b>Performance Evidence</b>	
<p>An individual demonstrating competency in this unit must satisfy all of the elements and performance criteria of this unit.</p> <p>There must be evidence that the individual has operated and maintained an extrusion process to produce at least one batch of product to meet product specifications, including:</p> <ul style="list-style-type: none"> <li>• applying safe work practices</li> <li>• applying food safety procedures to work practices</li> <li>• checking moisture content of output</li> <li>• taking corrective action in response to typical faults and inconsistencies.</li> </ul>	

<b>Knowledge Evidence</b>	
<p>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:</p> <ul style="list-style-type: none"> <li>• purpose and basic principles of each part of the process, including the purpose and methods used to achieve each stage of the extrusion process</li> <li>• basic operating principles of equipment used for the extrusion process, including:             <ul style="list-style-type: none"> <li>• main equipment components</li> <li>• status and purpose of guards</li> <li>• equipment operating capacities and applications</li> <li>• the purpose and location of sensors and related feedback instrumentation</li> </ul> </li> <li>• good manufacturing practices (GMP) relevant to work task</li> <li>• services required for the extrusion process and action to take if services are not available</li> <li>• the flow of the extrusion process and the effect of outputs on downstream processes</li> <li>• quality characteristics of extruded output, including required characteristics of mass or blend to be extruded, including:             <ul style="list-style-type: none"> <li>• gelatinisation and viscosity</li> <li>• dimensions, texture and hardness of extruded product</li> <li>• moisture content</li> </ul> </li> <li>• effect of variation in inputs and/or services on process performance</li> <li>• operating requirements and parameters and corrective action required where operation is outside specified operating parameters, including the effect of variation in key variables, including:             <ul style="list-style-type: none"> <li>• throughput and work input at each stage of the process</li> <li>• effect of time and temperature</li> <li>• barrel pressures and temperatures at each zone</li> </ul> </li> <li>• typical equipment faults for the extrusion process and related causes, including signs and symptoms of faulty equipment and early warning signs of potential problems, including:             <ul style="list-style-type: none"> <li>• screw and barrel assembly wear</li> <li>• die plate configuration and wear</li> <li>• wear of conditioner paddles</li> <li>• extruder knife condition</li> </ul> </li> <li>• methods used to monitor the extrusion process, including inspecting, measuring and testing as required by the process</li> <li>• inspection or test points (control points) in the process and the related procedures and recording requirements</li> <li>• common causes of variation in the operation of the extrusion process and corrective action required</li> <li>• contamination/cross contamination and food safety risks related to the extrusion process and related control measures</li> <li>• health and safety hazards and controls relevant to the operation of the extrusion process</li> <li>• requirements of different shutdowns as appropriate to the process and workplace production requirements, including emergency and routine shutdowns and procedures to follow in the event of a power outage</li> <li>• isolation, lock-out and tag-out procedures and responsibilities required for the operation of the extrusion process</li> </ul>	

<b>Knowledge Evidence</b>
<ul style="list-style-type: none"> <li>• procedures and responsibility for reporting production and performance information</li> <li>• environmental issues and controls relevant to the extrusion process, including waste/rework collection and handling procedures related to the process</li> <li>• basic operating principles of process control, including the relationship between control panels and systems and the physical equipment</li> <li>• cleaning and sanitation procedures required for extrusion equipment</li> <li>• procedures to track traceability of product</li> <li>• procedures to ensure biosecurity requirements are met.</li> </ul>

<b>Assessment Conditions</b>
<p>Assessment of skills must take place under the following conditions:</p> <ul style="list-style-type: none"> <li>• physical conditions:                             <ul style="list-style-type: none"> <li>• a food or feed processing workplace or an environment that accurately represents workplace conditions</li> </ul> </li> <li>• resources, equipment and materials:                             <ul style="list-style-type: none"> <li>• extrusion and related equipment and services</li> <li>• personal protective clothing</li> <li>• ingredients/blend/mass to be extruded</li> <li>• cleaning procedures, materials and equipment</li> </ul> </li> <li>• specifications:                             <ul style="list-style-type: none"> <li>• work procedures, including advice on safe work practices, food safety, quality and environmental requirements</li> <li>• information on equipment capacity and operating parameters</li> <li>• production schedule/batch specifications, control points and processing parameters</li> <li>• documentation and recording requirements and procedures.</li> </ul> </li> </ul> <p>Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.</p>

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