

# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** Food Microbiology

**Unit ID:** SCMIC3002

**Credit Points:** 15.00

**Prerequisite(s):** (SCMIC2001 and SCMOL2001)

**Co-requisite(s):** Nil

**Exclusion(s):** Nil

**ASCED:** 010905

**Description of the Unit:**

This unit focuses on the role of microbiology in food quality and safety. Students develop understanding of microbial food safety hazards and the diseases they can cause. Spoilage organisms and microbial quality indicators are considered. The techniques used to control microbial growth are explored and used to understand correct recipe and process formulation for microbiologically stable foods. The theory behind pathogen detection is outlined for both standard cultural and molecular techniques. Outbreak investigation and the techniques employed to monitor foodborne outbreaks and subsequent interventions are explored. Laboratory practicals focus on standard microbiological techniques for the isolation and identification of microorganisms from food. The practical component is carefully aligned to the Australian Standard methods for microbiological analysis to ensure students are following current industry guidelines.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

**Work Experience:**

No work experience

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment.

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	■	■	■	■	■	■
Intermediate	■	■	■	■	■	■
Advanced	■	■	✓	■	■	■

**Learning Outcomes:****Knowledge:**

- K1.** Recognise microbiological food safety hazards and describe their associated diseases.
- K2.** Appraise causes of food spoilage and describe the food quality indicators commonly used in industry.
- K3.** Recognise the food formulations and processes that prevent spoilage.
- K4.** Contrast existing technology for isolation of microorganisms from food with emerging technologies.
- K5.** Outline the food sampling and testing plans used to identify and enumerate microorganisms.

**Skills:**

- S1.** Demonstrate microbiological techniques for isolating and identifying relevant microorganisms from food.
- S2.** Examine the theoretical and practical effects of control factors on microbial growth and death.
- S3.** Critique laboratory data and report the outcomes in an appropriate scientific format.
- S4.** Demonstrate competency in bacterial growth and death kinetics calculations.
- S5.** Explain critical microbiological food safety concepts to both scientific audiences and the general public.

**Application of knowledge and skills:**

- A1.** Appraise new information on microorganisms and modern technologies for improving food safety.
- A2.** Formulate safe and stable food product recipes and processes.
- A3.** Demonstrate competency in the microbiological testing of food and making subsequent food safety decisions based upon the results.
- A4.** Analyse and interpret foodborne outbreak detection investigation data and formulate appropriate interventions.

**Unit Content:**

- Introduction to foodborne pathogens
- Food safety: HACCP and food safety systems
- Food spoilage and microbial quality indicators
- Food preservation and hurdle technology
- Predictive microbiology - microbial growth and kill kinetics
- Microbial sampling and testing plans
- Foodborne outbreak detection and intervention

**FEDTASKS**

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge)

provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are to be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: <ul style="list-style-type: none"> <li>Using effective verbal and non-verbal communication</li> <li>Listening for meaning and influencing via active listening</li> <li>Showing empathy for others</li> <li>Negotiating and demonstrating conflict resolution skills</li> <li>Working respectfully in cross-cultural and diverse teams.</li> </ul>	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: <ul style="list-style-type: none"> <li>Creating a collegial environment</li> <li>Showing self-awareness and the ability to self-reflect</li> <li>Inspiring and convincing others</li> <li>Making informed decisions</li> <li>Displaying initiative</li> </ul>	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: <ul style="list-style-type: none"> <li>Reflecting critically</li> <li>Evaluating ideas, concepts and information</li> <li>Considering alternative perspectives to refine ideas</li> <li>Challenging conventional thinking to clarify concepts</li> <li>Forming creative solutions in problem solving.</li> </ul>	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: <ul style="list-style-type: none"> <li>Finding, evaluating, managing, curating, organising and sharing digital information</li> <li>Collating, managing, accessing and using digital data securely</li> <li>Receiving and responding to messages in a range of digital media</li> <li>Contributing actively to digital teams and working groups</li> <li>Participating in and benefiting from digital learning opportunities.</li> </ul>	Not applicable	Not applicable

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: <ul style="list-style-type: none"> <li>• Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts</li> <li>• Committing to social responsibility as a professional and a citizen</li> <li>• Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses</li> <li>• Embracing lifelong, life-wide and life-deep learning to be open to diverse others</li> <li>• Implementing required actions to foster sustainability in their professional and personal life.</li> </ul>	Not applicable	Not applicable

### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K5, S5, A4	Investigation of a selected outbreak of foodborne illness.	Individual oral and/or poster presentation. Assessment will include peer review.	20 - 30%
K4, K5, S1, S2, S3, S4, A3	Performance of basic laboratory procedures and techniques and interpretation of data.	Participation and assessment of written laboratory report.	20 - 30%
K1, K2, K3, K4, K5, A1, A2	Theory test	Test	40 - 60%

### Adopted Reference Style:

APA ()

Refer to the [library website](#) for more information

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