Title	**Demonstrate knowledge of microbiological control**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to: explain the significance of micro-organisms in the food and beverage industry; explain the process of microbiological sampling and testing; describe microbiological contamination; and explain how plant cleaning is used to control microbes.

Classification	Food and Related Products Processing > Food Production - Beverages

Available grade	Achieved

Guidance Information

1 This unit standard is a general introduction to microbiology. For more specific information that relates to quality control used in laboratories see unit standards 8085 and 8441, for more safe operations in a micro laboratory see unit standard 8029.

2 This unit standard is to be assessed in the context of a typical New Zealand brewery with an appropriate quality assurance system.

Outcomes and performance criteria

Outcome 1

Explain the significance of micro-organisms in the food and beverage industry.

Performance criteria

1.1 The description classifies micro-organisms in terms of their characteristics.

Range micro-organisms – bacteria, fungi, algae, yeasts, viruses; characteristics – size, nutrition, growth rate.

1.2 The explanation compares environments which are favourable and unfavourable for micro-organisms in terms of factors which influence their growth.

Range factors – nutrients, oxygen, antibiotics, temperature, pH, radiation.

1.3 The description includes the potential effects of infections on raw materials, production, and finished product.

Outcome 2

Explain the process of microbiological sampling and testing.

Performance criteria

2.1 The explanation identifies the purpose of a microbiological sampling plan in terms of the process being assessed, and the microbiological standards being applied to the process.

2.2 The explanation describes the type of samples taken and the aseptic techniques used to ensure that they are fit for testing in terms of the requirements of a sample plan.

Range sample types – product, swab or swipe.

Outcome 3

Describe microbiological contamination.

Performance criteria

3.1 The description links the types of contaminating organisms to a process where contamination can be found.

Range organisms – algae, bacteria, moulds, wild yeast.

3.2 The description outlines the methods of organism detection in terms of the criteria for a positive result.

Range methods – visual, microscopic, growth media, forcing tests.

3.3 The description relates sources of contamination to potentially contaminating organisms.

Range sources – raw materials, product, plant, air, people.

3.4 The description outlines a process for the control of contamination and relates it to a source of contamination and potential contaminant.

Range control process – prevention, elimination, management.

Outcome 4

Explain how plant cleaning is used to control microbes.

Performance criteria

4.1 Differences between defined levels of cleanliness are described in accordance with organisational health and safety operating procedures.

Range levels of cleanliness – physically clean, chemically clean, sanitised, sterile.

4.2 Common cleaning detergents and chemicals are related to levels of cleanliness they achieve, degree of solution, preparation, and method used on equipment and plant in food and beverage processing areas.

Range common cleaning chemicals may include but are not limited to – caustic soda, nitric acid, sulphuric acid, chlorine based cleaners; preparation may include but is not limited to – chemical strength, temperature, time, turbidity;
evidence of two cleaning agents is required.

4.3 The description includes examples of hazards associated with using cleaning detergents and chemicals within a food and beverage processing area in terms of the potential hazards to people, product and plant.

4.4 The explanation describes how the design features of a plant contribute to an efficient and effective cleaning strategy.

Range plant – vessels, pipe work, water, equipment;
design features – degress of microbes, ease of cleaning fluids, retention of product, microbes and cleaning fluids, suitability of construction materials.

4.5 Manual cleaning and sanitation methods used within a food and beverage processing area are described in accordance with the organisation's health and safety operating procedures.

4.6 The explanation describes the advantages of cleaning-in-place systems (CIP's) over manual cleaning systems, and describes the main process steps used in hot and cold CIP's within a food and beverage plant.

4.7 The explanation describes the process checks and quality control measures in terms of the quality manuals of a food and beverage plant.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	6 May 1999	31 December 2022
Review	2	19 August 2004	31 December 2022
Review	3	28 January 2021	31 December 2022

Consent and Moderation Requirements (CMR) reference	0111

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.