**NZQA**

**Approved**

Achievement standard: 90950 Version 3

Standard title: Investigate biological ideas relating to interactions between humans and micro-organisms

Level: 1

Credits: 4

Resource title: Probiotics – beneficial bacteria in our food!

Resource reference: Science VP-1.11 v2

Vocational pathway: Services Industries

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| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-90950-02-7297 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

Vocational Pathway Assessment Resource

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Learner instructions

# Introduction

This assessment activity requires you to investigate biological ideas relating to interactions between humans and micro-organisms on how humans are affected by two beneficial bacteria found in food.

You will be assessed on how you comprehensively investigate the biological ideas relating to interactions between humans and micro-organisms by producing a report to show how humans are affected by two beneficial bacteria in our food.

The following instructions provide you with a way to structure your work so you can demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners.

# Task

You are a personal trainer in a gym and you often find yourself talking to clients about how diet can help with a fitness programme and general health. You point out that by eating yoghurt and aged cheeses they will be eating probiotics. You explain that probiotics are live micro-organisms, which when eaten in the right amounts in food give our bodies a health benefit. You decide to investigate probiotics further and present a report to future clients of your gym on the benefits of probiotics in food products.

You will work individually to gather and process information to present your report to future clients of your gym.

Complete both parts of this task.

## Part 1: Collect and process information

Carry out your research on two beneficial probiotic bacteria. *Lactic acid bacterium* (LAB) and *bifidobacterium* are the most common types of microbes used as probiotics.

Use a range of resources to collect your information, for example resource sheets, photos, videos, websites, and reference texts.

Before you begin, draw up worksheets to record the details of your research. Use a separate worksheet for each probiotic bacteria.

### Worksheet guidelines

Head each sheet with your name, and the name of the beneficial probiotic bacteria.

For each probiotic bacteria:

* describe the bacteria’s lifecycle
* explain how and why the bacteria improves the health of humans
* describe specific life processes of the bacteria, for example movement, respiration, growth, sensitivity, nutrition, reproduction, excretion
* describe what environmental factors affect each life process.

The information you research should allow you to:

* make links between the specific life processes of the probiotic bacteria and the environmental factors that affect these
* use biological ideas to explain why and how people use probiotic bacteria to improve their health.

Processing your information usually involves:

* selecting relevant information (sifting, sorting, photocopying, printing, or making notes)
* summarising the relevant information by highlighting text, writing notes, and circling useful diagrams/illustrations
* organising your information
* providing references for all your sources, for example website URL(s), magazine articles or book titles and authors.

## Part 2: Produce and present a report

You now need to use your collected and processed information to produce a written report that investigates the biological ideas relating to how humans are benefitted by the two probiotic bacteria.

The written report can include illustrations, diagrams, and graphs, if appropriate.

Use your findings and biological ideas to explain how or why humans are affected by the two probiotic bacteria you are investigating. You need to consider:

* the structure and life processes of micro-organisms
* the factors that affect the life processes of micro-organisms.

Make significant links about the interactions between humans and the two probiotic bacteria, including the impacts of this knowledge on humans’ personal actions or everyday life.

Making significant links may involve explaining, elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing.

Acknowledge all your sources of information.

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This research activity requires learners to comprehensively investigate and write a report for gym clients on two helpful micro-organisms found in our food (probiotics) that are beneficial to our health.

# Conditions

Learners will work individually.

# Resource requirements

Learners will need information from a variety of sources such as resource sheets, photos, videos, websites, and reference texts. You could provide learners with the source material or require them to research their own.

Most health organisations provide information that covers the interaction between micro-organisms and humans. Providing this information will give learners more opportunity to succeed.

## Useful internet links

[www.medicinenet.com/probiotics/article.htm](http://www.medicinenet.com/probiotics/article.htm)

<http://www.mayoclinic.com/health/probiotics/AN00389>

<http://en.wikipedia.org/wiki/Probiotic>

[www.webmd.com/digestive-disorders/tc/probiotics-topic-overview](http://www.webmd.com/digestive-disorders/tc/probiotics-topic-overview)

Food safety resources: [www.foodsafety.govt.nz](http://www.foodsafety.govt.nz).

# Additional information

Mutual exclusion exists between this standard and the externally assessed Achievement Standard 90927 (Biology 1.3) *Demonstrate understanding of biological ideas relating to micro-organisms*.

## Other possible contexts for this vocational pathway

Food safety, for example how to prevent cross contamination of food from becoming poisonous to humans in a fast food outlet, café, bistro or hotel restaurant.

Waste treatment and management in a local community.

# Assessment schedule: Science 90950 – Probiotics – beneficial bacteria in our food!

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner investigates biological ideas relating to interactions between humans and beneficial micro-organisms (probiotics) by writing a report to present to future clients of a gym:* using observations or findings and biological ideas to describe how the health of humans is benefitted by two probiotic bacteria
* providing all relevant evidence in their final report

For example,the learner:* + shows how lactic acid bacteria (LAB) produce lactic acid
	+ describes factor(s) that affect the life functions of the bacteria that produce lactic acid
	+ describes how probiotic bacteria benefit human health in eating foods like cheese or yoghurt.

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner investigates, in depth, biological ideas relating to interactions between humans and beneficial micro-organisms by writing a report to present to future clients of a gym:* using observations or findings to explain in depth how and why the health of humans is benefitted by two probiotic bacteria
* using these findings and biological ideas to give a reason for how or why the health of humans is benefited by probiotic bacteria
* providing all relevant evidence in their final report

For example, the learner:* + shows how lactic acid bacteria (LAB) produce lactic acid
	+ explains how factor(s) affect the life functions of bacteria that produce lactic acid
	+ explains how probiotic bacteria benefit human health in eating foods like cheese or yoghurt.

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner investigates, comprehensively, biological ideas relating to interactions between humans and beneficial micro-organisms by writing a report to present to future clients of a gym:* using observations or findings to explain comprehensively how and why the health of humans is benefitted by two probiotic bacteria
* using findings and biological ideas to make significant key links about the interactions between humans and probiotic bacteria, including the impacts of this knowledge on a human’s personal actions or everyday life
* providing all relevant evidence in their final report

For example, the learner:* + shows how lactic acid bacteria (LAB) produce lactic acid
	+ elaborates on how factor(s) affect the life functions of bacteria that produce lactic acid
	+ elaborates on how probiotic bacteria benefit human health in eating food like cheese or yoghurt.

*The above expected learner responses are indicative only and relate to just part of what is required.* |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.