

**Internal Assessment Resource**

Agribusiness Level 2

This resource supports assessment against Achievement Standard 91866

Standard title: Conduct an inquiry into the use of organisms to meet future needs

**Credits:** 4

Resource title: Fancy a cricket milkshake?

**Resource reference:** Agribusiness 2.8A Version 1

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| This resource:* Clarifies the requirements of the achievement standard
* Supports good assessment practice
* Should be subjected to the school’s usual assessment quality assurance process
* Should be modified to make the context relevant to students in their school/kura environment and ensure that submitted evidence is authentic
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| Date version published by Ministry of Education | December 2017 Version 1To support internal assessment from 2018 |
| Authenticity of evidence | Teachers must manage authenticity for any assessment from a public source, because students may have access to the assessment schedule or exemplar material.Using this assessment resource without modification may mean that students’ work is not authentic. Teachers 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. |

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Teacher guidelines

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

Teachers 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 students against it.

**Context/setting**

In recent times the leading cause for environmental impacts in New Zealand is the production of meat from livestock. Organisms not currently used for production may be manipulated to meet our future needs for environmentally sustainable protein production.

This activity requires students to conduct a comprehensive inquiry into whether the use of insects for protein will meet New Zealand’s future needs for sustainable agricultural production.

Before beginning this assessment, you will need to provide opportunities for the students to gain understanding of:

* the inquiry process
* different views, values and perspectives
* New Zealand’s future needs.

**Conditions**

Where a group approach is used, the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

A student can present their information in a format of their own choice. For example, written paragraphs, tables, graphs, videos and/or diagrams, which could form part of a poster, slideshow, a blog or website. You may want to give students guidance on the appropriate style and format for their findings. This achievement standard does not assess format or style.

As a guide this assessment should reflect approximately 40 hours of teaching, learning and assessment in and out of the classroom.

Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>

**Resource requirements**

Access to the Internet and to relevant sources of information.

This resource could be useful for supporting inquiry process teaching and learning: <http://bit.ly/2d8AB5A>

**Resources to support or to provide guidance for the students:**

<http://bit.ly/creepycrawliesonthemenu>

<http://bit.ly/Dinersgocrazyforbugs>

http://bit.ly/Idontlikecrickets\_oh\_no\_iloveit

<http://bit.ly/edibleinsectsfordinner>

<http://bit.ly/getoverinsectdisgustfactor>

<http://bit.ly/eating-bugs-is-the-protein-of-the-future>

<http://bit.ly/creepy-crawlie-superfood-we-should-be-eating>

<http://bit.ly/eat-insects-to-fight-world-hunger>

<http://bit.ly/eating-crickets-sustainable-protein>

**Additional information**

Other possible contexts include:

* Microorganisms (bacteria, fungi, viruses)
* Marine organisms
* Insects

If you are choosing an agribusiness context for this assessment, there is no expectation to cover all seven primary industries.

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Student instructions

**Introduction**

This assessment activity requires you to conduct an inquiry into whether the use of insects for protein will meet New Zealand’s future needs.

Your inquiry will show the different views, values and perspectives and justify a decision as to whether the use of insects for protein would meet New Zealand’s future needs.

You are going to be assessed on the depth and comprehensiveness of your inquiry.

Teacher note: Insert due dates and timeframes

**Task**

Some agribusiness leaders have suggested that New Zealand produce an alternative source of protein to meat such as insects, as this could have less environmental impact and achieve more sustainable protein production in the future.

Conduct a comprehensive inquiry into whether the use of insects for protein will meet New Zealand’s future needs for sustainable agricultural production.

Follow these steps:

* **Establish the framework for your inquiry**
* Decide on the focus for your inquiry.
* Develop two or more research questions to guide your inquiry.
* Identify external influences that could have an impact on future needs.
* Plan where you will obtain the information you need.
* **Carry out your research**
* Gather and record information from a range of sources to reflect a variety of relevant views, values and perspectives.
* Review your information and background ideas.
* **Present the findings of your inquiry** in the format of your choice such as a poster or newspaper front page. Your presentation must compare points of view, values and perspectives. This should be no longer than 2000 words. Your presentation will:
* report on the findings that are relevant to the inquiry focus
* compare points of views, values and perspectives that people hold
* reflect on and summarise the findings in relation to future needs
* evaluate the findings of the inquiry using external influences that could have an impact on future needs, such as ethical, economic, political, cultural, social, environmental, technological, biological, legal, or scientific. NB: There is no need to cover all these – you should focus on those relevant to your inquiry.
* consider the implications of the findings using the external influences
* prioritise, with reasons, the findings in relation to the external influences
* predict the short term and long-term impacts of insect use for protein
* conclude and justify your findings as to whether the use of insects for protein would meet New Zealand’s future needs
* include a bibliography that identifies all your sources.

**Assessment schedule: Agribusiness 91866 - Fancy a cricket milkshake?**

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| **Evidence/Judgements for Achievement** | **Evidence/Judgements for Achievement with Merit** | **Evidence/Judgements for Achievement with Excellence** |
| The student conducts an inquiry into the use of organisms to meet future needs. In their presentation, the student:* decides on a specific inquiry focus and develops inquiry questions
* gathers and reviews information and background ideas
* identifies external influences that could have an impact on future needs
* presents the findings that are relevant to the inquiry focus

**For example: (partial evidence)**The student conducts an inquiry into whether the use of insects for protein will meet New Zealand’s future needs for sustainable agricultural production. Inquiry questions could be: * What are New Zealand’s future needs?
* Will insect protein meet our protein needs?
* Is insect protein more sustainable than cattle protein?
* What are the benefits of insect protein?

The student uses a range of sources to gather and record information.The external influences that possibly affect the decision are: Environmental - is about maintaining the integrity of life support systems within production. It incorporates the important notions of maintaining and sustaining biodiversity and ecosystem services while producing insects for protein.Economic - means that resources used to produce, and distribute insects that will be used for protein for the present generation without compromising the ability of future generations to do the same, while making a profit.  Social - is about being inclusive of people’s mental and physical wellbeing and the cohesion of their communities based on a fair distribution of natural resources. Is this affected if people start using insects for protein? The findings show that insects provide a better source of protein than meat, due to being able to be produced with far lower environmental impacts than normal agriculture. The cricket is the world’s most efficient converter of biomass to protein, at 40% compared to 3% for a dairy cow. Insects have a minimal environmental footprint and is cheap to produce, which will support New Zealand’s future needs of protein production having few environmental impacts than current agricultural production. *The examples above are indicative samples only.* | The student conducts an in-depth inquiry into the use of organisms to meet future needs.In their presentation, the student:* compares points of view, values and perspectives that relate to the inquiry focus
* evaluates the findings and how the external influences could have an impact on future needs
* concludes as to whether the use of the organism might meet future needs.

**For example: (partial evidence)** In addition to the evidence for achieved:There are many differing viewpoints, values and perspectives on insect protein both as an alternative option to producing protein and whether it meets New Zealand’s future needs.Ian Proudfoot, Head of Agribusiness from KPMG believes that “within 10 years we will all be eating food with crickets or other insect protein in them and we won’t even realise it”. Jane Alba from Primal Collective says that “People all over the world (particularly South-East Asia and Central America) enjoy insects as part of theireveryday”. “I think the sustainability claims on this topic have been overstated given the current state of knowledge,” wrote study author Dr Mark Lundy of the University of California Division of Agriculture and Natural Resources. “I’m all for exploring alternatives, and I am impressed by the amount of innovation that has sprung up around insect cultivation and cuisine in the last few years,” he says. “However, I also think we need to be clear-eyed about what the sustainability gains are and aren’t, and focus our innovative efforts and limited resources to where they will have the most lasting impact.”Environmental influence – insects as food require 2000 times less water and create 100 times fewer greenhouse gas emissions, as well as take up less physical space to get the same amount of protein as animals.Economic influence – New Zealand relies on the agricultural sector for its economic wellbeing. That means the sectors needs to be constantly thinking about the future and how it can be relevant. Ethical influence – farmer’s attitude to the environment has changed to one where they are improving their environmental performance because it is the right thing to do rather than because they are required to. Social influences – alternative proteins are an emerging trend. Meal worm and other insect-based sources of protein will become more commonly available and accepted in the coming years.Producing insect protein as ingredients and / or products provides economic and environmental opportunities for New Zealand as it appears that insects can be produced cheaper, have less environmental impacts, and are in demand. However, more scientific research will need to be done to ensure that they fully meet New Zealand’s sustainability and environmental needs. *The examples above are indicative samples only.* | The student conducts a comprehensive inquiry into the use of organisms to meet future needs. In their presentation, the student:* evaluates the findings and considers the implications of the findings using the external influences
* prioritises, with reasons, the findings in relation to the external influences
* predicts what the short term and long term impacts might be of the organism use
* concludes and justifies whether the use of the organism might meet future needs.

**For example: (partial evidence)**In addition to the evidence for achieved and merit:Environmental, social, and economic influences are the key priorities in determining whether the use of insects might meet New Zealand’s future needs.Environmental influence - The use of insects on a large scale as an ingredient or a product is technically feasible, and established companies in various parts of the world are already leading the way. However, swapping chickens for crickets - while feeding them the same thing - is unlikely to make a real difference to the environment and to sustainability. Insect production should only go ahead if its production is environmentally sustainable. Insect production might be environmentally sustainable in the short term but in the long term, their production might contribute to further or unforeseen environmental issues such as escapees may damage our native forests. Social influence - The world is demanding high quality, nutritious food, particularly protein, and this demand will increase over the next 30 years. New Zealand producers need to recognise that there are other forms of protein being eaten around the world and they need to be prepared to adapt to these social changes.Economic influence – as New Zealand relies on the agricultural sector for its economic wellbeing, if we are to replace meat with insect protein, it needs to make economic and business sense. Insect production is likely to contribute to human nutrition and be of economic and environmental significance, if it does not rely on a diet that competes with conventional livestock. More innovation is needed for this to become a reality and for it to meet all New Zealand’s future needs. It may be a part of the solution but not the whole answer. *The examples above are indicative samples only.* |

Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.