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Level 3 Agricultural and Horticultural Science, 2018

91532 Analyse a New Zealand primary production environmental issue

2.00 p.m. Tuesday 27 November 2018
Credits: Five

Achievement	Achievement with Merit	Achievement with Excellence
Analyse a New Zealand primary production environmental issue.	Critically analyse a New Zealand primary production environmental issue.	Comprehensively analyse a New Zealand primary production environmental issue.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL parts of the task in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Merit

TOTAL 05

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INSTRUCTIONS

This assessment consists of ONE task, in TWO parts, which requires you to discuss the impact of the production of a specified agricultural or horticultural product on freshwater. Your answer should include the management practices that a producer of the selected product could implement to mitigate any negative impacts on freshwater.

Name of your selected agricultural/horticultural product: NZ Dairy Milk

RESOURCE A

Fixing freshwater issues is an "enormous challenge"

A report by New Zealand's top scientist has urged politicians to address freshwater issues, which he says are clearly linked to intensive farming and urbanisation. Professor Sir Peter Gluckman, Chief Science Advisor to the Prime Minister, has released a report analysing the health of New Zealand's freshwater based on existing science and data. It found clear evidence the freshwater estate was under pressure in terms of both water quality and quantity. There was a link between farming and declining water quality in pastoral areas, and contamination of urban waterways by expanding cities.

"New ways of utilising our land for economic gain that also have lower environmental footprints need to be found and adopted if we are to meet the vision New Zealanders have for their freshwaters," said Gluckman.

Text source (adapted): http://www.stuff.co.nz/environment/91418638/Top-scientist-Fixing-freshwater-issues-an-enormous-challenge.

Image source: https://pxhere.com/en/photo/1026654.

PART A

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Explain the negative social and environmental impacts on New Zealand's freshwater that might result from producing your selected product.

Intensive dairy farming operations occur in NZ on a huge scale with Milk being NZ top exported good. However though producing Milk on dairy farms there is a significant affect on NZ's freash waters.

One Socail impact is that 60% of NZ rivers and lakes are unswimable due to the Contamination in them. The contamination is mainly due to those bodies of water having dairy cattle excreating dung and urine directly into the water or very close to. It is said that Currently 1 third of Marlboroughs river are accessed by dairy cattle. ~~With Rivers~~ With a vast quantity of rivers being too unsafe to swim in these will be Negitive socail impacts of, a decrease in Recreational swimming which could lead to depression in some specail cases of people who enjoy it too such a level, Tourist operations may have to be discontinued if it involves swimming or entering the water, and Drinking water may be contaminated leaving locars who possibly rely on freash water to drink from, without an option.

More space for this answer is available on the next page.

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~~Through dairy~~ pro From producing dairy milk there will also be negitive environmental impacts. Through the process of nutrificaticn or the buildup of Nutricants, Namly Nitrogen Fertilizer in rivers. there will be a drastic decline in the rivers biodiversity.

To produce quality milk dairy farms topically apply Nitrogen Fertilzr in the form of uhea. Annualy 137 million Kgs of urea are applied to NZ dairy farms to promote grass growth. However 80% of this 137 million Kg's is leached into the soil and Eventually into our NZ waterways. This Nutricant of Nitrogen then builds up over time, this is called nutrificaticn. Nutrificaticn has the negitive impact of promoting algae blooms that choke other Native plant life and also can often Cause the water tempreture to raise Several degrees. Both those impacts have led to a decline in the biodiversity in our rivers. It is said that in 2016 75% of our Native fish were endangered due to the condition of our water ways in NZ, And since the dairy industries boom between 1994 - 2015 this has been continually getting worse.

RESOURCE B

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Farming leaders pledge to make all New Zealand rivers swimmable

Farming leaders representing 80 per cent of the industry have pledged to make all New Zealand rivers swimmable. Confessing that not all rivers were in the condition they wanted them to be, and that farming had not always been right, the group said the vow was "simply the right thing to do".

Image: Michael Spaans, Bruce Wills, Federated Farmers president Katie Milne, Mike Petersen, Carolyn Mortland (Fonterra), John Loughlin, and James Parsons at the Ngaruroro River in Hawke's Bay.

Text source (adapted): https://www.stuff.co.nz/business/farming/96026220/farming-leaders-pledge-to-make-all-nz-rivers-swimmable.

Image source: http://www.shersonwillis.com/wp-content/uploads/2017/08/Farming-leaders-have-pledged-to-help-make-New-Zealand%E2%80%99s-rivers-swimmable-for-future-generations.jpg.

PART B

Evaluate at least TWO courses of action that a primary producer of your selected product could implement to minimise negative effects on water quality, and justify which course of action you believe would be the most viable towards the pledge to make all New Zealand rivers swimmable.

In your answer:

- discuss the conflicts or challenges that may currently exist between increasing production and the commitment to make all New Zealand rivers swimmable in the future (*Note: conflicts or challenges could be economic, cultural, social, technological, or environmental*)
- use data and evidence to support your claim.

One Course of action to minimise the impact of dairy farming on N2 waterways and to try and reach the goal of making all rivers swimable is to ripesian plant. This is

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to plant deep rooted plants (to catch Nitrogen that has leached below the root zone of grass) along side our water ways. This will have the affect of providing a "wall" or fence between the river and the dairy cows, preventing them from directly accessing the river and excreting dung and urine into the water. However this would have the economic challenge of a significant cost to the farmer. Often it costs almost $100 per meter of fencing, which would be required to prevent the cattle from destroying the riparian plants and also each plant ~~can~~ could cost around $15 dollars each which coincides with the fact that NZ has vast quantities of farmland open to rivers would mean a huge cost. There could also be the technological challenge of lots of farmland and rivers may be ~~that~~ too difficult to access. Both of the challenges would impact the comitment of making all NZ rivers Swimable. * The cost of riparian planting may mean that the dairy farmer cannot afford to continue to produce dairy milk at the rate at which he is, thus causing a fall in supply.

A second mangesment practice to reduce the impact that dairying has on NZ's waterways could be to reduce stocking rates. This means get rid of a percentage of the dairy cows from a farm. This would mean that

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Extra space if required.
Write the question number(s) if applicable.

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Less cows are accessing the rivers and Also there would be less Nitrogen heading as there wouldnt have to be as much urea applied to farms with smaller dairy herds. However this Notion would conflict with the farmers desired to have all of W2's rivers Swimable and his drive to produce milk for a profit. if the farmer got rid of a third of his cattle ie ~~30~~ 20 from his herd of 60 then it would mean that his milk production would fall dramatically. This could lead onto the farmer having the social challenge of not being able to afford to pay off his mortage for example.

I believe that Ripesian planting would have the greatest impact on making W2 rivers Swimable as well as being easy to achieve as well as maintain A steady strong production of dairy milk. Ripesian planting will almost completly dismiss the cattle from accessing the water way, reducing pollution from fecal matter, whereas reducing stocking rates would not eliminate that factor. However the cost of Ripesian planting would be Significant to the farmer, possible affecting milk output. although this could be prevented by the government from Subsiding Ripesian planting. ~~Kayas~~ Thus Ripesian Planting is the most viable

Merit Exemplar 2018

Subject	Level 3 Agricultural and Horticultural Science	Standard	91532	Total score	05

Q	Grade score	Annotation
1	M5	Candidate gave accurate environmental and social impacts that are negative as a result of the production process. Facts and figures were provided but not to a great depth. Some inaccuracies or facts were included. Two viable actions were selected and discussed, with some good technical information. One of them was justified. There was no comment or very little evidence of any conflicts around water and the production process. Figures were not accurate enough to justify their case for either of the actions.