

## ACTIVITY EXAMPLE

### KEY WORDS

Acids and Bases | Genetics and Evolution | environment | animal health | nutrients | soil | elements | pH | acidity | germination | breeding | artificial insemination | technology

### ALSO USEFUL FOR

Social Studies | Economics | Agriculture | Environmental Science | Science | English

### PROGRAMME OUTLINE

#### 3 POINTS OF CONTACT

- Farmer comes into classroom (x2)
- Workplace visit (x1)

### EXAMPLE

1. Farmer comes into classroom, introduces him/herself, background to farming, their career and how science is used in the industry.
2. Workplace visit – showing students healthy and unhealthy pasture, technology in the milking shed, milking demonstration from cow to pail. **Student activity:** make ice-cream using milk from the cow.
3. **Student activity:** Dairy Farming Case Study

Videos featuring Justin Downing's farm to support this learning module can be found in the SSEP Resource Centre video library



*N.b. this activity was originally created for a learning assisted class of students but has been successfully adapted for a wide range of students.*

# Dairy Farming

## Case study



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## What is this Unit about?

In this unit we will be learning about Dairy Farming in New Zealand and why it is so important to us a country.

This short unit will involve:

- Discussion and teaching from a local Dairy farm owner.
- A field trip to the farm and a look into what owning and working on a dairy farm involves.
- Some short research on dairy farming issues/topics.



## Dairy Farming in New Zealand

Dairy farming is extremely important for the New Zealand economy. A large amount of exported produce from New Zealand comes from dairy farming. There are many dairy farms around New Zealand, a large proportion of which are in the Waikato region.

Why else do you think that dairy farming is important to New Zealand?

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## Thinking about farming:

In order to produce quality produce to either export or be sold in our own country, farmers need to make sure they are maximising the quantity and quality of their milk. This involves looking after their cows as well as the environment that the cows are in.

What do the following words mean?

Quantity	
Quality	

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### Good grass

In order for cows to produce good quality milk, the farmer needs to make sure that they are being fed good quality food. A large part of a cow's diet is made up of the grass that they are eating.

Grass needs plenty of nutrients in order to grow. Most of these nutrients come from the soil, however not all soil on the farm will be the same. And not all of the soil will have the same amount of nutrients. This means that farmers often need to add nutrients to their soil to get the grass to grow well.



Do some research and answer the following questions:

What can farmers add to the soil to make sure the grass grows well? \_\_\_\_\_

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How can they add these things to the soil? \_\_\_\_\_

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For grass to grow well the soil needs to have the right conditions. This includes having plenty of the key nutrients needed for plant growth.



The three essential plant nutrients are N, P, S and K. Fill out the following table:

Element Symbol	Element Name	Why is this element (nutrient) essential for plants?
N		
P		
S		
K		

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One of the other essential factors of soil is how acidic it is. All plants have a specific pH that they grow best in.

Carry out the following experiment and see how acidity may influence plant growth:

1. Collect 3 petri dishes. Label each dish with your name and then label them A, B and C. Place your dishes to one side.
2. Collect a 100 mL beaker.
3. Measure out 5 mL of water and add to the beaker. Measure out 5 mL of hydrochloric acid and add it to the beaker.
4. In each petri dish add 2-3 cotton wool pads.
5. In the center of these cotton wool pads add 10 radish seeds.
6. Add the following amounts of liquid to the correct petri dish.

Dish A	5 mL of water.
Dish B	5 mL of the acid/water solution from the 100 mL beaker
Dish C	5 mL of hydrochloric acid

7. Place the lids on top of the petri dishes and place the seeds on a side bench.

After a few days have a look at your petri dishes to see how many seeds/have germinated. Record them in the table below:

Growth Conditions	Number of seeds germinated
Water (Dish A)	
Weak Acid (Dish B)	
Acidic (Dish C)	

Do you think radish plants could grow in acidic soil? Explain your answer.

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*Most plants do not like acidic soil. So acidic soil can be a huge issue for the growth of the grass. Luckily you can modify the soil to make it less/acidic.*

What is the best pH for grass growth? \_\_\_\_\_

How can farmers make their soil less acidic so that they can have the best possible grass growth? \_\_\_\_\_

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What do farmers add to soil to make it less acidic? \_\_\_\_\_

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### Healthy Animals

Not only do farmers have to make sure they have good quality, nutrient rich food for their cows to eat, they also need to make sure they are healthy. Healthy and happy cows is not only good for the cows but can also provide the farmer with better quality milk.

*Conduct some research and suggest ways that a farmer may keep their cows happy and healthy?*

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What is mastitis and why is it an issue for cows? \_\_\_\_\_

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What happens to the milk if came from a cow with mastitis? \_\_\_\_\_

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## New Cows (Calving)

Calving season is one of the busiest times of the year for a dairy farm. In order to be able to keep cows milking you need them to give birth to a calf. As a farmer you will likely keep your best female calves to bring them up and add into your milking herd in a few years and sell the male calves.

There are two methods that a farmer can try to get their cows pregnant.

- Bulls can be placed in a paddock and nature can take its course.
- Artificial Insemination (AI).

Artificial insemination can be very expensive but can allow the farmer to choose which bull the semen comes from. This can mean that the chances of having a cow that will produce good quality milk etc may be increased.



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Have a look at the LIC website ([www.lic.co.nz/about/](http://www.lic.co.nz/about/)) to see what the company provides.

List three things you have learned about LIC from their website in the table below:

Fact 1	
Fact 2	
Fact 3	

There are two main breeds of cow that are successful for dairy farming.  
 Friesian and Jersey.

	
Friesian	Jersey

Each breed of cow has advantages and disadvantages. It is up to the farmer to weigh up the options and decided what types of cows they will have in their herd.

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	Friesian	Jersey	Friesian Jersey X
Milk (L per season)	4530	3266	4079
Protein (%)	3.72	4.18	3.95
MS produced (per Kg liveweight)	74	77	78
Weight of Cow	494	419	463

Which breed of cow typically produces a greater volume of milk? \_\_\_\_\_  
\_\_\_\_\_

Which breed of cow produces the most milk solids? \_\_\_\_\_

Which breed of cow tends to be the largest? \_\_\_\_\_

Many farmers will have a cross between a Friesian cow and a jersey cow.

Why do you think this is useful? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ACTIVITY EXAMPLE

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### Owning a Farm

Where did the farm come from? \_\_\_\_\_

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What are the busiest times of the year? \_\_\_\_\_

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How many workers are on the farm? \_\_\_\_\_

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When are cows milked and how often? \_\_\_\_\_

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What are the cows fed? \_\_\_\_\_

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## ACTIVITY EXAMPLE

What happens to calves once they are born? \_\_\_\_\_

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What happens to the calves that you want to keep to add to the herd?

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How do you know if your land needs fertilizer? \_\_\_\_\_

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### Working on a farm?

What qualities would you want in a worker on the farm? \_\_\_\_\_

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## ACTIVITY EXAMPLE

What would I be doing on a typical day if I was working on this farm?

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How could I work on making farming a career? \_\_\_\_\_

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## Technology on the Farm?

What technology is used by Justin to help him run his farm to its full potential?

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How does technology help Justin with his running of the farm?

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On the following page write a short letter to Justin to thank him for allowing us to visit his farm.

- You should mention at least two things that you learned from our trip.
- We will need to check your spelling and punctuation.
- Make sure you use formal and polite language

ACTIVITY EXAMPLE



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## ACTIVITY EXAMPLE

Write a short report on what you have learned in this topic. You should include some of the information you have learned during class as well as your trip to Justin’s farm.

Focus on your punctuation, spelling, ideas and sentence structure.

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