

What's so special about Camden Vale Special Milk?

A multi-stage unit of work

Rationale

Camden Vale Special Milk was produced at Camden dairies from 1926 to 1973. Dairy Farmers continued to market Camden Vale Special Milk after they absorbed the Camden Vale Co-operative Milk Company but processing of special milk ceased once the Camden Park Estate Ltd was sold. This unit takes the Camden Vale Special Milk example to encourage students to look at milk as a processed food. They will compare raw milk with homogenised and pasteurised milk, and also consider the production of butter and cheese.

While all of the units are flexible in their implementation this unit of work is particularly open ended as it is designed to be used in a multistage classroom and to apply to a broader range of teaching situations.

NSW syllabus links

This unit is designed to be applicable to a broad range of students and classrooms, the identification of specific outcomes is left to teachers' professional judgement.

Science and Technology:

Objective: Students develop knowledge and understanding of the Made Environment through Built Environments, Information and Products.

Values and attitudes: develop interest and positive, informed values and attitudes towards science and technology and recognise the importance and relevance of science and technology in their lives now and for the future.

History:

This unit of work will assist students in the development of the following historical concepts:

- Continuity and change
- Cause and effect
- Perspectives
- Empathetic understanding
- Significance

Geography:

Objective: Students develop knowledge and understanding of the features and characteristics of places and environments across a range of scales and develop knowledge and understanding of interactions between people, places and environments.

English and Creative Arts outcomes will also be address in this unit of work.

Unit at a glance

Learning experience	Location	Activities	Resources
1	Classroom	Class brainstorm 'dairy products', their treatment and production. Mind map.	Learning journals Wall or board space Internet access Images from learning package
2	Classroom	Joint class construction of a dairy farm map/diagram. Mind map	Learning journals Wall or board space Internet access Images from learning package
3	Classroom	Class brainstorm 'what is a dairy farmer?' Mind map.	Learning journals Wall or board space Internet access Images from learning package
4	Onsite or online	Learning journal activities	Learning journals Internet access if online
5	Classroom	Review of learning experiences 1 - 4, how has our understanding of developments in the dairy industry changed?	Learning journals Internet access
6	Classroom	Predicting what dairy farming will look like in the year 2215, applying understanding of development in the last 200 years.	Learning journals
7	Classroom	Advertisement for the dairy industry or Belgenny Farm	

Learning sequence

Learning experience 1: What is dairy?

Learning experience 1:
Science and
Technology
background

Aim: The aim of this learning experience is to bring to mind the broad range of dairy products available and where they come from. Students will consider the process and the reasons behind pasteurisation and homogenisation of milk, as well as the science and technology behind their introduction.

Learning intention

Students will be able to tell you the benefit of pasteurisation and homogenisation and the difference between making butter and cheese.



Activate prior knowledge

What is dairy? Brainstorm as a class using an Interactive Whiteboard (IWB) or wall space to record student's ideas.

Brainstorming will also be used as the first activity in the next two learning experiences so it is a good idea now to ensure that you have space to add to the text with each brainstorm so they can stay up for the rest of the unit of work.



Discuss / Investigate / View

Look at these images:

- Camden Vale Milk Café
- Milk cans
- Milk bottles
- Butter containers
- Cream bottles ([link](#))

When you think they date from? Why? What do they tell us about dairy products?

So if milk is a natural product, what processes are involved in getting milk to a store? Does that mean it is not natural anymore? What animals and resources are involved? View the [dairy process diagram](#) and the NSW DPI Paddock to Plate video on our website ([link](#)).

What about butter and cheese? Are they natural?

View the resource 'Making Dairy Products' available on our website ([link](#)) as a prompt to broaden students thinking about dairy products.



Suggested activities

Record ideas in a mind map in notebooks or learning journals if you are using them.

Alternatively students may choose to record their thoughts and ideas by writing, drawing, making a collage, discussing, recording an audio or video file.

Take it further

Games and Activities

Discover Dairy (Dairy Australia) [link](#)

Next

Next students will be looking at the geography of Belgenny Farm.

Learning experience 2: What is a dairy farm?



Aim: To have students consider that some places are better for dairy farms than others and why Camden was a successful dairy area.

Learning intention

Students will be able to tell you five factors that are needed for a successful dairy enterprise.

Review

Review learning experience 1—if we know what dairy products are, where might be a good place to produce them?

Discuss / Investigate / View

Brainstorm what a dairy farm looks like? Sounds like? Smells like? Have students draw or write on a large piece of butcher's paper or a clear board space what a dairy farm looks like.

What factors would need to be present in this location? Things to consider: natural resources (water, soil, vegetation), infrastructure including transport, access to markets.

Watch some of the videos listed here:

A day in the life of a dairy farmer from the ABC <https://youtu.be/RPANQnAHsyc>

Total Dairy https://www.youtube.com/watch?v=wurkcS7e_bM

And view some of the photo stories:

Dartbrook Dairy images <http://www.abc.net.au/local/photos/2011/08/30/3305962.htm> and <http://www.abc.net.au/local/photos/2011/08/30/3305962.htm>

Suggested activities

Students can record their ideas in a new mind map in their notebooks or learning journals.

Take it further

Listen to the 'Introduction to Belgenny Farm' <https://soundcloud.com/nsw-dpi-schools-program/belgenny-farm-introduction> (or read the transcript in the Appendix). Is there anything else that can be added to any of the mind maps? Add them in a different colour to highlight new understanding.

View Belgenny Farm on either Google Maps (<https://www.google.com.au/maps/place/Belgenny+Farm/@-34.0849481,150.7045709,3751m/data=!3m1!1e3!4m2!3m1!1s0x0:0xc3c0942a716ce23d!6m1!1e1>), Maps on iPad or Six Maps (NSW only) <https://maps.six.nsw.gov.au/>

Next

Next students will consider the people involved in dairy farming.

Learning experience 3: Describe a dairy farmer



Aim: Some students have a limited understanding of what farmers do—this lesson will highlight that it is a skilled and complicated profession.

Learning intention

Students will gain a greater understanding of the nature of dairy farming and be able to tell you three things they didn't know before the start of the lesson.

Review

Review the first two learning experiences where students considered what dairy products and dairy farms are.

Discuss / Investigate / View

Brainstorm what it means to be a dairy farmer. What do they look like? What do they do?

Watch some of the videos listed here. *Note* some are repeated from last lesson—ask students to focus on the people in the video rather than the farm—

- Future Dairy <http://www.futuredairy.com.au/Video.php>
- A day in the life of a dairy farmer from the ABC <https://youtu.be/RPANQnAHsyc>
- Future Dairy (American and aimed at younger students) <https://www.youtube.com/watch?v=NVAeW3CInzk>

Ask students whether this information makes them rethink their knowledge of dairy farmers and what they have recorded in their journals or notebooks.

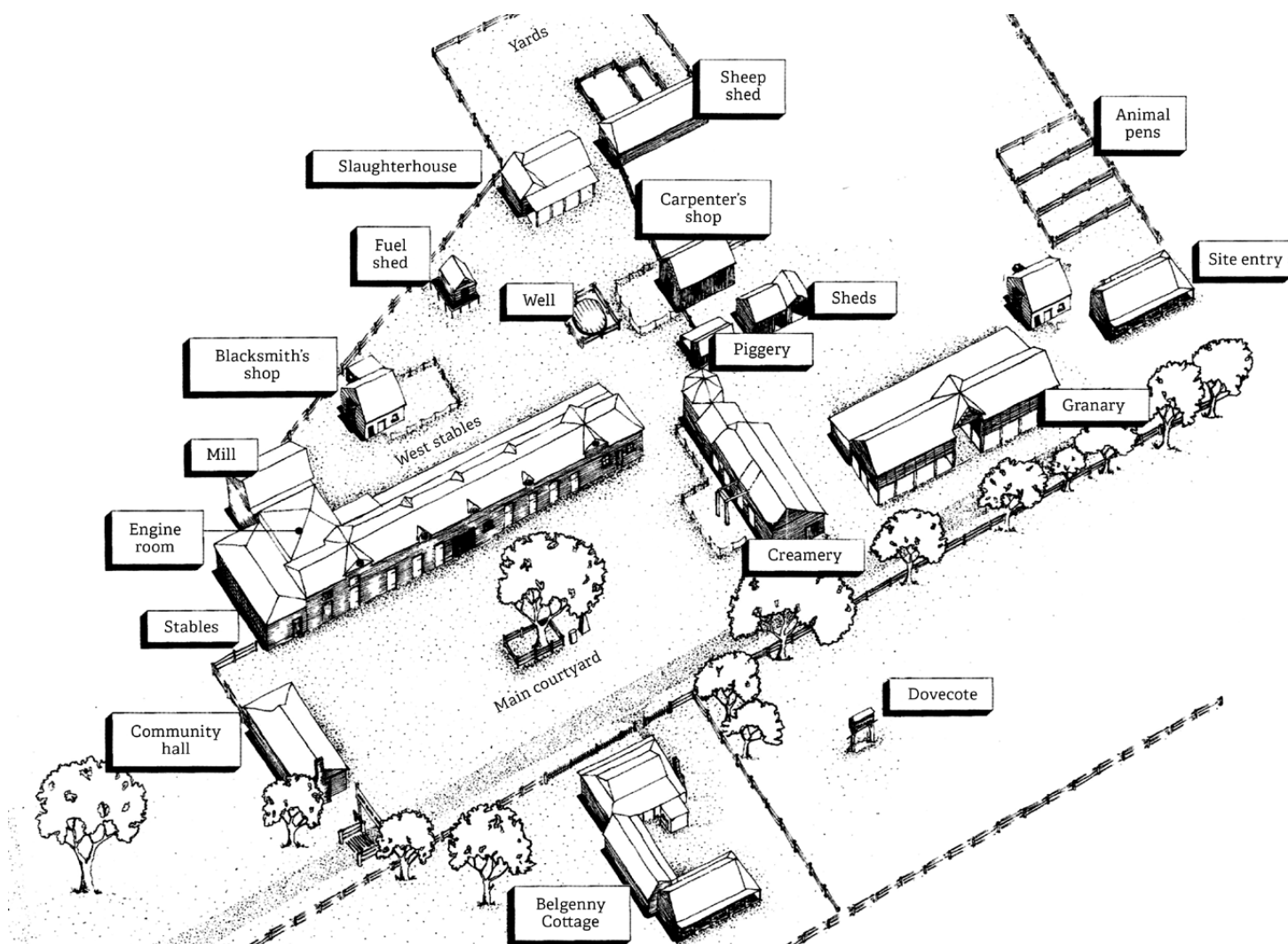
Suggested activities

Students can record their own understanding of what it means to be a dairy farmer in their notebooks or learning journals.

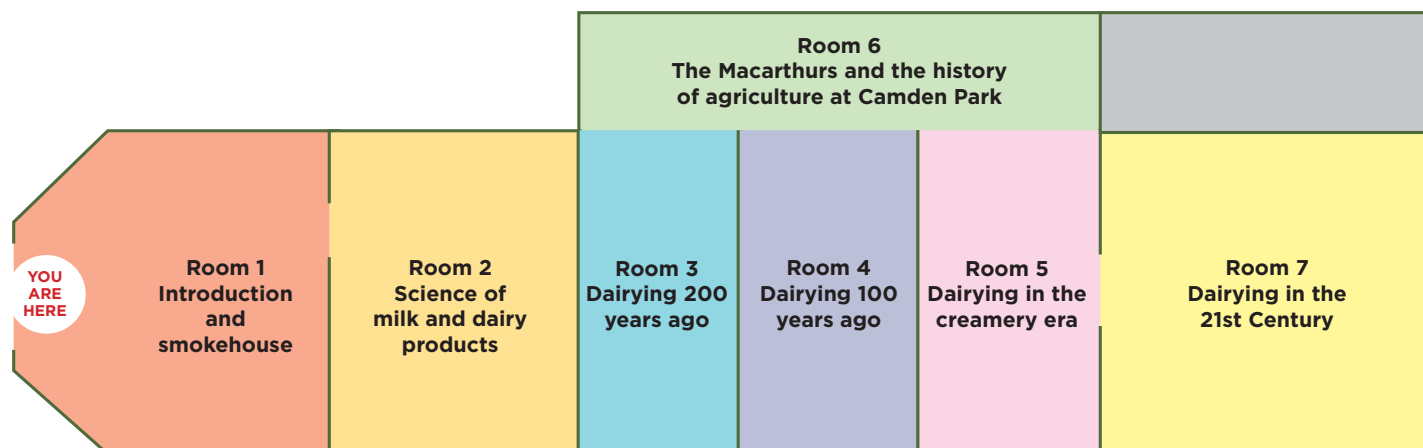
Next

Next, students will visit the Belgenny Farm Creamery.

Learning experience 4: Map of site



Guide to Creamery



Learning experience 4: The site visit

Learning experience 4: Site visit

Room 1 - Smokehouse

This room is the smokehouse, it was built in the 1830s or 40s and was not originally connected to the buildings next to it. In the days before refrigeration smoking was used to keep meat from going off, so the Macarthurs used this room to smoke pork and beef to preserve it. When an animal was killed to eat it was cut up and salted. The second step was to smoke it by hanging the meat in the roof of this room with a slow fire burning on the floor for one or two weeks until the meat was dried and smoked. It could be kept in this room for up to two years and eaten safely.

This room is a good example of how the needs of people change and how farmers adapt their operations and spaces to meet those needs. It also shows how broad farm operations are, and how in the past farmers needed to supply most of their needs on site.

Optional learning journal activity

In your learning journals add some detail to the diagram of how the smokehouse works.

Room 2 - Science of milk

Milk is a natural product produced by mammals to feed their young. Humans use milk from animals including cows to meet their nutritional needs, and from that milk we also get cream, cheese, butter, yogurt and a lot of other products. So it is a really important and useful product for people. To make sure that the milk that people consume is clean, healthy and readily available, dairy farmers need to take good care of their cows, the dairy and the farm and; the milk is treated to keep it safe for people to drink.

The posters in this room show the ways that milk is treated to keep it safe. There is also an example of how the government communicates with the public about keeping food safe.

Optional learning journal activity

In your learning journals have a go at labeling the process diagram.

Room 3 - Dairying 200 years ago

Two hundred years ago farmers needed to provide their own milk and vegetables and they also consumed meat from the property. All of the farmer's jobs were centred around making sure they could meet their own needs of food, water and shelter and then any extra produce they made, they could sell.

This room tells us a lot about products and science and technology. Imagine working in a dairy 200 years ago when milk was collected in wooden buckets and the cream and butter were made by hand. Butter and milk had to be consumed near where it was made because refrigeration and fast transport were not available.

Optional learning journal activity

In your learning journals draw stars over the tools used to produce milk in the era that this room represents.

Room 4 - Dairying 100 years ago

One hundred years ago dairy farmers started to get better access to machines to help them do their work. In the late 1800s a mechanical cream separator was installed here at Belgenny and in

the 1900s farmers got access to milking machines. These developments meant that fewer people needed to keep cows as dairy farms were able to increase their production by milking more cows per day. At this time there were also developments in transport that meant that farm produce could be sent to markets faster. This room is all about the improvements that meant that farmers could produce more and get it to people faster. It is also the room where the engine that ran the separator was located.

Optional learning journal activity

In your learning journals draw stars over tools used to produce milk in the era that this room represents.

Room 5 - Dairying in the creamery era

This whole end of the building was constructed in the 1820s as a coach house for horse-drawn vehicles. This section was converted into a creamery in 1898 by adding the upper storey and an elevated water tank. Here, milk was separated into cream and skim milk.

Cans of milk were hauled to the top floor from carts parked directly underneath. The milk was tipped into a vat and flowed into a machine called a 'separator'. The cream was taken to Menangle Central Creamery to be sold or made into butter. The leftover skim milk was fed to pigs on Camden Park, which could be eaten by the people living here or sold off farm.

Optional learning journal activity

In your learning journal add arrows to the diagram to show where the milk, and later the cream, moved through the creamery.

Room 6 - The Macarthurs

These are all members of the Macarthur family, the first that lived here were John and Elizabeth Macarthur with their children. Members of the Macarthur family still live in a house nearby and lots of the Macarthurs between then and now have worked and lived here over the years. Many of them made changes to the way the farm ran, what they grew and sold from the farm and what the buildings were used for.

Optional learning journal activity

In your learning journal match the portraits with the product that they are associated with or older students may choose to record some details of the achievements of one of the people highlighted here. When you return to school you may have a chance to research them in more detail.

Room 7 - Dairying in the 21st century

The Macarthurs often tried new ways of farming, usually early in its development; this room includes modern methods of dairying that have evolved since the Macarthurs settled here. Have a look at the objects in this room, how have things changed? What do you see in this room that you didn't in other rooms? Read the information about each of the objects and think about what they are made of ie robotic arm, rotolactor.

There is a model of the rotolactor in this room. It was one of only three in the world and was the start of rotary dairying that many modern dairies use now. Edward Macathur Onslow, who was responsible for building the rotolactor here in the 1950s, would probably never have believed that one day robots would milk cows, but they do in some dairies. At one stage there was also a robotic dairy on Camden Park. Robotic dairies are a gentle way of milking cows as the computer that operates the milking machines can tell (by reading the cows identification tag) which cow

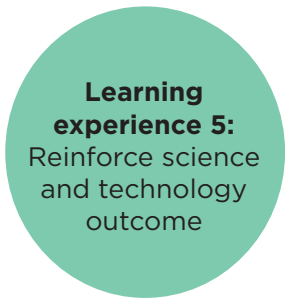
is in the stall, how long she needs to be milked and how much feed she needs. The computer can also tell if she is getting sick by testing the milk, which is then diverted from the milk tanker for disposal. If a cow is getting sick the farmer can arrange for the vet to come and treat her so she gets well again soon.



Optional learning journal activity

In your learning journal mark the equipment used in modern milk production. Add some interesting information that you have discovered in this room.

Learning experience 5



Aim: Students reconsider their understanding of dairy products prior to visiting Belgenny Creamery—has their appreciation of the industry changed?

Learning intention

Students will be able to state and justify whether their understanding of the dairy industry has changed since visiting Belgenny Creamery.

Review

Review Learning experiences 1 to 3. Ask students to volunteer what they have learnt or how their opinions have changed since their visit to Belgenny Farm.

Discuss / Investigate / View

Together look again at the dairy process diagram and discuss the changes / developments made at each stage of the process.

Ask students to choose one of the aspects in the process diagram eg milking or bottling or transport. Try to ensure that all of the areas are covered by someone so that when they come together to communicate the changes that aspect has undergone in the past 200 years most or all of the process is covered.

Optional learning journal activity

The historic/process diagrams in the learning journal will assist them to complete a review of the changes.

Next

Next students will take their understanding of the historical development of the dairy industry and attempt to predict its future.

Learning experience 6

Aim: Students apply their learning of the changes in the dairy industry since 1805 to predict the future of the Australian dairy industry.

Learning experience 6:
Activities designed to apply learning to a new situation

Learning intention

Students will make predictions about how they think the industry will change and develop in the next 200 years.

Review

The changes in the dairy industry in the last two hundred years.

Discuss / Investigate / View

Ask students to choose a part of the milk production process and predict what changes they imagine will occur in the next 200 years. Let students go crazy with this, who would have thought 200 years ago that robots would be milking cows in the year 2015? Students will share or deliver this as a whole class so it would be a good idea to cover each of the parts of the dairy process.

This is an opportunity for students to implement a structured design process; identifying tools available (or likely to be in the future!), any design constraints and to produce a solution.

Suggested activities

As a class decide how to deliver the ideas that students come up with—ideally you will be able to incorporate a range of responses ie written, drawn, spoken etc. Depending on the resources available at your school it may be possible to combine multi-model responses into one document eg PowerPoint, Padlet, or VoiceThread if you have access to them. BlogEd is another good option in a NSW government school.

Take it further

Ensure students have a chance to present their predictions to friends, family or other classes.

Next

Students will be working technologically again in the next learning experience, this time to design an advertisement for Belgenny Farm.

Learning experience 7

Learning experience 7:
Application of learning to a creative endeavour

Aim: Students will consider the learning process they have undertaken in the unit and come up with a slogan and poster or video advertisement for dairy products and / or Belgenny Creamery.

Learning intention

Students will devise a marketing slogan / poster or advertisement that reflects the knowledge they have gained during the unit.

Review

Ask students to reflect on the unit of work from the beginning—flip back through their learning journals or student notebooks as a prompt.

Discuss / Investigate / View

Brainstorm as a class the things that students have learnt—new knowledge, terms etc

Students can then take this information and decide what they would communicate about the unit.

Suggested activities

Decide—according to your students and school situation how you will promote the learning outcomes either in groups, as individuals or as a whole class project and in what format eg digital, written, visual etc. Think of a way to communicate this to other schools or classes that may be considering visiting Belgenny or completing the unit.

View some notable food marketing campaigns eg Got Milk? or Crunchy Nut Cornflakes. These may inspire students but also encourage them to find their own way of presenting their ideas.

Take it further

Ensure students have an opportunity to share their marketing strategies with an appropriate audience.

Appendix 1

Transcript of the reading (learning experience 3) adapted from Vernon Wood, Richard (2010) Birthplace of Australian Agriculture Belgenny Farm. Belgenny Farm Trust.

Belgenny Farm

A wonderful convergence of good soil, plentiful fauna, a freshwater river, ponds, forest and natural beauty made Belgenny a desirable place to live, work and to exploit during three distinct eras of occupation.

Over thousands of years the Dharawal shaped the landscape from the coast inland to near Camden. Their presence is recorded in rock engravings, cave paintings, and in stories about the land and its people. The name Belgenny is a variation of 'benkennie' or 'binhinny', a word used by the Dharawal traditional owners. It means 'the dry land'. The Dharawal influence was eventually overwhelmed by the British who came here in 1795 in search of a herd of cattle that had strayed from Sydney in 1788.

To British eyes, the landscape of forested hills and fenceless pasture, teeming with wildlife and dotted with Cabbage Gums that had been tended by Dharawal, Gundungarra and Dharuk people, appeared utopian and untouched. They named it 'the Cowpastures', and the area became a popular destination for dignitaries and officers from Sydney keen to see the escaped cattle herd, which by 1801 numbered more than 500 head. They studied the landscape and no doubt admired the scenery. It also became the haunt of escaped convicts who had 'gone bush'.

In 1805, John Macarthur was granted just over 2000 hectares of land specifically for the development of a wool industry. He chose a section of the Cowpastures, the best land available in the Colony of New South Wales, and named it Camden after Lord Camden in England who had recommended the grant. The property later became known as Camden Park.

The Macarthur family became preeminent in the development of Australia's colonial agriculture. At Belgenny Farm they pioneered fine wool sheep breeding, wool processing for export, grape growing, and wine making, silk production, fruit growing and horticulture, grain growing and refrigerated and mechanised dairying. The family's intensive and experimental farming over 168 years transformed the landscape and included the construction of many 'state of the art' agricultural buildings that remain intact today.

Most of Camden Park, the section we now call Belgenny Farm was sold in 1973. But, recognising its significance to history, architecture and agriculture, the NSW government bought back 1583 hectares in 1984 and built the Elizabeth Macarthur Agricultural Institute in 1990. This third era of occupation saw the reintroduction of the name Belgenny and the re-establishment of the farm as a place of agricultural innovation. It also ensured the preservation of its buildings and of a site significant to the Dharawal traditional owners and the Macarthur family.