

Topic 1: The life of a cattle or sheep farmer

Introduction

In this topic, students will activate their prior knowledge of farming and begin to explore what cattle and sheep production is all about.

Resources

- **Farm mind map** activity sheet (one per pair or small group)
- **Cattle and sheep production KWL chart** activity sheet
- The following videos (available on www.forteachersforstudents.com.au or YouTube):
 - From City Life to Cattle Farming
 - Grazing Cattle in the Kimberley
 - Innovative Cattle Stations in Australia
 - Broken Hill Organic Sheep Farming
 - Low stress stockhandling: Cattle in the Kimberleys
 - Australia's biodiversity: farming, pastoralism and forestry
- Farmer stories (available on this site)
- Books about farming (fiction or non-fiction)

Activities

Write the word 'farm' on the board. Ask students to think about what comes into their minds when they see that word. In pairs or small groups, have students record their initial thoughts and ideas on the '**Farm mind map**' activity sheet. Share these and compile a class mind map. Ask students to share any experience they have with farms or farming.

Display a copy of the **Cattle and sheep production KWL chart** on the board and add some ideas to the first column.

In the same pairs, or small groups, students draw what they think a farm looks like. What places, people or things do they think a farm has? Share the drawings.

Explain to students that they will be engaging in six topics to help them learn more about cattle and sheep production.

In this topic, students will explore what cattle and sheep producers do on their farms. To do this they will watch videos and read farmer stories. You may wish to select some specific stories for students to read or let them select their own.

As students watch and read, ask them to make a list of everything the farmers are doing. Students should also note any use of technology they see as this will become a focus in later topics.

If possible, invite a sheep or cattle producer to come and speak to your class, or organise a video link discussion.

As students read the stories and watch the videos, ask them to record any new vocabulary which will be included on a word wall and any questions they have about cattle or sheep production.

Display the **Cattle and sheep production KWL chart** again and list questions in the middle column.

Extension options

- Organise a visit to a farm or explore the 'Virtual Farm Visit' interactive on this site.

Assessment

- Contributions to class discussion
- Farm mind maps
- Contributions to word wall
- Contributions to KWL chart

Topic 2: Sustainability and biodiversity

Introduction

Sustainable and efficient farming is a top priority for Australian sheep and cattle producers. They are leading the way in developing and employing successful methods and practices to protect and preserve the environment.

In this topic, students will consider the term 'biodiversity' and assess the biodiversity of their own school environment. Then, they will work through learning stations to explore some of the environmental issues and challenges that farmers face and embrace in their daily operations.

Resources

- The following videos (available on www.forteachersforstudents.com.au or YouTube):
 - Biodiversity in Farming
 - Sustainability in Remote Areas, Cattle in the Kimberley
 - Sustainable Sheep and Cattle Farmers in Australia
 - 'Sustainability in farming is critical' with NSW Farmers
 - Australia's biodiversity: farming, pastoralism and forestry
 - Water Management, Cattle in the Kimberleys
 - Innovative cattle stations in Australia
- **Water use in the paddock** activity sheet
- **Water use in the paddock – solutions** sheet
- **Pest or not? That is the question** activity sheet
- **Let's eat** activity sheet
- **Let's eat – solutions** sheet
- Soil samples from around the school (or varying samples from home/outside the school – students need a variety of soils for this activity)
- Soil testing kits – available from hardware and gardening stores.
- Gardening gloves (optional)
- Small shovels
- Buckets or plastic containers

- Scissors
- Glue
- Coloured pencils or textas
- String

Activities

What is biodiversity? Ask students to discuss this term with a partner and write down words or phrases that come to mind. Share some of these ideas and come up with an initial definition. Show the 'Biodiversity in Farming' video then revisit the definition.

'Biodiversity is the variety of plant and animal life in the world or in a particular habitat.'

Discuss why students think biodiversity is important.

As a class reflect on the biodiversity of the school environment. In small groups, students go around the school and make notes, take photos or draw images relating to the biodiversity of their school environment. What sorts of animals and plants do they see? What ground cover? Any water sources?

When you return to the classroom, ask groups to discuss what they found and draw a flow chart to show how these elements of the school environment work together (e.g. how does the plant life support the animals, or how do the groundcover choices affect the plant life?).

Ask students to use their growing knowledge about farms, to think about how the idea of biodiversity would apply in a cattle and sheep production environment.

To explore elements of biodiversity students will work in small groups to work through several stations. This could be done as a rotation on one day, or students could complete one station each day over a week.

The stations:

Water

At this station, students will watch the 'Water Management, Cattle in the Kimberleys' video, read some facts about water then complete the **Water use in the paddock** activity sheet.

Soil

Please note: this activity requires adult supervision.

Students use a soil testing kit to test soil samples from around the school and record what they find, then research which types of plants will grow in the soil they have tested.

Pests

Students use the **Pest or not? That is the question** activity sheet to sort and classify animals as pests or not and then research to find out what damage/problems the pest animals can cause. Students make a pest mobile to display their information.

Emissions

Cattle and sheep farming produces about 10% of Australia's greenhouse gas emissions. Much of this comes from the energy used in production, but it is also a result of the digestive system of the animals and their burps which contain methane. At this station, students will explore how ruminants digest their food on the **Let's eat** activity sheet.

Whole class conclusion

As a whole class, watch the 'Innovative cattle stations in Australia' video and discuss how it shows the ideas of biodiversity. What sort of technology do students see being used to support this?

Extension options

- Students could select another area linked to sustainability or biodiversity (such as energy) and research further or create another learning station for their classmates.

Assessment

- Contributions to class discussions
- Work samples and activity sheets from stations

Topic 3: Looking after the animals

Introduction

Farmers take the health and comfort of their animals very seriously at all stages of the cattle and sheep farming process (from birth to the processing plant). Students will be introduced to the 'Five freedoms for animals under human control'. These are considered to be the *minimum basic standard* of care, and farmers always strive to do more for their animals.

Students will use the 'jigsaw' learning approach to find out more about the freedoms, then use them to create their 'ultimate' farm environment for a cow or sheep. They will present these to the rest of the class.

Resources

- **Looking after the animals** fact sheet (available in the Facts for students section)
- Computers with internet access
- The following videos (available on www.forteachersforstudents.com.au or YouTube):
 - Free from hunger and thirst
 - Free from discomfort
 - Free to express normal behaviour
 - Free from fear and distress
 - Free from pain, injury and disease
- Materials to make a habitat (if applicable)

Activities

Write 'animal welfare' on the board or a piece of paper. Ask students to share with a partner what they think it means or is involved in looking after animals. Share students' ideas. Students can draw on any knowledge they developed during Topics 1 and 2.

In pairs, or as a class, read through the **Looking after the animals** fact sheet. Students to note or highlight any unfamiliar words. Discuss these and add them to the word wall started in Topic 1.

Discuss the information on the fact sheet. What is familiar information? What is new information? Have they ever heard of the 'five freedoms' of animal welfare? Explain to students that these are the *basic minimum standards* of welfare and that farmers are always striving to find better ways to look after animals. Ask students if they have any animal welfare ideas that are not covered in the five freedoms. If students have animals at home, ask them how they apply these to their animals.

Using students' prior knowledge, how might animal welfare apply to cattle and sheep farming?

Researching the five freedoms for animals

Explain to students that they will be working in small groups to create (plan, design and/or make) a habitat for a cow or sheep. This habitat can be as creative as they wish, but it must take the five freedoms into consideration for their chosen animal.

This lesson utilises the 'jigsaw' cooperative learning strategy.

Groups of students will work together to become 'experts' in one of the five freedoms for animal welfare. Then, to design the habitats, groups will be formed that have one 'expert' for each freedom. This strategy ensures that all students are valued as they have knowledge required to complete the task

The expert groups will research one of the Five Freedoms for Animals under Human Control. Groups can begin with the videos listed in the resource list. Please note that these predominantly relate to cattle, but the principles can be applied to any animal. After students have watched their assigned video they may need to undertake further research to find out more about their topic and how it might apply to animals other than cattle. This site has further information about animal welfare and the RSPCA (www.rspca.org.au) has more information about the five freedoms.

As technology is becoming more common on farms, ask groups to consider how technology is being used within animal welfare considerations.

Once the groups are finished their research, they compile a short list of important points about their focus to share with the whole class.

Making the habitat

Form new groups to plan, design and/or make a habitat for a cow, sheep or goat that reflects the principles of the five freedoms. The groups should have an 'expert' in each of the five freedoms. Each member would be responsible for deciding how their freedom would be considered in the design. This might require further research to find information such as type of food the animal eats, what its natural behaviours are or how technology could be used in the design.

You may wish to set some parameters for students (such as ensuring it is a realistic farm design) or let students be imaginative in their designs.

If your class does not lend itself to groups of five, you may wish to share the information about the freedoms as a class, so that all students are familiar with all five freedoms before they create their habitats.

Each group should present their habitat to the class. They will explain its features and justify the choices linking back to the five freedoms principles.

Extension options

- Students to vote for the habitat that they think addresses the five freedoms the most successfully (they cannot vote for their own).
- Students take on the role of the animal and write a review/critique of another groups' habitat from the animal's perspective.
- Students use their maths skills to create their habitat to a scale.

Assessment options

- Contributions to class discussion
- Habitat plans or model with justification of choices (written or in oral presentation)
- Critiques written from an animal's perspective

Topic 4: Feeding the future – productivity and biosecurity

Introduction

Our global population recently passed the seven billion mark and is predicted to reach nine billion people by 2050. That's a lot of extra people to feed.

Despite being the world's second driest continent, Australia already plays an important role in feeding the world's population, producing 4% of the world's beef and 8% of the lamb and mutton that is consumed globally. As the demand for meat grows, however, supplying enough protein to satisfy the world's rapidly expanding population has become an important issue.

In this topic, students will be introduced to two important challenges faced by farmers in relation to ensuring food supplies into the future: climate variability and biosecurity.

Resources required

- **Climate variability – what's happening?** fact sheet
- **Australian climate zones** activity sheet (enlarged to A3 – one per pair)
- **Australian climate zones – solutions** sheet
- **Cattle 'cow'acteristics** activity sheet (one per pair)
- **Cattle 'cow'acteristics – solutions** sheet
- Computers with internet access
- This website along with:
 - Bureau of Meteorology
www.bom.gov.au
 - Farm Biosecurity
www.farmbiosecurity.com.au/about
- The following video (available on www.forteachersforstudents.com.au or YouTube):
 - Australian Agriculture – The Greatest Story Never Told
- **Feeding the future** fact sheet (Biosecurity and food safety section)
- **Biosecurity cause and effect** activity sheet

Activities

Climate variability

As a class, or in small groups, read through the **Climate variability – what’s happening?** fact sheet. Discuss the information and explore any unfamiliar terms and phrases (add these to the word wall). What else do students know about changes in climate and how this might effect cattle and sheep producers?

Ask students to visit the ‘Agriculture’ section of the Bureau of Meteorology website www.bom.gov.au and explore what sort of information is available to farmers. They should make notes about what they find. How could farmers use this information to plan for the future?

Once students have gathered some information, share it through a class discussion.

Explain to students that Australia has two general climate zones: warm/tropical and cool/temperate. Provide pairs of students with a copy of the **Australian climate zones** activity sheet. Ask them to identify (through colouring in) where these two zones are in Australia. Review as a class and agree on a decision.

It is important to note that cattle and sheep producers select the right breeds for their climate zone. This leads to increased productivity and less problems for the animals.

In the same pairs, students work through the **Cattle ‘cow’acteristics** activity sheet to explore the characteristics of four breeds of cattle and how these determine the best climate for them to be raised in. Once they have matched the characteristics with the correct breed they should glue the picture onto the map of Australia (on the **Australian climate zones** sheet), indicating if the cow is suitable for the warm/tropical or cool/temperate climate. If gluing the pictures will not work, students can write the names of the breeds on the map.

Biosecurity

Individually, or with a partner, read through the **Feeding the future** student fact sheet, focusing on the ‘Biosecurity and food safety’ section. Discuss the information and explore any unfamiliar terms and phrases. Add these to the word wall. Ask students to define ‘biosecurity’ in their own words.

Students to have some research time to further their understanding of biosecurity. Direct students to explore this site and the Farm Biosecurity website to further their understanding of the risks to farms and the ways those risks can be managed. Students to take notes during their research time.

After researching, the whole class should brainstorm the potential risks to farms, noting ideas on the board. Ideas of potential risks could include wild/feral animals (such as foxes, rabbits, feral pigs etc.) weeds, weed seeds, contaminated water and diseases.

With their partners, students choose one potential risk and complete the **Biosecurity cause and effect** sheet, showing the reason something happens (the cause) and the result of it (the effect). These could be displayed in the classroom for students to view the many and varied risks.

Extension options

- Students to dress up like a 'superhero farmer'. They are to prepare and deliver a presentation (with the use of visual aids such as photos or pictures) about how they protect their farms from pests and diseases.
- Invite a farmer to speak to the class about potential risks to their farm and how they prevent/reduce these risks.
- Give students the opportunity to create a 'farm profile' to investigate specific risks to livestock. This 'farm profile' can be accessed from the 'Toolkit' section of the farm biosecurity website.

Assessment

- Contributions to class discussion
- **Biosecurity cause and effect** activity sheet.

Topic 5: Technology and farming

Introduction

Technology has always been used on farms. Even in the early days, farmers used shovels, hoes and horse-drawn ploughs to make their job more efficient. Today, various technologies are being employed by farmers to increase productivity, save time and reduce stress on the animals. This includes drones, computerised data collection tools, vehicles (including helicopters) and machinery, and tablets smartphones and GPS systems.

In this topic, students will explore some of these technologies and discover how they can be used on farms to address many of the areas covered in topics 1 to 4.

Resources

- Computers with internet access
- The following videos (available on www.forteachersforstudents.com.au or YouTube):
 - National Livestock Identification System
 - NLIS Cattle video
 - NLIS
 - Helicopter
 - Mustering Cattle in the Kimberleys
 - General videos
 - Weighing cattle in the crush
 - Innovative Cattle Stations in Australia
- Websites
 - Bureau of meteorology (www.bom.gov.au)
A weather monitoring and forecasting website. There is also an app available
 - Practical Systems (<https://www.practicalsystems.com.au>)
Offers a range of farm management tools including stock management, farm records, farm mapping and financial management. This website requires a subscription for complete access, but there is basic information available for no cost.
 - Auctions Plus (auctionsplus.com.au)
This website is an online auction platform which allows farmers to buy and sell livestock online without having to go to the saleyards.

- Apps (these are related to cuts of meat and cooking)
 - Meat Cuts (www.beefandlamb.com.au/How_to/Cooking_beef_and_lamb/Tools_and_Apps/Meat_Cuts_Smartphone_App)
This app has information about nutrition and the different cuts of meat. There are also recipes available.
 - Steakmate (itunes.apple.com/us/app/steakmate/id742888059?mt=8)
This app will help you cook the best steak.

Activities

Students will work in groups to research how one type of technology is being used on farms. There are some videos, apps and websites listed in the 'Resources' list that provide starting points for research, but students could choose to focus on other areas such as farm machinery (e.g. tractors, quad bikes etc.), energy technology (such as solar panels or wind farms) or technologies used in animal welfare. There is information about these on this site. As students gather their information, they should think about how it applies to the ideas in Topics 1 to 4.

Once the group has gathered their information, they should decide how they will present it to the rest of the class in a format that can be understood and used as a resource by everyone. This could be a poster, information brochure or uploaded to a class website. This information will be used in Topic 6.

Extension options

- Invite a farmer into the classroom to talk about how he/she uses technology to make cattle and sheep production more efficient.
- If possible, visit a farm to see the technology in action.

Assessment

- Research notes
- Finished presentation products

Topic 6: Bringing it all together

Introduction

Throughout this unit of work, students have considered multiple aspects of sheep and cattle production and how technology is being utilised to make this job more efficient, safer and less stressful to animals.

In this final topic, students will work in pairs or small groups and utilise all the information they have gathered to plan and/or create their own farm.

Resources

- Items to create a map or model of a farm
- Notes and other work from all previous topics
- Computers with internet access
- **On the farm** activity sheet

Activities

Begin with a class discussion about what students have learnt about farming. You may wish to record what children have learnt in the final column of the KWL Chart.

In pairs or small groups, students will plan their own farm. This can be completed in several ways:

- A drawn plan with notes explaining the decisions they have made (this could be drawn to scale). Students can use the illustrations on the **On the farm** activity sheet to help them with this.
- A 3D model could be created with notes explaining the decisions they have made.
- An oral presentation accompanied by a photo story or power point presentation addressing the criteria.

When planning their farm, students should address the following criteria:

- The layout – what items will they have on their farm and where will they be located? Students can use the illustrations on the **On the farm** activity sheet for this.
- The location – where will their farm be located? This will dictate the climate.
- What they will be farming - will students have cattle, sheep or both on their farm?

- How they will manage issues such as water, power, animal welfare and the general environment?
- Which technology will they use?

Once students have finalised their farm, they should present it to the rest of the class.

Assessment

- Contributions to class discussions and KWL chart
- Farm plan/model and presentation