Primary Industries

**Stream Focus Area: Livestock health and welfare**

Welcome.

This module will assist you to review and revise content in the area of ‘Livestock health and welfare’ in the NSW HSC Primary Industries syllabus.

You will have studied:

[AHCLSK202 Care for health and welfare of livestock](https://training.gov.au/Training/Details/AHCLSK202)

**or**

[AHCLSK309 Implement animal health control programs](https://training.gov.au/Training/Details/AHCLSK309)

This module is broken up into:

* Important notes
* Key terms and concepts
* Activities
* Putting the theory into practice
* HSC Focus Areas

How to use the resource

Work through the notes and the suggested activities in any order. Great revision techniques include working through how a problem is solved, explaining the concept, testing yourself and retrieving information from your memory. Spread your revision over a number of sessions rather than sitting at one subject for lengthy periods.

Discuss your responses with your teacher, fellow students or an interested family member.

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# Important Notes

You should use the information in this module as a prompt and guide when revising your **study notes** or **text-book information** or **other resources** provided by your teacher. You can also access industry specific information at [SafeWork NSW](https://www.safework.nsw.gov.au/your-industry/), [Farmsafe Australia](https://www.farmsafe.org.au/) (National Farmers Federation) or [NSW Department of Primary Industries,](https://www.dpi.nsw.gov.au/)

The unit [AHCLSK202 Care for health and welfare of livestock](https://training.gov.au/Training/Details/AHCLSK202) describes the skills and knowledge required to care for the health and welfare of livestock.

The unit [AHCLSK309 Implement animal health control programs](https://training.gov.au/Training/Details/AHCLSK309) describes the skills and knowledge required to implement animal health control programs.

The outcomes of the HSC Primary Industries stream focus area ‘Livestock health and welfare’ require that the student:

* explains principles and techniques for monitoring and maintaining the health and welfare of livestock
* applies knowledge of animal health and welfare to the handling and treatment of livestock.

Make sure your revision covers all the content of this stream focus area as described in ‘HSC Focus Areas’.

Key Terms and Concepts, the Activities and ‘Putting the theory into practice’ (questions from past HSC papers) will assist with your revision of topics.

# Key terms and concepts

You can use the following information to revise the key terms and concepts from this unit of competency. Perhaps you could:

* Copy the table into your own file, remove all the key terms, then fill in the blanks (without peeking at the original file) with your own answers.
* Copy the table into your own file and remove the definitions. Write a definition in your own words – it doesn’t have to word perfect but should show you understand the concept.
* You could add extra words and definitions as you come across them. ‘Tab’ in the last box of the table to add another line.
* Add examples relevant to the Primary Industries environment. If the key term was ‘animal welfare’ your PI example might include reference to ‘the Prevention of Cruelty to Animals Act and the Prevention of Cruelty to Animals Regulation.

|  |  |
| --- | --- |
| Key term or concept | and Definition |
| Animal welfare | Legislation to protect animals and the prevention of animal cruelty. |
| Bacteria | Microscopically small forms of life that can live anywhere organic matter is found. Some bacteria cause diseases in plants and animals |
| Biosecurity | Protection of life |
| Biological control | A method to control pest parasites and pathogens instead of chemicals |
| Disease | A condition where any part of a living organism is abnormal |
| Euthanasia | The act of intentionally putting an animal down due to illness or a requirement to slaughter using approved techniques |
| Fauna | Animal life |
| Insecticide | A substance used to prevent, destroy, repel or control insect pests |
| Integrated Pest Management (IPM) | Uses a variety of control measures to keep pests from reaching harmful levels. Options could include exclusion, managerial/cultural, physical, genetic, biological and/or chemical |
| Life cycle | Stages in the life development of an organism |
| Microorganism | Any organism that can be seen only with a microscope |
| Pathogen | A disease-producing organism. Includes fungi, bacteria and viruses |
| Pest | A living organism that causes loss, damage or injury to plants, animals or produce |
| Physiological | The way the body of an animal functions |
| Resistance | The ability of a pest to tolerate the label rate of application of a chemical |
| Safety Data Sheets | Information produced by a manufacturer that provides the information needed to allow the safe handling of hazardous substance |
| Spray drift | The movement of airborne spray droplets from the spray nozzle beyond the intended target area by wind to an area not intended to be treated. |
| Stress | Upsetting situation for animal such as aggressive handling, lack of nutrition, illness from disease, bullying from other animals |

# Activities

### Activity 1: Research tasks

1. View the following video clips and research additional information. For each topic make a dot point list of notes and include examples which you might use in an HSC exam response.
   1. [safety](https://sites.google.com/a/education.nsw.gov.au/picertllruraloperationslivestockcluster/safety) (include the role of yard design)
   2. [livestock handling](https://sites.google.com/a/education.nsw.gov.au/picertllruraloperationslivestockcluster/disease) (choose one type of livestock)
   3. [routine husbandry activities](https://sites.google.com/a/education.nsw.gov.au/picertllruraloperationslivestockcluster/disease) (scroll down for this clip)
2. Use your own classroom notes and resources to answer the following:
   1. What is the meaning of the term ‘integrated pest management (IPM)?
   2. Outline THREE valid strategies that could be used in an integrated pest management program in a primary industries enterprise.
3. Review your understanding of [safe animal handling](https://www.safeworkaustralia.gov.au/agriculture) at the SafeWork Australia website.
4. List three common animal diseases you have studied. Describe their symptoms, how you could prevent them and how you could control the diseases. You could also research this at Australian Government Department of Agriculture, Water and the Environment [Animal pests and diseases](https://www.agriculture.gov.au/pests-diseases-weeds/animal)
5. Choose two animal pests from Australian Government Department of Agriculture, Water and the Environment [Plant pests and diseases](https://www.agriculture.gov.au/pests-diseases-weeds/plant) . Describe the pest and explain the best control methods for each pest.
6. Research [Animal Welfare in Australia](https://www.agriculture.gov.au/animal/welfare/animal-welfare-in-australia) to learn more and answer the following:
   1. Explain what is meant by the ‘Model Codes of Practice for the Welfare of Animals’ (Model Codes)
   2. Work is now underway to update the Model Codes and convert them into ‘Australian Animal Welfare Standards and Guidelines’. What is the purpose of this work?
   3. Who has a role or responsibility for animal welfare?
   4. Individual owners and users of animals have a responsibility to fulfil a duty of care for animals in their charge. What does this involve?
7. Codes of practice provides specific and detailed advice on how to carry out procedures within industry. Using the information at Department of Primary Industries ‘[Animal Trades Codes of Practice and Standards’](https://www.dpi.nsw.gov.au/about-us/legislation/list/prevention-cruelty-animals)
   1. Scroll down to find a Code of Practice related to an animal that interests you.
   2. Identify the full name of the Code of Practice you have researched.
   3. List the headings that appear in the Code of Practice
   4. Provide an example of where this code of practice would be relevant at, say, the school farm. You could use this in an HSC response.

**The following question is based on work originating (and with permission) from Calrossy Anglican School, Tamworth NSW.**

1. Information about ‘[Zoonoses – animal diseases that can infect people’](https://www.dpi.nsw.gov.au/biosecurity/animal/humans) is available from Department of Primary Industries. Research the following:
   1. Explain the term ‘zoonoses’
   2. List four occupations associated with agriculture or animals that are associated with increased risk of contracting a zoonotic disease.
   3. Which is the most commonly reported notifiable zoonotic disease in Australia. In which State does it mostly occur?
   4. Identify key points in managing the risks associated with zoonotic disease. Include both personal health and hygiene, reducing exposure and managing animal health.
   5. Outline two things that can be done when working with cattle to help protect against contracting ringworm and leptospirosis.

**Each of the following activities is based on work originating (and with permission) from Calrossy Anglican School, Tamworth NSW.**

### Activity 2: Identification

1. Choose two breeds of the same livestock and describe at least three distinguishing physical features.
2. Place each of the following breeds into the appropriate column of the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Classify these breeds |  |  |  |
| Hereford | Brahman | Limousin | Charolais |
| Droughtmaster | Angus | Shorthorn | Santa Gertrudis |
| Murray Grey | Sahiwal | Simmental |  |

|  |  |  |
| --- | --- | --- |
| British breeds | European breeds | Tropical breeds |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. Indicate the correct classification of each breed by placing an ‘x’ in the appropriate column of the table below.

|  |  |  |
| --- | --- | --- |
| Breed | Dairy breeds | Beef breeds |
| Friesen |  |  |
| Shorthorn |  |  |
| Jersey |  |  |
| Limousin |  |  |
| Guernsey |  |  |
| Angus |  |  |

1. Place each of the following sheep breeds into the correct column of the table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Classify |  |  |  |  |
| Dorper | Merino | Suffolk | Texel | Border Leicester |

|  |  |
| --- | --- |
| Longwool breeds | Meat breeds |
|  |  |
|  |  |
|  |  |

1. Summarise your understanding of the following methods and techniques used to identify livestock. The table will ‘grow’ as you enter text.

|  |  |  |  |
| --- | --- | --- | --- |
| Method or technique | Key points | Does this identify the individual animal or something else? | In place for the life of the animal? Explain. |
| Branding |  |  |  |
| Ear tattoo cattle |  |  |  |
| Ear tag cattle |  |  |  |
| NLIS ear tag cattle & sheep |  |  |  |
| NLIS *bolus* placed into first stomach of cattle |  |  |  |
| Sheep earmark |  |  |  |
| Pig brand |  |  |  |
| Tattoo on ram’s horn |  |  |  |
| Spraying coloured paint or dye (raddles) on selected animals |  |  |  |

1. In each of the following situations correct identification of the animal is critical to the success of the activity. Explain why this might be so.

|  |  |
| --- | --- |
| Procedure | Importance of accurate identification |
| Artificial insemination |  |
| Pregnancy testing |  |
| Treating sick animals (eg with antibiotics) |  |
| Selling bulls at auction |  |
| Mustering individual animals or small groups |  |

### Activity 3: Working with livestock

1. Suggest some key points that might be included under our duty of care to livestock:

|  |  |
| --- | --- |
| Animals must be provided with: | Animals must be free of: |
| For example - provision of adequate food |  |
|  |  |
|  |  |
|  |  |

1. In NSW, people working with animals are bound by the following – [‘Prevention of Cruelty to Animals Act 1979 (NSW)](https://legislation.nsw.gov.au/#/view/act/1979/200/whole)’ and ‘[Prevention of Cruelty to Animals Regulation 2012 (NSW)’](https://legislation.nsw.gov.au/#/view/regulation/2012/408/full) along with Codes of Practice, guidelines and delegations.

Answer True or False to each of the following.

|  |  |  |
| --- | --- | --- |
| Working with animals | True | False |
| It is an offence to fail to provide adequate food, water & shelter for animals. |  |  |
| Injuries to animals must be attended to & reported in necessary. |  |  |
| An authorised Inspector (eg from the RSPCA) can enter your property at any time if they suspect a breach of the law. |  |  |
| In serious enough cases of neglect, animals can be taken away or even put down by the authorities. |  |  |
| The RSPCA is not allowed to take any action that will mean the owner of neglected livestock will lose money. |  |  |
| The RSPCA may, in some cases, provide advice and assistance rather than prosecute. |  |  |
| Stock owners may be issued with a Warning and given the opportunity to improve animal welfare before being prosecuted. |  |  |

1. Identify the risks to both people and livestock associated with each activity in the table.

|  |  |  |
| --- | --- | --- |
| Activity | Risks to people | Risks to livestock |
| Mustering |  |  |
| Working cattle in yards |  |  |
| Vaccinating or drenching |  |  |
| Marking calves or lambs |  |  |
| Dehorning calves |  |  |
| Examining a cow that is lame in her hind leg |  |  |
| Giving an injection to a cow with pinkeye |  |  |
| Shearing sheep |  |  |

1. The website [**www.farmbiosecurity.com.au**](http://www.farmbiosecurity.com.au)is an excellent source of information regarding quarantine and biosecurity issues and their management and includes a range of [videos](https://www.farmbiosecurity.com.au/videos/). Identify at least ten biosecurity examples and how these might be prevented.

|  |  |
| --- | --- |
| Example | Means of prevention |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. Disposing of large amounts of manure is an environmental issue. Provide three examples of intensive animal industries that deal with this problem and their method of waste disposal. Discuss potential negative impacts of these methods (table will grow as you key in information).

|  |  |  |
| --- | --- | --- |
| Industry | Method/s of waste disposal | Potential negative impacts |
|  |  |  |
|  |  |  |
|  |  |  |

.

1. Discuss each of the following methods of animal disposal (the table will grow as you key in information). Make sure that you consider relevant issues such as:
   * Is the method convenient/easy?
   * Is the method likely to have an impact on the environment? How? Why?
   * Does the method comply with NSW legislation?

|  |  |
| --- | --- |
| Method of Disposal | Discussion |
| Burning |  |
| Burial |  |
| Composting |  |
| Dump carcase in the gully or creek |  |
| Take to a rendering\* plant |  |
| Take to the local landfill |  |

1. Use the table below to plan how to manage a potential risk. Suggest a situation known to you or alternatively consider the hazard to be ‘floodwaters resulting from localised heavy rain’.

|  |  |
| --- | --- |
| Management steps | Discussion |
| What are the risks? |  |
| What are the options available to us to help reduce the risk? |  |
| What options will we use? |  |
| How do we monitor the effectiveness of the methods used? |  |

### Activity 4: Livestock behaviour

1. Complete the following table, showing your understanding of what to look for when observing ‘normal’ livestock behaviour. One answer has been included as an example.

|  |  |
| --- | --- |
| What to look for | What is considered ‘normal’ behaviour |
| Approaching animals that are lying or standing in a group |  |
| Appearance of skin/hair |  |
| Gait of the animals as they move away |  |
| Faeces (including observations of area around tail and anus) | The faeces of the animals should be consistent with the feed that they are eating.  eg cattle eating lush, green feed will generally have loose, wet, runny faeces. They may have dags on their tail. Cattle eating dry feed should have dry faeces.  Faeces should not be excessively watery or foul smelling.  Faeces of cattle on grain based diets will often be loose but not excessively watery or profuse scouring. |
| Breathing |  |
| Size & shape of abdominal area |  |
| Face and eyes |  |

1. Think about a time when you have approached a mob of livestock in a paddock.
   1. What behaviour might indicate fear at your presence? What behaviours would you see?
   2. What would be a common situation where livestock might behave aggressively towards humans?
   3. How can you identify animals that are more naturally timid or aggressive than the rest?
   4. What actions can be taken to deal with extreme behaviours?

### Activity 5: Handling

1. Explain the key principles and procedures for handling livestock. Make sure you include:
   * reducing stress or discomfort
   * minimising risk to livestock
   * minimising risks to self and others
2. Describe each of the following techniques and methods used to handle livestock. The table will grow as you enter text.

|  |  |
| --- | --- |
| Technique/method | Guidelines |
| Move |  |
| Draft |  |
| Control |  |
| Inspect |  |
| Restrain |  |

### Activity 6: Nutrition

1. Write a paragraph (about 100 words) describing the relationship between livestock health and nutrition. Make sure you give examples.
2. Explain in one or two sentences each of the following aspects of feeding livestock.

|  |  |
| --- | --- |
| Technique/method |  |
| Intensive feeding systems |  |
| Extensive feeding systems |  |
| Types of feed |  |
| Feed supplements |  |
| Water |  |
| Safety of feed supply |  |

1. Provide examples of the following types of fodder and comment on the benefits of each. Some answers provided for you.

|  |  |  |
| --- | --- | --- |
| Type of fodder | Examples | Comment |
| Hay | * Cereal hay * Legume hay * Pasture hay |  |
| Silage |  |  |
| Grain |  | * High energy & moderate protein feed. * Whole grain can be fed to boost energy. * Need to be very careful feeding high energy rations to ruminants – can cause acidosis (grain poisoning) |
| Cereal straws |  |  |
| High protein meal |  |  |
| Cottonseed |  |  |

1. Water quality can vary considerably. Complete the following to show the effect of various situations. You might refer also to NSW Government Department of Primary Industries fact sheet ‘[Water requirements for sheep and cattle’](Source:%20http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/96273/water-requirements-for-sheep-and-cattle.pdf)

|  |  |
| --- | --- |
| Situation | Effect on quality of water |
| Shallow, warm water in a riverbed or edge of a dam |  |
| Stock water that is being pumped from underground where the groundwater is saline. |  |
| Cattle drinking water from a shallow creek. |  |
| Large amounts of animal manure or fertiliser washed into a creek by a heavy storm |  |
| Cattle standing in a shallow dam to cool off during hot weather |  |

1. Complete the following table providing additional examples of common toxic and noxious plants in NSW and the effect on animals. ‘Tab’ in the last line to add a row.

|  |  |
| --- | --- |
| Plant | Effects on animals |
| Paterson’s Curse |  |
| St John’s Wort |  |
| Johnson Grass |  |
|  |  |
|  |  |
|  |  |

1. Information pertaining to the chemical [2,4-D Amine 625](https://www.adama.com/documents/1380147/2764351/2%2C4-D+Amine+625+Label.pdf) is available from the manufacturer [Adama](https://www.adama.com/australia/en/). Scroll down to page 6 and locate information on ‘withholding periods’.
   1. Explain the consequences of attempting to sell a group of steers that had grazed a forage oat crop, five days after it was sprayed with 2,4-D amine.
   2. How long do we have to wait before cutting a paddock of forage barley (to make hay) after applying 2,4-D?
   3. What could happen if a neighbour sprayed a paddock with 2,4-D and the chemical drifted onto your paddock without your knowledge?

### Activity 7: Health

1. Create a table with examples of the following health conditions and how each might be treated.

|  |  |
| --- | --- |
| Health condition | Example and Treatment |
| A non-infectious condition |  |
| A parasitic disease |  |
| A fungal disease which can be passed on to humans |  |
| A bacterial infection |  |
| Scouring |  |
| Abdomen distortion |  |
| Injury |  |

1. Our workplace has a Biosecurity Plan explaining a variety of methods for stopping pests and diseases from entering our farm or our livestock. Two examples of actions taken follow:
   * We take delivery of 200 wethers. The animals are drenched and left in a paddock near the house for three weeks before being put out with other sheep.
   * All boundary fences are stock proof and well maintained.
   1. Explain how these methods may help prevent the spread of parasites and/or diseases
   2. Suggest two other biosecurity measures that might appear in the Plan.
2. There are times when an individual animal must be euthanised or ‘put down’.
   1. Suggest two things that may lead us to want to humanely end an animal’s life.
   2. Can you suggest situations in which a farmer is required to put down several (or occasionally many) animals?
   3. Suggest some important safety considerations that we need to be aware of when planning to euthanise an animal.
   4. Suggest an appropriate means by which the following animals may be humanely put down. Answer in the table.

|  |  |
| --- | --- |
| Livestock | Method/s of humane euthanasia |
| Cattle |  |
| Sheep |  |
| Horses |  |
| Chicken (in large numbers) |  |

### Activity 8: Treatment

1. You are carrying out a ‘normal’ inspection of livestock (your choice of animal) on your property when you observe a health issue (of your choice). Complete the following (the table will grow to fit additional information).

|  |  |
| --- | --- |
| Questions | Response |
| What symptoms did you observe in the animal(s)? |  |
| To whom will you report what you have observed? |  |
| What is most likely the cause of the problem? |  |
| Outline in point form the recommended treatment for the problem. |  |
| Where will you write down a record of *all details* of this incident? |  |
| Will follow-up treatment be required? Explain |  |
| Explain how you will monitor the animal(s) to see if the treatment has been effective? |  |

1. Create a summary table of common animal health treatments: drenching and vaccination.

|  |  |  |
| --- | --- | --- |
|  | Pour-on drenching | Vaccinating (eg 7-in-1) |
| Where does this treatment take place? |  |  |
| What equipment or materials do we require? |  |  |
| How can we check that the applicator or gun is delivering the amount it is supposed to deliver? |  |  |
| How do we set up the equipment prior to treatment? |  |  |
| How do you determine the dose rate per animal? Where can you find details of this? |  |  |
| Describe how the drench or vaccine is administered to the animal. |  |  |
| How do you dispose of empty drench or vaccine packs |  |  |
| What do you do with the applicator or vacc gun after you have finished the work? |  |  |

Putting the theory into practice

The following questions are from [past years’ NSW HSC examination papers](https://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/resources/hsc-exam-papers) for this subject. HSC exams are intended to be rigorous and to challenge students of all abilities. To better understand a question, you should look for key words and identify the aspect of the course to which these relate. You are then in a position to formulate your answer from relevant knowledge, understanding and skills.

All questions in ‘Putting the theory into practice’ are acknowledged © [2019 NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales.](https://educationstandards.nsw.edu.au/wps/portal/nesa/mini-footer/copyright)

## Multiple Choice

1. Chemicals are absorbed through the skin at different rates for different parts of the body. In which of the following are the body parts listed from highest to lowest rates of absorption?
   1. Forehead, upper foot, abdomen, forearm
   2. Abdomen, forehead, forearm, upper foot
   3. Forehead, abdomen, upper foot, forearm
   4. Abdomen, forearm, forehead, upper foot
2. Which of the following is an example of a natural disaster?
   1. Tractor roll-over on a soft steep slope
   2. Road closure as a result of chemical spillage
   3. Major crop damage arising from torrential rainfall
   4. Water contamination from a construction worksite
3. What is the shape of a mandatory blue safety symbol in the workplace?
   1. Circle
   2. Rectangle
   3. Square
   4. Triangle
4. Following a workplace audit, your supervisor has put in place a risk minimisation program using the hierarchy of controls.

|  |  |
| --- | --- |
|  | Risk minimisation strategy |
| W | Eliminate the risk |
| X | Other controls |
| Y | Monitor and review |
| Z | Minimise the risk |

In what order should the above strategies be applied?

* 1. W, Z, X, Y
  2. W, X, Y, Z
  3. W, X, Z, Y
  4. W, Y, X, Z

1. Which of the following is an example of substitution as a procedure for minimising risk?
   1. Using only pre-mixed chemicals
   2. Separating chemicals from all food products
   3. Using a modified mechanical sprayer to spray crops

Using a product in pellet form rather than as a dust or powder

1. A tractor applying chemicals is moving across a paddock at 5 km/h with a boom spray that covers 5 metres.   
     
   How long will it take to spray a 10­hectare paddock?
   1. 4 hours
   2. 5 hours
   3. 25 hours
   4. 40 hours
2. A farmer is spraying a 300 hectare paddock. The spray unit holds 500 litres. The application rate is 10 litres per hectare.

How many tankfuls will be used to completely spray the paddock?

* 1. 3
  2. 5
  3. 6
  4. 10

1. An insecticide is only supplied in 1 litre bottles. The mixing rate is 12 litres per 100 litres. The application rate of the mixture is 30 litres per hectare.   
   How many bottles of insecticide must be purchased to spray half a hectare?
   1. 1
   2. 2
   3. 3
   4. 4
2. The Bureau of Meteorology is predicting strong winds for the afternoon. A primary Industries worker is planning to spray for an outbreak of insects that afternoon.   
   What should the worker do?
   1. Record the wind speed
   2. Wear more PPE when spraying
   3. Reschedule the spray program
   4. Spray in the direction of the gusts
3. A chemical is being used for the first time at your workplace. It has been spilt on your work colleague. They do not appear to be in distress or badly injured.   
   What should your first action be?
   1. Call for an ambulance
   2. Check with your supervisor
   3. Use current first aid principles
   4. Review the MSDS for appropriate treatment
4. How would you determine the chemical output for a hand operated spray unit?
   1. Read the label for that chemical
   2. Carry out a pre-operation calibration check
   3. Read the operator’s instructions for the spray unit
   4. Mix the chemical and water in the correct proportions
5. The appropriate personal protective equipment (PPE) that must be worn when mixing a chemical is determined by
   1. using existing chemical records.
   2. using the same PPE that was used in the past.
   3. reading the chemical label after mixing the chemical.
   4. reading the material safety data sheet (MSDS) before mixing the chemical.
6. What is the colour of a mandatory safety sign on a primary industries worksite?
   1. Red
   2. Blue
   3. Green
   4. Yellow
7. What is the shape of a mandatory blue safety symbol in the workplace?
   1. Circle
   2. Rectangle
   3. Square
   4. Triangle
8. Which of the following best describes integrated pest management (IPM)?
   1. Breeding plants or animals that are pest resistant
   2. Alternating the chemicals used in a pest control program
   3. Encouraging or introducing natural enemies to control a targeted pest
   4. Using the most appropriate control strategies from a range of available options
9. In Australia, colours and shapes on safety signs have a particular meaning.

Which row in the table correctly matches the signs with their meanings?

|  | Emergency equipment and services | Action not permitted | Action must be done | Cautionary and an alert to a hazard |
| --- | --- | --- | --- | --- |
| a) | Yellow triangle with black border | Red hexagon with a line through it | Green rectangle with white symbol or text | Blue solid circle with white circle |
| b) | Blue solid circle with white circle | Red circle border with a line through it | Green rectangle with white symbol or text | Yellow triangle with black border |
| c) | Green rectangle with white symbol or text | Red circle border with a line through it | Blue solid circle with white circle | Yellow triangle with black border |
| d) | Green rectangle with white symbol or text | Red hexagon with a line through it | Yellow triangle with black border | Blue solid circle with white circle |

## Questions from Section II

These questions should be answered in the suggested number of lines (handwritten) as it gives a guide to the length of your response.  
  
Plan out your answer and key points before you commence writing. You may need to bring together knowledge from several areas of study/competencies to do justice to the answer.

Question 1

* 1. Outline the impacts of a natural disaster on primary industries. (3 marks)

* 1. Explain TWO work practices that could minimise the impact of wildlife habitat destruction. (3 marks)

Question 2

* 1. Discuss ONE current environmental issue affecting primary industries. (2 marks)

* 1. Name ONE government agency and outline its role in ensuring that primary industries comply with environmental legislation. (3 marks)

* 1. Explain the difference between environmental compliance and environmental best practice, giving an example of each. (3 marks)

## Questions from Section III

In the HSC –

* there will be one structured extended response question (15 marks)
* the question will have an expected length of response of around four pages of an examination writing booklet (approximately 600 words)

Your answer will provide you with the opportunity to:

* demonstrate knowledge and understanding relevant to the question
* communicate ideas and information using relevant workplace examples and industry terminology
* present a logical and cohesive response

You will note that these questions usually require you to bring together knowledge from several areas of study/competencies to do justice to the answer. You should allow about 25-30 minutes for a question in Section III of the exam.

Pay particular attention to incorporating a variety of aspects of your Primary Industries curriculum into the plan.

Consider how your study of **Livestock health and welfare** could be included in extended response questions, including the sample questions below.

Question 1

Evaluate a range of environmentally sustainable workplace practices that are used to manage current environmental issues affecting primary industries. (15 marks)

Question 2

Name a primary industries enterprise.

Identify the types of resources used in this enterprise and analyse strategies that could be implemented to improve the efficient use of those resources, including methods of measuring and monitoring.

Question 3

Explain how chemical labels and material safety data sheets (MSDS) assist in identifying hazards and risks when developing safe work practices

## Questions from Section IV

In the HSC –

* there will be two structured extended response question in Section IV, one for each of the stream focus areas (15 marks).
* you will answer the question on the stream you have studied
* each question will have two or three parts, with one part worth at least 8 marks
* the question will have an expected length of response of around four pages of an examination writing booklet (approximately 600 words) in total.
* Allow about 25-30 minutes for this question.

While Section IV is based on the stream focus areas (*Livestock health and welfare,* and *Plant pests, diseases and disorders*) you **can also include information from the mandatory focus area content**.

**Question 1 (2017 Q22)**

* 1. Name and outline the purpose of ONE piece of equipment used in the treatment of livestock. (2 marks)
  2. Explain the importance of safe work practices when working with livestock. (5 marks)
  3. Evaluate methods used to reduce stress and discomfort to livestock during handling. (8 marks)

**Question 2 (2018 Q22)**

* 1. Outline the purpose of animal welfare guidelines. (2 marks)
  2. Explain the link between nutrition and livestock health. (5 marks)
  3. Explain why hygiene, biosecurity and safe work practices are important when working with livestock. (8 marks)

**Question 3 (2014 Q21)**

* 1. Name and describe a method or technique that is used to identify livestock. 2
  2. Explain the importance of keeping records in relation to animal health. 5
  3. Explain the importance of correct disease identification for the control and future management of a disease. 8

**Question 4 (2019 Q22)**

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* 1. Describe strategies for dealing with animal residue and waste in a primary industries enterprise. (5 marks)
  2. Explain measures that could be implemented as part of a biosecurity plan to minimise the spread of disease among livestock (10 marks)

**Question 5 (2016 Q22)**

For an animal you have studied:

* 1. (a) Name TWO diseases, disorders or parasites which may affect that animal. (2 marks)
  2. Describe the signs and symptoms of the TWO named diseases, disorders or parasites. (4 marks)
  3. Describe the steps a primary industries worker would follow to prepare for, treat and record treatment details of ONE of the named diseases, disorders or parasites. (9 marks)

**Question 6 (2015 Q22)**

* 1. Name ONE livestock disease, parasite or disorder and describe in detail ways to prevent or treat this named disease, parasite or disorder. (3 marks)
  2. Describe the advantages of ONE method of prevention or treatment of this livestock disease, parasite or disorder. (3 marks)
  3. Justify safe work practices that should be followed when treating livestock diseases, parasites or disorders. (9 marks)

# HSC Focus Areas

For the purposes of the HSC, all students undertaking the 240 HSC indicative hours course in Primary Industries must address **all of the focus areas plus one stream focus area.**

The scope of learning describes the breadth and depth of the HSC Content, the minimum content that must be addressed, and the underpinning knowledge drawn from the associated unit(s) of competency.

Primary Industries **Stream** Focus areas

* Chemicals
* Safety
* Sustainability
* Weather
* Working in the industry

Primary Industries **Stream** focus areas (you will study one of the following)

* **Livestock health and welfare**
* Plant pests, diseases and disorders

The units of competency associated with the stream focus area ‘Livestock health and welfare’ in Primary Industries are [AHCLSK202 Care for health and welfare of livestock](https://training.gov.au/Training/Details/AHCLSK202) **or** [AHCLSK309 Implement animal health control programs](https://training.gov.au/Training/Details/AHCLSK309)

**How to use the scope of learning for ‘Livestock health and welfare’**

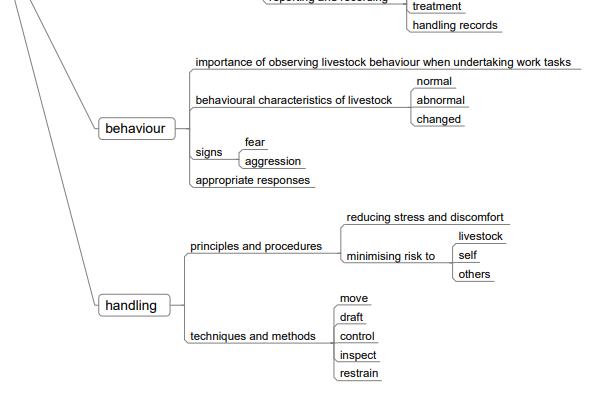
* draw up your own mind map showing the connection between the various concepts listed; examples appear on the last page of this module
* use the key terms and concepts to add to your mind map
* add examples or case study prompts to show how the concept is applied in the Primary Industries working environment

The following information is taken directly from page 56 ff ‘[Primary Industries Curriculum Framework Stage 6 Syllabus for implementation from 2020](https://educationstandards.nsw.edu.au/wps/wcm/connect/fa79abd8-9e46-43ce-822f-2700d4de40e7/primary-industries-curriculum-framework-syllabus-ahcv4.pdf?MOD=AJPERES&CVID=)’ © [2019 NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales.](https://educationstandards.nsw.edu.au/wps/portal/nesa/mini-footer/copyright)

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| identification |
| * broad knowledge of classification methods used to identify livestock:   breed  production type  identification system |
| * methods and techniques to identify livestock |
| * purpose and importance of accurate livestock identification |
| working with livestock |
| * understanding the responsibility of the primary industries workplace and its employees to maintain a duty of care towards livestock |
| * requirements when working with livestock:   legislation and regulations  industry codes of practice  workplace policy and procedures |
| * animal welfare guidelines including:   legislative  ethical  industry/sector specific  workplace  and their application |
| * importance of safe work practices when working with livestock:   livestock  handlers |
| * quarantine and biosecurity issues and their management:   hygiene procedures  biosecurity procedures  minimising disease introduction to:   * humans * livestock * environment   safe and hygienic procedure for dealing with animal residue and waste in an environmentally correct manner:   * clean up * disposal |

|  |
| --- |
| working with livestock cont/d |
| * animal welfare emergency procedures |
| * reporting and recording requirements in relation to animal health and welfare:   ill health/disease incidence  livestock losses  treatment  handling records |
| behaviour |
| * importance of observing livestock behaviour when undertaking work tasks |
| * behavioural characteristics of livestock:   normal  abnormal  changed |
| * common signs of fear and aggression in livestock and appropriate responses to these behaviours |
| handling |
| * principles and procedures for handling livestock:   reducing stress and discomfort  minimising risk to livestock, self and others |
| * techniques and methods used to handle livestock:   move  draft  control  inspect  restrain |
| nutrition |
| * an understanding of the relationship between livestock health and nutrition |
| * livestock diet and nutritional requirements |
| * feeding of livestock:   systems:   * intensive * extensive   elements:   * types of feed * feed supplements |
| nutrition cont/d |
| * water: * supply * quantity * quality   safe feed supply:   * hygiene * toxic/noxious plants * contaminants |
| health |
| * recognise and assess livestock condition:   normal  abnormal  injuries |
| * ill health in livestock:   common diseases and disorders:   * signs and symptoms * mode of transmission   parasite infestations:   * signs and symptoms * severity * resistance   testing procedures  prevention and treatment strategies  euthanasia procedures |
| * health status of livestock:   assess:   * physiological * health   issues identified  monitor:   * regular checks * post-treatment |
| treatment |
| * workplace procedures for dealing with sick and dead livestock |
| * common treatment procedures to maintain livestock health and welfare:   types of treatments:   * drenches * vaccines: * program * mode of action |
| treatment cont/d |
| * prescribed medicines   treatment site and facilities  equipment and materials used in the treatment of livestock:   * name and general features * selection: * correct for task * manufacturers’ specifications for use * use/application: * calibration * dosage/rates according to label * legislative requirements * safe disposal * cleaning * maintenance: * faults and malfunctions * reporting and recording * storage   preparation for treatments  administering and monitoring treatments  withholding periods for treated livestock:   * compliance * isolation * monitoring |

Creating a mind map is a great way to organise your knowledge and understanding of the content of a topic. It is important to try to include all the detail you can, so add definitions, case studies or examples to prompt your memory. Include the information downloaded from the unit of competency and also from the Scope of Learning and Key Terms and Concepts.

[](https://educationstandards.nsw.edu.au/wps/wcm/connect/c067c058-b388-40ad-a442-0626e28ea125/mind-map-vet-primary-industries-stage-6-livestock-health-and-welfare.pdf?MOD=AJPERES&CVID=)

Mind map being developed