

RESOURCE 1

EFFICIENT USE OF CONCENTRATES



Using this resource, pupils will explore how efficient use of concentrates is beneficial for farm economics, dairy cows milk yield and environmental sustainability.

<p>Learning Outcomes</p> <p>Unit 2: Animals on the Land</p>	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> • describe and explain how food sources (concentrates) are used to meet dietary requirements; • describe the main features of a lactation curve; • evaluate production rations; and • investigate the principal costs associated with keeping animals.
<p>Cross-Curricular Skills</p>	<p>Pupils will have opportunities to develop skills in:</p> <ul style="list-style-type: none"> • Using ICT • Communication
<p>Thinking Skills and Personal Capabilities</p>	<p>Pupils will have opportunities to develop skills in:</p> <ul style="list-style-type: none"> • Managing Information • Self-Management • Thinking, Problem-Solving and Decision-Making • Being Creative
<p>Resources</p>	<ul style="list-style-type: none"> • Internet access • Video 1: Efficient Use of Concentrates • Dairy Council NI 2020 Fact Book, pages 22–27 • Resource 1: Mind Map Template



CONTEXT

Purchased concentrates currently represent between 60–70 percent of variable costs of milk production on Northern Ireland dairy farms. Concentrates are more expensive than either grazed grass or grass silage. Concentrate prices can vary considerably from year to year.

In addition, [CAFRE Benchmarking data](#) indicates increasing reliance on concentrate feedstuffs in Northern Ireland, with average annual concentrate input per cow having increased from 1.8 tonnes in 2004/2005, to 2.6 tonnes in 2019/2020. This is due to a variety of reasons such as herd expansion and an increase in the genetic merit of the Northern Ireland dairy herd over the last 20 years, including higher yielding cows that require more nutrient-dense diets. The higher protein content in concentrates can lead to an increase in methane and ammonia emissions from livestock and their wastes.

This resource will enable pupils to evaluate the current use of concentrates on dairy farms and the efficient concentrate use research programme. It will enhance their knowledge of the Nutrition and Farm Economics parts of Unit 2: Animals on the Land. The following activities are designed to encourage pupils to consider these **key questions**:

- Why do dairy farmers use concentrates as well as grass or grazed silage?
- What are the negative impacts of concentrate usage on the environment?
- What can be done to lessen the negative impacts of concentrate usage?
- What range of benefits could efficient concentrate use have on a farm?

SUGGESTED TEACHING AND LEARNING ACTIVITIES

LAUNCH

Display the Efficient use of Concentrates PowerPoint slides 2, 3 and 4 describing the learning intentions, context and definitions for this resource.

Display slide 5. Recap with pupils the [lactation curve](#) for a dairy cow (Breeding and Reproduction) and discuss how food sources are used to meet the dietary requirements (Nutrition).

Working in small groups, encourage your pupils to:

- describe the main features of a lactation curve; and
- list and explain how the four food sources – forage, fibre (roughage), concentrates and minerals – are used to meet dietary requirements.

Ask your pupils to report back and establish prior knowledge.



You might also find it useful to setup an online collaborative whiteboard such as Google Jamboard or Padlet and invite the pupils to contribute what they know or understand about hedge management and biodiversity.

Display slide 6. **Use Video 1: Efficient Use of Concentrates** and page 22 of the [Dairy Council NI 2020 Fact Book](#) to introduce the context to the pupils. Highlight the importance of balancing the feeding of concentrates against the nutritional needs of the animal, the costs to the farmer and the impact on the environment.

ACTIVITY

Display slide 7. Use pages 23–25 of the [Dairy Council NI 2020 Fact Book](#) and Video 1: Efficient Use of Concentrates to complete a mind map.



You may wish to complete this activity with pupils using a digital tool such as Popplet or Google Drawings (go to the [Google Drawings website](#) and sign in using your Google account). You could then present it on screen or print it out.

MIND MAP: HOW DOES IT WORK?

Ask your pupils to:

- write the main topic or issue in the centre of a large page;
- draw the main ideas around the central concept, using branches to connect them;
- use a different colour for each main idea and highlighters to underline key words and concepts;
- add images to enhance the visual aspect of their map;
- draw sub-branches to highlight ideas connected to the main branch; and
- use the mind map as a springboard for more extensive revision, for example by developing revision notes writing one sub-branch on a postcard using the same colours and images as the mind map.

As a debrief, after completing the mind map encourage your pupils to think about why they clustered particular ideas together and how the map has clarified their thinking.

Refer to **Resource 1: Mind Map Template** for extra guidance.

EXTENSION

Extend this activity by inviting your pupils to present their mind maps to the class and highlight the key concepts.

DEBRIEF

Conclude by reviewing the **learning outcomes** and **key questions** from the start of the activity with your pupils.



If you used an online collaborative whiteboard in the launch activity, return to the whiteboard and ask your pupils to use a different coloured font to add any new ideas or information they have learned.



RESOURCE 1: MIND MAP TEMPLATE

