

Lesson 6: The rise of dairy = Social Factors.

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| Starter | <p>Kahoot: “Where is all the dairy?” either search the title or username JerseyGril89.</p> <p>Teacher notes have also been provided.</p> |
| Teach | <p>‘L6_ Social Factors’ PowerPoint.</p> <p>This PowerPoint goes over the cultural norm of drinking milk in western society, and how that looked in early New Zealand. It then goes into the genetic legacy of drinking milk and its origins.</p> <p>The increasing consumption of milk is mostly driven by demand from China and the uptake in the Western diet. Processing and the differences in milk is covered briefly (they will explore this further in the next activity). It finishes off with a story about young kiwi innovators looking at reducing plastic in New Zealand by tackling the milk bottle waste produced by cafes.</p> |
| Activity | <p>Consumer Decisions</p> <p>Hand out the cards from the ‘Consumer Decisions’ resource. Get students to discuss what they think each card means and then order the cards from what is <i>‘most important to them’</i> - <i>‘least important to them’</i>, if they were buying a litre of milk.</p> <p>Different people should have different priorities in regards to decision making and this helps create different markets which require different products.</p> |
| Activity | <p>Product Analysis and Sustainability</p> <p>Products and their labelling gives us insights into society and what is valued...</p> <p>This activity requires the collection of different milk bottles/products. the students will analyse the label and discuss the processing used.</p> <p>Products: Pams blue milk, anchor blue milk, meadow fresh green milk, A2 milk, non-homogenized milk, jersey milk, UHT milk, milk powder, Calci-plus milk, milk in a cardboard container (from fridge section), roan milk (if in canterbury) or in a glass bottle, almond milk in a tetra pak, oat milk in a tetra pak.</p> <p>Task 1: Analyse the label...</p> <p>Things for the group to discuss</p> <ul style="list-style-type: none"> • Is the product pasteurized? • Is it homogenized, • Are there any additives and if so what? Are they healthy or unhealthy? • Compare the two similar products made from different companies (e.g. Blue milk Anchor versus meadow fresh or Pams). What is the difference? And which factory are they most likely to go through? (Fonterra) • Hand out cards with the prices for each product or write them on the board and see if students can match the price with the product. • Using the ‘Consumer Decision’ cards can they match each card to a specific product? |

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| | <p>Task 2: Taste Test Could also do a taste test e.g. to compare UHT, milk powder, whole milk or trim milk.</p> <p>Task 3: Which of the products is sustainable?</p> <p>Have a discussion about what makes a product sustainable. It needs to be throughout the production line. Including the environmental impacts of on-farm practices, processing, transportation and end of product life.</p> <p>Each group needs to nominate and justify two products they think are the most sustainable and why and two products they think are the least sustainable.</p> <p>Lead to a discussion on consumer demands, why would people not pick the sustainable option? And how businesses are pressured by social expectations which introduces the idea of 'social licence', but also how businesses need to look at 'product stewardship'.</p> |
| Close | <p>Students fill in the "L6_Student Notes_Terminology" handout which has a range of terminology that has been used which helps us understand key ideas.</p> |



PowerPoint Notes:

Overview:

This activity requires a shopping trip, make sure you also save the receipt so you have the prices. Once the first class has done the activity you can keep the containers to use it with next year's class. The products listed provide a wide range of differentiation and lots to discuss when it comes to social factors around sustainability and health.

Lactose intolerance is when you have trouble digesting (breaking down) the lactose sugars. Lactose free milk is when a lactase enzyme has been added and the enzyme breaks the lactose making it easier to digest.

If you are allergic to milk often it is the protein and not the lactose that causes the issue. This is partly why the A2 milk protein has been bred into herds, as it is thought to not cause the same issues as the A1 protein. Special herds have been developed where they only carry the A2 gene so they can produce A2 milk.

Most milk comes from the same factory:

<https://www.stuff.co.nz/business/farming/dairy/106050501/micro-differences-between-milk-brands-so-why-are-some-customers-prepared-to-pay-a-premium>

Most milk goes through the same factories, "Fonterra collects 82 per cent of New Zealand's milk, meaning there's a very high chance the milk you poured on your cereal went through a Fonterra factory at some point."

Anchor is Fonterra's best known milk brand but they also produce Budget, Dairy Dale and more. Select, Cow & Gate and Signature Range are Goodman Fielder brands made using Fonterra-supplied milk.

At Countdown in Ponsonby, Auckland the milk fridge contains more than 30 cows' milk products from 11 different brands, and that doesn't include all the various sizes the bottles come in or things like cream and buttermilk.

Lee described three tiers of milk products; there's the top shelf brands (literally) such as organic milk brands Lewis Road and Kāpiti single farm and protein-specific A2 milk. Then there's the "mainstay" brands like Anchor and Meadowfresh, and then there's the no-frills brands put out by supermarkets.

Blind taste test pointers:

If you wanted to do a blind taste test I would recommend milk powder, blue milk, trim milk, non-homogenised milk and oat milk. Students tend to taste the difference between milk in a bottle and milk powder. See if they describe the differences between each one. Generally they find this quite fun and have little opportunity in day to day life to compare different products straight after each other, so on the whole we are very dependent on labels.



Sustainability notes:

Tetra paks are not easily recycled as they are made up of many different layers (like foils, plastic and cardboard). As a result they often go into landfill.

Travel miles must also need to be considered in regards to sustainability. Some countries can produce products more efficiently with less environmental impacts than others but it can be a hard equation to figure out.

Almond milk has been criticised due to water use and pesticide use which is having a major impact on bee populations (an introduced agricultural animal) but also the local environment.

A lot of the other plant based milk are monoculture crops that cover massive tracts of land which results in poor biodiversity and environmental impacts. However the same could be argued about dairy farming. Dairy farming does have more permanent grass cover (which encourages some species and protects the soil) and riparian planting is becoming an expectation. The other side effect is increasing demand for staple foods like rice which increases the price which makes it more difficult for developing countries to buy.

Roan milk in Canterbury has an alternative system where they keep the calves on the mums and take the excess milk for human consumption. They also have a glass bottle that you can exchange and goes back to be refilled (you get a discount on the next bottle).

Milk powder requires a massive amount of energy to dry the water out of the milk. But it is lighter and you can ship more so it could be good for carbon miles. It also has a longer shelf life.

UHT milk has no bacteria, which some people see as good but others see as bad because they want those microbes to add to the gut microbiome (think probiotics).

Jersey milk does have a slightly higher fat content and slightly lower protein content than Frisian milk (which has the opposite). This higher fat content gives a creamer taste. What cows are fed on also affects taste and profiles. For example if feed too many turnips (which they love) the milk will start tasting like turnips.

L6_Kahoot Quiz

Most of our exports are in the form of milk powder. This is a commodity which means it is often brought by companies as ingredient for a final product. Often milk is transformed into other products like cheese and yogurt. It can also be broken down into different parts and nutrients that have unique properties. These different parts will often not contain the allergen (like lactose), although if it could cause an allergic reaction then they will have that on the packaging.

Below is a summary of the questions that students found most surprising.

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| Question 2: Medications, vitamins, and supplements can contain hidden lactose. | All three of these items need to get into your system quickly, so both taste and bioavailability are factors. Enter lactose (a milk-based sugar) that is often found in birth control pills, other medications, and vitamin supplements. Desiree Nielsen is a Vancouver-based registered dietitian and said, “[Lactose] acts as a filler or base, improves the drug’s bioavailability, and the taste of a quick dissolve tablet.” |
| Question 6: Milk paint | This paint has milk in it which helps give that rustic look. |
| Question 7: Crème brulee | Traditionally made with cream (dairy), this store brought packet uses maize starch and gelling agents to replicate the texture. Always worth reading the labels. |
| Question 8: Flavoured chips/ crisps | Often found in the flavouring. We expect to find milk in flavours like cheddar or sour cream and onion, but it is surprising to find milk as a common ingredient in flavours such as barbecue, ketchup and dill pickle. |
| Question 10: Chicken tenders, battered fish. | Milk is added to the batter. |
| Question 12: Wine | A component of milk can be used to help clarify the wine. Milk itself is not often used in winemaking, but a milk by-product called casein is. It can be used as a fining agent. Fining processes are used to clarify wine. The winemaker adds a small quantity of casein to the wine, which is mixed thoroughly, and then left to settle. Unstable proteins, which might otherwise cause a haze if left in the wine, are removed electronically. In other words, the casein molecules are electrically attracted to the protein molecules and they stick together and precipitate. |
| Question 10: Frozen chips. | A component of milk is added to help stop frozen items sticking together. |
| Question 11 & 12: Casein and whey | Casein and whey are components of milk that can be separated out. Often used in protein shakes and the manufacturing of goods. |

Close Answers: Social Factors Terminology

| Term | Definition | Example |
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| Lactase persistence | Lactase's only function is the digestion of lactose in milk. Lactase persistence is the continued activity of the lactase enzyme in adulthood. It allows adults to consume milk without any side effects. | North West of Europe and some areas of the Middle East and Sub-Saharan Africa have high percentage of lactase persistence. |
| Homogenised milk | Homogenization is a high-pressure process that breaks fat into smaller particles. This allows the fat to mix and disperses throughout the milk making the milk more consistent. | Standard milk in the supermarket. Includes blue, green etc. |
| Non-homogenised milk | When milk is not homogenised and left natural. The fat in the milk are large particles that rise to the top making a layer of cream. | Meadow Fresh Farm House Milk |
| Pasteurised milk | When raw milk is heated to a high temperatures (74°C for 15 seconds) and then cooled so the pathogens that can be found in raw milk are killed. | All milk in the supermarket. Can only buy raw milk from the farm gate. Some farms now have vending machines where you can refill glass milk bottles with raw milk. |
| Ultra heat-treated milk (UHT)/ Long Life Milk | Is heated to 140°C for two seconds and then packaged so no microorganisms can enter the milk, so it is essentially sterile. | Meadow Fresh Long Life Milk. |
| Blue Milk | Milk that is homogenised and pasteurised but is not altered from when it comes from a cow meaning fat levels remain the same (2g/100ml). | Pam's Blue Milk |
| Green Milk | Milk that is homogenised and pasteurised. Fat is removed from the milk to make it lower fat (0.2g/100ml). | Pam's Green Milk |
| A2 milk | Only has A2 milk proteins and no A1 which makes it easier for some people to digest. | Anchor A2 milk |
| Nut milk | Does not come from an animal so technically more a juice, but has the appearance and consistency of milk. Comes from soaking the nuts to soften them and then blending them until smooth. | Almond, soy etc. |
| Market differentiation | Different people value and want different characteristics/ factors. If enough people value or want the same thing then you can create a market by catering to their needs/ wants. | Soy milk vs A2 milk vs organic milk vs regular milk. |
| Social licence | The ability to produce a product with the support from the community and long term acceptance. | Dairy farming and nitrates/ pollution. |
| Product stewardship | Is when producers, importers and consumers accept responsibility for the environmental impact a product can have and puts in place actions that resolve or mitigate the environmental impacts. | Ensuring that packaging can be recycled and it is easy to do so. Rather than producing new packaging which tends to be cheaper. |