

## SECTION 1 FACT CHECK COW'S MILK

Conventional dairy farming is considered a climate killer. Industrial agriculture, factory farming, and feed production harm the environment. Many are therefore looking for alternatives and switching to plant-based drinks. But is this really more sustainable?

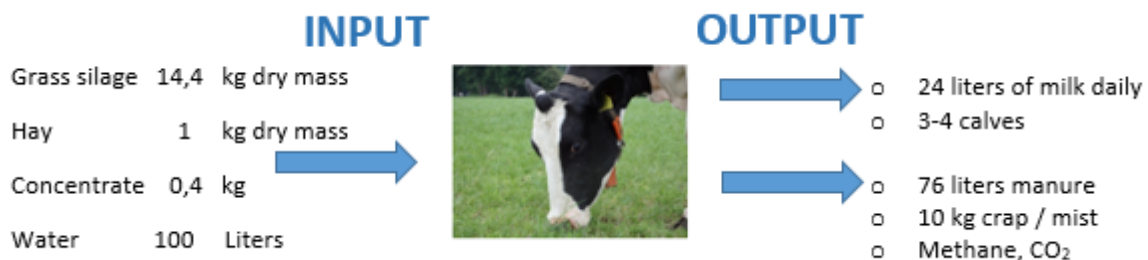
### Fact Check COW'S MILK



In terms of nutrients, cow's milk is superior to its plant-based competitors. It provides the body with vitamins A and B, as well as minerals such as phosphorus and zinc. Apart from that, its high calcium content speaks for itself. Health reasons for avoiding cow's milk: Intolerances such as lactose intolerance lead to undesirable reactions in those affected, for example abdominal pain.

Ethical aspects of partly questionable livestock farming: Like humans, cows only produce milk when they have had offspring. However, the calf is usually separated from its mother shortly after delivery, so that the milk is available for human consumption. If a cow's milk production declines, the next step is usually to the slaughterhouse.

Worldwide, around 270 million cows produce around 700 million tons of milk per year. The U.S. and India are the largest producers, with Germany currently in fourth place. With appropriate feeding of high-protein grass silage and concentrated feed, a Holstein high-performance cow produces up to 10,000 liters of milk annually. An "organic cow" does not reach these milk quantities.



One liter of fresh whole milk with a fat content of 3.5% costs between 0.79 and 1.39 euros in stores. Raw milk - i.e. milk that has not been treated - directly from the farm costs 1.00 euro per liter.

As for their eco-balance....

- On average, 623 liters of water are needed to produce one liter of cow's milk.
- In addition, 3.2 kg of CO<sub>2</sub> is emitted...
- ...and 8.9 m<sup>2</sup> of land is needed.

**Compare the tables in the DATA SHEET (SECTION 2).** These values come from studies by the Water Footprint Network, the Öko-Institut and Statista. Other sources include the work of Mekonnen & Hoekstra (2010) and Poore & Nemecek (2018).

### TASKS:

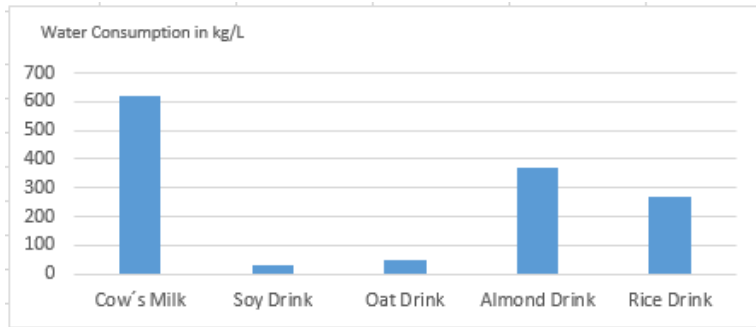
Gather more information on dairy farming and milk utilization to complete tasks 1-4.

1. In which country is milk produced? What is the production volume in tons? Uses the world map.
2. Describes livestock management. Are concentrates and roughage fed or is grazing preferred. What is the medical care situation?
3. Who exports cow's milk? Describes the world trade.
4. How is cow's milk produced? Outlines the technical process.

**SECTION 2 DATA SHEET** (Characteristics of water consumption, CO<sub>2</sub> footprint and land use)

**Water consumption of cow's milk and plant-based drinks compared 2018**

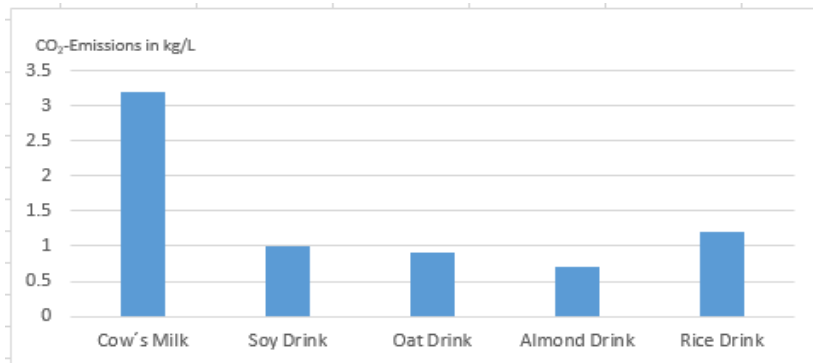
In terms of water consumption, plant-based drinks achieve a better eco-balance than cow's milk. While around 623 liters of water were consumed for one liter of cow's milk in 2018, the water consumption for the production of soy drink was only 28 liters.



	Water Consumption in kg/L
Cow's Milk	623
Soy Drink	28
Oat Drink	48
Almond Drink	371
Rice Drink	270

**CO<sub>2</sub> emissions of cow's milk and plant-based drinks in comparison 2018**

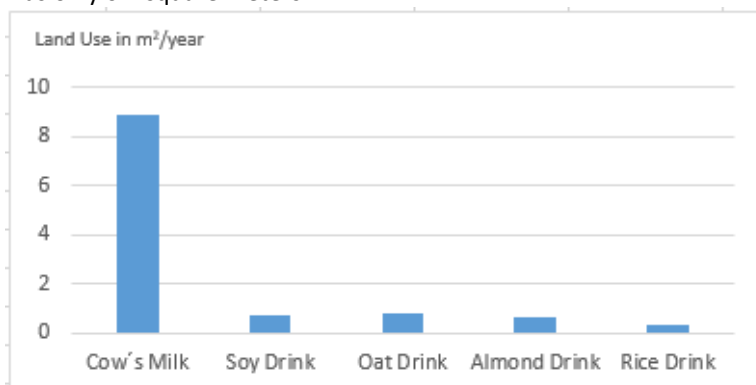
In terms of CO<sub>2</sub> emissions, plant-based milk achieves a better eco-balance than cow's milk. While around 3.2 kilograms of carbon dioxide were emitted in 2018 for one liter of cow's milk, CO<sub>2</sub> emissions in the production of almond drink were 0.7 kilograms.



	CO <sub>2</sub> -Emissions in kg/L
Cow's Milk	3.2
Soy Drink	1
Oat Drink	0.9
Almond Drink	0.7
Rice Drink	1.2

**Land consumption of cow's milk and plant-based alternatives in comparison 2018**

In terms of land consumption, plant-based milk achieves a better eco-balance than cow's milk. While around 8.9 square meters were required for one liter of cow's milk in 2018, the land required for the production of soy drink was only 0.7 square meters.



	Land Use in m <sup>2</sup> /year
Cow's Milk	8.9
Soy Drink	0.7
Oat Drink	0.8
Almond Drink	0.6
Rice Drink	0.3

TASK: Create an overview chart for the 5 products and discuss their life cycle assessments. The reference value should be one liter of cow's milk or plant-based drink.

As example: <https://www.facebook.com/quarks.de/photos/rpp.399241730563/10161264234100564>

These values come from studies by the Water Footprint Network, the Öko-Institut, FAOSTAT and Statista.



**SECTION 3      FACTS TABLE WITH GROUP DISCUSSION - EXPERT ROUND TABLE**

**Cow's Milk substitutes: What the plant-based alternatives can do**

In some German refrigerators, plant-based milk alternatives have now displaced classic cow's milk. In any case, cow's milk is ahead in terms of price. While it is sometimes offered for as little as 78 cents, consumers often think twice about whether they really need the almond drink for around 2 euros. Obviously, cow's milk consumption continues to be a subject of debate.

We want to shed some light on the subject and present some representatives of milk alternatives. From a purely legal point of view, only animal milk from cows, goats or horses is entitled to the name "milk". Most plant-based milk representatives therefore adorn themselves with the title "drink," which not infrequently causes additional confusion among consumers.

<b>Overview of arguments pro / contra cow's milk and plant-based alternatives</b>	
<b>COW'S MILK</b>	
<b>Animal Welfare</b>	
Factory farming	
Handling calves	
Life expectancy	
Attitudes	
other	
<b>Ecological reasons</b>	
Land consumption	
Water consumption	
other	
<b>Health</b>	
Vitamin B12	
Calcium	
Allergies	
World population, hunger	
<b>Economic reasons</b>	

Other arguments:

The great advantage of the vegetable alternatives is the absence of cholesterol and lactose. In terms of taste, some products are not convincing in their natural form. Manufacturers often add sugar, additives and flavorings, which quickly turns the supposedly healthy drink into a calorie bomb. In this case, it is worth taking a look at the nutritional information on the packaging. The missing calcium is now also added industrially to most milk alternatives.