# ENVIRONMENTALLY FRIENDLY MILK PRODUCTION

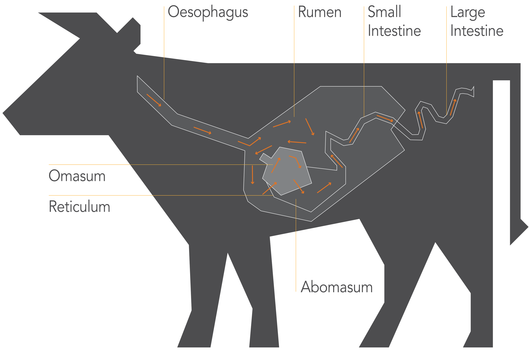
**What do cows eat and how much they eat per day?**
A dairy cow ration is composed by:

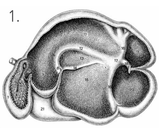
- **Forages** (grass , italian ryegrass, alfalfa, corn silage, etc), the main fiber source;
- **Concentrate feeds** (corn meal, barley meal, soybean meal, etc), characterized by a high energy and protein content.

A lactating cow eats about 50 kg of feed/day and produces on average about **30 kg** of milk/day.

## Why is it important feeding forages to ruminants?

- The digestive tract of ruminants is characterized by 3 «huge fermenters» , **rumen-reticolum-omasum** which precede the abomasusm or the glandular stomach
- In the rumen there are the optimum conditions for the growth of bacteria, protozoa and fungi which are able to digest the fiber compounds
- **Rumen microbes ferment** carbohydrates to make Volatile Fatty Acids (VFA) and gases. VFA are absorbed by rumen wall and are used by the ruminant as **energetic source**
- The 2 main gases produced by rumen fermentation are **carbonic dioxide** and **methane** . These 2 gases, especially methane, are green house gases.





1.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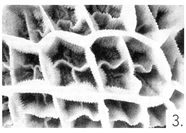
1. The rumen-reticulum complex
2. rumen papillae to increase the absorption

3. Reticulum membrane
4. the omasum with the typical laminae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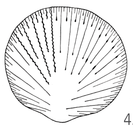
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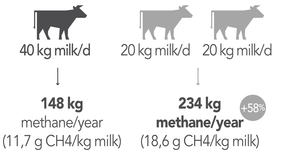
## How much methane does a cow actually produce?

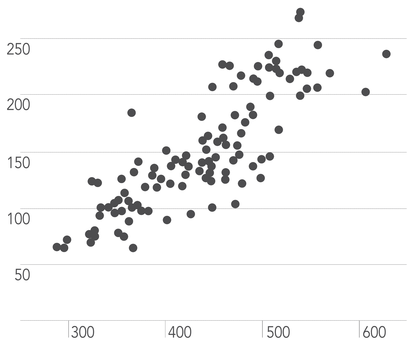



A dairy cow can produce **600 l methane/day**. The **more productive animals** have a lower methane production for kg of milk.

The **ration** fed to cows can affect methane production. (for example: dietary starch and lipid concentrations, the use of additive, etc).
It is important to not decrease milk production.

## Is the methane the only source of environmental pollution due to farming systems?

No. The excretion of **Nitrogen** and **Phosphorus** with feces and urine increases the environmental impact of the dairy farm. Only a small amount of ingested N (about 30%) is found in the milk. Feeding less Nitrogen (protein) allows to decrease urinary nitrogen excretion and improve N efficiency use in the milk.




Relationship between N urinary excretion (g/d) – Y axis -, and N intake (g/d) - X axis-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