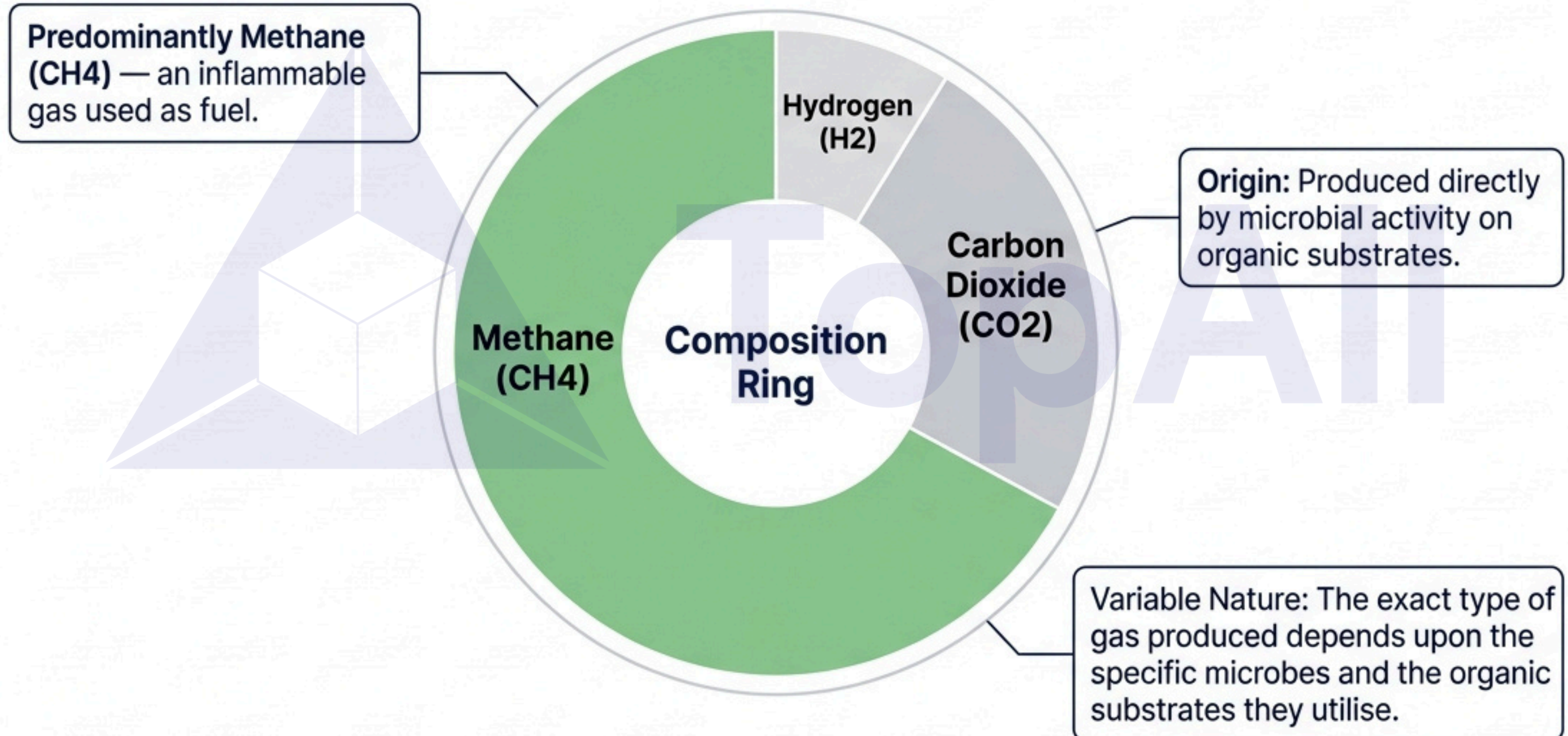




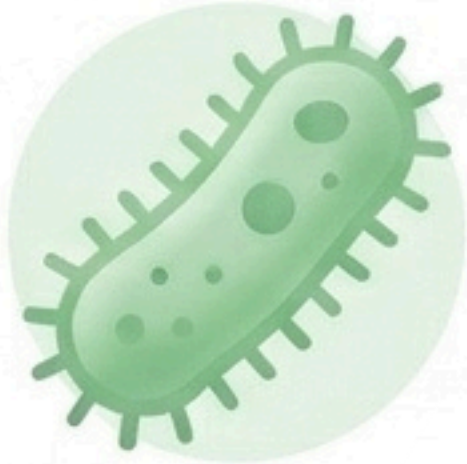
Biogas: **Fuel** from Microbes

Class 12 Biology / NEET Master Guide: Section 8.4

The End Product: What is Biogas?

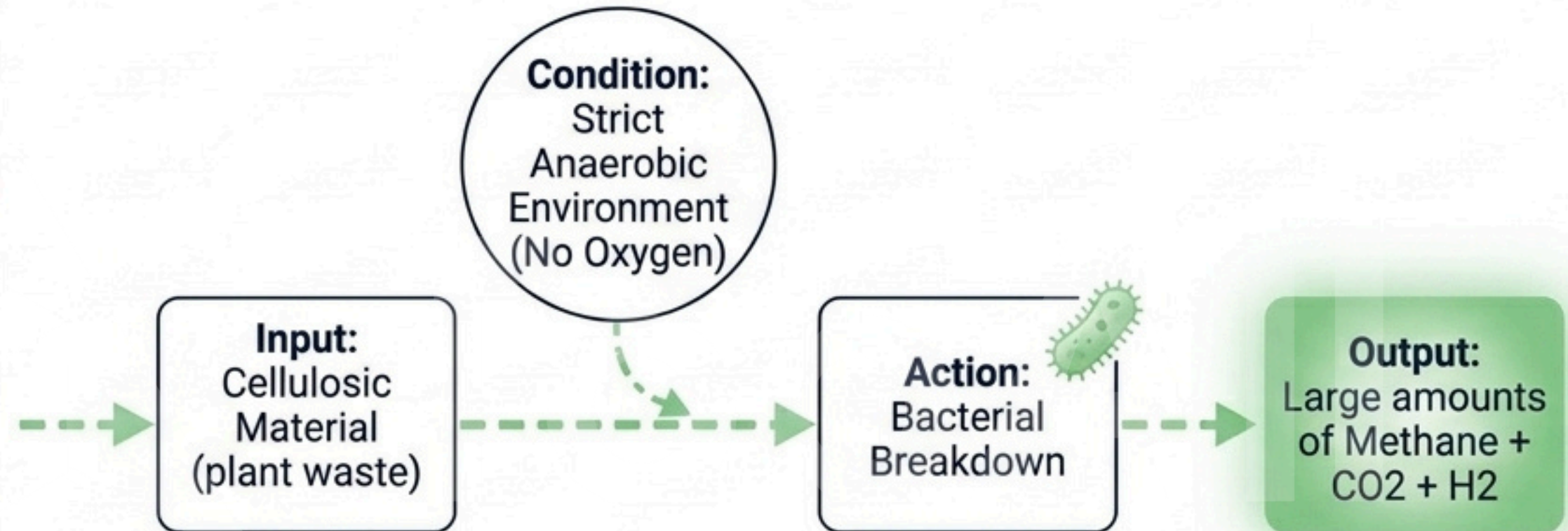


The Biological Engine: Methanogens



Class: Methanogens

Common Example:
Methanobacterium



Unlike the microbes used in dough or cheese (which mostly produce CO₂), methanogens are specialized to unlock methane from complex cellulose.



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$$E=mc^2$$



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Natural Habitats & The Source Material

The Rumen



Habitat: The rumen (part of the stomach) of cattle.
Function: Breaks down cellulosic material in plant food, aiding in cattle nutrition. (Note: Human beings cannot digest this cellulose).

Waste Treatment



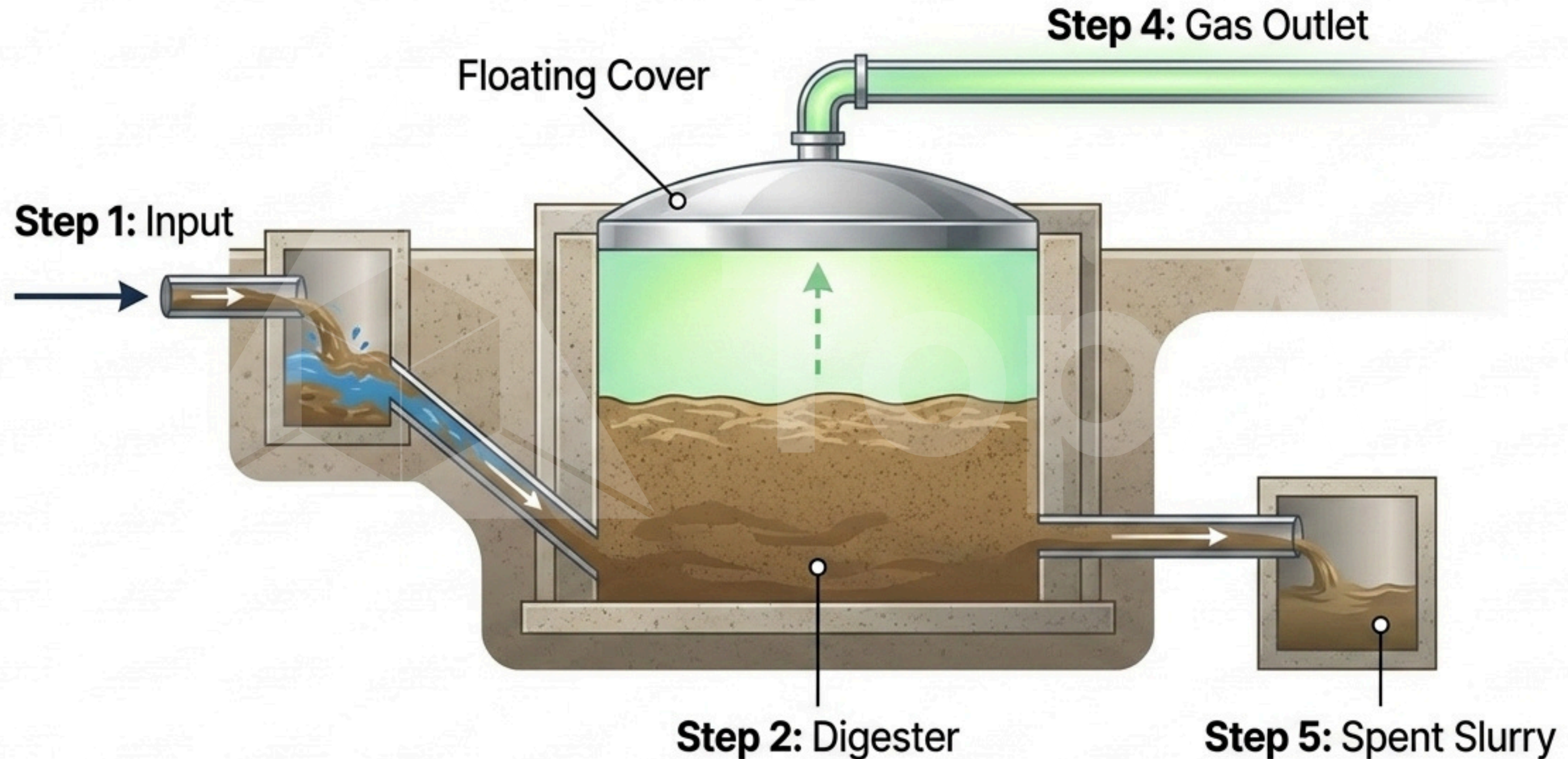
Habitat: Anaerobic sludge during secondary sewage treatment.



The Source: Gobar (Cattle Dung)

Because the rumen is packed with these microbes, cattle excreta is incredibly rich in both Methanobacterium and undigested cellulose—making it the perfect complete starter for biogas generation.

The Technology: Typical Biogas Plant Architecture



A Zero-Waste Rural Energy System

Built primarily in rural areas due to the abundant, continuous availability of cattle dung.



Dual-Value Matrix



Output:
Biogas (Gobar Gas)

Application: Direct supply via pipes for Cooking and Lighting in nearby rural homes.



Output: Spent Slurry

Application: Removed through a dedicated outlet and used as a highly nutrient-rich Fertiliser for crops.

NEET Master Summary: Biogas Production

The Microbe

Class: **Methanogens**

Key Example: **Methanobacterium**

Condition: **Strictly anaerobic**

The Chemistry

Substrate: **Cellulosic material**

Primary Output: **CH₄ (Methane)**

Byproducts: **CO₂ + H₂**

The Source

Found naturally in **cattle rumen & anaerobic sludge**.

Raw material: **Gobar (Cattle dung)**.

The Institutions (Exam High-Yield)

Technology developed in India by:

IARI: Indian Agricultural Research Institute

KVIC: Khadi and Village Industries Commission



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