



ATOMIC ENERGY CENTRAL SCHOOL NO-3, TARAPUR

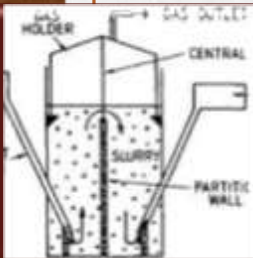


CLASS -XII



UNIT-VIII

CHAPTER-10- MICROBES IN HUMAN WELFARE



MODULE- 5/7



GOURI KRISHNA RAJESH, PGT - BIOLOGY



Components of
biogas



Design of
Biogas plant



Uses of biogas

What is biogas?

- Biogas is a mixture of gases, produced by the microbial activity and which may be used as fuel.
- It mainly consists of methane and carbon dioxide. Traces of Hydrogen sulphide and water vapour also present in biogas.
- Animal excreta, food scraps, wastewater, and sewage etc. are organic matter that can produce biogas by anaerobic digestion.
- Due to the high content of methane in biogas (typically 50-75%), biogas is flammable, and therefore produces a deep blue flame, and can be used as an energy source.

Role of microbes in biogas production

- Microbes produce different types of gaseous end-products during growth and metabolism.
- Certain bacteria, which grow anaerobically on cellulosic material, produce large amount of methane along with CO_2 , Hydrogen sulphide etc.
- These bacteria are collectively called methanogens, and one such common bacterium is Methanobacterium.
- These bacteria are commonly found in the anaerobic sludge during sewage treatment.

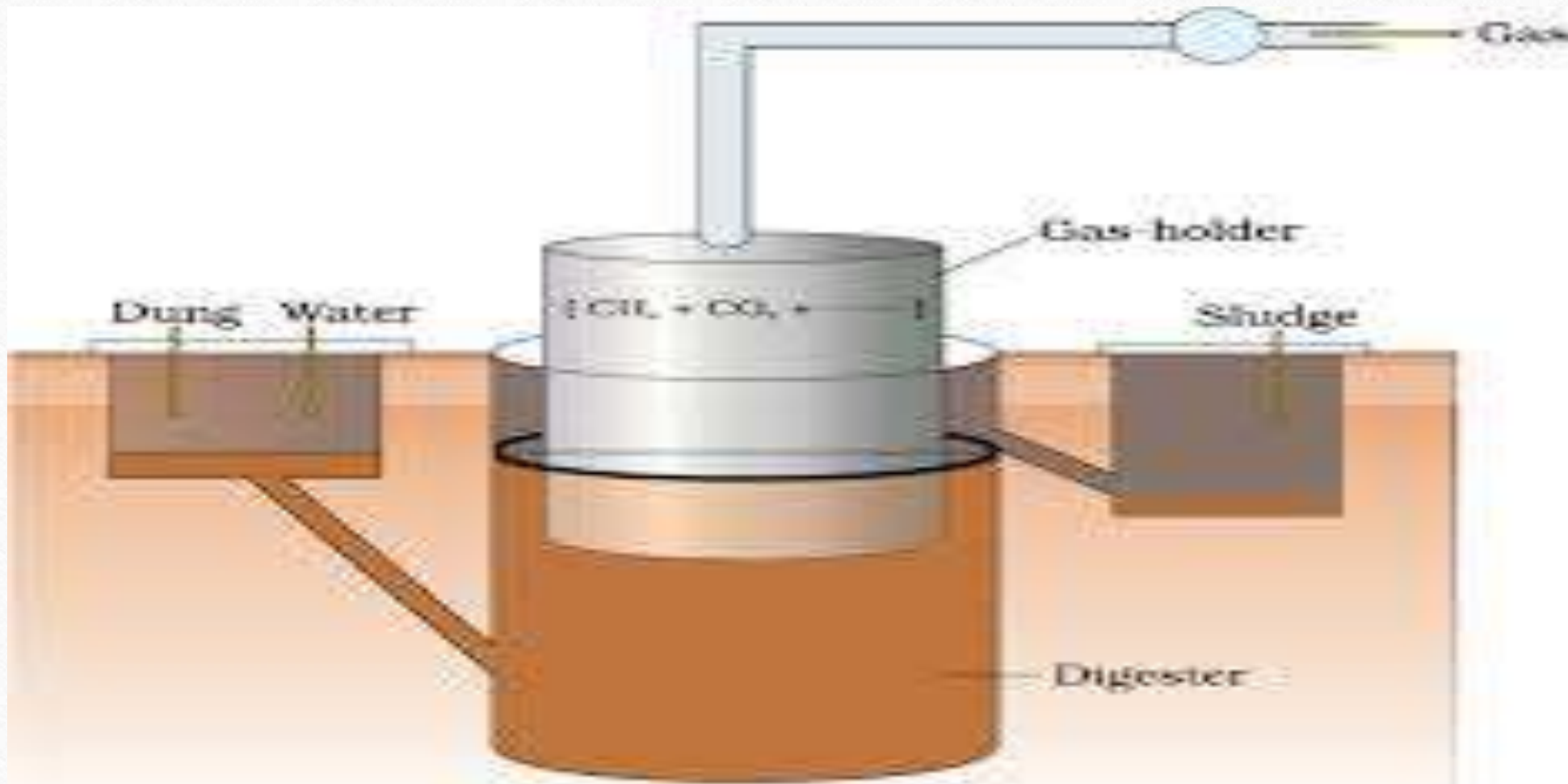
Role of microbes present in ruminants

- Methanobacteria are also present in the rumen of cattle.
- Rumen store food rich in cellulose. These bacteria in rumen help in breakdown of cellulose and play an important role in the nutrition of cattle.
- The dung of cattle, commonly called gobar, is rich in these bacteria. Dung can be used for generation of biogas, commonly called gobar gas.

How is a biogas plant designed?

- The biogas plant consists of a concrete tank (10-15 feet deep) in to which bio-wastes are collected. This is called as a digester. A slurry of dung is fed through an inlet or feed
- A floating dome shaped cover called gas holder is placed over the digester, which keeps on rising as the gas is produced in the tank due to the microbial activity.
- The biogas plant has an outlet from the top of the floating cover or gas holder, which is connected to a pipe to supply biogas to nearby houses.
- The digested slurry is removed through another outlet. This is used as manure.

A typical biogas plant



Uses of biogas

- Biogas has a calorific value of 35000 to 40000 KJ/Kg. It is used as domestic fuel for cooking.
- Biogas is used to produce electricity
- It is also used for lighting.

Advantages of using biogas

- Biogas is a renewable
- It is a clean, source of energy.
- Gas generated through biodigestion is non-polluting.

Institutes behind the biogas technologies in India

- The technology of biogas production was developed in India mainly due to the efforts of Indian Agricultural Research Institute (IARI) and Khadi and Village Industries Commission (KVIC)

References

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