

# PRODUCTION OF BIO GAS USING DOMESTIC WASTES

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## Abstract

Biogas production requires anaerobic digestion. We should go for creating an Organic Processing Facility to create biogas which will be more cost effective, eco-friendly, cut down on landfill waste, generate a high-quality renewable fuel, and reduce carbon dioxide & methane emissions. The anaerobic digestion of kitchen waste produces biogas with cow manure, a valuable energy resource and manure which consists of macro nutrients such as nitrogen, potassium, phosphorous which is highly efficient for agricultural land. Anaerobic digestion is a microbial process for production of biogas, which consists of primarily methane (CH<sub>4</sub>) & carbon dioxide (CO<sub>2</sub>). Biogas can be used as energy source and also for numerous purposes. But, any possible application requires knowledge & information about the composition and quantity of constituents in the biogas produced.

**KEY WORDS**—*Biogas, Digester, Methane, Manure, Macronutrients.*

## 1. INTRODUCTION

Due to scarcity of petroleum and coal it threatens supply of fuel throughout the world also problem of their combustion leads to research in different corners to get access the new sources of energy, like renewable energy resources. Solar energy, wind energy, different thermal and hydro sources of energy, biogas are all renewable energy resources. But, biogas is distinct from other renewable energies because of its characteristics of using controlling and collecting organic wastes and at the same time producing fertilizer and water for use in agricultural irrigation. Biogas does not have any geographical limitations nor does it require advanced technology for producing energy, also it is very simple to use and apply. Deforestation is a very big problem in developing countries like India, most of the part depends on charcoal and fuel-wood for fuel supply which requires cutting of forest. Also, due to deforestation it leads to decrease the fertility of land by soil erosion. Use of dung, firewood as energy is also harmful for the health of the masses due to the smoke arising from them causing air pollution. We need an eco friendly substitute for energy.

## 2. METHODOLOGY:

### Manure collection

Biogas is a renewable form of energy. Methanogens (methane producing bacteria) are last link in a chain of microorganisms which degrade organic material and returns product of decomposition to the environment.



Domestic waste and cow dung



#### PRECAUTIONS TO BE TAKEN

- The vegetables refuse like peels, rotten potatoes coriander leaves collected in bags.
- Vegetables or fruits containing citric acid such as lemon, mozambi, orange, fibre such as drumstick are eliminated.
- Safety measures are to be taken before collecting the rotten vegetables (i.e) gloves.
- The container used should be clean and air tight.

#### PRODUCTION OF BIOGAS AND MANURE

- Collection of wet garbage waste fraction.
- Pouring the ingredients into the anaerobic digester.
- Effluent storage.
- Gas handling.
- To check yield of biogas once in 3 days using guage.

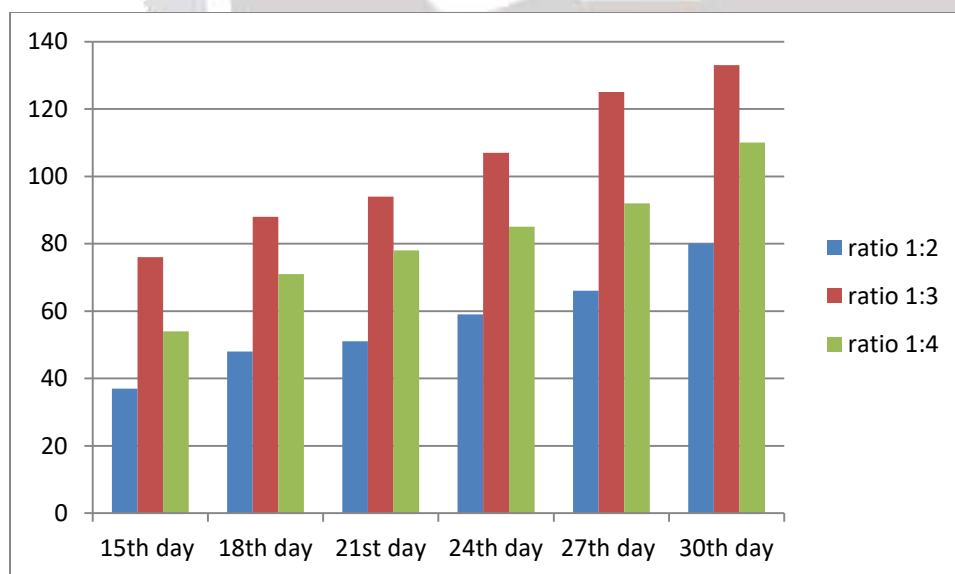
### 3. PROCEDURE

- It should contain 5kg of vegetables and remaining fully food materials which is collected from hostels, hotels, Mandabams etc.,
- The biogas setup should contain 6 unit of cow dung at the bottom. [cow dung should be dissolved with water]

- The dome is being placed over the biogas setup.
- Water is being surrounded for cooling purpose and to indicate whether the gas is leaking or not. If the gas is leaked, bubbles are produced in water.
- Firstly, Water is filled into 2hp motor to crush the waste and then it is transferred to 1hp motor where, it then converts into gas.
- If the gas is high, then the dome will be raised gradually. If it is low, it is on the surface.
- If the gas released is enough, the flame will be blue in color.

S.NO	KITCHEN WASTE AND COW DUNG RATIO	15 <sup>th</sup> DAY(pa)	18 <sup>th</sup> DAY(pa)	21 <sup>th</sup> DAY(pa)	24 <sup>th</sup> DAY(pa)	27 <sup>th</sup> DAY(pa)	30 <sup>th</sup> DAY(pa)
1.	Ratio 1:2	37	48	51	59	66	80
2.	Ratio 1:3	76	88	94	107	125	133
3.	Ratio 1:4	54	71	78	85	92	110

OBSERVATION:



#### 4. CONCLUSION

The analysis of waste materials gives us a clear view about the production of biogas. The characteristics of the wastes have been efficiently reviewed. Utilization of wastes to generate biogas could reduce the production cost, making the biogas more available and cheaper. If the biomass that is obtained could be used effectively, then the energy needs of humans could be met easily. A high quality biogas plant needs minimum maintenance costs and can produce gas for at least 15–20 years without major problems and re-investments.

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