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### **About Green Connect**

Green Connect resource management solutions specialize in bio-energy generation from all organic biodegradable waste on turnkey basis including design, execution, installation, operation and maintenance. Green Connect uses a proprietary biomethanation technology – Uniformly Distributed Organic waste Reactor (UDOW) for the effective treatment of organic waste containing high percentage of suspended solids. We have an installation base of more than 800 biogas plant across India.

We also have expertise in engineering, procurement, construction, operation and maintenance of Sewage Treatment Plants (STP) and Effluent Treatment Plants (ETP) ranging from 1 KLD to 1000 KLD capacity. With an expertise of over 12 years in the field of waste management , We have installed our plants in many corporate like Ramco Cements, KH Exports, Robert Bosch, Lucas TVS, Brakes India, yazaki Wiring Solutions, Kirloskar, India Cements, Chettinadu cements, Cavin Kare, Simson, Infosys etc. We also have Ready-to-install, factory assembled plug and play model portable plants of various capacities.

### **Vision**

To see that zero waste is generated from every institution and everything got from nature is repaid!

### **Mission**

**Inspired by Nature:** In nature, nothing is wasted, nothing is created but everything is transformed. Inspired by nature, green connect will find various alternative sources of sustainable energy.

**The 4 R's:** The path trodden by us will consist of the 4 R's - Refuse, Reduce, Reuse and Recycle.

**The Green Connect:** To establish a value based relationship with our customers and help them stay connected with the green.

## **Introduction**

In view of the increasing demand of organic agriculture, utilization of waste and environmental protection, sericulture focuses not only on the cocoon production, but also on other ways that can benefit the farm's economy. Insect farming technology provides a cheap source of biomass, which may be a good material in biogas production.

Studies showed that the examined substrates, silkworm breeding waste generate a biogas yield comparable to other substrates of agricultural origin, such as cattle, pig and chicken manures. Fermentation of silkworm excreta under mesophilic conditions produces 167.32 m<sup>3</sup>/Mg TS of methane and 331.97 m<sup>3</sup>/Mg TS of biogas, while fermentation of silkworm breeding waste yields 256.59 m<sup>3</sup>/Mg TS of methane and 489.24 m<sup>3</sup>/Mg TS of biogas. Moreover, the chemical composition of these raw materials was analyzed.

**About Silk Worm life cycle.**





Silkworms go through a simple life cycle. The eggs look tiny and dark. When these eggs hatch, the babies look small and black. Slowly, they become recognizable. The silkworms feed voraciously and then slowly spin a cocoon, where they stay comfortably for a long time.

Eventually, the cocoon bursts, and a moth comes out of it. However, after mating and depositing eggs, moths die.

### **About Biogas Plant (GASTODAY)**



GASTODAY equipment produces cooking gas from leftover domestic or home based food/vegetable/organic waste through the process of anaerobic bacterial digestion in simple terms, the organic waste is degraded biologically, and biogas which is produced as output, is used for cooking.

Plant Capacity `

Food waste – 1.5 kg/day

Gas in liters capacity – 70 liters

### **Experiment Procedure**

**Step 1:** Measure and take Silk Worm in 1.5 kg jar.



**Step 2:** Crush the silkworm using a crusher with the silkworm to the water ratio 1:1.





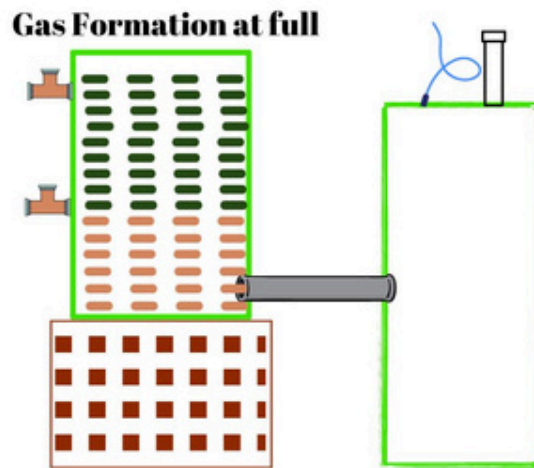
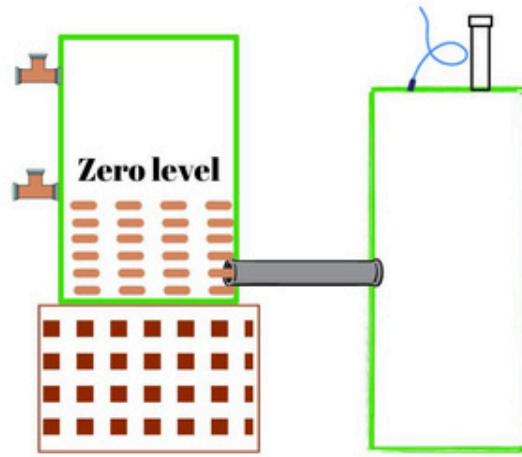
**Step 3:** Check the PH level in the crushed silkworm, and the pH level is 7.



**Step 4:** Feed the crushed silkworm into the biogas plant.



**Gas formation levels**





**Zero gas level**



**Gas formation at full**





## Observations

S.No	Date	SilkWorm in kg	Time	Ph input	Ph output	Gas in liters
1	21-09-23	1.5	-	6	8	-
2	22-09-23	1.5	3.41 mints	7	8	12.5 lit
3	23-09-23	1.5	6.33 mints	7	8	31 lit
4	25-09-23	1.5	17 mints	7	8	31 lit
5	26-09-23	1.5	17 mints	7	8	56 lit
6	27-09-23	1.5	17 mints	7	8	56 lit
7	28-09-23	1.5	16 mints	7	8	56 lit
8	29-09-23	1.5	17 mints	7	8	56 lit

## Result

- Findings 1: For every 25 kg of silkworm waste, 1 cubic meter of biogas is obtained.**

This observation demonstrates the potential of using silkworm waste as a feedstock for biogas production. The ratio of 25 kg of waste to 1 cubic meter of biogas provides a basis for calculating the gas

yield from a given quantity of waste. Biogas production from organic waste is an eco-friendly and sustainable method that can help convert waste into valuable energy.

1. **Findings 2: 56 liters of gas-burning flame time are 17 minutes in a single-burner domestic stove.**

When burning 56 liters of gas, the flame lasts for approximately 17 minutes in a single-burner domestic stove. This observation is significant because it gives us an idea of the energy content of the gas. It could be used to calculate the energy potential of a certain volume of gas for various applications, such as cooking or heating.

This observation reveals that 1000 liters of gas can sustain a flame for an extended period of 5 hours in a single burner domestic stove. This is valuable information for understanding the efficiency and duration of gas usage in various settings. It also implies that if you have a consistent supply of gas, it can be a reliable energy source for continuous use.

### **Conclusion**

Results are very encouraging and it presents a good opportunity for biogas generation from silk worm.

### **Literature References**

1. [The biogas production potential from silkworm waste](#)
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1. [Daily biogas production during methane fermentation of ...](#)
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