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## Comparative study on the nutrient concentration and productivity of bio-slurry before and after treatment with chemical fertilizer

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In biogas plant, there are mainly two products: methane gas which is use for different purposes like cooking, lighting and slurry which can be used as organic fertilizer. The main target of this study was characterizing the slurry by measuring the relative amount of macro and micro nutrients like Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, and Manganese by using standard methods. And comparative study on the productivity of organic fertilizer at different treatments steps with commercial fertilizer on selected crops has been performed. Potassium and Calcium values increase when it was composted. This is because of that decomposed vegetables are sources of both Ca and K during composting while Magnesium and Manganese values decrease when the slurry converts to compost. Both compost and commercial fertilizer have the same productivity for onion cultivation. Compost, gives the highest incremental yield of chills (even higher than that of chemical fertilizer). From productivity test 1.5 kg/m<sup>2</sup> onions and 3.75 kg/m<sup>2</sup> chills was produced using biogas-slurry compost.

Table: elemental composition of biogas feed stock at different treatment stages

Sample	K (g/l)	Ca (g/l)	Mg (mg/l)	P (mg/l)	N2 (%)	Mn (mg/l)
Waste	66.9	0.84	5.1	0.22	2.10	36.5
Slurry	107.55	0.69	2.3	0.20	2.52	46.1
Compost	146.11	2.22	4.91	0.35	1.68	55.3

Nitrogen decrease (33%) during composting this is due to volatilization of N<sub>2</sub> in the form of NH<sub>3</sub> and NH<sub>4</sub>.

### Biography

Kefale Wagaw is a Lecturer in Chemical Engineering Program and Researcher in biofuel energy and essential oil extraction from plants and fruits such as: biogas co-digestion and optimization, oil/biodiesel blending with kerosene. He is also interested in characterization and utilization of bioslurry for crop production, and bio-ethanol production.

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