A Solution for Improvement of Faecal Sludge Composting Process

Viet-Anh Nguyen*, Hong-Anh Do*, Jeroen H. J. Ensink**, Toshihiro Nakamiya***

*Institute of Environmental and Science Engineering (IESE), Hanoi University of Civil Engineering (HUCE).
**London School of Hygiene and Tropical Medicine (LSHTM), UK
*** LIXIL Corp. Japan
Introduction

- Population: 91 millions
- 67% living in rural, mountains and island areas,
- Fecal sludge from dry toilet usually reuse for the crops,
- Unpleasant environment contributes to slow decomposition process due to poor microbial community.
Introduction
Objectives

• To improve decomposition process and pathogen die-off,
• To reduce storage time,
• To assess the feasibility of improved solution.
Approach Methodology

• Using other adding materials instead of traditional ash and lime,
• Supplementing the useful microorganism for decomposition process,
• Giving aerobic conditions to the composting process
Material and Methods

- Fecal sludge from urine diverting toilet (FS)
- Sawdust (SW)
- Food waste (FW)
- The ratio of mixture: FS:SW:FW = 2:1:1
- C/N rate in range of 25:1 to 30:1
- The first 4 weeks, the drums is rotated with 3 times/week,
- From week 5th to week 16th: 1 time/week.
Material and Methods

Temp.

E. Coli

TS, VS, TOC, T-N

Helmith egg
Results and Discussions

![Graph showing temperature changes over time for different conditions.](image-url)
Results and Discussions
Results and Discussions

After 16 weeks of incubation

• E.coli in T1 were 4 log reduction, from $10^6$ to $10^2$.
• T2 were decreased 4 log from $10^5$ to $10^1$
• T3 were 1 log reduction, from $10^3$ to $10^2$. 
Conclusions and Recommendations

• Pathogen reduction in samples with bio-additive is more than in sample without bio-additive,
• The local bio-additives Sagi-bio provides condition to increase temperatures in drums rapidly and reached a high level of 44°C, compared with yeast,
• **Practice oriented view:**
  – Goal: hygienically safe fertilizer for farmers.
  – Faecal sludge treatment at household scale:
    • Composting drum
    • Ecosan toilet with Screw Mixing Tube
  – Co-composting for Faecal Sludge Treatment at Septage Treatment Station
  – Co-composting of Septage and Sewage Sludge.
Thanks for your attention

Hong - Anh Do (MSc, PhD stud.)
Institute of Environmental Science and Engineering (IESE), Hanoi University of Civil Engineering (HUCE)
E.mail: honganhdhxd@yahoo.com, anhnh@nuce.edu.vn