Extremely isotopically enriched ammonium shows high nitrogen turnover in the pile top zone of dairy manure compost

K. MAEDA[1]*, S. TOYODA[2], M.YANO[2], S. HATTORI[2], M. FUKASAWA[2], K. NAKAJIMA[1] AND N. YOSHIDA[2]

[1]NARO, Sapporo 062-8555, Japan, k_maeda@affrc.go.jp
[2]Tokyo Institute of Technology, Yokohama 226-8502, Japan

$\delta^{15}N$-NH_4^+-N of dairy manure compost piles with and without bulking agent (10% w/w) were compared to understand the significant mitigation of N_2O emission by the use of bulking agent. $\delta^{15}N$-NH_4^+-N of each locations of the pile (top, side and core) were also compared. Piles with bulking agent showed significantly higher value 17.7±1.3‰ than that of the piles without bulking agent (11.8±0.9‰) at the end of the process, reflecting significant higher nitrogen conversion and NH_3 loss occurred in the pile with bulking agent. The pile top samples, especially in the piles with bulking agent, showed very high NH_4^+-N concentrations with significantly enriched $\delta^{15}N$ values (12.7-29.8‰) indicate extremely high nitrogen conversion, nitrification-denitrification activity of the microbes and NH_3 volatilization occurred in this zone.