

## **Refused tea reduces the emission of ammonia from poultry litter**

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### **Abstract**

Volatilization of  $\text{NH}_3$  into the atmosphere has become an important environmental issue. Action of urease enzyme produced by microorganism breaks down the nitrogenous wastes (undigested proteins and excretory uric acid) in poultry litter into  $\text{NH}_3$  and subsequently volatilized into the environment. Polyphenols of some plant extracts inhibit the soil urease activity thereby reducing the release of  $\text{NH}_3$  from soil surface. Two laboratory experiments were conducted to test whether refused tea (RT); a polyphenol-rich by product of tea processing industry is capable of reducing  $\text{NH}_3$  emission from poultry litter. In experiment 1, broiler litter samples were incubated 1) as it is (control; C, 2) with 3% RT extract; RT3, 3), with 3% water; WTR3, 4) with 5% RT extract; RT5 and 5) with 5% water, WTR5. In experiment 2, broiler litter samples were incubated 1) with 0% RT powder, 2) with 3% RT powder and 3) with 5% RT powder. In both experiments treatments were arranged according to a completely randomized design with 5 replicates per each treatment. The volume of  $\text{NH}_3$  emitted from each incubation unit for 8 hours was trapped with a boric acid solution and subsequently titrated with HCl to determine the emission rate. Litter samples were analyzed for moisture and pH. Emission of ammonia was expressed as mg/hour/kg of dry litter. In experiment 1, emission of  $\text{NH}_3$  from C (1.22 mg/kg/day) reduced by 28% to 0.88 mg/hour/day when the litter sample was treated with 3% RT extract. Emission from RT3 was around 73% of that from WTR3. Emission from RT5 was significantly lower than that from WTR5. In experiment 2, ammonia emission rates of the litter treated with 3% RT powder (0.72 mg/kg/day) and with 5% RT powder (0.64 mg/kg/day) were significantly lower than the litter which was not treated with RT powder (1.65 mg/kg/day). Mixing of RT powder at 3 or 5% with litter significantly reduced the litter pH compared to control. It was concluded that RT could be used as a litter amendment to reduce the emission of  $\text{NH}_3$ .

**Keywords:** Ammonia, Poultry Litter, Refused Tea