



University of Zabol  
Graduate school  
Department of Animal Nutrition

**Thesis Submitted in Partial Fulfillment of the Requirement for the  
degree of Master of Science (M. Sc) in Animal Nutrition**

**Study of propionic and formic acids effects on quality of  
edible mushroom compost ensiled with molasses**

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## Abstract

This research was conducted to determine the chemical composition and nutritional value of edible mushroom silage compost by adding molasses, formic acid and propionic acid by *in vitro* method. For this purpose, mushroom compost waste was collected and cut into 3 to 5 cm pieces for silage. Then, using molasses (12%), formic acid (0.4%) and propionic acid (0.8%), the mixture was ensiled in plastic buckets at laboratory temperature before ensiling, and after 60 days, it was opened and immediately their pH was measured. This research was conducted in the form of 4 treatments with 3 repetitions. Chemical compounds including organic matter, ash and crude protein were measured by standard Haas method and digestibility of organic matter and metabolizable energy were measured by gas production method (*in vitro*). The results showed that the addition of molasses and propionic acid significantly improved the digestibility of organic matter in edible mushroom compost silage ( $P \leq 0.05$ ). By adding formic acid to edible mushroom compost silage, no significant change was observed in the digestibility of organic matter and gas production, but numerically, the digestibility of organic matter and gas production increased compared to the control treatment ( $P \geq 0.05$ ). Also, the results of gas production showed that propionic acid and molasses increased the amount of gas produced in most of the times compared to the control treatment ( $P \leq 0.05$ ). With these interpretations, it can be said that the addition of molasses and propionic acid improves the quality of edible mushroom silage compost to some extent. In general, the results of this

**experiment showed that the mixture of additives is recommended for the preparation of edible mushroom compost silage.**

**Key words: Silage, Mushroom, Gas test, Propionic acid, Formic acid, Molasses**