Conserving wheat straw and fungal treated wheat straw through ensiling

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Background

White rot fungi have the potential to degrade lignin of lignified biomass, and make carbohydrates available to rumen microorganisms. However, solid state fermentation should be stopped before fungi start consuming more carbohydrates. Therefore, conserving methods of fungal treated biomass need to be explored.

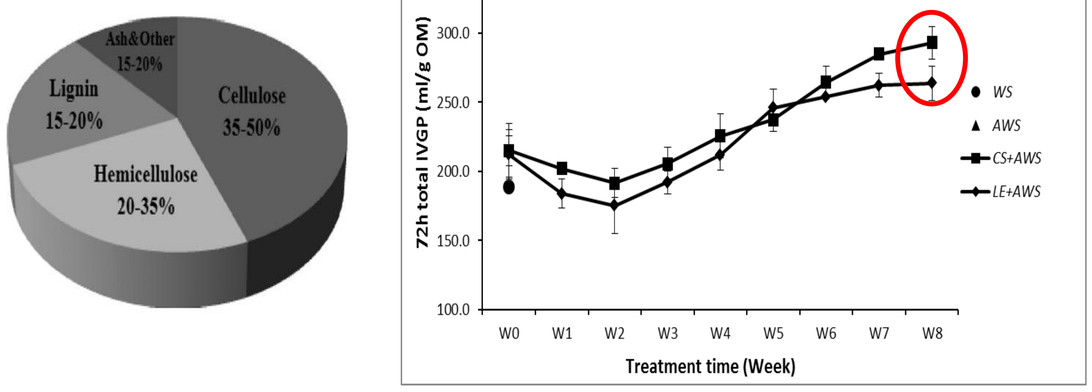

Figure 1. Chemical composition and in vitro gas production of wheat straw treated with *C. subvermispora* and *L. edodes*

Objective

Investigating the possibility of conserving fungal treated wheat straw under anaerobic condition. The fungi used in the current experiment were *Ceriporiopsis subvermispora* (CS) and *Lentinula edodes* (LE).

Methods

Box: 3L with filter in the lid
Wheat straw: 0.5cm
Spawn: 12-13g

CS (39 days)

LE (52 days)

64 days

Treatment	Without additives	With lactic acid bacteria	With lactic acid bacteria and molasses
WS	Wheat Straw	WS+ LAB	WS+ LAB+M
AWS	Autoclaved Wheat Straw	AWS+LAB	AWS+LAB+M
CS	C. *subvermispora*+AWS	CS+AWS+LAB	CS+AWS+LAB+M
LE	*L. edodes*+AWS	LE+AWS+LAB	LE+AWS+LAB+M

LAB: *Lactobacillus plantarum* (1×10^6 cfu/g wet sample)
M: Molasses (3% on wet basis)

Results

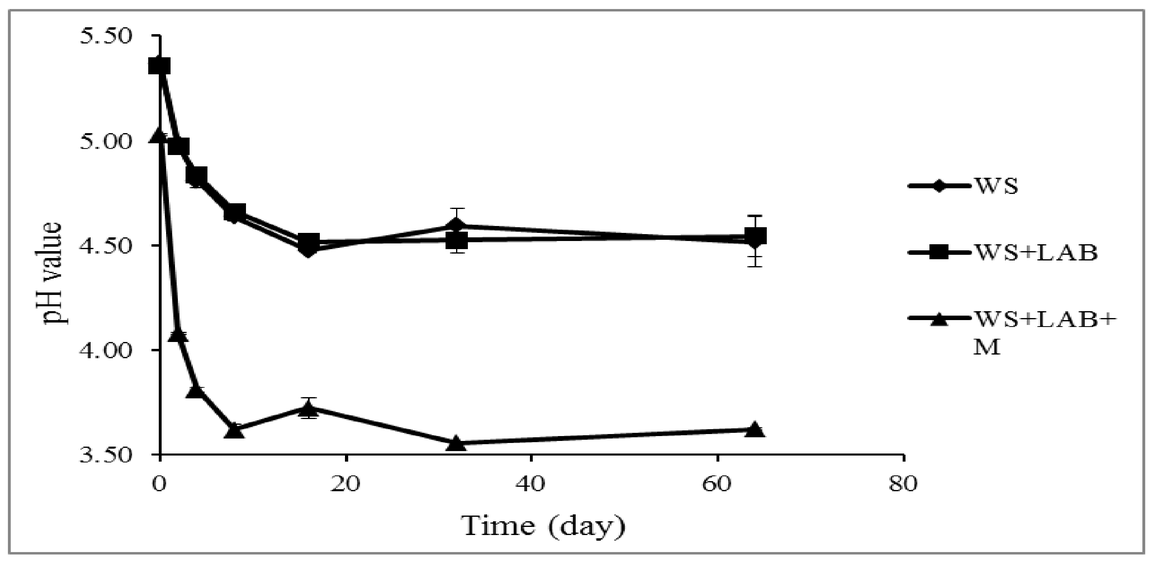

Figure 2. pH change of wheat straw during 64 days of conservation.

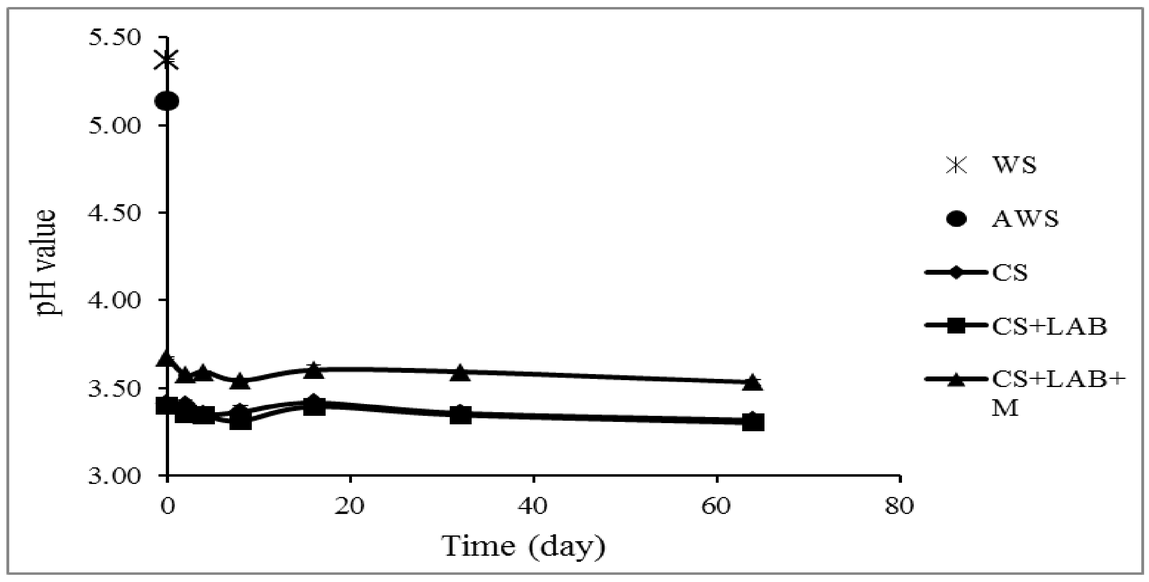

Figure 3. pH change of *C. subvermispora* treated wheat straw during 64 days of conservation

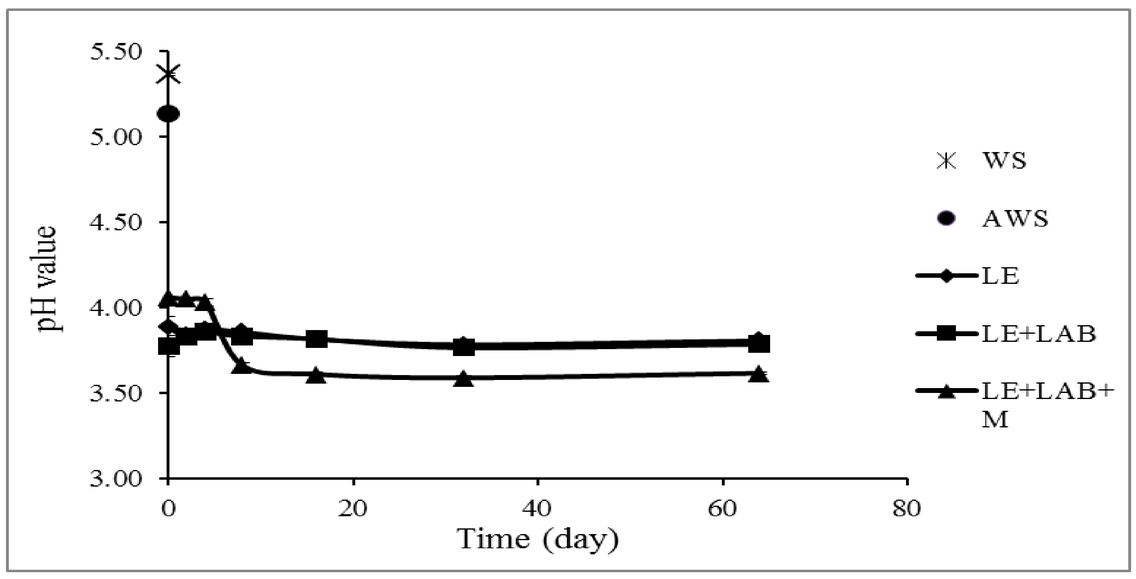

Figure 4. pH change of *L. edodes* treated wheat straw during 64 days of conservation

Conclusions

Both *C. subvermispora* and *L. edodes* decreased pH during solid state fermentation, which make it possible for fungal treated wheat straw conserve under anaerobic condition without adding additives.

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