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Effects of different silage additives on fermentation quality of paddy rice silage

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Key word : paddy rice ,silage ,wilting ,fresh ,fermentation quality

Introduction Good fermentation quality requires not only appropriate water content of silage materials , but also sufficient soluble carbohydrate , which provides adequate substrate for the activities of lactobacillus (McDonald P ,1991) . Compared with other conventional silage materials , Paddy rice has smaller number of lactic acid bacteria , lower content of sugar and higher content of buffer energy . Because of these limitations , it is not easily to make high quality silage using Paddy rice . In order to improving the fermentation quality of Paddy rice silage , special methods such as adding microbial additives or mixed silage need to be developed . The objective of this research was to test the silage quality of Paddy rice by adding different additives .

Materials and methods Paddy rices were harvested at late heading stage . They were chopped into about 2cm in length at the time of fresh or wilted and ensiled in polyethylene bags with or without different additives . The bags were sealed with vacuum packaging machine . LAB ($\geq 10^6$ cfu/g) was added at 0 .005% of materials . Sucrose was added at 2% . And LAB + Sucrose were added at 0 .005% + 2% . Each treatment had three replications . All treatments were sampled for analysis of fermentation quality after stored at room temperature for 45 days .

Results All additives treatments decreased ($p < 0 .05$) the pH value and butyric acid content , increased ($p < 0 .05$) lactic acid content . The ammonia nitrogen was decreased ($p < 0 .05$) by adding LAB + Sucrose . The main fermentation quality of paddy rice silage was showed in Table 1 .

Table 1 The fermentation quality of paddy rice silages .

Treatments	pH	Lactic Acid	Acetic Acid	Butyric Acid	Ammonia Nitrogen/ Total Nitrogen(%)	
		DM%				
Fresh	Control	5 .62 ^a	1 .82 ^c	1 .51 ^b	1 .06 ^a	8 .80 ^a
	LAB	4 .73 ^b	4 .23 ^b	2 .05 ^a	0 .08 ^b	7 .50 ^{ab}
	Sucrose	4 .52 ^b	4 .05 ^b	1 .93 ^a	0 .14 ^b	8 .76 ^a
	LAB+ Sucrose	4 .25 ^c	5 .33 ^a	1 .97 ^a	0 .08 ^b	6 .61 ^b
Wilted	Control	5 .32 ^a	1 .62 ^b	1 .05 ^b	0 .63 ^a	7 .79 ^a
	LAB	4 .52 ^b	4 .73 ^a	1 .23 ^{ab}	0 .07 ^b	8 .01 ^a
	Sucrose	4 .44 ^b	4 .87 ^a	1 .03 ^b	0 .04 ^b	7 .64 ^a
	LAB+ Sucrose	4 .17 ^c	5 .53 ^a	1 .47 ^a	0 .06 ^b	5 .51 ^b

The different letters in the same column indicate significant differences at $p < 0 .05$.

Conclusion All additive treatments improved the fermentation quality of paddy rice silages .

Reference

McDonald P , Henderson A R , Heron S J E . The Biochemistry of Silage [M] . Marlow , Bucks , England : Chalcombe Publ . , 1991 , 10 .