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## Effects of biological silage additives on organic acid content and pH in shrub silage

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**Key words :** biological silage additives ,shrub ,silage ,organic acid ,pH

**Introduction** Shrub has a large growing area in China and has a good nutritive quality . However , its wide use by livestock is limited by its stiffness and high lignin content and coarse-fibre ( Ma et al ,2004) . This experiment was to determine the effect of biological silage additives on organic acid content and pH of shrub silage in different shrub silage .

**Materials and methods** *Caragana korshinskii* and *Lespedeza hedysaroides* materials were collected and cut into 2-5cm lengths . Three additives were added : FAST-SILE (2.5g/t) , Caihe (250g/t) and fibrin enzyme (1000g/t) . Non-additive treatment was used as a control . The material was watered to 65% moisture and placed in a plastic fermentation tank (2.5L per L) and pressurized . This process was repeated three times each treatment . Samples were taken after 20 days of fermentation and organic acid content and pH were measured .

**Results** Lactic acid is the main constituent in *Caragana korshinskii* and *Lespedeza hedysaroides* silages and it is higher in the fibrin-enzyme added treatment than the control . Acetic acid , propionic acid content was present in lower quantities . And propionic acid were the lowest in the fibrin-enzyme added treatment ( $p < 0.05$ ) , while acetic acid content is the lowest in FAST-SILE added *Lespedeza hedysaroides* silage . Butyric acid was not detected in this study (data not shown) . Add fibrin enzyme can make the pH lower prominently in *Caragana korshinskii* silage , in *Lespedeza hedysaroides* silage Caihe and fibrin-enzyme debased the pH prominently and the Caihe added treatment is the lowest .

**Table 1** Effects of biological silage additives on organic acids content and pH in shrub silage . unit : %

variety	treatment	la	aa	pa	pH
<i>Caragana korshinskii</i>	Control	77.99±0.04b	20.37±0.11c	1.64±0.11c	3.66b
	FAST-SILE	70.69±0.03c	25.72±0.05b	3.58±0.13a	3.74a
	Caihe	68.23±0.05d	29.94±0.04a	1.83±0.05b	3.77a
	fibrin-enzyme	81.43±0.05a	17.18±0.01d	1.39±0.01d	3.55b
<i>Lespedeza hedysaroides</i>	Control	86.94±0.07c	11.51±0.00a	1.55±0.31c	4.46a
	FAST-SILE	89.79±0.03b	6.47±0.00d	3.73±0.17b	4.39a
	Caihe	84.39±0.07d	9.11±0.007b	6.49±0.30a	3.61c
	fibrin-enzyme	90.63±0.15a	7.85±0.04c	1.51±0.16d	4.25b

\* P<0.05

**Conclusions** Addition of fibrin enzyme to shrub silage can contribute to decomposing coarse-fibre to saccharine . It will provide the alimentation to lactobacillus zymolysis . PH is an important criterion to judge silage quality . However , this research showed that pH alone cannot completely reflect the quality of shrub silage .

### Reference

Ma wen-hi , Zhao Li-i& Yao Ai-ing .2004 . The Advances of Nutritive Value and Utilization Methods for *Caragana korshinskii* , *Journal of Ningxia Agric ultural College* , 24 , 72-75 .