

Effect of the ratio of materials used in fermented total mixed ration on the aerobic stability of the TMR compared with a mixed-silage

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Introduction

Fermented Total Mixed Ration (TMR) is an important forage for livestock, but if it has a high content of protein, the aerobic stability is poor (Wang, 2008). There is little published information about the aerobic stability of fermented TMR. This experiment was undertaken to study the effects of the ratio of materials used in TMR and mixed-silage on the pH, the numbers of lactobacillus, mould and yeast, and the temperature of the fermented TMR and mix-silage after opening.

Materials and Methods

The materials in the fermented TMR were ensiled as shown in Table 1, with 3 treatments; Control, Alfalfa and Maize. These were compared with mixed-silage consisting of only maize and alfalfa in a ratio 1:1. The three replications of each treatment were stored at room temperature and opened at 60d, when the pH, the numbers of lactobacillus, mould and yeast, and the temperature after opening were determined.

Results

The pH of the mixed-silage decreased slightly to the 3rd day and then increased rapidly ($P < 0.05$). The numbers of lactobacillus in all treatments declined during the first 5 days after opening, and then increased rapidly. The

Table 1. The composition of the fermented TMR (DM%).

Feed composition	Control	Alfalfa	Maize
Whole-crop maize	30	20	38
Alfalfa	30	40	22
Maize	23.6	23.04	19.2
Wheat bran	4	8.4	6.4
Soybean meal	6.8	4	8.8
Cottonseed meal	4	3.2	4
Calcium hydrogen phosphate	0.4	0.24	0.4
Stone powder	0.8	0.72	0.8
Salt	0.4	0.4	0.4
Nutrient level			
Crude protein	16.9	17.4	17.2
Calculated Net energy	6.37	6.27	6.38

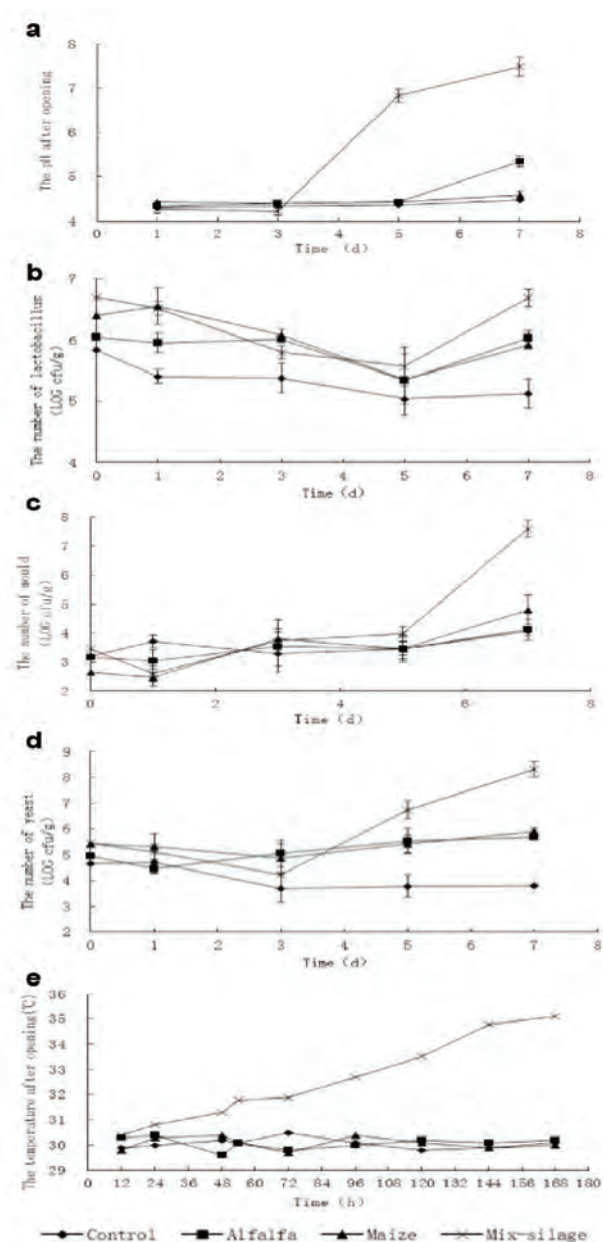


Figure 1. The pH (a), the numbers of lactobacillus (b), mould (c) and yeast (d), and the temperature (e) of fermented TMR after opening.

numbers of mould in all treatments increased after opening. The numbers of yeast in treatments except for the control declined during the first 3 days after opening, and then increased, especially in the mixed-silage ($P<0.05$). The temperature of mixed-silage increased rapidly ($P<0.05$) after opening whereas that of the fermented TMR treatments did not.

Conclusion

The aerobic stability of fermented TMR was better than

that of mixed-silage. The fermented TMR with high maize content had better aerobic stability than fermented TMR with high alfalfa content.

References

- Wang FJ, Nishino N (2008). Effect of aerobic exposure after silo opening on feed intake and digestibility of total mixed ration silage containing wet brewers grains or soybean curd residue. *Grassland Science* **54**(3), 164~166.