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Ramli Mohd Noor

National Institute of Livestock and Grassland Science, Japan

Yimin Cai

National Institute of Livestock and Grassland Science, Japan

Ryuichi Uegaki

National Institute of Livestock and Grassland Science, Japan

Hiroki Matsuyama

National Institute of Livestock and Grassland Science, Japan

Chuncheng Xu

National Institute of Livestock and Grassland Science, Japan

See next page for additional authors

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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Presenter Information

Ramli Mohd Noor, Yimin Cai, Ryuichi Uegaki, Hiroki Matsuyama, Chuncheng Xu, Norio Yoshida, Yasushi Tando, and Tatsuo Miwa

Fermentation quality of TMR silage with green tea grounds ensiled in flexible container bag silo

Ramli Mohd Noor^{1,2}, Yimin Cai¹, Ryuichi Uegaki¹, Hiroki Matsuyama¹, Chuncheng Xu¹, Norio Yoshida¹, Yasushi Tando³ and Tatsuo Miwa³

¹National Institute of Livestock and Grassland Science, Nasushiobara, Tochigi 329-2793, Japan, E-mail :cai@affrc.go.jp. ²Strategic Livestock Research Centre, MARDI, P.O.Box 12301, 50774 Kuala Lumpur, Malaysia. ³The National Federation of Dairy Co-operative Associations, Ginza, Tokyo 104-0061, Japan.

Key words : TMR, silage, green tea grounds

Introduction About 100,000 tons of fresh green tea grounds are produced annually in Japan. Although this by-product contains high crude protein (CP), amino acids and vitamins that may have a significant potential as an animal feed, its high content of moisture, nutritional imbalance, poor preservation and poor intake constrain its utilization as animal feed (Xu *et al.* 2007). Therefore, this study was undertaken to evaluate the fermentation quality of totally mixed ration (TMR) silage with green tea grounds ensiled in flexible container bag silo.

Materials and methods Wet green tea grounds (WGTG) was obtained from a commercial beverage factory, and wet brewers' grains (WBG) was obtained from a commercial brewing factory. The TMR silage was prepared using a compound feed, WGTG, WBG, alfalfa hay, oats hay, tall fescue hay and molasses at a ratio of 43:3:11:6:23:14:9:7:4:8:6:1:2 respectively on a fresh matter basis. After the adjustment of moisture content to 40%, the TMR silage materials were ensiled in a flexible container bag silo and stored outdoors for 123 days.

Results Moisture and CP content of TMR silage prepared with wet green tea grounds were 40% and 18% respectively. All TMR silages were well preserved, as indicated by their low pH values and ammonia-N contents and high content of lactic acid. Samples opened on days 15 and 31 showed good fermentation quality with pH values ranging from 4.2 to 4.3 and lactic acid content ranging from 2.5 to 4.1% on dry matter basis. When the TMR silage was kept until 123 days, results showed some decrease in quality where the pH value tended to increase to 4.4 at the top of the bag, whereas lactic acid content was decreased to 1.3%. However, butyric and propionic acids were not detected throughout the study.

Table 1 Fermentation quality of TMR silage with green tea grounds ensiled in flexible container bag silo.

Item	pH	DM (%)	Lactic acid	Acetic acid	Butyric acid	Propionic acid	Ammonia-N (g/kg DM)
			-----%DM-----				
July 9th (0-day)	5.33	59.84	0.80	0.13	nd	nd	0.33
July 24th (15-day)							
Top	4.34	52.50	2.51	1.94	nd	nd	0.78
Centre	4.25	56.41	3.55	1.74	nd	nd	0.85
Bottom	4.24	52.50	3.71	1.83	nd	nd	0.93
August 9th (31-day)							
Top	4.32	56.21	3.13	2.13	nd	nd	0.93
Centre	4.23	57.97	4.05	2.00	nd	nd	0.95
Bottom	4.21	58.17	3.75	1.96	nd	nd	0.89
November 9th (123-day)							
Top	4.42	53.94	1.29	3.97	nd	nd	1.28
Centre	4.34	53.35	2.05	3.60	nd	nd	1.22
Bottom	4.29	54.84	2.77	3.25	nd	nd	1.22

Conclusions It is concluded that the wet green tea grounds can be used as an ingredient in TMR silage production for animal feeding, although it is suggested that the fermentation period should not exceed 3 months when ensiled in a flexible container bag silo.

Reference

Chuncheng Xu, Yimin Cai, Naoko Moriya, Masuhiro Ogawa (2007) Nutritive value for ruminants of green tea grounds as a replacement of brewers' grains in totally mixed ration silage. *Anim. Feed Sci. Technol.* 138, 228-238.