

APPLICATION OF BIOTECHNOLOGY FOR RUMINANT FEEDSTUFF PROCESSING FROM GREEN GRASSES AND AGRICULTURAL BY-PRODUCTS IN GIA LAI PROVINCE

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Livestock development is an important strategy to promote industrialization - modernization of rural agriculture. In developed countries, agriculture occupies a rather low share in the economy, but the livestock sector plays a large proportion in agricultural incomes. In Vietnam, the livestock sector is not really in the overall development of the agriculture. Ruminants (cattle, buffalo, goat, sheep) are the important animals in livestock development in our country. There is limited grazing pastures so that processing feedstuffs for ruminants from green grasses and agricultural by-products must be considered.

This study was carried out from 2009 to 2011 at Chu Se and Dak Po districts, Gia Lai province in order to find out suitable procedures of ensiling green grasses, maize stalks and sugarcane tops.

Methods:

- Based on practical survey results and theories of roughage processing technologies and ensilage techniques, assumption procedures of making silage from green grasses, maize stalks and sugarcane tops were established.
- Tested the procedures and evaluated economic – technical indices through demonstration farms where local cattle are keeping.

Table 1. Chemical compositions of silages

No.	Criteria	Green grasses		Maize stalks		Sugarcane tops	
		Before silage (*)	After 5 months of silage	Before silage (*)	After 5 months of silage	Before silage (*)	After 5 months of silage
1	Dry matter (%/DM)	18,70 ±1,14	24,83 ±0,75	29,78 ±3,32	29,12 ±2,86	17,20 ±3,25	25,44 ±1,56
2	Crude protein (%/DM)	8,24 ±0,24	7,85 ±0,31	7,54 ±0,56	9,03 ±1,03	3,38 ±0,29	4,18 ±0,16
3	Crude fiber (%/DM)	27,34 ±3,97	27,67 ±2,01	28,73 ±2,86	30,76 ±4,16	31,17 ±4,34	31,74 ±5,14
4	Lactic Acid (%)	-	1,86	-	1,68	-	1,97
5	Butyric Acid (%)	-	0,12	-	0,09	-	0,12
6	Acetic Acid (%)	-	0,21	-	0,43	-	0,13
7	pH	6,12 ±0,08	4,01 ±0,42	6,55 ±0,12	4,79 ±0,12	5,68 ±1,28	4,25 ±0,11

(*) Before drying

The study results showed that:

- § Using additives including 5% molasses + 1% salt + 0.1% probiotic for grasses and maize stalks; 3% molasses + 1% salt + 0.1% probiotic for sugarcane tops with incubation in plastic bags is a suitable procedure for making silage
- § Silage products had colour from green yellow to dark yellow, melon smell, medium moisture and no appears black fungus. The products could store more than 5 months.
- § Nutrient composition of silages (dry matter, crude protein, crude fiber) were not changed compared to fresh stage ingredients. The amount of organic acids and pH were met the requirements of a silage product.
- § Cattle could consume an amount of silage equivalent to green grass in dry matter and therefore they had daily weight gain equal to cattle used green grass.

Table 2. Daily weight gain of cattle using silages

No.	Criteria	Green grass		Maize stalks		Sugarcane tops	
		Exp. group	Control group	Exp. group	Control group	Exp. group	Control group
1	No. of cattle	10	10	10	10	10	10
2	Exp. duration (day)	90	90	90	90	90	90
3	Initial weight (kg)	187,4 ± 48,8	167,6 ± 44,1	159,8 ± 33,7	165,4 ± 23,4	159,8 ± 33,7	165,4 ± 23,4
4	Final weight (kg)	219,6 ± 47,2	198,8 ± 42,7	193,4 ± 35,0	195,7 ± 23,0	193,4 ± 35,0	195,7 ± 23,0
5	Daily weight gain (g/day)	357,8 ± 32,6	346,7 ± 40,5	373,3 ± 46,3	336,7 ± 20,3	373,3 ± 46,3	336,7 ± 20,3

BW and DWG between groups are not significant difference at $P > 0.05$

Grass silage sample

Silage in nylon bags