

# ຜົນຂອງການນຳໃຊ້ໃບມັນຕົ້ນ ແລະ ໃບທອງແຫ້ງ ເປັນອາຫານເສີມ ຕໍ່ການກິນໄດ້ ແລະ ປະສິດທິພາບການຈະເລີນເຕີບໂຕຂອງ ງົວພັນພື້ນເມືອງ

ວັນນະພອນ ພຸດທະນາ<sup>1</sup> ແລະ ວຽງສະກຸນ ນາປະເສີດ<sup>2</sup>

## ບົດຄັດຫຍໍ້

ການທົດລອງມີຈຸດປະສົງເພື່ອ ປະເມີນປະສິດທິພາບໃນການຈະເລີນເຕີບໂຕ ຂອງງົວພັນພື້ນເມືອງ ໃນເມື່ອມີການເສີມດ້ວຍ ໃບທອງ ແລະ ໃບມັນຕົ້ນແຫ້ງ ພ້ອມດຽວກັບການໃຫ້ເພືອງບົ່ມດ້ວຍຢູເຣຍ ເປັນອາຫານຫຼັກ. ສົມມຸດຕິຖານໃນການທົດລອງຄັ້ງນີ້ແມ່ນ ການກິນໄດ້ຂອງອາຫານ ແລະ ປະສິດທິພາບການຈະເລີນເຕີບໂຕຂອງສັດດີຂຶ້ນ ເມື່ອມີການໃຫ້ອາຫານເສີມ ໃນຊ່ວງຂອງການທົດລອງທັງໝົດ 3 ເດືອນ. ງົວພັນເມືອງທັງໝົດ 12 ໂຕ ທີ່ມີນ້ຳໜັກສະເລ່ຍ  $80 \pm 10$  ກິໂລກຼາມໄດ້ລ້ຽງໄວ້ໃນຄອກຂັງດ່ຽວ ຕາມການທົດລອງແບບສຸ່ມໃນບຣອກສົມບູນ ມີສິ່ງທົດລອງ ຄື: 1) ໃບທອງ 0 ກຼາມ + ໃບມັນຕົ້ນ 500 ກຼາມ (T1), 2) ໃບທອງ 500 ກຼາມ + ໃບມັນຕົ້ນ 500 ກຼາມ (T2), 3) ໃບທອງ 0 ກຼາມ + ໃບມັນຕົ້ນ 1,000 ກຼາມ (T3), 4) ໃບທອງ 500 ກຼາມ + ໃບມັນຕົ້ນ 1,000 ກຼາມ (T4) ແລະ ທຸກໆສິ່ງທົດລອງ ແມ່ນປະສົມກັບກາກນ້ຳຕານ 500 ກຼາມ ທີ່ມີເພືອງບົ່ມ ເປັນອາຫານຫຼັກໃນທຸກໆມື້. ການກິນໄດ້ຂອງອາຫານ ແລະ ນ້ຳໜັກຂອງສັດແມ່ນໄດ້ວັດແທກ ເພື່ອເປັນຂໍ້ມູນພື້ນຖານໃນການວິເຄາະຫາຄວາມແປປວນທາງສະຖິຕິ ດ້ວຍໂປຼແກຼມ ຈິນສະເຕທ (Genstat) ໂດຍການປຽບທຽບຄ່າສະເລ່ຍຂອງສິ່ງທົດລອງ ຕາມວິທີຂອງ ດັນແຄນ. ພົບວ່າ ນ້ຳໜັກແຕ່ລະມື້ (ADG) ໃນ T1 ແມ່ນ 236.90 ກຼາມຕໍ່ມື້ ເຊິ່ງມີແນວໂນ້ມ ດີກວ່າສິ່ງທົດລອງອື່ນໆ ( $P > 0.05$ ) ແລະ ນ້ຳໜັກເພີ່ມ ຂອງສັດໃນ T1 ສະເລ່ຍແມ່ນ 15.83 ກິໂລກຼາມ/ໂຕ ດີກວ່າ T3 = 5,00; T2 = 6,00 ແລະ T4 = 8,00 ກິໂລກຼາມ/ໂຕ ຕາມລຳດັບ. ແຕ່ວ່າ ການກິນໄດ້ຂອງອາຫານເສີມ ແລະ ທາດຊີ້ນລວມ ແມ່ນສູງທີ່ສຸດໃນ T4 ຄື: 155.61 ແລະ 32.02 ກິໂລກຼາມ/ໂຕ ຕາມລຳດັບ ເມື່ອສົມທຽບກັບ 3 ສິ່ງທົດລອງ ຄື: T1 = 50.21 ແລະ 10.60 ກິໂລກຼາມທາດແຫ້ງ/ໂຕ, T2 = 70,72 ແລະ 14.94 ກິໂລກຼາມທາດແຫ້ງ/ໂຕ ແລະ T3 = 63.38 ແລະ 14.70 ກິໂລກຼາມທາດແຫ້ງ/ໂຕ ( $P < 0.0001$ ). ດັ່ງນັ້ນ ຈຶ່ງສະຫຼຸບໄດ້ວ່າ: ການໃຫ້ອາຫານເສີມດ້ວຍໃບທອງ ແລະ ໃບມັນຕົ້ນແຫ້ງ ເຂົ້າໃນການທົດລອງຄັ້ງນີ້ ແມ່ນບໍ່ມີຜົນຕໍ່ປະສິດທິພາບການຈະເລີນເຕີບໂຕຂອງງົວພັນພື້ນເມືອງ ແລະ ໃນນີ້ ຍັງໄດ້ໃຫ້ຄຳແນະນຳວ່າ ຕ້ອງເອົາໃຈໃສ່ໃນການສຶກສາເຖິງຄຸນນະພາບ ແລະ ການເກັບຮັກສາອາຫານ ເພາະວ່າ ມັນຈະມີຜົນຕໍ່ການທົດລອງ ໃນຄັ້ງຕໍ່ໄປ.

**ຄຳສັບສຳຄັນ:** ໃບທອງ, ໃບມັນຕົ້ນ, ເພືອງບົ່ມດ້ວຍຢູເຣຍ, ປະສິດທິພາບການຈະເລີນເຕີບໂຕ, ງົວພັນພື້ນເມືອງ

<sup>1</sup>ກົມລ້ຽງສັດ ແລະ ການປະມົງ, ກະຊວງ ກະສິກຳ ແລະ ປ່າໄມ້.  
<sup>2</sup>ຄະນະກະເສດສາດ ນາບົງ, ມະຫາວິທະຍາໄລ ແຫ່ງຊາດ ລາວ.

## Effects of Erythrina leaf and Cassava leaf hay as supplemented feeds on voluntary feed intake and growth performance in native cattle

Vannaphone Putthana<sup>1</sup>, Viengsakoun Hacknorat Narpasirth<sup>2</sup>

### Abstract

This experiment aims to measure the biological parameters of native cattle for beef production when Erythrina leaf and Cassava leaf diets were added with common basal diet of urea-treated rice straw. The hypotheses to be test were that: the feed intake and growth performance were responded to Erythrina leaf and Cassava leaf hay supplements, when they were added following treatments during three months of experimental time. Twelve native cattle of about 80±10 kg of body weight were housed in individual pens and allocated in Randomized Completely Block Design. The major treatments were Erythrina 0g + Cassava 500g (T1), Erythrina 500g + Cassava 500g (T2), Erythrina 0 g + Cassava 1000g (T3), and Erythrina 500 g + Cassava 1,000 g (T4). All treatments were mixed with 0.5 kg molasses and cattle were normally fed with urea treated rice straw as basal diet. Feed intake and biological body weight were measured and data basis were analyzed of variance by using in Genstat program. Pair wise comparisons of means were made with the DUNCAN method. It was found that, average daily gain (ADG) in T1 (263.90g/head/d) was better tendency comparing with the other treatments ( $P>0.05$ ) and body weight gain in treatment 1 (15.83 kg/head) was better than T2, T3 and T4: 6.00, 8.00 and 5.00 kg/head, respectively. However, supplement intake and CP supplement intake were highest in T4 (155.61 and 30.02kg DM/head, respectively) comparing with 3 treatments as T1, T2, and T3: 50.21 and 10.60 kg DM/head, 70.72 and 14.94 kg DM/head and 63.38 and 14.70 kg DM/head, respectively ( $P<0.0001$ ). Thus supplemented feeds were not effective on biological growth performance in this experiment and recommended that we should consider on feed quality and storage because it has affects on the results.

**Keywords:** *Erythrina leaves, Cassava leaves, Urea treated rice straw, Growth performance, and Native cattle*

---

<sup>1</sup>Department of Livestock and Fishery, Ministry of Agriculture and Forestry.

<sup>2</sup>Faculty of Agriculture (Nabong campus), National University of Laos (NUOL).

## Introduction

Mainly of Lao people are farmers due to agronomy and animal husbandry became economic fundamentals government priorities for developing country. Especially Lao environment conditions are extremely suitable for developing agriculture in term of ecology diversity, varieties property, suitable temperature and natural animals (Forse and Meyer, 2004).

Majority animals are grown becoming economic animal such as yellow cattle, pigs and poultry which free range system in natural field and the main purpose of production is meat product for consumption in livelihood, traditional ceremony and selling in the local market for their economic contribution. Beside that, farmers like to raise cattle for using on other values as draught power, transportation and manure which even more important at rural area (Ministry of Agriculture and forestry, 2003).

Therefore researchers try to find a new better feeds stuffs for exam in cattle emphasis on natural plants as many experiments mentioned to cassava utilization in fresh and hay forms (Napasirth *et al*, 2005). Thus two experiments from NUFU project were tested cassava leaf values as animal feeds. The first, Manisang *et al.*, (2005) reported that utilization of

600g, 800g and 1,000g cassava leaf hay as supplemented feeds on growth performance in native cattle were found that the major parameters of biological performance in 800g was better than 600g and 1,000g ( $P<0.05$ ) and agreement with the second, Kaensombath *et al.*, (2005) said that previous experiment of cassava leaf silage as feeds (0%, 50% and 100%) on growth performance in pigs, we found that the major parameters of growth performance and economic efficient in 50% was better tendency than 0% and 100% ( $P>0.05$ ). Nevertheless, Vietnamese people use alone cassava leaf silage as fattening pigs feed and they said that the pigs were grown as well as pigs which used completed feed (personal contraction).

However, there are new feed stuffs to be substituted cassava leaf by *Erythrina* leaf where is able to be found oversee and it is in legume family. Farmers like to grow in surround of land for being fence and *Erythrina* leaf is usually consumed (human and animal), because it is high contain of 21.4% CP, very low hydro cyanic (HCN) toxin comparing with cassava leaf. (Kaensombath *et al.*, 2006; Napasirth *et al*, 2005).

As the result, this experiment aims to measure the biological parameters of native cattle for beef production when *Erythrina* leaf and Cassava leaf hays were added with common urea-treated rice straw.

## Materials and Methods

**Animals and Location:** Twelve native cattle, with average body live weight of  $80 \pm 10$  kg of around 365 days of age were used in this experiment. Cattle were allocated in individual pen on farm of Department of Animal Science, Faculty of Agriculture, University of Laos.

**Feed and Feeding:** Basal diet as Urea-treated rice straw were feed ad libitum and added supplemented feeds following treatments.

**Source of Roughage:** Collecting rice straw following up experimental quantity, then treated with 5% Urea on rice straw and kept unless 14 days in the tank with strong covering plastic cloth.

**Experimental Design:** In this experiment was used Randomized Completely Block Design (RCBD), there were 4 treatments in 3 replications: Erythrina 0g + Cassava 500g (T1), Erythrina 0g + Cassava 1,000g (T3), Erythrina 500g + Cassava 500g (T2) and Erythrina 500g + Cassava 1,000g (T4).

**Methodology:** The cattle were weighted, deparasite of external and internal parasite and vaccination. After 20 days of pretrial adjusting with roughage and supplemented feeds. The cattle were fed basal diet ad libitum following the

body live weight and supplemented feeds were followed up treatments and free water supply.

**Data Collection:** Feed samples and feed intake were collected from feed offer and feed refusal, and biological growth performance were measured in the experimental time.

**Data Analysis:** Samples of the freshly process were taken for analysis of dry matter, crude protein, crude fiber, ash by micro-wave radiation (Undersander *et al* 1993) and neutral detergent fiber (Van Soest 1991). While the data bases were analyzed of variance, following Randomized Completely Block Design (RCBD) for comparing significant of each treatment by using Genstat program.

## Results and Discussions

### *Chemical composition of feeds*

Cattle were fed about 2.5% BW in every day and the cattle on all supplemented group consumed diets with no palatable problems causing of rice straw was treated and improved 0.5 kg of molasses (Firdous and Gilani, 1999). In other hand, 5% Urea treated rice straw samples and supplements were collected and analyzed for chemical composition. They were found that, 10.22% crude protein in treated rice straw was higher than Napasirth *et al.*, (2006)

reported that 5% Urea treated rice straw can improve dry rice straw from 3% to 8.24% of crude protein. Normally crude protein of rice straw is about 3-4% depending on feed stuff location (Vilayphon, 2003; Visit and Thongsay, 2003; Wanapat, 1990; Napasirth *et al.*, 2005).

**Biological intake and growth performance**

Common curve of each period body weight gain was increased irregularly (Figure 1). Average Daily Gain (ADG) in T1 (263.90g/head/d) was better tendency comparing with the other treatments (P>0.05) and body weight gain in treatment 1 (15.83 kg/head) was better than T2, T3 and T4: 6.00,

8.00 and 5.00 kg/head, respectively (Table 2). In addition, Trach and Thom, (2002) stated that supplemented 4 hours roadside grazing a day cattle with rice straw ad libitum and 2 kg fresh brewer’s grains/head/day and found that, ADG and weight gain in supplemented group was higher than control group. In other hand, supplement intake and CP supplement intake were highest in T4 (155.61 and 30.02kg DM/head, respectively) comparing with 3 treatments as T1, T2, and T3: 50.21 and 10.60 kg DM/head, 70.72 and 14.94 kg DM/head and 63.38 and 14.70 kg DM/head, respectively (P<0.0001). Because of Erythrina and Cassava leaves had high crude protein content (Khamparn and Malavan, 2006).

**Table 1: Characteristic of chemical composition in experimental feeds.**

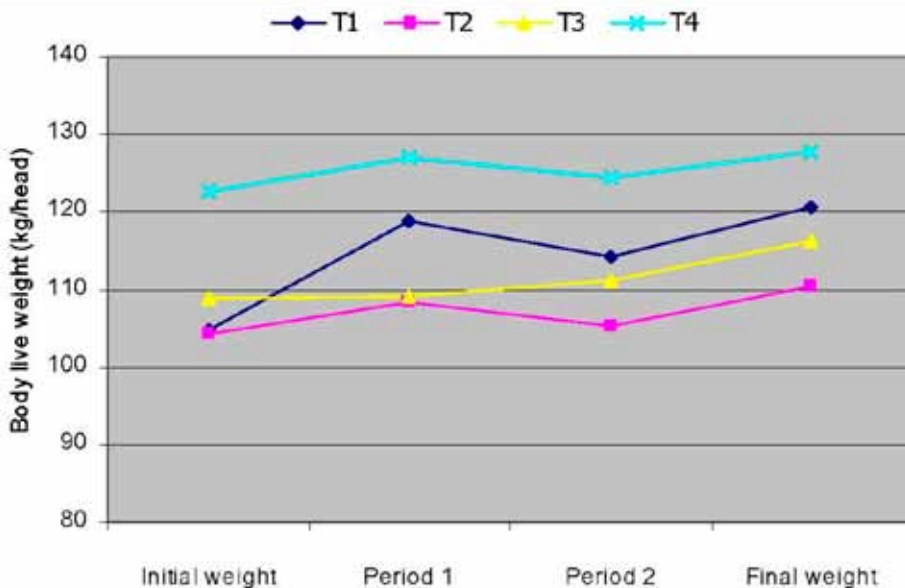
Basal diet and supplements	Chemical composition				
	%DM	%CP	%Ash	%NDF	%CF
Dry rice straw	94.47	3.21	10.38	72.14	32.95
Treated rice straw	85.37	10.22	10.15	67.95	33.85
Dry erythrina	91.99	19.77	12.99	44.28	24.46
Dry cassava leaves	85.38	18.23	8.34	56.33	14.70

DM = dry matter, CP = crude protein, NDF = neutral detergent fiber and CF= crude fiber, Ash

**Table 2:** Mean value of biological intake and growth performance when Erythrina leaf and Cassava leaf hays were added with common urea-treated rice straw.

Items	Treatments					
	T1	T2	T3	T4	CV (%)	P-value
No. Animals	3	3	3	3		
<b>Body live weight (Kg/head)</b>						
Initial weight	104,83	104,33	108,77	122,67	19,99	0,72
Final weight	120,67	110,33	116,17	127,67	13,11	0,60
Weight gain	15.83	6.00	8.00	5.00	17.7	0.42
ADG (g/head/day)	263,90	100	133,30	83,30	91,56	0,45
<b>Feed intake (Kg DM/head)</b>						
Supplements	<b>50,21c</b>	<b>70,72b</b>	<b>3,38bc</b>	<b>55,61a</b>	9,10	0,0001
Crude protein of supplement	<b>10,60c</b>	<b>14,94b</b>	<b>14,70b</b>	<b>30,02a</b>	11,60	0,0001
Treated rice straw	343,08	321,63	334,70	341,19	3,50	0,20
Crude protein of treated rice straw	56,50	52,95	55,09	56,15	3,50	0,20

<sup>abc</sup> Mean values in same row without common letter are different at  $P < 0.05$



**Figure 1.** Periodic live weight gain with supplemented feed.

## Conclusions & Recommendations

As the results of this experiment it can be seen that body live weight gain and average daily gain were not significant ( $P>0.05$ ). Furthermore, body weight gain, and average daily gain in cassava supplemented 500g group (T1) was better tendency comparing with other groups. In other hand, supplement intake and CP supplement intake were highest in T4 comparing with 3 treatments ( $P<0.0001$ ). Thus supplemented feeds were not effective on biological growth performance in this experiment and recommended that we should consider on feed quality and storage because it has affects on the results.

## Acknowledgements

The present study was carried out with the financial support from the Lao Agriculture Research Fund (LARF). The author would like to thank LARF organization and Faculty of Agriculture (FOA), National University of Laos for giving the money and advice during research.

## Reference

**Firdous, R and A.H, Gilani. 1999.** Effect of storage of maturity and cultivars on the digestibility of hold maize plant and its morphological fraction. Asian-Aust. J.AnimSci. 12:1228 -1233.

**Forse, B and C, Meyer., 2004.** What should we do without veterinarians. Department of Animal Husbandry and Fishery. Faculty of Agriculture, National University of Laos.

**Kaensombath. L, F. Southam-mavong, S. Vongdala, and P. Lasahas, 2005.** Effects of cassava leaf silage on growth performance in pigs. Department of Animal Science, Faculty of Agriculture, National University of Laos.

**Kaensombath. L, P. Thipphon-huang, V. Chidtavongsa, and Y. Chanthavong, 2006.** Effects of feed intake and digestibility of local goat by given forage trees. Department of Animal Science, Faculty of Agriculture, National University of Laos.

**Manisang. B, V. Napasirth. V. Y. Yer, P. Banthasouk, 2005.** Effect of different levels cassava hay supplementation in native cattle in dry season. Department of Animal Science, Faculty of Agriculture, National University of Laos.

**Khamparn, P (2006).** Utilization of Tithonia as growing goats feed. Department of Livestock and Fishery, Faculty of Agriculture, National University of Laos, Laos PDR.

**Malavan, C (2006).** Digestibility and nitrogen balance in pigs fed basal diet of Cassava root. Department of Livestock and Fishery, Faculty of Agriculture, National University of Laos, Laos PDR.

**Ministry of Agriculture and forestry, 2003.** Data of Domestic Animal 2002-2003. Animal Husbandry Center, Ministry of Agriculture and forestry.

**Napasirth, V, B. Manisang, V. Y. Yer, P. Banthasouk, 2005.** Response of local (yellow) cattle to supplementation of urea treated rice straw with fresh or dried cassava foliage. Department of Animal Science, Faculty of Agriculture, National University of Laos.

**Napasirth, V, C. Tavanikone, and K. Sayavong, 2006.** Effects of levels of fresh and dried cassava leaf as supplemented feeds on feed intake and growth performance in native cattle. Department of Animal Science, Faculty of Agriculture, National University of Laos.

**Napasirth, V., K. Sommart and S, Pholsen. 2005.** Effects of energy feed source in concentrate on voluntary feed intake, ruminal fermentation, digestibility and rate of passage in beef cattle. Department of Animal Science, Faculty of Agriculture, Khon Kaen University.

**Soulinthone, T and B. Siliphong. 2003.** Utilization of by-product as feed for native cattle in dry season. Final Report, Department of Animal Science, Faculty of Agriculture, National University of Laos.

**Trach, N. X and Thom, M. T. 2002.** Responses of growing beef cattle to a feeding regime combining road side grazing and rice straw feeding supplemented with urea and brewer's grains following an oil drench. Hanoi Agricultural University.

**Vilayphon, B. 2003.** Tropical pasture and Forage management, Handbook. Department of Animal Science, Faculty of Agriculture, Khon Kaen University.

**Vongsamphanh, P and M, Wanapat. 2003.** Comparisons of cassava hay yield and chemical composition of local and introduced varieties and effects of levels of cassava hay supplementation in native beef cattle feed on rice straw. Livestock Research Center, National Agriculture and forestry Research institute, Ministry of Agriculture and Forestry, Vientiane, Lao PDR. Department of Animal Science, Faculty of Agriculture, Khon Kaen University.

**Visit, D and S, Thongsay. 2003.** Utilization of by-product as feed for native cattle in dry season. Final Report, Department of Animal Science, Faculty of Agriculture, National University of Laos.



**Wanapat, M. 1990.** Ruminant nutrition. Funny public limited. Bangkok. Thailand.

**Wanapat, M., Wachirapakorn, C., Palanit, P., and Toburan, W. 1991.** Effects of urea/molasses supplementation and urea--treated ricetraw on voluntary feed intake and ruminal fermentation in native cattle fed straw baesd diets. Department of Animal Science, Faculty of Agriculture Khon Kaen University, Khon Kaen 40002. Workshop proceedings Utilization of straw in ruminant production systems. 7-11 October 1991 at the Malaysia Agriculture Research and Development Instute. p. 132-136.