RESEARCH ARTICLE

ຜົນຂອງການໃຊ້ແຂມໝັກຕໍ່ການກິນໄດ້ ແລະ ການຈະເລີນເຕີບໂຕ ຂອງງົວພື້ນເມືອງລາວ[1]

ວົງປະສິດ ຈັນທະຄຸນ[2], ສັງຄົມ ອິນທະປັນຍາ, ທະນູສົນ ກັນດີ ແລະ ຄຳບຸ ໄຕຍາມາດ

ພາກວິຊາ ວິທະຍາສາດການລ້ຽງສັດ ມະຫາວິທະຍາໄລສຸພານຸວົງ

ບົດຄັດຫຍໍ້

ແຂມເປັນພືດທີ່ເກີດຕາມທຳມະຊາດທີ່ເກີດຂຶ້ນໃນເຂດໜາວ ໂດຍສະເພາະແມ່ນພາກເໜືອ ຂອງປະເທດລາວເປັນຈຳນວນຫຼາຍ, ແຂມເປັນພືດສີຂຽວທີ່ພົບເຫັນໃນຊ່ວງລະດູແລ້ງ ແນວໃດກໍ່ດີການນຳໃຊ້ແຂມເຂົ້າໃນການ້ຽງສັດສັດຍັງບໍ່ທັນມີຂໍ້ມູນ, ສະນັ້ນ ໃນການສຶກສາຄັ້ງນີ້ຈຶ່ງມີຄວາມສົນໃຈໃນການນຳໃຊ້ແຂໃມໝັກເພື່ອເປັນອາຫານຂອງງົວພື້ນເມືອງຂອງລາວ ເຊິ່ງມີຈຸດປະສົງເພື່ອສຶກສາຜົນຂອງການນຳໃຊ້ແຂມໝັກເປັນແຫຼ່ງອາຫານຫຍາບຕໍ່ການກິນໄດ້ ແລະ ການຈະເລີນເຕີບໂຕ ໃນງົວພື້ນເມືອງຂອງລາວ. ງົວພື້ນເມືອງເພດຜູ້ຈຳນວນ 12 ໂຕທີ່ມີນ້ຳໜັກສະເລ່ຍ 101±6 ກິໂລກຼາມ ຈັດເຂົ້າແຜນການທົດລອງແບບສຸ່ມສົມບູນໃນບ່ອກ (RCBD) ປະກອບມີອາຫານ 4 ສິ່ງທົດລອງຄື: ເຟືອງໝັກຢູເຣຍ (UTR), ຫຍ້າເນເປຍໝັກຮ່ວມກັບກາກນ້ຳຕານ (NPS-M), ແຂມໝັກກາກນ້ຳຕານ (TGS-M) ແລະ ແຂມໝັກກາກນ້ຳຕານຮ່ວມກັບຢູເຣຍ (TGS-MU). ກ່ອນການເຂົ້າການທົດລອງງົວທຸກໂຕແມ່ນໄດ້ປັບໃຫ້ຄຸ້ນເຄີຍກັບອາຫານເປັນເວລາ 2 ອາທິດ ແລະ ໃຫ້ອາຫານແມ່ນໃຫ້ງົວກິນແບບເຕັມທີ່ ພ້ອມທັງມີນ້ຳສະອາດໃຫ້ກິນຕະຫຼອກເວລາ. ຜົນການທົດລອງພົບອັດຕາການກິນໄດ້ (ຄິດເປັນນ້ຳໜັກແຫ້ງ DM) ຂອງອາຫານແມ່ນມີຄວາມແຕກ່າງກັນທາງດ້ານສະຖິຕິ (P<0.05) ໂດຍອາຫານທີ່ກິນໄດ້ຂອງ UTR ແລະ TGS-M (5.2 ແລະ 4.8 ກິໂລກຼາມ/ມື້) ສູງກວ່າ TGS-MU ແລະ NPS-M (3.8 ແລະ 3.5 ກິໂລກຼາມ/ມື້). ອັດຕາການຈະເລີນເຕີບໂຕພົບວ່ານ້ຳໜັກເພີ່ມຂຶ້ນສະເລ່ຍ (ADG) (ກິໂລກຼາມ/ວັນ) ແລະ ອັດຕາການປ່ຽນອາຫານມາເປັນນ້ຳໜັກໂຕ (FCR) ມີຄວາມແຕກຕ່າງກັນທາງດ້ານສະຖິຕິ (p<0.05) ເຊິ່ງ TGS-M (0.16 ກິໂລກຼາມ/ວັນ), ດີກວ່າໝູ່ເມື່ອທຽບກັບ UTR, TGS-MU ແລະ NPS-M (0.08, 0.07 ແລະ 0.05 ກິໂລກຼາມ/ວັນ) ຕາມລຳດັບ. ອັດຕາການປ່ຽນອາຫານມາເປັນນ້ຳໜັກໂຕ (FCR) ມີຄວາມແຕກຕ່າງກັນທາງດ້ານສະຖິຕິ (p<0.05) ເຊິ່ງ TGS-M (29.44), ແມ່ນມີຄ່າຕ່ຳກວ່າໝູ່ເມື່ອທຽບກັບອາຫານ UTR, TGS-MU ແລະ NPS-M (64.19, 53.52 ແລະ 71.42) ຕາມລຳດັບ. ສະຫຼຸບຜົນການທົດລອງແມ່ນການນຳໃຊ້ແຂມໝັກຮ່ວມກັບກາກນ້ຳຕານແມ່ນຊ່ວຍເພີ່ມການກິນໄດ້, ການຈະເລີນເຕີບໂຕ ແລະ ການປ່ຽນອາຫານມາເປັນນ້ຳໜັກໂຕ ດີກວ່າການນຳໃຊ້ຫຍ້າເນເປຍໝັກ ແລະ ເຟືອງໝັກຢູເຣຍ.

ຄຳສັບສຳຄັນ

ງົວພັນພື້ນເມືອງ, ແຂມ, ການກິນໄດ້, ການຈະເລີນເຕີບໂຕ.

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[1] **ການອ້າງອີງພາສາລາວ**

ວົງປະສິດ ຈັນທະຄຸນ, ສັງຄົມ ອິນທະປັນຍາ, ທະນູສົນ ກັນດີ ແລະ ຄຳບຸ ໄຕຍາມາດ (2018). ຜົນຂອງການໃຊ້ແຂມໝັກຕໍ່ການກິນໄດ້ ແລະ ການຈະເລີນເຕີບໂຕ ຂອງງົວພື້ນເມືອງລາວ, ວາລະສານວິທະຍາສາດມະຫາວິທະຍາໄລສຸພານຸວົງ, ສະບັບທີ 3 : ໜ້າ 136-143.

[2] ***ຕິດຕໍ່ພົວພັນ***

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RESEARCH ARTICLE

Effect of Tiger Grass (Khaem) Silage on Growth Performance rate and Nutrients Digestibility in Local Yellow Cattle

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ABSTRACT

Tiger grass (Khaem), a non-timber forest product (NTFP) is mainly cultivated and propagated because of the economic demand for its flowers which are processed into soft brooms. Khaem as a protein source or green grass in dry season for local yellow cattle and swamp buffaloes has been relatively limited information in Laos. The aim of this study was to determine the Khaem silage as source of fiber and protein for cattle during dry season to improve the feed digestibility and growth rate in "Yellow" local cattle. The 12 local cattle with 101±6 kg live weight were randomly assigned to receive 4 dietary treatments according to a Randomize Completed Block Design. Four treatments were Urea treated rice straw (UTR), Napier Grass Silage (NGS-M), Tiger grass silage + Molasses (TGS-M), Tiger grass silage + Molasses + Urea (TGS-MU) as a roughage was fed *ad libitum*. All animals were allowed to adapt to feeds respective before samplings were conducted. It was found that the chemical composition of 4 treatments particularly UTR were high of protein than other treatment. Furthermore, the treatments UTR and TGS-M were increased ($P<0.05$) in terms of total DM intake and ADG. In addition, feed convert ratio (FCR) were significant difference ($P<0.05$) lowest in TGS-M than other treatments. Based on this experiment, it could be concluded that feed roughage silage, particularly TGS-M was improve the growth performance of local Yellow cattle.

Keywords

Yellow local cattle, Tiger Grass (Khaem), DM intake, Digestibility, Napier Grass.

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RESEARCH ARTICLE

1. INTRODUCTION

In Lao PDR, Livestock production especially ruminants production is an important part of the national economy and an integral component of state and local economies. Inadequate feed supply is a major constraint to ruminant production during the dry season in the tropics. This has been the basic reason for poor performance of livestock. Tropical grass fodder and crop by-products available during dry season in tropics have a low nutritive value due to their low protein and fermentable energy though they grow rapidly during the period of heavy rainfall and high temperature and this leads to grass maturing early. In the topics, long dry seasons, low soil fertility and low feed availability throughout the year, all adversely influence rumen microbes and fermentation (Wanapat, 2000). In addition, Lao PDR is long dry seasons and only low-quality roughages as rice straw and some of agriculture crop-residue and reality limited of green feed for ruminants.

Tiger grass, a non-timber forest product (NTFP) is mainly cultivated and propagated because of the economic demand for its flowers which are processed into soft brooms. There was no report from the field about how the villagers further utilize this commodity. My limited review of literatures in the past suggested that this grass has multiple uses apart from soft brooms (Bisht and Ahlawat, 1998). Tiger grass produces panicles for a maximum period of 10 years. Tiger grass, one of economic-grass could grow well in infertile soil, especially in the upland area. Broom grass is growth in many countries including India, China, Burma, Thailand, Vietnam, Cambodia, Malaysia, Indonesia and the Philippines. The cost benefit analysis shows more benefit for farmers to trade in finished brooms instead of selling raw materials (Nicholson et al., 2008). A wiki page (Dok khaem) reported a unique and new species of tiger grass in Laos yet to be verified that distinguishes between its male and female flowers.

Khaem, is available source of livelihood for upland communities and Several studies reported that the tender culms, leaves and tips of T. maxima are used as fodders for cattle during lean period (Saikia et al., 1992); Bisht and Ahlawat, 1998; Shankar et al., 2001; Baldino, 2002; Dogan et al., 2008; Bhuchar, 2008; Malla and Chhetri, 2009; Roothaert et al., 2005). In Myanmar, captive elephants in the Okkan Reserved Forest fed on T. maxima (Himmelsbach, 2006).

However, the use of Khaem as a protein source or green grass in dry season for local yellow cattle and swamp buffaloes has been relatively limited information in Laos.

The nutritive value of pastures falls rapidly with maturity and, during the dry season. The rate of acceptability of forage is related to the readiness to which the forage is selected and consumed. In the north of Laos, local knowledge of farmers was used as basis for planning ruminant diets particularly Khaem traditional treated as feed supplementation for their cattle in dry season but not yet analyses for chemical composition and digestibility.

The research was to determine the Tiger grass (Khaem) silage as source of fiber and protein for cattle during dry season to improve the nutrients, feed intake, and growth rate in “Yellow” local cattle, There were a further advantage in feeding tiger grass were the new source of feed that suitable for dry season.

2. MATERIALS AND METHODS

2.1 Location of experiment conducted

The experiment was carried out at the Department of Animal Science, Faculty of Agriculture and Forest Resource, Souphanouvong University, Luang prabang, North of Laos. The experiment was carried out from January to March, 2018.

2.2 Treatments and design

The experiment was arranged as The 12 local yellow cattle with 101±6 kg live weight were randomly assigned to receive 4 dietary treatments according to a Randomize Completed Block Design. with periods of 15 days on each treatment, 10 days for adaptation and 5 days for data collection. All animals were fed *ad libitum*.

The four diets were:

UTR = Urea treated rice straw

NGS-M = Napier grass + Molasses Silage

TGS-M = Tiger grass + Molasses silage

TGS-MU = Tiger grass Molasses + Urea silage.

2.3 Animals and housing

Twelve local yellow cattle (n=12) were used with initial live weight of about 101±6 kg and an average age of 14 months at the start of experiment were used. All animals were confined in separate pens. Vaccination was done against epidemic diseases and drenching against internal parasites before the commencement of the experiment.

2.4 Feeding and management

Animals were adapted gradually to the experimental feeds at least two weeks to allow adaptation to the treatment source. The tiger silage is offered *at libitum* of recorded intake the previous week. It was bought from farmers in the area. Tiger grass or Khaem and Napier grass was cut hold stem and leaf 20 cm from the ground after chop to 5-10cm then made a silage and stored in sealed tank for 14 days before feeding. The NPN source as urea treated rice straw were dissolved urea with water and sprayed over the rice straw by following the ratio prior to each new feed of foliage. Tiger grass was harvested daily from areas of farmers in the rural areas. Feeds were offered two times a day, at 7.00 am and 4.30 pm and put in to individual cement feeders. Water was supplied during the whole periods.

2.5 Data collection and measurements

The cattle were weight before feeding in the morning at the beginning of the experiment and at 15 day intervals. Feed offer and residues were recorded daily to determine feed intake (DMI). Feed refusals were collected and the DM weight was recorded each morning for individual animals. The DM of feed and faecal samples was determined as described by Undersander et al. (1993).

2.6 Chemical analysis

Experimental diets were analyzed according to AOAC (1997) procedures for DM, ash, CP content and neutral detergent fibre (NDF) were determined using the procedure of Van Soest et al. (1991).

2.7 Statistical analysis

All of the collected data were subjected to analysis of variance (ANOVA) and when the differences among the groups were identified, through the use of a computer programme (Sirichai, 2007).

3. RESULTS

3.1 Chemical composition of treatments

The compositions of urea treated rice straw are shown in Table 1. The UTR contained 84.6 % NDF and 6.4 % CP. While TGS-MU contained 78.3 % NDF and 5.9 % CP, TGS-M contained 79.8 % NDF and 5.4 % CP and NPS-M contained 73.2 % NDF and 4.5% CP respectively.

3.2 Feed intake and growth performance in yellow local cattle

The results of UTR, NPS-M, TGS-M and TGS-MU on feed intake and average daily gain (ADG) and feed convert ratio (FCR) in local yellow cattle are presented in Table 2. DM intake of UTR (5.2 kg/day) and TGS-M (4.8kg/day) was significantly ($P<0.05$), while $BW^{0.75}$ and BW change were similar among treatments. However, ADG were significantly ($P<0.05$) at TGS-M (0.163 kg/day) higher than other treatment. FCR was significantly ($P<0.05$) the value was lowest at TGS-M and following by TGS-MU and UTR and highest at NPS-M (Table 2).

Table 1. The chemical composition of treatments

Items	Treatments			
	UTR	NPS-M	TGS-M	TGS-MU
DM	85.1	20.2	23.4	13.1
Ash	10.2	11.4	10.3	9.7
CP	6.4	4.5	5.4	5.9
NDF	84.6	73.2	79.8	78.3

DM = dry matter, CP = Crude protein, NDF = Neutral detergent fiber, urea treated rice straw (UTR), Napier Grass Silage molasses (NGS-M), Tiger grass silage + Molasses (TGS-M), Tiger grass silage + Molasses + Urea (TGS-MU), SEM = standard error of the mean.

Table 2. Influence of treatments on voluntary dry matter feed intake and growth performance in yellow local cattle.

Items	Treatments				SEM	p-value
	UTR	NPS-M	TGS-M	TGS-MU		
DM, intake						
kg/d	5.2^{a}	3.5^{b}	4.8^{a}	3.8^{b}	0.3	0.04
% BW	3.5	4.9	5.3	4.5	0.3	0.06
$g/kgBW^{0.75}$	123	143	160	134	7.7	0.06
ADG, kg/day	0.081^{b}	0.049^{b}	0.163^{a}	0.071^{b}	0.001	0.02
FCR	64.19^{ab}	71.42^{a}	29.44^{c}	53.52^{b}	3.54	0.02

^{a,b,c} Means in the same row with different superscripts differ ($P<0.05$), DM = dry matter, urea treated rice straw (UTR), Napier Grass Silage molasses (NGS-M), Tiger grass silage + Molasses (TGS-M), Tiger grass silage + Molasses + Urea (TGS-MU), SEM = standard error of the mean.

4. DISCUSSION

4.1 Chemical composition of treatments

The chemical compositions of four treatments are shown in Table 1. The rice straw contained high fibrous fractions (NDF, ADF) with low rumen degradation, therefore chemical treatment methods especially urea (5.0%) or urea-lime (2.5+2.5%) have been used to improve digestibilities and overall feed intakes (Wanapat et al., 2009). However, as reported by Leng (1993) that the ruminants fed on low-quality roughages required additional fermentable N, required to increase rumen microbial protein synthesis. Therefore, different substrates required different concentrations of ammonia to achieve optimal microbial yield (Ørskov, 1999).

4.2 Feed intake and growth performance

Voluntary DM intake is limited by high fibre content in forages fed to ruminants (Allen, 2000). The fibre (NDF) content in the diet consumed in the present study was about 73.2-84.6%, which can be regarded as a high level. However, Kafle (2005) claimed that although this Tiger grass species produces more foliage, its palatability is less. It also causes haematuria among cattle and buffaloes that fed on them. Joshil and Singh (1989) On the other hand, Khaem was the second most preferred fodders by the farmers and showed a 6% animal response (9th) (Subba et al., 2002).T. maxima (Tiger grass) was also ranked third as farmers' preferred feeds for livestock and was reported to stimulate milk production and observed to be palatable to animals even during rain or cold weather conditions. The increase in silage intake may be explained, at least partially, by the higher residual WSC content in the silage treated with molasses (Murphy, 1999). Alternatively, it has been discussed that the aerobic stability of the silage with molasses was increased thereby potentially preventing the growth of spoilage organisms (Danner et al., 2003). Similarly, Wanapat et al. (2009) also reported that also reported that 5.5% urea-treated rice straw increase dry matter intake in dairy cows (from 4.4 to 6.0 kg/day) when compared with untreated rice straw Wanapat et al. (1985) also reported that urea treated rice straw could increase overall intake, digestibility of CP, NDF and ADF. Therefore, this study Tiger grass silage with molasses (TGS-M) was showed higher growth rate (ADG) than Napier silage molasses (NPS-M), it could be effect by leaf portion of tiger grass quite so bigger than Napier grass leaf and more effect may be cause by egg of Nepier grass was high than tiger grass that used in this experiment so, they could be course for effect growth performance of cattle that fed NPS-M than TGS-M or TGS.

5. CONCLUSION

Based on this experiment, it could be concluded that feed roughage silage, particularly urea treated rice straw (UTR) and Tiger grass (Khaem) silage + Molasses (TGS-M) were improved DM intake, ADG and FCR than Napier grass silage with molasses (NPS-M) of local Yellow cattle.

6. ACKNOWLEDGEMENTS

The authors would like to express most sincere thanks to the Swedish International Development Agency MEKARN II PROJECT for their kind financial support and Department of Animal Science, Faculty of Agriculture and Forest Resource, Souphanouvong University (SU), Luang Prabang, Laos for their kind to use of research facilities and Laboratory equipment.

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