Utilization of Sunnhemp Meal in Beef Cattle Diet Supplemented with Urea-Treated Rice Straw

Supreena Srisaikham[1*] and Pipat Lounglawan[2*]

[1]Faculty of Agricultural Technology, Burapha University, Sa Kaeo Campus, Sa Kaeo 27160, Thailand
[2]School of Animal Technology and Innovation, Institute of Agricultural Technology, Suranaree University of Technology, Nakhon Ratchasima 30000 Thailand

[*]Corresponding authors. E-mail: supreena.sr@buu.ac.th, pipat@sut.ac.th
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ABSTRACT

The objective of this study was to determine the effects of the utilization of sunnhemp (Crotalaria juncea) meal (SM) in beef cattle diet in North-East Thailand. The first experiment was conducted to determine the effects of cutting intervals and height on the yield and nutrient composition of sunnhemp. The experiment was a 3×3 factorial arrangement in a randomized complete block design (RCBD) , in which factor A was the cutting intervals (30, 40 and 50 days) and factor B was the cutting heights (30, 40 and 50 cm) above ground level. It is concluded that a cutting interval of sunnhemp at 50 days achieves greater dry matter and nutrient yields than at 30 days. In terms of nutrient content, there is also a considerable increase in crude fiber, neutral-detergent fiber, acid-detergent fiber, and acid-detergent lignin in sunnhemp. In contrast, the results showed that cutting height at 30, 40 or 50 cm had no effect on the chemical composition values of sunnhemp. The second experiment was to study the effect of SM supplemented with urea-treated rice straw (UTRS) on the growth rate of Brahman×Thai-Native beef cattle. Twelve cattle, averaging 218±14 kg body weight (BW) and approximately 14-17 months' old were stratified randomly and assigned to RCBD in 4 treatments of 3 beef cattle each. The treatments were equal amounts of SM supplement with UTRS at 0, 25, 50 and 75% respectively. There were no significant differences in the live weight change, average daily gain (ADG), dry matter intake and rumen fermentation among treatments of

0, 25 and 50% of SM supplement. However, the BW and ADG significantly decreased at 75% of SM supplement with UTRS.

Keywords: *Crotalaria juncea*, Sunnhemp meal, Beef cattle diet, Urea-treated rice straw

INTRODUCTION

Livestock feed is an important factor in the success of cattle farming. Animal feed costs are usually accounts for 60-70% of animal production (Habtamu, 2014), of which approximately 10 up to 16% are roughage and 65-80% are concentrated feed expenses (Wanapat et al., 2013), depending on the quality of the feed and the feeding method (Seyoum et al., 2007). Supplementing the concentrate from a basal feed diet or grass fortifies nutritional deficiencies. However, fresh grass is only of good quality at an early stage, because the nutritive value of fresh grass may vary throughout the year and its quality gradually decreases with the age of forage harvest and rising temperature (Lee et al., 2017). Therefore, it is necessary to supplement it with high levels of concentrated feed in order for the cattle to receive sufficient nutrients for production, which causes higher production costs for farmers. Concentrated feed consists of 2 types of important nutrients, which are, firstly, a basal diet, such as diets with high carbohydrates which are usually low in price and, secondly, protein supplements. Cattle are usually fed a concentrated diet, which means that they do not often get enough protein to meet their nutrient requirements, especially in steer cattle. The provision of protein supplements mixed with basic feed will increase the protein content for animals. Most protein supplements are derived from the oil extracted or expressed from types of grain, such as palm kernel meal, cotton seed meal (Wanapat and Rowlinson, 2007) and soybean meal (Martens et al. , 2012) , etc. , Although these protein sources are of good quality, more palatable and contain different amounts of protein according to the type of plant, they are expensive. The problem is how to decrease the expensive price of the protein feed for beef cattle to supplement poor quality roughage in order to achieve efficient production. This can be done by adding protein supplements from other plant sources which provide the energy of the basal diet plus the added nutritive value from the feed intake.

Many legume species have the potential to be used as the raw material for animal feed, and widely grown especially in the tropics and subtropical areas of India, Nepal, Srilanka and Southern Africa (Tripathi et al., 2013) . Sunnhemp (*Crotalaria juncea*) is a type of legume plant grown for fiber (Tripathi et al., 2012) that has been mostly used as a green manure (Sarkar and Ghoroi, 2007; Tripathi et al., 2013) to improve soil fertility by nitrogen fixation (Rhizobium), medicinal values (Lawal et al., 2013), local fodder (Sarkar et al., 2015) and is