



University of Kentucky  
UKnowledge

---

International Grassland Congress Proceedings

XIX International Grassland Congress

---

## Changes of Forages Fed to Dairy Cows in the Whole Year in Taiwan

F. H. Hsu  
*Council of Agriculture, Taiwan*

C. H. Lu  
*Council of Agriculture, Taiwan*

Follow this and additional works at: <https://uknowledge.uky.edu/igc>

 Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/19/19/20>

The XIX International Grassland Congress took place in São Pedro, São Paulo, Brazil from February 11 through February 21, 2001.

Proceedings published by Fundacao de Estudos Agrarios Luiz de Queiroz

---

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

## CHANGES OF FORAGES FED TO DAIRY COWS IN THE WHOLE YEAR IN TAIWAN

F.H. Hsu<sup>1</sup> and C.H. Lu<sup>1</sup>

<sup>1</sup>Department of Forage Crops, Taiwan Livestock Research Institute, Council of Agriculture,  
Hsinhua, Tainan, Taiwan

### Abstract

Objectives of this study were to determine the kinds and the percents of forages fed to dairy cows in the whole year. Data were taken weekly by the dairy farmers for one year, including kinds and weights of forages fed to dairy cows, the heads of milking cows, dry cows and heifers. Dairy farmer A used napiergrass (*Pennisetum purpureum*) green chop 68.2%, napiergrass silage 15.3%, pangolagrass (*Digitaria decumbens*) hay 3.2% and imported bermudagrass (*Cynodon dactylon*) hay 13.3% to feed cows. Dairy farmer B fed cows with napiergrass green chop 65.1%, pangolagrass 13.0% and imported hays 21.9%, i.e., bermudagrass, alfalfa (*Medicago sativa*), redtop (*Agrostis gigantea*), oat (*Avena sativa*) and ryegrass (*Lolium perenne*). Dairy farmer C fed dairy cows on corn (*Zea mays*) silage 24.0% and green chop 33.5%, pangolagrass hay 9.1% and imported hays 33.4%, i.e., bermudagrass, alfalfa and timothy (*Phleum pratense*). Dairy farmer D purchased total mixed ration 58.6% to feed cows. The other forages were corn green chop 14.0%, bermudagrass hay 11.6% and timothy hay 8.6%. Dairy farmer E used corn silage 38.7%, pangolagrass hay 36.5% and haylage 8.1%, alfalfa hay 14.1%, oat hay and agricultural by-product to feed cows. The forages could be provided steadily when forage crops grew vigorously from April to November. Forage yield decreased after November. Thus, the forages were not available

enough to feed cows and the imported hays increased. It was suggested that dairy farmers might make hay or silage during forage growth seasons to keep forages available enough in the whole year.

**Keywords:** Forage, green chop, hay, silage, dairy cow

### **Introduction**

People have led a good life due to making big progress in the economy in Taiwan. The amount of dairy products consumed by people was increasing yearly (Hsu, 1994). There is still potential in developing the dairy industry in Taiwan. Forages fed to dairy cows was estimated about 30% of milk production cost (Hsu *et al.*, 1994). It might be helpful for keeping dairy cows healthy and reducing milk production cost if the forages could be provided steadily in the whole year. Hsu and Lu 2000 indicated that 49.3% dairy farmers considered silages as a stable source for providing forage in Taiwan. The objectives of this study were to determine the kinds and the percents of forages fed to dairy cows for planning the forage supplying system in the whole year.

### **Material and Methods**

Ten dairy farmers were chosen to help take the data weekly from April, 1995 to April, 1996, including the kinds and the weights of forages fed to dairy cows, the heads of milking cows, dry cows and heifers. Finally, the data of five dairy farmers were selected and statistically analysed to determine the percents of each forage to all the forages fed to cows in the whole year. The dry matter percentages for determining the dry matter of different forages were as follows: napiergrass green chop 15%, napiergrass silage 25%, pangolagrass green chop 22%, pangolagrass haylage 45%, corn green chop 25%, corn silage 35%, total mixed

ration TMR 50% and orange residue 65%, respectively.

## **Results and Discussion**

The kinds and the percents of forages fed to dairy cows in the whole year for the selected 5 dairy farmers were shown in Table 1. The major forages fed to dairy cows for dairy farmers A and B were napiergrass green chops with 68.2 and 65.1%, respectively. In addition, dairy farmer A used napiergrass silage 15.3%, pangolagrass hay 3.2% and imported bermudagrass hay 13.3% to feed cows, while dairy farmer B fed the cows with pangolagrass 13.0% and imported several kinds of hay to supply the short.

Dairy farmer C used corn green chop 33.5% and silage 24.0% to feed dairy cows (Table 1), respectively. Corn silage was fed between April and October, 1995, while corn green chop was fed between November, 1995 and April, 1996. Both corn silage and green chop were 57.5% of total forages fed to dairy cows. In addition, the farmer used pangolagrass hay 9.1% and imported alfalfa hay 22.6%, bermudagrass hay 5.0% and timothy hay 5.8% to meet the requirement.

Dairy farmer D fed the cows with total mixed ration (TMR) 58.6%. The other forages were local forages produced 17.4%, i.e., napiergrass green chop and silage, pangolagrass green chop and corn green chop, and imported hay 24.0%, i.e., bermudagrass, timothy, sudangrass and alfalfa hay (Table 1).

Dairy farmer E established a stable forage supplying system in the whole year (Figure 1). The farmer had made corn silage during corn growth season. Thus, corn silage was fed to cows between April and November, 1995. It was about 36.5% of total forages used. The other forages were pangolagrass hay 36.5% and haylage 8.1%, respectively. The farmer also imported about alfalfa hay 14.1% and used agricultural by-product to feed cows (Table 1). However, the forages could not be provided steadily after November, 1995 because most

forage crops stopped to grow in winter.

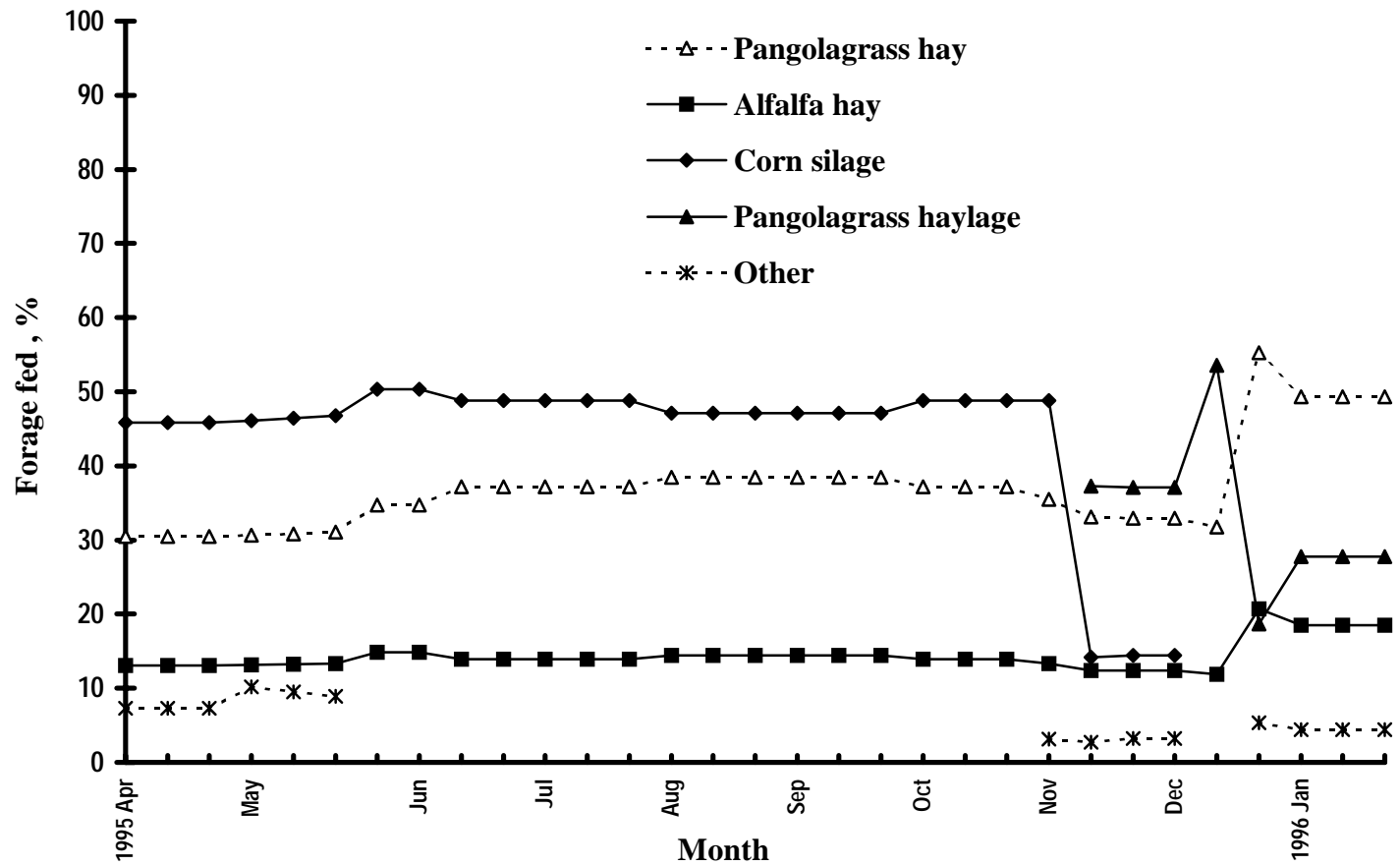
Based on the results obtained, it showed that forages could be provided steadily between April and November since the forage crops grew vigorously during this period. However, the forage production was reduced because temperature went down and rainfall was decreased after November. Therefore, the kinds of forages and imported hay used to feed cows were increased and the supply was not stable. It was suggested that dairy farmers might make enough silage or hay during forage growth season. Thus, the local forages produced could be provided steadily to reduce imported hay and decrease the milk production cost in Taiwan.

### **References**

- Hsu, F.H.** (1994). Case studies on crop-livestock production system in Taiwan ROC in relation to technical socioeconomic and environmental concerns. Proceeding International Seminar on Upland Farming Systems and the Role of Livestock Production, Thailand. pp. 135-150.
- Hsu, F.H., Cheng Y.K. and Lee M.J.** (1994). Production and utilization of forage crops. Taiwan Livestock Research Institute Monograph Series No. 25.
- Hsu, F.H. and Lu C.H.** (2000). Study on the response to silage making and utilization of dairy farmers. (unpublished).

**Table 1** - The kinds and the percents of forages fed to dairy cows of 5 dairy farmers.

Foragetype	Dairy farmer				
	A	B	C	D	E
	-----%-----				
Napiergrass green chop	68.2	65.1	—	2.4	—
Napiergrass silage	15.3	—	—	0.9	—
Pangolagrass hay	3.2	9.2	9.1	—	36.4
Pangolagrass green chop	—	3.8	—	0.1	—
Pangolagrass haylodge	—	—	—	—	8.1
Corn green chop	—	—	33.5	14.0	—
Corn silage	—	—	24.0	—	38.7
Bermudagrass hay	13.3	6.7	5.0	11.6	—
Alfalfa hay	—	3.0	22.6	—	14.1
Redtop hay	—	2.8	—	—	—
Oat hay	—	3.6	—	—	1.3
Ryegrass hay	—	5.8	—	—	—
Timothy hay	—	—	5.8	8.6	—
Timothy alfalfa hay	—	—	—	3.7	—
Sudangrass hay	—	—	—	0.1	—
Total mixed ration (TMR)	—	—	—	58.6	—
Orange residue	—	—	—	—	1.4



**Figure 1** - Changes in the proportion of the forages fed to dairy cows of farmer E during the year.