

Effect of forest grazing on cattle growth and plantation species⁽¹⁾

Kuen-Jaw Chen⁽²⁾ Cheng-Yung Lin⁽³⁾ Shi-Chuan Chang⁽²⁾ Tzu-Rung Li⁽⁴⁾
Jiunn-Cheng Lin⁽⁵⁾ Tien-Szu Liao⁽⁶⁾ Pin Chang⁽⁷⁾ Yung-Hsiu Chen⁽⁸⁾
Chin-Shien Wu⁽⁵⁾ Chao-Hsien Hsieh⁽⁹⁾ Churng-Faung Li⁽¹⁰⁾ Ling-Tsai Wu⁽¹¹⁾
Hsieh-Pin Chu⁽²⁾ and Chun-Ta Chang⁽⁹⁾⁽¹²⁾

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Abstract

The purpose of these serial studies were to afforest our land and produce good quality beef simultaneously by forest grazing. In an 8-hectare afforestation area, nine to 16 head of Yellow hybrid beef heifers were grazed rotationally in five rounds by electric fencing. Grazing intensity treatments were decided by the grazing days and set to no grazing, light grazing or heavy grazing. During the 4-yr experimental period, the growth of eight original forestation trees, the body weigh gain of heifers, and the predominance of 10 main grasses were recorded. Samples of 20 plants in the forestation area were collected at both spring and summer seasons for analyzing their compositions and digestibility. Finally, a 6-yr ecological analysis was applied to evaluate the economic benefit of forest grazing system. After 4-yr growth without grazing, tree *Zelkova serrata* had the highest survival rate (99.4%). *Fraxinus formosana* Hayata grew the highest (409.3 cm). *Pometia pinnata* has the lowest survival rate (20%) and also the shortest (75.9 cm). Heavy grazing significantly suppressed the height and stem diameter of *Zelkova serrata*, but the heights of *Fraxinus formosana* Hayata and *Liquidambar formosana* were higher in heavy grazing treatment. Heavy grazing also significantly stimulated the predominance of *Digitaria decumbens* Stent. and both grazing treatments decreased the predominance of *Mikania micrantha*. Nutrition values of plants in the forestation area were diverse and rich. Crude protein was ranged from 5.9 to 17.9%, neutral detergent fiber from 33.7 to 74.1%, acid detergent fiber from 20.1 to 49.1% and *in vitro* dry matter digestibility from 21.5 to 77.7%. With heavy grazing, the total body weight gain of heifers per hectare was higher than that in light grazing system. However, the daily body weight gain per heifer was as low as 0.66 kg by heavy graying whereas 0.78 kg by light graying. Benefit from forest grazing included the calf production, carbon sequestration, water resource nourishment and weed control, etc. The estimation of a 6-yr crude profit was around 18,650,034 NT\$. It is concluded that forest grazing can save the investment in the afforestation and is a low-cost and healthy beef production system.

Key words: Beef cattle, Forest grazing, Plantations.

(1) Contribution No. 2067 from Livestock Research Institute, Council of Agriculture, Executive Yuan.

(2) Taitung Animal Propagation Station, COA-LRI, Taitung 954, R.O.C.

(3) Kaohsiung Animal Propagation Station, COA-LRI, Pintung R.O.C.

(4) Forage Crops Division, COA-LRI, Hsinhua, Tainan 712, R.O.C.

(5) Forestry Economics Division, COA-FRI, Taipei 100, R.O.C.

(6) Department of Forestry, National Chung Hsing University, Taichung 402, R.O.C.

(7) Hualien forest district office, COA-FB, Hualien 970, R.O.C.

(8) Liouguei Research Center, COA-FRI, Kaohsiung 844, R.O.C.

(9) Animal Industry division, COA-LRI, Hsinhua, Tainan 712, R.O.C.

(10) Animal Nutrition Division, COA-LRI, Hsinhua, Tainan 712, R.O.C.

(11) Hsin-Chu Branch, COA-LRI, Hsin-Chu, Taiwan 368, R.O.C.

(12) Corresponding author, E-mail: ctchang@mail.tlri.gov.tw.