Rotational Grazing Effects of Dairy Cows on Yield and Consumption in Dwarf Napiergrass at a Paddock Scale for 3 Years from the Establishment in Southern Kyushu, Japan

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Key words : dry matter intake ,dwarf napiergrass ,rotational grazing ,yield

Introduction The main factor limiting milk production from pasture is a low dry matter intake (DMI) . It is important that herbage mass be maintained throughout the day in order to achieve a high daily DMI ,but changes in quantity and quality associated with the consumption of the sward have a detrimental effect on herbage mass and intake rate (McGilloway et al ., 1999) . Dwarf-late (DL) napiergrass pasture ,oversown with Italian ryegrass ,can be utilized in rotational grazing in Miyazaki , southern Kyushu (Ishii et al . ,2005 ; Wadi et al . ,2007) . This study was conducted to determine herbage matter ,herbage consumption and DMI of grazing dairy cows from dwarf napiergrass pasture at a paddock scale for 3 consecutive years from the establishment in southern Kyushu ,Japan .

Materials and methods Rotational grazing of 20 lactating dairy cows was conducted by switching the paddock every week in 1 ha of DL napiergrass pasture (consisting of 5 paddocks with 0. 2 ha of pasture per paddock and established in May 2005) . Every paddock was fertilized with 17 .0-20 .0 g N/m^2 of chemical compound fertilizer by split application 3-4 times of during the summer season in 2005-2007 . Grazing was scheduled for 3 cycles from July to November each year . Herbage mass at both pre-and post-grazings was determined by cutting plants at 10 cm above the ground level for 10 plants per paddock by the line transect method . Herbage consumption (HC) by dairy cows and DMI to dairy cows were derived from the difference between pre-and post-grazing herbage mass , herbage production during the grazing period , grazing cow number and grazing period in each paddock .

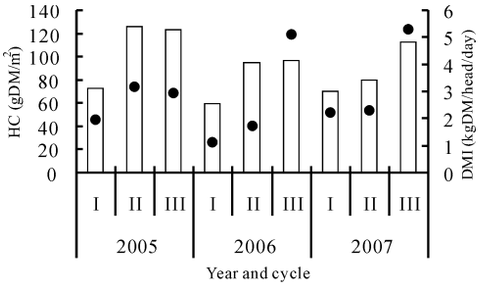

Figure 1 . *Changes in herbage consumption (HC) and dry matter intake (DMI) in the dwarf-late napiergrass pasture in 3 years . Average DMI (kg DM/head/day) : 2 .85 .* □ *:HC ,*● *:DMI .*

Table 1 *Annual mean in plant characters* in the dwarf-late napiergrass pasture .*

Year	Cycle	PH(cm)		TN(no ./m^2)		PLB(%)		HM(g/m^2)	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
2005	Ⅰ	102 .6	47 .6	14 .5	16 .3	77 .6	59 .3	137 .5	80 .3
	Ⅱ	112 .4	46 .9	33 .2	36 .4	67 .4	33 .8	223 .0	122 .1
	Ⅲ	100 .9	44 .6	45 .9	41 .6	47 .3	10 .1	232 .7	118 .8
2006	Ⅰ	103 .7	42 .8	14 .2	16 .7	82 .6	45 .1	81 .9	31 .4
	Ⅱ	100 .9	44 .3	32 .3	35 .8	75 .7	36 .1	120 .9	49 .2
	Ⅲ	85 .5	38 .8	45 .3	30 .2	38 .4	8 .0	148 .7	74 .6
2007	Ⅰ	95 .1	45 .1	19 .5	18 .1	77 .6	53 .0	116 .6	46 .5
	Ⅱ	68 .0	37 .6	42 .5	42 .3	68 .0	37 .6	152 .8	72 .6
	Ⅲ	103 .4	41 .6	65 .3	68 .4	63 .2	19 .8	233 .9	121 .5

* PH : plant height , TN : tiller number , PLB : percentage leaf blade , HM : herbage mass .

Results and discussion Plant characters ,such as plant height ,tiller number ,herbage mass at both pre-and post-grazings ,and HC increased consistently from the first to the last grazing cycle (Table 1 ,Figure 1) . Pre-grazing herbage mass averaged 160 .89 g/m^2 across 3 grazing cycles in 3 years (Table 1) . DMIs by dairy cows ,averaged at 2 .85 kg DM/head/day ,were closely correlated with HCs ,except for the last cycle in 2006—2007 where the grazing ph was too short for only 1-2 days per paddock . Overwintering ability was almost perfect in Miyazaki ,judged by 99 .9% of regrown plants in May 2006 . Thus ,DL napiergrass pasture can be utilized at a paddock scale by rotational grazing system of dairy cows whose dry matter intake averaged 2 .85 kg DM/head/day for 3 months in a summer season for 3 years from the establishment .

References

Ishii ,Y . ,Mukhtar ,M . ,Idota ,S . ,Fukuyama ,K . ,2005 . Rotational grazing system for beef cows on dwarf napiergrass pasture oversown with Italian ryegrass for 2 years after establishment .*Grassland Science* , 51 ,223-234 .
Mcgilloway ,D .A . ,Cushnahan ,A . ,Laidlaw ,A .S . ,Mayne ,C .S . ,Kilpatrick ,D .J . ,1999 . The relationship between level of sward height reduction in a rotationally grazed sward and short-term intake rates of dairy cows . *Grass and Forage Science* , 54 ,116-126 .
Wadi ,A . ,Ishii ,Y . ,Idota ,S . ,Hasyim ,H . ,Fukuyama ,K . ,2007 . Rotational grazing effects on dwarf napiergrass at a paddock scale by dairy cows in Miyazaki . *Japanese Journal of Grassland Science* , 53 (Suppl .) ,46 .