

**BEEF CALF PRODUCTION USING YEAR-ROUND GRAZING ON  
TROPICAL GRASS PASTURE IN SUMMER COMBINED WITH  
COOL TEMPERATE GRASS PASTURE IN WINTER.**

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**Abstract**

...Bahigrass (*Paspalum notatum* Fluegge) showed a poor quality with low crude protein in summer but blood biochemical levels of grazing beef cows were similar to drylot feeding cows except of concentration of urea nitrogen. Italian ryegrass (*Lolium multiflorum* Lam) showed very good quality with high crude protein (about 20 percentage) in winter. And so, suckler cows gained live weight in winter and suckling calves were showed very high growth rate (daily gain was about 1.0 kg). Total live weight gains of grazing cows were heigher than those of drylot feeding cows. Postpartum reproductive performances of grazing cows were similar to drylot feeding cows. It was found that Japanese black cows were adapted to hot summer and were able to calving on pasture in cold winter was no problem in Kyusyu, Japan.

**Keywords :** Bahigrass, italian ryegrass, year-round grazing, beef calf production.

**Introduction**

There are about 30000 hectare of abandoned fields from paddy fields and orchards in

less favored areas (LFA) in Kyushu. Recently the fields are increasing because farmers are advancing in age. On the other hand livestock farming, especially beef calf production farming suffer hard times since free trade of beef.

The purpose of this study to develop a beef calf production system to reduce costs and save workload by year-round grazing on tropical and temperate grass pastures, in LFA in Kyushu.

### **Material and Methods**

Japanese black cows were grazed on bahiagrass from May to October and on italian ryegrass from November to April. Rotational grazing is 2 weeks grazing and stocking rate was 2.5 cows per hectare except July and August. The stocking rate from July to August was 5 cows per hectare to prevent bahiagrass from being overproduced. The cows calved on italian ryegrass pasture in winter and cows and calves were grazed without supplement feeding. Calves were weaned at four months of age. Live weight and blood biochemical level were measured every 7 days. Body and skin temperature were measured every 30 days with clinical and infrared thermometer. Milk yield was measured every 30 days by method of calf live weight difference before and after suckling .

In parallel to the grazing experiment, Japanese black pregnant cows were housed and fed according to the Japanese Feeding Standard .

### **Results and Discussion**

Bahiagrass showed a poor quality in summer, especially for crude protein that decreased very much. It was under 10% from July to October. And so, blood concentrations of urea nitrogen of grazing cows were significantly lower than those of drylot feeding cows, however blood concentrations of total protein and glucose and liveweight gain of grazing

cows were similar to those of drylot feeding cows (Table 1). It was found that Japanese black cows could be adapted to feeding low protein.

The skin temperature of grazing cow was much higher than that of drylot feeding cow in summer, being 55 °C and 35 °C, respectively, on August, but body temperature of grazing cow was similar to that of drylot feeding cow. Plasma concentrations of thyroxine, estradiol and progesterone were no different between grazing and drylot feeding cows. And it was found that Japanese black cows had the ability to adapt themselves to hot summer in Kyushu, Japan. Italian ryegrass showed very good quality with high crude protein in winter and it was over 20% except on February. And so, the suckler cows gained liveweight in winter and suckling calves even without supplement feeding showed very high growth rate (daily gain was about 1.0 kg). Plasma concentrations of cholesterol and glucose of grazing calves were higher than those of drylot feeding calves. Postpartum reproduction performances of grazing cows were similar to drylot feeding cows (Table 2). Calving on pasture in cold winter (environmental temperature was -2 °C) was no problem and newborn calves were vigorous.

These results show beef calf production system of year-round grazing on tropical grass pasture in summer and temperate grass pasture in winter was very reasonable and low cost system in Kyushu, Japan.

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**Table1** - Live weight gain, blood biochemical levels and reproductive performance of cows

	<u>Grazing</u>	<u>Drylot</u>
Live weight gain (kg)	101.3	52.3
<u>Blood biochemical level†</u>		
Urea nitrogen (mg/dl)	9.6	12.2*
Total protein (g/dl)	7.5	7.4
Glucose (mg/dl)	67.5	63.3
Thyroxine (ng/dl)	42.8	45.0
Estradiol (pg/dl)	8.6	8.5
Progesterone (ng/dl)	8.2	9.2
<u>Reproductive performance</u>		
Gestation period (days)	290.0	286.5
Postpartum interval to first estrus (days)	66.5	69.0
Postpartum interval to conception (days)	76.3	74.3
No ofartificial insemination	1.5	1.5
Milk yield (kg/day)	5.6	5.8

† Means during grazing period on bahiagrass

\*P<0.05

**Table 2** - Calf performance and blood biochemical levels of calves

	<u>Grazing</u>	<u>Drylot</u>
Postpartum interval to standing (minutes)	37.8	49.0
Postpartum interval to suckling (minutes)	78.8	85.5
Birth weight (kg)	31.6	30.5
Weaning weight (kg)	149.9	145.9
Average daily gain (kg)	0.99	0.96
Blood biochemical level †		
Urea nitrogen (mg/dl)	10.8	8.3
Total protein (g/dl)	5.8	5.8
Cholesterol (mg/dl)	175.6	145.4*
Glucose (mg/dl)	124.6	106.0*
GOT (IU/l)	52.1	55.1

† Means during grazing period on italian rygrass

\*P<0.05