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The management of New Zealand beef cattle exported to South Korea

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ABSTRACT

Much of the non-arable area of South Korea is suited to the establishment of permanent improved pasture. In 1974 the New Zealand Government began a co-operative project to establish a pasture based beef cattle farm on 354 ha in the alpine region of South Korea. Two hundred Hereford and Angus breeding stock were sent from New Zealand to form the foundation herd for the project. The project's extension programme included 25 private farms.

Permanent pastures comprising perennial ryegrass, cocksfoot, timothy, white and alsike clovers were successfully established following the fencing and mobstocking of scrub with the application of fertiliser. New Zealand cattle showed superior growth rates to native cattle in the temperate climate. No major disease problems were encountered. Continuous grazing during the 6 months of pasture growth and the conservation of surplus pasture as hay or silage for winter provided adequate nutrition for the spring calving herd.

Keywords Beef cattle; *Bos taurus*; animal husbandry methods; grazing lands; Korea

INTRODUCTION

Expertise in managing cattle specifically for beef production is lacking in Korea because the average number of cattle on a Korean farm is only 1.5, used primarily as draft animals. In 1974 the New Zealand Government, through the Ministry of Foreign Affairs, began a bilateral aid project to establish a pasture based beef cattle farm in the alpine region of South Korea. The broad object of the project was to find a productive use for steep and/or low fertility non-arable uplands, and for better land of more than 25° slope retired from cultivation in soil conservation schemes. In the absence of acceptable alternative uses most of these areas would have been afforested.

While the farm was large in the Korean context (354 ha), it served to demonstrate a number of practical measures applicable to smaller units. These were: to graze native swards with cattle, so reducing low scrub by cutting, trampling and browsing; to oversow with improved species; to maintain the swards with controlled grazing. The use of cattle for these purposes was expected to produce a highly desired commodity — beef.

The mean annual rainfall was 1500 mm, most of which fell during the warm summer months when monthly mean temperatures were 19 to 20°C. The region has a long severe winter with frosts during 8 months and a mean monthly temperature of -6°C to -8°C during the 3 coldest months. The site for the

project was typical of much of the non-arable area of South Korea which appeared suited to the establishment of permanent improved pasture. Prior to the New Zealand participation, 180 ha of the farm had been used as the site of an animal breeding station and some of this area had been sown in cocksfoot and timothy without legumes and unfenced.

As adequate pasture was already available the first priority in the farm development was the provision of fences to confine the cattle yet to be sent from New Zealand. Korean cattle are of the *Bos taurus* type and are primarily draft animals which are traditionally housed or tethered. Consequently concrete fence posts had to be constructed on the farm and the local staff taught basic fencing skills. The task was also complicated by the need to fence off numerous private small holdings within the perimeter of the farm.

New Zealand was involved in the project from 1974 to 1979 with 3 experts: a project director, an extension officer and a farm manager.

Cattle Shipment

In December 1974 the first shipment was made of 46 Angus heifers, 54 Hereford heifers and 3 bulls of each breed in the charge of a New Zealand veterinarian and a stockman. Due to a late change in sailing date the cattle had only 10 days preparation at Tauranga prior to shipment. During this period they were confined, fed hay and lucerne chaff, vaccinated for

brucellosis, blackleg, leptospirosis, IBR, BVD and tested for tuberculosis and Johnes disease. The cattle were confined on the deck in wooden crates (4.8 × 2.4 m) divided in two, with 4 heifers or 2 bulls in each half. The daily ration for each was 3 kg hay, 3.5 kg lucerne chaff and 1 kg cattle nuts. The voyage lasted 19 days and was without incident. The diet of New Zealand fodder continued during the 2 weeks in quarantine in Pusan after which the cattle were transported 600 km to the farm by road. They were housed for the remaining 5 months of winter and fed maize silage and rough hay.

Management and Performance of Breeding Herd

In spring the cattle were turned out on to fenced areas which had been oversown in winter on to snow with temperate grasses and clovers. Pastures were topdressed with 600 kg/ha fused phosphate in spring. Subsequently a pasture seed mix of perennial ryegrass (15 kg/ha), cocksfoot (3 kg/ha), timothy (3 kg/ha), white clover (2 kg/ha) and alsike clover (3 kg/ha) proved satisfactory.

Korean staff accustomed to housing their native cattle at night were at first apprehensive about 24 hour grazing, contending that the cattle could become chilled or might be stolen during the night. When no such misfortunes eventuated the concept of nutrient recycling was gradually accepted.

The mean calving interval for Korean native cattle was 17 months and consequently calving occurred throughout the year. Efficient pasture based beef production required seasonal calving and in 1975 bulls were joined for 42 days from early June (summer). The calving performance of New Zealand cattle in 1976/8 is shown in Table 1.

TABLE 1 Calving performance.

	1976	1977	1978
Cows joined	100	97	173
Joining period	6/6-17/7	12/6-11/8	22/6-20/8
Mean calving date	1/4	8/4	15/4
Calves weaned %	76	85	86
Cows joined			

The extensive use of 2-wire electric fences for internal subdivision from 1976 enabled stock to be concentrated on scrub areas which were oversown and topdressed following the 'hoof and tooth' treatment. Annual dry matter production from native grass oversown with cocksfoot was 2900 to 4800 kg/ha and where oversown with perennial ryegrass, cocksfoot, timothy and clover the production was 9400 to 11600 kg/ha. Table 2 shows cow live weights and calf growth. The 1976 and 1977 data are from the 100

cattle shipped in 1974, whereas 1978 includes these animals plus a further 94 heifers sent by air in 1977 because of the unavailability of suitable shipping.

TABLE 2 Cow live-weight changes and calf growth (kg).

	1976	1977	1978
Cow live weight			
joining	337	388	367
calving	386	454	401
weaning	434	460	442
Calf			
birth weight	26	28	29
weaning weight	195	179	167
daily gain	0.70	0.72	0.71
weaning age (d)	241	210	196

A major aim of the project was to show that average quality conserved pasture was a complete feed for wintering beef cattle. By 1977 sufficient area had been developed to produce enough hay and silage for winter. The cows weighed 460 kg at the start of winter and were fed a daily ration of 3.4 kg hay and 12.8 kg silage throughout the 150-day feeding period. Cows lost a modest 25 kg live weight during winter. A trial in which breeding cows remained outdoors without any artificial shelter (in what by New Zealand standards was an extremely severe winter) showed that when fed the same ration as housed cattle, they lost 20 kg more live weight. This difference was reduced to less than 2 kg 3 months after winter. There was no effect on calf birth weight or subsequent growth.

A winter feeding trial comparing Hereford, Angus and Korean native yearlings fed silage and hay to appetite showed that the Hereford and Angus gained 0.39 kg/d and the Korean native cattle 0.24 kg/d. The Korean native cattle required 35% more feed per unit live-weight gain.

Small Farms

As a result of the satisfactory performance of the Hereford and Angus cattle the Korean Government imported 100 yearling beef heifers from New Zealand in 1977. Most of these cattle were distributed to farmers in the vicinity of the demonstration farm and part of the extension programme involved assisting these farmers. Some had previously been assisted to fence and oversow their 10 to 20 ha farms but others had to tether the yearlings which had been reared under typical extensive management in New Zealand.

Where the cattle were continuously grazed on pasture the farmers had to be taught how to identify heifers in oestrus. Because most had previously managed a single native cow they were unfamiliar with behavioural characteristics of cattle in oestrus when run together in a herd. Farmers also required assistance to formulate winter feeding rations which

included conserved pasture, as traditionally the household scraps and rice straw had been adequate for their 1 or 2 cattle.

A further 5000 beef cattle were exported from New Zealand in 1978 as part of the Korean Government plan to encourage beef cattle farming.

As techniques were proved the emphasis in the project changed from the development of the large demonstration farm to assisting 30 individual farmers to transform their management from the traditional cut and carry system to the more efficient 24 hour grazing of cattle on fenced improved pasture. Through the example of these farmers and the experience gained by local rural guidance officers a nucleus for the further development of pasture based beef production was established.

CONCLUSIONS

The New Zealand cattle had superior growth rates to native cattle in the temperate mountain ranges but

were probably less well adapted to lowland and southern environments of high summer temperatures to which Brahman and Santa Gertrudis had already been introduced.

The seasonal pattern of pasture growth was difficult to manage with very high rates of summer growth and a dormant period of 6 months. Efficient pasture utilisation under grazing therefore required seasonal calving but considerable excesses remained for conservation as hand-cut hay or silage.

Health problems were minimal. Antibiotics and anthelmintics were readily available as were miscellaneous physics for undiagnosed disorders. Cattle grazing improved pastures showed no signs of bloat and the mountain regions were free from tick-borne diseases endemic in warmer areas.

After several months, winter housing and hand feeding reduced Herefords and Angus to a dairy cow docility which persisted under grazing in the absence of dogs, the main tormentors of New Zealand herds.