

11. Hanwoo Research

(1) Improvement of Growth Performance and Meat Quality in Hanwoo Steers Disqualified from Performance Test

Recently, Korean government drives Hanwoo farmers towards larger farming size to keep Hanwoo industry sustainable against global trend of FDA/DDA. Hanwoo breeding goals should keep the pace with this trend. This study was conducted to investigate improvement of growth performance and meat quality according to the adaptation of castration, optimal feeding management and ruminally protected amino acid-enriched fatty acid (RPAAFA) in Hanwoo bulls disqualified from performance test. Bulls were castrated at approximately 14 months of age. Eighteen Hanwoo steers, 15 months of age and weighing 412.9 ± 24.9 kg, were distributed into 2 groups. Animals were fed a basal diet supplemented with RPAAFA at 0g (control) or 100g (treatment), respectively. Final body weight and average daily gain for treatment tended to be higher than those of control, whereas feed conversion ratio tended to be lower in treatment than in control. The supplementation of RPAAFA did not affect rib eye area, back fat thickness, meat color, fat color, texture and maturity. The appearance rates of yield 'A' grade and high quality grade (1++, 1+ and 1) for treatment tended to be higher than those of control. Contents of moisture, fat, protein and ash in longissimus muscles were similar between control and treatment. The supplementation of RPAAFA had small effect on water-holding capacity, oxidation and reduction potential, myoglobin and fatty acid contents in longissimus muscles. Thus, present result showed that castration and optimal feeding management according to different months of age may be desirable for meat quality and economic income of Hanwoo steer disqualified from performance test. Also, present results indicate that supplementation of RPAAFA may be recommended for producing high yield and quality Hanwoo beef.

(2) Research for hanwoo on-farm technologies

Hanwoo Experiment station in National Institute of Animal Science implemented integrated on-farm technologies - breeding, reproduction, feeding, management - on 16

Hanwoo commercial farms selected by their herd sizes (50, 100, 200 heads). Performance and parental records were collected with the aids of individual record sheets. Records of around 1,500 heads contained information on pedigree, body weight, carcass characteristics and reproduction(insemination, calving). Birth weights were measured of a total of 563 new-born calves. Female calves weighed 26.21kg on average at birth, while male calves weighed 28.19kg on average. Average birth weights by parity were 26.22, 26.62, 27.87, 29.12, 28.83, 30.00, 28.50, 31.50kg from 1st to 8th. Age of farm owners ranged from 26 to 61 (average 48) years. And 16 selected farms were composed of three cow-calf operators and thirteen life feeding operators. Average calf mortality was 4.4%. Registrations were 25% basic, 57% pedigree, 18% advanced. Nine farms have inseminated cows and heifers by owners and the other seven farms employed AI technicians. Of the cattle marketed, 73.5% was graded as at grade I quality. Average number of AI services per conception was 1.7 times. Average calving interval was 12.5 months. Average age of heifers at first conception was 14 months. Average number of calves borne by cows was 3.5 heads. Linear types of 569 cows were visually appraised with measurements of wither height, body length and body condition (1~9 scores). Average BCS was 5.94, good for reproducing females. Average scores of stature, rump slope, thigh muscling were 6.06, 6.22 and 5.95, respectively, which were higher than the national averages. But the average score of hind leg standing was 4.60, which is lower than the national average.

Table 11-1. Distribution of linear type of score for heifer in commercial farms(Units : 1~9)

Parity	Farm No.	BCS	Height	Rump slope	Thigh muscling	Hind leg standing
1	273	5.58	5.56	6.14	5.67	4.03
2	153	5.78	5.99	6.05	5.85	4.42
3	90	6.17	6.20	6.22	6.07	4.80
4	35	5.94	6.43	6.20	6.06	4.74
5	18	6.22	6.11	6.50	6.11	5.00
mean	569	5.94	6.06	6.22	5.95	4.60

Scale(9) : height(over 134cm), Slope(Reentering angle, hip gout line), Thigh muscling(very thick), Hind leg standing(hoof level)

(3) Develop the computer program for mating plan.

This study was conducted to develop the computer program for mating plan which includes methods for animal breeding on selection and mating. Till date, the proven bull selection in Korea is achieved based on the performance test and progeny test by national government. Cows are selected by each farmers. Mating system in the farm is the method for achieving the breeding goal by using specific cow and proven bull semen. However, there are few program to help mating plan in Korea. JAVA program was developed to calculate the pedigree index (breeding value) and inbreeding coefficient for virtual mating. Web application was developed to serve the mating plan to the farmers. The farmers select the best proven bull for each cow to achieve the breeding goal and to check the genetic gain of cows using this system.



Mating system for Hanwoo farm



Registration for user

(4) Hanwoo nutrition research for field application of Korean feeding standard for Hanwoo cow

This experiment was conducted to study the optimal nutritional level for 48 heads Hanwoo heifer in Youngju, Kyungbuk experimental farm from 2008 to 2010. The experimental animals of Hanwoo heifer age of 5 month were allotted 4 treatments of 12 heads by concentrate feeding level as 1.2, 1.4, 1.6 and 1.8% to compare BW, and fed hay and rice straw as forage. The growing terms were divided into growing (4~8 month), puberty(9~14 month) and pregnant (15~19mon) stage. The animals were executed with the artificial insemination around 15 month of age and 270kg of BW, daily feed intake and



monthly weighing was recorded. The initial BW was about 123.2kg, 167.2~176.3kg at 8 months, 243.4~269.7kg at 14months and 322.9~363.1kg at 19months of age, heavier as more concentration., and 0.49~0.55, 0.42~0.52, 0.53~0.62kg and 0.47~0.57kg at growing (4~8mon.), puberty (9~14mon.), pregnant (15~19mon) stage and overall in average daily gain was observed. Feed intake was 1.8~2.74kg of concentrate, 3.44~3.50kg tall-fescue hay in growing stage, 2.42~3.87kg of concentrate, (concentrated fodder, rice straw) 4.07~4.2kg of rice straw in puberty and 3.57~6.01kg of concentrate and 4.74~4.82kg of rice straw in pregnant were found in the present investigation. DM, CP and TDN intake was found 6.10~7.52kg, 0.57~0.79 and 3.44~4.58kg respectively. The 1st insemination was carried out in 16.7~17.4 months of age.