

CROSS BREEDING FOR BEEF CATTLE IMPROVEMENT IN SOUTHERN VIETNAM

The semen of some famous temperate bulls (Charolais, Hereford, Simental, Limusine, Santa Gertrudis), tropical bulls (Red Brahman, Droughtmaster, Red Belmont, Red Bragus) and dual-purpose bulls (Tarentaise, Abondance) have been used for artificial insemination on Lai Sind cows for producing F₁ cattle. The first experiments were carried out in Ninh Binh Province (1975) and Gia Lai Province (1980). From late of 1980s to early 1990s, a national breeding program for beef cattle was conducted in Vinh Phuc Province and Central Highlands followed by many studies in several areas. The results of these studies were different due to the differences in quality of dams, feeding and nutrition and management. The objective of this article is reviewing the result of recent studies on cross breeding in Southern Vietnam in order to make a strategy for breeding in beef production next period.

Growth, color and appearance of crossbreds

Growth: The birth weight of F₁ crossbreds of temperate cattle (such as Charolais, Limousin, Hereford, Simental and Santa Gertrudis) was higher than that of Lai Sind. In Bao Loc district (Lam Dong province), growth rate of crossbreds in sucking period were approximately 500g/day higher than that of Lai Sind (400 g/day). After weaning, calves were grazed in the same herd with cows without supplement, therefore growth rate of all crossbreds in this period was low (250 - 300 g/d) due to feed shortage. Consequently, the live weight at 12 months was 140 – 170 kg/head and average daily gain in the period of 12 – 24 months was only 300 g/day.



Lai Sind used to cross with exotic genetics

Researches in other areas showed that F₁ crossbreds of Charolais always grow fatter than crossbreds of other breeds. Live weight at 12 months of F₁ Charolais which were kept in the same condition as local cattle ranged from 164.4-173.0 kg (Cai, 1999; Cuong, 2001; Quyen, 2002 and Ly, 1995). Live weight at 18 months was 148 kg at An Phu farm (Dat *et al.*, 1992), 232 kg in Bao Loc (Ly, 1995) and 308.8 kg at Ben Cat farm (Quyen, 2002).



Crossbred Charolais x Lai Sind

Live weight at 12 months of F₁ Tarentaise and F₁ Abondance kept in smallholders was 12-15% higher than that of Lai Sind. Average gain in the period of 0-12 months was 320 g/day (Cai *et al.* 1999). In Madrak (Daklak Province), live weight at 400 days of crossbreds of Brahman, Droughtmaster, Red Belmon

and Red Bragus was 124, 140, 148 and 134 kg, respectively. The growth rate in this period ranged from 260 to 320 g/d (Cuong *et al.* 1999).

The results of current study in Ben Cat show that the live weight at 6, 12 and 18 months of F₁ crossbreds of Charolais, Droughtmaster and Brahman were 144.1, 244.7 and 320.7 kg, 128.5, 214.6 and 298.8 kg, and 116.9, 193.0 and 269.2 kg, respectively. All crossbreds had higher live weight as compared to Lai Sind at the same age. Live weight of Lai Sind in this study was also higher than that of F₁ Charolais, which was reported in previous studies. Higher live weight in our study resulted from adequate nutrition levels for specific crossbred at a specific age. This can be interpreted that adequate feeding and nutrition play an important role in growth rate of crossbreds.

Appearance: Charolais crossbreds have a pure light yellow coat; short legs and good conformation. These cattle are easily accepted by farmers. Crossbreds of Simental, Santa Gertrudis and Hereford have white spots or strips coat, memberane of the eyes and nose are reddish or carrot and not be preferred by farmers.

The F₁ crossbreds between *Bos taurus* bulls and local cows have short legs and good conformation (an importance criterion for beef breed selection) which related to higher potential of beef production. At 18 months without fattening, carcass percentage of F₁ crossbreds of Charolais, Hereford and Simental were 56.3, 54.7 and 48.2%, respectively, higher than the figure 44.6% of Lai Sind (Quyen *et al.* 2002). Both F₁ Tarentaise and F₁ Abondance are no lump. However, farmers like to keep crossbreds of Abondance than Tarentais one because they have a pure golden

coat and better growth rate. Brahman F₁ crossbreds have longer legs, dropping ears, higher lump, deep dewlap and brown coat. Crossbreds of Droughtmaster have shorter lump, light yellow to light orange coat and good conformation.



Red Sindhi, a genetic resource for local cattle improvement



Droughtmaster cows used in crossing program

Reproduction: There is very few reports both on reproduction of female and fattening of male crossbreds beef cattle because of lacking of resource to conduct experiments and collect data in a long period. The data at Ben Cat farm in several years showed that average live weight of cows (F₁ Charolais, Hereford, Simental) was above 450 kg, average calving interval was 14.8 months. Milk yield of these cows was high so that sucking calves (0-5 months) could gain above 800 g/day.

Option for beef cross breeding

F₁ Charolais with good appearance and higher beef production but farmers do not want to invest in this breed because they can not be sold as breeder and be used for daught as Zebu cattle. Besides, Charolais crossbreds only give high production under an adequate investment.

The appearance of Tarentais crossbreds is similar to Lai Sind but still not be accepted because they have no lump. F₁ Red Brahman and Droughtmaster is a good option. They are easy to manage and their coat is suitable to the traditional thinking of farmers. The more important is the female of these cattle can be used as dams in cross breeding with beef cattle (Charolais) or dairy cattle (HF).

Therefore, the option for intensive beef production is Charolais (bull) x Lai Sind (cow). Droughtmaster or Brahman (bull) x Lai Sind (cow) is a good option to produce dual-purpose crossbreds.

Under a limited nutrition, all F₁ crossbreds beef cattle showed good adaptability, fatter growth rate and higher live weight as compared to local cattle. Among crossbreds, F₁ Charolais has adapted with local climate and feeding condition, obtained the highest weight gain and would be the best option for intensive beef production.

Droughtmaster crossbreds has higher weight gain than Red Brahman one. With good growth rate and preferred color and conformation, crossbreds of tropical beef cattle can be kept as dual-purpose cattle in smallholder system.

Nutrition is an important factor for the development of crossbreds, it should be therefore an important criteria in selecting breeds for crossing program.



Tropical genetic resources used for cattle improvement program