

Freeze Branding of Crossbred Cattle on Cheju Island

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제주도 肉用交雜牛의 冷凍烙印 試驗

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Summary

The effect of freeze branding young crossbred cattle of three coat colours using carbon dioxide as the coolant. Cattle were branded at 10, 20, 30, 40, and 50 sec. intervals. At 30 sec. 75% grey, 80% chocolate brown and 100% black had clear brands three months after branding.

Introduction

The expansion of the cattle industry on Cheju Do has increased rapidly over the last few years. Furthermore there has been a change in emphasis from primarily beef to one of dairying (50%). This will necessitate more sophisticated management. There will then be an even greater need to keep accurate records and therefore positive identification of individual animals is essential.

A permanent method of marking cattle has long been a problem. Hot-iron-branding has been in use for a long time but although easy to read has disadvantages of permanent hide damage and causing stress to the animal. Recently plastic and metal ear tagging has been employed but there is some risk of tearing out, also these tags can only be read at close distance. Freeze branding is a relatively new idea for low cost permanent marking animals without stress. A permanent brand is left, composed of white hair after the freeze branding "irons" kills the pigment producing cells of the hair-follicles. Taylor (1948) first demonstrated

in the rat that depigmentation of the hair can result when the skin has been exposed to solid carbon dioxide. This was also demonstrated in the dog, cat, cow and sheep (Farrell et al, 1966: Lyne et al, 1967).

In many countries there has been an increased interest in freeze branding where it is often done on a commercial basis.

A trial was conducted to ascertain the benefits of freeze branding on Korean crossbreds under local conditions, using a small number of animals.

Materials and methods

Animals selected for branding were uncastrated males, these were four sixteen months old Korean X Santa Gertrudis (Chocolate brown) and sixteen months old Korean X Brahman (4 Black and 4 Grey). Animals were restrained in a cattle crush. The area to be branded was clipped and swabbed with methylated spirits. The cold branding "iron" was then applied to the skin for the appropriate time. The pressure of application was not measured. The branding "irons" were made of cast brass with solid

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numerals 75mm high a face width of 10mm.

A solution of methylated spirits and crushed dry ice was used as the coolant. The required amount of methylated spirits is poured into a container and crushed dry ice added until there is some solid left in the solution. A "boiling" of the solution will occur until it has reached an equilibrium, temperature with the "irons," (-70° C.). Subsequently when an iron has been used and replaced in the container "boiling" will recur. More dry ice may need to be added to the solution in order to maintain the presence of some solid i. e. slight excess of dry ice in the solution to ensure that the temperature is always at its minimum.

Brands were applied for 10, 20, 30, 40 and 50 sec. intervals on the rump of the animal. The date of branding was the 18th of May and three subsequent inspections were made to determine the effect of the branding on the 24th of August, 9th of September and the 24th of October, 1980.

Results and discussion

The effectiveness of freeze branding was graded into four categories; illegible, faint, clear and clear with visible hide damage. Three months afterward it was observed that animals branded for 10 sec. had illegible brands irrespective of coat colour. Of the cattle branded for 20 sec. 63% chocolate brown, 60% black and 25% grey animals had clear brands. When branded for 30 sec. 75% grey, 80% chocolate brown and 100% black had easily read brands. At 40 sec. 80% chocolate brown and 100% grey and black had clear brands. When branding "irons" were applied for 50 sec. there was a 100% clarity with the three coat colours. However in this case there was visible hide damage (See Fig 1.

and plate 1, 2.). There was virtually no change observed during the two subsequent inspections, influenced by the environment (Dowling and Nay, 1960; Jenkinson and Nay, 1968). We consider the ideal area for branding is the rump. It should be carried out when cattle have their short summer coat as clipping is reduced and branding "irons" more effectively applied.

Day et al (1971) used Shorthorn X Ayrshire and Hereford X Ayrshire which were mainly brown and white. In the present trial it was decided to concentrate on the three predominant colour types found on Cheju. Animals branded for 20 sec. give relatively satisfactory results on chocolate brown and black. This time

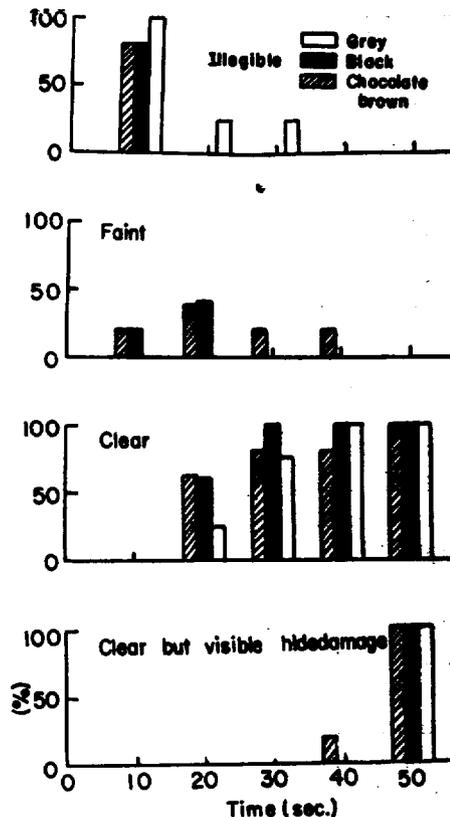


Fig. 1. The effect of coat colour and time interval on freezebranding efficiency.

period was also tried by Day et al (1971) with poor results. They suggested that a longer period of 25 to 30 sec. would be more effective.

The recent trial proved that a 30 sec. interval gave clear brands with no visible hide damage. A longer period of freeze branding (40 sec.) gave excellent results with no apparent damage to the hide. However without histological examination this was not possible to verify.

Liquid nitrogen can also be used for freeze branding but in Cheju was difficult to obtain and expensive. With the rapid expansion of the dairy industry in the next few years the use of freeze branding is recommended.

Acknowledgement

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Literatures Cited

- Day, N., D. McEwan Jenkinson and J. walker-Love 1971. Freeze-brang of young beef animals, *Animal production* 13: 93-99
- Dowling, D. A. and Nay, T. 1960. Cucle changes in the follicle and hair coat in cattle. *Aust. J. Agric. Res.* 11: 1064-1071
- Farrel, R. K., Koger, L.M. and Winward, L. D. 1966. Freeze branding of cattle, dog and cats for identification. *J. Vet. Med. Ass.* 149: 745-752
- Jenkinson, D., McEwan and Nay, T. 1968. Sweat gland and hair follicle measurement as a indicators of skin type in cattle. *Aust. J. Bio. Sci.* 21: 1001-1011
- Lyen, A. G., Hollis, D. E., Chase, H. B. and Hayman, R. H. 1967. Changes experimentally produced in the skin pigmentation of the skin and coat of sheep. *Aust. J. Sci.* 30: 30-31
- Taylor, A. C. 1949. Survival of rat skin following freezing. *J. Exp. Zool.* 110: 77-112

圖 文 抄 錄

肉用交雜牛에 冷凍烙印의 效果를 調査하기 위하여 Dryice를 利用 세가지 毛色에 試驗을 行하였다. 冷凍烙印時間은 10, 20, 30, 40, 50秒로 處理하였다. 30秒處理에서 75% 灰色牛, 80%의 褐色牛와 100% 黑色牛가 明確한 烙印效果를 나타내고 있었다.

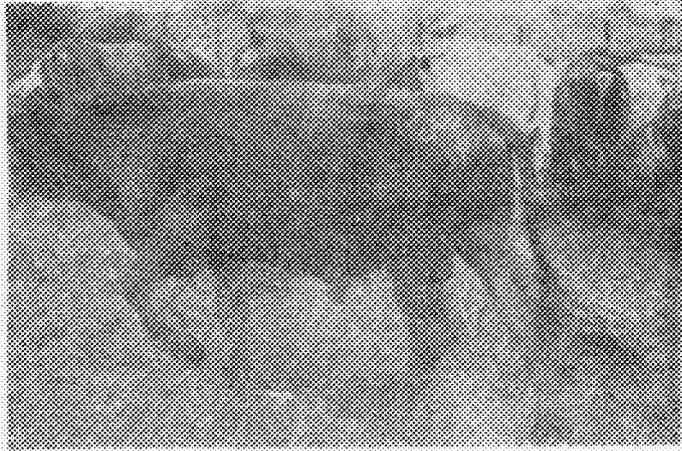


Plate 1. Shows black coated animal freeze branded from left to right at 20, 30 and 40 seconds.



Plate 2. Shows brown coated animal freeze branded from left to right at 20, 40 and 30 seconds.