Freeze branding for cattle identification on the farm

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FREEZE BRANDING FOR CATTLE IDENTIFICATION ON THE FARM

CATTLE identification presents many problems to beef and dairy farmers, and also to research workers. Although many methods are available no one simple method appears to be the complete answer.

In particular, means of identifying animals without handling them and at a distance of several yards are necessary to facilitate management under grazing conditions, such as for selection and culling on performance.

The recently-introduced freeze branding seems the most permanent method devised so far for this purpose.

Permanent identification can be obtained by the application of extreme cold which selectively destroys the melanocytes (or pigment producing cells), resulting in the growth of white or bleached hair on the branded area. This provides a readily distinguishable brand, except on white animals.

Equipment required
- Coolant medium—either dry ice (frozen CO₂) in methyl alcohol or methylated spirits, or liquid nitrogen.
- Insulated container for the coolant.
- A set of copper or high quality bronze alloy branding irons with sufficient weight and facing. These are available in 2 in., 3 in., or 4 in. sizes and should be selected to suit the size and age of the animals to be branded.
- If liquid nitrogen is used as the coolant, the operator’s face and hands must be protected.
- Set of cattle clippers to remove hair as close to the skin as possible, preferably electrically operated.
- Alcohol or methylated spirits with suitable applicator, such as a cloth, if liquid nitrogen is used.
- Suitable cattle crush or head bail.

Procedure

Dry Ice Method: Add the dry ice (in a chipped form) to the coolant (alcohol), avoiding splashing. Use enough coolant to completely cover the iron heads. The
carbon dioxide boils off vigorously as the dry ice is added. Progressively add more dry ice as it is used up, until eventually the alcohol shows only gentle bubbling and some solid ice is present. This indicates that the liquid has reached the temperature of the dry ice (−96°C) and it is ready for use. As long as there is ice in the solution the correct temperature will be maintained.

**Liquid Nitrogen Method:** The liquid nitrogen may either be used in the transporting container if its neck is wide enough, or placed in a suitable insulated container with an open top just large enough to accommodate the irons.

As the irons are placed into the coolant solution, it will boil very vigorously. This will continue until the irons have cooled down to the temperature of the liquid, when they are ready for use.

The procedure should then be:
1. Restrain the animal.
2. Clip the hair as closely to the skin as possible from the area selected for branding.
3. Brush away the loose hair, dirt and any other foreign material, and if dirty thoroughly cleanse with an alcohol-soaked cloth.
4. Soak the area to be branded with alcohol before applying the irons (only necessary with liquid Nitrogen method).
5. Select the iron required, shake off excess coolant and apply to the area to be branded, maintaining steady, even pressure over the whole face of the iron.

**Branding times**

It is important that the selected animals be in good condition, as this enables even pressure to be maintained over the whole face of the iron. Failure or partial failure of brands to ‘take’ has been experienced with stock in poor condition.

The following exposure times are suggested for dairy and beef cattle branded with dry ice.

<table>
<thead>
<tr>
<th>Age</th>
<th>Dairy</th>
<th>Beef</th>
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<tbody>
<tr>
<td>4 to 8 months</td>
<td>25 sec.</td>
<td>30 sec.</td>
</tr>
<tr>
<td>9 to 18 months</td>
<td>30 sec.</td>
<td>35 sec.</td>
</tr>
<tr>
<td>Over 18 months</td>
<td>35-40 sec.</td>
<td>40-45 sec.</td>
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</table>

The above will depend on condition, the fatter animals requiring the longer time.

If liquid nitrogen is used, a little more than half the above times is needed.
Applying the iron

On white animals, allow an additional 10 to 15 seconds exposure time; this will destroy the hair and produce a bare brand, similar to a fire brand.

Events following freeze brand application
1. The skin is frozen and indented in the form of the brand applied.
2. The skin will thaw out in 2 to 3 minutes after branding.
3. The branded area begins to redden, and blistering develops.
4. The blisters persist for 24 to 48 hours, depending on length of exposure.
5. After the reddening and blistering recedes the area appears dry and scurfy.
6. A scab will form and persist for 3 to 4 weeks.
7. When the scab falls off a varying amount of skin and hair will be lost.
8. White hair will begin to appear 6 to 10 weeks later, depending on the stage of the natural hair growth cycle when the brand was applied.
9. The brand will remain legible, appearing similar to a fire brand, until white hair appears.

Equipment costs
Branding irons:
Home-made, from ¼ in. diameter solid copper rod—$30 to $40 depending on size required, for numerals 0 to 9. Factory-made—$65 irrespective of size. Can be hired at about $10 a week.

Coolants:
LIQUID NITROGEN METHOD: Liquid nitrogen costs about $1 for 5 lb and ¼ to ½ lb is needed per adult animal; container cost (3 lb size)—$200; container hire cost per week—$3.00.
DRY ICE METHOD: Dry ice (ex Carba Aust.)—over 10 lb 9c per lb, under 10 lb 15c per lb, plus freight; container cost—$10; methylated spirits $2 per gallon.

The amount of coolant required will depend greatly on the distance from the source of supply to the farm, the organisation and preparation of the stock before the job is started and the weather at the time of branding.

Branding positions
Any well-muscled area will readily take a freeze brand, although the condition of the animal is of major importance.

In beef cattle, the rump has proved to be one of the most successful areas, and the shoulder is also satisfactory. The upper part of the ribs is usually suitable, but success here depends more on the animal's condition.
If the dairy is a herringbone type, the rear of the hindquarters is best.

For dairy cattle milked in a walk-through dairy, the rump is again the best position.

Freeze branding service

A contract freeze branding service for farmers may become available from the Artificial Breeding Board and interested farmers should contact the Manager of the Board, Uduc Road, Harvey.

Recommendations

If the farmer is set up to do his own freeze branding the dry ice method would be the most suitable, as there is some risk to the operator when liquid nitrogen is used.

Freeze branding should not be attempted in extremely wet weather unless the operation can be carried out under cover. In hot weather large losses due to evaporation of dry ice will result, and irons may warm up too quickly whilst being applied to get good brands.

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