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Freeze Branding to Identify Dairy Animals

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Lack of accurate individual animal identification has long been a limiting factor in livestock improvement or disease control and eradication programs. Recently, however, research efforts to find better identification methods have increased.

The most significant development to date is a technique called freeze branding. This simply involves branding the animal's skin with an identification mark chilled to an extremely low temperature, which kills the pigment-producing cells. When the brand thaws, the old hair falls out and is replaced over time, by a regrowth of white hair.

In 1966, U. S. Department of Agriculture research animal scientists ran several freeze branding trials on dairy cattle. Their initial results indicated that age and breed differences might be important in determining optimum exposure time for branding. Also, liquid nitrogen brands appeared to be inferior to dry ice plus alcohol brands, since they generally caused more skin and follicular damage.

To substantiate these findings, a more exhaustive study was initiated in 1967. This project compared freeze branding administered at various ages (3, 6 and 12 months) on different breeds (Holstein, Jersey and Guernsey) in different seasons (spring, summer and fall) and tested two refrigerants (dry ice plus alcohol and liquid nitrogen) at various time exposures (10, 20 and 30 seconds) on different parts of the body (neck and shoulder, rib cage and rump, and thigh). The results confirmed that optimum branding exposure time depended not only on the coolant, but also on the age of the animal, the breed and the branding site.

Based on these studies, then the following procedures are recommended for freeze branding of dairy cattle:

1. Select for branding a flat, well muscled surface. In general, rump brands have been found superior to rib cage brands.

2. Clip the hair in the area selected as close to the skin as possible.

3. Brush from the clipped area any loose hair, dirt and dandruff.

4. Then soak the area with alcohol before each digit is applied.

5. Apply pressure when branding to insure uniform contact.

6. If branding with the dry ice-alcohol refrigerant, use the following time exposures based on age--
<table>
<thead>
<tr>
<th>Age</th>
<th>Dairy</th>
<th>Beef</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1 month</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>2-3 months</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>4-8 months</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>9-18 months</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Over 18 months</td>
<td>30</td>
<td>35</td>
</tr>
</tbody>
</table>

result in a "bald" brand.

Freeze branding is best done in the spring or fall, which coincides with the natural hair growth cycle when color-producing cells are most active and thus easier to destroy. The dry ice-alcohol brands still appear superior to the liquid nitrogen brands.

Freeze branding shows considerable promise in meeting the requirements of an ideal individual animal identification system. But additional research is needed to perfect the technique and minimize the variations that persist under certain conditions.

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