



FREEZE BRANDING

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FREEZE BRANDING (cryogenic branding) is a technique in which a super-cold branding iron applied to the animal's hide kills the pigment-producing cells. The result is that white hair instead of colored hair grows at the brand site.

WHY FREEZE BRAND?

The advantage of a freeze brand is that it is readable at any time of the year if it is properly applied. The white hair against a dark background can be seen at a distance both summer and winter. Freeze branding produces less scar tissue and less hide damage. The hair continues to grow which indicates skin health. Intense cold branding causes less pain to the animal than hot iron branding.

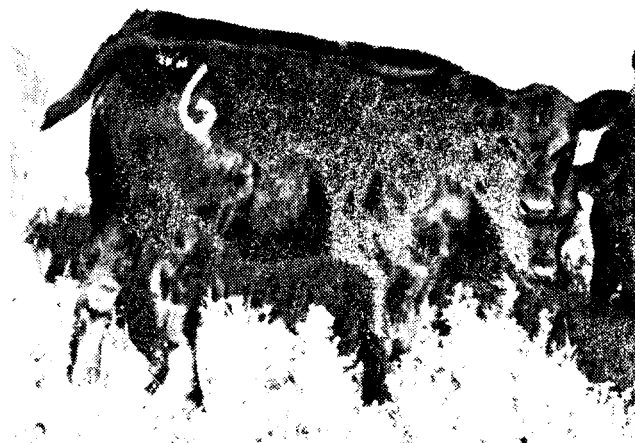
MATERIALS NEEDED FOR FREEZE BRANDING

- A squeeze chute or device to restrain the animal.
- An electric or manual hair clipper.
- Branding irons.
- Alcohol and dry ice or liquid nitrogen.
- An insulated container for the coolant.
- A squirt bottle for alcohol.
- Grooming brush.
- Gloves.

IRONS

Copper and bronze "irons" or their alloys are satisfactory. Steel irons have also been used satisfactorily when slightly more time is allowed for the cold to penetrate. You can buy them from livestock supply companies. If an iron is custom made, it should have a face about 3/8 inch wide, preferably rounded, and it should be 1 to 2 inches deep from the face to the back to give it capacity to retain cold. The 4-inch height is recommended for cows while the smaller 3-inch size may be used for weanling calves and short yearlings. For greater maneuverability in the chute, the handle should not exceed 12 to 16 inches in length.

Some country livestock associations have irons available. Contact your County Extension Agent about the availability of irons.



Greater legibility from a distance

CLIPPERS

An electric hair clipper for cattle is the best. However, they are rather expensive and require electric current. A hand clipper with a 3-inch head can be used. Brand inspectors find this type of clipper satisfactory if handled properly.

DRY ICE

You can usually buy dry ice in the larger cities. Check on sources with your county agent. Dry ice will not store for more than a couple of days. Dry ice companies will ship dry ice blocks in a cardboard container, but the purchaser must prepay the shipping charges and carton cost before they will send it by public carrier. You'll no doubt be more satisfied if a local distributor or creamery can handle the material at a reasonable price.

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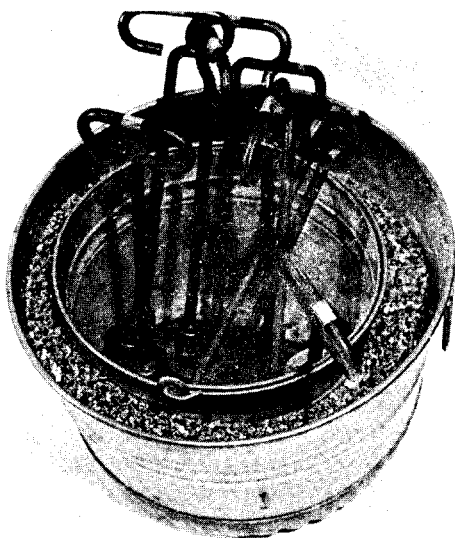
Order about one-half pound of dry ice per head to be branded.

ALCOHOL

Methanol (methyl alcohol) is the most economical available coolant. It may be available at some service stations as it is used in high performance race cars.

CONTAINER FOR THE COOLANT

A container can be improvised from a bushel basket with 2 or 3 inches of insulation in the bottom. Put a half-bushel basket inside and fill insulation around it. This will hold nine irons. If only two or three irons are used, a similar arrangement can be made with a water pail and a half-bushel basket. An insulated picnic container is also satisfactory. **DO NOT USE PLASTIC PAILS** as they will crack when super cooled.



An insulated container for the coolant

Use enough alcohol to cover the branding irons. About 2 gallons are needed for the half-bushel basket. Add dry ice in chunks of about 1 pound each, until the liquid stops bubbling. This will take about 5 minutes. Insert the irons into the coolant letting the irons chill for 10 minutes the first time; after that they will re-cool in a couple of minutes after each use.

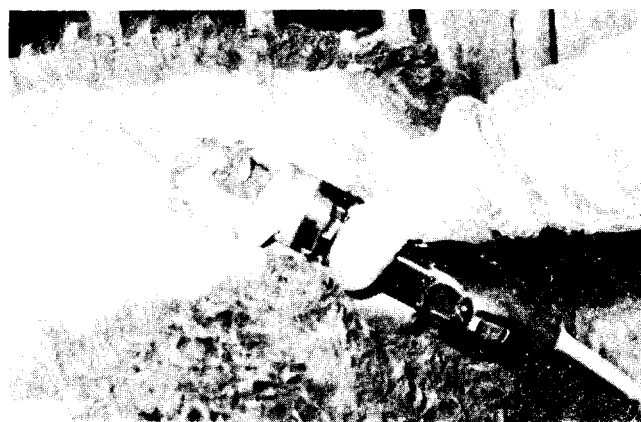
Keep a chunk of dry ice in the coolant at all times. The amount of ice is not critical. As long as it is detectable in the liquid the temperature of the solution will be 90 to 100 degrees below zero Fahrenheit. Wear gloves when handling dry ice. Saw the dry ice in slices about 2 inches thick. The dry ice company will do this if you request it. A slice can then be broken with a hammer into four or five pieces. Do not pulverize the dry ice.

LIQUID NITROGEN

When using liquid nitrogen as a coolant, hold the irons on the animal for only 15 to 20 seconds. Liquid nitrogen has a temperature of -320°F . (-196°C). Liquid nitrogen jugs for freeze branding must have at least a 4-inch opening. Liquid nitrogen will cool the irons at a faster rate and requires no additional coolant, but it is usually more expensive than dry ice and alcohol.

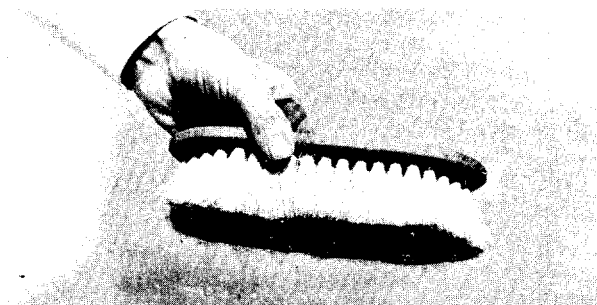
BRANDING PROCEDURE

Order all needed materials well in advance of when you need them. Since dry ice will deteriorate, you should pick it up the day you want to use it. Order a few extra pounds to allow for deterioration enroute to the farm. Restrain the animal in a squeeze chute, or with a headgate in an alley.



Electric clipper

Closely clip an area a bit larger than the numbers to be used on the upper part of the rump. If a large number of cattle are to be branded, an electric cattle hair clipper is almost necessary. Clip and brand high on the rump so the numbers can be easily read in cattle alleys, crowded pens, chutes or from horseback. Number brands for individual identification should be placed on the rump area which includes from the tail head down to the hock. Brands on the lower quarter become dirty easily and will be impossible to read if cattle are in a group.



Grooming brush

Clean the clipped area of hair, dirt and dandruff with a grooming brush.



Saturate brand area with alcohol

Apply room temperature alcohol with a squirt bottle to the clipped area. Re-brush to remove any foreign material still on the skin. A satisfactory squirt bottle can be made from a plastic liquid soap container with a cap that has been perforated; an ordinary oil can, clothes sprinkler or a small hand sprayer will also work.

Before applying the branding iron, again saturate the skin with alcohol to provide a liquid contact between the iron and the skin. **This step is critical for successful branding, as alcohol evaporates rapidly and the area must be wet.**



Firm, uniform pressure for a readable brand

More than one iron can be used at one time. However, one operator for each iron gives the best results.



Locate numerical brand on rump between pin and hip bones

TIMING

Apply the branding irons to the clipped hide immediately after the area is cleaned and saturated with alcohol. Administer uniform, firm pressure on the irons to obtain a readable brand. Be sure the entire surface of the branding iron is in contact with the hide. Leave copper branding irons on the hide of cows for a period of 50 to 60 seconds and on calves for 40 to 50 seconds. If steel irons are used, allow 10 more seconds. **TIME ACCURATELY.**

The length of time the branding iron is left on the hide will vary with hide thickness and season of the year. In the spring, when hair is growing fast, thick-skinned animals may develop proper brands when the branding time is shortened to 30 seconds. During the winter, thick-hided animals will require as much as 60 seconds. Apparently the pigment-producing cells are more easily destroyed during the periods of active hair growth. Underbranding causes poor results while overbranding caused by too much time kills the hair follicles and produces a hair-free brand. Use a stop watch to be exact!

Age of Animals	Dry Ice Alcohol	Liquid Nitrogen
Up to Weaning (4-8 months)	40-50 Seconds	15 Seconds
Yearling (9-18 months)	40-50 Seconds	15-20 Seconds
Mature animals	50-60 Seconds	15-20 Seconds

NUMBERING SYSTEMS

You can use a numbering system to note the year of birth. This can be accomplished by using the last one or two digits of the year as the first part of the animal's total number. Preferably, use the last two digits of the year to avoid duplicate numbers every 10 years.

Instead of placing the year numbers as part of the total number, you may wish to place the year numbers above or below the other numbers used in numbering the animal

The North Dakota Beef Cattle Improvement Association and Extension are recommending and encouraging the use of a letter to designate the year instead of using numbers. The letter may be placed above or below the calf number.

The International year/letter designations are:

L—1979
M—1980
N—1981
P—1982
R—1983
S—1984
T—1985
U—1986
V—1987
W—1988
X—1989
Y—1990
Z—1991

APPEARANCE OF BRAND

Immediately after the branding iron is lifted, the hide area appears to be frozen stiff and is indented in the form of the iron. As the skin thaws, symptoms similar to frostbite appear. The skin becomes red and swollen over the branded area. In about a week the hair is usually lost on the brand site, and the skin remains bare until the next hair growth cycle. White hair generally appears on this scar about six weeks to four months later and grows to the same lengths as the other hair on the animal.

Some brands applied for as little as 20 seconds have resulted in a good growth of white hair, while other brands applied for 60 seconds have failed to produce any white hair. This has also been reported at times when liquid nitrogen was used as the coolant. Evidently factors other than timing affect the "take" of freeze brands.

Thickness of the animal's hide seems to influence the time needed to produce a good brand. Calves are easiest to brand, followed by yearlings, cows, and bulls. Dairy cattle seem to be easier to brand than beef cattle. Herefords, for example, seem to need a longer time than Angus.

Excited cattle seem to be harder to brand than cattle that are handled quietly. This may be due simply to the difficulty of keeping the iron in proper contact with the skin.

UNSATISFACTORY RESULTS MAY BE ATTRIBUTED TO:

- Inadequate restraint of the animal
- A poor job of clipping
- Failure to saturate the brand area with alcohol immediately before the iron is applied.
- Not applying firm pressure on the iron.
- Not holding the iron on the hide the proper length of time.

SAFETY PRECAUTIONS

Since super-cold materials can stick to the skin and cause tearing, all equipment and materials must be handled with caution. Wear gloves to protect hands. Vapors from super-cold liquids are very cold and can damage the delicate tissues of the eyes and nose. Proper ventilation is important: work should be done in the open air or in a well-ventilated building. Since alcohol is flammable, avoid smoking. After completing the branding, let the coolant "warm up" before placing it in a storage container. Leave the container cap loose or off until the liquid reaches room temperature or it may burst the container. During the branding procedure, take all precautions to avoid injuries and be sure to keep children away from the branding area.

Questions on registering a brand should be forwarded to the Agricultural Commission, State Capital Building, Bismarck, North Dakota. Questions on brand identification, inspection losses, etc., should be forwarded to the Chief Brand Inspector, c/o North Dakota Stockmens' Association, 407 South Second Street, Bismarck, North Dakota 58501. Freeze Branding with a registered brand is not recognized as an official brand by the North Dakota Stockmens' Association.