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# FREEZE BRANDING CATTLE



1967  
Extension Bulletin 341  
May 1967  
Agricultural Extension Service  
University of Minnesota

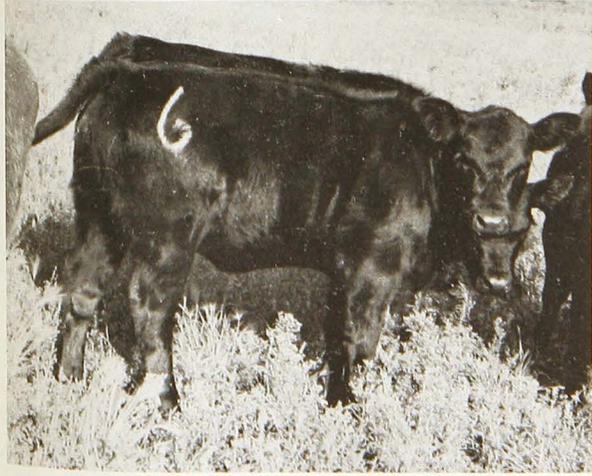
C. J. Christians, R. E. Jacobs, R. L. Arthaud, and C. D. Peterson

## Why Freeze Brand?

Freeze branding is a new technique devised for the permanent identification of cattle. Super-cold branding destroys the melanocytes (pigment-producing cells) in the skin of the animal without destroying the hair follicle. Eventually the new hair regrowth will appear white over the branded area.

Freeze branding causes little pain to the animal. The brand maintains its legibility during all seasons of the year and permits greater visibility of the animal from a distance. Minimum scar formation is produced, meaning less dockage from hide damage in contrast to the hot branding technique. It also reduces the possibility of bacterial infection and skin irritation by external parasites.

However, it is not distinguishable on white animals, and it is possible to alter these brands more easily than those burned into the hide by a hot iron.



Greater legibility from a distance

## Materials Needed

- Squeeze chute or device to restrain animal
- Electrical or manual hair clipper
- Branding irons
- Coolant
- Refrigerant
- Container for coolant
- Gloves

Although freeze branding is painless, a chute is essential to restrain the animal because the iron must be placed firmly in contact with the skin for the desired length of time.

To obtain a legible brand, clip the hair as closely as possible at the branding site. An electric hair clipper for cattle is the quickest and most efficient instrument; however, it is expensive and requires an electrical source. Cordless, self-powered clippers or manual clippers are more versatile and have been successfully used by brand inspectors.

Several supply companies, among them the L & H Manufacturing Company (Mandan, North Dakota) and the Hawkeye Casting Company (Manchester, Iowa), have perfected freeze branding irons. An evaluation of copper, aluminum, and steel branding irons shows copper to have the most efficient heat transfer. Steel irons require slightly more time for the cold to penetrate as compared to copper and other alloys.

The preferred iron should have a 3/8-inch rounded face. A depth of 3 inches from the face to the back will give the iron ample cold retaining capacity. A 4-inch high iron is recommended for cows, while the smaller 3-inch size may be used for weanling calves. For greater maneuverability in the chute, the handle should not exceed 12 to 16 inches in length.

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Electric clippers are efficient, but expensive



Locate numerical brand on rump between pin and hip bones

Various compounds such as methyl alcohol, isopropyl alcohol, ethyl alcohol, or acetone can be used successfully as coolants. Methyl alcohol can be purchased as alcohol type anti-freeze (methanol) at most service stations or supply stores for less than \$1 per gallon. Methanol is the most economical available coolant. It does, however, uniformly color both dry ice and irons in the container, making it difficult to differentiate between them.

Dry ice or liquid nitrogen can be used as a refrigerant. Dry ice has a wide distribution in Minnesota: local creameries or other distributors handle the material at a reasonable price (approximately 25 cents per pound). It will require approximately  $\frac{1}{4}$  pound of dry ice to brand each animal, plus an adequate amount to cool the coolant. For easy handling have the distributor cut the dry ice into 2-inch slices.

Artificial insemination organizations may be able to provide liquid nitrogen and jugs for freeze branding. These jugs must have at least a 4-inch opening. Although liquid nitrogen will cool the irons at a faster rate and requires no additional coolant, it is more expensive than dry ice.

An insulated container of some sort is essential to keep the coolant at low temperatures. An old picnic cooler, fishing box, or a 3-gallon bucket in an insulated bushel basket are good containers. The size should be large enough to handle about 2 gallons of coolant, 1 pound of dry ice, and the branding irons.

Since the temperature of dry ice is around  $-90^{\circ}$  F., wear gloves to handle the dry ice and branding irons. Insulated gloves which have a waterproof coating protect hands during the branding procedure.

## Branding Procedure

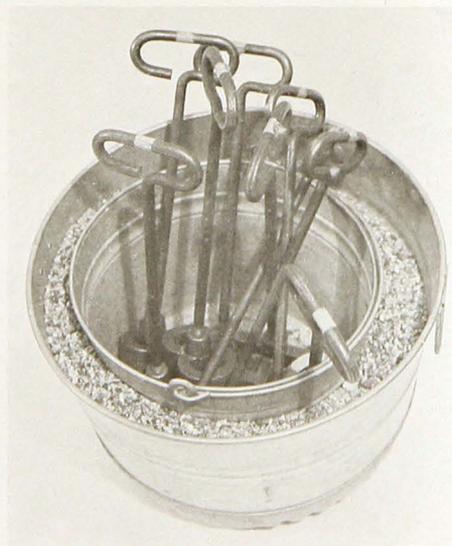
Order all needed materials well in advance of when you need them. Since dry ice will deteriorate, you should pick it up the day you want to use it. Order a few extra pounds to allow for deterioration enroute to the farm.

In preparing the alcohol-dry ice bath, pour enough coolant into the cooler container to cover the branding irons. The ratio of dry ice to alcohol is not critical. Simply add enough alcohol to cover the irons and enough dry ice to chill the alcohol.

Add dry ice in chunks of about 1 pound each (the size of your fist). Chill for 10 minutes for the first time. Once the irons are cooled, they will chill in a couple of minutes after each use.

With the animal restrained in a squeeze chute, locate the number brands on the rump area between the pin and hip bones close to the tailhead. The brand must be visible in the working chute and pasture. Brands located on the lower part of the body are difficult to read. Each animal should receive a different number for quick individual identification. One simple method is to use continuous numbers, making a notation of the numbers used each year.

Clip the brand area as closely as possible and clean and saturate it with room temperature alcohol



An insulated container for the coolant



Saturate brand area with alcohol or acetone

or acetone. During the warm seasons of the year, the alcohol may evaporate rapidly. Take a squeeze bottle or oilcan filled with alcohol and squirt a liberal amount of alcohol on the clipped area prior to and while branding the animal. The alcohol will provide a liquid contact between iron and skin.

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 seconds and on calves for at least 40 seconds. If steel irons are used, allow 10 more seconds.

The length of time the branding iron is left on the hide will vary with hide texture and season of the year. In the spring of the year, when hair is growing fast, thin-skinned animals may develop proper brands when the branding time is shortened to 30 seconds.



Firm, uniform pressure for a readable brand



A certified registered herd brand

During the winter months, 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. Time and temperature trials are still being conducted to determine the most desirable length of time the branding iron can be left on the hide at any given season of the year.

### 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 6 weeks to 4 months later and grows to the same length as the other hair on the animal.

Under Minnesota branding law, registered herd brands must be burned into the hide with a hot iron brand. Freeze branding is still in the experimental stage as a new method of cattle branding; it is illegal for herd identification use but not for numerically branding individual cattle.

A herd brand registered with the Minnesota Livestock Sanitary Board should be placed in the designated location such as on the shoulder, rib, or left or right side of the rump, corresponding to the area recorded in the state brand book. For information on registration of herd brands, ask your county agent for a copy of Animal Husbandry Fact Sheet 9, *Branding Beef Cattle*, or write to the Minnesota Livestock Sanitary Board, 1246 University Avenue, St. Paul, Minnesota 55101.

## 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 and acetone are flammable, avoid smoking cigarettes. After completing the branding, let the coolant "warm up" before placing it in a container. Leave the container cap loose or off until the liquid reaches room temperature or it may explode. During the branding procedure take all precautions to avoid injuries and be sure to keep children away from the branding area.

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Adapted from North Dakota State University Extension Service Circular A-501, Fargo, North Dakota 58102.

Mention of commercial names in this publication is for convenience only; no endorsement of firms named is intended nor is criticism implied of those not mentioned.

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture, Luther J. Pickrel, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101.  
10M-6-67