

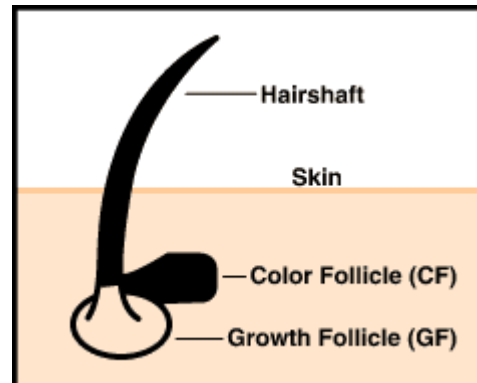
Operating Instructions for Freeze Branders

Freeze branding is a technique in which a super-cold branding iron, properly applied to the animals hide, kills the colour pigment producing cells. The result is that white or colourless hair instead of coloured hair, grow at the brand site. Freeze branding is effective on both cattle and horses along with dogs. One advantage of freeze branding is that it produces a readable brand at any time of the year.

Skin Anatomy

The skin of the animal contains millions of hairs which make up the animals coat. Figure 1 is an enlarges, simplified drawing of one hair shaft with its colour (pigment) producing follicle (CF) and its growth follicle (GF), both shown below the skin.

Under normal circumstances hair grows as a clear shaft (like a clear straw) from the GF. On coloured animals, pigment (black, brown, red, yellow etc.) is added from the CF below the skin to the clear hair shaft, which gives the hair its colour.



When the intensely cold iron used in freeze branding is placed on the skin for the correct time and at the correct pressure, the cold temperatures destroys the CF's at the brand site so they no longer can produce pigment; however, the hair still continues to grow for the GF's. The result is that hair at the brand site contains no pigment and appears white. This is the desired result-a uniform, white brand. If the iron is pressed to the skin for a shorter period of time and/or with less pressure that required, some hairs grow in coloured and some hairs grow in white, so the brand has a streaked appearance. If the iron is held on a longer period of time, the cold destroys the GF's as well, so that no hair grows at all. On light coloured animals the bald is desirable because the dark skin with no hair shows up better that a white brand.

Recommended Materials and Equipment

- Holding chute or some other positive device to keep the animal from moving
- Container large enough so the irons can stand upright when the heads are submerged in the coolant
- Coolant-Dry Ice and Alcohol or Liquid Nitrogen
- Electric clipper (surgical blade preferred)
- Grooming brush for cleaning the brand site
- Gloves
- Stopwatch
- Squirt bottle
- Bronze Freeze Brands

- 99.9% alcohol (lower percentages contain water which can cause an ice layer to form during branding and decrease the penetration of the cold through the skin)

Brand Selection

Freeze branders are cast of copper alloy (brass) which is generally preferred because of its temperature holding capacity. Standard sizes are 2", 2 1/2", 3, 3 1/2", 4", 5" and 6" in height. They have a variety of face sizes, not vented and a 18" steel handle for convenient application. Corresponding numbers are stamped on top of the handle, enabling you to choose the proper iron without removing the brander for the coolant container.

Branding Site Selection

Before branding, care should be taken in selection of the site to be branded. Each state or county may have its own regulations regarding the placement of the brand on the animal. Be sure to check with your county clerk, county extension agent or state brand inspection agency about branding and brand ownership regulations.

When branding on the shoulder, be sure the iron head is not partially on a thinner muscle mass over the scapula with the remainder of the iron head on a heavier, deeper muscle mass not covering bone. Unequal head pressure can produce a non-uniform brand. This situation can also arise when branding on the butt, a portion of the branding iron head is partially on the rear of the pelvic bone and the remainder is on the muscle below.

Dry Ice and Alcohol

Alcohol will be needed for this branding method. Among refrigerants used is methyl, ethyl (meths), or isopropyl alcohol. It is very important that any alcohol used be 99% in strength or it will turn to slush at the extremely low temperature needed (approximately 160 to 180 degrees below zero).

Acetone is another very good refrigerant, because it is clear and the quantity of dry ice in the container is always visible. Some of the suppliers of acetone are drug companies, welding supply firms and animal health supplies. After extensive use, alcohol will lose strength because of its tendency to absorb moisture. Alcohol should be changed after branding approximately 150 head of livestock. Care should be taken when handling 99% alcohol it is extremely inflammable.

Liquid Nitrogen

Liquid nitrogen is a very good coolant and will cool to a temperature of approximately 240 to 250 degrees below zero. Liquid nitrogen is available through artificial insemination organizations and welding supply firms. Care should be taken when handling liquid nitrogen because of its extremely cold temperature.

Branding Times

Branding times vary according to the type of metal in the irons (all times show here are for L&H brass freeze branding irons) and the age (skin thickness) and color of the animal. Branders should calibrate their freeze branding irons by branding the recommended times and keeping accurate records of times and results.

Animal	Coolant	Application Time
Colt	Liquid Nitrogen	6-12 Seconds
	Dry Ice & Alcohol	16-24 Seconds
Horse	Liquid Nitrogen	8-12 Seconds
	Dry Ice & Alcohol	20-24 Seconds
Calf	Liquid Nitrogen	21-24 Seconds
	Dry Ice & Alcohol	40-50 Seconds
Cow	Liquid Nitrogen	25-30 Seconds
	Dry Ice & Alcohol	50-60 Seconds
* Darker colored animals requires the minimum amount of time suggested		

Branding Procedure

Chill the irons in the desired coolant. Pour enough coolant into the container to adequately cover the heads of the irons by 1". The surface of the coolant will appear to boil when the irons are introduced into the coolant, when this boiling subsides the irons are as cold as the coolant will allow and are ready to use.

Restrain the animal with your desired method, squeeze chute or calf table for cattle and twitch or stock for horses, making sure the site to be branded is accessible. If the animal needs to be sedated consult your veterinarian.

Clean the brand site of foreign material. Clip the brand site as square as possible, particularly at the bottom, to aid in square placement of the brand. Thoroughly dry the brand site if the animal is sweating or is wet from the rain or washing.

Squirt room temperature alcohol over the brand site thoroughly covering the entire shaved area. This removes some skin oils and helps transfer cold from the iron head to the skin.

Immediately after the alcohol soak, quickly remove the appropriate iron from the container, align it properly and firmly press the iron squarely on the brand site. As the iron is pressed to the skin the stopwatch should be started. Hold the iron firmly applying 35 to 45 pounds of steady pressure, with a slight rocking motion. When the appropriate time has elapsed on the stopwatch, the iron should be immediately removed from contact with the skin.

After branding, immediately place the iron back in the container of coolant. It should be re-cooled completely before it is used again.

Time	Brand Site
15 Seconds	Indented pattern shows
5 to 10 Minutes	Swelled pattern shows
5 Days	Swelled pattern disappears
1 Month	Top layer of skin sheds
2 Months	White hair starts growing

3 Months

White hair growth complete

Post Branding Results

Immediately after freeze branding you will see a frozen indentation in the animals skin. Within five minutes the indentation will disappear and swelling will begin. The brand will be readable but the swelling will cause the mark to have two or three times the thickness that the actual finished brand will have. The brand will be swollen for 48 to 72 hours. After the swelling dissipates the brand may not be easily seen. About 20 to 30 days the brand will begin to get flaky and scaly. By the third or fourth week the scab will start to turn loose. Once the scab is gone, white, peach fuzz type hair should appear in 30 days. Full hair growth will depend upon the time of year the brand is applied.

Precautions

Dry ice and the cold liquid can cause injury to humans, and precautions should be taken so these do not come in contact with your skin. Acetone and alcohol are flammable and should be used in open air or a well ventilated building. Avoid smoking and keep this material away from open flames or electric cattle prods. Vapour from this liquid is also dangerous to the tissues of your eyes and nose.

Materials used and procedures are based on factual information, but not guaranteed.