	Washington State University Institutional Animal Care and Use Committee	Standard Operating Procedure #7
	Title: Large Animal Branding, Ear Tagging and Microchip Implanting	
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Standard Operating Procedures for Large Animal Branding, Ear Tagging and Microchip Implanting

1.0 Background:

1.1 Individual animal identification is essential for proper management of all agricultural animals used in research and teaching at Washington State University (WSU) including cattle, horses, swine, sheep, goats and camelids.

2.0 IACUC Requirements:

2.1 All methods listed below for identification must be outlined and approved on the Animal Subject Approval Form (ASAF) before implementation. PI's may refer to this SOP in the ASAF for details of the procedures. All personnel performing any of these procedures must be trained by someone who is proficient at the procedure and the training must be documented.

2.2 Monitoring of animals after Livestock Branding, Ear Tagging, Microchip implanting

2.2.1 All animals will be observed during the daily check.

2.2.2 Personnel performing the procedures will be trained to conduct the restraint and process associated with the branding or tagging.

2.2.3 New personnel performing the procedures will be under the direct supervision of an experienced Facilities Manager or Investigator.


2.3 Permanent identification is also an essential aspect of the cattle industry as legal proof of ownership, and branding of cattle is recognized as a viable option. Numerous studies (Lay et al., 1992; Schwartzkopf-Genswein et al., 1997) assessed pain and behavioral response to hot iron branding vs. freeze branding and have concluded that freeze branding offers a permanent form of identification that is easy to read, causes minimal damage to the hide, and is less painful than hot branding. Thus, freeze branding is the **only** method of branding acceptable at WSU.

3.0 Freeze Branding:

3.1 Species: Cattle, Horses

3.2 Background:

3.2.1 When super-cold or chilled (-100°to -300°F) special branding irons are applied to the hide of the animal, the pigment-producing cells in the hair follicle are destroyed or altered. The first day after branding the skin swells producing a welt. In two to three weeks, the brand will form a scab and peel. Six to eight weeks after branding, healthy unpigmented hair (white in color) will replace the scab.

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3.3 Equipment and Materials Needed:

3.3.1 Personal Protective Equipment

3.3.1.1 Insulated safety gloves and face shield must be worn by the personnel performing the procedure.

3.3.2 Inspection of Instruments

3.3.2.1 All instruments i.e., brass freeze brand irons, electric clippers, safety razor, alcohol, gauze, liquid nitrogen container, Styrofoam cooler, and squeeze chutes should be inspected prior to use and ensure that they are in safe working order.

3.3.3 Freeze-branding Irons

3.3.3.1 Branding irons should be heavy copper or bronze with slightly rounded faces. They should be 3- to 4-inch irons, 3/8- to 1/2-inch thick and at least 1 inch deep.

3.3.4 Coolants

3.3.4.1 Dry ice and alcohol are the most commonly used coolants. Use 95-99% isopropyl alcohol only. A minimum of 10 pounds of dry ice is usually needed to cool irons along with 3-5 gallons of alcohol to brand 20-30 animals.

3.3.4.2 Liquid Nitrogen can also be used as a coolant, but because it is colder, you must take care not to leave the irons on the animal too long. Refer to the Table below.

3.3.5 Container for Coolant

3.3.5.1 The container should be insulated to keep the solution as cold as possible. Use two metal containers, one set inside the other with an insulating compound between, or a bucket wrapped in insulation. Styrofoam coolers are excellent but should be set inside another container because they are fragile and easily broken. Select a container large enough to accommodate all the irons needed.

3.3.6 Clippers

3.3.6.1 Clip the hair closely before branding.

3.3.7 Brush and Plastic Squirt Bottle


3.3.7.1 A stiff bristle brush is handy for brushing away loose hair and removing skin scurf after the animal has been clipped. A squeeze bottle is helpful for applying alcohol to the clipped area. A 20 oz plastic bottle with a 1/8" hole in the lid works well also.

3.3.8 Restraining Equipment

3.3.8.1 The animal must be securely restrained in a squeeze chute, stocks or head gate. Calves may be restrained on the ground on their sides.

3.3.9 Chilling the Irons

3.3.9.1 When dry ice is added to alcohol, it will bubble profusely. As the solution is cooled, it will reach a steady rate of bubbling. The alcohol or liquid nitrogen should cover the head of the iron by at least one inch. Cool irons for 20 minutes before using them on the first animal. After the irons have been used in branding, they should be put back in the solution immediately if they are to be used again. It will take at least 2 minutes for them to reach minimum temperature again.

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3.4 Length of Time for Iron Application

<u>Branding iron contact time for freeze branding</u>		
<u>Age of animal</u>	<u>Contact time (seconds)</u>	
	<u>Dry Ice and Alcohol</u>	<u>Liquid Nitrogen</u>
<u>4 to 8 months</u>	<u>25</u>	<u>15</u>
<u>9 to 18 months</u>	<u>30-40</u>	<u>20</u>
<u>Over 18 months</u>	<u>45-50</u>	<u>25-30</u>
<u>Mature animals with thick hide (i.e. Hereford)</u>	<u>50-60</u>	<u>35</u>

3.5 Step-by-Step Branding

- 3.5.1 *Step 1:* Cool irons as listed above.
- 3.5.2 *Step 2:* Restrain the animal in head gate or squeeze chute, clip the area selected to brand. After clipping, brush away loose hair and any scurf that is on the skin.
- 3.5.3 *Step 3:* Saturate the branding area with alcohol. You may need a brush to work the alcohol all the way to the skin.
- 3.5.4 *Step 4:* Immediately after you have applied the alcohol solution, apply the branding iron to the hide. Apply very firm pressure to the iron. Hold the iron on the area and don't let it slip. Rocking the iron gently from top to bottom and side to side will make a better brand. Have an assistant keep track of the time so the branding irons are in place for the desired length of time.
- 3.5.5 *Step 5:* Remove the iron from the animal and immediately place the iron in the coolant for additional branding.
- 3.5.6 A good brand will show up as indented on the animal after branding, and after a few minutes will swell and create a raised version of the brand.


3.6 Pain Relief Recommendation

- 3.6.1 The AVMA guideline on branding, recommends for best practice to use pain relief with freeze branding. A topical anesthetic such as lidocaine or systemic analgesics such as Flunixin are appropriate options. Please contact OCV at or.ocv.alert@wsu.edu for veterinary consultation on appropriate pain relief

4.0 Ear Tagging:

4.1 **Type:** Radio Frequency Identity Tags (R-FID button), silver and plastic tags

4.2 **Species:** Cattle, Swine, Sheep, Goats, Llamas, Alpacas, and other Camelids, Bighorn sheep, Captive Deer

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4.3 Equipment and Materials Needed:

4.3.1 Personal Protective Equipment

4.3.1.1 Clean examination gloves are recommended for personnel performing the procedure.

4.3.2 Inspection of Instruments

4.3.2.1 Squeeze chutes, halters, tag applicator and tags should be inspected prior to use to ensure that they are in safe working order.

4.3.3 Ear Tags

4.3.3.1 Please see the [USDA APHIS website](#) for listing of Official Ear tags.

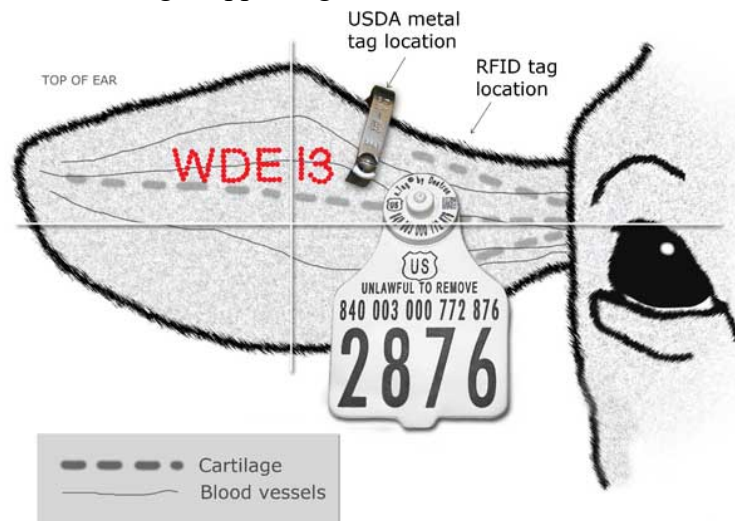
4.4 Step-by-Step Tagging

4.4.1 *Step 1:* Adult animals should be restrained in the squeeze chute, head gate or manually (small ruminants) just long enough to perform the procedure.

Wildlife are typically tagged while under chemical restraint.

4.4.2 *Step 2:* The head should be haltered to prevent injuries to the animal or attendants. The ears should be cleaned with betadine or alcohol and hair clipped if necessary. The numbered tags with special applicators may be applied on one or two ears.

4.4.3 *Step 3:* The tags are inserted into the outer portion of the ear avoiding the outer cartilage supporting the ear.




5.0 Microchip Implanting:

5.1 Type: Microchip

5.2 **Species (example):** Horses, cattle, sheep, goats, swine, wild ungulates, bear, dogs, cats and other similar species

5.3 Background:

5.3.1 The USDA published a final rule in 2013 establishing regulations regarding the traceability of U.S. livestock moving interstate. One of the permitted methods of identification is a 15-digit microchip that begins with the designated US prefix 840. WSU also recognizes microchips as a permanent form of individual identification in numerous species.

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5.4 Equipment Needed

5.4.1 Personal Protective Equipment

5.4.1.1 Clean examination gloves.

5.4.2 Inspection of instruments

5.4.2.1 Microchip frequencies include: 125 kHz, 128 kHz and 134. 2 kHz.

Ensure that your scanner will read your microchip before implanting and understand what type of microchip you need for your particular species. Microchips come in sterile, individual injectors that look like a large syringe and needle and are sealed.

5.4.3 Implant location

5.4.3.1 Cattle, camelids, sheep and goats: can be microchipped behind the left ear as a subcutaneous injection or in the tail web for goats and sheep. Large carnivores can be implanted similar to a dog or cat in the subcutaneous tissue of the neck between the shoulder blades.

5.4.3.2 Horses typically are microchipped in the nuchal ligament on the left side halfway between the poll and the withers approximately one inch below the midline of the mane, only after a clip and surgical scrub of the area.

5.5 Step-by-Step Microchipping

5.5.1 *Step 1:* Restrain the animal in a squeeze chute, manually or with a halter. In special cases an animal may need to be sedated for implantation.

5.5.2 *Step 2:* Clean area well or clip and scrub based on species.

5.5.3 *Step 3:* Insert the needle under the skin or into the nuchal ligament, depress plunger, pinch the skin where the needle went in and pull the needle out ensuring that the microchip stays under the skin.

6.0 References:

6.1 Virginia Cooperative Extension: Cattle Identification: Freeze branding

<https://pubs.ext.vt.edu/400/400-301/400-301.html>

6.2 Lay, D. C. Jr., T. H. Friend, R. D. Randel, C. L. Bowers, K. K. Grissom, and O. C. Jenkins. 1992. Behavioral and physiological effects of freeze or hot-iron branding on crossbred cattle. *Journal of Animal Science* 70: 330-336.

6.3 Schwartzkopf-Genswein, K. S., J. M. Stookey, and R. Welford. 1997. Behavior of cattle during hot-iron and freeze branding and the effects on subsequent handling ease. *Journal of Animal Science* 75: 2064-2072.

6.4 AVMA Literature review on the Welfare Implications of Hot branding and Its Alternatives 2011.

https://www.avma.org/KB/Resources/LiteratureReviews/Documents/hot-iron_branding_bgnd.pdf

6.5 http://msue.anr.msu.edu/uploads/236/58567/Radio_Frequency_Identification_RFID_Technology_for_Cattle.pdf

6.6 https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA_Traceability