

SUMMARY: AABP ANIMAL WELFARE COMMITTEE BRANDING WORKING GROUP ACTIVITIES



OVERVIEW

The American Association Bovine Practitioners (AABP) Animal Welfare Committee formed a working group to provide information on branding practices, particularly research on the effect of branding on animal welfare, branding requirements of various states, and alternative methods of identification. The group was formed in June of 2019, and spent the last six months gathering information. The group has summarized the information here, and welcomes member feedback.

CURRENT PRACTICES/REASONS FOR BRANDING

Primary reasons for branding cattle include prevention of theft and ease of identification of cattle in open grazing situations. Cattle theft still occurs in the U.S., and several western states have full-time livestock detectives to investigate cattle theft and recover stolen cattle. Some pertinent data include:

OKLAHOMA According to a *Reuters* article, an average of 2,500–3,000 head of cattle are reported stolen annually.

TEXAS In the same article referenced above, Texas reports 3,500–4,000 head of cattle stolen each year.

COLORADO Brand laws are some of the strictest in the U.S., but still have around 100 head of cattle reported stolen each year (*Colorado Sun*).

KANSAS Employs a full-time livestock detective, branding is not required. An estimated 25–70 cattle theft incidents are reported each year (*The Kansas City Star*).

MISSOURI No statistics on annual reports of cattle theft were found, but in recent years, there were several news articles reporting cattle theft ranging from one to 600 head. The most recent story includes two brothers from Wisconsin who came to Missouri to check on cattle missing while in a Missouri man's care. The two brothers were killed, their bodies burned and disposed of in various sites (<https://www.nbcnews.com/news/us-news/missouri-farmer-charged-killing-two-wisconsin-brothers-cattle-business-n1070666>).

WYOMING Another state with strict brand laws, in 2018, seven cattle thefts were reported, involving a total of 590 head (*Buffalo Bulletin*).

IDAHO Averages 250 reports of stolen cattle per year (*Reuters*).

MONTANA Over a three-year span, 7,300 head of cattle have been stolen (*Reuters*).

LITERATURE REVIEW

Assessment of pain and welfare in animals is difficult because it requires interpretation of physiological or behavioral responses and the translation of these responses back into a scale for pain and welfare. In general, opinions should not be formed based on a single study, but on the body of knowledge and on consistency of findings. Lay et al published three experiments^[1-3] in 1992 studying the effect of hot-iron branding, freeze branding and sham branding (pressure with a cold branding iron). Both types of brands caused more pain compared to the sham procedure. Hot-iron branding caused more pain than freeze branding and the pain was interpreted as more intense at time of branding while freeze branding was more painful after 15–30 minutes.

In 1997, Schwartzkopf-Genswein et al performed similar experiments^[4-6]. The research quantified force and duration of escape behaviors by measuring forces exerted by the animal on the head gate and squeeze chute during procedures. Hot-iron branding was more painful at the time of branding than freeze branding. Higher skin temperatures post branding were found in both hot-iron and freeze branded sites compared to control and higher temperatures in hot-iron branded sites versus freeze-branded sites after 144 hours, again leading to the conclusion that hot-iron branding causes more inflammation and thus more pain than freeze branding. Tucker et al found that hot-iron branding wounds stayed painful for at least eight weeks based on avoidance behavior and a single dose of flunixin does not mitigate the pain associated with branding^[7]. In a separate trial by Tucker et al, a cooling gel applied either once or twice after branding cooled the brand but did not improve healing^[8]. A study by Melendez et al in 2018^[9] compared a multitude of outcomes between groups of two-month-old bull calves and found that castration plus branding led to greater behavioral and physiological responses than castration alone and was considered more painful. A subcutaneous injection of meloxicam prior to the procedure reduced some of the pain parameters and was considered effective at mitigating pain caused by branding.



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STATE BRANDING LAWS

At the federal level, the Animal and Plant Health Inspection Service's (APHIS) Animal Disease Traceability (ADT) regulations require "official ID" for all breeding animals over 18 months of age entering interstate commerce but not going directly to slaughter ^[10]. Through the program, APHIS mandates that certain forms of animal identification (i.e. specific ear tags) be recognized by all states. However, ADT regulations do not mandate whether states accept brands or tattoos as "official" identification. Each state has different laws and regulations regarding branding, which leaves the industry with a patchwork of various regulations that must be followed.

Based on the working group's research, the only state that does not recognize a brand as an official form of animal identification is Kentucky. States that require branding are Arizona, New Mexico and Utah; however, all three states offer exemptions from branding for certain classes of cattle. New Mexico, in particular, offers a number of exceptions for cattle of various classes. In most states, if producers elect to brand their cattle, they are required to register the brand with the state. Some states merely suggest registering a brand. Additionally, to move between states or counties, or for a change in ownership, a brand inspection is required in about half of the states, most of them being in the western part of the country. The term "brand inspection" is relative to each state. For example, in Oregon, a brand inspection is equivalent to an "ownership inspection" and is required for cattle, whether or not they are branded, when a change of ownership occurs, before shipment out of state, before sale at auction, and before slaughter. Because of this patchwork of regulatory requirements, it is difficult to provide specific information for each state. If AABP members are interested in the branding requirements of a specific state, the information can be found on the AABP website on the Animal Welfare Committee page at https://aabp.org/members/resources/State_Branding_Laws_2020.xlsx

POSSIBLE ALTERNATIVES TO BRANDING

One of the primary challenges when considering the welfare aspects of hot-iron branding is reliance on this method of permanent identification by many producers with extensive management systems and the requirement or recognition of brands as official animal identification by many states, particularly in the western part of the U.S. Several states require branding of cattle and many more have brand registries and recognize branding as the primary proof of ownership. This permanent, visible proof of ownership is one of the primary drivers of the practice.

Producers with extensive management systems also rely upon brands as a theft deterrent and as a method of tracing and reclaiming stray cattle. While veterinarians recognize the current research establishes that hot-iron branding is indeed painful and stressful on the animal, they also understand that clients need a viable alternative before they will be willing or able to end this practice. To answer this question, the working group reviewed several potential alternatives for their ability to replace branding as a permanent identification system. This review focused upon three factors which are important for a viable method of permanent identification: permanence, visibility and traceability. An additional factor which can be considered is pain and stress of implementation in comparison to branding, however there is very little literature available regarding pain and stress associated with the methods outlined below.

USDA IDENTIFICATION

The United States Department of Agriculture (USDA) employs several permanent identification systems which are required and recognized for USDA testing programs and official records. For many years, the USDA has pushed to build this into a required permanent identification program for the country which would provide a viable and recognized method of animal identification both practically and legally. Implementation of a full traceability system that includes all cattle in the U.S. has been blocked for many years by multiple industry and political groups. Like all tagging methods, these would involve some pain and stress associated with handling.

METAL TAGS This is the older form of USDA identification. These tags were either the USDA Brucellosis Eradication Program (orange) tags or the generic silver identification tags. These tags are managed by the state USDA offices and numbers are individual and traceable.

Permanence Semi-permanent; can still be removed

Visibility Poor; animal must be restrained to read

Traceability Good; could be better

RFID TAG The move by the USDA to build a program around Radio Frequency Identification (RFID) tags as the primary form of permanent identification provides some significant advantages. This move, however, has been a significant stumbling block for producers who do not wish to pay the higher cost of the tags, but in many production programs these tags have been adopted for their ease of use and significant data management advantages.

Permanence Semi-permanent, can still potentially be removed (despite label that reads “Should not be removed under penalty of law”)

Visibility Poor; animal must be restrained to read visibly, but easily read by electronic readers

Traceability Good; could be a good basis for efficient traceability system

BREED TATTOO OR INDIVIDUAL NUMBER Many breed associations recognize and register individual registration numbers which can be tattooed in an animal’s ear. In several states these tattoos are recognized by state livestock identification bureaus as proof of ownership. As this method uses skin puncture during the tattoo process, it would involve a degree of pain and stress of handling.

Permanence Permanent

Visibility Poor; animal must be restrained to read; colored breeds may be even more difficult

Traceability Good for registered breeds, less for non-registered

FLAP OR PLASTIC TAGS The primary form of identification on many farms is a numbered ear tag which then traces back to farm records. While this system is convenient and widely-used on farms, it would require significant work to build it into a permanent identification system. However, it could be recognized as a part of an identification program. One example of this is the branding alternative offered by New Mexico for confined animals. The state uses a flap tag which has the farm’s brand, along with the animal’s farm number, in lieu of a brand on the animal. Like all tagging methods, this would involve some pain and stress of handling.

Permanence Could be removed or lost

Visibility Good visibility

Traceability Currently poor, but could be used as part of permanent ID (visible with secondary permanent)

FREEZE BRAND While freeze branding is potentially less painful than hot-iron branding there is still concern about pain and stress associated with this method. This method has been used on many farms for individual cattle identification and in different species (horses) as permanent identification. One challenge with this form of identification is that it does not work as well on light-colored hair coats. In cases where cattle have lightly colored hair, the brand has to be left on longer to produce alopecic areas rather than just bleaching of the coat.

Permanence Permanent

Visibility Good; except on potentially light-colored hair coats

Traceability Good; could be better

BOLUS RFID There are several RFID bolus devices which are available for on-farm identification of animals. The advantage of this system is that the bolus is administered like a magnet and will come to rest in the animal’s digestive system. Since this device is internal it is difficult to remove. Because it lodges in the digestive content, which is discarded when the animal is slaughtered, it should not contaminate the food supply. The challenge associated with this method is the need to provide an external alert to indicate the presence of the RFID device, so a paired flap tag would be a good option. This would potentially involve some stress of handling and discomfort during the passage of the bolus, but likely little pain.



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REFERENCES

1. Lay, D.C., Jr., et al., *A comparative physiological and behavioral study of freeze and hot-iron branding using dairy cows*. J Anim Sci, 1992. 70(4): p. 1121-5.
2. Lay, D.C., et al., *Effects of freeze or hot-iron branding of Angus calves on some physiological and behavioral indicators of stress*. Applied Animal Behavior Science, 1992. 33: p. 137-147.
3. Lay, D.C., Jr., et al., *Behavioral and physiological effects of freeze or hot-iron branding on crossbred cattle*. J Anim Sci, 1992. 70(2): p. 330-6.
4. Schwartzkopf-Genswein, K.S. and J.M. Stookey, *The use of infrared thermography to assess inflammation associated with hot-iron and freeze branding in cattle*. Canadian Journal of Animal Science, 1997. 77(4): p. 577-583.
5. Schwartzkopf-Genswein, K.S., et al., *Comparison of image analysis, exertion force, and behavior measurements for use in the assessment of beef cattle responses to hot-iron and freeze branding*. J Anim Sci, 1998. 76(4): p. 972-9.
6. Schwartzkopf-Genswein, K.S., J.M. Stookey, and R. Welford, *Behavior of cattle during hot-iron and freeze branding and the effects on subsequent handling ease*. J Anim Sci, 1997. 75(8): p. 2064-72.
7. Tucker, C.B., et al., *Pain sensitivity and healing of hot-iron cattle brands*. J Anim Sci, 2014. 92(12): p. 5674-82.
8. Tucker, C.B., et al., *Effect of a cooling gel on pain sensitivity and healing of hot-iron cattle brands*. J Anim Sci, 2014. 92(12): p. 5666-73.
9. Melendez, D.M., et al., *Effect of subcutaneous Meloxicam on indicators of acute pain and distress after castration and branding in 2 mo old beef calves*. J Anim Sci, 2018.
10. United States Department of Agriculture Animal and Plant Health Inspection Service Animal Disease Traceability Program: https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA_Traceability. Accessed February 13, 2020.

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Permanence Permanent (except for surgical removal or potential passage)
Visibility Poor; essentially invisible without a paired external ID or RFID reader
Traceability Good; could be better

MICROCHIP While this form of permanent ID is widely recognized in non-food animal species it would pose a potential food safety risk in cattle. These devices could be placed in a non-edible location, like the ear, however there would be a small chance of migration of a microchip implant to an unapproved location. This method would also not be visible and would benefit from a paired visible ID to denote the presence of a microchip. This method would likely involve handling stress, particularly if the ear is used, as the animal would need to be well-restrained, and may cause a small amount of pain, as the microchip would need to be injected.

Permanence Permanent (could potentially be cut out, especially if located in the ear)

Visibility Poor; essentially invisible without a paired external ID or RFID reader

Traceability Good; these form the basis for permanent identification for many other species

GPS NECK COLLARS AND EAR TAGS One of the emerging technologies which could provide a significant tool for traceability of animals, especially in extensive management systems, is the use of GPS tracking. This technology has been used for years to follow wildlife, but traditionally has been bulky and limited in range. With modern GPS systems, the size of devices has decreased significantly, potentially providing a viable method of tracking cattle on extensive ranges. Currently, there are several forms of neck collars with trackers which can link via satellite, allowing their use without a ground sensor. There are also several ear tags with trackers which require a closer ground sensor to track cattle. While these technologies do not provide a form of permanent identification, they could be used to trace animals on extensive ranges to prevent strays and theft which, again, are two primary reasons cited for branding. The neck collar would not be associated with pain unless poorly fitted, and the ear tag would involve similar pain and stress experience as other tagging methods.

Permanence Neck collars easily removed; ear tags semi-permanent

Visibility Provide extensive visibility and tracking of cattle

Traceability Good for tracking cattle; poor as a regulatory form of traceability

BLEACHED NUMBERING One method of identification occasionally used for research projects is the use of hair bleaches to lighten the hair coat color and produce visible numbers. This method would likely be pain-free but would not be permanent.

Permanence Temporary

Visibility Good visibility

Traceability Poor; not as not permanent

COMBINATION OF METHODS Using the three criteria identified above, there is not one method of cattle identification which provides permanence, visibility and traceability. However, a combination of two or more methods could provide both permanence and visibility. For example, the method of combining tattoos or RFID along with a flap tag is already available for the USDA system and for several state ID systems. The only challenge is that the tags could potentially be cut out in the case of stolen cattle.

CONCLUSION

After reviewing the current literature, state branding laws and alternative methods of identification, the AABP Branding Working Group concludes that while hot-iron branding has been associated with pain in cattle, there is no clear method of animal identification which provides an obvious alternative to the method, meets all the concerns of cattle producers regarding stray cattle and cattle theft, and meets the legal requirements of states which rely upon branding. Freeze branding has consistently been shown to be less painful than hot-iron branding and, although not pain-free, could be recommended as an alternative until better methods become available. At this point in time, the working group believes that the best alternative to avoid the pain associated with hot-iron or freeze branding is the use of USDA RFID tags and implementation of a robust traceability program, either by the producer him/herself, or through a full national animal identification program. ■