

Farm Animal Management @Purdue

Methods of Livestock Identification

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Animal identification is the basis for keeping accurate production records of the herd/flock. Individual animal identification allows producers to keep records on an animal's parentage, birth date, production records, health history, and a host of other important management information. Accurate records provide the producer with enough information to make individual or whole herd/flock management decisions. In many instances, the producer needs to be able to quickly identify an animal. A successful identification system makes this task more efficient. Identification is also important to indicate ownership of a particular animal, or to indicate the herd/flock of origin.

There are many identification systems, but selection should be based on the method that best fits an operation's needs. Factors such as size of the operation, type of records kept,

and how easy or difficult the method is to apply. Two different methods should be used to assure permanent identification. Once a system has been selected, it is important to be consistent with providing each animal a unique and permanent identification number that matches with each method used. Be careful not to duplicate numbers over a minimum of a ten-year period.

When an animal is born/purchased, it should be identified immediately with only one unique number, which will serve as its identification number until it departs from the herd/flock.

Numbering Systems

There are many numbering systems that can be used to identify animals in a herd. One of the most commonly used and highly recommended systems uses a combination of letters and numbers, designating birth year and birth order,

Table 1: Letter identification system.

1990 – Z	1994 – D	1998 – H	2002 – M	2006 – S	2010 – X
1991 – A	1995 – E	1999 – J	2003 – N	2007 – T	2011 – Y
1992 – B	1996 – F	2000 – K	2004 – P	2008 – U	2012 – Z
1993 – C	1997 – G	2001 – L	2005 – R	2009 – W	2013 – A

Source: *Beef Cattle Identification Methods*. Nelson et al.

and source of replacement breeding stock, determines which system(s) to choose. When selecting forms of identification, consider the application methods for each type, along with visibility from a distance, equipment needed for application, cost, perma-

respectively. Such a system is shown in Table 1. The letters O, Q, V, and I are not used, they could be mistaken as numbers. This leaves 22 letters, which when combined with numbers can form the basis for individual animal identification. This system ensures a unique

number will not be replicated over a 22-year period. For example, an animal with the ID number L10 or L010 was the 10th animal born into the herd in 2001.

Year of Birth	Birth Order	ID
1995	1st	5001
2002	10th	2510
2011	100th	1100
2015	50th	5050
2021	150th	1650

Another system, which can be used for smaller herds of less than 500, consists of using only numbers to indicate birth year and birth order. The ID number is made up using the last digit of the birth year as the first number of the identification number. The next three numbers of the ID correspond to the birth order. To avoid duplication in this system, use _001 -- _499 for the first ten years (from 1990-2000), and _500 -- _999 for the second ten years (from 2001-2010), rotating every ten years. For example, in Table 2, the animals born in 1995, 2011, and 2015 are identified using the last digit of their birth year, and the ending from _001 -- _499, depending on their birth order. The animals born in 2002 and 2021 are identified using the last digit of their birth year, followed by adding their birth order to a number from _500 -- _999, to get the last three digits of their ID number.

Identification Methods

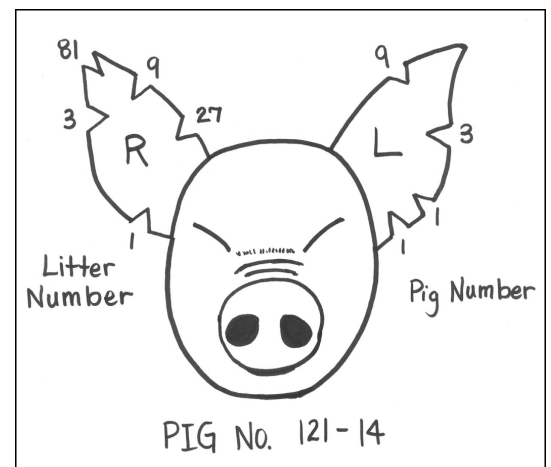
Ear Notching (Figure 1) Ear notching is widely used in the swine industry as a system of animal identification. There are variations in systems, but all of them identify a pig by litter number and individual pig number. Ear notching can also be used in other animal species, but it is not utilized as widely as it is in the swine industry.



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Figure 1: A pig after removal of a v-shaped notch at the 3-position on the right ear.

Ear notching involves removing V-shaped portions of the pig's ear that correspond to a specific litter number and also an individual pig number from that litter. Not all operations find it necessary to notch ears at processing, and some may only notch a litter number, or the week of birth. It is necessary to notch a pig's ears for litter and individual numbers when the pig needs to be recognized separately from other pigs. Pigs being kept as replacement breeding stock and for exhibition purposes need to be ear notched. Ear tags are often used in conjunction with ear notches in a breeding herd.



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Figure 2: Ear notching system used by the purebred swine associations of the United States.

There are many systems of ear notching, but when using the system of ear notching required by the purebred swine associations of the United States, the litter number is notched in the pig's right ear, and the individual pig number is notched in the pig's left ear (See Figure 2). The notches from the right and left ear should combine to give each pig a unique identification number. The notches are numbered from the bottom of the ear, with the number one being next to the head. Multiplying this number by three will give the next notch number (i.e., 3, 9, 27) which is adjacent to the area where the previous notch was located. Start at the bottom of the ear next to the head and continue to the top of the ear, then work back toward the head. The exception to this is the tip of the right ear, which is the position for the 81-notch.

Each notch, with the exception of the 81-notch, can only have two notches for any single number. For example, a pig identified as 28-3 would be the third pig from the twenty-eighth litter. This pig would have one notch each at the 27 and 1 position on the right ear, and one notch at the 3 position on the left ear. A pig identified as 18-2 would have two notches each at the 9 and 1 positions on the appropriate ear.



Figure 3: Ear tagging pliers and plastic, pre-numbered tag.

To notch ears, use an appropriate sized notcher, according to the age of the animal. It is important to keep the equipment in disinfectant to prevent infection. Ear notching causes minimal stress to the pigs, and they can be returned immediately back to the crate. The notches will bleed, but not heavily, and a scab will form in about a day. The notches will be completely healed in about a week. It is usually easiest to notch ears at the same time as other pig processing procedures. Registered pigs must be notched within 7 days of birth.

Ear Tags

Ear tags are another common form of identification used in all species. A number of companies make and sell ear tags and corresponding applicators. The flexible, plastic tags can be bought pre-numbered (Figure 3), or they can be purchased as blank tags. The producer can use ear tag ink to number them accordingly. The tags come in a variety of colors and sizes. Selection depends on the age of the animal and the environment where the animal lives.

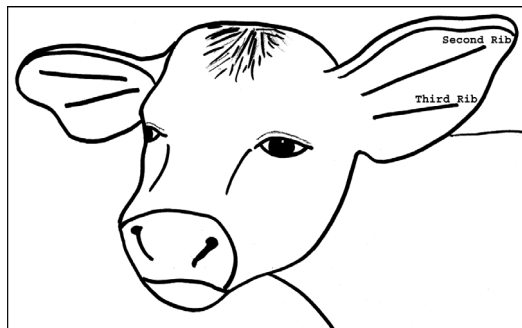


Figure 4: Diagram illustrating the 2nd and 3rd ribs of the ear.

The tags are pierced through the animal's ear, and allow for an animal to be identified from the front and the back, if the tag is numbered on both sides. Tags should be installed between the second and third cartilage rib (Figure 4) of one or both ears, using an applicator gun that



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Figure 5: Freeze brand number 'D98' on the rump.

corresponds to the type of ear tag being used. Ear tags are easy to use, flexible in all types of weather, inexpensive, and usually easy to read. There can also be limitations with ear tags. They can be ripped from the ear, or become lost if not applied properly. Permanent marking ink is used to number blank ear tags. However, the ink can fade over time. It is recommended that another method of identification be used along with ear tags.

Freeze Branding

Freeze branding is another method of animal identification that allows for animals to be identified from a greater distance than with ear tags. Brands can be read any time of the year. Freeze branding, similar to hot branding, involves the use of branding irons, with letters and numbers, being chilled in liquid nitrogen or dry ice and alcohol. Upon application to the animal's hide, the

chilled branding iron kills the cells that produce color pigment in the hair follicles, but does not kill the growth follicles. After freeze branding, white or colorless follicles are produced in the branded region, which results in a permanent brand (Figure 5).

Freeze branding irons come in various sizes and are usually made of copper, copper alloy (brass), or bronze, because of their temperature holding capacity. Some recommended equipment and items to have on hand include:

- Holding chute for restraint of the animal
- Container for liquid nitrogen or dry ice and alcohol
- Electric clippers with a surgical blade
- Grooming equipment for cleaning the brand site
- Gloves
- Squirt bottle with a solution of 95% isopropyl alcohol
- Branding irons
- Timing device



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Figure 6: Branding irons soaking in a wooden box filled with liquid nitrogen.

Table 3: Application times	
Hair color	Application time at weaning (Add 15 seconds for yearlings)
Black	45 seconds
Dark Red	1 minute
Yellow	1 minute, 15 seconds
White	2 minutes, 15 seconds

The branding procedure consists of cooling the irons in liquid nitrogen or dry ice and alcohol, until they are ready for use (Figure 6). The irons are ready for use when the "boiling" of the liquid surrounding the irons diminishes. While

the irons are being cooled, restrain the animal in the squeeze chute, and begin clipping the hair in the branding area, usually in a rectangular shape, followed by brushing or using a blower to remove any loose hair or dirt. Apply the alcohol over the clipped area. This allows for increased penetration of the cold through the skin, and also removes some skin oils. Align the cooled branding iron over the branding region, and apply with firm, constant pressure, making sure the whole iron has contact with the skin, and remains in the same position (Figure 7). Start timing the length of the application, and when the appropriate time (see Table



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Figure 7: Chilled branding irons being applied to the rump area.

3) has elapsed, remove the iron, and place it back in the liquid nitrogen. Irons that have just been used will need adequate time in the liquid nitrogen for re-cooling before being used again.

After the application, the area will begin to swell, and will continue to be swollen for 48-72 hours. About 20 to 30 days after the swelling has subsided, the brand will form a scab. Once the scab has disappeared, white or colorless hair will begin to grow in the branded region, and by 3 months after branding, new hair growth should be complete. The success of the freeze brand depends on several factors: the age of the animal, hair color,

time of year, branding site, method of application, and a little luck.

Older animals require an extended application time because the pigment-producing hair follicle is harder to kill. White animals also require an extended application time because you are actually performing a bald brand, to kill the entire hair follicle. This allows for the skin to be seen as a brand, which provides a more visible brand for this color of animal. The time of the year that the brand is applied affects how easily the pigmented cells are destroyed. During spring and fall, the hair follicles are the most active, and therefore, most easily destroyed.

The branding site can vary between the shoulder, and the rump, with the rump being more desirable due to its flat, muscular characteristics. How well the brand area is prepared, and how well the brand is applied affects the clearness of the brand. If a branding iron is moved during application, or pressure is not applied equally and firmly, the resulting brand will look streaky or smudged due to colored hair follicles in the branded area, or could cause an "8" to look like a "3." Freeze brands are permanent and easily visible from a distance. Disadvantages of freeze branding include the permanency of this method and the fact that a brand can never be removed or replaced, and the up front costs of purchasing all the needed materials and equipment.

Electronic Identification

There are many different forms of electronic identification used in the world today. Of these, the most common include electronic ear tags, microchips, and electronic collars. When using electronic ear tags, it is best to use an additional method of identification, in case the tag becomes lost.

Microchips are a form of identification that involves the implanting of an elec-

tronic chip, with a miniature radio transponder and antenna, under the skin of an animal. The most common implant site is near the neck, between the shoulder blades, or near the base of the ear. The transponder can also come in the form of a bolus that can be ingested by ruminant animals. A benefit of using microchips is that they are permanent and relatively painless to implant. Drawbacks to microchips include: the possibility that the chip may migrate into the meat of a market animal; specialized equipment is needed to read and implant the chips, and they are not readable from a distance.

Electronic collars are similar to neck chains, except they have an attached tag with an electronic number that can be read by a scanner. Electronic collars are easy to use, but they can become a nuisance and can cause choking if they are not adjusted properly to the growth of the animal or if they become hooked on protrusions.

With each of these electronic ID methods, a scanner interprets the radio signal from the tag or implant as a numerical code, which brings up a corresponding computer file for that particular animal. Thus, a production history can be located quickly by scanning the electronic chip. Electronic identification can be used to automatically dispense feed to animals,



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Figure 8: Dairy cow with a neck chain and corresponding numbered tag.

and can be beneficial in the milking parlor by providing and recording valuable information during each milking.

Electronic identification systems will become more refined and industry accepted in the future. These systems have a distinct advantage of being able to store the increasing amount of data the progressive animal manager has to interpret.

Neck Chains

Neck chains, or ropes, are used as a common method of identification in dairy cattle. The neck chains have a numbered tag attached that corresponds to that animal's identification number (see Figure 8). The chain or rope should be positioned around the animal's neck, tight enough not to slip over their head, but loose enough to allow easy breathing and growth for young animals. They are easy to apply, painless to the animal, and can be seen fairly well. However, if growing animals are not inspected frequently, the chain can become too tight. Chains can also become caught on protrusions that choke the animal. Furthermore, the chains are not permanent, and can be hard to see when animals are grouped together.

Nose Printing

Nose printing is used as a form of permanent identification, and is most commonly used for the sale and exhibition of sheep and cattle. Nose printing is useful, because it cannot be modified in any way, unlike many other forms of identification. Nose printing is similar to finger printing, in that the lines and dotted pattern from a nose print are specific for each animal, and can be recorded by making an ink print. When two prints of the same animal are compared, there must be six identifiable matching lines or dots common to both prints (see Figure 9 and Figure 10 for examples of acceptable prints). Printing is performed by restraining the animal's head, either in a head gate



Figure 9: Three acceptable nose prints of the same sheep, illustrating similar lines and dotted patterns.



Figure 10: Acceptable beef nose print.

or with a halter, and placing a minimal amount of ink on the animal's dried nose. The ink is then transferred to an index card, supported by a wooden block or stiff backing, by pressing the card against the animal's nose. If the prints are readable, they should be allowed to dry, and clearly identified with the owner's name and the animal's identification number. Problems associated with nose printing include: the use of too much ink, a build-up of moisture on the animal's nose, and not holding the animal still, which can result in a smeared, unreadable print.

Paint Branding

Paint branding is a temporary form of identification. It is sometimes used along with a form of permanent identification. Irons similar to those used in freeze

branding or hot branding can be used to print a number on the animal's back using paint. This method of identification may be useful in situations where animals are assigned to specific pens or crates and need to be returned to the same pen or crate after they are

turned out. Examples are a farrowing or gestation barn, a lambing pen, or livestock shows. Paint branding can also be useful when offspring need to be identified with their parents.

For exhibition or sales, paint branding is useful as a form of temporary identification because it is easily visible, and it is used to identify the animal in the sale directory. Prospective buyers can evaluate their selections before purchasing. During most livestock sales or shows, animals are paint branded as they are weighed-in.

The paint numbers are usually applied from the left side of the animal for consistency, in reading the number from the animal's head to its tail. Special paint is poured into a shallow pan, lined with burlap or a similar material to soak up the paint. The appropriate numbered irons are pressed in the paint soaked burlap, and then applied perpendicular to the animal's backbone, by pushing down firmly and with a slight rocking motion, so that the entire brand comes in contact with the animal. Using too much paint causes the excess to run off the animal's back. This produces an illegible brand. It is important to use the correct brand numbers and to be alert for the animal's movements, to prevent smearing the brand.

When using a 6 or a 9, it is necessary to underline the number using the bottom of the number '1' branding iron, to prevent errors in reading the identification number. Between brands, the branding irons

should be allowed to hang to allow any excess paint to drip into the drip pan. Once all branding is complete, the branding irons should be cleaned, removing as much paint as possible.

Tattooing

Tattooing is another form of permanent identification that is commonly used in all species and involves imprinting an identification number/letter combination into the skin of the animal using indelible ink. The tattooing instrument uses number/letter dies made of sharp, needlelike projections that are secured on the application pliers. The ink is usually applied to the tattoo site after it has been disinfected with alcohol. Using the pliers, the identification number is pierced into the skin, and additional ink is rubbed into the punctures. After healing, the permanent tattoo will be visible. For cattle, goats, sheep, and swine, the tattoo is placed above the first rib of the ear so it does not interfere with the use of ear tags. Horses are often tattooed on the inside surface of their lips. Sheep can be tattooed on the inside of their flank, and swine can be tattooed on the shoulder for carcass identification during slaughter. Most purebred animals are required to be registered and permanently identified by their breed associations. Tattooing is the best permanent method of identification for registered animals because it does not harm the animal's appearance or reduce its value in any way.

The best time to tattoo depends on the species of animal. Cattle are easiest to tattoo when they are young calves. Goats and sheep should be tattooed at about 6 months, when the ear tissue is finished growing, and there is more space to apply the tattoo. Horses should be tattooed as late as possible because as the animal

grows, the tattoo will fade and become spread out. Swine can be easily tattooed at a young age, but as the animal's ear or carcass grows, so will the identification number.

To begin tattooing an animal, the animal must be restrained so that firm, constant pressure can be applied until the needles on the dies have protruded deep enough into the skin, to leave a permanent tattoo. When preparing the letters/numbers on the pliers, they will appear backwards as you look at them. It is usually a good idea to check the dies on a piece of paper before application to the animal. Next, locate the area to be tattooed, clean the area with alcohol, and apply the tattoo ink to the area. Squeeze the handles of the tattooing pliers over the tattoo site making sure they are compressed completely. After application, rub additional ink into the piercings. For carcass tattoos in swine, a tattoo hammer is used, and is swung toward the tattoo site with enough force, so that the needles will penetrate the skin. The animal can be released after the number has been recorded. Tattoo equipment should be disinfected between each use.

One disadvantage of tattooing is that the animal must be restrained to apply and read the identification number. In dark-pigmented ears, the number is almost unreadable, unless a flashlight is placed behind the ear. Therefore, it is best to use green tattoo ink in dark pigmented ears. It is also a good idea to use another form of easily visible identification to accompany the tattooing method.

Summary

Accurate animal identification systems are the basis for data collection and many necessary management practices. Identification of animals within a herd/flock is valuable to producers and managers to make logical decisions based on an animal's records.

Animal identification methods differ, and each has its own benefits. All methods can be useful when used in the correct manner and under the right conditions. Oftentimes, more than one method is used for maximum accuracy. With these stipulations in mind, it is best to determine the needs and expected uses of animal identification on an operation, before choosing the best method(s) of identification.

References

Battaglia, Richard A., *Handbook of Livestock Management*. 3rd ed. New Jersey: Prentice-Hall, Inc., 2001.

L & H Manufacturing Company, *Freeze Branding: Operating Instructions for L & H Freeze Branders*.

Nelson, L.A., W.L. Singleton, T.M. Lutz, *Beef Cattle Identification Methods*. Purdue University Animal Sciences Department.

Rusk, Clinton P., *Electronic Identification of 4-H Livestock Projects*. Purdue University 4-H Youth Department.