

WORKING DOCUMENT FOR CONSULTATION PURPOSE

4

ISSN 1810-0708

FAO ANIMAL PRODUCTION AND HEALTH



guidelines

GUIDELINES FOR ANIMAL WELFARE: IDENTIFICATION OF BEEF CATTLE



GUIDELINES FOR ANIMAL WELFARE: IDENTIFICATION OF BEEF CATTLE

M. J.R. Paranhos da Costa
F. Galindo Madonado
X. Manteca i Vilanova
S. M. Huertas Canén
Dahlanuddin
C. Phillips
D. Battaglia

Recommended Citation

FAO. 2010. *Guidelines for animal welfare: identification of beef cattle* Edited by M. J.R. Paranhos da Costa, F. Galindo Madonado, X. Manteca i Vilanova, S. M. Huertas Canén, Dahlanuddin, C. Phillips and D. Battaglia. FAO Animal Production and Health Guidelines. No. 4. Rome.

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

ISBN xxx-xx-x-xxxxx-x

All rights reserved. FAO encourages reproduction and dissemination of material in this information product. Non-commercial uses will be authorized free of charge. Reproduction for resale or other commercial purposes, including educational purposes, may incur fees. Applications for permission to reproduce or disseminate FAO copyright materials and all other queries on rights and licences, should be addressed by e-mail to copyright@fao.org or to the Chief, Publishing Policy and Support Branch, Office of Knowledge Exchange, Research and Extension, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

Contents

Acknowledgments

1. Introduction
2. Objectives of beef cattle identification
 - 2.1 Individual identification
3. Basic elements of beef cattle handling
 - 3.1 Habituation and operant conditioning
 - 3.2 Driving and restraining adult animals
 - 3.3 Driving and restraining calves
4. The impact of identification on beef cattle welfare
 - 4.1 Positive effects: keeping control on the farm and the animals
 - 4.2 Negative effects:
 - Distress and pain
 - Risk of accidents
 - Risk of infections and parasites infestation
 - Risks of lesions and other problems on the identification sites
5. Beef cattle identification methods
 - 5-1 An overall view
 - 5.2 Efficiency of identification methods and risks of impairing cattle welfare
6. Handling procedures for beef cattle identification
 - 6.1 Ear-tattooing
 - 6-2 Ear-tagging
 - 6.3 Fire branding
 - 6.4 Freeze branding
 - 6.5 Paint marks
7. Care of the animals after the identification procedures
 - 7.1 The process of wound healing
 - 7.2 Reducing the risk of infections and parasite infestation
8. Good practices of beef cattle identification step by step
9. Final considerations

Acknowledgments

The Food and Agriculture Organization of the United Nations (FAO) would like to express its appreciation to all the experts, resource persons and those who contributed to the preparation of this publication by providing their time and expertise, data and other relevant information, or by reviewing and providing comments on the document.

Special acknowledgment is given to Anita Schmidek and Hugo Durán for their fundamental contribution to this publication. The authors are also grateful to Viola Weiler and[ADD if needed] for their support and contributions. The photos used in this manual were taken by Anita Schmidek, Mateus Paranhos da Costa, Murilo Quintiliano,[ADD if needed].

The organizations and companies listed below contributed to the publication, being among those which promote practices to improve farm animal welfare: Agropecuária Jacarezinho, Allflex do Brasil, Estação Experimental de Zootecnia de Sertãozinho (EEZS-IZ/SAAESP), Ford Dodge Animal Health, Fundação de Apoio a Pesquisa, Ensino e Extensão (FUNEP), Irmão Beckhauser Ltda, [ADD if needed].

1. Introduction

Animal welfare is recognized as a core component of a responsible livestock sector. It is accepted to be integral to programmes that improve animal health, increase livestock production, respond to natural disasters where animals are involved, and to be instrumental in defining the fit between the genetic makeup of animals and the environments in which they are kept.

FAO recognizes, on the other hand, that animal welfare practices, despite their evident positive impacts, are insufficiently applied throughout the sector, both in traditional and modern systems.

To enable more explicit attention to animal welfare and its mainstreaming into practice, FAO's Animal Production and Health Division (AGA) is producing a series of Guidelines that provide specific advice, from the best expertise available, and concrete, detailed information on how to take care of animal welfare during several key practices in animal husbandry.

It is reasonable to assume that the improvement of beef cattle welfare is not a difficult task, mainly when they are maintained in extensive conditions. However, special attention should be paid when handling the animals; mainly when driving them from the pastures to the corral and when going through some routine handling procedures for key activities (e.g. weighing, vaccinating, identifying, etc.). When doing this we usually produce a disruption in cattle's social activities, reducing the animal personal space and causing breakdown in the equilibrium of the hierarchy of dominance.

Minimizing these negative effects is not an easy task, given the conditions under which cattle are usually handled. It is not rare to handle cattle in an inappropriate way, by galloping, shouting and sometimes using physical aggression. Under these conditions the animals usually react with fear that leads to avoidance behaviour with the consequence that the animals usually flee from or attack people, when they are unable to escape.

The problem is even more complex. Cattle have a good memory and the ability to recognize people, being able to present anticipatory reactions and to try to run away from being handled after experiencing negative interactions with people. Nevertheless, this learning capability could be used to improve the animal reactions when handled by promoting positive interactions with the same animals which, in turn, lead to an improvement in the interactions in between cattle and humans.

This publication, by applying animal behaviour considerations and observations, indicates some good practices to handle beef cattle for their identification; they emphasize a positive approach aiming to promote cattle welfare and at the same time improve labour efficiency and safety. Biosecurity considerations have also been taken into account.

They are partially based in a previous publication by Schmidek, A., Durán, H. and Paranhos da Costa, M.J.R.¹ which was written after five years of research and practical work on beef cattle identification, offering opportunities for learning and exchanging experiences, and focused specifically on the conditions of Brazilian beef cattle farms. This empirical background is also reflected in these Guidelines, but they have a broader approach, considering several methods of cattle identification and expanding the content and the application to worldwide scenarios.

¹ Schmidek, A., Durán, H. and Paranhos da Costa, M.J.R.¹. 2009. Boas Práticas de Manejo: Identificação. Jaboticabal: Editora Funep, 39 pp. (ISBN 978-85-7805-032-0)

These Guidelines have been developed through a wide consultation process, whereby all players involved in the livestock sector (producers and professionals through their association, multilateral and non-governmental organizations, research and educational centres, etc.) had the opportunity to provide inputs.

The publication is intended to guide farmers, veterinarian, animal scientists and all operators handling cattle for animal identification purposes and can also serve as training material.

Translations and adaptations of these guidelines to specific circumstances and production systems is encouraged.

2. Objectives of cattle identification

Animal identification is an essential component to define ownership and assure traceability and disease control. It also serves multiple other purposes: the unique identification of animals is the basis for pedigree and performance recording, artificial insemination schemes, subsidy payment schemes, good farm management, prevention of animal rustling, trade certification and contributes to secure access to markets for higher quality and geographically identifiable products.

Cattle identification is important for management purposes because it provides beef farmers a mean for better control not only over herd performance and management, but also on the conditions of the facilities and equipments and the use of products (vaccines, medicines, food, etc). With the help of this information, farmers can review their management strategies or set up new ones and can introduce new measures to improve the efficiency of their farms.

2.1 Individual identification

Individual identification should take place in all beef farms. It is usually characterized by a code (defined by the combination of numbers, letters or symbols) that is given to a particular animal.

The code should ensure a positive and unique identification for each individual, making possible to differentiate it from its herd mates. The herd might represent the animals from a specific pasture or farm, or the cattle population from a specific area or even from a specific country. A unique identification means that there is no other animal with the same identification code within the herd. In other words, there is no repeated code in a herd. Positive identification means that the code attributed or read is correct. A clear example of non-positive identification occurs when an animal identification number is not recorded or read correctly.

Unique and positive identification is very useful for management purposes, allowing the farmers to have a better control on their herds and helping to track the use of veterinary drugs, to control certain operations (e.g. artificial insemination and pregnancy diagnosis) and to take decisions about selective breeding, for example.

Ideally, individual identification should be carried out as soon as possible in the animals' life, preferably during the first days of life of the calf, or soon after the arrival of an animal on the farm.

3. Basic elements of beef cattle handling

The procedures for beef cattle identification, although usually simple, require attention. It is important to work with a well trained working team that perform its task with attention and organization, using adequate facilities and equipments and good quality materials and products.

Important: In beef cattle identification, animals should be handled quietly and safely, without causing pain or compromising their welfare.

3.1 Habituation and operant conditioning

Cattle have a good memory and high learning capacity. They are able to learn from their positive and negative experiences with human beings and the places and way in which they are handled: their reactions are usually related with these experiences.

The adoption of simple measures, like leaving the animals in a paddock nearby the corral when waiting for the beginning or the end of a particular operation or setting up strategies to promote cattle's habituation or positively conditioning to the handling procedures, can reduce stress and improve labour efficiency.

Habituation reduces the frequency of fear responses, which are common when an animal faces new situations. Habituation means literally to be familiarized with people, facilities and handling procedures; assuming that the animals do not receive any reward or punishment during the habituation process.

However, habituation is not always sufficient, since cattle identification procedures usually induce a negative stimulus, resulting in anticipatory cattle aversive reactions by increasing avoidance and aggressive behaviour. To reduce these unwanted reactions is necessary to balance negative and positive stimuli, and this can be done by using operant conditioning techniques with positive reinforcement.

Operant conditioning with positive reinforcement can be achieved by rewarding the animals that present the desired behaviour. A little of tasty food, highly attractive to the animals, is assumed to be a good reward for cattle, and it should be offered as soon as possible after handling them; for example, just after driving the animals from the pasture to the corral, or just after driving them through the corral facilities. However, for animals fed mainly on concentrates, a specific rewarding feeding programme should be set up to keep the animals highly motivated to feed; alternatively positive physical contact could be used for positive reinforcement.

Practical tips about how to achieve beef cattle habituation or positively conditioning towards people or handling:

- Stay with the animals whenever possible.
- When riding a horse, dismount and stay for a while in the middle of the herd on foot.
- Do not threaten the animals.
- Do not miss opportunities to promote positive contact with the animals when carrying out the work routines.
- Whenever possible, offer rewards to the animals after a handling procedure. Feed is always good reward for cattle, not because of its nutritional value, but due to its flavour.
- All animals must have access to the rewards, and anything causing competition among them should be avoided.

The time necessary for habituation and operant conditioning is quite variable among individuals; special attention should be paid to more reactive animals.

Avoid handling frightened and agitated animals, giving them a time, resuming the activities after 10 to 15 minutes break.

Remember! Cattle are able to make a distinction between specific situations, facilities and people and they will react to them according to their previous experiences.

3.2 Driving and restraining adult animals

Animal welfare during beef cattle identification is more easily achieved when some facilities are available. For example, it is easier to insert an ear tag or to apply a freeze branding when the animal is properly restrained and is strongly recommended to use a squeeze chute to do it. Nevertheless, it is possible to achieve good results also when adequate facilities and equipments are not available, by improving handling skills.

The animals should be handled with calm and patience. Cattle are especially sensitive to acoustic stimuli, so intense noise should be avoided. Do not chase or threaten the animals, neither hit the animals with woods and prod, nor use electric prod. Do not use untrained dogs for beef cattle driving or herding.

When driving them from the pastures to the corral consider using a "guide", a person riding a horse in front of the herd and "calling" the animals and showing them the path to follow.

Sometimes cattle are reluctant to be driven. This is common when the animals do not know the place. Under such circumstances it is recommended to introduce some "mother cows" in the herd. Mother cows are docile animals that were trained to be driven from the pastures to the corral or inside the corral, promoting social facilitation, which happens when an animal imitates the others' behaviour. In this case facilitating driving since the animals probably will follow them, walking in the right direction. Mother cows should be previously trained before start working with them.

When the pasture is far from the corral, drive the animals one day before start the identification procedures, accommodating them in a pasture or paddock near the corral, where the animals should have easy access to food, water and shade.

Do not keep the animals for long time waiting for the handling to start or finish; especially when water, feed and shade are not available. Use the pasture or paddock near the corral also to keep the animals before and after identification.

It is also important to have a feeding trough available on this pasture or paddock, a place to offer a small amount of feed to animals every time that they are driven to the place. Doing this you conditioned the animals positively, making driving easier in the future.

It is always easier to work with smaller groups of animals that are familiar to each other. Drive small groups of animals from the paddock to the corral and soon after identifying them, drive them back to the paddock. If possible limit the herd size to a 100 animals, and divide it in groups with no more than 10 when driving them through the corral facilities.

Avoid keeping animals in isolation, since this situation usually increases stress and aggressive behaviour.

Do not overload the corral pens, the animals get stressed under such situation, and it is more difficult to control them.

Driving cattle inside the corral should also be carried out calmly. A flag can be used to stimulate and orientate the movement of the animals.

Usually cattle jump, lie down and try to escape from the identification procedures, making the work difficult and risky. Use proper restraints to reduce the risk of these negative reactions. Be sure that you have reasonable control on animal reactions before starting identifying it. Doing this is expected a reduction in stress and labour accidents.

There are many ways to restrain beef cattle, lassoing, helter, squeeze chute, etc. It is strongly recommended to use a squeeze chute with head gate if available, since it reduces the risk for both humans and animals. Restraining cattle in a squeeze chute should be done with care, since there is a risk of injuring the animal when the procedure is not carried out properly.

Drive the animals one by one into the restraining chute without rush. Do not shout or threat the animals neither hit or electric prod them. Never throw the gates and the restraining structures on the animals' body. The handlers should be in control, and the speed and force applied to these structures should be well controlled.

Before restraining an animal with the head or sideways, be sure that the front gate is closed (if existing). Never use the head gate to stop an animal, by doing this you increases the risks of harming animals and breaking equipments.

Do not beat the gates on the animals' body when closing them. Trigger the head gate when the animal is standing, and do it with care.

Warning! There are several types of head gate restrainers; some of them have projections in both sides, aiming to restrain specific categories of cattle (see photos). Under such conditions restraining should be done with extra care, since the risk of injuring the animals is higher.

In some cases it is important to combine more than one method of restraint, using restraining chute and halter at same time. This is necessary when the restraining system is not working well or when it does not fit well with cattle size.

Improper animal restraint could cause serious problems. Be sure that restraining is done properly before starting identifying the animal.

3.3 Driving and restraining calves

In some cases young calves can be handled for identification purposes in the pasture, paddock or in any other place wherever the animals are, without driving them to a corral. This should be done with extreme care, since after parturition the cows are usually very protective, and can attack the person carrying the work.

When the work is done in the first or second day of age it is still possible to hold the calves using the hands. It is necessary at least two people to do the work: the cow and calf approach should be done slowly on a horse back, one person take care of the cow, keeping it far from its calf, while the other person dismount and hold the calf. These are not easy tasks; the people in charge of them should be well prepared to do both activities.

When doing the work with order calves, cows and calves should be driven into a corral or a small paddock. Be extremely careful when driving herds with young calves. Never drives the herd on gallop nor threat the animals.

Special care should be taken when calves are less than one month old. Avoid crowding or any other situation that put the calves at risk of being trampled, crushed or pressed by adult cattle.

Attention to the bottleneck points, such as: narrow corridors, or when crossing gates or bridges. Under such situations slows down, and drive the animals in line, keeping the control.

Be aware, if any calf does not succeed to follow the herd or if it walks with difficulty, stops driving. Wait some minutes and continue driving the herd only after its recovery. If the recover is not probable, find another way to lead the tired or injured calf to the corral. A very young calf can be transported by a horse rider, on the saddle. If a heavy calf or two or more calves are presenting the problem, use a wagon or cart to transport them.

Once getting the animals into the corral, accommodate them in a dry, clean and large area; with plenty of space and without crowding.

Calves must be separated from their mothers before starts handling. This should be done carefully, in the open areas of the corral. Never drive mixed groups of cows and calves trough the chute and other restraining facilities, the risk of calf injuries increases when doing this.

Usually a proper cow-calf separation can be done in a gate, driving the cows to a next corral pen. This is usually done by two or three people riding horses, but is also possible to do it on foot. Avoid putting calves at risk, work with calm, without threatening or hitting them.

It is possible to use operant conditioning to facilitate mother-offspring separation. Start calling the cows when separating them from their calves and reward both with tasty food just after finishing separation. This can be done either in the pastures or in the corral pens.

When doing in cow-calf conditioning for separation the pasture is recommended to use a special structure to facilitate the work. A simple and cheap suggestion of drawing is presented in the figure below; this structure is very useful for many other purposes, when separating animals from the herd is required (e.g. weaning).

Driving calves inside the corral is not a simple thing. Very young calves (less than 30 day of age) are easily threatened by the presence of livestock people and usually do not understand their commands, and usually the facilities and equipments dimensions (mainly the chute) do not fit with the calves size till they reach around 150 to 200 kg. Under such conditions calves usually get wild, they try to escape through the fences, and turn back and swing inside the chute. It is even worse when driving four or more animals through the chute at the same time, since they usually get stuck.

The use of a handling board is recommended to drive very young calves from the corral pens to the restraining facilities (as showed in the figure on the left side) and to drive any calf, up to 150 kg, inside the chute. Doing this you facilitate driving and also protect your self to be kicked by the calves, when walking behind them.

The handling board could be made with wood and it should be light but strong enough to resist pressure and kicking. Its form and size should fit to the chute's shape and dimensions when used to drive the calves through it (see figures in the right side).

Avoid working with more than three calves every time when driving them through the chute.

Young calves should not be restrained in the head gate; use your hands to do it. A person should stay inside the restraining chute, holding the calves, one by one. For older calves, or those with 60 kg or more, adopt the same restraint procedures described previously in this guide (driving and restraining adult cattle for identification), but with extra care.

When working in a paddock or when restraint facilities are not available, lassoing can be used. It is better doing it after the mother-offspring's separation. Be careful, lassoing should be done properly, do not pull or drag a lassoed calf, just hold and get closer of it, then dismount and hold the calf with your hands.

After identifying all calves should be released in the paddock where their mothers are already accommodated.

Avoid carrying out simultaneously other potentially stressful procedure (e.g. dehorning, castration, etc.); and avoid carrying them out just before nor soon after the identification.

4. The impact of identification on beef cattle welfare

There are some identification procedures that could be considered as stressors for cattle, mainly when adopting methods that cause lesions, such as: ear tattooing, ear tagging, ear notching, fire and freeze branding. Besides, restraining the animals is usually already stressful by itself.

However, when the procedures are carefully done fewer negative effects are expected, since in this case stress and pain usually last for a shorter period time, even when invasive identification methods are used. Moreover, these effects could be compensated by creating some positive stimuli to balance the negative ones.

The aim should be the improvement of identification procedures to reduce risks for humans and animals.

4.1 Positive effects: keeping control on the farm and the animals

The individual identification of animals can be beneficial to avoid generating unnecessary stress, by providing an important element for herd management and record keeping on individual animals and therefore allowing farmers and livestock keepers to define with more precision which animal need to be handled for specific purpose (e.g. provision of veterinary drugs). Proceeding in this way is less stressful for the animals and less laborious for the workers. This means that only when strictly necessary the animals will be submitted to the stress of being handled for a specific purpose.

For example, when a veterinary treatment is needed only for some few animals in a herd, some types of individual identification allows livestock people to separate them from the herd mates in the pasture, avoiding driving the entire herd to the corral.

Besides, the individual identification allows livestock keepers to follow more closely the recovering process in animals submitted to a veterinary treatment.

4.2 Negative effects

The level of stress or pain could be quite variable during beef cattle identification. It depends among others on the identification method, the quality and duration of handling, cattle's previous experiences and temperament, and the conditions of the place where the identification is carried out, among others.

Adverse situations usually result in distress and pain, impoverishing the welfare of the animals and increase the risks of accidents, identification failure and site lesions.

Distress and pain: Short term stress and pain are often there when executing beef cattle identification, but they usually last for a very short time. Distress and long lasting pain result from bad handling mainly when this is done without care or aggressively, and when cattle are kept for long time under stressful environmental situations (e.g. exposed to low or high temperatures for long time, maintained isolated or in unstable social groups, kept in a place with lack of space or with no access water or food for long period of time, or when threatened by dogs or people).

Risk of accidents: Cattle usually react to the identification procedures presenting avoidance behaviour, by trying to escape, jumping, kicking, and butting; these reactions increase the risk of harming themselves and the workers and could result in broken bones, scratching, bruising and other injuries in workers and animals.

Risk of infections and parasite infestations: Cattle identification can results in a skin injury and the open wound can be infected by microorganisms or infested by flies'

larvae. The risks of infections and parasite infestation are variable, and sometimes they could be quite high, depending on the identification method, environmental conditions, handling procedures' quality and animal immune response, among others.

Risks of lesions and other problems on the identification sites: Severe inflammation and skin tumours could occur in the identification site respectively as a consequence of ear-tagging and freeze or fire branding.

5. Beef cattle identification methods

5.1 An overall view

There are many methods to identify beef cattle, some of them are temporary and others permanent. Temporary identification can be removed, lost or may fade with the time, while a permanent identification should last in the animal's body for a long period of time, ideally for its entire life.

The ideal method for identification for all animals has not been established yet, since no single method combines the six wanted characteristics of being: 1) permanent (that can not be removed, altered, discoloured or lost), 2) easy to apply, 3) low cost, 4) legible at distance, 5) safe to workers (without risk of accidents), and 6) animal friendly (that do not cause discomfort, pain or stress).

The most used methods for beef cattle identification are: ear-tattooing, ear tagging (visual or electronic), fire and freeze branding and paint marks, (the one is often used for short term identification). There are other methods, among them intra-ruminal boluses, ear notching, nose and horns printing, and retina scanning, which are less frequently used.

The decision on which method is going to be used depends on the purpose of the identification, local rules and regulations, environmental conditions, herd size and availability of resources.

Negative effects of the identification, like stressing the animals, damaging the hides and exposing the workers to a high risk of accidents, should also be considered; avoiding the use of those methods that produce such adverse effects.

5.2 Efficiency of identification methods and risks of impairing cattle welfare

It is important to recognize that all methods for beef cattle identification have some limitation. Therefore, it is common to recommend the use of two complementary methods, usually combining the qualities of easy reading and long permanence.

It should also be acknowledged that the efficiency of every identification method is directly dependent on the quality of handling procedures, it is expected that the improvement of the handling procedures results in lower risks of identification replications or losses.

The efficiency of some beef cattle identification methods and the risks of impairing animal welfare are summarized in the tables below. The information presented in the tables takes into account that all conditions (facilities, equipment, products, handling procedures, etc.) should meet the criteria of good practices for beef cattle identification.

The interpretation of the informations presented in the tables below should take into consideration that: 1) Cattle often react to the handling procedures, making difficult to carry them out in an ideal way. 2) The intensity of the reaction depends on the cattle temperament and its previous experiences with handling procedures. 3) The risk of negative effects due to the identification procedures increases proportionally with the intensity of the reaction.

Identification methods	Permanent	Easy to apply	Low cost	Legible at distance	Safe for workers	Animal Welfare
Ear-tattooing	✓	✓	✓	✗	✓	✓
Plastic ear-tagging	✗	✓	✓	✗	✓	✓
Electronic ear-tagging	✓	✓	✗	✗	✓	✓
Fire branding	✓	✗	✓	✓	✗	✗
Freeze branding	✓	✗	✗	✓	✗	✗
Chemical branding	✓	✗	✓	✓	✗	✗
Intra-ruminal boluses	✓	✗	✗	✗	✓	✓
Injectable transponder	✓	✓	✗	✗	✓	✓
Nose printing	✓	✗	✓	✗	✓	✓
Retina scanning	✓	✗	✗	✗	✓	✓
Ear-notching	✓	✗	✓	✗	✗	✗
Paint marks	✗	✓	✗	✓	✓	✓

✓ = highly satisfactory, ✓ = satisfactory, ✗ = acceptable, ✗ = not acceptable

Summary of the efficiency of identification methods according to the six animal health and welfare key parameters

Identification methods	Pain	Stress / Distress	Infections	Parasite infestation	Extra handling	Later site lesions	Allergic reactions
Ear-tattooing	+++	+	++	++	++++	-	-
Plastic ear-tagging	+	+	++	+++	++	+	-
Electronic ear-tagging	+	+	++	+++	-	+	-
Fire branding	+++ +	+++ +	++	++	-	+++	-
Freeze branding	+++	+++	+	++	-	+++	-
Chemical branding	+++ +	+++ +	+	++	-	+++	+++
Intra-ruminal boluses	+	++	-	-	-	-	-
Injectable transponder	+	+	++	-	++	-	-
Nose printing	-	++	-	-	++++	-	-
Retina scanning	-	++	-	-	++++	-	-
Ear-notching	+++	+++	+++	+++	-	-	-
Paint marks	-	+	-	-	+	-	+++

Risks for dairy cattle welfare according to the identification method, where: - = no risk, + = low risk, ++ = moderate risk, +++ = high risk, ++++ = very high risk

There are many concerns about the use of fire and chemical branding due to their negative effects on the welfare of the animals; particularly when applying the brand on sensitive areas of the animal's body. Their uses are prohibited or discouraged in some countries, and in some cases it is recommended to use adequate anaesthesia followed by analgesia protocols when applying fire branding. However, in some cases its use is compulsory and its application is usually (almost always) carried out without care.

6. Handling procedures for beef cattle identification

In this topic the handling procedures of five methods for beef cattle identification, ear-tattooing, ear-tagging (visual and electronic), fire branding, freeze branding and paint marks, are described. They are the most used methods for dairy cattle identification.

6.1 Ear-tattooing

Ear-tattooing is relatively easy to apply and low cost. However, it is important to do it in a proper way, ensuring that tattooing will not spread diseases in the herd and that the identification code will be legible later in the animal's life.

The main limitation of tattooing is the difficult of reading the identification code, being necessary to restrain the animals to read the identification code with accuracy and in a safe way.

Ear-tattoos are usually applied in the first week of calves live and often, it is combined later on with another identification method (usually ear-tagging or freeze branding), which offer better visibility from a distance.

The specific equipments and products used for ear-tattooing are: tattoo pliers, characters (numerals from 0 to 9, letters from A to Z or symbols) and tattoo ink.

There are basically two types of tattoo pliers. The most common one has a rubber pad in one side and a metal rail in the other. The characters are, in this case, detachable pieces representing numbers, letters or symbols, which are attached to the metal rail to generate the identification code. These characters are shaped by combining metallic needles in a certain way to define the character; one side of the needles are fixed in a metal block and the other, the thinner side, is free to pierce the animals' ears.

In the other type of tattoo pliers, the metal rail is replaced by a rotating structure. In this case the characters are fixed in this rotating structure, spinning independently, one from each other, to define the desired identification code. In this type of pliers, the risk of characters' loss is smaller, but it is more difficult to replace them when damaged.

The characters' size should be compatible with the size of the animals' ears. It is recommended to use small characters for tattooing calves, avoiding a too wide space among the punctures that results in difficulties to read the tattoo when the animal becomes adult.

When tattooing is applied in an animal with pale skin, use black ink, and for those with dark skin, use green ink. Do not improvise: use only good quality tattoo ink.

Be sure that all the equipments and materials necessary for cattle identification are available, in good conditions and disinfected, before start the animals handling.

The characters set should be complete and each character should be in good condition, without any broken or bent needles and free of rust or waste.

Be sure that the tattoo pliers are clean, aligned and oiled and that the tattoo ink is in good quality and that is sufficient to carry out all the planned work.

Keep the tattooing equipments clean and in good repair. Store them in a case with cover, organizing the characters (numbers and letters) in an ascending order. By doing this you facilitate the tattoo pliers preparation.

To achieve a good quality tattoo, which means been easily legible and for long period of time, the procedures should be done with attention and care. The animals should be properly restraint. Young calves can be restrained manually and adult animals and

heavy calves should be restrained in a squeeze chute or (for the tame ones) using a halter. In all situations it is necessary at least two people to do the work, one person being responsible for restraining and the other for tattooing.

Prepare the tattoo pliers and set up the identification code for a specific animal. Be sure that the characters are not placed upside down or in a wrong sequence. To be sure that the identification code is correct, use a sheet of paper to pierce the identification code on it. Do it every time before sticking an animal's ear. Remember: The identification code usually should be changed after tattooing every animal; this must be done carefully, and identification code checking is recommended before every tattoo application.

The tattoo should be well positioned in the ear. Avoid tattooing on the edges, ribs and on ear's areas plenty of veins or covered by hair; when tattooing is done in these positions there is a higher risk of low quality identification.

The ideal position for a tattoo is the centre of the ear, in between the two main ear ribs. Attention: When using ear-tags as a second method of identification, the tattoo should be positioned above the upper ear-rib or below the bottom ear-rib, opting for the area with less hair and fewer blood vessels.

Clean the site where tattooing is going to be applied, this improves the identification quality. Use preferably a soft cloth with alcohol. If this is not possible, clean the area to be tattooed using your own fingers.

Rub the tattoo site with ink; be sure that the size of the covered area is slightly larger than the tattoo size. Place the tattoo pliers on the site and clamp it, piercing the ear. Doing this you ensure a better quality of tattoo since the ink fills the needles' holes during piercing.

Open and remove the pliers carefully to avoid compromising the tattooing with scratches. After removing the pliers rub more ink on the tattooed site; use your finger or a small soft brush to spread the ink on it, filling the holes with ink.

Do not pass the tattoo ink only after piercing the ear, since the blood coming out of the holes may hinder the ink penetration, resulting, eventually, in identification problems.

Under normal conditions avoid manipulating the tattooed site until it gets well healed. The risks of parasitic infestation and healing problems on fresh tattoos are usually low, but sometimes they occur.

It is important to observe the animals during the first two weeks after tattooing and, when identifying signs of parasitic infestation or inflammation treat the animal as soon as possible, following the recommendations of a veterinarian.

Always disinfect the tattooing characters after using them; this could be done boiling them in clean water for at least 20 minutes. Do this to avoid spreading infectious diseases in the herd.

6.2 Ear-tagging

There are different types, colours and sizes of plastic ear-tags; and there are many possibilities of their use for cattle identification, which could be defined by shape, colour, or characters, or also by combining them.

Colours are often used to identify groups of animals, e.g. pregnant or non-pregnant cows, and characters are usually used for individual identification.

The most common shapes of ear tags are: 1) button tags, they are cheaper and have lower risk of getting lost, but the legibility is very limited; 2) large tags, which can be found in different colours, with a printed code or not (blank), allowing hand writing and; 3) maxi tags that are the largest ones, being possible printing or writing big characters on them, improving the legibility at distance; however, due to their size the risk of getting lost is higher.

Ear tags can also be used to fit Radio Frequency Identification (RFID) devices in cattle, being the electronic component usually encapsulated into button tags. There are specific recommendations about how to insert electronic tags in the animals' ears.

The decision about what type of tags to be used should take in consideration the objective of identification, resource availability, breed, animal's age, ears' size and environmental conditions where the animals are kept. Be careful when defining the type of tags, a appropriate shape and size of tag should be used; e.g. the use of big ear tags should be avoided when the animals are kept under extensive conditions in pastures covered by bushes.

The use of ear tags for beef cattle identification is growing in many parts of the world, especially because it is relatively cheap, easy to apply and, it is expected to have a good visibility from a short distance. However, this is not always the case, mainly when using numbered tags, because is very difficult to read the numbers at distance when the tags get dirty.

The main critical points of the ear tags' use is retention failure, due to they tend to fall out and the risk of falling out increases with the ear tags size. Besides that, after a certain period of time the characters tend to fade or be covered by dust, becoming illegible.

There are two main factors that increase the risk of ear tags lost: low quality ear tags and bad handling procedures during the ear tags application.

When using good quality ear tags and adopting proper procedures for its application, it is expected at least 97% of retention per year, as defined by the International Committee for Animal Recording (ICAR). In other words, when good quality ear tags are properly applied in 100 animals, for example, it is expected that after one year at least 97 of them will have the tags in their ears.

This result is not always achieved in practice, and failures of retention can be very high, sometimes more than 30%. This is usually due to a combination of the use of low quality ear tags and failures during the procedures for ear tags insertion.

There is a big variation in the quality of ear tags available in the market, and for long term identification it is recommended the use those with high quality, which should present:

- Flexibility.
- Resistance to solar radiation.
- Format that reduces the risk of getting stuck in fences and shrubs.
- Free rotation between the "male" and "female" parts, after the application.
- Adequate space (8 mm) between the "male" and "female" parts.
- High quality impression, assuring readability for long period of time.

Another important point to minimize ear tags losses is to carry out the procedures for ear tags application properly.

The ear tags' application is not an easy task. Do not underestimate its complexity. All activities should be well planned and organized and the work should be carried out with attention and patience. It must be done by trained people, using proper equipments and products and the procedures should be done in a correct and safe way to minimize

the risk of accidents and failures in the process. If these conditions are not met there is a higher risk of failure in beef cattle identification, since under such conditions the risks of losing the ear tags and errors in an animal's identification are high. Moreover, when the application of ear tags are made without care and attention there is higher risk of labour accidents, resulting in injuries in the workers and animals.

It is safer and more efficient when ear tags are applied during the cold and dry season. Under such conditions there is a lower risk of parasites infestation that results in animals suffering, extra work, ear tags lost and higher costs.

When ear tags are applied under conditions of high risk of parasitic infestations, it is recommended the preventive use of insect killers or repellents. In such cases it is also important to take extra care by monitoring the animals daily after the ear tags' application.

No special facilities are required for ear tags application, especially when identifying neonate calves that can be restraint by hand (controlling its body and head movements), followed by the tags application procedures.

The younger the animal it is easier restraining and identifying. For older animals (calves with more than 100kg and adult cattle) it is recommended to use a squeeze chute.

Before starting the ear tags application procedures the animal should be well restrained, preventing head movements, which hinder the work and can result in accidents. It is recommended to use a head gate restrainer to do it, holding it very close to the animal's head. Do not hold the animal's in the base of the neck, because under this situation the animal is able to move its head laterally, making the work more difficult and dangerous. In the case of a restraining chute with two head gate restrainers, use both.

When the restrainers do not immobilize the animal's head properly, it is recommended ask for help. Under this situation other person should restrain the animal's head, either by hand (for calves) or using a halter or a rope. Do this to prevent head movements, which hinder the work and can result in accidents.

Keep the animal restrained until removing the tags pliers from its ear. Sudden movements at that time can tear the animal's ear.

The wrong use of the tag pliers and the inefficiency in the cattle restraining at the time of application of the ear tags can cause many problems, including: fixing the ear tags out of the animal's ear (resulting in ear tag loss), ripping the ear of the animal (causing unnecessary suffering, increasing the risk of ear tags loss and requiring care to wounds) and apply the ear tags in no recommended places (increasing the risk of ear tags loss).

When applying electronic ear tags, be sure of using the correct applicator for the device being applied, as recommended by the ear tags' manufacturers.

Before starting the application, make sure that the equipment is in good condition to work. The tag pliers must be clean, lubricated and aligned (which facilitates its use) and the steel needle (where the "male" part of the ear tag is introduced) should not be loose or crooked, since under these conditions the ear tags could be damaged and badly fixed in the animal's ear.

If the needle is slack, tighten it with a screwdriver of appropriate size. Bent needles should be changed; depending on the pliers there is a spare needle on the inside its cable, use it when necessary.

The procedures for beef cattle ear tagging should be done calmly, without causing unnecessary stress to the animals.

An important point for planning and organizing the beef cattle identification activity is the definition of how many animals will be identified in each work period. When identifying more than 50 animals per hour is an indicator that the procedures have been carried out too fast, increasing the risk of application and identification errors that leads to losing the animal identity.

The working team must have at least four people: one should be responsible for organizing and preparing the ear tags for the application (in addition to making the necessary endorsements), two people are responsible for the restraint procedures (and needs an assistant when the animals are the busiest) and a third person will be responsible for applying the ear tag.

Other people can help in driving the animals from the corral pens to the restraining chute, trying to maintain always an animal ready to be identified. Remember! People involved in the handling procedures should be well trained, and the labour efficiency is usually lower when working with either excess or lack of people.

For the application of two ear tags, one in each ear of the same animal, it is recommended to have two pliers and two people to apply the tags. By doing this, the work can be done without speeding and the restraining time for each animal is reduced, minimizing animal stress and the risk of accidents.

During the procedures for ear tags application always remember that the goal is to establish a single and definitive identification. Therefore, make sure that there are no ear tags with repeated numbers and that female and male tags have the same identification code, and carry out the handling procedures properly. Work with calm and attention! This is the best way to avoid mistakes.

The ear tags should be positioned in the middle of the ear and between the two main ribs. To set the correct location of the application, consider the two extreme points the ear of the animal, located on the top edge and bottom, as shown in the figure below. Trace an imaginary line between these two points (identified as 1 and 2 of the figure) and, on the line, identify the central position between the two main ribs (positioned horizontally in the animal's ears).

This is the right site for ear tags application in beef cattle, since it is the point of maximum resistance and of lower risk of ear tags getting stuck in fences and shrubs (reducing the risk of the ear tags' losses), besides offering good conditions for visual reading the identification code. This way to define the position of the ear tags is valid for all cattle breeds.

For the ear tags application, hold the pliers in perpendicular position in relation to the ear. When using the pliers horizontally in relation to the ear the tag would be inserted in the edge and not in the middle of the ear. This is especially important when inserting tags in adult Zebu cattle.

The insertion of electronic ear tags should be done following the same recommendations, the only differences are: there are special pliers for doing it and electronic tags should be inserted in the animal's ear closer to the head, as showed in the figure below.

Avoid troubles! Do not apply the tags neither in the ear edges nor on the ear's ribs and nor on the lower or upper parts of the ears.

Remember! The ear tags represent a "foreign body" in the cattle ears. Therefore, it is necessary to carry out regular inspections to monitor possible problems and take

actions to solve them as soon as possible. Inspections should be frequent in the first 15 days after the ear tags' application (doing it daily, if possible) and also when there is a higher risk of fly infestation (during hot and wet weather, in locations with high incidence of flies and when the ear tags are applied very close to the animals' head).

When inserting ear tags in situations of extreme risk of parasitic infestation it is indicated to drill holes in the ears of calves previously to the ear tags application. These holes should be done early in the calf's life; preferably at the same time that navel healing and they should be made exactly the places where the ear tags will be applied, using a special awl or a leather punch. The awl (or the leather punch) should be clean, no rust, sharp and without any deformation in the cutting area. The size of the hole is very important: Use an awl with 6mm in diameter; holes smaller than 5 mm usually get closed due to the healing process, and holes with 7 mm or more usually result in ear tags' loss, since the hole's size increases due to the calf's growing. The ear tags should be applied later, after the complete healing of the ear's holes, and it can be done when running other regular handling activities, e.g. when carrying out vaccination or weighing procedures.

6.3 Fire branding

Fire branding is used in beef cattle mainly to identify breeds, owners, individuals and specific handling practices, like vaccination, for example. Its use is still very common, and sometimes compulsory.

From the animal welfare perspective the use of fire branding is not recommended. It always causes pain and suffering, especially when applied on the most sensitive parts of the animal's body, such as its face.

The negative effects of fire branding on cattle welfare can be noticed by the changes in their behaviour. It is not unusual to face difficulties when driving the animals to the corral some days after fire branding application; under such conditions it is more frequent to see animals trying to escape from the corral (where fire branding was applied), making driving difficult, jumping, running and even, attacking people. Such behaviours are indicators that cattle are considering the corral a dangerous place; and this is because they remember the suffering experienced when kept in that specific place.

Besides that, cattle fire branding is a time consuming procedure and could cause economic losses, due to damaging to hides.

From the animal welfare perspective, it is preferable to use freeze branding than fire branding, always when feasible. The best hot iron brand is achieved when the hair follicles are destroyed without burning through the hide, but this is not an easy task. When fire branding is done without care there is a serious risk of burn injuries in the animals and in the people who are carrying out the work.

It is strongly recommended to use a squeeze chute to restraint cattle for fire branding, especially when working with heavy calves and adult animals; and to dress thick gloves to do the work.

It is recommended to use brand furnaces that allow sorting the iron brands in ascending order, making the work easier and decreasing the risk of errors. Be sure that the brand furnace has appropriate size and that power or fuel (wood, coal or gas) is available and sufficient to do the job.

The brands should be made with iron or steel; being the later the recommended material since it withstands heat and is more durable.

Before start working verifies that the set of iron branding is complete, with all the numbers or letters needed for identification.

Branding irons characters should present round corners and be segmented with gaps on it, especially placed on the characters' curves and corners, as showed in the figure below. The brands should be made with iron or steel; being the later the recommended material since it withstands heat and is more durable.

Do not use broken, sharp or worn iron brands, since the risk of bad quality identification and open wounds in the animals' skin is high. Be sure that iron brands are clean, free of skin peels and burnt hair, before applying them on the animal's body.

There is a tendency to consider of using large brands, aiming to have a legible code at distance. However, large brands results in more pain and higher damages to hides. Consider to use branding irons with 8 cm in diameter, or no larger than 11 cm, to reduce these negative effects.

The person in charge of doing the job should be well trained on good practices of beef cattle handling and be experienced in doing it. There is a high risk of problems when it is done by inexperienced, insecure or tired people, or by those who do not care for the animals.

Experience could be achieved practicing fire branding on a piece of wood until to get the skills to do it on the animals' body.

Fire branding should be performed in places of the animal's body that are easily visible, cause less pain (areas with lower sensitivity) and minimize damaging to the hide. In some cases the fire branding position in the animal's body is defined by law, by the breeders' associations or by other official bodies.

Always when possible avoid fire branding the animal's face, since in the skin's face there is a high density of pain receptors. When face fire branding is compulsory, do it with extra care, and always protect the eye of the animal at the time of branding.

One suggestion is to apply the fire brand on the upper part of the fore- or back-limbs, just below the belly line; this is because it is less painful and the damages to hides are lower. Avoid to fire brand on sites where the skin is movable, since it causes more discomfort to the animal during the healing period.

Do not apply fire brand on an animal's body during rainy days nor do it when the animals are wet or covered of mud or dung. When a hot iron is applied on the wet or dirty surface it loses heat quickly, making difficult to achieve a good brand. Usually, under these conditions, is necessary to repeat the application of hot iron on the animal's body.

Special attention should be given to heifers and cows, since they increase the frequency of urination when stressed, spreading the urine with their tails on the hind legs, on the point where the fire branding is usually applied. Work with small groups of animals, to prevent crowding that leads to animals wetting or soiling ones on the others, due to urination and defecation.

Position the brand furnace in a safe place, close to the restraining chute (or close to the place where the work will be done). Be sure that there is no risk to humans or animals stumbling in the brand furnace during the procedures.

To find the ideal temperature to make the marks, note the colour of the mark that is on fire. When the iron colour is black, is a sign that it is still cold, and in such condition it may be hot enough to burn the hair, but not to produce a lasting mark. When the iron is red, it could be too hot, presenting a higher risk of deep burning. The iron should be the colour of ashes at the application time, indicating that it is hot enough to produce a

good brand.

To make a good fire brand the animal has to be well restrained. This should be done preferably in a squeeze chute, when it is not available, the animal should be well tied.

Use also tail restraint for more effective mobilization; it can be done by grasping the butt of the tail and raising it vertically without breaking. Be careful! Do not make excessive force or twist the tail of the animal, because it causes pain and, in extreme cases, can lead to a fracture.

After restraining the animal, pick up the hot iron with the correct code, and place it firmly in the right place for branding, and then, without much force, press it against the animal's body. Try to distribute the pressure uniformly, avoiding to put more pressure on one part of the hot iron than in the others.

When the animal is very agitated, wait until it calm down, then position the iron brand.

The movements for fire branding application should be firm and consistent. Do not make sudden movements during branding, it can hurt the animal and smear the mark.

The movements for fire branding application should be firm and consistent. Do not make sudden movements during branding, it can hurt the animal and smear the mark.

Keep the hot iron on the skin only for the time necessary for the branding (for few seconds, 3 to 5); keeping it for longer increases pain and causes serious injuries that take longer to heal. Do not reapply the brand in the same site; this results in more pain and imperfect identification code.

When hot iron is removed, the brand on the animal's body must show a brown colour, with no open wounds and nor bleeding.

Remember! The fire branding is an aggression to the animal's skin, it is a painful procedure and poses risk for infection. Avoid applying it whenever possible

6.4 Freeze branding

Freeze branding is done using coolants to chill branding irons that are applied on the animals' body. It is expected to damage only the pigment-producing hair cells (melanocytes) that results in white hair in the place where the brand was applied.

When freeze branding is done properly it results in less suffering for the animals and causes less damage to hides than fire branding. However, it is more expensive and demands more time to run the complete procedure than fire branding, besides of low efficiency when applied on areas covered with white hair.

The freeze brands are usually made of cooper or cooper-based alloy (brass or bronze). Sometimes steel irons are also used, but there is a higher risk of low quality brand.

Similarly to hot iron brands the face of freeze irons characters should be rounded and they should present a round shape and be segmented, with gaps especially placed on the characters' curves and corners.

There are two practical possibilities for chilling the iron brands: dry ice-alcohol solution and liquid nitrogen. In both cases it is recommended to apply the brands on a shaved body surface, to achieve a better result.

Before starting work verify that the set of iron branding is complete, with all numbers, letters, or symbols needed for identification.

The responsible for doing the freeze brand should also be experienced and trained on good practices of beef cattle handling. Like for fire branding it is common to face problems when it is done by inexperienced, insecure or tired people, or for those who do not care for the animals.

Restraint the animals during the application of freeze brand is strongly recommended, even when working with tame animals.

The brand site should be bathed with methylated spirits just before applying the freeze branding iron, holding the iron firmly on it for 21 seconds.

When the iron brand is held for a too short time on the animal's body there is a risk of losing the identification, since the melanocytes will not be damaged and, when it is held for too long time, there is a increasing risk of hides damaging and unnecessary animals suffering.

6.5 Paint marks

Paint marks are temporary forms for cattle identification, being useful only for short-term purposes, often for less than a month.

They are less invasive than the other methods, and when properly done usually do not harm the animals. Nevertheless, they are not considered as a valid method for cattle control, being used only for some handling purposes.

In spite of the apparent simplicity, the procedures for paint marking the animals should be done with care and attention, since stressful situations could arise during handling and the identification code can smear before it completely dries.

There are different types of paint marks, which could be done using dyes, sprays, paints and sticks. Use only non-toxic and rapidly-drying substances for cattle paint marking.

Human hair dying is not often used for cattle identification, but it is a good alternative for animals with light colour pelage, since it is easy to find good quality human hair dyes in the market, they are relatively cheap and some of them could last for more than a month.

Sprays, paints and sticks are commonly used for beef cattle paint marking. There are many colours available. A good result is achieved when using black tint on animals with light colour pelage and yellow tint on those with dark colour pelage.

When applying paint it is common to use paint branding irons to stamp the characters (numbers, letters or symbols) on the animal's body. The characters sizes are quite variable, but usually they are around two or three times bigger (ranging from 20 to 28 cm) then those used for fire or freeze branding.

Carry out the identification procedures with care, preferentially restraining the animal in a chute, and when a chute is not available, the animal should be well tied.

Define the identity code site on the animal's body previously. Take into account the risks of negative effect on animal welfare and the animal's postures and movements, and consider the possibility of seeing the code even when the animal is lying down. Avoid paint marking on the mucosa or close to the animal's eyes.

Paint marks should be applied always on a dry and clean surface.

It is recommended to work with small groups of animals to prevent crowding, which increases the risk rubbing that leads to blotting the identification code.

The paint material or products should be positioned in a safe place, close to the place where the work is going to be done. Be sure that there is no risk of humans or animals stumbling on it during the procedures.

After restraint an animal, pick up the paint iron with the correct code and plunge the character inside the paint; remove it and wait a few seconds for the paint excess drips. Apply the paint iron firmly on the branding spot, and then press it, distributing the pressure uniformly and without much force, on the animal's body.

Do not try to paint branding on agitated animals, wait until they calm down for the paint brand application.

Do not do sudden movements during paint branding since it results in blotted marks.

After finishing the work, remove the paint residue from the iron brands using paint removal solution and, when necessary, a wire brush with fine bristles to remove dry paint.

7. Care of the animals after the identification procedures

7.1 The process of wound healing

Wound healing is defined as a process that results in the regeneration of injured tissues, usually resulting in a scar.

Most of the dairy cattle identification methods result in skin wounds (fire and freeze branding, ear tagging, ear clipping, ear notching, ear tattooing) and, in some cases the resulting scar defines the animal identification (tattooing, fire and chemical branding). In these cases, wound healing is important from the animal welfare point of view as well as for identification efficiency.

7-2 Reducing the risk of infections and parasite infestations

The complete healing of the injuries caused by the insertion or application of the identification usually occurs in a few weeks. During this period there are risks of inflammation, infection and parasites infestation on the open wound, resulting in animal suffering and risk of losing the identification.

To reduce these problems all procedures should be carried out with care and hygiene. Do not work with equipments (pliers, iron brands, awls, etc.) and products (tags, clips, etc) covered with mud, faeces or dust.

When the incidence of myiasis is high, it is recommended to use fly repellents on the injured site, and always when necessary to expand the preventive control, use injected medications with specific action against myiasis and with long lasting effect.

Animals with inflamed tissues or bleeding in the identification sites, showing abnormal behaviours (scratching their bodies or shaking their heads or legs frequently), and staying most of the time separated from their herd, should be driven to the corral for a closer inspection. If the identification site is infested by parasites, remove the eggs and larvae; and when the problem occurs in the ear tags sites, remove the tags and apply anti-larvicide's medications on site. In severe cases consult a veterinarian, it might be necessary to use antibiotics and anti-inflammatory drugs.

8. Animal welfare practices during beef cattle identification step by step

- 1 - Cattle identification should be well planned and organized.
- 2 - Define the type of identification to be used, which animals will be identified, where the work will be done, and who will be responsible for the work.
- 3 - Check in advance whether the facilities, equipment and materials are available, clean and in good condition. Always use good quality equipments and materials.
- 4 - Those responsible for handling should be well trained and informed about the procedures for beef cattle identification.
- 5 - Define the roles of each team member before start working.
- 6 - Define the right rhythm of work to ensure that the identification will be well done. Take your time, do the work with calm and careful.
- 7 - With the exception of newborn calves, all animals must be driven into a restraint chute for identification. Identification should be done only when the animal is well restrained!
- 8 - Identification should be done only when the animal is well restrained.
- 9 - Drive the animals to the corral with care, without running or screaming.
- 10 - Organize the numbers (or codes) for identification to facilitate their use.
- 11 - Avoid mistakes! Make sure that the identification code is correct before applying it in the animal.
- 12 - Monitor the animal regularly after identification; do it more frequently in the first three weeks after identification or when the presence of maggots is more likely
- 13 - If the animal is very agitated, wait to calm it down before positioning the identification.
- 14 - In the event of parasitic infestation or inflammation, treat the animal as soon as possible, following the recommendations of the veterinarian.

Tattooing

- 15 - Do not tattoo on the ear ribs or in areas with thick veins or covered by hair.
- 16 - Clean the site where the tattoo is going to be applied.
- 17 - Apply tattoo ink in the site, being sure that all tattoo area is covered with ink.
- 18 - Use black ink for animals with light skin and green for those with dark skin.
- 19 - Position the tattoo pliers in place and press it to perforate the ear cartilage.
- 20 - Remove the tattoo pliers carefully and apply more ink on the tattoo, rubbing gently.

Ear tagging

- 21 - When applying ear tags in the rainy and hot season adopt preventive control to avoid parasitic infestation.
- 22 - The ear tags applicator should be maintained in upright (standing) position, avoid the horizontal position (lying down).
- 23 - Apply the ear tags in the middle ear and between the two main ribs, avoiding the veins.

Fire branding

- 24 - Avoid whenever possible as it causes sever pain poses risk for infection.
- 25 - If fire branding is strictly necessary, do not perform it on rainy days or when the animals bodies are wet or covered with mud or dung.
- 26 - Use appropriated irons in good repair and with the right temperature.
- 27 - Position the brand firmly in the correct site of the cattle body, without much force, and hold it there for a few seconds. Do not make sudden movements.

Freeze branding

- 28 - Shave the freeze branding site.
- 29 - Bath the freeze branding site with methylated spirits just before applying the iron,
- 30 - Hold the freeze iron firmly on it for 21 seconds.

Paint marks

31 - Paint marks should be applied always on a dry and clean surface.

32 - Work with small groups of animals to prevent blotting the identification code.

33 - Do not do sudden movements during paint branding since it results in blotted marks.

9. Final considerations

The adoption the recommended practices presented in this booklet is not simple, it requires compromise, organization and control. When following it properly the results are remarkable, improving safety and efficiency during cattle handling, promoting dairy cattle welfare and providing a good individual identification.

As a rule, they do not imply an increases in costs nor in labour time necessary to perform the operation and it must be taken into account that when cattle are handled in a hurry there is a higher risk of accidents, shorter permanence of the identification, poor quality of cattle identification, that at the end will require more time and labour to be sorted out.

Remember: Prevention is better than cure! The identification handling procedures for dairy cattle should be carried out with care and attention to avoid problems.

Quamus doluptat ad ut latia int. Apisquis excepraepa sam ent dolest volum et ea sectusam fugitas ea dolut pro velliti id explici cullatin eos nus. Ictis ersperr orporem re sedicim poribus volor ratiama fuga. Epudae. Nam quassin tinvel ium eariasperit autati aceptatias apeliqum bla si acestrum rerum eium, optaqua speditatios dolut aut volorio ma doluptis im hit enis magnime nim quia post, temquundero molorem equat occae vent ab is aut volumen ectatec epediam fugiae pero inullupta qui abo. Optatium repelle nderitem evenit ut quam et ut aut fugita se voluptat odio. Ni offic to es ipsam, sum, quam hil ex et, es saerferiti xcepraepa sam ent dolest volum et ea sectusam fugitas ea dolut pro velliti id explici cullatin eosnus.

ISBN

ISSN



9

E /1/0 10/1 00