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Technical Guidelines for Management of Beef Cattle

The “Technical Guidelines for Management of Beef Cattle” were developed and issued by the Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF-J), based on the standards for animal welfare in the Terrestrial Animal Health Code of the World Organisation for Animal Health. This document is the English version of the guidelines translated by MAFF-J. While every effort has been made to ensure that the translation is as accurate as possible, the accuracy and completeness of the content is not entirely guaranteed. For accurate and up-to-date information, please refer to the original Japanese version.

Ministry of Agriculture, Forestry and Fisheries of Japan

Livestock Industry Bureau

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Section 1. Management method

1. Observation and recording

It is important to keep track of the health of beef cattle to make sure they are being reared comfortably. Signs of poor health in the cattle include changes in posture, changes in coat condition, eye discharge, nasal discharge, diarrhea, poor appetite, fatigue, loss of rumination, rapid and irregular breathing, persistent coughing or panting, trembling, lameness, and abnormal behaviors.

It is important to keep daily records to ensure that the rearing environment is comfortable for the cattle. The items to be recorded include the health status of the cattle, the occurrence of diseases and accidents and their causes, individual reproductive records, feed rations or intake, adequate water supply, maximum and minimum temperatures, and humidity.

[Actions recommended for implementation]

Beef cattle should be observed at intervals appropriate to the management practices and the risks to the health and welfare of the cattle at least once a day, even in intensive farming systems. In particular, the frequency of observation should be increased to prevent the occurrence of sickness or injury when there are neonation calves, newly weaned calves, cattle before and after parturition, or cattle that have just undergone surgical procedures, or immediately after changes in the rearing environment or during hot or cold seasons.

When observing beef cattle, their health status should be assessed by observing factors including their body condition, feeding and rumination status, occurrence of injury or lameness, and resting behaviors. The absence of any signs indicating a deterioration in animal welfare should be confirmed by referring to the animal welfare measurables shown in Section 6, and it should also be checked that feed and water are being administered appropriately, ventilation is adequate, lighting is adequate, and bedding is clean.

If beef cattle show signs of health deterioration, clinical examination and lesion observation should be utilized to take appropriate action immediately. Diseased or injured cattle should be given appropriate treatment as soon as possible by the manager (e.g., owner) or handler (person actually involved in the management of the cattle). If the manager or handler is unable to provide adequate care, veterinary treatment should be provided. When cattle die, they should be promptly handled and reported, and the cause should be ascertained.

Daily records should be kept of the health status of the cattle, the occurrence of diseases and accidents and their causes, individual reproductive records, feed rations or intake, adequate water supply, maximum and minimum temperature, and humidity. In particular, for the occurrence of diseases and accidents, and the circumstances when they occur, the mortality rates, morbidity rates, and culling rates, along with the causes of any increase or decrease and the details of treatment should be checked and recorded regularly; i.e., daily, monthly, annually, or with reference to key management activities within the production cycle. Items to be recorded should be added in accordance with the situation requires, for example, when a behavior that may be causing animal welfare problems is observed (see Section 6.1).

When the herd is reorganized by introducing cattle from outside or from different herds, special care should be taken for the observation and recording as this can be very stressful for the cattle.

[Actions recommended for future implementation]

None

2. Handling of beef cattle

Cattle are animals that are sensitive to changes in their surrounding environment; therefore, it is important for managers and handlers to treat cattle carefully and build good relationships with them during daily management, which will lead to improved animal welfare.

[Actions recommended for implementation]

When working in the cattle barn or approaching beef cattle, managers and handlers should avoid sudden actions that may cause unnecessary stress, avoid rough handling, and handle the cattle as carefully as possible. Cattle should not be moved by breaking their tails, grabbing their eyes, pulling their ears, or by any other methods that cause them pain.

Behaviors such as cattle refusing to move, attempting to kick people or facilities, or vocalizing should be noted as signs of a lack of good relations as well as temperament.

When transporting cattle, the loading, transportation, and unloading should be conducted appropriately according to the "Technical Guidelines for the Transport of Farm Animals". In addition, where beef cattle are herded into a handling facility from extensive conditions, they should be moved quietly and calmly at the pace of the slowest animal, and the cattle should not be driven to the point of distress. Weather conditions should be taken into account and cattle should not be herded in excessively hot or cold conditions.

In situations where the gathering and handling of the cattle is likely to be stressful, consideration should be given to the avoidance of multiple handling events by combining necessary management procedures within the one handling event. If handling itself is not stressful, management procedures should be staged over time to avoid additive stress of multiple procedures.

Exposure of cattle to sudden movement or visual contrasts (such as sudden changes in brightness or color) should be minimized whenever possible.

When cattle are handled with tools, handlers should avoid use of those that may cause unnecessary pain to the cattle, such as those with sharp tips or sharp edges. Electric goads and other assistive devices that may cause pain and distress can only be used on the hindquarters when other methods have failed and the cattle is free to move, and should not be used on sensitive areas such as the udder, face, eyes, nose, or anogenital region. Goads or other aids should not be used repeatedly, even if the cattle do not respond or fail to move; instead, the obstacles preventing the cattle from moving should be verified.

Electroimmobilisation (a method of paralysis by low-voltage electric current) should not be used, and electric goads should not be used on calves.

[Actions recommended for future implementation]

None

3. Dehorning (including disbudding)

Beef cattle may not be dehorned, as their horns are useful when mooring.

However, beef cattle may butt horns against others to secure feed and establish social ranking, resulting in injuries, abortions, etc. Injury and stress can also lead to a decline in carcass quality.

The selection of dehorning or hornless cattle is considered effective means of preventing unnecessary injuries and abortions, especially during group feeding in the cattle barn. Additionally, dehorning is important to prevent accidental deaths or injuries of managers or handlers caused by the horns of cattle.

While dehorning at a young age is preferable, methods of dehorning when horn development has commenced or more advanced involve the removal of the horn by cutting the base of the horn close to the skull with dehorning tools or saws.

As an alternative to dehorning, there is a method to use a "horn cover", which covers part of the horns.

[Actions recommended for implementation]

To prevent excessive stress on the cattle during dehorning, managers and handlers should seek guidance from veterinarians as to the optimum method and timing for their type of cattle and production system and these procedures should be performed in such a way as to minimize any pain and stress to the cattle. If necessary, these procedures should be performed using anaesthesia and analgesia by a veterinarian.

For appropriate dehorning, the procedure should be performed during the horn bud stage and within two months of birth at the latest when the horns are still undeveloped and can be removed by a thermal cautery with minimal stress. In this case, the procedure should be performed along with secure retention and it is strongly recommended that the procedure be performed under the administration of anaesthesia and analgesia by a veterinarian.

If dehorning is performed after the horns have developed and attached to the skull, it should always be done under the administration of anesthesia by a veterinarian.

After dehorning, the beef cattle should be carefully observed, and if any suppuration is observed, the cattle should be promptly treated or cured, and the procedure should be rechecked, confirmed, and revised as necessary.

Where chemical paste is used, special attention should be paid to avoid chemical burns to other parts of the calf or to other calves. This dehorning procedure should be performed within two weeks of birth.

Operators should be trained and competent in the procedure used, and be able to recognize the signs of pain and complications, which may include excessive bleeding or sinus infection.

[Actions recommended for future implementation]

None

4. Tail docking

Cattle use their tails to ward off pests such as flies, horseflies, and mosquitoes. Tail docking is occasionally performed to prevent tail tip necrosis in confinement operation.

[Actions recommended for implementation]

Tail docking should not be performed, given that cattle would be stressed by the inability to ward off pests and that a larger per-head space and providing clean bedding have been shown to be effective in preventing tail tip necrosis.

[Actions recommended for future implementation]

None

5. Castration

When male cattle are fattened without castration, coarse and tough meat is produced. In addition, when uncastrated male cattle are kept in herds, they fight intensely with each other, resulting in frequent injuries, reduced growth, and a decline in meat quality.

For this reason, it is common practice in Japan to surgically castrate male cattle for meat production.

[Actions recommended for implementation]

If it is necessary to castrate beef cattle, managers and handlers should seek guidance from veterinarians as to the optimum method and timing for their type of cattle and production system, consider factors such as avoiding overlap with the weaning period to prevent stress and minimize the risk of infections in cattle, and perform the castration before the age of three months. If the calf is older than three months, it should be performed as early as possible. Moreover, when castrating cattle older than three months, managers and handlers should seek guidance from veterinarians on the availability and advisability of analgesia or anaesthesia for castration of beef cattle, and should be done under the administration of anesthesia and analgesia by a veterinarian, if necessary.

Operators should be trained and competent in the procedure used, and be able to recognize the signs of complications. After castration, the beef cattle should be carefully observed, and if any suppuration is observed, the cattle should be promptly treated or cured, and the procedure should be rechecked, confirmed, and revised as necessary.

[Actions recommended for future implementation]

None

6. Identification

Cattle managers are obligated to employ ear-tagging that displays individual identification numbers and to notify the birth or transfer of the cattle in accordance with the “Act on Special Measures Concerning the Management and Transmission of Information for Individual Identification of Cattle (Cattle Traceability Act; Act No. 72 of 2003)”.

For this reason, when a calf is born, the cattle manager must promptly attach ear-tags and notify the birth. Additionally, when beef cattle are given over, received, or die, a notification of the change must be made promptly.

[Actions recommended for implementation]

When attaching the ear-tags, they should be attached quickly in the appropriate position (the center of the auricle, avoiding blood vessels) using proper equipment to minimize any pain and stress to the cattle, while taking care not to cause suppuration by attachment. After the ear-tags are attached, care should be taken to prevent the cattle from accidentally catching the ear-tags on fences or other objects, which could result in injury to their ears.

Freezing branding and hot iron branding should not be performed if alternative individual identification methods are available. Operators should be trained and competent in the procedure used, and be able to recognize the signs of complications.

[Actions recommended for future implementation]

None

7. Hoof management

The hooves of cattle are essential for stabilizing weight and for normal standing and lying down. Deformation or diseases affecting the hooves can lead to poor posture and adverse effect on weight-bearing and gait, and may result in non-ambulatory; therefore, it is necessary to maintain the hooves in a healthy condition.

The hooves of free-range cattle in pastures and other areas are moderately worn through contact with the ground; however, for confined cattle, regular hoof trimming is necessary as the hooves become too long or deformed.

[Actions recommended for implementation]

Regular hoof trimming should be performed to maintain normal hoof function and prevent hoof diseases. In addition to regular hoof trimming, given that the condition of hooves can change depending on the condition of the flooring and nutritional management, managers and handlers should acquire the proper knowledge and basic skills, observe the hooves frequently on a daily basis, and consult with veterinarians and hoof trimmers in order to manage hooves.

Hoof trimming should be performed at least once a year.

[Actions recommended for future implementation]

None

8. Nose rings

In Japan, beef cattle are widely fitted with nose rings to facilitate smooth movement of cattle due to the need for management of individual cattle, such as breeding management.

[Actions recommended for implementation]

When attaching the nose ring, it should be attached quickly in the appropriate position to minimize any pain and stress to the cattle. Additionally, when a strong force is expected to be applied to the nose ring, alternative measures, including wearing a headcollar, should be considered.

After the nose ring is attached, it should not be used improperly, such as excessive twisting. Care should be taken to prevent beef cattle from getting injuries by accidentally catching the nose ring on a fence or other objects.

[Actions recommended for future implementation]

None

9. Breeding

Breeding methods include natural mating, artificial insemination, and embryo transfer. The choice among these methods depends on the rearing environment and management policy. Animal welfare problems may arise when various reproductive data, such as estrus cessation, prolonged parturition intervals, low conception rates, high abortion rates, and high dystocia rates are poor compared to expected standard values.

[Actions recommended for implementation]

Regarding genetic selection, health and animal welfare considerations, in addition to productivity, should be taken into account when choosing a breed or subspecies for a particular location or production system.

The protection and development of genetic lines that inhibit or reduce animal welfare problems are encouraged.

For breeding, in addition to considerations to avoid risks associated with genetic defect traits, sire selection should account for the maturity and size of the female. Heifers and cows should not be implanted, inseminated, or mated in such a way that the progeny results in increased risk to dam and calf welfare. In particular, heifers should not be bred before they are physically mature enough to ensure the health and welfare of both dam and calf at birth.

When performing artificial insemination or embryo transfer, a qualified person, such as a veterinarian or livestock inseminationist, should carry out the procedure by using appropriate equipment and instruments at the appropriate timing based on reliable detection of estrus to minimize any pain and stress to the beef cattle. If necessary, the procedure should be performed under the administration of anesthesia or analgesia by a veterinarian.

Pregnancy diagnosis should be performed by a veterinarian in a manner that does not cause any pain and distress to the cattle.

Pregnant cows and heifers should be managed during pregnancy so as to achieve an appropriate body condition range for the breed, since excessive fatness increases the risk of dystocia, and metabolic disorders during late pregnancy or after parturition (refer to Appendix I: “Nutritional Degree” Assessment Procedure).

When a sire is used for semen collection, a veterinarian or a livestock inseminationist should perform the procedure such that it does not cause any pain and distress to the bull and any teaser animal. When a bull is used for natural mating, safe floor or ground conditions should be ensured for the cattle to prevent injuries due to slips or other causes.

Ovariectomy of heifers is sometimes required to prevent unwanted pregnancies under extensive released conditions. Managers and handlers should seek guidance from veterinarians on the appropriateness, and surgical spaying of beef cattle should be performed by a veterinarian using analgesia or anaesthesia.

[Actions recommended for future implementation]

None

10. Parturition

Although it is most important that parturition takes place without problems, there are cases where cattle require assistance from the manager or handler due to dystocia, premature births, stillbirths, or placental retention (retained placenta), which can be very stressful for the cattle.

[Actions recommended for implementation]

The parturition area should be kept clean and well maintained by paying special attention to provide the cattle with a clean and comfortable environment (including bedding, calving pen, appropriate temperature, and hygiene). During parturition, the floor surface may become slippery due to amniotic fluid, posing the risk of bone fractures and sprains; therefore, the floor (or the ground if outside the barn) should be flat and dry to provide a parturition area considering the burden on the dam during parturition.

Also, lighting in preparation for nighttime parturition, heating, and new bedding for slip prevention should be provided and new bedding needs to be provided for each parturition.

Group pens for calving should be managed based on the principle “all in - all out”. The group calving pen should be thoroughly cleaned and provided with fresh bedding between each animal group. The time interval between first and last calving of cows kept in the same group calving pen should be minimized. Pregnant cattle should be moved to the parturition area at the appropriate time before parturition begins, based on the gestation length and parturition signs.

After the onset of parturition signs, the cows and heifers should be monitored, and animals observed to be having difficulty in calving should be assisted by a competent

handler under the guidance from veterinarians, if needed, as soon as possible after they are detected.

Parturition assistance should be provided only to assist in cases of dystocia and is not intended to shorten the delivery time. In addition, it should be performed so as not to cause excessive pain and distress.

Newborn calves are susceptible to hypothermia. The temperature and ventilation of the birthing area should consider the needs of the newborn calf. Soft, dry bedding and supplemental heat can help prevent cold stress.

Calves should be handled and moved in a manner which minimizes distress and avoids pain and injury. Recently born calves should not be transported until the navel is dry, and after which time any transport required should be carried out in accordance with the "Technical Guidelines for the Transport of Farm Animals."

[Actions recommended for future implementation]

None

11. Cow-calf separation and weaning

Different strategies to separate the calf from the cow are utilized in beef cattle production systems. But separation is stressful for both cow and calf. Separation techniques include fence line separation and the use of devices placed in the nose of the calf to discourage suckling.

Weaning means the transition from a milk-based diet to a fibrous diet, which is very stressful for calves.

[Actions recommended for implementation]

Managers and handlers should plan and conduct the cow-calf separation such that does not cause excessive stress on the cow and calves, based on a thorough understanding of their physiological characteristics. In addition, calves separated from their dams may need to be isolated for a while, where they cannot hear their dams' cries to facilitate the separation process.

If necessary, handlers should seek expert advice on the most appropriate time and method of weaning for their type of cattle and production system.

Calves should be weaned only when their ruminant digestive system has developed sufficiently to enable them to maintain growth and welfare.

Early separation of the cow and calf may be carried out for the purpose of disease control and early recovery of the reproductive function of the cow. However, this practice should be performed in a planned manner by individuals with a thorough understanding of the physiological and behavioral characteristics of calves, along with the necessary equipment and expertise.

During the post-weaning period, calves of similar size should be herded together to acquire sociality within the herd.

Cow-calf separation and weaning should be performed by persons who have mastered the technique and should not be performed at the same time as other stressful procedures such as surgical procedures or prolonged transportation. Special

care should be taken if abrupt weaning is immediately followed by additional stressors such as transportation, as calves are at risk of increased morbidity under these circumstances.

[Actions recommended for future implementation]

None

12. Control of diseases and accidents

The prevention of disease and injury through daily management is of utmost importance.

Managers and handlers need to acquire knowledge to identify and appropriately address cattle affected by chronic illness or injuries, such as being non-ambulatory after parturition.

[Actions recommended for implementation]

Beef cattle health management should be conducted to ensure optimal physical and behavioral health and animal welfare. There should be an effective program for the prevention and treatment of diseases and conditions consistent with the programs established by a qualified veterinarian as appropriate. The program, including production information (e.g., number of heads and number of offspring), morbidity rates, mortality rates, culling rates, and treatment matters, should be regularly updated by managers or handlers. For parasites, appropriate program for monitoring, control, and treatment should also be in place.

Managers and handlers should have experience in recognizing and dealing with non-ambulatory cattle and managing chronically ill or injured cattle. They should also consult with veterinarians as needed. If animal handlers are not able to correct the causes of ill-health or distress or if they suspect the presence of a disease, they should seek advice from those having training and experience, such as veterinarians or other qualified advisers.

Vaccinations and other treatments administered to cattle should be undertaken by people skilled in the procedures and on the basis of veterinary advice in accordance with the “Veterinarians Act (Act No. 186 of 1949)” and other relevant laws and regulations, and in consideration of the welfare of cattle.

Beef cattle identified as sick or injured should be separated as carefully as possible and given appropriate treatment at the first available opportunity by competent and trained animal handlers. In the case special isolation is required, consideration should be given to all the requirements of the cattle, including additional bedding and alternative flooring. Shade should be provided to cattle suffering from sun sensitivity, and the cause should be identified if possible. Non-ambulatory cattle should not be transported or moved unless absolutely necessary for treatment or diagnosis. Such movements should be done carefully using methods avoiding dragging or excessive lifting. Non-ambulatory cattle should have access to water at all times and be provided with feed at least once daily. Furthermore, these cattle should be protected from predators and provided with shade.

For sick and injured cattle, a prompt diagnosis should be made by a veterinarian to determine whether the animal should receive additional care, emergency shipment, or on-farm euthanasia. Based on the veterinarian's diagnosis, if the prognosis is poor with little chance of recovery after treatment, the decision of emergency shipment or on-farm euthanasia should be undertaken by a competent person. On-farm euthanasia, except for cases where culling is carried out in accordance with the “Act on the Prevention of Infectious Diseases in Livestock (Act No. 166 of 1951)”, should be conducted as soon as possible, following documented procedures and utilizing appropriate equipment, with reference to the "Technical Guidelines for On-Farm Euthanasia of Farm Animals”.

Records of diseases and accidents should be kept, and if the frequency of occurrence is high, consultation with a veterinarian or relevant experts should be sought for appropriate action, as the presence of disease may be suspected, or the cause of disease, pain, distress, or suffering may not have been improved.

[Actions recommended for future implementation]

None

13. Cleaning and disinfection of cattle barns

Ensuring a comfortable environment for beef cattle is important for maintaining good hygiene and minimizing the risk of disease and injury. The accumulation of manure can cause foul odors and pests, provide a breeding ground for pathogens, and cause accidents such as slips and swollen hooves, which can lead to stress in cattle.

[Actions recommended for implementation]

Flooring, bedding, resting surfaces, and outdoor yards should be cleaned as conditions warrant, to ensure good hygiene, comfort and minimize risk of diseases and injuries.

Areas in contact with cattle, including facilities and equipment, should be cleaned and disinfected to keep the facilities and equipment clean.

To ensure a comfortable environment for cattle, the floor surface should be kept dry by proper removal of manure and addition or replacement of the bedding.

Pens should be cleaned as conditions warrant and, at a minimum, after each production cycle.

[Actions recommended for future implementation]

None

14. Biosecurity measures on farm

In the event of the entry of highly infectious pathogens such as foot-and-mouth disease virus into a farm, there is a high risk that the disease will spread simultaneously throughout the entire herd, posing a significant problem for animal welfare.

In order to prevent the outbreak of infectious diseases and to maintain the cattle health, it is necessary to implement thorough biosecurity management to prevent the entry of pathogens into the farm. Hematophagous insects like horseflies, stable flies, and blackflies, along with ectoparasites such as ticks and lice, not only contribute to the transmission of various pathogens, but also adversely affect cattle through bloodsucking. Furthermore, rodents and other harmful animals play a role in transmitting pathogens and degrade the rearing environment by causing contamination of feed and damage to facilities and equipment (e.g., electrical wiring).

[Actions recommended for implementation]

In addition to complying with the “Biosecurity Standards” as outlined in the “Act on the Prevention of Infectious Diseases in Livestock”, managers and handlers should design, implement, and periodically review “Biosecurity plans” and acquire the necessary knowledge for the daily prevention of infectious disease outbreaks. In the case of any abnormalities observed in cattle or other necessary situations, managers and handlers should consult with veterinarians and when specific symptoms outlined in the “Act on the Prevention of Infectious Diseases in Livestock” are confirmed, they should notify that to the Livestock Hygiene Service Center immediately.

When vehicles enter or leave a farm, or people enter or leave a cattle barn, they should be disinfected appropriately.

The major sources for spread of pathogens including harmful animals, hematophagous insects, and ectoparasites should be prevented from invading and if they emerge, prompt extermination measures should be taken.

[Actions recommended for future implementation]

None

15. Group composition and social environment

It is necessary to understand dominance hierarchies that develop within different groups for evidence of agonistic behavior and excessive mounting behavior, and to consider the cattle herd composition.

[Actions recommended for implementation]

Management of cattle should take into account the social environment and social interactions of cattle within groups, particularly in intensive system. Managers and handlers should understand the dominance hierarchies that develop within different groups and focus on high-risk animals, such as very young, very old, small, or large size in the group.

The handlers should understand the risks of increased agonistic interactions between cattle, particularly after mixing groups. In particular, the introduction of heifers into new group, the mixing of cattle of different size and age in the same pens, the mixing of bulls, high stocking density, insufficient space at the feeder, and insufficient water access can lead to excessive agonistic behavior. For this reason, cattle that are suffering from excessive agonistic behavior or mounting behavior should be removed from the group in question using appropriate enclosures, if necessary. Adequate fencing should be provided to minimize any animal welfare problems.

Horned and non-horned cattle should not be mixed because of the risk of injury. Individual management of calves in calf hatches to produce successor cattle is expected to promote the observation of health status and minimize the risk of disease spread.

Rearing is carried out in groups composed of cattle of similar age and physical size. During this period, abnormal behaviors such as cross-sucking of ears, nipples, external genitalia, and tails should be monitored and measures should be taken to prevent such behaviors, including providing sucking devices, revising or modifying feeding practices, and providing other environmental enrichments.

[Actions recommended for future implementation]

None

16. Promoting understanding of animal welfare

It is necessary to understand that ensuring good animal welfare involves management practices such as designing management systems, maintaining proper rearing environments, responsible rearing, and providing appropriate care and that serious problems may arise if these factors are compromised.

Good management of beef cattle plays a crucial role in ensuring good animal welfare. It is also necessary to constantly recognize that the acquisition of correct knowledge, skills, and an aptitude for animal welfare by managers and handlers will contribute to the reduction of the number of beef cattle rendered unfit due to problems including hoof diseases, digestive and respiratory diseases, and reproductive disorders. This, in turn, will lead to the long-term, healthy rearing of beef cattle.

[Actions recommended for implementation]

Managers and handlers should be competent with relevant experience or training to equip them with the necessary practical skills and knowledge of beef cattle behavior, handling, health, biosecurity, physiological needs and welfare (e.g., coughing, eye discharge, changes in locomotor behavior, reduced feed and water intake, changes in weight and body condition, changes in behavior, or abnormal appearance). In particular, they should acquire the knowledge and skills to identify and appropriately manage non-ambulatory cattle, recently calved cattle, and cattle suspected of being affected by chronic illness or injured, as well as the knowledge to evaluate the suitability of transportation and the appropriate body condition (see Appendix I: "Nutritional Degree" Assessment Procedure).

There should be a sufficient number of animal handlers to adequately ensure the health and welfare of the cattle.

[Actions recommended for future implementation]

None

Section 2. Nutrition

1. Nutritional and water requirements

(1) Beef cattle in general

To ensure the health of cattle and support activities such as normal growth and reproduction, it is necessary to provide them with feed containing appropriate nutrition for their developmental and fattening stages, avoiding both excess and deficiency.

For beef cattle, feeding concentrated feed is required to meet the nutritional needs, but as ruminant animals, ruminant behavior is known not only to maintain a normal gastrointestinal environment and promote the digestion and absorption of feed, but also to contribute to psychological stability. Therefore, it is necessary to feed a certain proportion of roughage, with appropriate quality and quantity.

The body condition score of cattle is a good indicator of nutritional control and the health status.

[Actions recommended for implementation]

Cattle should be provided with access to an appropriate quantity and quality of balanced nutrition and water that meets their physiological needs and should not allow body condition to fall outside an acceptable range. In this case, roughage should be fed at a certain proportion to maintain the normal gastrointestinal environment of the cattle, with careful attention paid to both its quality and quantity. Adequate roughage feeding should be provided, as inadequate roughage may suppress ruminant behavior and cause tongue-rolling behavior.

Water requirements are influenced by factors such as temperature, body weight, and feed composition. Inadequate water intake can result in various diseases; therefore, fresh, potable, and sufficient water should be provided at all times.

When cattle are maintained in extensive conditions, the animal handler should ensure that the period of reduced nutrition is not prolonged and that mitigation strategies are implemented if welfare is at risk of being compromised; e.g., providing additional feed and water. In addition, managers and handlers should become familiar with potential micronutrient deficiencies or excesses in their respective geographical areas and use appropriately formulated supplements where necessary.

The "Japanese Feeding Standards for Beef Cattle", "Japanese Standard Tables of Feed Composition", and other sources should be referred to for information on the types and quantities of required nutrients. Since fluctuations in feed ingredient values are particularly large in roughage, analysis of self-supplied feed should be conducted by feed analysis centers or similar facilities.

Managers and handlers should understand the impact of cattle size, age, weather patterns, diet composition, and sudden dietary changes in respect to digestive upsets and their negative consequences (e.g., acidosis, bloat, liver abscess, and laminitis) and consult a cattle nutritionist for advice on ration formulation and feeding programs.

[Actions recommended for future implementation]

None

(2) Fattening cattle

In beef production in Japan, meat quality, represented by marbling, tends to be emphasized due to consumer preferences and actual conditions of meat distribution. Consequently, fattening cattle tend to be heavily fed concentrated feed for a long period of time.

However, for cattle, which are ruminant animals, ruminant behavior is known not only to maintain a normal gastrointestinal environment and promote the digestion and absorption of feed, but also to lead to psychological stability.

[Actions recommended for implementation]

It is necessary to feed a certain proportion of roughage, with appropriate quality and quantity.

Some rearing methods, aiming to increase intramuscular fat marbling, control the dosage of vitamin A fed to the cattle during the middle stage of fattening, however, vitamin A deficiency can lead to symptoms such as loss of appetite, visual disturbance, and edema. Therefore, attention should be paid to the appropriate feeding of nutrition including vitamin A by referring to sources such as the "Japanese Feeding Standards for Beef Cattle" and "Japanese Standard Tables of Feed Composition".

Water requirements are affected by factors such as temperature, body weight, feed composition, and others. Inadequate water intake can result in various diseases; therefore, cattle should have access to water at all times.

[Actions recommended for future implementation]

None

(3) Breeding female cattle

Breeding female cattle are characterized by high nutritional requirements at the end of pregnancy and during lactation.

[Actions recommended for implementation]

Careful attention should be paid to excessive or insufficient feed depending on the stage of pregnancy and lactation.

It is essential to maintain proper body condition, since excessive feeding that leads to over-fat condition can result in decreased pregnancy rates and dystocia.

Water requirements are affected by factors such as age, body weight, feed composition, pregnancy status, and temperature. In the case of lactating cattle, insufficient water intake can cause reduced milk production; therefore, cattle should have access to water at all times.

[Actions recommended for future implementation]

None

2. Ensuring the quality of feed and water

When feed and water are stored in feeders and waterers for a long time, problems such as contamination due to the growth of mold and bacteria will occur. Additionally, attention should be paid to the storage conditions of feed, as poisoning by toxins from molds that have developed in the spoiled silage may occur.

Contamination of feed and water with excrement of wild animals such as rats and wild birds can lead to diseases.

[Actions recommended for implementation]

The feeder and waterer should be sufficiently large and they should be clean and free of spoiled, moldy, sour, packed or unpalatable feed. Concerning water, attention should be paid to high temperatures in summer and freezing conditions in winter.

Feedstuffs and feed ingredients should be of satisfactory quality to meet nutritional needs, be managed to minimize contamination and degradation, and be tested for the presence of substances that would impact on the health of the cattle.

Measures to prevent the entry of wild animals should be taken to avoid contamination of feed and water with excrement from rats, wild birds, and other animals that could cause diseases in cattle.

When cattle are grazed, attention should be given to contaminated puddles, poisonous plants such as bracken, and other potential hazards to cattle.

[Actions recommended for future implementation]

None

3. Feeding and water supply methods

When installing feeders and waterers, it is necessary to ensure that all cattle have adequate access to feed, water, and nutrition without any problems, and to keep in mind that the requirements of feed and water vary according to age, weight, etc.

[Actions recommended for implementation]

In all rearing systems, feeding and watering facilities should ensure that all cattle have adequate access to feed, water, and nutrition without any problems.

Managers or handlers should design feeding and water supply systems to prevent excessive fighting among cattle, ensure sufficient space according to the systems, and take appropriate measures.

In intensive production systems the feeder should be sufficiently large so that cattle have adequate access to feed.

When cattle are introduced into a new cattle barn, it should be confirmed that they are able to consume feed and water.

All cattle should be fed at least once a day with the required amount of feed containing the required nutrients, and feeding time should ideally be consistent every day. During hot weather, feeding should be avoided during the hottest hours of the day.

When new feed is introduced, it should be introduced gradually so that roughage with good palatability can be consumed at any time.

[Actions recommended for future implementation]

None

4. Colostrum and calf feeding

Newborn calves immediately face a rapid change in their survival environment from the mother's body to the outside world, and the calf itself has weak resistance; therefore, proper management is necessary to help the calves adapt to the new environment.

Colostrum is the first milk secreted after parturition, playing a crucial role in maintaining calf health, especially containing immunoglobulins that are responsible for transmitting immunity from the dam to the calf. Since the absorption capacity of immunoglobulins in calves rapidly declines with time after birth, sufficient colostrum should be provided within 24 hours of birth (most effectively within 6 hours).

When feeding milk, it is preferable to use a feeding bucket or bottle, as using a regular bucket may result in the milk flowing into the rumen, causing indigestion and flatulence. In particular, feeding buckets that are easy to clean are desirable for hygiene control.

When using a feeding bottle, it is said that making the nipple hole smaller for ingestion affects the sense of fullness and reduces abnormal behaviors (e.g., licking each other and feeding behavior against a wall) after intake.

In addition, consideration should be given to the fact that it has been suggested that feeding only liquid feed from four to six weeks of age may inhibit development of the ruminant stomach.

[Actions recommended for implementation]

To provide passive immunity and adapt calves to their new environment, handlers should ensure that calves receive sufficient colostrum within 24 hours of birth, and colostrum should be free from the risk of contagious diseases that could be transmitted through colostrum.

In order to promote normal rumination behavior after weaning, high-quality chow and hay should be fed from about one week of birth.

Calves over two weeks of age should be fed concentrate and roughage that meets daily requirements, to promote rumen growth and reduce abnormal mouth movements (e.g., tongue play).

[Actions recommended for future implementation]

None

Section 3. Cattle barn

When newly building or renovating a cattle barn, the impact of climate and geographical factors should be evaluated and the barn designed based on expert knowledge on the health and welfare of beef cattle, while taking into account the five freedoms. In order to mitigate the negative effects of these factors, efforts should be made to adapt the cattle breed to the location of the farm or to consider alternative locations. In addition, consideration should be given to the following: (1) ensuring the environment inside the cattle barn is comfortable for cattle, and fresh air can be supplied to the entire barn at all times; (2) prevention of the invasion of pathogens and harmful animals such as wild animals, rats, and flies; (3) maintaining stable temperature and humidity inside the cattle barn, avoiding significant changes due to fluctuations in the weather environment, such as heat and cold, which may adversely affect cattle health; (4) designing the barn structure to facilitate daily management and observation of the cattle, equipped with necessary management facilities; and (5) providing a structure that enables appropriate disposal of excrement.

It is necessary to strive for appropriate management, including repairs to prevent cattle from being injured by damaged parts of the cattle barn and equipment.

[Actions recommended for implementation]

The impacts of climate and geographical factors on beef cattle should be evaluated when farms are established. Efforts should be made to mitigate any negative impacts of those factors, including matching beef breed to location and consideration of alternate sites. All facilities for cattle should be designed, constructed, maintained, and operated to minimize the risk to the welfare of the cattle that is caused by significant changes in temperature and humidity in the cattle barn due to fluctuations in the weather environment such as heat and cold.

Attention should be paid to prevent cattle from being injured by damaged parts of the cattle barn.

The barn should be designed and managed to control the invasion and generation of harmful animals such as wild animals, rats, and flies.

The structure should be designed to facilitate daily management and observation of the cattle and equipped with necessary management facilities, ensuring appropriate excrement disposal.

[Actions recommended for future implementation]

None

1. Rearing system

There are various options for cattle rearing systems, including tethered, untethered, grazing, and combinations of these methods.

To provide a comfortable environment for cattle, the management skills of managers and handlers are important, and sufficient training in the use of equipment and other facilities is also necessary.

Allowing cattle to graze or exercise in paddocks has advantages in terms of comfort for the cattle, such as helping maintain normal hoof condition, preventing arthritis and other problems due to lack of exercise, along with preventing dystocia.

(1) Tethered system

The tethered system is in which cattle are kept moored by chains or ropes.

[Actions recommended for implementation]

Managers and handlers should be aware of the higher risks of welfare problems where cattle are tethered. Cattle should, as a minimum, be able to lie down, stand up, maintain normal body posture, and groom themselves unimpeded.

An adequate length of cattle bed for the cattle's body should be ensured.

Cattle kept in a tethered system should be allowed adequate exercise while untethered, to prevent animal welfare problems.

If tethered outdoors, they should be allowed to turn around and walk.

If the sires are housed, they should have sufficient space for rest and exercise and be able to see other cattle. Additionally, when used for natural mating, no slippery material should be used on the floor.

[Actions recommended for future implementation]

None

(2) Untethered system

The untethered system is a method in which cattle are kept in an enclosure of a certain size without being moored.

[Actions recommended for implementation]

Since untethered cattle can cause injury due to fighting or competition among cattle when they have the freedom to move, they should be watched carefully and attention should be paid to stocking density and herd organization.

In free-stall cattle barns, at least one cattle bed per head of cattle should be prepared.

[Actions recommended for future implementation]

None

(3) Grazing system

The grazing system is a method in which cattle are allowed to graze directly on grassland and the normal condition of their hooves is easily maintained.

The stocking density should depend on the available feed and water supply and pasture quality.

[Actions recommended for implementation]

Electric pasture-fences and gates should be properly installed and maintained to prevent animal welfare problems and used properly in accordance with the instruction manual.

To ensure a good hygiene condition and minimize the risk of diseases and injury, cattle should be moved appropriately between grazing areas.

Cattle should be protected as much as possible from predators such as brown bears.

If herding dogs are used, managers and handlers should train them properly, understand that dogs may cause fear and stress in cattle, and always keep dogs under supervision.

[Actions recommended for future implementation]

None

2. Structure and facilities

The structures of cattle barns and facilities, such as pens, should ensure that cattle will not be damaged by protrusions, and should be easily cleaned and disinfected.

The structure and materials of the cattle beds need to be comfortable and safe for the cattle to prevent injury from slips, etc. In addition, when using bedding, clean and dry materials should be used. Particular attention should be paid during the nursing period, as calves are susceptible to gastrointestinal diseases such as diarrhea and respiratory diseases such as pneumonia.

[Actions recommended for implementation]

Slopes of pens should be maintained to allow water to drain away from feed troughs and not pool excessively in the pens.

Alleys and gates should be designed and operated to allow free movement of cattle. Floors should be designed to minimize slipping and falling, promote foot health, and reduce the risk of claw injuries. Surfaces of concrete alleys should be grooved or appropriately textured to provide adequate footing for cattle.

Cubicles, races, chutes, and pens should be properly maintained and be free from sharp edges and protrusions to prevent injury to cattle.

There should be a separated area where individual animals can be examined closely and which has restraining facilities. Mechanical and electrical devices used in facilities should be safe for cattle. Hydraulic, pneumatic, and manual equipment should be adjusted, as appropriate, to the size of cattle to be handled. This equipment should be constructed and used in a way that minimizes the risk of injury, pain or distress.

In addition, hydraulic and pneumatic operated equipment should have pressure limiting devices to prevent injuries. The manufacturer of such equipment should consider animal welfare at the time of design and preparation of instruction manuals.

Bedding should be provided to all animals housed on concrete. In straw, sand, or other bedding systems such as rubber mats, the bedding should be suitable (e.g., hygienic, non-toxic) and maintained to provide cattle with a clean, dry, and comfortable place on which to lie.

If a housing system includes areas of slatted floor, cattle, including replacement stock, should have access to a solid lying area. The slat and gap widths should be appropriate to the hoof size of the cattle to prevent injuries.

Dipping baths and spray races used for ectoparasite control should be designed and operated to minimize the risk of crowding and to prevent injury and drowning.

Cattle loading yards and ramps should be designed to minimize the risk of stress and injury to cattle and to ensure the safety of managers and handlers.

[Actions recommended for future implementation]

None

3. Space allowance

Since the required rearing space varies depending on factors such as the breed and weight of the cattle, barn structure, and rearing system, it is difficult to uniformly mention the appropriate level. What is important is that managers or handlers observe the cattle carefully and determine whether the rearing space is appropriate.

When the space is overcrowded, this causes stress to cattle and leads to abnormal behavior such as tongue-rolling, disease, and fighting.

[Actions recommended for implementation]

Cattle should be offered adequate space for comfort and socialization. The rearing space should be arranged and managed with consideration for various activities such as lying down, standing, and feeding. All cattle in a group should have sufficient space to lie down, rest, stand up, and groom at the same time. Crowding should not adversely affect normal behavior of cattle and durations of time spent lying. If abnormal behavior is seen, corrective measures should be taken, redefining the areas. Where there are areas that are not suitable for resting such as excessive water and fecal accumulation, these areas should not be of a depth that would compromise welfare and should not comprise the whole of usable area available to the cattle.

When determining the rearing space, sufficient room should be provided for cattle to lie down or stand up, considering actions such as bearing weight on the forelimbs (knees) and moving the head back and forth. If only resting space is provided for individual cattle, there should be at least one such space per head and it should allow cattle to stand and lie comfortably on a firm floor surface. In a free-stall system, the floor should be appropriate for the size of the largest cattle, for example, in length, width, and height.

Calves, whether in individual or groups, should be given sufficient space to comfortably turn themselves around, rest, stand up, and groom themselves, while still being able to see other cattle.

When calves are housed in groups, measures such as installing empty nipples should be taken to prevent diseases and injury to the umbilical cord and vulva, which can be caused by suctioning each other.

Inadequate rearing space for growing cattle may adversely affect weight gain, and measures should be taken to control and prevent such occurrences.

In the grazing system, the stocking density should be commensurate with the available feed and water supply and pasture quality.

[Actions recommended for future implementation]

None

Section 4. Environment of cattle barns

1. Thermal environment

The comfortable temperature range for cattle depends on the stage of maturity, breed, and other factors.

The optimum temperature range for beef cattle is 4 to 20°C for growing cattle and 10 to 15°C for castrated fattening cattle. However, the comfort of cattle is affected by environmental factors such as temperature, humidity, wind, solar radiation, ventilation method and stocking density, and factors on the cattle side including breed, age, body condition, metabolic rate, hair color and density. Therefore, it is important to observe the cattle carefully and maintain their comfort level.

When it is too hot for cattle, they may experience increased respiration rate, decreased appetite, and reduced reproductive performance. Sudden temperature changes can cause heat or cold stress.

[Actions recommended for implementation]

Managers and handlers should be aware of the risk that heat stress poses to cattle, know the temperature and humidity that need to be addressed, and maintain comfort by observing the cattle carefully and taking measures to control temperature in the barn when temperatures are abnormally high.

If conditions are expected to induce heat stress, and increased respiratory rates, decreased appetite, and reduced reproductive performance are observed, heat control measures, such as shading from direct sunlight, providing adequate drinking water, using large fans for airflow, spraying water on the roof, installing misting systems, feeding during cooler nights, and reducing stocking density, should be taken to lower the temperature experienced by the cattle as much as possible, and routine daily activities that require moving cattle should cease.

A contingency plan and crisis management manuals outlined in Section 5.3 should include that when the risk of heat stress reaches very high levels, handlers give priority to access to additional water and could include provision of shade, fans, and provision of cooling systems as appropriate for the local conditions, and these should be appropriately implemented. In addition, the contingency plan should include that during extremely cold weather conditions, handlers provide cattle with shelter, and appropriate feed and water.

Newborn calves are sensitive to cold, and measures should be taken to protect them from cold, such as using thermal jackets, installing far-infrared heaters, or preventing drafts. In addition, cattle that are susceptible to cold stress such as young cattle and those suffering from some diseases, should be provided with extra bedding, feed, and water, and if they are in pasture, protective measures should be taken such as moving the cattle from pasture to a barn.

[Actions recommended for future implementation]

None

2. Ventilation

Maintaining good air quality in the barn and providing adequate ventilation are important for the health and welfare of beef cattle. They are effective in reducing discomfort and the risk of disease among the cattle.

The air composition is influenced by stocking density, cattle body size, flooring, bedding, manure management, cattle barn design, and ventilation systems.

In order to provide a constant supply of fresh air and keep the comfortable environment for beef cattle, adequate ventilation should be provided to remove ammonia, hydrogen sulfide, carbon dioxide, dust and moisture generated in the cattle barn to the outdoors. It should also be noted that ventilation during hot weather has the effect of discharging heat in the cattle barn and helping the body heat dissipate by using the wind from ventilation fans, and it is not solely intended to blow air directly to the bodies of the cattle.

In particular, inadequate ventilation leading to the retention of ammonia and other substances in the barn poses risks not only to the cattle but also to human health by causing damage to the respiratory organs and other organs. Since ammonia is generated from cattle manure, the amount and concentration of ammonia vary greatly depending on the ventilation system and the manure treatment conditions.

[Actions recommended for implementation]

The ventilation system should be designed to provide a constant supply of fresh air throughout the cattle barn.

Ammonia concentration should not routinely exceed 25 ppm at cattle level, at which managers and others working in the cattle barn experience unpleasant odors, and the dust level should be kept to a minimum through constant supply of fresh air, and thorough ventilation and excrement removal.

[Actions recommended for future implementation]

None

3. Lighting

The cattle barn should be provided with appropriate lighting equipment, as necessary, to ensure that the light is bright enough for the cattle to perform natural behaviors such as feed and water intake, and bright enough for managers and handlers to observe and manage the condition of the cattle effectively.

[Actions recommended for implementation]

Appropriate lighting equipment should be installed to enable beef cattle to perform natural behaviors such as the intake of feed and water, and to allow managers or handlers to carry out their daily work without hindrance.

Confined cattle that do not have access to natural light should be provided with supplementary lighting which follows natural periodicity sufficient for their health and welfare, to facilitate natural behavior patterns and to allow adequate inspection of the cattle.

The lighting should not cause discomfort to cattle and should include weak night lighting for confined cattle. Adequate lighting should also be provided in and around the entrances and exits of the holding facility.

[Actions recommended for future implementation]

None

4. Noise

Cattle can adapt to various degrees and types of sounds. Excessive noise, however, may surprise cattle, reduce feeding and lead to accidents. It may also induce anxiety or fear, hindering normal resting or sleeping and resulting in stress.

[Actions recommended for implementation]

Ventilation fans, feeding machinery, or other indoor or outdoor equipment should be constructed, placed, operated, and maintained in such a way that they cause the least possible amount of noise.

To prevent stress and fear reactions, exposure of cattle to sudden and loud noises, including those caused by humans, should be minimized whenever possible.

[Actions recommended for future implementation]

None

Section 5. Confirmation of the situation related to animal welfare

1. Confirmation of animal welfare status

It is important to confirm and record the current management of beef cattle on the farm in order to address the concept of animal welfare appropriately.

2. Inspection and management of equipment

If automated equipment, such as automatic feeders, is installed, its failure could negatively affect the health of cattle and the rearing environment, and it should be appropriately maintained and managed.

[Actions recommended for implementation]

All facilities should be constructed, maintained, and managed to minimize the risk to the welfare of beef cattle. Additionally, the equipment should be inspected at least once a day to ensure proper operation, considering the frequency recommended by the equipment manufacturers. If a fault is found, it should be repaired promptly.

In cases where electric fences are used, they should be installed, used, and maintained appropriately in accordance with the instruction manuals.

[Actions recommended for future implementation]

None

3. Emergency response

Outages of electricity, water, and feed supply systems may compromise animal welfare. Therefore, to respond to emergencies such as fires on the farm, flooding, power outages, water outages due to natural disasters, and feed supply disruptions due to road conditions, and to prevent adverse effects on the health of cattle and the rearing environment, each farm should take measures such as obtaining contact information of main service providers, considering stockpiling feed and fuel, and water intake methods, and developing their own power generators and alternative systems for equipment such as for manure removal.

[Actions recommended for implementation]

To address the failure of electricity, water, and feed supply systems, as well as to minimize and mitigate the effects of natural disasters or extreme climatic conditions (e.g., earthquakes, fires, droughts, floods, blizzards, typhoons, high temperature stress), managers and handlers should have contingency plans to cover the failure of these systems, by being familiar with them, and share them with all relevant parties, rather than to deal with the consequences of the disaster. The contingency plan or crisis management manual should cover the procedures for euthanasia of sick or injured cattle and the management of farm in the face of an emergency disease outbreak, consistent with the farm animal hygiene measures of national and prefectural Veterinary Services.

In case of feed shortage due to drought or other reasons, managers and handlers should take measures to minimize the reduction period of feed supply and to mitigate

the risk of damage to the health and welfare of beef cattle. Animal management decisions should be made as early as possible and these should include a consideration of reducing the number of cattle.

If feed is not available, steps should be taken to avoid starvation, including relocation of the cattle, sale, slaughter, and euthanasia.

Backup systems such as alarms and generators should be checked periodically, considering the frequency recommended by the equipment manufacturer.

If there is a risk of damage to cattle or cattle barns as a result of natural disasters, preventive measures should be taken in advance whenever possible. Among the advance measures, the evacuation plans include feasible actions, such as moving cattle to lower-risk areas on the farm property. Also, measures to prevent the spread of damage should be implemented after the weather conditions have recovered.

[Actions recommended for future implementation]

None

Section 6. Criteria or measurables for the welfare of beef cattle

Animal-based criteria can be useful indicators of animal welfare. These criteria can be considered as a tool to monitor the impact of design and management, given that both of these can affect animal welfare.

[Actions recommended for implementation]

Consideration should be given to the design of the system and animal management practices.

The use of these indicators and their appropriate thresholds should be adapted to the different situations where beef cattle are managed.

1. Behavior

Certain behaviors could indicate an animal welfare problem. These include decreased feed intake, altered locomotory behavior and posture, altered lying time, altered respiratory rate and panting, coughing, shivering and huddling, excessive grooming and the demonstration of stereotypic, agonistic, depressive or other abnormal behaviors.

2. Morbidity and injury rates

Morbidity rates, including for infectious and metabolic diseases, lameness, peri-partum and post-procedural complications, and injury rates, above recognized thresholds, may be direct or indirect indicators of the animal welfare status of the whole herd.

Understanding the aetiology of the disease or syndrome is important for detecting potential animal welfare problems.

Scoring systems, such as for body condition, lameness and milk quality, can provide additional information.

Both clinical examination and pathology should be utilized as an indicator of disease, injuries and other problems that may compromise animal welfare.

3. Mortality and culling rates

Mortality and culling rates affect the length of productive life and, like morbidity rates, may be direct or indirect indicators of the animal welfare status.

Depending on the production system, estimates of mortality and culling rates can be obtained by analyzing death, culling, and their temporal and spatial patterns of occurrence. Mortality and culling rates, along with their causes, should be recorded regularly, e.g., daily, monthly, annually or with reference to key husbandry activities within the production cycle.

Anatomical examination can help determine the cause of death.

4. Changes in weight and body condition

In growing animals, weight gain may be an indicator of animal health and animal welfare.

Body condition outside an acceptable range and significant body weight change may be indicators of compromised welfare.

5. Reproductive efficiency

Reproductive efficiency can be an indicator of animal health and animal welfare status.

Poor reproductive performance can indicate animal welfare problems.

Examples may include:

- anoestrus or extended post-partum interval;
- low conception rates;
- high abortion rates;
- high rates of dystocia;
- retention placenta (retained placenta);
- metritis;
- loss of fertility in breeding bulls.

6. Physical appearance

Physical appearance may be an indicator of animal health and animal welfare, as well as the conditions of management.

Animal welfare may be compromised if the following are observed:

- presence of ectoparasites;
- abnormal coat color, texture, or hair loss;
- excessive soiling with feces, mud, or dirt (cleanliness);
- swelling, injury, or lesions;
- discharges (e.g., from the nose, eyes, or reproductive tract);
- feed abnormality;
- abnormal posture (e.g., rounded back, head low);
- emaciation or dehydration.

7. Handling responses

Improper handling can result in fear and distress in cattle.

Indicators include the following:

- evidence of poor human-animal relationship, such as excessive flight distance;

- disturbed behavior in the chute or race such as repeated reluctance to enter;
- percentage of animals injured during handling, such as bruising, lacerations, broken horns or tails, and broken legs;
- percentage of animals slipping or falling;
- percentage of animals vocalizing abnormally or excessively during restraint;
- percentage of animals not moving without the use of electric goad;
- percentage of animals striking restraints, fences, or gates.

8. Complications due to routine procedure management

Surgical and nonsurgical procedures are commonly performed in beef cattle for improving animal performance, facilitating management, and improving animal welfare and human safety.

However, if these procedures are not performed properly, animal welfare can be compromised.

Indicators of such problems could include the following:

- post procedure infection, swelling, and pain behavior;
- reduced feed and water intake;
- post procedure body condition and weight loss;
- myiasis;
- morbidity and mortality.

9. Euthanasia

At least, the following reasons may be considered when deciding that euthanasia is appropriate.

- severe emaciation, weak cattle that are non-ambulatory or at risk of becoming non-ambulatory;
- non-ambulatory cattle that will not stand up, refuse to eat or drink, or have not responded to therapy;
- rapid deterioration of medical condition for which therapies have been unsuccessful
- severe, debilitating pain;
- compound (open) fracture;
- spinal injury;
- central nervous system disease;
- multiple joint infections with chronic weight loss;
- calves that are premature and unlikely to survive, have a debilitating congenital defect, or otherwise unwanted;
- part of disaster management response.

Appendix I

"Nutritional Degree" Assessment Procedure (from 'Wagyu Registration Procedures Manual, 2021 Edition', published by the Wagyu Registry Association)

(1) Nutritional degree is divided into 9 categories.
(2) The six areas to be judged are the withers, spine, ribs, hip angle, buttocks, and tailhead area. These areas allow palpation of the skeleton and are judged based on the state of fat accumulation.
(3) The nutritional degree is determined by the simple average of the six areas (rounded to the first decimal place).

<table>
<tr><td colspan="2" rowspan="2">Classification</td><td colspan="3">Underweight</td><td colspan="3">Normal</td><td colspan="3">Overweight</td></tr>
<tr><td>Very underweight</td><td>Underweight</td><td>Slightly underweight</td><td>Lean</td><td>Normal</td><td>Slightly overweight</td><td>Moderately overweight</td><td>Overweight</td><td>Very overweight</td></tr>
<tr><td colspan="2"></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
<tr><td rowspan="2">Withers</td><td>Visual Assessment</td><td colspan="2">Vertebrae are pointy and peaked;
Every Individual vertebra is clearly distinguishable</td><td>Slightly fleshy</td><td colspan="3">Rounded and smooth</td><td colspan="3">Bone structure is not externally apparent</td></tr>
<tr><td>Palpation</td><td colspan="2">Can touch vertebrae with hand</td><td>Very small amount of fat</td><td>Protrusions can be distinguished by light pressure</td><td></td><td>Protrusions cannot be distinguished without considerable pressure</td><td colspan="3">Marked accumulation of subcutaneous fat</td></tr>
<tr><td colspan="6"></td><td>Large accumulation of fat</td><td>Excessive fat</td><td>Very excessive fat</td></tr>
<tr><td rowspan="3">Spine</td><td rowspan="2">Visual Assessment</td><td colspan="2">Tip of spine is sharp and protruding</td><td rowspan="2">Tip of the spine has a rounded contour</td><td rowspan="2"></td><td rowspan="2">Smooth transition throughout</td><td rowspan="2">Dorsum appears flat</td><td colspan="3" rowspan="2">Bone structure is not externally apparent</td></tr>
<tr><td>Spine is easily distinguishable</td><td>Spine is distinguishable</td></tr>
<tr><td rowspan="2">Palpation</td><td colspan="3">Can touch spine with hand</td><td colspan="3">Spine can be identified by light pressure</td><td colspan="3">Spine cannot be identified without significant pressure</td></tr>
<tr><td colspan="2">No fat</td><td>Very small amount of fat</td><td>Small amount of fat</td><td>Moderate fat accumulation</td><td>Slightly fatter</td><td>Large accumulation of fat</td><td>Excessive fat</td><td>Very excessive fat</td></tr>
<tr><td rowspan="3">Ribs</td><td>Visual Assessment</td><td>Ribs are easily distinguishable</td><td>Ribs are distinguishable</td><td></td><td>1-2 ribs are visible</td><td>Smooth transition throughout</td><td></td><td colspan="3">Bone structure is not externally apparent</td></tr>
<tr><td rowspan="2">Palpation</td><td colspan="3">Can touch ribs directly with hand</td><td colspan="3">Ribs can be identified by light pressure</td><td colspan="3">Ribs are covered with fat</td></tr>
<tr><td colspan="2">No fat</td><td>Very small amount of fat</td><td>Small amount of fat</td><td>Moderate fat accumulation</td><td>Slightly fatter</td><td>Large accumulation of fat</td><td>Excessive fat</td><td>Very excessive fat</td></tr>
<tr><td rowspan="3">Hip angle</td><td>Visual Assessment</td><td colspan="2">Hip angle's edge protrudes sharply with minimal flesh</td><td></td><td colspan="3">Hip angle's edge is slightly rounded</td><td colspan="3">Hip angle is rounded and the space between the hip angles appears flat.</td></tr>
<tr><td rowspan="2">Palpation</td><td colspan="2" rowspan="2">Can touch hip with hand</td><td colspan="2" rowspan="2">Very small amount of fat</td><td colspan="2" rowspan="2">Accumulation of fat can be identified by light pressure</td><td colspan="3">Clear fat accumulation on pressure.</td></tr>
<tr><td>Large accumulation of fat</td><td>Excessive fat</td><td>Very excessive fat</td></tr>
<tr><td rowspan="3">Buttocks</td><td rowspan="2">Visual Assessment</td><td colspan="2" rowspan="2">Ischium protrudes sharply with minimal flesh;
Buttocks are extremely concave</td><td rowspan="2">Buttocks are slightly concave</td><td colspan="4" rowspan="2">Ischium is slightly rounded;
Buttocks appear flat</td><td colspan="3">Ischium is rounded</td></tr>
<tr><td></td><td colspan="2">Fat mass (tail pillow) appears</td></tr>
<tr><td rowspan="2">Palpation</td><td colspan="2" rowspan="2">Can touch ischium with hand</td><td colspan="2" rowspan="2">Very small amount of fat</td><td colspan="2" rowspan="2">Accumulation of fat can be identified by light pressure</td><td colspan="3">Clear fat accumulation on pressure.</td></tr>
<tr><td>Large accumulation of fat</td><td>Excessive fat</td><td>Very excessive fat</td></tr>
<tr><td rowspan="3">Tailhead area</td><td>Visual Assessment</td><td colspan="3">Below the tailhead is a depression, and the skeleton is sharp</td><td></td><td colspan="2">Skeleton is rounded</td><td colspan="3">Becomes rounded</td></tr>
<tr><td rowspan="2">Palpation</td><td colspan="3" rowspan="2">Can touch skeleton with hand</td><td colspan="2" rowspan="2">Very small amount of fat</td><td colspan="2" rowspan="2">Accumulation of fat can be identified by light pressure</td><td colspan="3">Clear fat accumulation on pressure.</td></tr>
<tr><td>Large accumulation of fat</td><td>Excessive fat</td><td>Very excessive fat</td></tr>
<tr><td colspan="2">Old classification</td><td>1</td><td>2</td><td>3−</td><td colspan="3">3</td><td>3+</td><td>4</td><td>5</td></tr>
<tr><td colspan="10">Reference</td></tr>
<tr><td colspan="2">Dewlap</td><td colspan="3"></td><td>Some fat</td><td>Moderate fat</td><td>Becoming well-filled</td><td>Becoming swollen</td><td></td><td>Excessive fat</td></tr>
<tr><td colspan="2">Lower paralumbar fossa</td><td colspan="3"></td><td></td><td></td><td>Slightly higher fat</td><td>Considerable fat</td><td></td><td>Excessive fat</td></tr>
<tr><td colspan="2">Udder area</td><td colspan="3"></td><td></td><td></td><td>Slightly higher fat</td><td>Considerable fat</td><td></td><td>Excessive fat</td></tr>
</table>