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Technical Guidelines for Management of Dairy Cattle

The “Technical Guidelines for Management of Dairy 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**

Table of Contents

| | |
|--|-----|
| Section 1. Management method | 1 |
| 1. Observation and recording | 1 |
| 2. Handling of dairy cattle | 2 |
| 3. Dehorning..... | 3 |
| 4. Tail docking | 4 |
| 5. Identification | 4 |
| 6. Hoof management..... | 5 |
| 7. Milking | 5 |
| 8. Non-lactating period | 6 |
| 9. Reproduction | 6 |
| 10. Calving..... | 7 |
| 11. Cow-calf separation and weaning | 8 |
| 12. Control of diseases and accidents | 9 |
| 13. Cleaning and disinfection of cattle houses | 10 |
| 14. Biosecurity measures on farm..... | 10 |
| 15. Group composition and social environment | 11 |
| 16. Promoting understanding of animal welfare | 12 |
| Section 2. Nutrition..... | 13 |
| 1. Nutritional and water requirements..... | 133 |
| 2. Ensuring the quality of feed and water | 144 |
| 3. Feeding and water supply methods..... | 144 |
| 4. Colostrum and calf feeding..... | 155 |
| Section 3. Cattle house | 166 |
| 1. Rearing system | 16 |
| (1) Tethered methods..... | 177 |
| (2) Untethered methods | 177 |
| (3) Grazing system | 17 |
| 2. Structures and facilities | 18 |
| 3. Space allowance | 19 |
| Section 4. Environment of cattle houses | 211 |
| 1. Thermal environment | 211 |
| 2. Ventilation | 222 |
| 3. Lighting..... | 222 |
| 4. Noise | 23 |
| Section 5. Confirmation of the situation related to animal welfare..... | 244 |
| 1. Confirmation of animal welfare status | 244 |
| 2. Inspection and management of equipment | 244 |
| 3. Emergency response | 244 |
| Section 6. Criteria or measurables for the welfare of dairy cattle | 266 |
| 1. Behavior | 266 |
| 2. Morbidity and injury rates | 266 |
| 3. Mortality and culling rates..... | 266 |
| 4. Changes in body weight, body condition, and milk yield | 277 |
| 5. Reproductive efficiency | 277 |
| 6. Physical appearance | 277 |
| 7. Handling responses..... | 277 |

| | |
|---|------|
| 8. Complications due to routine procedure management..... | 2828 |
| 9. Euthanasia | 2828 |
| Appendix I | 29 |
| Appendix II | 300 |
| Appendix III | 311 |

Section 1. Management method

1. Observation and recording

It is important to keep track of the health of dairy cattle to make sure that 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, lactation status such as milk yield, feed rations or intake, adequate water supply, maximum and minimum temperatures, and humidity. Participating in herd testing makes it possible to capture details such as the milk yield and milk constituents of each cow. This also provides a more accurate understanding of the health status of individual cows.

[Actions recommended for implementation]

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

When observing dairy 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 status. 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 dairy 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 appropriate treatment, 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 cattle, the occurrence of diseases and accidents, as well as their causes, lactation status such as milk yield, feed rations or intake, adequate water supply, maximum and minimum temperatures, 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 as the situation requires, for example, when a behavior that may be causing animal welfare problems is observed (refer to Section 6.1).

When the herd is reorganized by introducing cattle from outside or from different

herds, special care should be taken for the observations and records as this can be very stressful for the cattle.

[Actions recommended for future implementation]

None

2. Handling of dairy cattle

Cattle are animals that are sensitive to changes in their surrounding environment. In particular, dairy cattle are usually milked at least twice a day, so 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 house or approaching dairy 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 to the milking parlor at milking time, attempting to kick at 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 Transport of Farm Animals." In addition, when gathering untethered cattle into a handling facility, they should be moved quietly and calmly at the pace of the slowest cattle, 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 the additional stress of multiple procedures.

Exposure cattle to sudden movements or changes in visual contrast (sudden changes in lighting contrast or color) should be minimized as far as 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 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 are free to move, and should not be used on sensitive areas such as the udder, face, eyes, nose, or anogenital region. Goads and other aids should not be used repeatedly if the cattle fail to respond or move, and in such cases it should be investigated whether some physical or other impediment is preventing the cattle from moving.

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

[Actions recommended for future implementation]

None

3. Dehorning

Dairy cattle may butt horns against others to secure feed, establish social hierarchy, or for other reasons, and this can result in such as injuries and abortions.

The selection of dehorning or hornless cattle is considered effective means of preventing unnecessary injuries and abortions, especially during group feeding in the cattle house. 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, dehorning should be performed using anesthesia or analgesia administered by a veterinarian.

For appropriate dehorning, the procedure should be performed during the horn budding 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 anesthesia or 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 dairy cattle should be carefully observed, and if signs of infection, such as suppuration, are observed, the cattle should be promptly treated or cured, and the procedure should be rechecked, confirmed, and revised as necessary.

When 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 after 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 contamination of raw milk caused by dirt from the tail hair that dirty the cattle's body and udder, and to prevent the tail from causing injury to handlers. Alternative methods for preventing contamination from the tail hair include improving the environment of the floors and bedding, proper manure disposing, and cleaning and trimming the tail hair. Alternative methods for preventing the tail from causing injuries to handlers include lifting the tail during milking or when working near the cattle.

[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 it does not contribute to improving the health and animal welfare of cattle.

As an alternative, trimming of tail hair should be considered where maintenance of hygiene is a problem.

[Actions recommended for future implementation]

None

5. 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 dairy 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

6. 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. During the lactation period in particular, the udder and teats are easily injured when the cattle are lying down, which may cause mastitis. 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 become deformed.

Observing the gait and standing posture of cattle using the lameness score (refer to Appendix I) and the lameness assessment method when tethered (refer to Appendix II) can help with the early detection of hoof disorders.

[Actions recommended for implementation]

Regular hoof trimming should be performed to maintain normal hoof functions 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

7. Milking

Milking is usually carried out more than twice a day, so it is important to milk the cows quickly and hygienically without causing them any discomfort. Milk yield and milk constituents vary depending on several factors such as genetics, breed, age, and nutrition, but they are also known to change due to stress during milking. It is necessary to provide the number of workers and milking machines involved in the milking process according to the number of cattle to be milked.

[Actions recommended for implementation]

Milking machines (including automatic milking systems) should be constructed and used in a calm and considerate manner in order to avoid pain and distress by minimizing damage to the teats and udders of dairy cattle, and using them to avoid over-milking.

Milking machines should be inspected and maintained regularly, and the operation of the equipment should be checked. Manufacturers of such equipment should provide operating instructions that consider animal welfare.

A regular milking routine should be established relevant to the stage of lactation, the composition of the herd, and the capacity of the system. Special care should be paid to animals being milked for the first time. They should be familiarized with the milking

facility prior to giving birth to prevent accidents when they are milked for the first time. In addition, management should ensure that waiting times are minimized, as long waiting times can lead to health and welfare problems such as lameness and reduced feeding time.

Slippery floors in milking areas and dairy changes in milking times and frequency under a timed milking system are stressful for dairy cattle, so such conditions should be improved.

Special attention should be paid to the hygiene of the udders of dairy cattle and the milking equipment, and milking in a calm and considerate manner to avoid causing pain and distress. All cattle should be checked for abnormal milk at every milking.

Preventing mastitis is important to ensure the comfort of dairy cattle, so teats should be disinfected before and after milking.

Managers and handlers should regularly check the information provided by the milking system including herd testing data and act accordingly to protect the welfare of the cows.

[Actions recommended for future implementation]

None

8. Non-lactating period

To stop milking the cattle is carried out about two months before the calving in order for the dam to recover her strength, provide nutrients to the fetus, and restore mammary tissue in preparation for lactation in the next calving.

[Actions recommended for implementation]

During the non-lactating period, treatment should be provided if the cattle are suffering from mastitis.

During the early stages of lactation, cattle are susceptible to suffering from energy deficiencies, so appropriate nutritional maintenance should be conducted during the non-lactating period to maintain good body condition.

[Actions recommended for future implementation]

None

9. Reproduction

Reproduction methods include natural mating, artificial insemination, and embryo transfer, which are selected based on factors such as the rearing environment and management policy. Animal welfare problems may arise when various reproductive data, such as estrus cessation, prolonged calving intervals, low conception rates, high abortion rates, and high dystocia rates are poor compared to expected standard values.

[Actions recommended for implementation]

For 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 should be 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, and care should be taken when selecting the bulls to be mated with or sex-sorted semen. 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 dairy 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 pain or 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 calving. (refer to Appendix III: Sample simplified body condition score).

When a sire is used for semen collection, a veterinarian or livestock inseminationist should perform the procedure such that it does not cause any pain or distress to the bull or 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.

[Actions recommended for future implementation]

None

10. Calving

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

[Actions recommended for implementation]

The calving areas should be kept clean and well maintained by paying special attention to providing the cattle with a clean and comfortable environment (including bedding, calving pen, appropriate temperature, and hygiene). During calving, 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 calving area considering the burden on the dam during calving.

Also, lighting in preparation for nighttime calving, heating, and new bedding for slip prevention should be provided and new bedding should also be provided for each calving.

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 calving area at an appropriate time before calving, based on the gestation length and calving signs.

After the onset of calving 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 of veterinarians, if needed, as soon as possible after they are detected.

Calving assistance should be provided only to assist in cases of dystocia, and not for the purpose of shortening the delivery time. In addition, it should be performed so as not to cause excessive pain or distress.

Newborn calves are susceptible to hypothermia, so 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.

Newborn calves should be handled and moved in a manner which minimizes distress and avoids pain and injury. They 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 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 dairy cattle production systems, but cow-calf separation is stressful for both cow and calf.

Weaning means the transition from liquid feed (whole milk or milk substitute) to solid feed (such as artificial milk or hay), 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 the 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.

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 most important thing about diseases and injuries is to prevent their occurrence through daily management.

Managers and handlers need to acquire knowledge to identify and appropriately treat cattle with chronic diseases and injuries, such as being non-ambulatory after parturition.

[Actions recommended for implementation]

Dairy cattle health management should be conducted to ensure optimal physical and behavioral health and 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 should include the recording of production data (e.g., number of cows and milk yields), morbidity rates, mortality rates, culling rates, and medical treatment, and it should be kept up to date by the manager or handler. For parasites, appropriate program should be implemented to monitor, control, and treat.

Managers and handlers should acquire knowledge for identifying and appropriately managing non-ambulatory, chronically ill, or injured cattle, and should consult with veterinarians as appropriate. 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 “Veterinarian Act (Act No. 186 of 1949)” and other relevant laws and regulations, and in consideration for the welfare of cattle.

Dairy 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 that 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 a day. Furthermore, these cattle should be milked where necessary, protected from predators, and provided 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 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, the presence of disease may be suspected, or the cause of disease, pain, distress, or suffering may not have been improved. If necessary, a veterinarian should be consulted and appropriate action should be taken.

[Actions recommended for future implementation]

None

13. Cleaning and disinfection of cattle houses

Ensuring a comfortable environment for dairy 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 facilities and equipment clean.

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

After the shipment of cattle, bedding should be removed, and the pens should be thoroughly cleaned and disinfected when the house is vacated.

[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 such as horseflies, stable flies, and gnats, as well as 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 pest animals are involved in the transmission of various 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 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 the Livestock Hygiene Service Center immediately.

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

The major sources for spread of pathogens, including pest 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 a housing 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 risk of increased agonistic interactions between cattle, particularly after mixing groups. In particular, the introduction of heifers into a 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 enclosure, 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 hutches 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 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 dairy 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 dairy cattle rendered unfit due to problems including mastitis, hoof disease, digestive and respiratory diseases, and reproductive disorders. This, in turn, will lead to the long-term, healthy rearing of dairy 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 dairy cattle behavior, handling, health, biosecurity, physiological needs and welfare (recognizing early specific signs of disease or distress, such as coughing, eye discharge, changes in milk properties, changes in locomotory behavior, as well as recognizing non-specific signs such as reduced feed and water intake, changes in weight and body condition, and 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 scoring (see Appendix III: Sample simplified body condition score).

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

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

For high-performing dairy 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 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.

In particular, feed should be provided with attention given to the nutritional balance during the final month of pregnancy and the deficiency of roughage intake relative to raw milk production from immediately after calving through the peak lactation period.

Water requirements are influenced by factors such as temperature, milk yield, 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 Dairy 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, the 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, feed 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. 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 feeders and waterers should be easy to clean, and properly maintained through regular inspections and cleaning in consideration of the frequency recommended by the equipment manufacturer. 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, and other factors.

[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 watering systems to prevent excessive fighting among cattle, ensure sufficient space according to the systems, and take appropriate measures.

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

When cattle are introduced into a new cattle house, 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 immunity; therefore, proper management is necessary to help the calves adapt to the new environment.

Colostrum is the milk first secreted after parturition, playing a crucial role in maintaining calf health, especially containing a large amount of 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 after birth (most effectively within 6 hours after birth).

When feeding calves, 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 preferable 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 behavior (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 during the period 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 after 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 after 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 house

When newly building or renovating a cattle house, the impact of climate and geographical factors should be evaluated and the house should be designed based on expert knowledge of the health and welfare of dairy 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 in the cattle house is comfortable for cattle, and fresh air can be supplied to the entire facility at all times; (2) prevention of the invasion of pathogens and pest animals such as wild animals, rats, and flies; (3) maintaining stable temperature and humidity inside the cattle house, avoiding significant changes due to fluctuations in the weather environment, such as heat and cold, which may adversely affect cattle health; (4) designing the housing 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 manure.

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

[Actions recommended for implementation]

The impact of climate and geographical factors on dairy cattle should be evaluated when farms are established. Efforts should be made to mitigate any negative impacts of those factors, including matching cattle breed to the location of the farm and consideration of alternative sites.

All facilities for cattle should be designed, constructed, maintained and operated to minimize the risk to the health and welfare of the cattle that is caused by significant changes in temperature and humidity in the cattle house due to fluctuations in weather environment such as heat and cold.

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

The house should be designed and managed to control the invasion and generation of pest 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 disposal of manure.

[Actions recommended for future implementation]

None

1. Rearing system

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

To provide a comfortable environment for the 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 methods

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

Compared to stanchions and stalls, tie stalls, which is a method of tethering cattle with chains or ropes, are said to place fewer behavioral restrictions on cattle.

[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.

When tethered outdoors they should be able to turn around and to walk.

When using a cow trainer, it should be properly installed and used, and appropriate maintenance should be performed, taking into account the maintenance frequency recommended by the equipment manufacturer.

When the sires are kept in a housing system, care should be taken to ensure that they have sight of other cattle with sufficient space for resting and exercise. If used for natural mating, the floor should not be slatted or slippery.

[Actions recommended for future implementation]

None

(2) Untethered methods

The untethered system is a method in which cattle are kept in an enclosure of a certain size without being moored. This includes free stalls and free barns. Exercise can bring additional benefits, such as reducing the risk of lameness.

[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]

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

In particular, tracks and races between the fields and milking areas should be laid out and managed so as to minimize the overall distances walked. Construction and maintenance of tracks and races, including their surface, should minimize any risk to the welfare of the cattle, especially from foot health problems.

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 from predators such as brown bears.

If herding dogs are used, managers and handlers should train them properly, understand that dogs can cause fear and stress in cattle, and keep the dogs under control at all times.

[Actions recommended for future implementation]

None

2. Structures and facilities

The structures of cattle houses 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 bed need to be comfortable and safe for the cattle to prevent injury from slips and falls. In addition, when using bedding, it should be clean and dry. 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.

Collecting yards such as entry to the milking parlors should be designed and managed to minimize stress caused by overcrowding and prevent injuries and lameness.

Milking parlors, free stall, standings, cubicles, 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 equipment used in the facilities should be safe for cattle. Hydraulic, pneumatic, and manual equipment should be adjusted, as appropriate, to the size of the 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 manufacturers 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 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 slopes should be designed to minimize the risk of stress and injury to cattle and to secure 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, house 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 durations of time spent lying. If abnormal behavior is seen, corrective measures should be taken, such as redefining the areas. Areas that are not suitable for resting, such as those with excessive water and fecal accumulation, should not be included in the determination of the area available for 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 animal, for example, in length, width, and height.

Calves, whether individual or in 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 houses

1. Thermal environment

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

The optimum temperature range for dairy cattle is 10°C to 20°C for mature cattle, but lactating dairy cattle are said to be more adaptable to low-temperature environments than other farm animals. The comfort of cattle is affected by environmental factors such as temperature, humidity, wind, solar radiation, ventilation methods, and stocking density, and factors on the cattle side, including breed, age, body condition, lactation ability, metabolic rate, lactation stage, and 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, reduced milk yield and quality, and reduced reproductive performance. Sudden temperature changes can cause heat or cold stress.

[Actions recommended for implementation]

Managers and handlers should understand 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 the temperature in the house when temperatures are abnormally high.

If conditions are expected to induce heat stress, and increased respiratory rates, decreased appetites, reduced milk yield and quality, 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 the 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 house.

[Actions recommended for future implementation]

None

2. Ventilation

Maintaining good air quality in the cattle house and providing adequate ventilation are important for the health and animal welfare of dairy 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 house design, and ventilation systems.

In order to provide a constant supply of fresh air and keep a comfortable environment for dairy cattle, adequate ventilation should be provided to remove ammonia, hydrogen sulfide, carbon dioxide, dust and moisture generated in the cattle house to the outdoors. It should also be noted that ventilation during hot weather has the effect of discharging heat in the cattle house 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 cattle house poses risks not only to the cattle but also to human health by causing damage to the respiratory 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 house.

Ammonia concentration should not routinely exceed 25 ppm at cattle level, at which managers and others working in the cattle house 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 house and milking facilities 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 and check the operation of such as milking equipment.

[Actions recommended for implementation]

Appropriate lighting equipment should be installed to enable dairy 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.

Lighting in milking facilities should be bright enough for workers to properly operate tools such as milking equipment. In addition, housed 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 the animals. Housed cattle should be provided with subdued nighttime lighting. Entrance to and exit from restraint facilities and their surrounding area should be well lit.

[Actions recommended for future implementation]

None

4. Noise

Cattle are adaptable to different levels and types of noise. However, exposure of cattle to excessive noise 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 unexpected 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 dairy 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 for feeding, watering, milking, and defecation 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 dairy cattle. Additionally, the equipment should also 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.

Equipment for milking in particular should be maintained and managed, such as daily inspections and replacement of consumable parts since its failure could cause mastitis.

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 the 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 outage due to natural disasters, and feed supply disruptions due to road conditions, and to prevent adverse effects on the health of cattle and their rearing environment, each farm should take measures such as obtaining contact information of main service providers, considering stockpile of feed and fuel, and water intake methods, and developing their own power generators and alternative systems such as for milking and 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 the 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 dairy 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 houses as a result of natural disasters, preventive measures should be taken in advance whenever possible. Among the advance measures, the evacuation plans should 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 dairy cattle

The following animal-based criteria can be useful indicators of animal welfare. In consideration of the fact that the design of the system and animal management practices can affect animal welfare, the following measurables can be considered as a tool to monitor the impact of both design and management.

[Actions recommended for implementation]

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

The use of these indicators and their appropriate threshold should be adapted to the different situations where dairy 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 for infectious and metabolic disease, lameness, pre-partum and post-partum, or 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 etiology of the disease or syndromes is important for detecting potential animal welfare problems. Mastitis, and hoof, reproductive, and metabolic diseases are also particularly important animal health problems for adult dairy cows.

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 the productive life and, like morbidity rates, may be a direct or indirect indicator of 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.

Post-mortem examination is useful in determining the cause of death.

4. Changes in body weight, body condition, and milk yield

In growing animals, body weight changes outside the expected growth rate, especially excessive sudden loss, are indicators of poor animal health or animal welfare.

Future performance, including milk yield and fertility, of replacement heifers can be affected by under- or over-nutrition at various stages of development.

In lactating animals, body condition outside an acceptable range, significant body weight change, and significant decrease in milk yield may be indicators of compromised welfare.

In non-lactating animals and bulls, 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 welfare status.

Poor reproductive performance can indicate animal welfare problems. Examples may include:

- anestrus or extended post-partum interval,
- low conception rates,
- high abortion rates,
- high dystocia rates,
- retained placenta,
- metritis,
- loss of fertility in breeding bulls.

6. Physical appearance

Physical appearance can 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),
- swellings, injuries, or lesions,
- discharges (e.g. from the nose, eyes, or reproductive tract),
- feet 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:

- negative behavior at milking time, such as reluctance to enter the milking parlor,

- kicking, vocalization,
- 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 fractured legs,
- percentage of animals slipping or falling,
- percentage of animals vocalizing abnormally or excessively during restraint and handling,
- percentage of animals not moving without the use of electric goads,
- percentage of animals striking restraints, fences, or gates.

8. Complications due to routine procedure management

Surgical and non-surgical procedures may be performed in dairy 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 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


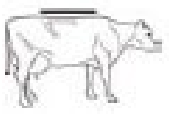

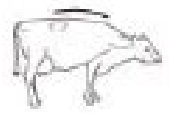

At least, the following reasons may be considered when deciding that euthanasia is appropriate:

- 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, have not responded to therapy,
- rapid deterioration of a medical condition for which therapies have been unsuccessful,
- severe and debilitating pain,
- compound (open) fractures,
- 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,
- as part of disaster management response.

Appendix I

Lameness Score of Dairy Cattle (Locomotion Score)

The lameness score is a numerical value used to evaluate whether a cow is walking normally. The evaluation is conducted through a visual observation of the cow's condition when standing and walking, and the condition of its legs. A score of 2 or higher is considered to result in a decrease in fertility, and a score of 3 or higher is considered to result in a decrease in milk yield.

| | |
|---|---|
| 1.0  | Normal Stands and walks normally with a level back. Makes long confident strides. |
| 2.0  | Mildly lame Stands with flat back, but arches when walks. Gait is slightly abnormal. |
| 3.0  | Moderately lame Stands and walks with an arched back and short strides with one or more legs. Slight sinking of dew-claw in limb opposite to the affected limb may be evident. |
| 4.0  | Lame Arched back standing and walking. Favoring one or more limbs, but can still bear some weight on them. Sinking of the dew-claws is evident in the limb opposite to the affected limb. |
| 5.0  | Severely lame Pronounced arching of back. Reluctant to move, with almost complete weight transfer off the affected limb. |

(Source: Sprecher, D.J. et. al.1997.Theriogenology 47:1179-1187)

Appendix II

Lameness Assessment Method When Tethered

The presence or absence of lameness is checked while the animal is walking. However, there are cases where the animal is tethered, or it is impossible to make the animal walk. For such cases, a method of assessing lameness while tethered has been developed in the EU.

The following are some points to note:

- Resting a foot (one more than another)
- Standing on the edge of a step (to avoid bearing weight on one foot/part of foot).
- Frequent weight shifting between feet or repeated movements of the same foot (this could also be due to nervousness, flies, or anticipation of feeding).
- Reluctance to bear weight on a foot when moving.

Firstly, observe how the cow stands when undisturbed. Then move the cow to the left and to the right, observing how she shifts weight from foot to foot. Then observe the position the cow returns to after movement.

If the cow has been lying down, get it up and wait 3 - 4 minutes before assessing

(Source: Welfare Quality® (2009). Welfare Quality® assessment protocol for cattle. Welfare Quality® Consortium, Lelystad, Netherlands.)

Appendix III

Sample Simplified Body Condition Score

This sample has been simplified. For details, conduct the evaluation in 0.25 increments. Determine a score of 1 for the emaciation beyond the sample, and a score of 5 for overweight, as necessary.

| | Score 2 (Emaciated) V-shaped | Score 3 (Normal) V-shaped | Score 4 (Overweight) U-shaped |
|--|---|--|---|
| Entire body Evaluate the accumulation of subcutaneous fat throughout the entire body. | The hips and ischium are angular, and there is no visible fat. The coccygeal ligament is clearly visible. | The hips and ischium are rounded, but the coccygeal ligament is visible. | The hips and ischium are hidden by fat, and the coccygeal and sacral ligaments are not visible. |
| Rump Evaluate the lines on the body surface that connect the hips and ischial bones as V-shaped or U-shaped. |  |  |  |
| Hindquarters Evaluate if the ischial, coccygeal and sacral ligaments are hidden by fat. |  |  |  |

Photo: Tochigi Prefectural Livestock & Dairy Experimental Center
Photo courtesy of: National Agriculture and Food Research Organization
Institute of Livestock and Grassland Science, Senior Researcher Akiko Nishiura.
Rakuno Gakuen University, Professor Ken Nakada.

<http://liaj.lin.gr.jp/japanese/kentei/BCScomp2.pdf>

(Source: Livestock Improvement Association of Japan, Inc.,
FY2016 Project to Improve Dairy Cattle Performance)