GOOD ANIMAL HUSBANDRY PRACTICES FOR BEEF CATTLE AND BUFFALO CODE OF PRACTICE

PNS/BAFS 200:2023

EXPLANATORY MANUAL

Canva,n.d

DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURE AND FISHERIES STANDARDS

Explanatory Manual

Good Animal Husbandry Practices for Beef Cattle and Buffalo - Code of Practice (PNS/BAFS 200:2023)

Bureau of Agriculture and Fisheries Standards (BAFS)
Quezon City, 2023

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Foreword

In the year 2022, an assessment of PNS/BAFS 200:2017 was conducted to ensure its alignment with the ASEAN Good Animal Husbandry Practice (GAHP) for Beef Cattle and Buffalo. This effort aligns with ASEAN Member States (AMS) 's commitment to fully harmonizing their national standards with ASEAN standards. The outcome of the alignment activity indicated a harmonization rate of 69% for PNS 200:2017.

During the same year, the results of the alignment assessment were presented at the 6th Meeting of the Expert Working Group (EWG) on ASEAN GAHP. The EWG concurred with the self-assessment, confirming the alignment of PNS/BAFS 200:2017 with the ASEAN GAHP on Beef Cattle.

In response to this alignment initiative, the Department of Agriculture - Bureau of Agriculture and Fisheries Standards (DA-BAFS) established a Technical Working Group (TWG) to amend PNS/BAFS 200:2017 through DA Special Order (SO) No. 617, series of 2022. This amendment, as outlined in Special Order No. 487, series of 2022, titled "Creation of TWG for the Development of PNS for Agriculture and Fishery Products, Machineries, and Infrastructures," effectively supersedes the previous PNS/BAFS 200:2017, which underwent technical refinement.

Subsequently, with the aim of providing comprehensive guidance on the provisions of the PNS, an Explanatory Manual (EM) has been developed for the PNS Good Animal Husbandry Practice - Code of Practice by a separate TWG created through Special Order No. 272, series 2023, titled “Creation of Technical Working Group for the Development of Knowledge Products of Philippine Nationatl Standards (PNS). An Explanatory Manual, or EM, serves as valuable reference material, offering supplementary information, clarifications, and photographs pertaining to the provisions and requirements of the PNS.

This Explanatory Manual serves as a helpful companion, enhancing the user's understanding of the PNS. Its development is the result of a series of TWG meetings, workshops, and data-gathering activities, all aimed at effectively conveying the requirements of the PNS.

Director's Message

We are pleased to introduce the Explanatory Manual for the PNS Good Animal Husbandry Practice (GAHP) for Beef Cattle and Buffalo - Code of Practice, carefully developed for its intended users.

As highlighted in the State of the Nation Address (SONA) of President Ferdinand Marcos Jr. in July 2023, our nation faces the challenge of enhancing agricultural production through consolidation, modernization, mechanization, and improvement of value chains. Likewise, ensuring food security is of utmost importance, guided by science, for the well-being of current and future generations.

As part of the solution, we advocate the adoption of the PNS GAHP for Beef Cattle and Buffalo - Code of Practice. The Bureau is dedicated to promoting the use of the PNS, and as a result, we have developed this Explanatory Manual to provide valuable information to the Bureau of Animal Industry (BAI), as the regulatory agency, along with other agencies within the Department of Agriculture (DA), and all the relevant stakeholders involved in this sector.

Our hope is that this Explanatroy Manual will serve as a valuable resource, aiding the BAI and other relevant stakeholders in their operations. By promoting the adoption of the PNS, we take a significant step towards achieving safe and sustainable beef cattle and buffalo production.

We thank everyone for their continued support and dedication to the advancement of our livestock industry.

KAREN KRISTINE A. ROSCOM, PhD
Director IV

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Section 1

Scope

1 Scope

This Standard sets out the general principles of good practice and minimum requirements in the commercial or backyard rearing/farming of beef cattle and buffalo for food use. Industry specific requirements for the different types of animals and different types of production system may be developed provided that they satisfy the minimum requirements set out in this Code.

Section 2

Normative References

2 Normative references

The following documents are referred to in the text in such a way that some or all of their contents constitute the requirements of this document. The latest edition of the referenced documents (including any amendments) applies.

An Act amending certain sections of Republic Act no. 8485, otherwise known as "The Animal Welfare Act of 1998", Republic Act No. 10631. (2013). https://www.officialgazette.gov.ph/2013/10/03/republic-act no-10631/

Agricultural Machinery Testing and Evaluation Center (AMTEC)-University of the Philippines Los Baños (UPLB). (2001). Cattle feedlot (PNS/PAES 405:2001). https://docplayer.net/200400726-Philippine agricultural-engineering-standard-paes-405-2001-agricultural structures-cattle-feedlot.html

AMTEC-UPLB. (2001). Cattle ranch (PNS/PAES 406:2001). https://amtec.ceat.uplb.edu.ph/wp-content/uploads/2019/07/406- 1.pdf

AMTEC-UPLB. (2001). Carabao feedlot (PNS/PAES 408:2001). https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsd GRvbWFpbnxncmFjZWxhb3JkZW5zYW50aXNhc3xneDo1YjAwYzc zNjdlYjAwZGZl

Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2017). Good Animal Husbandry Practices (GAHP) for beef cattle and buffalo (PNS/BAFS 200:2017). https://bafs.da.gov.ph/bafs_admin/admin_page/pns_file/PNS%20BA FS%20200-2017-GAHP%20Beef.pdf

BAFS-DA. (2022). Swine - Good Animal Husbandry Practices (GAHP) (PNS/BAFS 267:2022). https://bafs.da.gov.ph/bafs_admin/admin_page/pns_file/2022-12-29- PNS.BAFS%20267.2022_PNS%20Swine%20%E2%80%94%20Good %20Animal%20Husbandry%20Practices%20(GAHP)%20(1).pdf

Department of Agriculture (DA). (2008). Administrative Order (AO) No. 06 series of 2008 "Accreditation of foreign rendering plants exporting processed animal proteins to the Philippines." https://nmis.gov.ph/images/pdf/ao-06-2008.pdf

Office International des Epizooties (OIE). (2018). Bovine spongiform encephalopathy. Terrestrial animal health code. https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/2018/ en_chapitre_bse.htm#chapitre_bse

Section 3

Definition of Terms

Explanatory notes on the provisions of the standards are found inside the yellow boxes. Additional information are presented as notes and/or images. Section numbers of the manual mirrors the content of the PNS.

3 Definition of Terms

For the purpose of this document, the following terms and definitions apply:

3.1 Abnormal behavior

any behavioral change developed as a response to disease or poor management practice causing stress to the animal (BAFS, 2017)

3.2 Animal

large ruminant (e.g. cattle, buffalo,) livestock conventionally raised or reared for food and non-food (e.g. animal by-products such as leather, etc.) purposes (BAFS, 2017)

3.3 Authorized

that which has been permitted by the competent authority (BAFS, 2017)

3.4 Beef cattle

bovine animal that has been genetically selected primarily for meat production (BAFS, 2017)

3.5 Buffalo

bubaline animal that has been genetically selected primarily for meat production (BAFS, 2017)

3.7 Dam

female animal used for breeding and having given birth at least once (BAFS, 2017)

3.8 Dehorning

removal of horns after they have already formed (BAFS, 2017)

3.9 Disbudding

removal or destruction of horn buds, done in young animals whose horns have not yet formed (BAFS, 2017)

3.10 Establishment

given due permission, a firm authorized to operate (BAFS, 2017)

3.11 Farm operator (farm owner)

legal entity who is responsible for the management and general operation of the farm; the term maybe used interchangeably (BAFS, 2017)

3.12 Farm technician

a certified trained personnel who is technically skilled and knowledgeable in the various aspects of specialized farm operation (BAFS, 2017)

3.13 Farm worker

trained personnel directly responsible for the rearing of animals (BAFS, 2017)

3.14 Feeds

any single or multiple materials, whether processed, semi-processed or raw, which is intended to be fed directly to domesticated animals to meet the nutrient requirements in order to maintain life, promote growth, production and reproduction (BAFS, 2017)

3.15 Feed supplement

refers to a feed ingredient or mixture of feed ingredients intended to supply the deficiencies in a ration or improve the nutritive balance or performance of the total mixture (BAFS, 2017)

3.16 Forage

anything grown on the ground intended for use as animal feed, whether for grazing, cut and-carry, ensiling, or haying (BAFS, 2017)

3.17 Gait

way of walking or pace of the animals (BAFS, 2017)

3.18 Ration

total amount of feed given for one day (BAFS, 2017)

3.19 Rearing (farming)

the act of raising of animals (BAFS, 2017)

3.20 Vehicle

any means of transporting large animals, including but not limited to trucks, tractors, trailers, trains, ferries, and ships (BAFS, 2017)

3.21 Weaning

process of complete withdrawal from the dam and withdrawal of milk feeding (BAFS, 2017)

Explanatory Note:

For more detailed information, weaning can be described as a process of removal of the calf from the dam after birth or full withdrawal of milk feeding.

Section 4

General Skills and Responsibilities of the Farm Operators and Workers

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

4 General Skills and Responsibilities

4.1 The farm owner/operator and farm workers should undergo training on the necessary knowledge and skills about basic procedures of farm management including the correct handling of animal, pasture development, forage development, feeding management, animal health management and, other routine management practices and usage of farm tools or equipment and should be reviewed on a regular basis (BAFS, 2017; ASEAN).

Explanatory Note:

Farmers' lack of skills and training results in the failure of many farmers' organizations to manage the farm (Ocampo, 2020). DA offices that can provide training are the Department of Agriculture (DA) - Agricultural Training Institute (ATI) and the DA Regional Field Offices (RFO). The DA-ATI can provide extension services such as training, farm and business advisory services, technology demonstration, and information, education, and communication (IEC) support services (ATI, n.d.).

The DA-ATI contact information is:

Address: ATI Building, Elliptical Road, Diliman Quezon City
Trunkline: +632 89298541 to 49
Email: director@ati.da.gov.ph
Website: www.ati2.da.gov.ph

The World Organisation for Animal Health (WOAH) in 2009 advised to evaluate and determine the training needs before the conduct of training since the field of animal husbandry is constantly evolving with new measures and techniques.

Farmers and farm managers are further encouraged to:

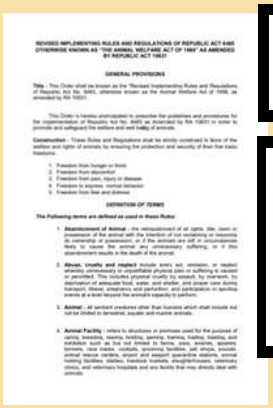
- actively seek and use relevant training opportunities for themselves and their workers;
- be aware of any training courses that may be compulsory in their localities; and
- keep records of all training attended.

4.2 The farm owner/operator should be responsible for the welfare of the animals by giving adequate provisions so that they are able to perform at their optimum levels (BAFS, 2017).

Explanatory Note:

Animal welfare refers to an animal's physical and mental state in relation to the conditions in which it lives and dies. Owners or managers of livestock should apply animal welfare practices (WOAH, 2023).

The Philippines passed the "Revised Implementing Rules and Regulations of Republic Act (RA) No. 8485, otherwise known as the Animal Welfare Act of 1998, as amended by RA 10631". This Law aims to protect and promote the welfare of all animals, focusing on the five basic freedoms of animals.



REVISED IMPLEMENTING RULES AND REGULATIONS OF REPUBLIC ACT 8485 OTHERWISE KNOWN AS "THE ANIMAL WELFARE ACT OF 1998" AS AMENDED BY REPUBLIC ACT 10631

Construction - These Rules and Regulations shall be strictly construed in favor of the welfare and rights of animals by ensuring the protection and security of their five basic freedoms:

1. Freedom from hunger or thirst
2. Freedom from discomfort
3. Freedom from pain, injury or disease
4. Freedom to express normal behavior
5. Freedom from fear and distress

Image 1. **Cover page of Animal Welfare Act of 1998 as amended by Republic Act 10631**

4.3 The farm operator/owner should provide farm workers with appropriate attire and footwear for protective measures (BAFS, 2017).

Explanatory Note:

The following are the prescribed clothes for general husbandry and routine examination/procedure:

- coveralls;
- rubber boots; and
- hard hat (optional).

Image 2. **Personnel wearing appropriate working clothes for general husbandry and examinations/procedures**

4.4 Appropriate working uniform/attire and footwear, as prescribed by the farm management, should be provided to visitors who need to be at the production area, as may be deemed necessary (BAFS, 2017).

Explanatory Note:

Source: PCC, n.d

Image 3. **Prescribed farm attire which includes disposable coveralls, disposable rubber boots, and face mask.**

4.5 In cases of housed staff, the farm owner/operator should provide comfortable accommodation for the workers (BAFS, 2017).

Explanatory Note:

Farm accommodation varies immensely. Owners may offer staff house for an individual, shared, or live off-farm. Employees' accommodations are usually in a safe (area) state with functioning appliances.

Before a staff moves in, a property inspection report for each room needs to be completed together with the employer and employee, and any existing damage recorded. Thus, it is essential that both parties understand accommodation expectations and legal requirements.

Image 4. **The (a) exterior and (b) interior of the staff house provided for farm workers include (c) kitchen with basic appliances, (d) bathroom, and (e) toilet and bath.**

4.6 The farm owner/operator should always promote a safe and healthy working condition in the farm. Accident and emergency procedures should be available with clear instructions for all workers. First aid kits, fire extinguishing equipment, and information on hotline numbers should be easily available at all times, and placed conspicuously in strategic locations (BAFS, 2017).

Explanatory Note:

The first aid provider is usually designated on the farm and is available to execute the procedures for administering emergency first aid. The first aid provider is equipped through proper training to provide emergency first aid.

Per the Department of Labor and Employment (DOLE) Department Order (DO) No. 235 series of 2022, also known as *Rules on the Certification of First Aiders and the Accreditation of First Aid Training Providers*, the designated first aider shall take the minimum certification training course based on the establishment's employment size and risk level as shown below:

Table 1. Types of first aid certification training courses

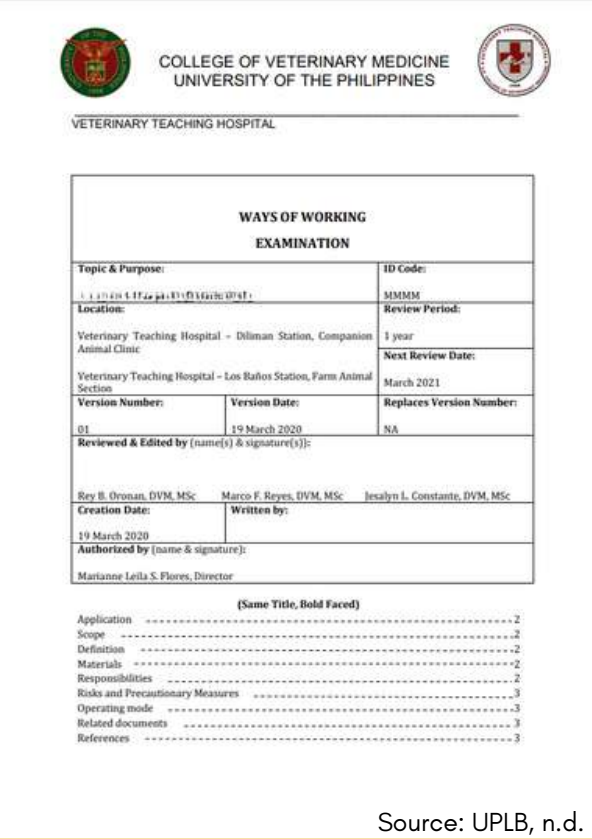
Training courses	Employment Size	Risk level
Emergency first aid training	< 9	Low, Medium, and High
Occupational first aid and Basic life support training	10-50	Low
Standard first aid and Basic life support training	10-50 ≥ 51	Medium and High/ Low, Medium, and High

Note: Department Order No. 235 series of 2022

First aid kits and fire extinguishers that are placed strategically can aid in emergency situations.

Image 5a. **First aid kit located in house pen**

Image 5b. **Fire extinguisher located in an office building**



COLLEGE OF VETERINARY MEDICINE
UNIVERSITY OF THE PHILIPPINES

VETERINARY TEACHING HOSPITAL

WAYS OF WORKING
EXAMINATION

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Reviewed & Edited by (name(s) & signature(s)): Rey B. Oronan, DVM, MSc; Marco F. Reyes, DVM, MSc; Jesalyn L. Constante, DVM, MSc		
Creation Date: 19 March 2020	**Written by:**	
Authorized by (name & signature): Marianne Leila S. Flores, Director		

(Same Title, Bold Faced)

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Operating mode 3
Related documents 3
References 3

Source: UPLB, n.d.

The presence of Standard Operating Procedures (SOP) provides step-by-step procedures in the farm or a certain task. Moreover, it provides all personnel with the necessary information on how to perform specific tasks, especially in cases when the person responsible is unavailable or unable to carry out the work. The availability of an SOP allows for continuity of operations even in the absence of designated individuals.

Image 5c. **Sample of Standard Operating Procedures (SOP)**

4.7 Farm personnel to animal ratio should be included in the farm operation manual including the services of a farm supervisor/manager and veterinarian (BAFS, 2022).

Explanatory Note:

The farm operations manual serves as a guide for farm owners, farm workers, and visitors in the activities of the farm. The determination of the farm personnel-to-animal ratio typically depends on factors such as the size of the farm, the number of animals being raised, and the specific requirements and needs of the animals.

4.8 The farm owner/operator should ensure that all farm workers undergo annual routine health check-up/medical examination.

Explanatory Note:

Farm owners take into account the health of farm personnel/farm workers. As stated in the Occupational Safety and Health (OSH) Standards, protecting every workman against the dangers of injury, sickness, or death through safe and healthful working conditions will assure the conservation of valuable manpower resources and the prevention of loss or damage to lives and properties (DOLE, 1989).

In addition, according to Republic Act No. 11058 or the "Act Strengthening Compliance with Occupational Safety and Health Standards and Providing Penalties for Violations Thereof," it is the worker's duty to ensure compliance with OSH standards in the workplace by properly using all safeguards and safety devices furnished for the workers' protection.

To assess the medical condition of the farm worker or monitor their health status, below is the list of medical tests/check-ups that may be done to ensure the health and safety of workers who are publicly and privately employed:

1. Physical examination
2. Chest X-Ray
3. Complete Blood Count
4. Urinalysis
5. Stool examination
6. Electrocardiogram (for employees that are 40 years old and above)

Checking farm workers regularly for possible diseases is a crucial preventive measure to minimize transmission of diseases and help protect animal health, and promote the well-being of both the farm worker and animals.

There are also zoonotic diseases, which are illnesses that originate in animals and can be transmitted to humans through direct contact with animals or indirectly through the consumption of contaminated food. Some examples of zoonotic diseases include the following:

Bovine Tuberculosis	This can cause pulmonary infection in humans caused by *Mycobacterium bovis*. Agricultural workers may become infected by inhaling bacteria via the coughing of infected cattle. Humans can also present urogenital infections and *M. bovis* shedding in the urine is a potential reverse zoonosis from humans to cattle (McDaniel et al., 2014).
Rift Valley Fever	It is an acute hemorrhagic fever commonly seen in domesticated animals including cattle and buffalo. This disease is caused by RFV virus (CDC, n.d.) "RVF virus can be acquired through the handling of infected animals" (McDaniel et al., 2014).
Anthrax	It is a serious infectious disease caused by *Bacillus anthracis*. Humans can acquire anthrax through contact with infected animals or ingestion of contaminated meat (CDC, n.d.).

4.9 The farm operator should report immediately or within 24 hours to relevant authorities, any incidence of abnormal behavioral changes, health conditions and mortalities in the farm or any characteristic of a reportable/notifiable disease outbreak (BAFS, 2017).

Explanatory Note:

In the Philippines, the Joint DOH-DA-DENR Administrative Order No. 02 series of 2020 titled "Guidelines to Operationalize the Philippine Inter-Agency Committee on Zoonoses (PhilCZ)," provides guidelines for reporting zoonoses in livestock, poultry, and other domestic animals as follows:

1. Field reports of sick or dead animals with notifiable zoonotic diseases from livestock Inspectors, Inspectors/Agricultural Technicians, meat inspectors, barangay response teams, DA Quick Response Teams, veterinary private practitioners, as well as from the community shall be reported immediately to the Municipal/City/Provincial Veterinary Office (MVO/CVO/PVO) and BAI.

   Note: Whenever there are no Veterinary Offices in the concerned local government, reports shall be submitted to the immediately concerned veterinarians in the Provincial Veterinary Office.

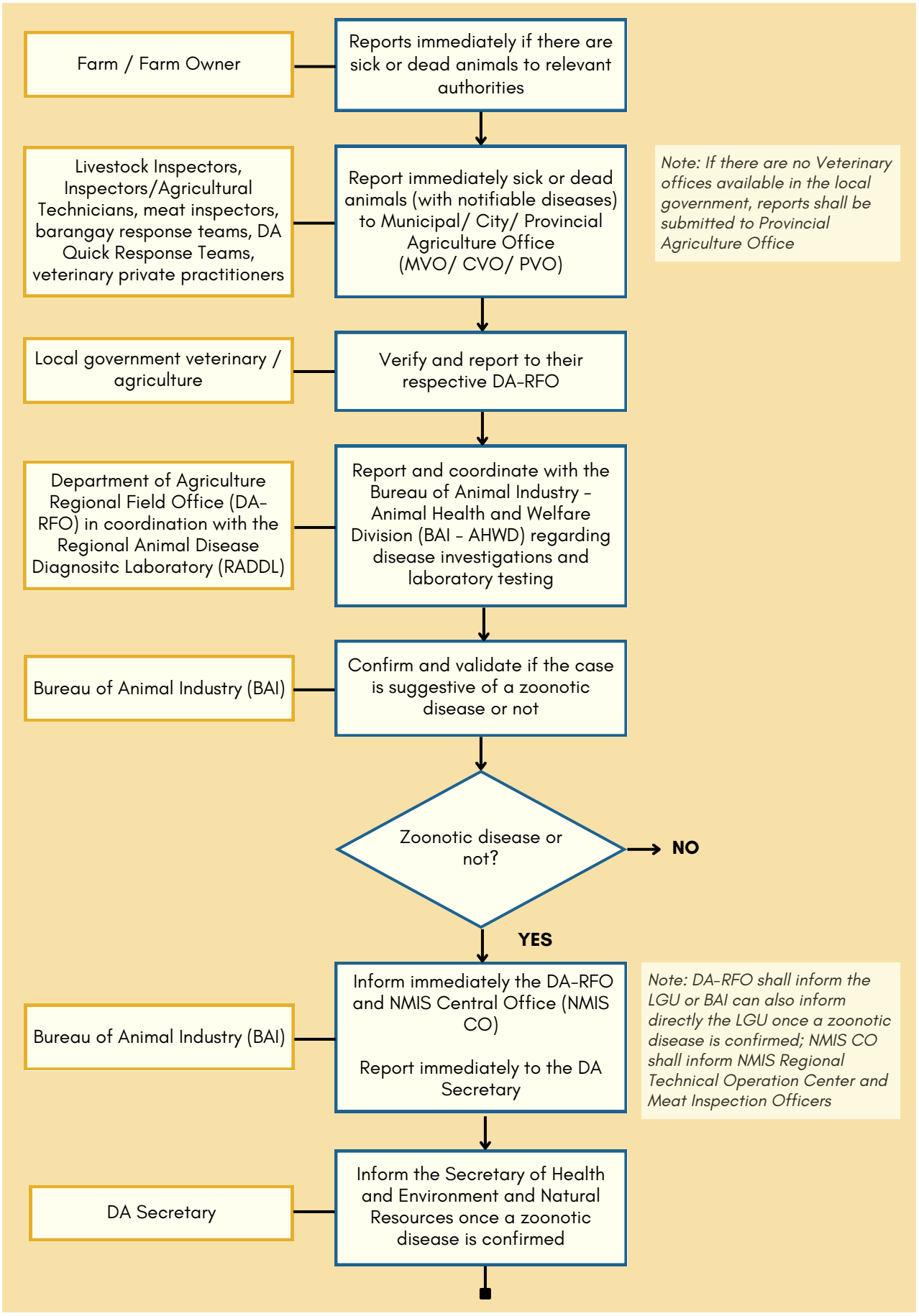
2. These local government veterinary/agriculture offices shall verify and report to their respective DA-Regional Field Office (DA-RFO) in coordination with the Regional Animal Disease Diagnostic Laboratory (RADDL). The DA-RFO shall then report and coordinate with the BAI (Animal Health and Welfare Division) and Animal Disease Diagnosis and Reference Laboratory or ADDRL, formerly the Philippine Animal Health Center regarding disease investigations and laboratory testing.

3. The BAI shall also inform the DA-RFO, DOH Regional Offices (RO), and local government veterinary/agriculture offices of similar reports received from other sources for verification and reporting.

4. The BAI shall also confirm and validate if the case is suggestive of a zoonotic disease or not and inform the DA RFO and NMIS Central Office (NMIS CO) immediately. In turn, the DA RFO shall inform the concerned LGU veterinarians, and the NMIS CO shall inform its concerned Regional Technical Operation Center (RTOC) and Meat Inspection Officers of the results. The BAI can also directly inform the LGU. Cases of zoonotic diseases (suspected/confirmed by the BAI) shall be reported immediately to the Secretary of Agriculture.

5. The Secretary of Agriculture shall immediately inform the Secretary of Health and the Secretary of Environment and Natural Resources once a zoonotic disease is confirmed.

Schematic diagram of reporting zoonoses



The competent authority is responsible for ensuring or supervising the implementation of public health, animal health and welfare, and biodiversity protection and conservation. It is also responsible for international disease notification. The disease notification table summarizes the detail of notifying diseases.

Table 2. Disease notification table

Report	Submission time	To be completed by	In collaboration with	Under the supervision of
Immediate notification	Within 24 hours after confirmation of the exceptional epidemiological event	Focal Point for Animal Disease Notification		National delegate
Follow-up reports	Weekly after an immediate notification	Focal Point for Animal Disease Notification		
Six-month reports (for terrestrial and aquatic animal diseases)	Within 1 month after the end of a semester	Focal Point for Animal Disease Notification	Focal Point (FP) for Wildlife + FP for Aquatic animals	
Wildlife annual report	At the end of the year, after validation of the 2 six-month reports for terrestrial animal diseases	Focal Point for wildlife	Focal Point for Animal Disease Notification	

(Source: WOAH, n.d.)

Immediate notification reports (from the competent authority of the member country) as stated in the WOAH-listed diseases are submitted within 24 hours of disease confirmation, while **follow-up reports** are submitted on a weekly basis.

Farm personnel should immediately report to the veterinarian if there are diseases observed, or if the number of mortalities continues to increase, and subsequently take appropriate measures.

In some instances, when no veterinary doctor is available nearby, the farm personnel may immediately inform (including the observable signs and symptoms) the veterinary doctor virtually. The doctor will provide his/her diagnosis and instruct personnel on the necessary actions.

Below are examples of notifiable diseases that can be found in cattle (WOAH, n.d.):

1. Bovine anaplasmosis
2. Bovine babesiosis
3. Bovine genital campylobacteriosis
4. Bovine spongiform encephalopathy
5. Bovine tuberculosis
6. Bovine viral diarrhoea
7. Enzootic bovine leukosis
8. Haemorrhagic septicaemia
9. Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis
10. Infection with Mycoplasma mycoides subsp. Mycoides SC (Contagious bovine pleuropneumonia)
11. Theileriosis
12. Trichomonosis
13. Trypanosomosis (Tsetse-transmitted)

4.10 The farm operator should keep and maintain complete records of farm operations, management routines, environmental management, and animal health records like disease monitoring and medication for traceability purposes (ASEAN, 2019).

Explanatory Note:

Image 6a. **Sample of an individual water buffalo identification, production and health record**

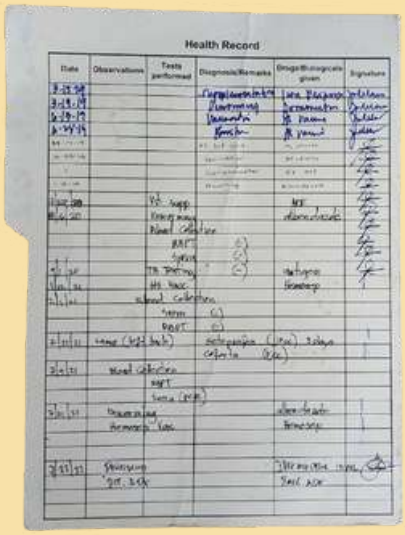


Image 6b. **Sample of health record in ruminants showing the date, test performed and medications given**

ANIMAL DEATH REPORT
For the month of: **April 2023**

Date	No. of hds.	Breed/Classification	Sex	Species	E.T./Brand Number	Age	Cause of Death
4-4-2023	1	Purebred Suckling	F	Ruminant	76BU	2 days old	Bottled Teat
4-7-2023	1	Purebred Suckling	M	Ruminant	78BU	1 day old	Still birth

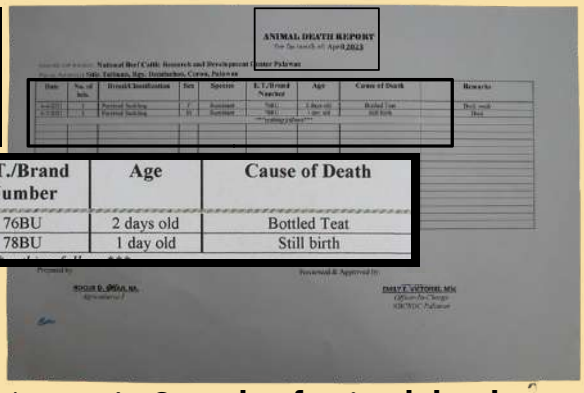


Image 6c. **Sample of animal death report with date, sex, animal identification, age and cause of death**

ANIMAL DISPOSAL REPORT

Commercial Brahman Cow	3/28/2023	F	101-12	11 yrs. old	/	

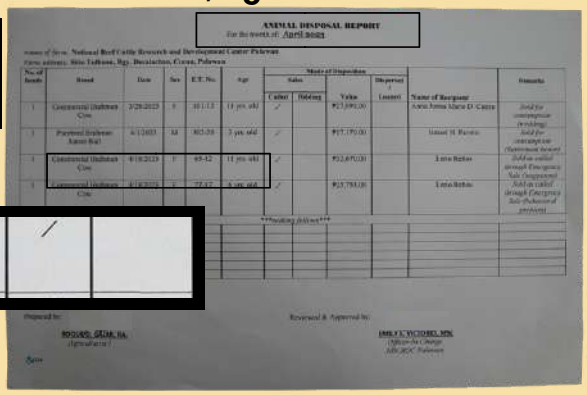


Image 6d. **Sample of animal disposal report with details such as animal type, date, sex and age**

Section 5

Legal Responsibilities of the Farm Operator/Owner

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

5 Legal Responsibilities of the Farm Operator/Owner

5.1 The farm owner should conform to existing animal farming and welfare legislation. This covers the management of environment issues, farm location, animal welfare requirements, disease control and reporting, dead animal disposal, production of wholesome food and occupational hazards associated with animal farming (BAFS,2017).

Explanatory Note:

Existing legislation and other issuances related to animal farming and welfare are briefly discussed below. It is advisable to seek information from the authorities and related agencies for updated and more detailed issuances.

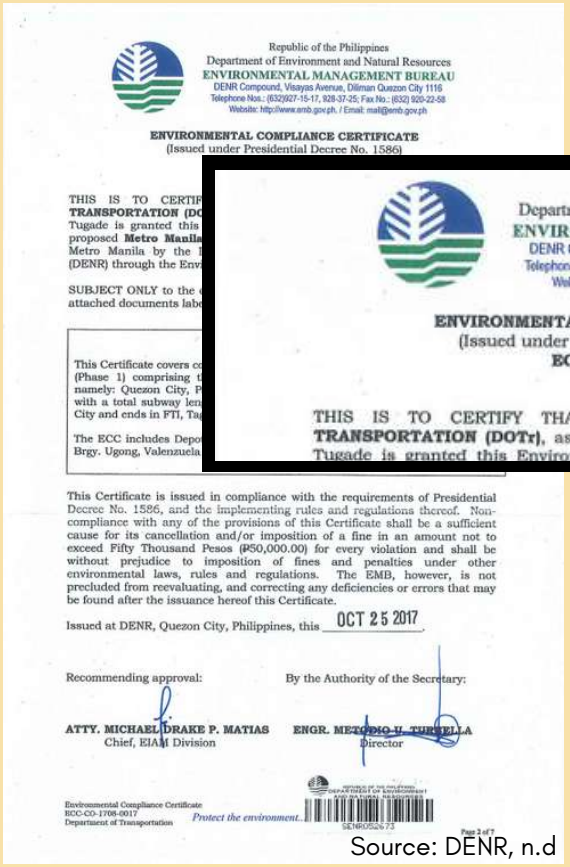
Table 3. Legislations and other issuances related to animal farming and welfare

Activities	Legislation and other Issuances
Animal welfare	**Animal Welfare Act (Republic Act No. 8485)** This provides for the protection and promotion of the welfare of all animals in the Philippines. It prohibits cruel acts such as maltreatment, torture, and killing of animals, and sets standards for their proper care and treatment. More details on animal welfare are discussed in Section 6 (Animal Welfare Responsibilities) of this Explanatory Manual.
Management of environment issues	**Philippine Environmental Impact Statement System (Presidential Decree No. 1586)** This provides a framework for assessing the potential environmental impacts of many activities, including livestock farming. Pursuant to Section 4 of PD 1856, *no person, partnership, or corporation shall undertake or operate any declared environmentally critical project or area without first securing the Environmental Compliance Certificate*. **Department of Environment and Natural Resources (DENR) Revised Guidelines For Coverage Screening and Standardized Requirements (EMB Memorandum Circular 005)** This provides guidelines for the coverage screening process and standardization of requirements under the Philippine Environmental Impact Assessment (EIA) system.

Table 3 (continuation). Legislations and other issuances related to animal farming and welfare

Activities	Legislation and other Issuances
Management of environment issues (continuation)	The circular outlines the procedures, criteria, and forms for the coverage screening process, as well as the requirements for obtaining an Environmental Compliance Certificate (ECC) for projects within the EIA system's scope. Environmental issues are usually addressed during the application for an Environmental Compliance Certificate (ECC) or Certificate of Non-Coverage (CNC).
Disease control and reporting	**Department of Agriculture (DA) Revised Guidelines on the Reporting of Notifiable Diseases to the Comptent Veterinary Authority (DA Administrative Circular No. 08 Series of 2021, amending DA AC No. 3 Series of 2018)** This covers the guidelines on animal disease reporting and the list of animal diseases to be reported to the Competent Veterinary Authority. This Circular aims to improve the reporting of disease and outbreak investigation for better scope and comprehension of the animal disease situation in the country and to strengthen the implementation of the prevention, control and eradication of emerging and re-emerging animal diseases.

Note: Please note that the information provided above is not an exhaustive list of the legislation pertaining to animal farming and welfare. To obtain the most recent and comprehensive information regarding animal farming and welfare legislation, it is essential to consult the competent authority responsible for overseeing these matters.



Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Avenue, Diliman Quezon City 1116
Telephone Nos.: (632)927-15-17, 928-37-25; Fax No.: (632) 920-22-58
Website: http://www.emb.gov.ph. / Email: mail@emb.gov.ph

ENVIRONMENTAL COMPLIANCE CERTIFICATE
(Issued under Presidential Decree No. 1586)

THIS IS TO CERTIF
TRANSPORTATION (DO
Tugade is granted this
proposed **Metro Manila**
Metro Manila by the
(DENR) through the Env

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attached documents labe

This Certificate covers c
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with a total subway len
City and ends in FTI, Ta

The ECC includes Depo
Brgy. Ugong, Valenzuela

This Certificate is issued in compliance with the requirements of Presidential Decree No. 1586, and the implementing rules and regulations thereof. Non-compliance with any of the provisions of this Certificate shall be a sufficient cause for its cancellation and/or imposition of a fine in an amount not to exceed Fifty Thousand Pesos (₱50,000.00) for every violation and shall be without prejudice to imposition of fines and penalties under other environmental laws, rules and regulations. The EMB, however, is not precluded from reevaluating, and correcting any deficiencies or errors that may be found after the issuance hereof this Certificate.

Issued at DENR, Quezon City, Philippines, this OCT 25 2017

Recommending approval:

ATTY. MICHAEL DRAKE P. MATIAS
Chief, EIAM Division

By the Authority of the Secretary:

ENGR. METODIO H. TUPTELLA
Director

Environmental Compliance Certificate
ECC-CO-1708-0017
Department of Transportation

Protect the environment.

Page 2 of 7

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
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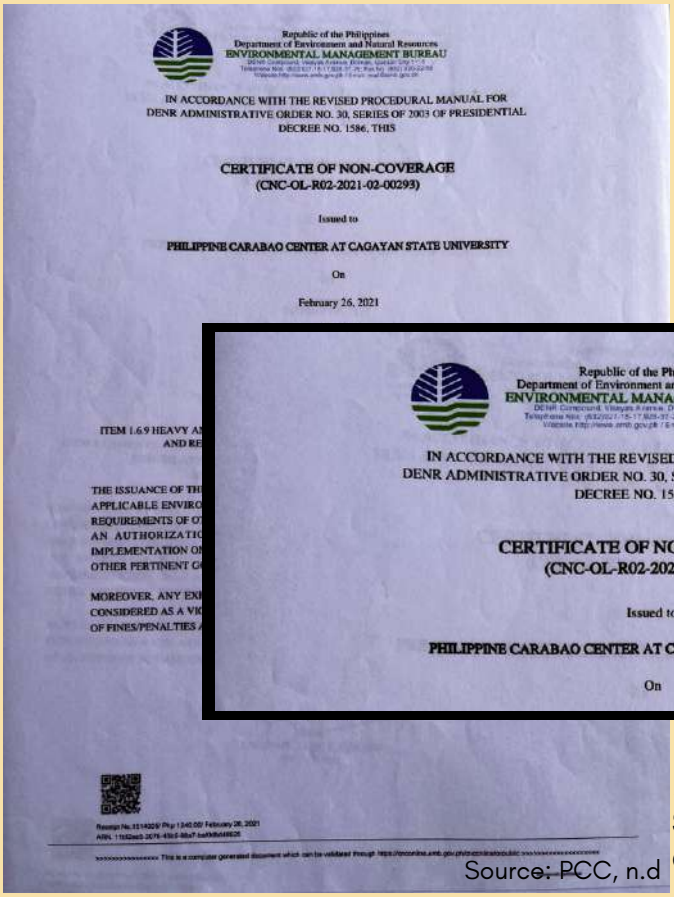
Website: http://www.emb.gov.ph. / Email: mail@emb.gov.ph

ENVIRONMENTAL COMPLIANCE CERTIFICATE
(Issued under Presidential Decree No. 1586)
ECC-CO-1708-0017

THIS IS TO CERTIFY THAT THE PROPONENT, **DEPARTMENT OF TRANSPORTATION (DOTr)**, as represented by its Secretary, Atty. Arthur P. Tugade is granted this Environmental Compliance Certificate (ECC) for the

Source: DENR, n.d

Image 7a.
Sample of Environmental Compliance Certificate (ECC)



Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU

IN ACCORDANCE WITH THE REVISED PROCEDURAL MANUAL FOR DENR ADMINISTRATIVE ORDER NO. 30, SERIES OF 2003 OF PRESIDENTIAL DECREE NO. 1586, THIS

CERTIFICATE OF NON-COVERAGE
(CNC-OL-R02-2021-02-00293)

Issued to

PHILIPPINE CARABAO CENTER AT CAGAYAN STATE UNIVERSITY

On

February 26, 2021

ITEM 1.6.9 HEAVY A
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OF FINES/PENALTIES

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU

IN ACCORDANCE WITH THE REVISED PROCEDURAL MANUAL FOR DENR ADMINISTRATIVE ORDER NO. 30, SERIES OF 2003 OF PRESIDENTIAL DECREE NO. 1586, THIS

CERTIFICATE OF NON-COVERAGE
(CNC-OL-R02-2021-02-00293)

Issued to

PHILIPPINE CARABAO CENTER AT CAGAYAN STATE UNIVERSITY

On

Source: PCC, n.d

Image 7b.
Sample of Certificate of Non-Coverage

5.2 The farm operator should conform to existing labor legislation (BAFS, 2017).

Explanatory Note:

Republic of the Philippines
DEPARTMENT OF LABOR AND EMPLOYMENT
National Capital Region

This

CERTIFICATE OF COMPLIANCE
ON GENERAL LABOR STANDARDS

is hereby issued to

for having been found compliant with General Labor Standards pursuant to Joint Assessment conducted on July 7, 2016 and validation conducted on August 25, 2016. This Certificate is valid for two (2) years from issuance unless earlier revoked or cancelled.

Given this 7th day of September 2016, at Manila, Philippines.

ATTY. JOHNSON G. CAÑETE, CESO III
Regional Director

Source: Fair shipping, n.d

Image 8. **Sample of Certificate of Compliance with General Labor Standards**

Section 6

Animal Welfare Responsibilities

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

6 Animal Welfare Responsibilities

6.1 The farm workers should not cause cruelty to animals, in accordance with the Republic Act 10631 (An Act amending certain sections of Republic Act 8485), otherwise known as "The animal welfare act of 1998" such as:

a. Maltreatment of animals under his/her care and attention.
.

Explanatory Note:

The following are the examples of activities that show cruelty to animals which can be grounds for complaint:

1. Animals are in immediate danger of death or harm.
2. Animals are hurt or abused.
3. Neglected or abandoned animals
4. Animals are suffering from untreated injury or disease.
5 Animals are not receiving adequate food, water and/or shelter.
6. Animals are being used in illegal activity (e.g., water gavage).
7. Animals have been deliberately poisoned (other than for the control of declared pests).

Food Safety and Inspection Service (FSIS) of the US Department of Agriculture (USDA) recommends using a systematic approach to humane handling and slaughter of livestock in a way that minimizes excitement, discomfort, and accidental injury the entire time livestock is held in connection with slaughter. Furthermore, to develop and maintain a systematic approach to meet the humane handling requirements, FSIS has stated that establishments should follow four steps:

1. Conduct an initial assessment of where and under what circumstances livestock may experience excitement, discomfort, or accidental injury while being handled.
2. Design facilities and implement practices that will minimize excitement, discomfort, and accidental injury to livestock.
3. Evaluate handling methods periodically.
4. Improve handling practices and modify facilities when necessary.

b. Neglect of animal, such that it experiences pain, suffering or distress.

Explanatory Note:

Based on Section 6 of the Animal Welfare Act of 1998, "it shall be unlawful for any person to torture any animal or to neglect to provide adequate care, sustenance or shelter, or maltreat any animal."

c. Failure to implement the proper feeding program to maintain the live weight of the animal within the normal physiological range for the species type, age and sex.

Explanatory Note:

A proper feeding program considers age, sex, breed, stage of lactation, and health condition. Cattle can be fattened based on the roughage-concentrate ratio. Roughages and concentrates are feed resource types (Philippine Carabao Center, 2009). A proper ratio of roughage to concentrate helps improve nutrient utilization efficiency. Hence, in providing roughage, good quality grass-legume mixture (pasture herbage) should be assured (Reddy Y.R., 2016). Below are examples of roughages and concentrates:

Types of feed resources:

Roughages	These are feed resources coming from grasses (native and improved pasture) and legumes (shrubs, vines and fodder trees) (Philippine Carabao Center, 2009).
Concentrates	These are feed resources coming from mash and pellet form. These contains high energy and protein than grasses and either pure or mixtures of different feed ingredients of energy source and protein sources (Philippine Carabao Center, 2009).

d. Removal of any part of the anatomy without adequate anesthesia, whenever applicable.

Explanatory Note:

Local anesthesia using lidocaine (testicular, spermatic cord blocks, or epidurals) mitigates the distress of the process but does not prevent the cortisol response or postoperative behavior changes. Preoperative Nonsteroidal Anti-Inflammatory Drugs (NSAID) improve the cortisol response but are not sufficient pain control for the procedure.

Appropriate and adequate restraint and application of analgesia or anesthesia are considered when removing horns, testicles, hoof, tail, udder, or other organs.

The type of restraint used on cattle depends on the animal's age, sex, breed, and previous exposure to people. The types of restraint generally used for ruminants: chemical, physical and psychological means see Annex A.

e. Putting to sleep (euthanasia), confining, handling or transporting any animal in a manner causing deliberate pain, suffering or distress.

Explanatory Note:

Euthanasia is a process of inducing humane and painless death to animals and is only performed by a duly licensed veterinarian. The DA Administrative Order (AO) No. 09 series of 2011 also known as "Amendments to Section 6.2.a.a and Section 7 of DA Administrative Order No. 13, Series of 2010 (Revised Rules and Regulations on the Euthanasia of Animals)" set standards on all activities relating to the conduct of euthanasia of animals and specifies the approved methods for euthanasia. More details are available on the DA-BAI's website at www.bai.da.gov.ph.

For beef cattle and buffalo, the acceptable agent and methods of euthanasia are barbiturates, penetrating captive bolt and firearms (gunshot).

f. Keeping an animal alive, especially that which is pronounced physically or physiologically incapacitated, unless it is under the direct care of a licensed and registered veterinarian (BAFS, 2017).

Explanatory note:

Incapacitated animals can be described as recumbent, immobile, and regarded as unconscious due to lack of physiological responses from a distance, but may not be clinically dead (Stokke, 2018).

A licensed and registered veterinarian can provide direct care since the primary focus of veterinarians is to oversee the well-being and clinical care of animals, monitoring and promoting animal well-being at all times during animal use and all phases of the animal's life.

Image 9. **Physically incapacitated cow**

6.2 The farm technicians and workers should not neglect animals according to the following criteria:

a. Freedom from hunger and thirst and malnutrition. Feed withdrawal of animals destined for slaughter should follow the guidelines set by the National Meat Inspection Service (NMIS);

b. Freedom from physical discomfort and pain;

c. Freedom from injury and disease;

d. With due consideration to the differences in the production system (confined and free-range/grazing), animals should be given enough freedom to conform to essential behavior patterns; and

e. Freedom from fear and distress (BAFS, 2017).

Explanatory Note:

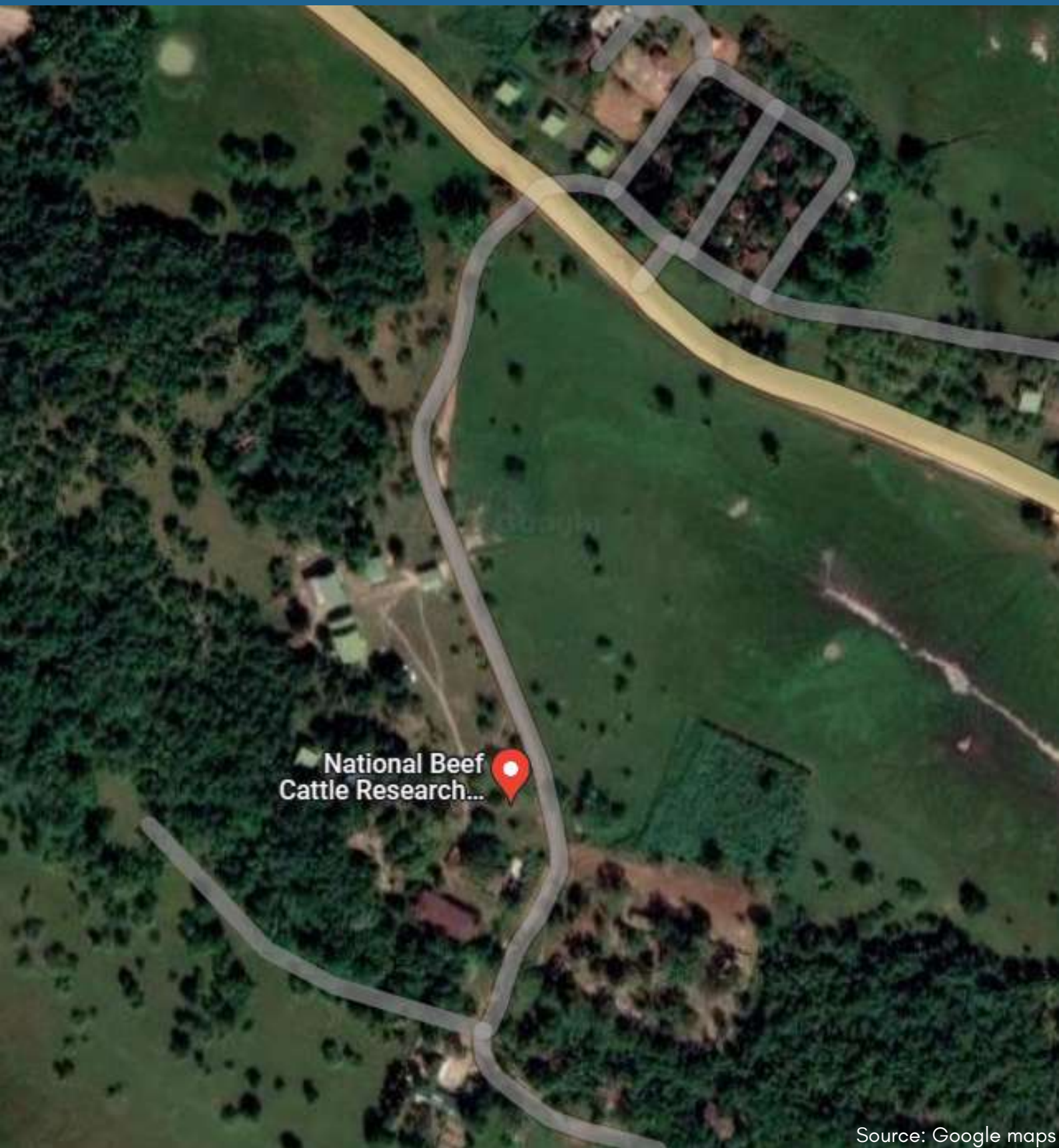
To further elaborate the five freedoms of animal

1. **Freedom from hunger and thirst**
   - Providing accessible potable water and monitor the diet to maintain healthy vigor
2. **Freedom from physical discomfort and pain**
   - Providing an appropriate environment, including shelter (e.g size and space of pens) for comfortable resting area
3. **Freedom from injury and disease**
   - Providing disease preventive measures and treatment
4. **Freedom to conform to essential behavior patterns**
   - Providing sufficient space, proper facilities and company of the animal's own kind (same species)
5. **Freedom from fear and distress**
   - Ensuring proper conditions and treatment to avoid mental suffering

Image 10. **Sample poster showing the five freedoms of animals**

Farm Location

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.



Source: Google maps

7 Site selection

The farm should:

a. Be strategically located within the approved land use plan of the local government and should be compliant with the DENR regulations and other regulations as prescribed by law (e.g, Laguna Lake Development Authority).

Explanatory Note:

Possible considerations in strategically selection the farm locations for a new or expanded livestock operation include:

1. Distance to neighboring residences
2. Direction of prevailing winds in relation to neighbors
3. An adequate source of water
4. Access to land for manure application
5. Topography and soil type
6. Proximity to surface water bodies, sinkholes, and flood plains
7. Depth to groundwater

Moreover, the farm preferably has good access to markets, roads and highways, and electricity, depending on the need (Missouri University Extension, n.d.)

Image 11a. **Philippine Carabao Center (PCC) farm layout, located strategically near city proper**

Image 11b. **National Beef Cattle Research and Development Center (NBCRDC) farm layout, accessible to major roads and highways**

In addition, as one example provided in this section of this manual (a), the Republic Act No. 4850, also known as the Laguna Lake Development Authority Act, created the Laguna Lake Development Authority (LLDA). The LLDA is responsible for land use planning and zoning within Laguna Lake to ensure sustainable development and prevent activities that may harm the lake's ecosystem.

Rules and Regulations Implementing Section 41 of R.A 4850, as amended, states the use of the Laguna de Bay shoreland areas shall be strictly regulated. Agricultural use may be allowed in all lands located at and below elevation of 12.50 meters provided that:

1. The use of fertilizers shall be regulated based on DA-FPA.
2. Use of less persistent pesticides shall be required (i.e. Category IV of FPA Standards)
3. Integrated Pest Management (IPM) is practiced
4. Such use does not result in land reclamation

b. Have a continuous supply of adequate power and potable water;

Explanatory Note:

Image 12a. **Water tank**

Image 12b. **Water tank**

c. Be accessible to major facilities of production (i.e. feed mill, water system, forage area).

Explanatory Note:

Image 13a. **Napier grass located near the working corral**

Image 13b. **Forage area located in the front of the farm**

d. With the exception for those practicing integrated farming with their own post-harvest facilities, the farm should not be near service/public slaughterhouses.

Explanatory Note:

Wastewater from slaughterhouses is considered a major water polluter as it contains nitrogen and phosphorus that triggers toxic algal outbreaks and causes dead zones. It also harbors bacteria, viruses, and parasites that pose a threat to water quality making it unsafe for drinking, recreation, or for use in irrigation (Ridllington et al., 2021).

In Integrated Farming System (IFS), on the other hand, farm by-products and other available resources are utilized through recycling (Ridllington et al., 2021). IFS also encourages the integration of livestock and crop production in the agriculture system (Senthamilan et al., 2019).

e. Existing farms should have full control of the risks and ensure that there are mitigation measures in place. New farms should comply with the above provisions (BAFS, 2017).

7.2 Site history

If there are available data/information from relevant government agencies or organizations on the prior land use, then it should be used to establish that the site is not a possible source of physical, chemical and microbiological hazards. However, when these data are not available and uncertainty exists as to the suitability of the land for agricultural use, it is recommended to have the soil analyzed for heavy metal contamination, etc.

Explanatory Note:

One institution that can conduct laboratory services such as heavy metal analysis is the University of the Philippines Natural Sciences Research Institute (UP NSRI) Research and Analytical Services Laboratory (RASL). Their contact details are presented below:

UP NSRI Research and Analytical Services Laboratory

P. Velasquez Street cor. Quirino Avenue, UP Diliman, Quezon City
(02) 8281-3157 (Direct Line) / (02) 8981-8500 local 3608 (UP Trunkline)
nsri.rasl.upd@up.edu.ph

Image 14. **Location of the NSRI**

Section 8

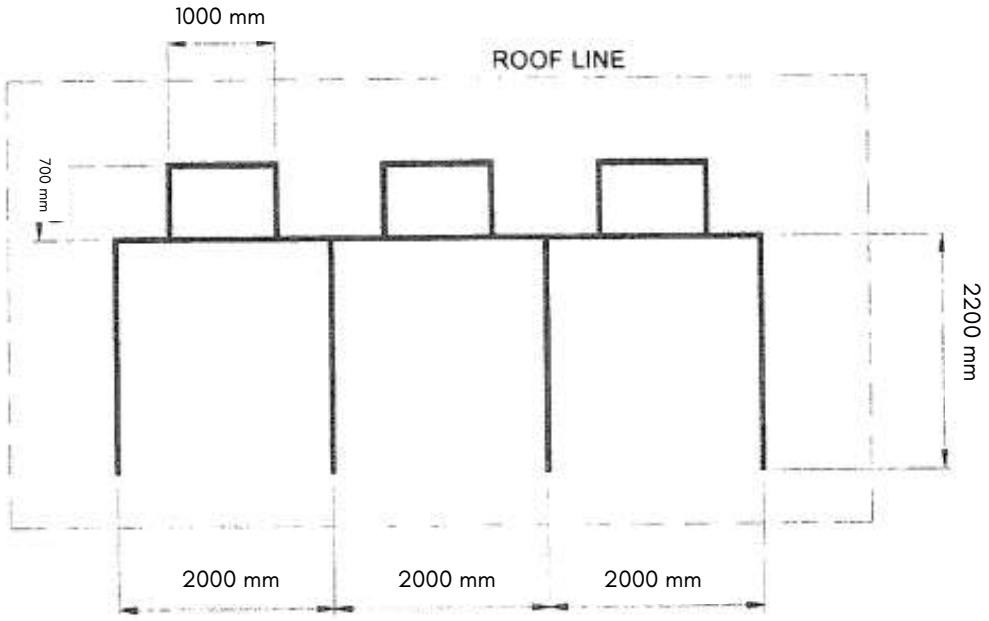
Animal Housing

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box.

8 Animal housing

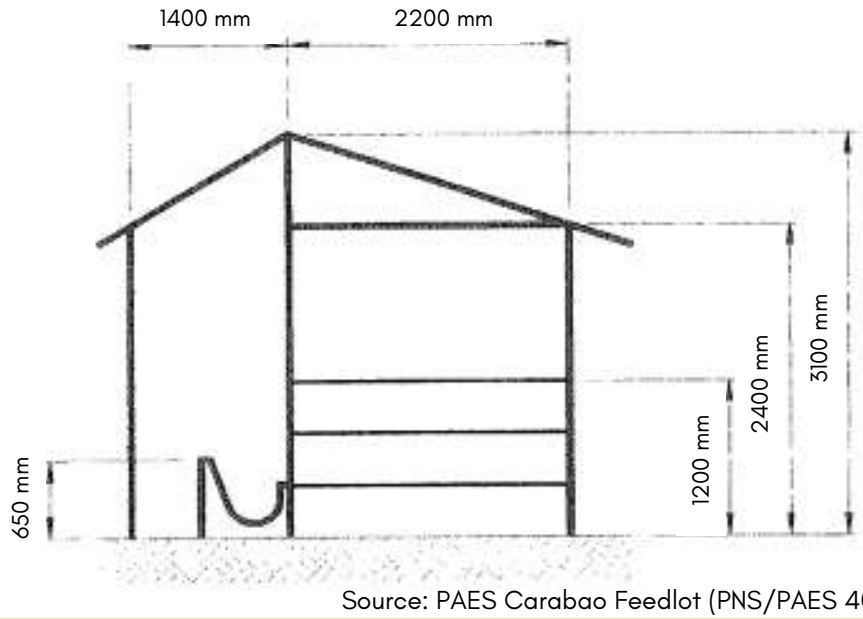
8.1 Farm owners/operators when building animal housing facilities may refer to PNS/PAES 405:2001 Cattle Feedlot, PNS/PAES 408:2001 Carabao Feedlot, PNS/PAES 406:2001 Cattle Ranch and other animal housing standards (BAFS, 2017).

Explanatory Note:



Source: PNS for Carabao Feedlot (PNS/PAES 408:2001)

Image 15a. **Sample of top view of layout of carabao feedlot**



Source: PAES Carabao Feedlot (PNS/PAES 408:2001)

Image 15b. **Sample of side view of layout of carabao feedlot**

Image 15c. **Side view of a carabao feedlot**

Image 15d. **Floor plan of a cattle feedlot**

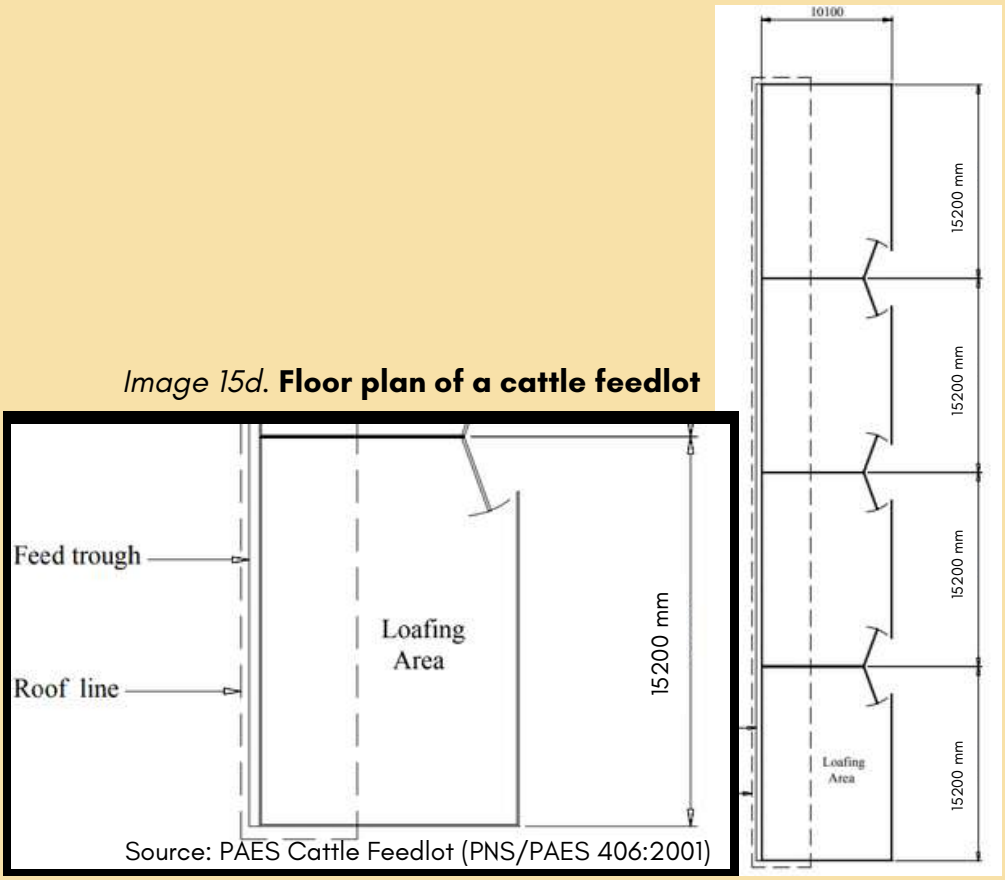


Image 15e. **Cattle feedlot**

Image 15f. **Communal pen**

8.2 The farm building should be designed and constructed appropriately for the intended purpose, should provide proper ventilation and should be well maintained (BAFS, 2017).

Explanatory Note:

Image 16. **Open-sided carabao housing**

8.3 The building intended for keeping animals should be constructed in an orientation that minimizes the adverse effects on animal performance and eliminates possible hazards to its surroundings (BAFS, 2017).

Explanatory Note:

According to the Compendium of Animal Welfare Legislation, Policies, and Issuances in the Philippines (2021), the animal in custody must be provided with shelter that is appropriate for the species. The structure must be designed in a way that will not harm animals, or expose them to extreme sunlight and weather. The shelter must also take into account the natural habitat and should allow the animals to express their natural behavior.

8.4 The building should be designed and constructed using materials that:

a) should not cause any injury or impart hazard to the animal;
b) provide comfort;
c) can be easily cleaned and disinfected;
d) can be easily replaced when damaged;
e) create efficient stock management; and
f) enhance biosecurity (BAFS, 2017).

Explanatory Note:

Image 17. **Pens designated for cattle to provide comfort**

8.5 There should be an effective drainage system in place at the building (BAFS, 2017).

Explanatory Note:

Image 18. **Various types of drainage in the facilities**

8.6 Animals should be provided with sufficient floor space/size suitable for their age, body weight and size to allow animals to feed and drink comfortably (BAFS, 2017).

Explanatory Note:

Image 19a. **Cattle provided with sufficient floor space**

Source: PCC, n.d

Image 19b. **Carabaos are provided with sufficient floor space to avoid overcrowding.**

The minimum space requirement for carabao is 4 m^2/animal. For cattle, the shed area requirement is 4 m^2/animal and the loafing area requirement is 5 m^2/animal (PAES 408:201, PAES 405:2003).

Note:

Loafing area — It is an area that the animals can use for other activities (feeding or lying) or for displaying estrus behavior and social bonding. In addition, this area is often utilized to regulate body temperature when humidity and temperature are high (Farm Health Online, 2018).

8.7 The feeding and drinking equipment and facilities should conform with the standards/requirements appropriate for age and number of beef cattle/ buffalo and should be constructed and conspicuously placed such that:

a. animals are allowed to eat and drink freely, allowing them to behave normally; and

Explanatory Note:

According to PAES 405:2001, the dimension of the feed trough should be:

- depth: 400 mm
- bottom width: 450-700 mm
- top width: 700-900 mm

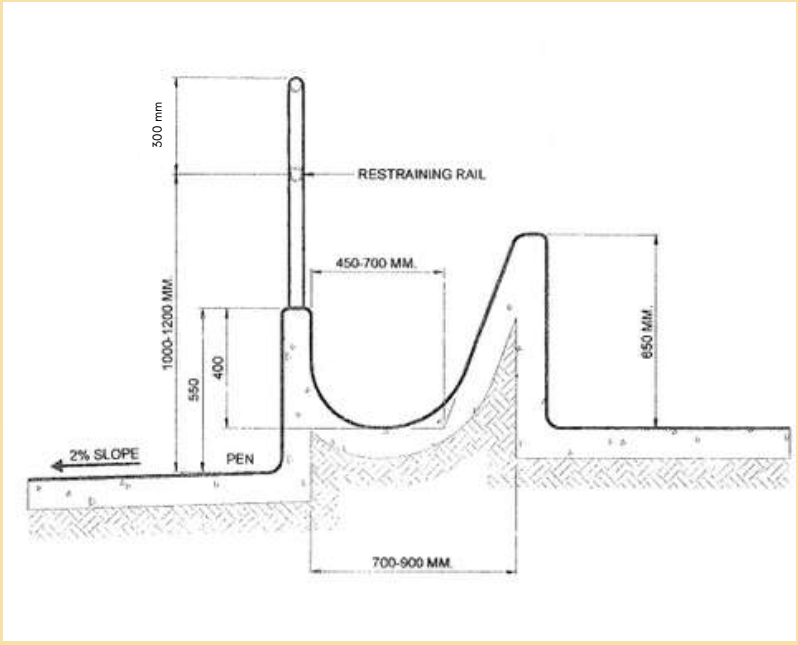
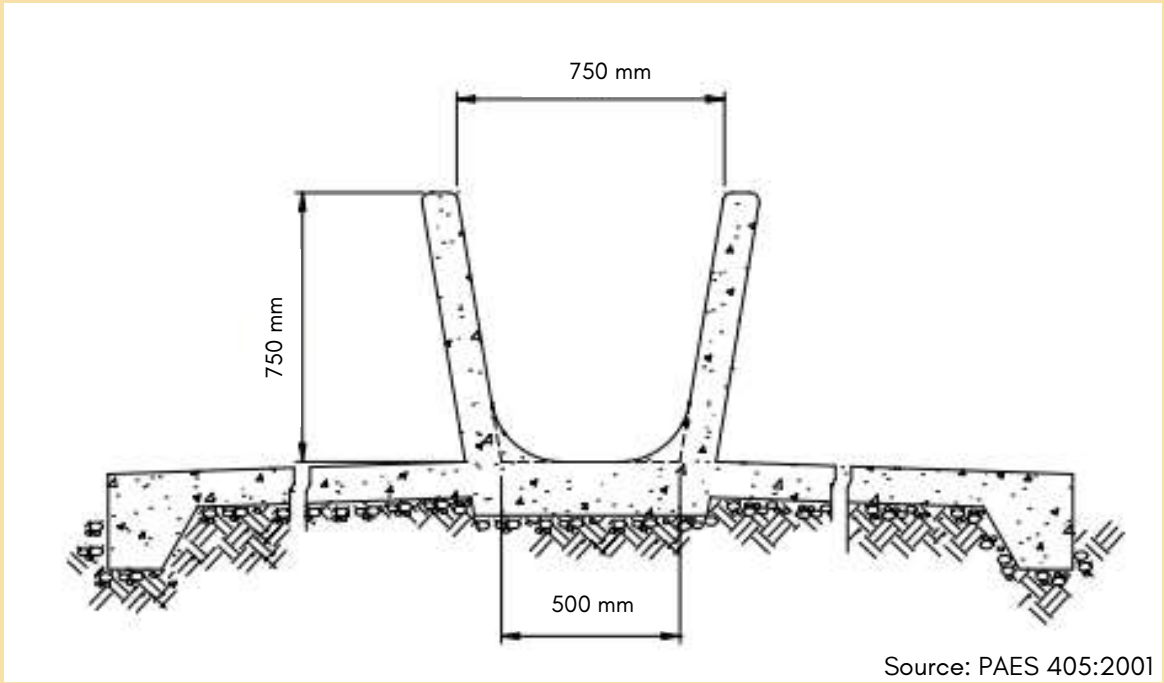


Image 20a. **Typical cross section of a feeding trough**

Image 20b. **Sample feeding trough**

Image 20c. **Water buffaloes consuming forage placed in the feeding trough**



Source: PAES 405:2001

Image 20d. **Typical drinking trough layout**

b. contamination with animal feces and urine is prevented.

Explanatory Note:

Image 21a. **Typical drinking trough**

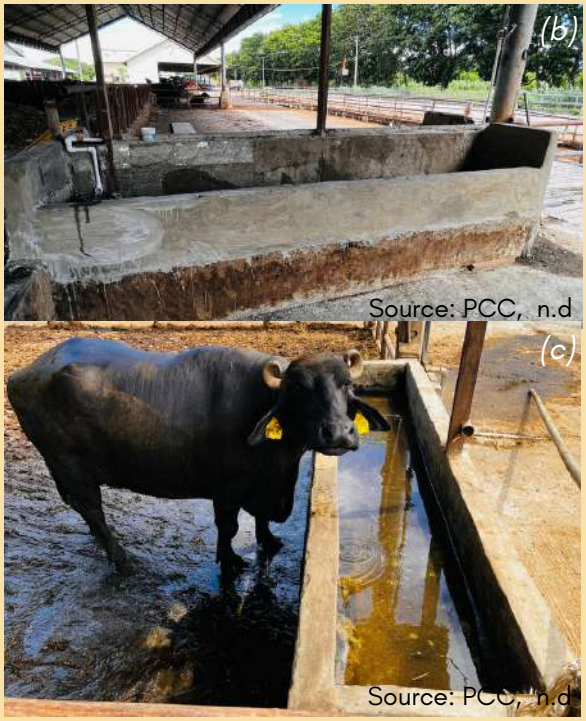


Image 21. **(b) communal water trough, (c) carabao drinking in the communal water trough**

8.8 Pens and pathways should:

a. be designed and constructed to prevent animals from escaping; and

Explanatory Note:

Image 22. **Properly constructed communal feeding trough**

b. be free from protruding objects or structures (e.g. nails and bolts) that may cause injury to the animals and farm operators and farm workers (BAFS, 2017).

8.9 Housing design (particularly roof height and sides) should provide proper ventilation (whether natural or artificial) to maintain a comfortable environment (BAFS, 2017).

Explanatory Note:

According to Philippine National Standard/Philippine Agriculture Engineering Standard Agriculture Structure for Cattle Feedlot or PNS/PAES 405:2003, the minimum height of the top of the roof beam shall be 2.5 m from the floor.

Source: PCC, n.d

Image 23a. **Well-elevated and properly maintained roof**

Image 23b. **Shed-type housing design with roof**

Image 23c. **Monitor-type housing design with roof**

8.10 Animal buildings should have adequate lighting to ensure that animals can be thoroughly inspected as required (BAFS, 2017).

8.11 Electrical installations and wirings should be protected and should not be accessible to the animals (BAFS, 2017).

Explanatory Note:

Image 24. **Electrical wirings covered with flexible PVC for electrical wirings**

8.12 Floors and pathway used by the animals should be made from safe, stable, non-slippery and well-lighted materials to prevent injury or abnormal gait to the animals (BAFS, 2017).

8.13 The design of alleys and chutes should allow effective management of the animals.

a. Floors of alleys and chutes should be properly built to provide good footing, preventing slippage and injuries (BAFS, 2017).

b. Alleys and chutes should have sides of sufficient height to prevent animals from jumping off or falling (BAFS, 2017).

8.14 The farm should provide effective and appropriate facilities to restrain or handle animals without causing undue stress and injury to both animals and farm workers (BAFS, 2017).

Explanatory Note:

Image 25a. **Movable restraining facility (cattle squeeze chute) located in the working corral**

Image 25b. **Non-movable restraining facility**

8.15 The premises should be kept clean at all times to prevent disease occurrence, establishment of breeding ground for pests and avoid environmental degradation.

Explanatory Note:

Image 26a. **Clean and properly maintained pathways**

Image 26b. **Personnel assessing the cleanliness of the facilities**

Image 26c. **Clean and maintained pathways**

Image 26d. **Clean working corral**

Section 9

Facilities

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

9 Facilities

9.1 Working corral or yard

9.1.1 The working yard or corral should have appropriate restraining tools and equipment (BAFS, 2017).

Explanatory Note:

Image 27a. **Restraining area located inside the working corral**

Image 27b. **Squeeze chute a) side view b) front view (head gate)**

9.1.2 There should be facilities that would permit necessary segregation of animals. In particular, an isolation pen or area for sick, injured, or disabled animals that require necessary veterinary attention (BAFS, 2017).

Explanatory Note:

Image 28. **Isolation area adjacent to feedlot area**

9.1.3 If applicable, facilities for breeding and other husbandry practices should be properly designed to provide the animals a comfortable and conducive environment for reproduction (BAFS, 2017).

Explanatory Note:

Image 29. **Cattle provided with comfortable pens**

9.2 Pasture area or Paddocks

9.2.1 Grazing Animals

9.2.1.1 There should be enough space for the animals (BAFS, 2017).

9.2.1.2 Shade or shelter within the pasture area should be provided (BAFS, 2017).

9.2.1.3 Land for production of animal feed and feed ingredients should not be located in close proximity to industrial operations where industrial pollutants from air, ground water or runoff from adjacent land would pose a food safety concern (ASEAN, 2019).

9.2.1.4 Pasture area must be properly maintained and managed to avoid being over grazed and polluted or heavily infested by parasites. Rotational grazing may be practiced, i.e. the herd is moved after one pasture lot has been grazed for some time.

Explanatory Note:

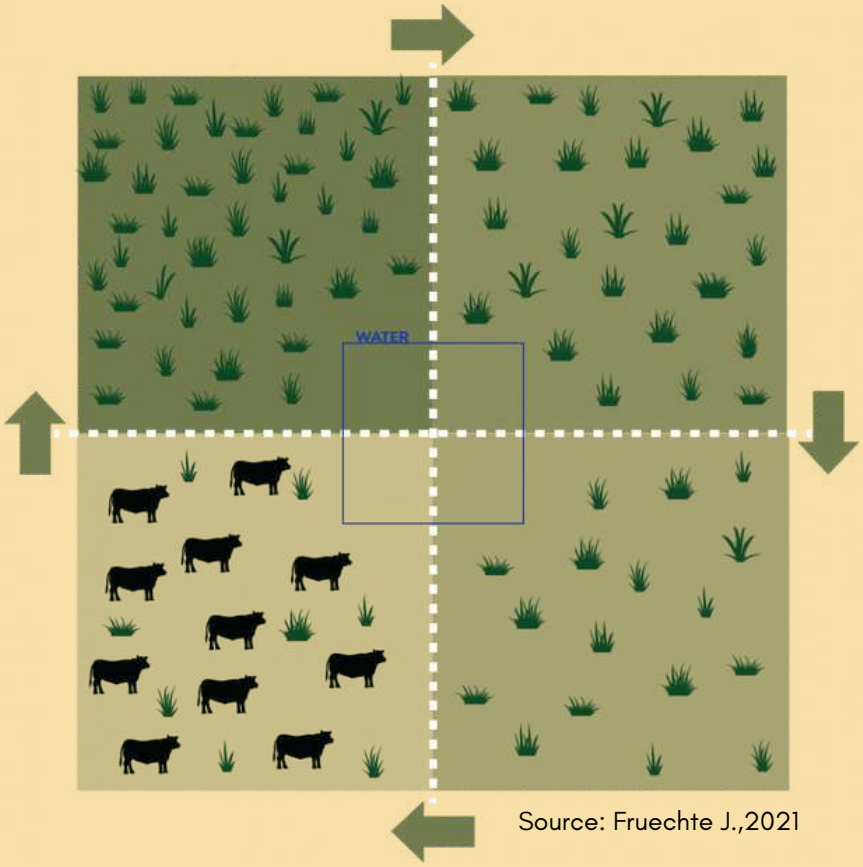
Source: PCC, n.d

Image 30a. **Pasture area**

Image 30b. **Pasture area**

9.2.1.5 The rotational grazing protocol of the farm should take into consideration cross contamination of disease to other groups of animals, application of pesticide and chemical fertilizer, manure decomposition and pasture quality to reduce risk on animal health and environmental contamination. Where manure fertilization of pastures is practiced, an appropriate handling and storage system should be in place and maintained to minimize environmental contamination (ASEAN, 2019).

Explanatory Note:



Source: Fruechte J.,2021

Image 31. **Sample diagram of rotational grazing**

9.2.2 Confined Animals

9.2.2.1 Those practicing cut-and-carry should establish their own forage or obtain a steady supply of forages (BAFS, 2017).

Explanatory Note:

Image 32a. **Forage area**

Image 32b. **Manual harvesting of forage**

Image 32c. **Transferring of collected forages to pens**

Image 32d. **Feeding of forage in pens**

9.2.3 Feed Storage facilities

9.2.3.1 The farm should have a facility for proper storage of all feed materials (BAFS, 2017).

Explanatory Note:

Source: PCC, n.d

Image 33. **Properly stacked feeds**

9.2.3.2 The feed storage should be kept clean at all times (BAFS, 2017).

9.2.3.3 The storage should have adequate ventilation, adequate protection from moisture to prevent acquisition of molds, and should be vermin-proof (BAFS, 2017).

9.2.3.4 Effective stock rotation should be practiced, i.e. "First in – first out" rule (BAFS, 2017).

9.2.4 Condemnation/Disposal Facility

9.2.4.1 There should be a separate area for disposal of mortalities that is enclosed and isolated, and should conform to existing environmental waste management regulations (BAFS, 2017).

Explanatory Note:

According to Manual of carcass disposal (2022), any dead animal shall be immediately removed and disposed of within 24 hours after death. When the cause of death is a dangerous communicable disease, the remains shall be buried within 12 hours after death.

In handling large carcasses,

1. It should be wrapped in plastic sheets or tarps.

2. Gloves, tarps, and any other materials used during the handling of carcasses should be disposed of accordingly.

3. The truck bed and any other non-disposable equipment should be disinfected using either a 10% bleach solution or a concentrated liquid solution.

4. Shovels, spades, and other small paraphernalia may be immersed in a bucket containing the solution. Spraying or pouring of the solution can be done with any other surfaces including the truck bed. Nitrile gloves should be worn during disinfecting and disposed of accordingly afterward.

5. Hands should be washed with soap and water after handling the animal carcasses and after disinfecting equipment.

For the burial ground,

1. A burial ground shall at least be 25 meters distant from any dwelling house and no house shall be constructed within the same distance from any burial ground.

2. No burial ground shall be located within 50 meters of any source of water supply.

3. Ideally, the carcass should be covered with two feet of soil within a day of burial.

For incineration,

The incinerator must have approval from both provincial and local authorities to burn pathological wastes (Oita University, 2022).

Image 34. **Mortality pit**

9.2.5 Perimeter Fencing

9.2.5.1 The fence, including its posts (e.g. concrete, iron, hardwood and live posts) and gates, should be effectively designed to prevent entry of stray animals, and escape or injury of the farm animals (BAFS, 2017).

Explanatory Note:

Image 35a. **Perimeter fence for pasture area**

Image 35b. **Perimeter fence to segregate pasture areas**

9.2.5.2 If electric fence is used, it should be operated as per manufacturer's instructions (BAFS, 2017).

Explanatory Note:

Image 36a. **Properly installed electric fence**

Image 36b. **Electric fence with warning sign**

Section 10

Farm Management

Explanatory notes on the provisions of the standards are found inside the yellow boxes. Additional information are presented as notes and/or images. Section numbers of the manual mirrors the content of the PNS.

10 Farm Management

10.1 Animal sourcing, identification and traceability

10.1.1 Animal identification should be done (ear tagging and other forms of identification that are compliant with animal welfare regulations) and the records of identification for the animals should be kept properly. If needed, animal identification records may be reported and registered with the local government authority (BAFS, 2017).

Explanatory Note:

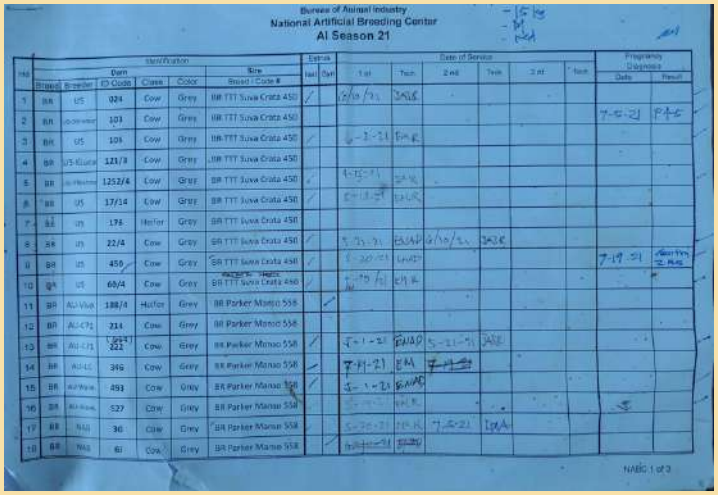
Image 37a. **Animals with ear tags**

Image 37b. **Ear tag plier**

Note: Ear tag plier is being used in applying ear tags on the ears of the animals

Image 37c. **Branding**

Note: Branding is one of the identification methods, which creates permanent identification (Hutu, 2020).



Bureau of Animal Industry
National Artificial Breeding Center
AI Season 21

Image 37d. **Identification record of imported animals**

Image 37e. **Animal identification placed outside of the pen**

10.1.2 If the establishment imports animals, records of pertinent documents should be kept (BAFS, 2017).

10.1.3 The farm operator should record all movement of animals in and out of the farm. This includes records of veterinary protocols as prescribed by the concerned authority (BAFS, 2017).

Explanatory Note:

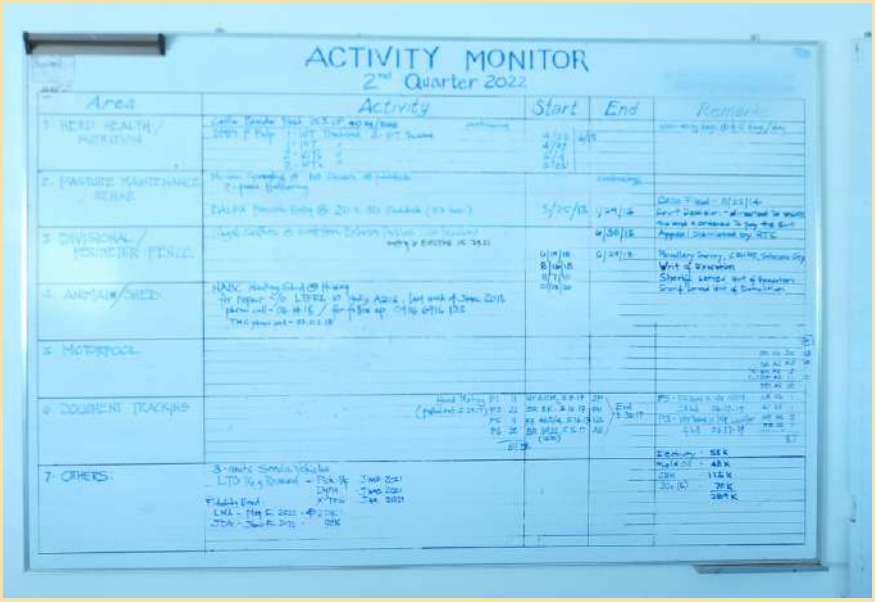
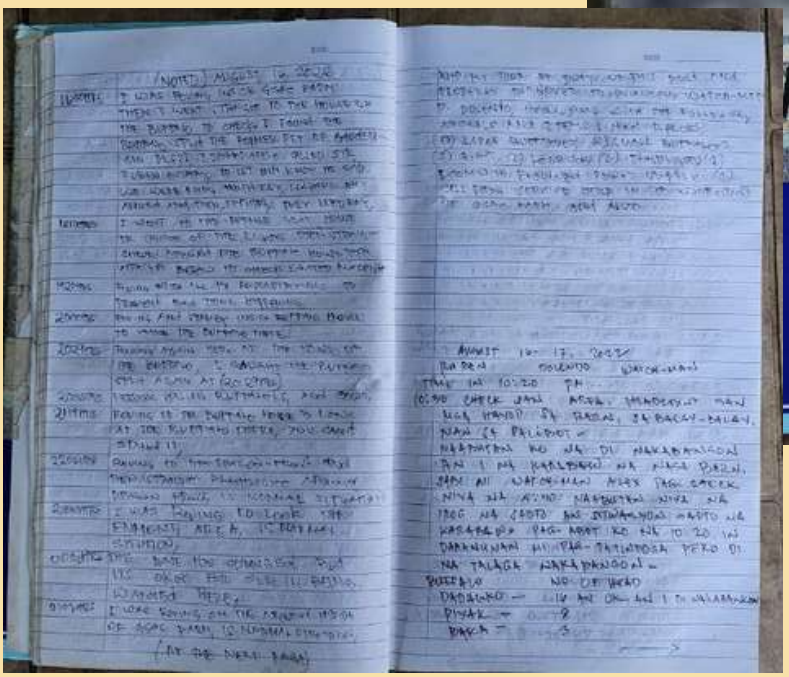


Image 38a. **White board where movement of animals are recorded**

Image 38b. **Sample of a watch-man record book**



10.2 Breeding and weaning

10.2.1 Only sexually mature animals of appropriate age and weight, and free from any disease or probable inherited abnormality should be bred (BAFS, 2017).

Explanatory Note:

For the majority of *Bos taurus* heifers breed in North America (Angus, Hereford, Simmental, and Charolais), calving for the first time usually happens at 22 to 24 months of age (primiparous cows). The next calving happens at approximately 12-month intervals until they reach 6 to 10+ years of age (Day and Nogueira, 2013).

On the second breeding of primiparous cows, they are recommended to be bred 3 to 4 weeks earlier than the multiparous cows in order to recover from their first calving. Thus, heifers should become pregnant for the first time at 12 to 15 months of age assuming a gestation period of 280 to 285 days, and accounting for more than 2 months variation in the birth date of heifers selected to serve as replacements (Day and Nogueira, 2013).

For the Philippine carabao, the age at first fertile mating is 2.42 years (29 months), and the age at first calving is 3.64.years (44 months) (Copland, 1985).

10.2.2 In natural mating, appropriate ratio of male to female animals should be practiced; general recommendation is 1 male for 25 females (BAFS, 2017).

10.2.3 Only duly trained certified personnel should perform assisted breeding techniques (e.g. artificial insemination, embryo transfer and ovum pickup) on the animals (BAFS, 2017).

Explanatory Note:

Image 39. **Personnel demonstrating proper artificial insemination**

10.2.4 The calves should be weaned only at a recommended body weight and age.

Explanatory Note:

Based on age and body weight, there are two basic considerations to be followed when weaning a calf.

1. Weaning at birth from the dam (applicable in the case of dairy calves raised for beef purposes e.g., veal and steer)

   This is done immediately after parturition wherein the calf is separated from the dam. The calf is artificially reared using whole milk or a milk replacer.

2. Weaning from milk

   The average age of weaning a calf from milk is three months old. At this age, the calf weighs about 80-90 kilograms. Generally, it is recommended for the calf's birth weight to double in 90 days. At this time, the calf has already developed rumen and capable of surviving on forage diet.

10.2.5 Weaning should be conducted with minimum stress to both the dam and its young.

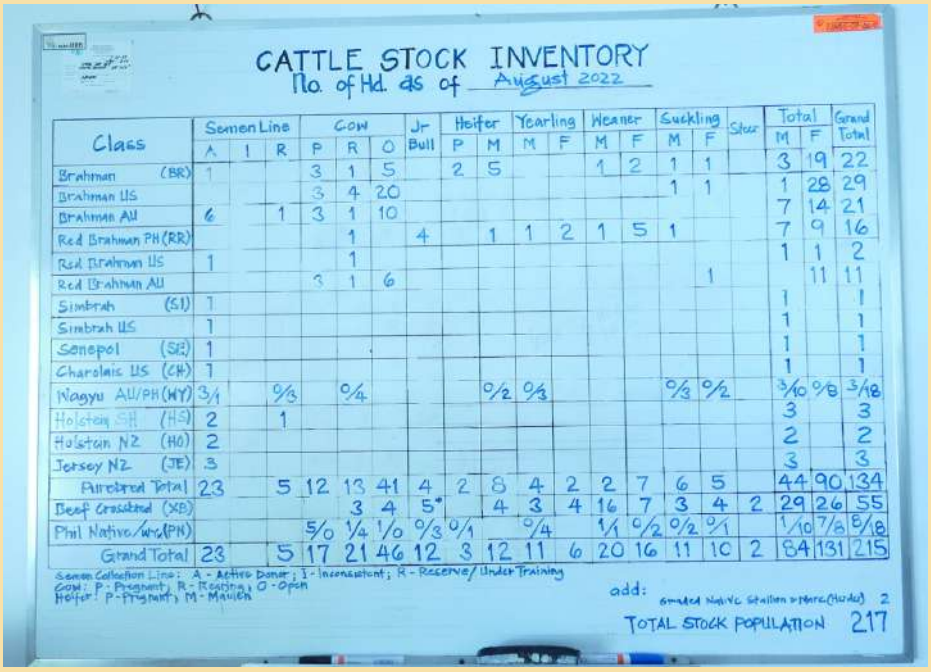
10.2.6 The farm operator should provide the basic facilities for the newly weaned animals.

Explanatory Note:

Image 40. **Individual pen for newly weaned calves**

10.2.7 The farm operator should maintain individual animal records that contain their lactation, breeding and reproductive performance.

Explanatory Note:



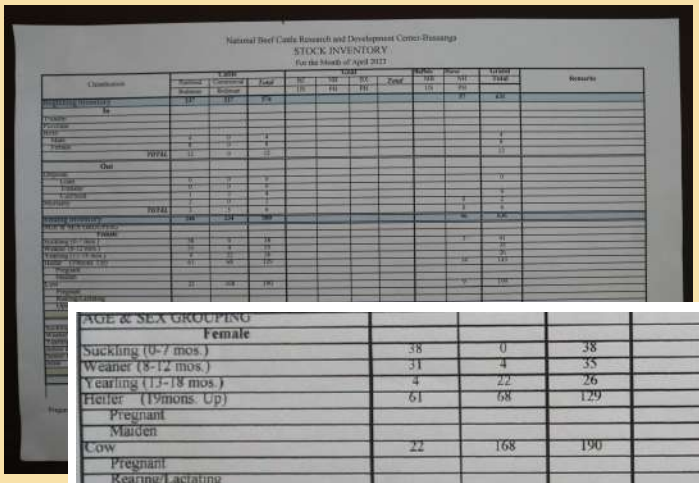
CATTLE STOCK INVENTORY
No. of Hd. as of August 2022

Class	Semen Line A	Semen Line I	Semen Line R	Cow P	Cow R	Cow O	Jr Bull	Heifer P	Heifer M	Yearling M	Yearling F	Weaner M	Weaner F	Suckling M	Suckling F	Steer	Total M	Total F	Grand Total
Brahman (BR)	1			3	1	5		2	5			1	2	1	1		3	19	22
Brahman US				3	4	20								1	1		1	28	29
Brahman AU	6		1	3	1	10											7	14	21
Red Brahman PH (RR)					1		4		1	1	2	1	5	1			7	9	16
Red Brahman US	1				1												1	1	2
Red Brahman AU				3	1	6									1			11	11
Simbrah (SI)	1																1		1
Simbrah US	1																1		1
Senepol (SE)	1																1		1
Charolais US (CH)	1																1		1
Nagyu AU/PH (NY)	3/1		0/3		0/4				0/2	0/3				0/3	0/2		3/10	0/8	3/18
Holstein SH (HS)	2		1														3		3
Holstein NZ (HO)	2																2		2
Jersey NZ (JE)	3																3		3
Purebred Total	23		5	12	13	41	4	2	8	4	2	2	7	6	5		44	90	134
Beef Crossbred (XB)					3	4	5*		4	3	4	16	7	3	4	2	29	26	55
Phil Native/Wx (PN)				5/0	1/4	1/0	0/3	0/1		0/4		1/1	0/2	0/2	0/1		1/10	7/8	8/18
Grand Total	23		5	17	21	46	12	3	12	11	6	20	16	11	10	2	84	131	215

Semen Collection Line: A - Active Donor; I - Inconsistent; R - Reserve/Under Training
Cow: P - Pregnant; R - Rearing; O - Open
Heifer: P - Pregnant; M - Maiden

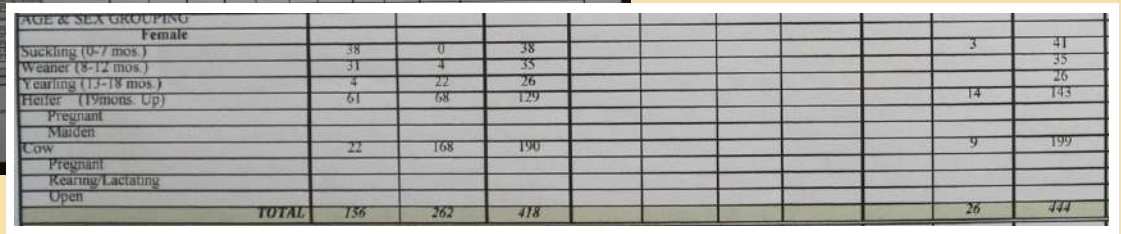
add: Grated Native Stallion 2
TOTAL STOCK POPULATION 217

Image 41a. **Individual animal record**



National Beef Cattle Research and Development Center-Bansalan
STOCK INVENTORY
For the Month of April 2023

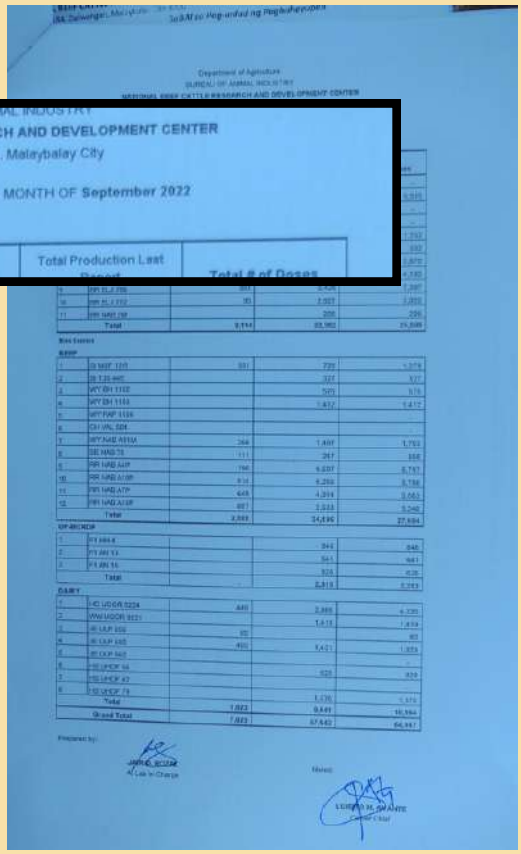
Image 41b. **Stock inventory monthly report**



AGE & SEX GROUPING										
Female										
Suckling (0-7 mos.)	38	0	38						3	41
Weaner (8-12 mos.)	31	4	35							35
Yearling (13-18 mos.)	4	22	26							26
Heifer (19mons. Up)	61	68	129						14	143
Pregnant										
Maiden										
Cow	22	168	190						9	199
Pregnant										
Rearing/Lactating										
Open										
TOTAL	156	262	418						26	444

10.2.8 Breeding programs and activities should be properly recorded, maintained, monitored and evaluated.

Explanatory Note:



BUREAU OF ANIMAL INDUSTRY
NATIONAL BEEF CATTLE RESEARCH AND DEVELOPMENT CENTER
Lot 184, Dalwangan, Malaybalay City

SEMEN PRODUCTION FOR THE MONTH OF **September 2022**

Bos indicus
BEEF

			Total Production Last Record	Total # of Doses

Image 42a. **Record of semen production**

FROZEN SEMEN CODE

#	BREED	BREEDER CODE	PEN MARKINGS COLOR	PEN MARKINGS # OF LINES	STRAW POWDER COLOR
1	BR	036	Blue	1	Blue
2	BR	82	Green	2	Blue
3	BR	Z3	Blue	2	Blue
4	BR	445	None	None	Blue
5	BR	461	Red	1	Blue
6	BR	2156	Red/Red	2	Blue
7	RR	909	Blue	1	Red
8	RR	036	None	None	Red
9	SI	12/9	Blue	1	Brown
10	SI	6609	Red	1	Brown
11	SI	32	Green	1	Brown
12	HO	9237	Green	1	Yellow
13	HO	9229	Blue	2	Yellow
14	HO	9224	Red	2	Yellow
15	WW	9221	Red	1	Yellow
16	JE	656	None	None	Yellow
17	JE	662	Green	1	Yellow
18	JE	692	Red	1	Yellow
19	BO	647	None	None	Green
20	NB	C21	Blue	2	Green
21	NB	D13	Green	1	Green
22	NB	D3	Red	2	Green
23					
24					
25					

Image 42b. **Record of frozen semen**

10.3 Feeds and Nutrition

10.3.1 Animals should be provided with optimum level of nutrition at all times, as required for their respective functions and well-being.

Explanatory Note:

Image 43a. **Calf feeding on feed mixture**

Feed formulation and feeding balanced diet for beef cattle are keys to achieving successful beef cattle operations. As such, proper formulation of ration allows nutritionists to determine the duration for which the beef cattle will be fed until the targeted body weight is achieved.

The following criteria should be considered before the diet formulation and ration development (Briggs and Felix, 2021):

1. animal type;
2. animal sex;
3. animal weight;
4. available feed ingredients;
5. use of feed technologies; and
6. housing type.

To provide adequate nutrition, there are the basic nutrients needed by the animals. These are:

1. carbohydrates;
2. fats;
3. proteins;
4. minerals;
5. vitamins; and
6. water.

Sample feeding programs are presented in Annex B of this Explanatory Manual.

10.3.2 There should be adequate and continuous access to clean and safe water.

Explanatory Note:

Image 44. **Additional water tank in case of power interruption**

10.3.3 Drinking water for animals should be of appropriate quality for the animals being produced. Where there is reason to be concerned about contamination of animals from the water, measures should be taken to evaluate and minimize hazards. Some of water used on farm shall be located in the areas where contamination from hazardous substances can be prevented (BAFS, 2017).

10.3.4 Safe, clean, and adequate rations or feeding materials (silage, grasses, legumes and concentrates) suited for cattle and buffaloes should be provided.

10.3.5 The production of forage crops should be monitored to minimize the risk of biological, chemical and physical hazards which affect animal health (ASEAN, 2019)

10.3.6 When giving commercial feed, farm operators should use those that have been officially registered with the competent authority, e.g. Animal Feeds, Veterinary Drugs and Biologicals Control Division (AFVDBCD) of the Bureau of Animal Industry (BAI) (BAFS, 2017).

Explanatory Note:

To see the full list of companies registered as commercial feed traders, commercial mixed feed manufacturers, feed distributors, feed exporters, feed importers, feed indentors, feed ingredient manufacturers, feed repackers, feed suppliers, non-commercial mixed feed manufacturers, and toll manufacturers you may access the BAI website at www.bai.da.gov.ph.

10.3.7 In cases of farm-mixed feed formulation, farm operators should only use ingredients from authorized and traceable suppliers. Records of purchases should be kept (BAFS, 2017).

10. 3.8 On-farm feed manufacturers shall secure license to operate from the competent authority and should be mixed in a manner that will minimize the potential from cross-contamination between feed of feed ingredients that may have an effect on the safety or withholding period of the feed or feed ingredients (ASEAN, 2019).

Explanatory Note:

Image 45. **Certificate of License to Operate (LTO)**

10.3.9 The farm may also keep a record of available forage.

Explanatory Note:

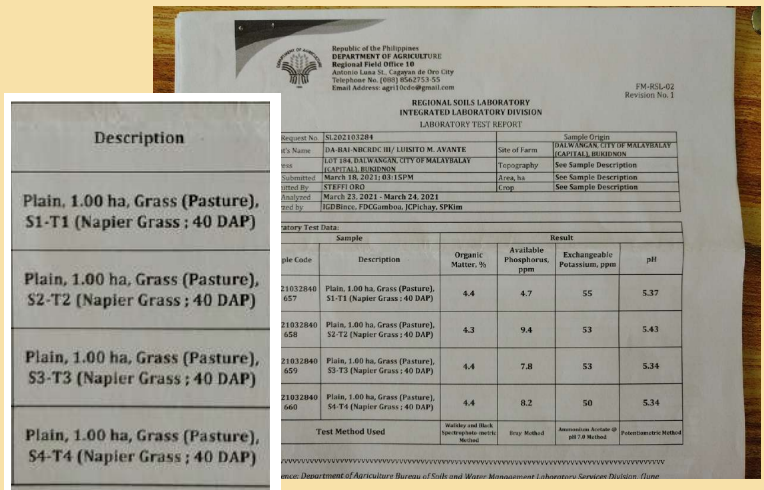


Image 46. **Sample list of forages existing in a farm**

10.3.10 Banned chemicals, feed additives, supplements and any form of medication in the diet of the animals, including those disallowed by the authorities or importing countries, should not be used (BAFS, 2017).

Explanatory Note:

Below are the banned medication for animals.

Chloramphenicol

Banned per DA Administrative Order (DO) No. 60 series of 1990 and DOH Administrative Order (AO) No. 91 series of 1990. It may cause hemotoxicity in humans in the form of bone-marrow depression (dose-related and reversible) and severe aplastic anemia (non-dose-related and irreversible).

Nitrofurans

Banned per DA-DOH Joint AO No. 2 series of 2000. Nitrofurazone is also found carcinogenic while Furazolidone is carcinogenic and genotoxic.

Olaquindox and Carbadox

Banned per DA AO No. 1 series of 2000 and DOH AO No. 4-A. Both drugs have a long withdrawal period of about 70 days. As such, no MRLs were established. Olaquindox and Carbadox were also observed to be genotoxic to humans.

Beta-agonist

Banned per DA AO No.14 series of 2003. This causes tremors, shakiness, and food poisoning. These symptoms were seen in drugs under this classification except Ractopamine where MRL (for cattle and pigs: Muscle and Fat: 10 µg/kg; Liver: 90 µg/kg) was adopted by the Codex Alimentarius Commission in 2012.

10.3.11 Instructions of medication of each specific drug being administered should be strictly followed, particularly the withdrawal period (BAFS, 2017).

Explanatory Note:

Image 47. **Sample instruction of medication of each specific drug**

Instruction of Medication of Each Specific Drug

Drug Name	Active Ingredient	Route of Administration	Dosage	Withrawal Period	Contraindications	Batch No.	Lot No.	MFD Date	Expiration Date	Storage Requirements
CBS	Calcium Borogluconate	IV,IM	250-500ml	none	none		2011186V	11/2020	11/2023	Temp.not exceeding 30C
Viton-500	Retinol, Pamitate Cholecalciferol Tocopherol	IM, SC	5ml	none	none		VT-180401	4/4/19	4/2022	Temp.not exceeding 30C
Vitol-450	Retinol Propionate Cholecalciferol Alpha Tocopherol Acetate	IM, SC	5ml	none	none		359587	4/2019	4/2022	Temp. between 15-25C
Dectomax	Doramectin	IM, SC	1ml/33kg	35 days	none		1930980	7/1/19	7/1/22	Temp. below 30C
Diramin NPK	Norfloxacin + Pectin +Kaolin	Oral	100ml	5 days	none		0338	4/2020	4/2022	Temp.not exceeding 30C
Ancoprofen	Ketoprofen	IV,IM	100ml	meat-1 day milk-0	none		4004558	3/2019	3/1/22	Temp.not exceeding 30C
Interflox-100	Enrofloxacin	IM,SC	100ml	meat-21 days milk-4 days	none		359631	2/2019	2/2022	Dark at room temperature (15-25C)
Albendrench Forte	Albendazole	Oral	1ml/15 kgs	meat-14 days milk-3 days	none		1901024	1/2019	1/2022	Temp.not exceeding 30C
Ceftiofur	Ceftiofur (as hydrochloride)	SC	1 ml/50kg	meat-2 days milk-zero	none		1901135	2/2019	2/2022	Temp.not exceeding 25C
Samorin	Trypamidium-Samorin	IM	2.5 ml/100 kg.	1 month	none		TFR723AA	9/8/18	8/2022	
Duramycin 300 LA	Oxytetracycline dihydrate	SC, IM	1ML/10 kg.B.W	milk-7 days	none		1933965	8/1/19	8/1/22	Temp.not exceeding 30C
Tetramax	Oxytetracycline dihydrate	IM	meat-21 days milk-7 days	meat-28 days	none		4004798	5/1/19	5/1/22	Temp.not exceeding 30C
Baycox 5%	Toltrazuril	Oral	3 ml/10kg	63 days	none		1920560	4/4/18	4/2022	Temp.not exceeding 30C
Ivomec	Ivermectin	SC	1 ml/50 kg	meat-21 days milk-28 days	none		BQ238/17	1/9/19	1/9/22	Temp.not exceeding 25C

10.3.12 The feed mixing equipment should be kept clean at all times and have regular preventive maintenance schedule (BAFS, 2017).

10.3.13 The farm operator should provide a daily feeding schedule or routine (BAFS, 2017).

10.3.14 Procurement documents of feed concentrates and ingredients should be kept and updated properly and should include:

a. supplier or source of feed concentrate and its registration number;
b. type of feed and supplements;
c. quantity;
d. declaration of ingredients;
e. document of feed analysis;
f. date of delivery; and
g. date of manufacturing and batch number.

10.3.15 The type and quantity of ration being fed to the animals should be recorded.

10.3.16 The preliminary examination on physical appearance of feed quality shall be conducted prior to feeding (ASEAN, 2019).

10.4 Use of animal protein

10.4.1 The use of mammalian meat, meat by-products, and bone meal shall comply with the requirements stated in DA Administrative Order No. 6 series of 2008 and in chapter 11.4 of Terrestrial Animal Health Code of Office International des Epizooties (OIE).

Explanatory Note:

For the purposes of recognizing the official risk status of Bovine Spongiform Encephalopathy (BSE), 'atypical BSE' is excluded. Atypical BSE is a condition believed to occur spontaneously in all cattle populations at a very low rate. According to Chapter 11.4 of the Terrestrial Animal Health Code, titled "General provisions and safe commodities," the following recommendations and/or intentions are made to manage the health risks for humans and animals associated with the presence of the bovine spongiform encephalopathy (BSE) agent in cattle:

1. When authorizing the import or transit of the commodities and any products made from the commodities listed below and containing no other tissues from cattle, Veterinary Authorities should not require any BSE-related conditions, regardless of the BSE risk status of the cattle population of the exporting country, zone or compartment.
   a. milk and milk products;
   b. semen and in vivo derived cattle embryos collected and handled in accordance with the recommendations of the International Embryo Transfer Society;
   c. hides and skins;
   d. gelatine and collagen prepared exclusively from hides and skins;
   e tallow with maximum level of insoluble impurities of 0.15% in weight and derivatives made from this tallow;
   e. dicalcium phosphate (with no trace of protein or fat);
   f. deboned skeletal muscle meat (excluding mechanically separated meat) from cattle which were not subjected to a stunning process prior to slaughter, with a device injecting compressed air or gas into the cranial cavity or to a pithing process, and which passed ante- and post-mortem inspections and which has been prepared in a manner to avoid contamination with tissues listed in Article 11.4.14.; and
   h. blood and blood by-products, from cattle, which were not subjected to a stunning process, prior to slaughter, with a device injecting compressed air or gas into the cranial cavity, or to a pithing process.
2. When authorizing the import or transit of other commodities listed in Chapter 11.4, Veterinary Authorities should require the conditions prescribed in this chapter relevant to the BSE risk status of the cattle population of the exporting country, zone, or compartment.
3. When authorizing import of commodities according to their conditions, the risk status of an importing country is not affected by the BSE risk status of the exporting country, zone or compartment.

10.5 Other management practices

10.5.1 The farm personnel, when performing the management practices listed below, should use the appropriate tools and equipment, observe proper procedure (including provisions for restraint and pain management), and should keep records of such activities:

- Hoof trimming
- Disbudding/dehorning
- Castration
- Other routine management practices

Explanatory Note:

Below are the sample of tools that are usually being used for hoof trimming and dehorning.

Hoof trimming tools

(48a)

Hoof Nipper/Trimmer

(48b)

Source: Atlantic Equine

Hoof Knife

(48c)

Brush

(48d)

Hoof rasp and file

(48e)

Hoof chisel

Dehorning tool

(48h)

(48i)

Electric calf dehorner

10.5.2 Guard dogs should be caged. Herding dogs should be properly trained.

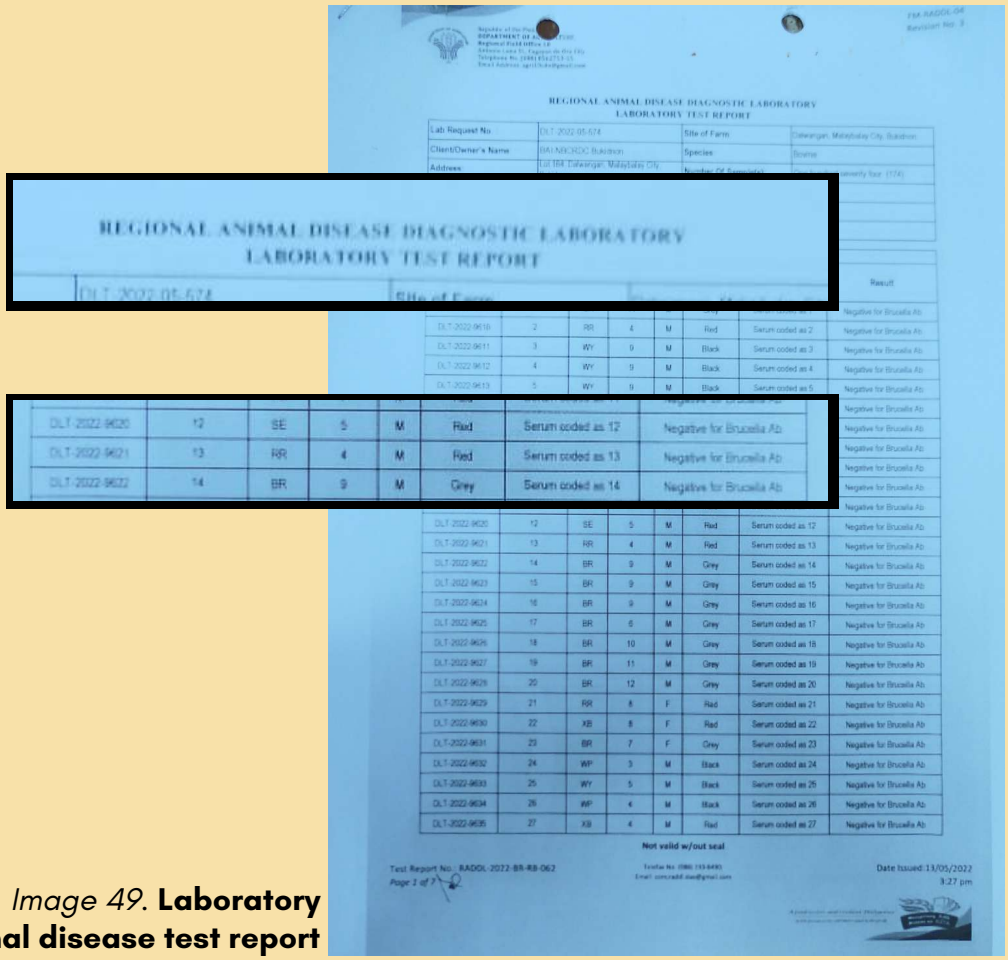
Animal Health Management

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

11 Animal Health Management

11.1 The farm operator with the assistance of a veterinarian, should be responsible for maintaining good health of the animals at all times, through proper management practices that include prevention, treatment and disease control and containment measures of the disease affecting the animals (BAFS, 2017).

Explanatory Note:



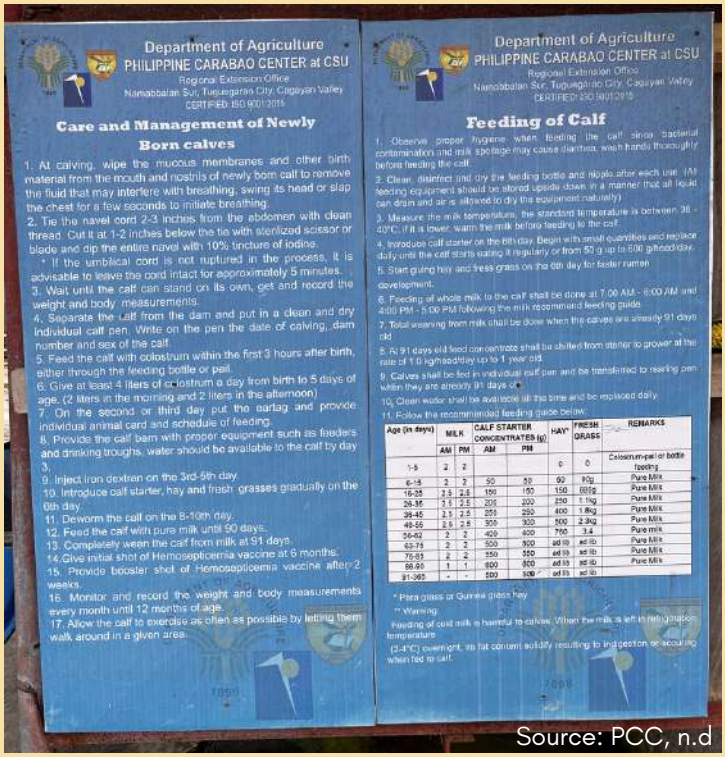
REGIONAL ANIMAL DISEASE DIAGNOSTIC LABORATORY
LABORATORY TEST REPORT

DLT-2022-9620	12	SE	5	M	Red	Serum coded as 12	Negative for Brucella Ab
DLT-2022-9621	13	RR	4	M	Red	Serum coded as 13	Negative for Brucella Ab
DLT-2022-9622	14	BR	9	M	Grey	Serum coded as 14	Negative for Brucella Ab

Image 49. **Laboratory animal disease test report**

11.2 There must be a written animal health program in place that is updated regularly and supervised by a licensed veterinarian, in accordance with the requirements of the competent authorities.

Explanatory Note:



Source: PCC, n.d

Image 50. **Poster of care and maintenance of calves in the farm**

11.3 The health status of the animals in the farm should be monitored and recorded regularly by the farm, and veterinary assessment of the establishment should be carried out annually by a licensed veterinarian and/or by a competent authority.

Explanatory Note:

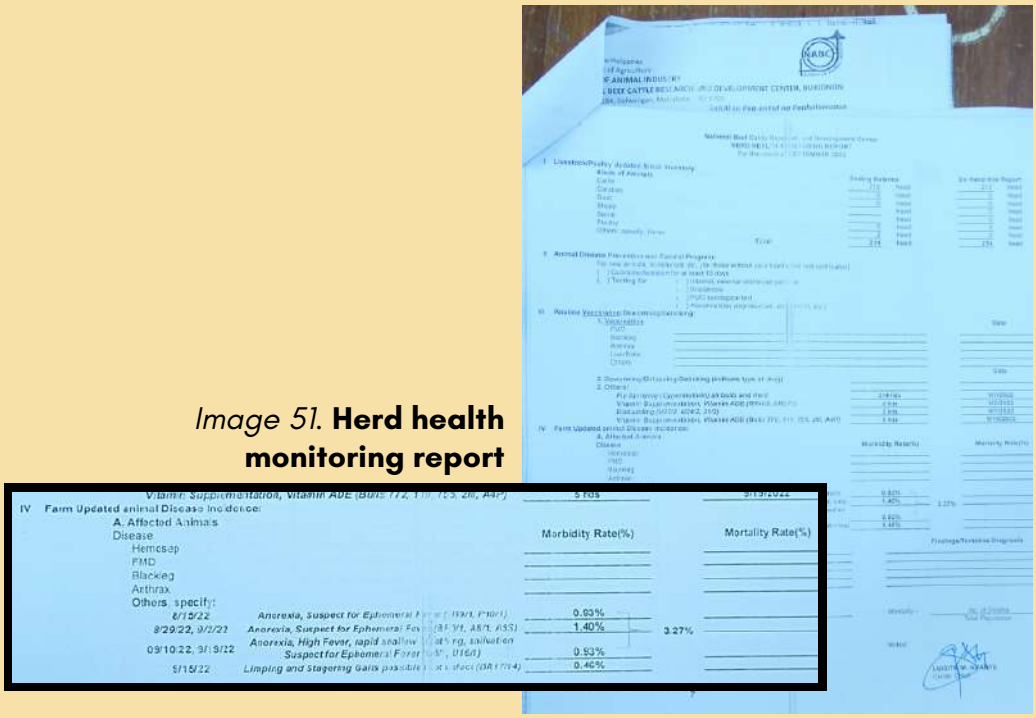


Image 51. **Herd health monitoring report**

11.4 The vaccination program should be adopted against the diseases as maybe required by competent authorities. There must be an official control program for brucellosis and tuberculosis.

Explanatory Note:

Sample control programs for various diseases are presented in Tables 11 and 12. It is important to note that a veterinarian is essential for maintaining the health and well-being of the animals and ensuring the productivity and sustainability of the farm.

Table 11. Sample control program for various diseases

Samples taken	Laboratory Analyses	Follow up Actions
Feces	• Fecalysis (Sedimentation, Flotation) • DNA/RNA extraction for PCR-based screening of agents	**Helminth** Give dewormer (Albendazole/ Triclabendazole)
Urine	• DNA Extraction for screening of *Leptospirosis sp.*	**Leptospirosis** Treat immediately with antibacterial drug (Marbofloxacin or Doxycycline)
Whole blood	• Blood parasite examination (*Trypanosoma evansi* and *Microfilaria spp.*) • DNA/RNA Extraction for PCR-based screening of agents (*Trypanosoma evansi*, etc.) • Complete Blood Count	***Trypanosoma sp.,*** Treat immediately with anti-trypanosomal drug (Samorin/Cymelarsan) ***Microfilaria spp.*** Give Ivermectin/Doramectin
Blood serum	• Screening of *Brucella spp.* • Blood serum chemistry • Screening of serum-based test kit like ELISA	Isolate the buffalo, proceed with confirmatory test (Test and Slaughter)

(Source: Philippine Carabao Center, n.d)

Table 12. List of farm activities with their purpose/description and actions to be taken (remarks).

Farm Activities	Purpose	Remarks
Deworming	To treat Fasciolosis and other disease-causing gastrointestinal parasites	Fecal collection is done to monitor effectiveness of dewormer
Hemosep vaccination	To prevent Hemorrhagic Septicemia caused by *Pasteurella multocida* - an acute disease affecting lungs	**Allergic reaction** - Epinephrine **Vaccination failure** - Pen-Strep
Weighing	To monitor Average Daily Gain (ADG) and Feed Conversion Ratio (FCR) of animals	Done weekly, monthly, quarterly and annually depending on age and physiologic state of the animal
Ear tagging	To properly identify animals; Replacement of old and unclear ear tags	Done as early as week 1
TB testing	To regularly screen animals for Tubercolosis - a chronic, infectious and zoonotic disease affecting lungs	Isolate the buffalo, proceed with side by side testing - Comparative TB Testing and Bovigam TB Testing (Test and Slaughter)
Vitamin and Mineral Administration	To prevent vitamin and mineral deficiency	Given depending on the need and overall health and physiologic status of the animal

Note: Philippine Carabao Center, n.d

11.5 Adequate measures should be implemented in order to prevent udder infections, metabolic diseases, external and internal parasites (BAFS, 2017).

11.6 Drugs, medicines, and vaccines should be administered by a licensed veterinarian or trained personnel under the supervision of a licensed veterinarian (BAFS, 2017).

11.7 Drugs or medicines should only be used for prophylactic and treatment reasons (BAFS, 2017).

Explanatory Note:

It is important to note that drugs or medicines are intended for animal use and are registered with the BAI.

11.8 Instruction on medication of each specific drug being administered should be strictly followed, particularly the withdrawal period. The farm should secure certification from a veterinarian prior to slaughter (ASEAN, 2019).

Explanatory Note:

Withdrawal period is the time interval between the last administration of a drug to an animal and the point at which the levels of residues in the tissues or products fall below the stated Maximum Residue Limit (MRL) (Hagren et al., 2005)

11.9 The use of illegal and banned medication and vaccines should be prohibited (use vaccines accredited by BAI; the same with controlled drugs (BAFS, 2017).

11.10 Drugs, medicines, and vaccines should be stored and identified properly; proper disposal of these items should be followed to prevent contamination to the environment (BAFS, 2017).

Explanatory Note:

Images 52a and 52 b show drugs, medicines, and vaccines kept in their original container, secured, and stored properly.

Image 52a. **Medicine shelf placed in a colder part of the room, away from direct sunlight**

Image 52b. **Drugs and some medicinal supplies are properly arranged in a tackle box**

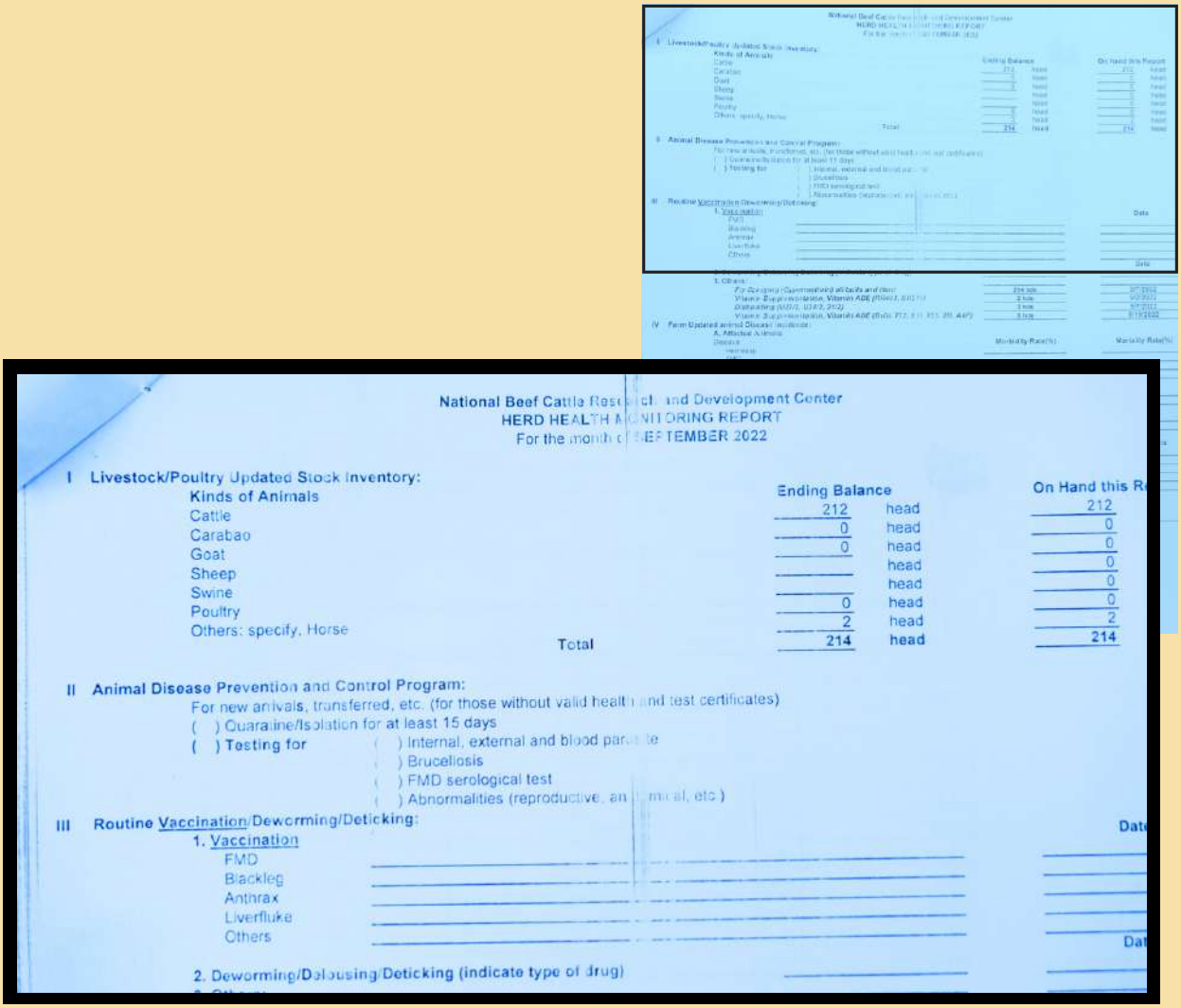
Image 52c. **Medical supplies and other chemicals are stored and arranged properly**

Image 52d. **Examples of drugs being used in the farm**

11.11 The use of needle during injection shall be done in such a way that no part of broken needle remains in body and the corrective action for remained needle in beef cattle and buffalo body shall be in place (ASEAN, 2019).

11.12 The farm operator should keep and maintain complete records of farm operations, management routines, and animal health records like disease monitoring and medication. These records should be easily retrievable.

Explanatory Note:



National Beef Cattle Research and Development Center
HERD HEALTH MONITORING REPORT
For the month of SEPTEMBER 2022

I Livestock/Poultry Updated Stock Inventory:

Kinds of Animals	Ending Balance		On Hand this R
Cattle	212	head	212
Carabao	0	head	0
Goat	0	head	0
Sheep		head	0
Swine		head	0
Poultry	0	head	0
Others: specify, Horse	2	head	2
Total	214	head	214

II Animal Disease Prevention and Control Program:
For new arrivals, transferred, etc. (for those without valid health and test certificates)
( ) Quarantine/Isolation for at least 15 days
( ) Testing for ( ) Internal, external and blood parasite
( ) Brucellosis
( ) FMD serological test
( ) Abnormalities (reproductive, an[illegible]mical, etc.)

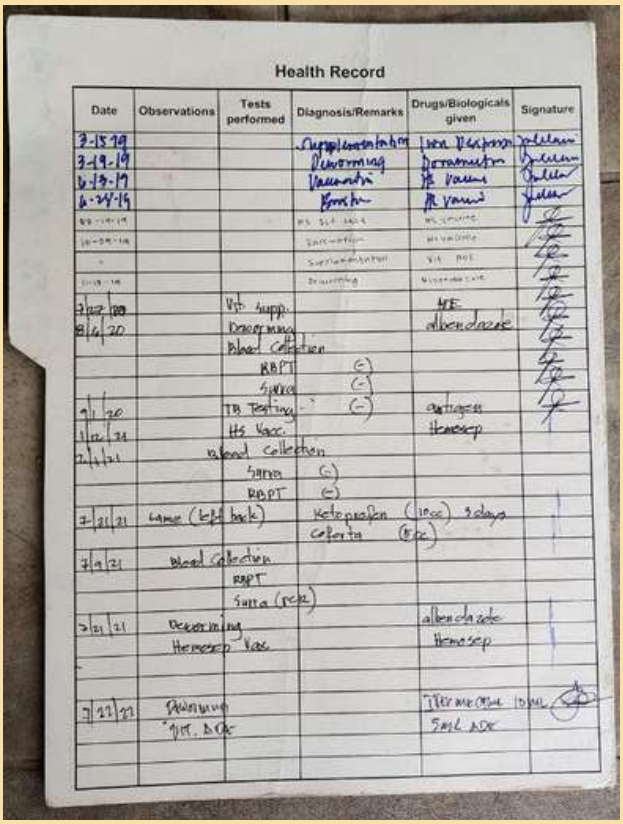
III Routine Vaccination/Deworming/Deticking:
1. Vaccination — Date
FMD
Blackleg
Anthrax
Liverfluke
Others
2. Deworming/Dalousing/Deticking (indicate type of drug)

Image 53. **Sample of herd health monitoring report**

a. Records include, but are not limited to, the following:

- Vaccination program;
- Deworming;
- Disease condition;
- Diagnosis;
- Intervention or treatment done;
- Control measures;
- Post-mortem findings;
- Surveillance;
- Disposal (BAFS, 2017); and
- Farm traffic record (vehicle and visitors entry and exit). (ASEAN, n.d)

Explanatory Note:


Health Record

Date	Observations	Tests performed	Diagnosis/Remarks	Drugs/Biologicals given	Signature
3-15-19			Supplementation	Iron Dextran	
3-19-19			Deworming	Dewormer	
6-19-19			Vaccination	Vaccine	
6-24-19			Booster	Vaccine	
7/22/20		Vit supp.		ME	
8/6/20		Deworming		albendazole	
		Blood Collection			
		RBPT	(-)		
		Serum	(-)		
9/1/20		TB Testing	(-)	antigens	
1/22/21		HS Vax.		Hemosep	
2/1/21		Blood Collection			
		Serum	(-)		
		RBPT	(-)		
7/21/21		Lame (left back)	Ketoprofen (10cc) 3 days		
			Ceforia (5cc)		
7/9/21		Blood Collection			
		RBPT			
		Serum (rck)			
5/21/21		Deworming		albendazole	
		Hemosep Vax		Hemosep	
7/27/21		Deworming		Ivermectine (0.5ml)	
		9in. 1 Dr		5in1 1Dr	

Image 54. **Sample health record which includes different tests performed in the animal**

b. The farm should maintain updated records of medicine purchases and administrations that should be readily available for inspection (BAFS, 2017).

c. The procurement records should have:

- Date of purchase;
- Name of the product (generic compound);
- Quantity purchased;
- Batch number;
- Expiry date;
- Name of supplier (BAFS, 2017)

d. Drug or medicine administration records should consist of the following:

- Type of drugs or medication used;
- Batch number;
- Quantity of medicine used;
- Date administered;
- Route of administration;
- Identification of animals/group treated;
- Number of animals treated;
- Date of completion of treatment;
- Withdrawal period;
- Name of the person who administered the medicine.

Section 12

Animal Welfare Management

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

12 Animal Welfare Management

12.1 Proper techniques should be applied to handle and restrain animals. Animals should always be handled and restrained in such a way to minimize fear, stress, pain and injury (BAFS, 2017).

Explanatory Note:

Image 55a. **Restraining area for performance of husbandry procedures and minor surgical procedures**

Image 55b. **Head gate of the chute**

12.2 Appropriate and functional facilities, equipment, and tools should be used for effective animal handling and restraint, in order to minimize stress and injury to animals. The operators should acquire the skills and techniques to use the tools properly (BAFS, 2017).

12.3 Sick, injured or disabled animals should be separated from healthy animals and should be given the necessary veterinary attention, including euthanasia if required and following the rules and regulations in euthanasia.

Explanatory Note:

Based on the Department of Agriculture Administrative Order No. 13 series of 2010 or also known as the "Revised Rules and Regulations on the Euthanasia of Animals", the approved methods of euthanasia for ruminants, including beef cattle and buffalo:

For ruminants (domestic)	**Barbiturates, penetrating captive bolt and gunshot.**

12.4 Sticks or canes should not be used to restrain the farm animals. However, a stick or cane may be used for the worker's safety when handling larger or aggressive animals.

Section 13

Animal Transportation

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

13 Animal Transportation

13.1 Animals should be transported in appropriate vehicles and in a manner that does not cause excessive stress throughout the travel and does not predispose them to injury and disease.

Explanatory Note:

Image 56. **(a) Transport vehicle with animals. (b) Clean and empty transport vehicle**

13.2 Animals being transported should be in a good state of health. However, stressed, sick and pregnant animals, may be transported but with extra-precautionary measures.

13.3 Transport vehicles should comply with the requirements of the competent authorities and should:

a. Allow easy loading and unloading;
b. Have communication equipment and first aid kit;
c. Ensure safety of the animals and personnel during transport;
d. Be clean and sanitized;
e. Be equipped with floors that provide secure footing;
f. Have proper drainage for collection of urine;
g. Whenever necessary, underloaded vehicles should contain partitions to avoid injury of animals during transport;
h. Have a decal/label **"live animal on board"** at the sides and front/back; and
i. Should be registered to BAI as Transport Vehicle Carrier Accompanied by a registered livestock handler.

13.4 Appropriate space allowance and ventilation should be provided during transportation (BAFS, 2017).

13.5 Where appropriate, animals should be segregated according to species, size, sex, and age (BAFS, 2017).

13.6 The transport of animals from point of origin to final destination should be through the most direct and appropriate route which should be completed without unnecessary delay and should follow the animal travel plan (BAFS, 2017).

Explanatory Note:

Transporting animals could create stress. Stress comes in many forms, e.g., deprivation of water or food, rough handling, exhaustion due to transporting over long distances, and mixing of animals reared separately resulting in fighting. From an animal welfare viewpoint, stress is unacceptable and should be avoided due to its deleterious effects on the quality of the meat (FAO, 1991). As such it is suggested that the duration of the journey should be short and direct, without any stoppages. Cattle and buffalo should not travel for more than 36 hours. If the journey will take more than 36 hours, the animals should be offloaded after 24h provision of feed and water.

The Bureau of Animal Industry - National Veterinary Quarantine Services Division (BAI-NVQSD) provided an online application for a local shipping permit (Memorandum Circular No.24 series of 2020 or the "Guidelines on the use of Local Shipping Permit Application System for Clients"). Based on the MC, all shippers transporting live animals/animal by-products, need to complete the following requirements:

- Veterinary Health certificate (validity is 3 days after the issued date);
- Registration of Transport Carrier;
- Livestock Handler's License;
- Laboratory Test Results and Laboratory Compliance Certificate; and
- Individual Certificate of Product Registration (CPR) issued by DOH-FDA.

A sample application form is presented below. It should be noted that the form may be revised from time to time. It is advisable to contact the Bureau of Animal Industry (BAI) for the most updated information.

APPLICATION FORM FOR LIVESTOCK, POULTRY AND BY-PRODUCTS HANDLER'S LICENSE

Under PD No. 07 series Of 1972, otherwise known as the "orderly marketing of livestock, poultry, meat and animal by-products" as amended by AO No. 08, 2005

SINGLE PROPRIETORSHIP OR INDIVIDUAL APPLICANTS

Name of Applicant: Last Name First name Middle I

Address: [complete]

Business Name: TIN:

Contact No.: Email Ad:

Image 57. **Animal health transport and handlers- By-products handlers License individual application form**

13.4 Appropriate space allowance and ventilation should be provided during transportation (BAFS, 2017).

13.5 Where appropriate, animals should be segregated according to species, size, sex, and age (BAFS, 2017).

13.6 The transport of animals from point of origin to final destination should be through the most direct and appropriate route which should be completed without unnecessary delay and should follow the animal travel plan (BAFS, 2017).

13.7 Animals should be transported during the coolest part of the day (BAFS, 2017).

13.8 Transport permits and health certificates that conform to the veterinary protocols imposed by the competent authority should be acquired and brought along during transport (BAFS, 2017).

13.9 The transporter should be fully responsible for the care and welfare of the animals as well as ensure the cleanliness of the vehicle during the entire process of transporting. Disposal of the waste should be done in an environment friendly manner (BAFS, 2017).

13.10 Animals intended for slaughter should follow the National Meat Inspection Service guidelines for resting of animals prior to slaughter (BAFS, 2017).

13.11. In cases wherein the establishment seeks the services of a second (2nd) party to ship the live animals, the shipper should be properly informed of the recommendations stated above (BAFS, 2017).

Biosecurity Measures

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

Source: PCC

14 Biosecurity Measures

14.1 The farm should have a written protocol of biosecurity measures. Proper warning signage should be provided (BAFS, 2017).

Explanatory Note:

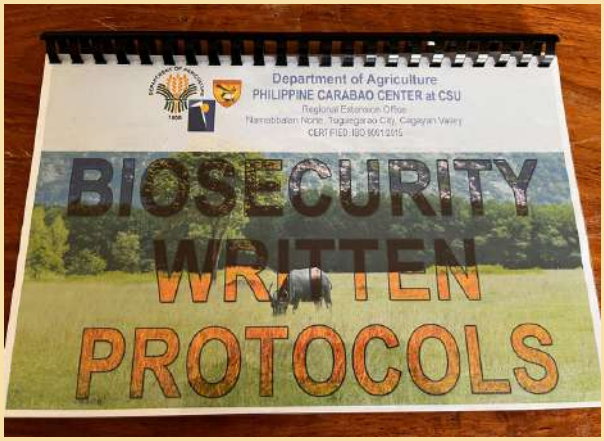


Image 58a. **Biosecurity protocols book**

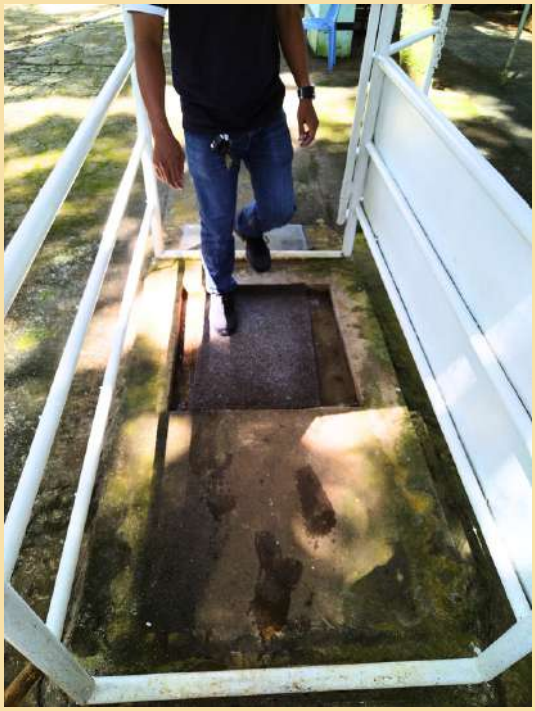


Image 58b. **Foot dip at the entrance of the farm**

Image 58c. **Foot dip**

14.2 Biosecurity procedures should be well implemented and continuously monitored to prevent introduction of disease into the farm and/or to control its spread within the farm (BAFS, 2017).

14.3 The biosecurity measures should take into consideration the relevant diseases identified by local regulations/authority (BAFS, 2017).

14.4 The farm should have the appropriate and functional lay-out and infrastructure to ensure effective implementation of the biosecurity measures. These should include facilities for disinfection, with appropriate concentration of disinfectant, at entry (e.g. wheel bath or spraying, shower for visitors, handwashing facility, etc.)/exit point of the farm and the building (footbath) (BAFS, 2017).

Explanatory Note:

Image 59a. **Wheel bath**

Source: PCC, n.d

Image 59b.
Handwashing area

14.5 All incoming animals should undergo the appropriate quarantine measures (BAFS, 2017).

Explanatory Note:

According to Department of Agriculture Administrative Order (AO) No. 09 series of 2010, 48 hours before the arrival of consignment at the preliminary border inspection site (port of entry), the importer or his authorized representative shall notify the concerned DA Border Inspector by completely filling out the Application for Import Inspection as contained in the DA Border Inspector's Report Form.

14.6. Stray animals should not be allowed within the premises (BAFS, 2017).

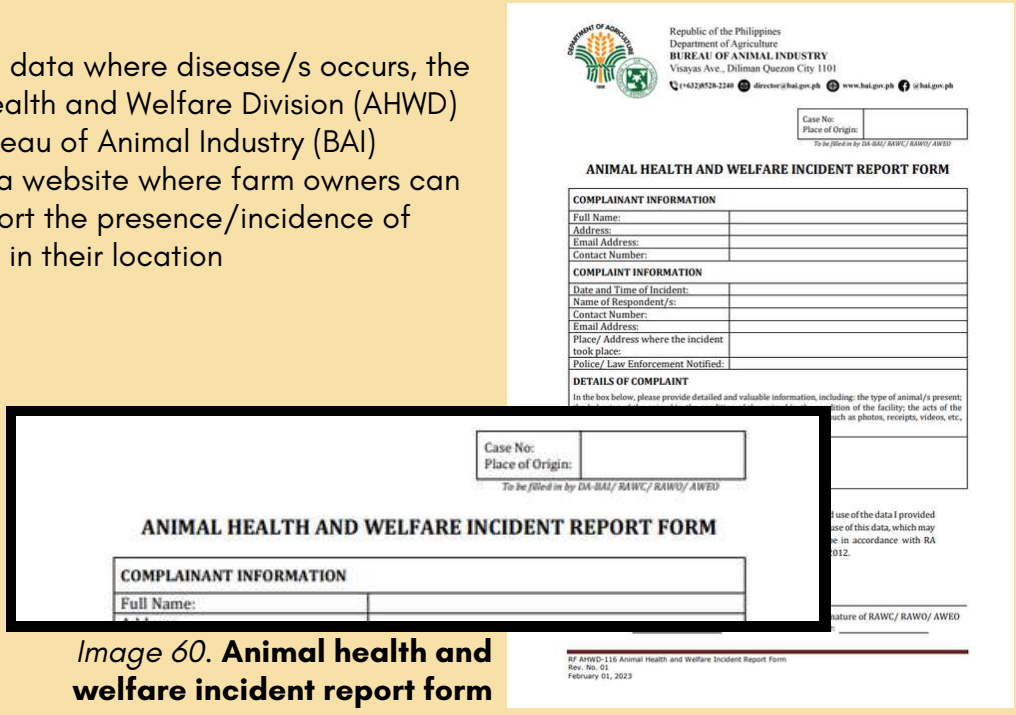
14.7 Imported animals and animal products should be accompanied by official documentation from the competent authority (BAFS, 2017).

14.8 All persons who show clinical signs of sickness such as fever, respiratory or gastrointestinal infection should not be allowed to enter the farm (BAFS, 2017).

14.9 Disease prevention and control measures shall be documented and be under supervision of a licensed/registered veterinarian or competent authority (ASEAN, 2019).

Explanatory Note:

To collate data where disease/s occurs, the Animal Health and Welfare Division (AHWD) of the Bureau of Animal Industry (BAI) provided a website where farm owners can easily report the presence/incidence of disease/s in their location



Republic of the Philippines
Department of Agriculture
BUREAU OF ANIMAL INDUSTRY
Visayas Ave., Diliman Quezon City 1101

Case No:
Place of Origin:
To be filled in by DA-BAI/ RAWC/ RAWO/ AWEO

ANIMAL HEALTH AND WELFARE INCIDENT REPORT FORM

COMPLAINANT INFORMATION	
Full Name:	
Address:	
Email Address:	
Contact Number:	
COMPLAINT INFORMATION	
Date and Time of Incident:	
Name of Respondent/s:	
Contact Number:	
Email Address:	
Place/ Address where the incident took place:	
Police/ Law Enforcement Notified:	
DETAILS OF COMPLAINT	

RF AHWD-116 Animal Health and Welfare Incident Report Form
Rev. No. 01
February 01, 2023

Image 60. **Animal health and welfare incident report form**

To access the form you may visit the BAI website

Section 15

Personnel Hygiene and Farm Sanitation Program

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

15.1 Farm personnel shall have good personal hygiene as part of biosecurity measure (BAFS, 2022).

15.2 Farm premises should be kept clean and free of potential conditions conducive to breeding of pests, animal parasites and disease outbreak. This is to avoid negative effects on the landscape, environment and animal welfare (BAFS, 2017).

Explanatory Note:

Image 61a. **Well kept paddock**

Image 61b. **Identified isolation area**

Image 61c. **Working corral**

Image 61d. **Clean pen**

Image 61e. **Empty feeding trough**

15.3 Organic materials should be regularly removed from all livestock contact surfaces (i.e., floors, pen partitions). Where bedding is used, it should be regularly replaced (BAFS, 2017).

15.4 The farm should have a proper and functional drainage system towards a water treatment facility. Solid and liquid waste should be managed and disposed according to existing relevant guidelines imposed by competent authorities (BAFS, 2017).

15.5 The farm should have proper handling and disposal system for sick, injured and dead animals, and should be in accordance to existing regulations of the authority (BAFS, 2017).

Explanatory Note:

Image 62. **Disposal of dead animals**

15.6 The farm should have a written sanitation program that includes integrated pest management, e.g. fly control, rodent control, etc. (BAFS, 2017).

15.7 After destocking of beef cattle and buffalo, the house and equipment shall be thoroughly cleaned and disinfected. The house shall be closed for a certain period of time in accordance with related national requirements (ASEAN, 2019).

15.8 Regular waste removal would discourage ammonia buildup and promote better air quality within buildings (BAFS, 2017).

15.9 The farm should take appropriate measures to minimize excessive odor coming from the farm, especially those that may be associated with waste decomposition (BAFS, 2017).

15.10 Water used for other purposes aside from drinking water shall be clean, free from physical hazards, safe and sufficient for using in the farm at all time (BAFS, 2017).

15.11 Water management such as water testing and maintenance of drinking water system should be done regularly (ASEAN, 2019).

Section 16

Environmental Management

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in black font color.

16.1 The farm operator should take necessary measures to ensure that activities related to livestock farming do not contribute to the degradation of the environment (i.e., land, water, air) and cause destruction to bio-diversity (BAFS, 2017).

Explanatory Note:

To help with environmental management, the ISO 140001:2015 *Environmental Management Systems* specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance. It provides a framework for organizations to establish, implement, maintain, and continually improve their environmental performance (ISO, 2015).

According to ISO 140001:2015, planning is one of the good aspects of organizational discipline. It is essential that organizations (i.e. farms) have the capacity to determine potential emergency situations where negative environmental impact potentially takes place in order to avoid or minimize environmental damage (ISO, 2015).

In order to determine environmental impact, an organization should use "established criteria". It is suggested that the following be considered:

- The likelihood of the impact occurring.
- The scale of the environmental damage.
- The level of concern within interested parties.
- The requirements of appropriate compliance obligations (legal and other requirements.

Table 13. Sample scoring system in establishing criteria of environmental impact

Likelihood severity occurs	Potential Severity Rating			
	Minor	**Moderate**	**Significant**	**Catastrophic**
Very likely	Moderate	High	Extreme	Extreme
Likely	Low	Moderate	High	Extreme
Unlikely	Very Low	Low	Moderate	High
Rare	Very Low	Very Low	Low	Moderate

Source: NQA ISO 14001:2015 Environmental Management System Implementation Guide

The abovementioned standard sets out explicitly the framework that is required in achieving farm environmental objectives and considerations. To have a better understanding, having an "Action plan" manages the objectives that the standard requires.

16.2 The farm operator should maintain and display clear instructions on procedure for disposal of farm solid wastes and farm chemical wastes (e.g. paint, expired pesticide/herbicide and containers, etc.) (BAFS, 2017).

Explanatory Note:

Maintaining clear disposal instructions for farm solid and chemical wastes aligns with the Ecological Solid Waste Management Act (Republic Act 9003) in promoting responsible waste management. It encourages:

- waste segregation,
- environmentally sound practices,
- legal compliance,
- public awareness,
- pollution prevention,
- resource conservation, and
- long-term sustainability (Republic of the Philippines, 2001).

Image 63. **Trash bins properly labeled**

16.3 The farm operator should be familiar with the proper procedure for disposal and schedule of actions to be taken, especially at times of emergency (BAFS, 2017).

Section 17

Review and Evaluation of Practices

The provisions of the standard are written in black font color. Additional information such as notes, images and anecdotal practices are provided as Explanatory Notes inside a yellow box in red font color.

a. Practices should be checked for compliance and evaluation for effectiveness and doability on a regular basis.

b. In cases where provisions are no longer applicable, they should be amended.

Annexes

Annex A
The types of restraint generally used for ruminants (chemical, physical and psychological)

Chemical restraint

1. Injections and venipuncture

During the restraining of cattle, equipment e.g. squeeze chute with a headgate and a halter is usually used in applying injections and venipuncture. Moreover, the jugular vein is the common site for administering intravenous medications in cattle.

For downed cattle (in sternal position), it can be restraint by jugular venipuncture by using a halter and lead rope, pulling the cow's head to the side of the most accessible hind leg, and tying the lead to the hind leg above its hock.

Types of injections (Chastain C.B, n.d)

1. Subcutaneous injection

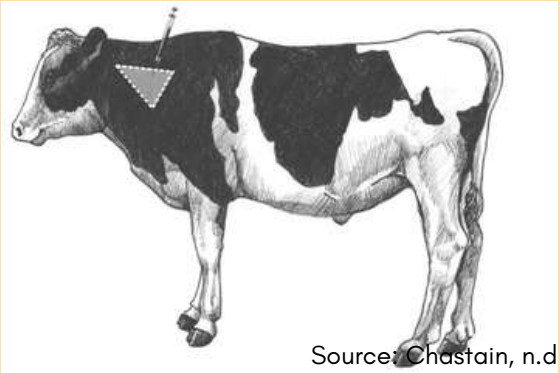
It is usually administered on the side of the neck.

2. Intramuscular injection

Application of injection is restricted to the anterior neck area only. The injections are given about 4in (10cm) below the top of the neck and 4in (10cm) in front of the shoulder.

Note:

- Injections should not be given to cows in alleyways, chutes or in narrow spaces in between bars or planks.
- Injections should be given in a way that prevents the cow's movements from suddenly pulling away from the needle before the injection can be completed



Source: Chastain, n.d

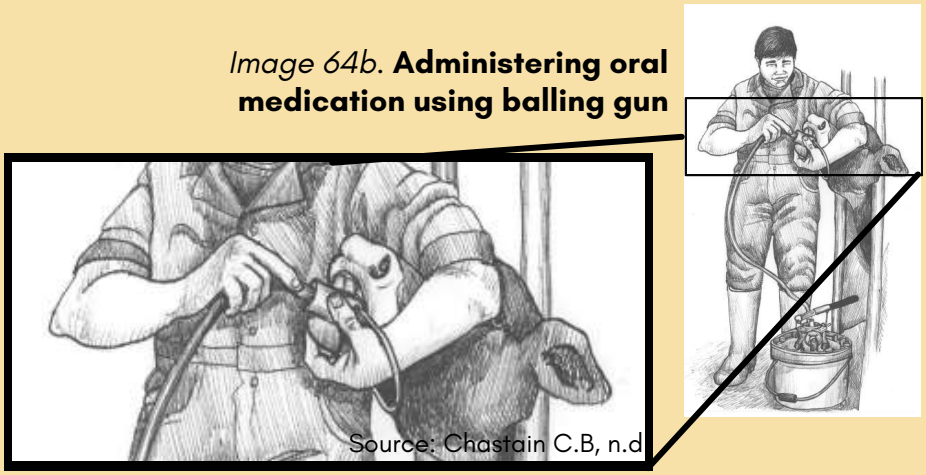
Image 64a. **Intramuscular injection site in cattle**

2. Administration of oral medications (Chastain C.B, n.d)

Individual

If the cattle are restrained in a chute, the halter is removed first before administering oral medication. Meanwhile, if the cattle have a head restraint, the tablet (bolusing) is administered using a balling gun while liquids (drenching) are administered using a drenching syringe.

Image 64b. **Administering oral medication using balling gun**



Source: Chastain C.B, n.d

Group

To administer oral medication to calves, the calves are crowded together (their packed bodies provide the restraint) and the handler wades backward while catching calves and drenching them.

Physical restraint

Physical restraint is also one of the methods being used by the handlers to control the movement of the animals or to train animals to follow their handlers (Singh R., 2020). Below are some of the activities in restraining animals (physically).

1. Capturing calf (Chastain C.B, n.d)

Calf can be caught by hand if herded with its mother into a pen, after which the mother is sorted into another small pen.

2. Moving calf (Chastain C.B, n.d)

Small calves can be moved by putting an arm in front of their chest and the other arm around their rump. They are then picked up and carried, or they are walked forward while blocking backward or side movements. Larger calves must be herded in ways similar to adult cattle.

3. Standing restraint (Chastain C.B, n.d)

A calf is backed into a corner by the handler. The handler straddles its neck while facing the calf's nose. A handler can gain access to the jugular vein with both hands by bending over and pushing the calf's head to the side and restraining it with an elbow.

4. Flanking a calf (Chastain C.B, n.d)

Small calves be laid down on their side in the same manner as putting a dog in lateral restraint by reaching over the calf's neck and flank and grasping the front and hind leg closest to the handler's legs. The calf is lifted up and its legs rotated away from the handler while letting its body slide down the handler's legs. The calf is held on its side by the handler's forearm on its neck and holding onto its lower front and hind legs.

For larger calves, the handler should stand next to the calf's left side with his left arm under its neck. The right-hand grasps the calf's right flank skin and the left hand is moved to grasp the right front leg at its knee. The handler's right knee is pushed into the calf's left flank. The calf is lifted in timing with its attempt to jump out of the grasp and its feet are rotated away from the handler. The calf continues to be held as it slides down the handler's right leg. To continue holding a calf down, the handler places a knee on its neck and holds the upper front leg in a flexed position. To tie a downed calf on its left side, a handler straddles the calf's rump in a kneeling position and his right knee is placed behind the calf's hocks.

Source: Chastain C.B, n.d

Image 64c. **Flanking a small calf**

Psychological restraint

Psychological restraints take advantage of the use of the voice and proper body position to prompt the cattle to move. Tools such as whip, paddle, or electric prod are only applied on extremely stubborn animals.

Usually, the animals are allowed to look over the place. Caution is encouraged since sudden movements will startle the animals, and a change in light will make them leery. During the movement of animals, one person is positioned toward the opening of the gate, and the other one is positioned behind the group. The person in the back puts pressure on the group by stepping forward. The person in front puts pressure on the group by walking toward the rear of the group (Sheldon C.C et al., n.d).

Source: Sheldon C.C et al., n.d

Image 64d. **Personnel putting pressure on the cow to move along the fence**

ANNEX B
Sample feeding programs

Feeding for lactating cows

At any stage of lactation, the buffalo cow should be given the best feed by the farm. However there are some important steps that needs to be carried out. These are:

Step 1 Determine the cow's body weight and identify the nutrient requirement of the cow based on the International standard on nutrient requirements of buffaloes

Step 2 Determine the cow's current stage of milk production/lactation

Lactation has four stages based on the duration (in days) of milk production after calving. These are early lactation, mid-lactation, late lactation, and dry period. Every stage, except for the dry period, has a different volume of milk production and requires a specific feeding ration

Stages of lactation

Early lactation	*1 to 100 days (peak milk production) postpartum*
Mid-lactation	*101 to 200 days (declining milk production) postpartum*
Late lactation	*201 to 305 days (declining milk production) postpartum*
Dry period	*60 to 90 days before the next lactation*

Step 3 Get the milk yield and its fat content

a. Identifying the lactation stage facilities the estimation of the volume of milk production. A daily record of milk production, however, is the best reference of milk volume.

b. Laboratory test (i.e. MilkoScan) provides the milk fat content. Milk sampling and analysis should be carried out every month.

Step 4 Get the nutrient composition of available feed resource for the herd

a. List down all the available feed resources for the herd
b. Check and write down the corresponding nutrient composition of available grasses and legumes from Reference Table 2
c. Check and write down the corresponding nutrient composition of the concentrates

Step 5 Tabulate the information and prepare sample ration

Example:

Data
Lactating cow - 550 kg BW
- Milk has 7% butter fat

Below is the summary of data requirements for the formulation of feed ration: Volume of milk production per day and for the whole lactation period and the nutritional requirements based on Reference Table 4.

Table 4. Summary of data requirement for the formulation of feed ration

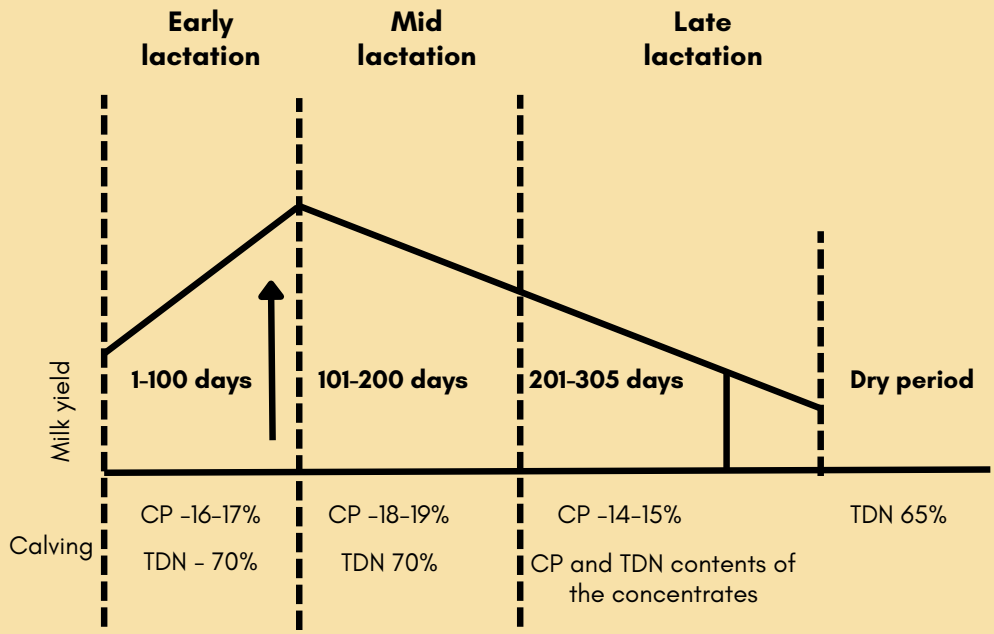
Item	Level of production, liters				
Daily milk production, kg	**4**	**6**	**8**	**10**	**12**
Total milk production, kg	1120	1830	2440	3050	3660
Requirements					
Dry matter (DM), %BW	2.5	2.7	3.0	3-3.5	3.5
Total Digestible Nutrients, kg	5.9	6.9	8.3	8.8	9.7
Protein, g	1028	1264	1618	1736	1972
Calcium, g	34	41	50	54	60
Phosphorus	26	31	39	42	47
Vitamin A, IU	27	27	27	27	27

Daily Milk Production

During early lactation - 8 liters
Mid-lactation- 6 liters
Late lactation- 4 liters

The figure below summarizes the nutrient requirements i.e energy and protein of lactating cows at different stages of lactation (early, mid and late lactation) and volume of milk production.

Figure 1. Different stages of lactation (early, mid and late lactation) indicating the nutrient required by the animals.



Note: Philippine Carabao Center, n.d

Feeding of calf from birth to weaning

For the newly born calf, it is important that colostrum – first milk of the cow that contains high amount of antibodies which serves as a defense or provides immunity against common diseases- is given away within the first 5 days.

The following are the important pointers in the feeding of a calf from birth to weaning:

1. Feed the calf with the colostrum within the first three hours after calving either through the pail/bottle or by natural suckling until the latter 2/3 of standing estrus or 8-14 hours after the onset of estrus

2. In an artificially-reared calf, the milk replacer is gradually introduced to the calf at the rate of 50:50 (normal milk: milk replacer) for a week. Thereafter, the calf is fed with 100% milk replacer up to the weaning period of 90 days.

Feeding management of weanling buffaloes/ newly weaned calves (3-6 months)

At weaning, the calves have a body weight of around 80-90 kg. Management of newly weaned calves is important because these animals will serve as replacement bulls or heifers for future breeding and dairy production. Below is the suggested ration for a newly weaned calf, weighing 80 kg, and has an Average Daily Gain (ADG) = 500g

Table 5. Suggested ration for newly weaned calf

Ration, as fed	Feeding system	
	Grass-based	Grass-legume based
Grass (Napier, Para grass, humidicola)	3-4 kg	3-4 kg
Legume (Rensoni, stylo)	None	1.4 kg
Concentrate, starter mix	2.2 kg	1.6 kg
Mineral mix	Free choice	Free choice

Assumptions: Dry matter of grass = 25%, legume= 35%; concentrate = 90%

Feeding of heifers

Heifers require adequate nutrition for normal growth and early achievement of pubertal weights. Heifers may be fed individually or in-group with other heifers. To reach pubertal age, heifers should have an ADG of 500-600 grams. There are three phases of feeding heifers based on their age and BW to meet their nutrient requirements. Below is the suggested ration to heifers weighing 180 kg, ADG = 500g.

Table 6. Suggested ration for heifers weighing 180 kg, ADG = 500g

Ration, as fed	Feeding system	
	Grass-based	Grass-legume based
Grass (Napier, Para grass, humidicola)	14 kg	14 kg
Legume (Rensoni, stylo)	None	1.7 kg
Concentrate, starter mix	1.1 kg	0.6 kg
Mineral mix	Free choice	Free choice

Assumptions: Dry matter of grass = 25%, legume= 35%; concentrate = 90%

Phase 1: Growing heifers, 6-12 month old

- Heifers weighing 150 to 230 kg
- Provide feed ration that is composed of fresh grasses with supplementary concentrates and/or legumes
- Supplement them with vitamins and minerals during the dry season because their ration is mostly composed of rice straw or hay and other farm by-products

Phase 2: Heifers at 13-18 month old

- Heifers weighing 230 to 310 kg and nearing their pubertal weight
- Provide feed ration containing adequate levels of protein, energy, minerals, and vitamins to support an ADG of 500 grams
- Supplement them with concentrates containing 15-16% Crude Protein (CP) and about 65-70% TDN content.
- The ration containing fresh grass (ad libitum), spent grain and rice straw, or combinations of fresh grass and legumes can support the desired ADG

Table 7. Suggested ration for heifers weighing 230-310 kg, ADG = 500g

Ration, as fed	Feeding system	
	Grass-based	Grass-legume based
Grass (Napier, Para grass, humidicola)	20.4 kg	20.4 kg
Legume (Rensoni, stylo)	None	2.8 kg
Concentrate, starter mix	2 kg	1 kg
Mineral mix	Free choice	Free choice

Assumptions: Dry matter of grass = 25%, legume= 35%; concentrate = 90%

Phase 3: Heifers at 19-24 month old

- Heifers weighing 310 to 350 kg
- Provide feed ration that is more energy balanced with protein to support an average daily gain of 300-400 grams
- In the confinement system, use rations containing rice straw (ad libitum) and supplementary concentrates or spent grain.
- Fresh grass (Napier or Para grass) can support 300-400 ADG of the animals. Whenever available, legumes can serve as a practical supplement to support the daily nutrient requirement of breeding heifers.

Table 8. Suggested ration for heifers weighing 310-350 kg, ADG = 300-400g

Ration, as fed	Feeding system	
	Grass-based	Grass-legume based
Grass (Napier, Para grass, humidicola)	25 kg	25 kg
Legume (Rensoni, stylo)	None	3.7 kg
Concentrate, starter mix	2 kg	1 kg
Mineral mix	Free choice	Free choice

Assumptions: Dry matter of grass = 25%, legume= 35%; concentrate = 90%

Feeding of pregnant buffaloes

During the early stage of pregnancy, the cow's feed ration is the same with its maintenance requirement. In its last trimester, pregnant cows need about 25 to 30 % more nutrients than their maintenance requirement to support the fetus' development and the regeneration of the mammary tissues.

Pregnant cows require 50% higher DP and 25% higher TDN than that of the maintenance requirement. Also, it is important that flushing a cow by giving an additional 1.0 to 1.5 kg concentrates, provides additional nutrients to prepare the pregnant cows prior to parturition, lactation, and for subsequent reproduction (re-breeding). Flushing of a cow is done 1 -2 months before the expected calving up to 2 months after parturition. Below is the suggested ration for pregnant weighing 350 kg, ADG- 450g

Table 9. Suggested ration for pregnant buffaloes weighing 350 kg, ADG = 450g

Ration, as fed	Feeding system	
	Grass-based	Grass-legume based
Grass (Napier, Para grass, humidicola)	26 kg	26 kg
Legume (Rensoni, stylo)	None	4.2 kg
Concentrate, starter mix	2.4 kg	1.2 kg
Mineral mix	Free choice	Free choice

Assumptions: Dry matter of grass = 25%, legume= 35%; concentrate = 90%

Feeding of dry cows

To meet the daily nutrient requirements for the maintenance of dry cows, it is essential to feed them with a ration composed of rice straw with minimal concentrates (e.g., rice bran or spent grain)

Table 10. Suggested ration for dry cows

Ration, as fed	Feeding system	
	Grass-based	Grass-legume based
Grass (Napier, Para grass, humidicola)	55.2 kg	55.2 kg
Legume (Rensoni, stylo)	None	4.2 kg
Concentrate, starter mix	1.1 kg	None
Mineral mix	Free choice	Free choice

Assumptions: Dry matter of grass = 25%, legume= 35%; concentrate = 90%

Feeding of bulls

The same feeding management for the young bull and growing heifer is used to achieve the desired ADG of 500 grams. It is also necessary to give good quality forage and concentrate supplements at this growth stage.

For mature bulls, the following are for consideration:

- Avoid overfeeding, as this will lead to obesity and may reduce libido or sexual urges, semen volume, and other semen characteristics.
- Preferably, the maintenance ration for breeding bulls should consist of an adequate amount of fresh forage to meet its DM, CP, TDN, and mineral requirements.
- In preparing ration, it is important to include the macro and micro minerals such as calcium, phosphorus, copper, selenium, and iron.
- In cases when dry forage (i.e., hay or straw) is used, it is supplemented with vitamin A, D, E, and K regularly.

Sample ration for beef cattle

Example A. Ration for a 250 kg steer gaining 0.75 kg/day

Step 1: Write down the nutrient requirements

	Dry matter (kg)	TDN	CP	Ca	Total P (g)
Amount	6.4	3.8	693	21	**17**
Percent of Dry matter (DM)		59.4	10.8	0.33	**0.26**

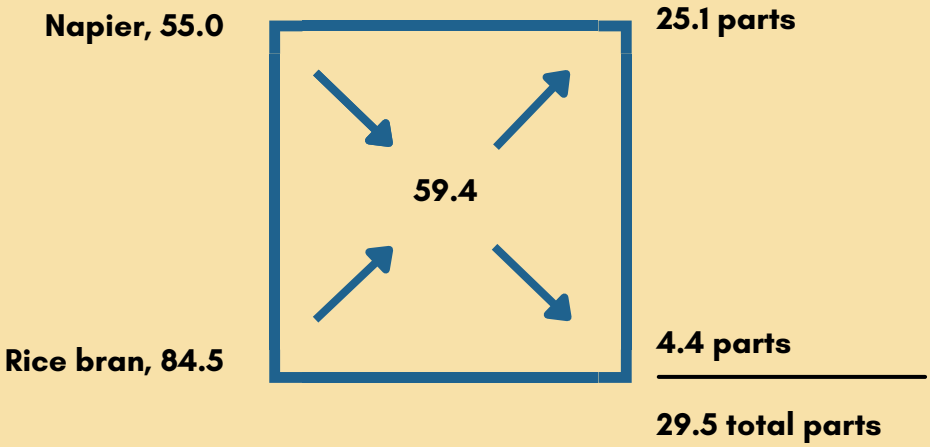
Step 2. List down the available feeds

	Dry matter (kg)	TDN	CP	Ca	Total P (g)
		%DM basis			
Amount	22	55.0	9.6	0.42	**0.39**
Rice bran, D1	91.9	84.5	13.5	0.08	**1.64**
Ipil-Ipil Leaf meal	90	60.3	22.2	0.35	**0.27**

Step 3. Calculate if Napier grass alone can satisfy the TDN requirement

$$6.4 \text{ kg DM} \times \frac{55\% \text{ TDN}}{100} = 3.52 \text{ kg TDN}$$

Since the amount of TDN from Napier is less than the requirement, the concentrate is considered to replace part of Napier as an energy source. Assuming rice bran is available and cheap, the proportions of Napier and rice bran based on TDN is calculated as follows:



25.1/29.5 x 100 = 85.1% Napier

4.4/ 29.5 x 100 = 14.9% rice bran

85.1% Napier x 6.4 kg DM = 5.45 kg DM from Napier

14.9% rice bran x 6.4 kg DM = 0.95 kg DM from rice bran

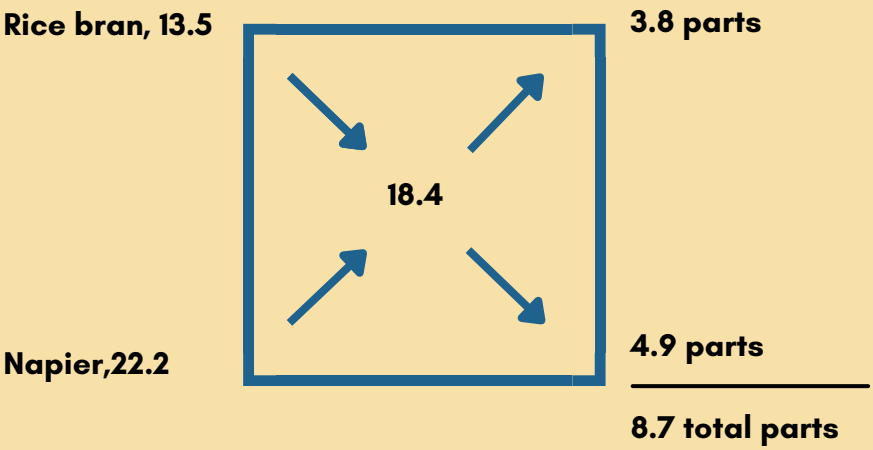
Step 4. Determine if the combination of Napier and rice bran satisfies the requirement for crude protein

	Dry matter (kg)	TDN (kg)	CP (g)	CaG (g)	Total P (g)
Napier grass	5.45	3.0	518	22.89	21.26
Rice bran, D1	0.95	0.80	128	0.76	15.20
Total	6.4	3.8	646	23.65	36.46
Requirement	6.4	3.8	693	21	17
Balance			-47	+2.65	+19.46

Balance in CP of 47 g can be satisfied by replacing part of the rice bran with Ipil-ipil meal. The combination of rice bran and Ipil-ipil leaf meal should supply 18.4% CP and is calculated as follows:

693 g CP required
- 518 g CP from Napier grass
175 g from rice bran and ipil-ipil leaf meal

175 g CP/950 g DM x 100 = 18.4% CP



3.8/8.7 x 100 = 43.68% rice bran

4.9/ 8.7 x 100 = 56.32% Ipil-ipil leaf meal

0.95 kg DM x 43.68% = 0.41% rice bran

0.95 kg DM x 56.32% = 0.54 Ipil-ipil leaf meal

Feeds	Amount (kg)	TDN (kg)	CP (g)	Ca (g)	Total P (g)
Napier grass	5.45	3.0	518	22.89	21.57
Rice bran, D1	0.41	0.35	55.4	0.33	6.56
Ipil-ipil **Leaf meal**	0.54	0.36	120	2.11	1.62
Total	6.4	3.71	693.4	25.33	29.75

On as fed basis, the animal should receive the following feed per day:

Napier grass $\frac{5.45 \text{ kg DM}}{22\% \text{ DM}}$ = **24.8 kg**

On as fed basis, the animal should receive the following feed per day:

Rice bran $\frac{0.41 \text{ kg DM}}{91.9\% \text{ DM}}$ = **0.45 kg**

Ipil-ipil leaf meal $\frac{0.54 \text{ kg DM}}{90\% \text{ DM}}$ = **0.60 kg**

Another approach in calculating the formula for ration for beef cattle is to have a pre-determined roughage to concentrate ratio based on availability and prices.

Step 1: Write down the nutrient requirement of the animal

DM (kg)	TDN (kg)	CP (g)	Ca (g)	Total P (g)
7.4	4.3	753	23	18

Step 2: List down the available roughage

Feeds	DM	TDN	CP (g)	Ca (g)	Total P (g)
		%DM basis			
7.4	4.3	47	3.80	0.32	0.10

Step 3: Calculate the dry matter intake of roughage and concentrate mixture based on the roughage to concentrate ratio (60:40).

7.4 kg DM x 60% = **4.44 kg DM from rice straw**

7.4 kg DM x 40% = **2.96 kg DM from concentrate mixture**

Step 4: Identify the amount of nutrients supplied by the roughage

Feeds	Amount (kg)	TDN (kg)	CP (g)	Ca (g)	Total P (g)
Rice straw	4.44	2.09	169	14	4

Step 5: Calculate the amount of nutrient to be supplied by the concentrate mixture by subtracting the values obtained in Step 4 from the nutrient requirement

TDN (kg)	CP (g)	Ca (g)	Total P (g)
2.21	584	9	14

Step 6: Compute the nutrient composition of the concentrate mixture by dividing the amount of nutrients in Step 5 by the amount of concentrate mixture (Step 3)

$$\frac{2.21 \text{ kg TDN}}{2.96 \text{ kg}} \times 100 = \textbf{75\% TDN}$$

$$\frac{0.584 \text{ kg CP}}{2.96 \text{ kg}} \times 100 = \textbf{20\% CP}$$

$$\frac{0.009 \text{ kg Ca}}{2.96 \text{ kg}} \times 100 = \textbf{0.30\% Ca}$$

$$\frac{0.014 \text{ P}}{2.96 \text{ kg}} \times 100 = \textbf{0.47\% P}$$

Step 7: Formulate the concentrate mixture based on the nutrient composition calculated in Step 6. Start with a fixed amount of the following: salt at 1%, urea at 1% as a cheap source of crude protein, molasses at 5%, for palatability, and dicalcium phosphate at 1% to supply calcium and phosphorus. Copra meal and rice bran can be used as the major ingredients. Since the concentrate mixture is being used as a protein supplement, use protein content as the basis for determining the proportion of major ingredients. The following equation can be used.

Let x = amount of Rice bran D1

$92 - x$ = amount of copra meal

$$0.135x + 0.2126(92-x) + 0.04(5)\,2.88(1) = 20$$

$$0.135x + 19.56 - 0.2126x + 0.2 + 2.88 = 20$$

$$-0.0776x = 20 - 22.64$$

$$x = \frac{-2.64}{-0.0776}$$

$$x = 34.02$$

$$92 - x = 57.98$$

The concentrate mixture, on DM basis, is as follows:

Ingredients	Amount, (kg)	TDN (kg)	CP (kg)	Ca (g)	Total P (g)
Rice bran	34.02	28.75	4.59	0.03	14
Copra Meal	57.98	50.11	12.33	0.09	0.37
Molasses	5.00	3.95	0.19	0.05	0.01
Limestono	1.00	-	-	0.39	0.16
Urea	1.00	-	2.88	-	-
Salt	1.00	-	-	-	-
Total	100.00	82.81	19.99	0.56	1.10

The ration, on as fed basis, is as follows:

Ingredients	Amount (kg)	Percent of mix
Rice bran	37.02*	34.34*
Copra meal	61.03	56.60
Molasses	6.67	6.19
Limestone	1.02	0.95
Urea	1.02	0.95
Salt	1.05	0.97
Total	107.81	100.00

Calculated dry matter of concentrate mixture	=	92.75%
*34.02 kg/ 91.9 DM of Rice bran	=	37.02 kg
**34.02 kg/ 107.81 kg x 100	=	34.34%

On as fed basis, the animal should receive the following:

Rice straw	$\frac{4.44 \text{ kg DM}}{0.90}$	=	4.93 kg
Concentrate Mixture	$\frac{2.96 \text{ kg DM}}{0.9275}$	=	3.19 kg

The Body Condition Scoring (BCS) system is being used to assess body energy stores in beef cows. For beef cows, the BCS system range from 1-9 (a score of 1 reflecting cow/s that are emaciated and a score of 9 for those cow/s that is/are obese (Lalman et al., 2017). Below is the description for each score:

BCS 1 Severely emaciated and physically weak with all ribs and bone structure easily visible. Cattle in this score are extremely rare and are usually inflicted with a disease and/or parasitism.

BCS 2 It appears emaciated, similar to BCS 1, but not weakened. Muscle tissue seems severely depleted through the hindquarters and shoulder.

Image 63a. **BCS 2**

BCS 3 It is very thin, with no fat on ribs or in brisket, and the backbone is easily visible. Some depletion appears evident through the hindquarters

Image 63b. **BCS 3**

BCS 4 It appears thin, with ribs easily visible and the backbone showing. The spinous processes (along the edge of the loin) are still very sharp and barely visible individually. Muscle tissue is not depleted through the shoulders and hindquarters.

Image 63c. **BCS 4**

BCS 5 It is described as moderate to thin. The last two ribs can be seen and little evidence of fat is present in the brisket, over the ribs, or around the tail head. The spinous processes are smooth and difficult to identify.

Image 63d. **BCS 5**

BCS 6 It exhibits a good smooth appearance throughout. Some fat deposition is present in the brisket and over the tail head. The back appears rounded and fat can be palpated over the ribs and pin bones.

Image 63e. **BCS 6**

BCS 7 It appears in very good flesh. The brisket is full, the tail head shows pockets of fat and the back appears square due to fat. The ribs are very smooth and soft handling due to the fat cover.

Image 63f. **BCS 7**

BCS 8 The cow is obese. The neck is thick and short and the back appears very square due to excessive fat. The brisket is distended and has heavy fat pockets around the tail head

BCS 9 These cows are extremely obese and may have problems with mobility due to excessive weight and restriction of limbs. The animal's topline will be square and flat with large dimples or pockets due to excessive fat cover. The front leg set will be wide due to a bulging brisket. The entire underline will bulge with fat, including the udder and naval. The tail head will not be visible as it will be covered in a large mass of fat.

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This Explanatory Manual (EM) serves as a supplementary learning material for the Philippine National Standard (PNS) Code of Good Animal Husbandry Practices (GAHP) for Beef Cattle and Buffalo - Code of Practice (PNS/BAFS 200:2023). The EM aims to aid stakeholders by promoting uniform understanding and interpretation of the PNS to ensure efficient adoption and implementation of the Standard.

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