



**Ministry of Agriculture**  
**Animal and Plant Health Regulatory Directorate**

**Feedlot Health management Guideline**



December, 2010  
Addis Ababa  
ETHIOPIA

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## Foreword

This technical document entitled “Feedlot Health Management Guideline” is one of the documents in a series of guidelines and Standard Operating Procedures (SOPs) developed by the Ministry of Agriculture (MoA) in collaboration with the Ethiopian Sanitary and Phytosanitary and Livestock and Meat Marketing (SPS-LMM) Program. SPS-LMM program is financed by USAID and is implemented by the Norman Borlaug Institute for International Agriculture, Texas A & M University System. The main goal of the SPS-LMM program is to increase exports of meat and livestock to benefit Ethiopian livestock producers and exporters and to promote national economic development.

This guideline and SOP is intended to assist feedlot operators to prevent the introduction of diseases, control infectious diseases and diseases caused by management and feeding errors during the fattening cycles.

At this point, the Animal and Plant Health Regulatory Directorate (APHRD) would like to thank the SPS-LMM program and USAID for developing and publishing this guideline and SOP.

Last but not least, I would like also to thank Drs. Wondwosen Asfaw and Nega Tewelde for preparing this guideline and SOP.

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## 1. Introduction

The economic success of a feedlot is dependent upon whether or not the daily gains of the animals cover their maintenance costs per day, and above all whether or not a profit can be returned. A feedlot is an extremely sensitive production system which runs up considerable costs for animal purchase, feed, personnel, etc. Therefore the main prerequisite for the successful running of such an operation is that the animals gain weight from the day they arrive, and that there is neither stagnation nor any loss of weight because of disease or poor management practices.

Apart from this, the value of individual animals is so high that total losses must be excluded. For this reason, the animal health scheme is responsible for not allowing diseases which reduce daily weight gains or cause mortalities in animals. Outbreaks of disease with high morbidity and a high mortality rate must not occur under any circumstances.

The production principle of an intensive fattening operation is optimizing of production factors and minimizing costs. The animal health concept must, therefore, fit into this principle as the economic viability of the feedlot significantly depends on the presence or absence of diseases which affect productivity.

Animals which are brought to feedlots from lowland part of the country are subject to many challenges. These are:

- stress during transportation with possible subsequent infections;
- exposure to environmental conditions which are not accustomed by animals;
- Stress related with exposure of animals to management measures such as vaccination, marking, weighing, separation, etc.
- massive contact with animals from various areas which are disease carriers and/or harbor infections;
- exposure of animals to infection as a result of communal feeding and watering troughs;
- an abrupt change in feed as a result of feeding animals with high-energy rations as soon as they arrive from the lowlands;

## 2. Objective

The objective of this guideline is to assist feedlots to:

- Prevent the introduction of diseases;
- Control infectious diseases and
- Prevent diseases caused by management and feeding errors during the fattening cycles.

### 3. General approach

Animals vaccinated when they arrive in feedlots may not have the required immunity to withstand diseases as they are under the challenges of transportation and environmental stresses. As a result, daily costs for the fattening operation would exceed the corresponding daily gains. In addition, it allows animals which are carriers of infection to be introduced to feedlots.

Since animals find themselves in a familiar environment, it might be a good idea to carefully inspect, select and purchase animals and leave them for about 10-14 days at the area of origin before transporting them to feedlots.

While animals are in their places of origin, the following animal health measures should be carried out. These include,

- treatment against endo-parasites, ticks, etc;
- immunizing animals against soil-borne, contact and stress related diseases such as
  - for cattle: anthrax, blackleg, lumpy skin disease, foot and mouth disease, contagious bovine pleuro-pneumonia, pasteurellosis;
  - for sheep and goat: sheep and goat pox, pasteurolosis; Peste des petits ruminants
  - for sheep: ovine pasteurellosis;
  - for goats: contagious caprine pleuro-pneumonia;

As soon as the arrival of the animals in the feedlot, the following practices should be routinely carried out.

#### 3.1. Animal identification

Animal identification and the ability to trace animals have become important tools to ensure food safety and improve management. Identification of animals may be on an individual or group basis, and it should be able to be deduced from good record keeping and animal identification. Where a food safety incident occurs, it should be possible to determine the source of the problem and to take appropriate action. The ability to trace animals at least one step forward and one step back from the current holding is recommended.

#### 3.2. Record keeping

When a problem arises in a feedlot, record keeping is central to any effort to trace the source of the problem and eliminate it. Hence, as far as is practicable, feedlots should keep records of:

- All animal populations on the feedlot (groups or individuals as relevant).
- All animal arrivals, including their identification marks or devices (if there is any), origin and date of arrival,

to ensure that incoming animals are traceable to their sources.

- Movements of other animals around the feedlot.
- Changes to feeding or health regimes, and any other management changes that may occur.
- Origin and use of all feeds, drugs, disinfectants, herbicides and other consumable items used in the feedlot.
- Known diseases/infections, diseased/infected animals and mortalities, as far as possible giving details such as dates, diagnoses (if known), animals affected, treatments and results.

### 3.3. Hygiene and disease prevention

Measures aimed at preserving cleanliness, preventing pathogen build-up and breaking possible pathways of transmission are essential in the management of any modern feedlot enterprise, regardless of the species or the production system.

Therefore, precautions should aim at:

- Reducing contact between healthy animals and potentially infected animals.
- Maintaining the hygiene and safety of all facilities.
- Ensuring the health of all workers in the feedlot and the implementation of hygienic working procedures.
- Taking all appropriate measures to prevent contamination by vehicles entering and traversing the feedlot.
- Minimizing contact between livestock and visitors, and taking all hygienic measures necessary to reduce the possible introduction of pathogens and contaminants.
- Ensuring overall health of livestock through good nutrition and reducing stress.
- Maintaining an appropriate stocking density for the species and age group in question, by following APHRD SOPs and guidelines.
- Keeping records of all animals in the feedlot.

### 3.4. Training

The Competent Authority should periodically assess training needs amongst stakeholders and promote necessary training. This would contribute to the commitment and effective execution of all practices described in this guideline.

Therefore, feedlot managers should:

- Actively seek and use relevant training opportunities for themselves and their workers.
- Be aware of any training courses that may be compulsory in the country.
- Keep records of all training undergone.

## **4. Animal health management**

### **4.1. Addressing biological hazards**

As a general principle, closed and all-in all-out systems are recommended from a food safety and bio-security reasons.

Owners or managers of feedlots should:

- Ensure that animal health, welfare and disease notification issues are addressed.
- Seek veterinary assistance to immediately investigate any suspicion of serious disease.
- Comply with regulations concerning restrictions on animal movements.
- Separate diseased from healthy animals such that transmission of infection does not occur and, where necessary, cull diseased animals.
- Acquire animals only from sources with a known and safe health status and, where possible, with supporting health certificates from veterinarians along the source.
- Keep newly arrived animals separate from resident stock for an appropriate period of time to monitor them for diseases and infestations and prevent transmission of diseases.
- Ensure, wherever necessary, that newly arrived animals are given time to adapt to new feeding regimes, are not overcrowded, and that their health is regularly monitored.
- Ensure that equipment and instruments used in the feedlot are suitably cleaned and disinfected between each use.
- Effectively remove or dispose off dead and fallen stock where possible so that other animals cannot come into contact with carcasses and that carcasses do not contaminate the drinking water and feeds and keep records of all such disposals.

### **4.2. Addressing physical hazards**

Owners or managers of feedlots should apply animal welfare practices in accordance with animal handling guideline of APHRD, and in particular:

- Ensure that people working with animals are properly experienced and trained for the tasks they should perform.
- Ensure that facilities and equipment are properly designed and maintained to prevent physical injury.
- Ensure that animals are handled and transported appropriately.



## 5. Veterinary medicines and biological products

Owners or managers of feedlots should:

- Be aware of and comply with restrictions on medicines or biological products for use in livestock.
- Use veterinary medicines and biological products strictly in accordance with the manufacturer's instructions or veterinary prescription.
- Use antimicrobials only in accordance with regulatory requirements and other veterinary and public health guidance.
- Keep detailed records of the origin and use of all medicines and biological products, including batch numbers, dates of administration, doses, individuals or groups treated and withdrawal times. Treated individuals or groups should be clearly identified.
- Maintain required storage conditions for veterinary medicines and biological products.
- Ensure that all treatments or procedures are carried out using instruments that are appropriate and correctly calibrated for the administration of veterinary medicines and biological products. Dispose of used instruments (including needles) in a bio-secure manner.
- Keep all treated animals in the feedlot until the relevant withdrawal times have expired (unless the animals should leave the feedlot for veterinary treatment) and ensure that products from these animals are not used for human consumption until the withdrawal periods have elapsed.
- Ensure that all handling or treatment facilities are safe and appropriate to the species in question, facilitate correct and calm handling and restraint, and that their construction is such that the likelihood of injury is minimized.

## 6. Animal feeding and watering

### 6.1. Common measures

Owners or managers of feedlots should:

- Acquire feed from suppliers who follow recognized good manufacturing practices.
- Manage the feed chain (transport, storage, and feeding) in such a way as to protect feed from contamination (biological, chemical, and physical hazards) and minimize deterioration. Feeds should be used as soon as possible and, if applicable, in accordance with label instructions.
- Ensure that only water of known and acceptable quality (i.e. fit for animal consumption) is used for watering stock.
- Keep records of all feeds and dates of acquisition and feeding; where possible the animals/groups of animals fed

should be clearly recorded. Self-mixed feeds should have their ingredients and mixes recorded, as well as dates of feeding and animals fed as specified above.

- where on-farm manufacture of feeds is practiced, follow procedures designed to minimize contamination and prevent the inclusion of undesirable feed components. where necessary, expert assistance should be sought.
- Ensure that nutritional levels are adequate to promote animal health, growth and production.
- Ensure that changes to feeding regimes are, wherever possible, gradual, and that the regimes are safe and follow acceptable feeding practices.
- Prevent animal access to places where feeds are stored and to places where hazardous chemicals are stored.

## 6.2. Addressing biohazards

Owners or managers of feedlots should:

- Ensure that antibiotics are not used in feed for growth promoting purposes in the absence of any public health safety assessment and recommendations.
- Ensure that ruminant protein is not fed to ruminants.
- Regularly inspect and, when necessary, clean and disinfect feeding and watering facilities such as drinkers and troughs.
- Ensure that effluents are managed in such a way that drinking water sources are not contaminated.

## 6.3. Addressing chemical hazards

Owners or managers of feedlots should:

- Use herbicides and pesticides judiciously and according to the manufacturer's instructions and applicable legislation such that animal exposure to these chemicals is minimized. Records of usage, including the date and location of application, should be kept.
- Ensure that when feed additives are used, that manufacturer's instructions as to dosage levels and withdrawal periods are followed, and that records of usage of such feed additives are kept.

## 6.4. Addressing physical hazards

Owners or managers of feedlots should:

- Ensure that animals are not kept in sheds, pens etc where they are likely to ingest foreign objects and that all facilities are kept clean and free from metal objects, pieces of wire, plastic bags, etc.

## **7. Environment and infrastructure**

### **7.1. Common measures**

Owners or managers of feedlots should:

- where animals are confined, ensure that the housing or pens are constructed such that the basic needs of the animals are fulfilled especially with regard to ventilation, drainage, and manure removal. Walking surfaces should be level, non-slip, and all surfaces should ideally be cleanable and if possible washable.
- Locate farms in areas free from industrial and other pollution and sources of contamination and infection.

### **7.2. Addressing biohazards**

Owners or managers of feedlots should:

- Ensure that feedlot layout and building construction provide for adequate separation of animals by production group as necessary.
- Ensure that buildings and perimeter fences are constructed so that contact with other livestock and wild animals is minimized.
- Maintain adequate separation between clean and contaminated materials (e.g. feed and manure).
- Ensure that effluent is properly disposed off and that facilities where animals are kept are at an appropriate distance from any disposal points.
- Ensure that any bedding or litter is regularly renewed and that used bedding or litter is disposed off safely.
- Apply appropriate pest and vermin control measures, which may include the use of barriers such as nets or fencing, or the use of pest/vermin population control measures.

### **7.3. Addressing chemical hazards**

Owners or managers of feedlots should:

- Use chemical disinfectants (for tyre and foot baths) and cleansers strictly in accordance with the manufacture's instructions, ensuring that disinfected or cleaned surfaces and facilities are properly rinsed if necessary.
- Seek professional advice with regard to the use of disinfectants or cleansers.

### **7.4. Addressing physical hazards**

Owners or managers of feedlots should:

- Manage pastures such that livestock are not exposed to dangerous and impassable areas.

## **8. Animal handling**

### **8.1. Addressing biohazards**

Owners or managers of feedlots should:

- Ensure that all animals destined for export/abattoir have the required health certificates and are clean, healthy and fit to travel and have not had recent contact with diseased stock or infectious material.
- Keep records of animals leaving the feedlot as well as their destination and date of dispatch.

### **8.2. Addressing chemical hazards**

Owners or managers of feedlots should:

- Ensure full compliance with existing legislation such that applicable maximum residue levels are not exceeded.
- Ensure that no animal destined for slaughter has been subjected to treatment for which the withdrawal period has not elapsed.

### **8.3. Addressing physical hazards**

Owners or managers of feedlots should:

- Ensure that mustering or catching and handling of animals prior to loading is carried out in a safe and humane manner.
- Ensure that loading facilities are appropriately constructed.
- Take the necessary care during animal loading so as to minimize injury.

**Annex 1. Hazards and corresponding control points**

Hazards	Control points
<b>Biohazards</b>	
Introduction of pathogens and contaminants	<ul style="list-style-type: none"> <li>• Sources of animals (horizontal and vertical transmission)</li> <li>• Sourcing of breeding stock</li> <li>• Breeding procedures</li> <li>• Semen and embryo quality</li> <li>• Bedding</li> <li>• Feed and water</li> <li>• Records of acquisitions and animal movements</li> <li>• Health and hygiene of visitors and personnel</li> <li>• Contact with other animals (including wildlife/rodents/insects, etc.)</li> <li>• Vehicles/clothing/instruments/equipment</li> <li>• Infected/contaminated carcasses, tissues or secretions</li> </ul>
Transmission of pathogens and contaminants	<ul style="list-style-type: none"> <li>• Animal housing and population density</li> <li>• Disease diagnosis (horizontal and vertical transmission)</li> <li>• Health and hygiene of visitors and personnel</li> <li>• Vehicles/clothing/instruments/equipment</li> <li>• Infected/contaminated carcasses, tissues or secretions</li> <li>• Bedding management</li> <li>• Insect or pest vectors</li> </ul>
Microbial and parasitic infections on pastures and paddocks	<ul style="list-style-type: none"> <li>• Pasture management</li> <li>• Microbial/parasite diagnosis</li> </ul>
Microbial load on skins	<ul style="list-style-type: none"> <li>• Environment of animals</li> <li>• Waste management</li> <li>• Bedding management</li> <li>• Population density</li> </ul>
Airborne infections and contaminations	<ul style="list-style-type: none"> <li>• Farm location</li> <li>• Animal housing and ventilation</li> <li>• Population density</li> </ul>
Carrier animals shedding pathogens	<ul style="list-style-type: none"> <li>• Animal management</li> <li>• Diagnosis</li> <li>• Population density</li> </ul>

<b>Hazards</b>	<b>Control points</b>
Increased susceptibility to pathogens	<ul style="list-style-type: none"> <li>• Animal management (incl. transport)</li> <li>• Diagnosis</li> <li>• Population density</li> </ul>
Antimicrobial and parasiticide resistance	<ul style="list-style-type: none"> <li>• Diagnosis</li> <li>• Therapeutic regimes</li> <li>• Record keeping</li> </ul>
Feed borne infections and contaminations	<ul style="list-style-type: none"> <li>• Feed production, transport and storage</li> <li>• Feed quality</li> <li>• Feed equipment</li> <li>• Record keeping</li> </ul>
Waterborne infections and infestations	<ul style="list-style-type: none"> <li>• Water quality</li> <li>• Effluent management</li> <li>• Watering equipment</li> </ul>
Livestock not well adapted to conditions	<ul style="list-style-type: none"> <li>• Breeding selection</li> <li>• Record keeping</li> </ul>
<b>Chemical hazards</b>	
Chemical contamination of environment, feed and water	<ul style="list-style-type: none"> <li>• Farm location</li> <li>• Animal movement</li> <li>• Use of agricultural chemicals</li> <li>• Feed and water quality</li> <li>• Equipment and building materials</li> <li>• Hygiene practices</li> </ul>
Toxins of biological origin (plants, fungi, algae)	<ul style="list-style-type: none"> <li>• Feed, pasture and water quality</li> <li>• Farm location</li> <li>• Animal movements</li> <li>• Feed production, storage and transport</li> </ul>
Residues of veterinary medicines and biological products (incl. medicated feed and water)	<ul style="list-style-type: none"> <li>• Treatment of animals</li> <li>• Sales and prescription control</li> <li>• Record keeping</li> <li>• Residue control</li> <li>• Quality of feed and water</li> </ul>
Radionuclide pollution	<ul style="list-style-type: none"> <li>• Farm location</li> <li>• Sources of feeds and water</li> </ul>
<b>Physical hazards</b>	
Broken needles and other penetrating objects.	<ul style="list-style-type: none"> <li>• Treatment of animals</li> </ul>
Injuries	<ul style="list-style-type: none"> <li>• Farm location</li> <li>• Infrastructure</li> <li>• Population density</li> <li>• Animal handling</li> <li>• Construction and equipment</li> </ul>

Hazards	Control points
Ingestion of dangerous/harmful objects	<ul style="list-style-type: none"><li>• Farm location</li><li>• Source of feeds and water</li><li>• Record keeping</li><li>• Construction and equipment</li><li>• Infrastructure</li></ul>

## **Annex 2. Feedlot animal health surveillance**

Constant surveillance by the feedlot personnel and the veterinarian is crucial for good management of a feedlot. The frequency of regular visits by the veterinarian to the feedlot will vary from daily to once weekly or once monthly depending on the size of the lot, the management capabilities, the type of cattle fed, and the nature and prevalence of diseases encountered.

There are several components of a feedlot health and management service that a veterinarian can provide. Continued disease surveillance through regular necropsy examination and regular observations of sick cattle is necessary. A necropsy on all dead cattle should be done by the veterinarian. A necropsy provides for the identification of diseases that are occurring and confirmation of the clinical diagnosis. It also helps in the evaluation of the effectiveness of the various personnel involved with the health of the cattle, such as the buyer, truck driver, processing crew, pen checkers, treatment crew, feeders, manager, and veterinarian. Finally it is needed for the evaluation of the effectiveness of specific disease prevention programs and any changes that may be necessary.

A focal point in management of disease in the feedlot is rapid and accurate diagnosis. This necessitates a good surveillance system, a careful full-time search for sick animals, appropriate facilities for examination and treatment of sick animals, accurate identification of animals, and first-class laboratory facilities, especially a necropsy service.

The training and supervision of feedlot employees in the detection and early treatment of sick cattle should be emphasized. Employees should be given regular informational sessions which illustrate the clinical signs of the common diseases. It is the manager's responsibility to ensure that adequate personnel are available to thoroughly inspect each pen of cattle at least once daily and preferably twice daily. It is the veterinarian's responsibility to ensure that these personnel are adequately trained and to monitor or design monitoring systems to ensure the competence of the individuals.

### **Surveillance Method**

The feeding pens must be under surveillance every day and on at least two occasions per day. When certain epidemics of disease occur, it is necessary to check the animals as often as every six hours on a 24-hour basis for several days in order to detect new cases as early as possible, when they will respond to treatment. The surveillance can be done from horseback or by walking through pens, but it is essential to be up close and to be able to move the cattle apart, but slowly and with the least possible excitement. Pen checking is an art that requires constant practice and attention to small details.

The selection of pen checkers is very important. They need to



be observant, knowledgeable, and trustworthy and must have sharp eyes if early diagnosis is to be made. One such pen rider can maintain surveillance over 10,000 head of cattle. If the lot is large enough, it is most economical if the riders work in three's, permitting one to cut out and drive to the sick animal yards.

The signs of ill health that are used to determine the presence of illness are:

- Animals standing in isolation;
- Rapid respiratory rate, coughing and nasal discharge;
- Animals not coming up to the feed bunk and appearing empty;
- Reluctance to rise or move, walking slowly. Appear to be lame or have other abnormal gait, such as knuckling of the fetlocks or dragging of the toes;
- Crusted muzzle, nasal discharge, sunken eyes;
- Rough, dry-looking hair coat;
- Diarrhea with or without blood in the feces;
- Straining to urinate with grunting and tail switching;
- Drooped head and ears with an arched back;
- Rectal temperature over 40°C.

Cattle showing these or other obvious signs of illness are examined more closely in the isolation area. It is important to follow the standard treatment protocol recommended by the veterinarian. If treatment is appropriate it is administered, in most cases, once daily for three days.

Recovered animals are put back into their original pens. Animals which do not recover or that relapse after the first treatment are retreated. Obviously, there comes a time when the expenditure of more money on an animal that is going to be an uneconomical proposition is unwarranted. A decision on what course to take depends on whether or not the animal's life is in danger or whether or not it is a matter of doing poorly.

If the animal's life is at risk there is the potential loss of capital invested, and all efforts are directed toward avoiding this. If the animal can still be sold and chances of recovery are slim, it is usual to cull it after two courses of treatment. This rule of thumb depends on the fact that it costs a great deal more, in terms of labor, to keep an animal in the isolation pen than in the feeding yards, and sick animals should either be returned quickly to their own pens or be slaughtered. In some feedlots, it is the practice to make up a pen of slow gainers, but this can be a nuisance and in most cases the rate of gain is not sufficient to justify the effort.

### **Treatment Protocols**

The veterinarian must specify procedures for the clinical management of sick cattle and provide a standard protocol that

outlines specific treatments for disease syndromes, dosages, treatment intervals, routes of administration, and withdrawal times. The effectiveness of the treatment protocol should be regularly evaluated by determining the response rates for the various treatment regimens. The failure of feedlots to use regular, competent veterinary supervision and to analyze treatment protocols often leads to the use of many different drugs indiscriminately, which results in an over expenditure for treatment and often an increase in the case fatality rate or the size of the dead pile.

### **Vaccination Protocols**

An important component of feedlot health programs is the planning of vaccination programs. The vaccines and the vaccination schedule will vary from area to area, depending on the prevalence of disease in the feedlot area and in the area from which the cattle originated. The kinds of vaccines used and the vaccination schedule should be based on the expected incidence of the disease, the cost of the disease when it occurs, the cost of the preventive procedure (vaccine plus labour), the field efficacy of the vaccine, and other alternative control procedures available. All of these factors are based on sound data obtained from the disease records generated by the feedlot or other similar feedlots as well as continued scrutiny of the scientific literature and ongoing clinical trials conducted by the veterinarian in these feedlots.

### **Nutritional Advice**

Large feedlots frequently consult a qualified nutritionist to assist in the formulation of least-cost diets. The veterinarian should establish effective regular communication with the nutritionist and be aware of the composition of the diets and any changes that are being planned. In other situations, the feedlot veterinarian may be in a position to provide regular nutritional advice as part of a complete service.

Because feed is the major portion of the cost per unit of body weight gain, it is imperative that the diet be least-cost and at the same time provides the nutrients that will allow optimum growth and finishing. Most of the emphasis in feedlot nutrition has been on developing least-cost diets that will support a maximum growth rate without any deleterious effects.

The precise specifications of the diets may be the responsibility of the nutritionist but the feedlot veterinarian frequently must evaluate the quality of the feed delivery system. This means checking to determine if the cattle are fed on time, is the feed mixed properly, is the feed intake intermittent because of inclement weather or muddy ground surfaces.

Specific nutrient deficiencies are extremely rare because diets are prepared every few days or daily, and it would be highly unusual for a feedlot to use a feedstuff deficient in a

specific nutrient for a prolonged period. Such a situation may occur in a small farm feedlot that prepares its own feedlot diet with little or no attention to the necessity for supplementation of home-grown feeds.

The nutritionally related diseases of well-managed feedlot cattle are few but may be the cause of large economic losses when they occur. They include:

- Carbohydrate engorgement (grain overload or D-lactic acidosis);
- Ruminant tympany or feedlot bloat;
- Feeding errors, for example, accidental incorporation of an excessive amount of a feed additive or the sudden unintended changes in the ingredient composition of the diet.

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