Biosecurity practices on beef cattle farms in Bone Regency, South Sulawesi

View the article online for updates and enhancements.

Biosecurity practices on beef cattle farms in Bone Regency, South Sulawesi

V S Lestari, D P Rahardja and S N Sirajuddin

Faculty of Animal Science, Universitas Hasanuddin, Jl. Perintis Kemerdekaan Km. 10 Makassar 90245, South Sulawesi Province, Indonesia

E-mail: veronicasrilestari@yahoo.com

Abstract. The aim of this research was to know the application of biosecurity practices on beef cattle farms in Bone Regency, South Sulawesi. Total sample was 51 beef cattle farmers which was choosed purposively. Data were consisted of primary and secondary data. Data were collected through observation and depth interview by using questionnaire. Biosecurity practices consisted of sanitation, tools and equipment, diseases and diseases prevention, and calf management. There were 34 questions adopted from Biosecurity Good Management Practices. By using Guttman scale, the score for each answer was 1 if beef cattle farmers DO, and 0 if DO NOT DO Biosecurity practices. Data were analyzed descriptively by using percentage. The research revealed that the application of biosecurity practices on beef cattle farms in Bone Regency was in medium level. The lowest percentage was calf management (35.00%), followed by disease prevention (40.00%). Extension and training should be given intensively to improve their level of biosecurity practices.

1. Introduction

In Indonesia, beef cattle farmers can be classified as small holders farmers who most of them use traditional or semi intensif maintenance. Beef cattle famers let their beef cattle since in the morning until in the evening for grazing. Some of beef cattle were put in semi permanent cowshed, but most of them just put their beef cattle under their house or beside their house. This is not good for the health of the owner. Beef cattle farmers keep their beef cattle for saving. There is no motivation to increase the number of their beef cattle. On average they keep 2-3 heads which can be sold any time. Beef cattle productivity was also low because of some factors such as lack of management, lack of technology and deseases. As a result, domestic beef production cannot fulfil the demand for beef. According to Arifin (2020), the demand for meat was 773,720 tons in 2018 [1]. Local beef cattle population was 17 million heads. Import of live beef cattle was 400,000 head and meat was 160,000 tons.

Indonesian Government through Directorate General of Livestock and Animal Health provided many regulation to improve beef cattle productivity, one of them was the application of biosecurity in the farm as mention in The Republic of Indonesia's Government Regulation Number 47 of 2014 about Control and Management of Animal Diseases Article 36: At least in nurseries, breeding farms, animal shelters, animal markets, slaughterhouses, means of animal transport, animal health services, conservation units and veterinary laboratories, biosafety and biosafety must be carried out.

In cattle farms, biosecurity initiatives included animal movement, equipment sharing, and businesses and contractors visiting the farms [2]. Reference Buhman et al (2000) clarified that separation, traffic control and sanitation are the key components of biosecurity which can be detailed as follows [3]: 1) Isolation is an activity intended to avoid animal interaction in an area or environment. The most important animal care steps and the interaction with newly arrived animals. The yarding of livestock by age group or by production group is another practice. Facilities used to measure insulation must be neat and disinfected. 2) Traffic control is a method for avoiding disease transmission by the movement of animals other than livestock (horses, dogs, cats, wildlife, rodents and birds) and visitors. Newly arrived animals should be conscious of their vaccination status; this is an intervention for optimizing biosafety. So it is very important to know the state of the welfare of newly arrived animals. Traffic controls on farm stops should be enforced or pollution of the animals, feed and equipment used should be reduced. Transport equipment and personnel shall not leave the field for the purpose of handling dead animals without first washing and disinfection. 3) Sanitation is a protective measure against contamination the fecal pollution. Fecal contamination can occur orally on animals (contamination with a fecal-oral cross). This contamination can occur in equipment such as containers used for drink and food. The first step in sanitation measures is the removal of organic matter, especially fecal matter. Certain biological matter contains blood, saliva, respiratory secretions and urine from animals which are sick or dead. To prevent contamination, All the equipment used, particularly feed and beverage containers, must be cleaned and disinfected. The most barrier to adopt biosecurity on their beef cattle farms was a shortage of extension staff, a shortage of veterinarians, a lack of experience in animal husbandry and a lack of resources. Bone Regency is the most populous of beef cattle in South Sulawesi [4]. But, in 2015 Bone Regency has experience with 7 Anthrax disease cases which very dangerous for human and cattle [5]. Therefore, the local government cq. Animal Husbandry Services provided some biosecurity practices such as vaccination and isolation in order to prevent the Anthrax cases were not spread to another places. The goal of this study was to understand biosecurity practices at beef cattle farms in Bone Regency, South Sulawesi.

2. Research method

This research was conducted in South Sulawesi, in the Bone Regency. The total sample was 51 beef cattle farmers, who were picked deliberately. Data were collected using questionnaires through observation and in-depth interview. Biosecurity practices can be devided into 5 variables which consisted of sanitation, equipments, diseases, prevention of diseases, and care of calves. The Guttman scale, with two scores, was used: 1 for those doing biosecurity practices, and score 0 for those who were not doing biosecurity practices. Data was descriptively analyzed using the percentage table. To know the level of biosecurity practices, we used formula from Karthikeyan [6]:

$$\text{Adoption index} = \frac{\text{Respondent total score x 100}}{\text{Total possible score}}$$

Based on the adoption index, the respondents were classified into low, medium and high adoption category. The respondents were classified as follows, based on the degree of the acceptance of biosecurity measures: (1). Low adopter ranking (up to 33%); (2). Partial adopters (34%–66%); (3). High adopters (67-100 percent).

3. Results and Discussion

3.1. Features of respondents

Based on the age of respondents, on average was 46.51 years. This mean that they were in an age of productivity. As we know that to manage cattle need a lot of power. Based on gender, mayority of respondents were men (56.86%). Looking at the education level of respondents, on average they spent 9.18 years at school. This mean that they finished from Junior High School. Based on their farm

experiences, on average was 9.75 years. This mean that they have experience in beef cattle farming. Number of cattle they manage on average was 4.33 head. This was categorized as small scale farms.

3.2. Biosecurity practices

Table 1. Biosecurity practices on beef cattle farm in Bone Regency, Province of South Sulawesi.

Activities	Percentage
Sanitation	70.00
Equipment	72.00
Diseases	52.00
Diseases prevention	40.00
Calf management	35.00
Average	**50.57**

Table 1 suggested that equipment was the highest degree of biosecurity practices on beef cattle farms in Bone Regency, South Sulawesi Provinces (72.00%). This activity consisted of using different equipment to feed and clean stalks or completely clean between uses, never leaving manure trading equipment in stalks of different animal classes, clean polluted vehicles and equipment before healthy cattle use, daily manure trading equipment in stalks of different animal classes, clean polluted vehicles and equipments, cleaning and disinfecting periodically equipment used by medicines.

Based on the observation and survey, most of beef cattle farmers use the same equipment to feed and clean stalks. To prevent their beef cattle from infectious diseases, it can be recommended that beef cattle farmers should keep all equipment clean and use various equipment.

The second highest level of biosecurity practices was sanitation (70.00%). Such tasks consisted of attemps to clean equipment used orally between animals to avoid manure contamination of feed and equipment used orally; attempts to prevent cross-contamination between healthy and sick/dead cattle; regular review of activity activities to determine the potential for contamination of cattle; immediate remedy is offered if manure unintentionally contaminates feed or water. In this activities, the most importance thing was to keep their beef cattle not contaminated from manure, food and drink equipment. Based on the observation and survey, there was no daily assessment of their activity tasks to evaluate the potential for contamination of cattle.

The medium level of biosecurity practices was diseases and diseases prevention (52.00% and 40.00%) respectively. This activities consisted of equipment provides a sterile environment for the retention, care and separation of sick cattle; equipment avoids cross-contamination between groups of water, manure, feed or equipment. Have a strategy to control the size of the population, age distribution, and flow of animals to minimize disease risk. Second, treat animals of the highest health status; everybody uses strict sanitation practices; All death animals were tested by a veterinarian; all cows that abort were gathered by the veterinarian for blood tests. Clean the infected vehicles and equipment around safe cattle prior to use. Know the history of the health of the herds from which cattle were bought. Transporting animals in cars that were safe. Have an external animal management network that could spread illnesses (rodents, etc.). Limit the access of people to cattle pens, feed mixing and storage area, and area of treatment. At the perimeter of the operation, the loading area is located. The dead animal pickup area is located so that the operation is not contaminated by rendering trucks. Keep a record of the operation's visitors. In fact, most beef cattle farmers did not use strict sanitation practices, no limit access to the cowsheds and no record for visitors.

The lowest level of biosecurity practices was calf management (35.00%). Calf management consisted of strategic vaccination and parasite control program in place for all animals, for at least six months,

The 3rd International Conference of Animal Science and Technology

IOP Conf. Series: Earth and Environmental Science **788** (2021) 012194

replacement cattle are kept separate from other cattle, the calving area is clean and disinfected, all calves are born from cows screened clean of infectious diseases. Replacement cattle have a different source of water, veterinary consultation annually on calf treatment, All calves were born from animals that were indefinitely labelled before any groupin happens. The calving area was clean and disinfected. In fact, beef cattle farmers did not know whether or not all calves were born from cows that had been tested for infectious diseases.

On average, the level of biosecurity practices was 50.57% and were catagorized as partial adopters. This research was supported by [7–9].

4. Conclusion

It can be inferred, based on the findings, that the extent of adoption of biosecurity was classified as partial adopters. To increase the level of biosecurity practices, it can be recommended for local government, animal husbandry service, private sectors and veterinerians to give extension, information and a good service about biosecurity to beef cattle farmers.

Acknowledgment

References

[1] Arifin M 2020 Sistem budaya ternak ruminansia untuk menghasilkan daging berkualitas *Hulu-Hilir dalam Menghasilkan Daging Berkualitas* (Jakarta: Indonesia Livestock Club)

[2] Brenan M L and Christley R M 2013 *BMC Veterinary Res.* **9** 1–8

[3] Buhman M, Dewell G and Griffin D 2000 *Biosecurity Basic for Cattle Operation and Good Management Practices (GMP) for Controlling Infectious Diseases* (Nebrasca: NebGuide)

[4] Lestari V S, Sirajuddin S N and Abdullah A 2018 Constraints of biosecurity adoption onbeef cattle farm *Eur. J. Sustain. Dev.* **7** 151–6

[5] Central Statistical Bureau 2017 *Bone Regency in Figure Bone* (Jakarta: Central Statistical Bureau)

[6] Singh B and Singh R 2006 Impact of transfer of technology program on knowledge, adoption and productivity of pearl millet in arid zone of Rajasthan *Ann. Arid Zone* **45** 107–10

[7} Lestari V S, Sirajuddin S N and Asnawi A 2014 Biosecurity adoption on cattle farms in indonesia *Eur. J. Sustain. Dev.* **3** 403–8

[8] Lestari V S, Rahardja D P and Sirajuddin S N 2019 Identification of biosecurity on beef cattle farms *IOP Conf. Ser. Earth Environ. Sci*. **247** 012005

[9] Lestari V S, Sirajuddin S N, Saleh I M and Prahesti K I 2019 Level of biosecurity adoption practices in beef cattle farmers in South Sulawesi, Indonesia *IOP Conf. Ser. Earth Environ. Sci* **372** 012024