Biosecurity Adoption on Cattle Farms in Indonesia

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ABSTRACT
The aim of this study was to know biosecurity adoption on beef cattle farms. This research was conducted for a month at Barru regency, South Sulawesi province, which famous as one of beef cattle breeding villages in Indonesia. Sample was chosen through random sampling. Total sample was 30 beef cattle farmers. Data were collected through observation and interview. Biosecurity measures consisted of 35 indicators which was grouped into 4 namely: management practice, sanitation, disease and disease prevention, and calf management. Each indicator was divided into two groups: adopt and not adopt. Data were analysed descriptively. The results revealed that 47.4% of beef cattle farmers have adopted biosecurity on their farms and was categorized as a “partial adopter”. This percentage should be increased in order to increase meat production and food safety.

Keywords: adoption, biosecurity, beef cattle, farmers

1. Introduction

Biosecurity is defined as security from transmission of infectious diseases, parasites and pests. Biosecurity has focus on maintaining or improving the health status of animal and preventing the introduction of new disease pathogens by assessing all possible risks to animal health (Satyanarayana et al., 2008; Zavala, 2011; Muller et al., 2007; Fraser et al., 2010; Iqbal, 2009; Dorea et al., 2010; Julien and Thomson, 2011; Fasina et al., 2011). The aim of implementing biosecurity measures on cattle farms is: a) to preserve a high health status of animals by protecting them from new and existing pathogens and b) to ensure the production of safe food. General biosecurity measures should be implemented in any farm regardless of any specific problem (Valergakis et al., 2008).

Biosecurity has three major components: segregation, cleaning and disinfection (FAO, 2008). Biosecurity will not only maintain the good environment but also minimize infectious and zoonotic diseases and subsequently increase public health (Sharma, 2010). According to Brenan and Christley (2012), biosecurity measures on cattle farms consisted of animal movement, equipment sharing and companies and contraction visiting the farms. Valergakis et al. (2008) argued that the lack of professional attitude by farmers, the defective design and development, as well as the inadequate organization of Greek cattle farms, are the main obstacles in implementing biosecurity measures. But, part of the responsibility lies on the veterinary profession as well; lack of training and motivation is the most probable explanation.
Adoption is a process of receiving an innovation, hopefully there is a change in cognitive, affective, and psychomotoric to any body who get innovation from extension worker (Ban and Hawkins, 1999). Using adoption index, biosecurity adoption of layer smallholders in South Sulawesi was classified into a “partial adopter”. The low level of biosecurity at farm gate and traffic onto the shed can be enhanced by layer smallholders through voluntary adoption (Lestari et al., 2011). The adoption of biosecurity were associated with gender, age, education, farming experience, farm-income, family size and social capital. These variables contributed 20.00% variation on biosecurity adoption of laying hen farms. However, only farm income, family size and social capital were the major factors influencing to the adoption of biosecurity (P < 0.05) (Lestari et al., 2012).

Barru regency was famous as a beef cattle breeding village in South Sulawesi province. The development of cattle farming were slowly. It is caused by several factors, such as farmers knowledge about cattle management practice is still low, farmers have cattle as saving, and they sell cattle when ever they need money. They used traditional (extensive) method, some of farmers don’t provide housing for their cattle, some of farmers keep their cattle under their house. Beef cattle farmers usually gave low quality of grass especially in dry season. They still lack of technology such as urea molasses block and artificial insemination. Ella (2002) stated that a). the low of cattle productivity both in quality and quantity was caused by in-breeding for a long time; b). decreasing productivity caused decreasing carcass weight and c). the limited of quantity and quality of feed.

Suriani (2009) said that in 2006 in Gowa regency as one of regencies in South Sulawesi provinces, 50 people were infected by anthrax. In 2009, 12 head of horses, 5 head of beef cattle and 2 head of buffaloes dead because of anthrax. Anonymous (2009) added that in 2008, 3 head of beef cattles dead in Gowa regency. In addition, 11 people were infected, so isolation and vaccination were done by Animal Husbandry Service. According to Suriani (2011), 30 cows died suddenly at the same place. Therefore, vaccination, blood and serum sampling were conducted.

Demand for meat increased according to population, and community welfare. To fulfill demand for meat in Indonesia, Indonesia imported 40% of total meat demand from Australia, New Zealand and the United States. According to Jefriando (2014), imported meat increased more than twice: from 6,193,000 ton (US$ 24,801 million) to 13,525,000 ton (US$ 58,633 million) in January 2014 and March 2014 respectively. Indonesian government made many regulation to the development of beef cattle production. One of them is biosecurity. Biosecurity is important to be implemented on beef cattle farms in order to increase meat production and food safety.

The study was undertaken with the following objective to determine the level of biosecurity adoption on beef cattle farms in Barru regency, South Sulawesi province, Indonesia.

2. Research Method

This research was conducted in Barru regency for a month. Sample was chose through random sampling. Total sample was 30. Data were collected through observation and interview. Biosecurity measures were devided into 4 steps adopted from
Buhman et al. (2007) namely good management practice, sanitation, disease and disease prevention, and calf management. Biosecurity measures consisted of 35 questions. Biosecurity adoption on beef cattle farms were categorized into two groups: adopt (score 1) and not adopt (score 0). Data were tabulated using frequency distribution and were analysed descriptively.

The adoption level of the respondents was measured by making use of adoption index (Karthikeyan, 1994 in Rahman, 2007).

\[
\text{Adoption index} = \frac{\text{Respondent total score}}{\text{Total possible score}} \times 100
\]

Depending upon the extent of adoption of biosecurity measures, the respondents were categorized as follows: (1) Low adopters (up to 33%); (2) Partial adopters (34-66%) and (3) High adopters (67-100%).

3. Results and Discussion

a. The characteristics of respondents

Characteristics of respondents can be seen in Table 1.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Sd</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>42.1</td>
<td>10.5</td>
<td>25.0</td>
<td>61.0</td>
</tr>
<tr>
<td>Education (year)</td>
<td>12.9</td>
<td>5.05</td>
<td>6.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Farm experience (year)</td>
<td>16.7</td>
<td>1.7</td>
<td>1.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Number of family (person)</td>
<td>4.0</td>
<td>2.0</td>
<td>1.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Number of beef cattle (head)</td>
<td>8.0</td>
<td>6.0</td>
<td>2.0</td>
<td>30.0</td>
</tr>
</tbody>
</table>

Table 1 showed that the average of age respondents was 42.1 years. This mean respondents were in a productive age. To look after cattle, manpower was needed. The average length of their education was 12.9 years. This mean that respondents were well educated because they finished their formal study at senior high school. They can make a good decision. The average of respondents farm experience was 16.7 years. This mean that respondents have long experience to handle of their beef cattle. Number of family of respondents was 4.0 person. Family can help look after their cattle. The average number of beef cattle was 8 heads.

Biosecurity Adoption

Biosecurity adoption on beef cattle farms can be seen in Table 2.

<table>
<thead>
<tr>
<th>No</th>
<th>Biosecurity measures</th>
<th>Adopt (%)</th>
<th>Not Adopt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Management practice</td>
<td>46.70</td>
<td>53.30</td>
</tr>
<tr>
<td>2</td>
<td>Sanitation</td>
<td>55.70</td>
<td>44.30</td>
</tr>
<tr>
<td>3</td>
<td>Disease and disease prevention</td>
<td>42.11</td>
<td>57.89</td>
</tr>
<tr>
<td>4</td>
<td>Calf management</td>
<td>48.33</td>
<td>51.67</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>47.40</strong></td>
<td><strong>52.60</strong></td>
</tr>
</tbody>
</table>
As can be seen in Table 2, the highest level of biosecurity measures was sanitation 55.7%. This included sanitation on feedstuffs, tools and equipment. While the lowest biosecurity adoption was disease and disease prevention (42.11%). Therefore, veterinarian or extension staff should more intensive in giving information about diseases prevention. Total biosecurity adoption level was 47.40%. Respondents can be categorized as partial adopters, because the percentage was between 34-66% (Karthikeyan, 1994 in Rahman, 2007). This research agree with that of Lestari et al. (2011).

**Conclusion**

Based on the results, it can be concluded that the level of biosecurity adoption on beef cattle farms in Barru regency, South Sulawesi province, Indonesia was categorized as “low adopter”. Veterinarian or extension staff should more intensive in giving information about good management practices.

**References**


