**LEMBAR REKAPITULASI**
**HASIL PENILAIAN 2 (DUAT) SEJAWAT SEPIDANG ATAU 2 (DUAT) PEER REVIEW**
**KARYA ILMIAN: PROSIDING**

<table>
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<th>Judul Makalah</th>
<th>Future Prospect for Buffalo Development in West Sulawesi Province Based on Reproductive Management</th>
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<td>Penulis Makalah</td>
<td>Muhammad Yusuf, Sudirman Baco, Muhammad Nasir Karim.</td>
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- [ ] Prosiding Forum Ilmiah Internasional
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Future Prospect for Buffalo Development in West Sulawesi Province
Based on Reproductive Management Applied

Muhammad Yusuf, Sudirman Baco, Muhammad Nasir Karim
Department of Animal Production, Faculty of Animal Science,
Hasanuddin University, Makassar 90245, Indonesia

Abstract

The objective of this study was to know the application of reproductive management of buffalo in West Sulawesi Province and its potential for development in the future. This study was conducted during a period from July to August 2012 in three different sub-districts; Mehalaan, Messawa, and Nosu. Primary data was collected with the help of a questionnaire to the 60 farmers that included the number of buffalo, raising management, and reproductive management. While secondary data was obtained from related institution such as local government and livestock service. The results of this study showed that reproductive management applied by the farmers was still very low. Mating system of buffaloes in this area was two different methods; natural mating without any help and natural mating with the help of the farmers. Mostly farmers had good knowledge about estrus. Most of them were capable to identify buffaloes in estrus by observing their behavior. In order to improve buffalo development in this region, it is necessary to involve short- and long terms such as extension to the farmers, recording, dietary management, manipulation of the estrous cycle and control of ovulation, the use of high fertility buffalo bulls (natural mating) and AI, crossbreeding, genetic selection, and sustainable management improvement. Therefore, it is potential for future buffalo development in this area such as improvement the general knowledge of the farmers in raising buffalo and enhances the reproductive management in order to increase pregnancy rate and calving rate, and reduces mortality rate.

Key words: Buffalo, Future prospect, Reproductive management.

Introduction

The role of buffalo in the agricultural economy of many developing countries in Asia is very important (Perera, 2011). This due to that the buffalo provide draft power, milk, meat, and hides (Nanda and Nakao, 2003; Sarwar et al., 2009; Perera, 2011; Terzano et al., 2012). Therefore, it is important to maintain or increase the growth rate of buffalo population. The growth of buffalo population varies through the different regions as well as buffalo production (Perera, 2011).

In Indonesia, buffalo population has decreased from year to year include West Sulawesi Province. In this province, buffalo population in 2008 was 14,920 heads and it was decreased to 10,494 heads in 2012. One of the reasons for this problem is low reproductive management applied by the farmers (Yusuf et al., 2013). The purpose of
Buffalo in this region is mainly used for draft operations in agriculture without any efforts to improve reproductive management to increase reproductive efficiency.

Nanda and Nakao (2003) noted that for more than 5000 years, buffalo have been used for draft, that are particularly suited to work on wet fields with a strong body, broad hooves, flexible pastern and fetlock joints. Furthermore, Pasha and Hayat (2012) stated that buffalo products and their contribution as a triple purpose animal that provide milk, meat and mechanical power to mankind. They also stated that among different products obtained from buffalo, milk, meat and hides are more important. Therefore, the importance of reproductive management in order to increase buffalo population and buffalo production is a pivotal determination for sustainability of this breed. Therefore, this study aimed to show the reproductive management applied by the farmers and the prospect for development in the future.

Materials and Methods

Animals and management

A total of 158 buffaloes raised by 60 farmers in three different sub-districts (Mehalaan, Messawa, and Nosu) in Mamasa Regency, West Sulawesi Province, Indonesia during a period from July to August 2012 were involved in the present study. The buffalo was managed in a small holder system. The housing system for the animals was in the simple house during nighttime and free during daytime for grazing without any additional feeds such as concentrate, mineral, and feed additive. The buffalo are usually sent out in the morning time to the field for grazing and return back in the late afternoon.

Reproductive management

In this region, estrus detection was conducted by the farmers during grazing time however this detection did not conducted regularly. If the animal shows estrus signs, they were naturally mated with the buffalo bull if available at the time of estrus. Otherwise, the owner will seek for the buffalo bull of the other farmer. There was no special attention to the reproductive management performed by the farmers such as recording, estrous synchronization, and the use of artificial insemination (AI).

Data collection

Two types of data were collected in the study; primary and secondary data. Primary data was collected with the help of a questionnaire to the 60 farmers that included the number of buffalo, raising management, and reproductive management. While secondary data was obtained from related institution such as local government and livestock service.

Statistical analysis

All data were tabulated and drawn using Excel program (Microsoft Excel, 2007). Buffalo population at different years was analyzed using simple linear regression.
Results and Discussion

Buffalo population and growth

Buffalo population in 2008 in this West Sulawesi Province was 14,920 which was decreased significantly to 10,494 in 2012 (Figure 1). This means that during this period, the average growth of buffalo population decreased approximately 1,107 heads per year. The reason for this decreased was not really understood. This might be due to that the purpose of buffalo in this region is mainly used for draft operations in agricultural land (Yusuf et al., 2013), and the use for draft operations are slowly changed by using mechanical machine.

The other purpose of buffalo in this region is to obtain milk and meat. However, this production is intended as the secondary income of the farmers after agricultural plantation. This suggests that to improve the growth rate and population of buffalo in this region, it is necessary to recalculate the role of this animal in supporting farmers’ income. This due to that most of the farmers stated that the economical value of buffalo is high in supporting their needs. Therefore, one of efforts in order to maintain or increase the growth rate and population of buffalo in this region is to reevaluate the role of buffalo in economical term especially to the farmers.

![Figure 1. Buffalo population in West Sulawesi Province from 2008 to 2012 (BPS, 2013)](image)

Application of reproductive management in buffalo

Reproductive management applied by the farmers in the present study has been described in our previous report (Yusuf et al., 2013) including mating system, knowledge of the farmers regarding estrus, and the use of reproductive technology. Basically, mating system applied by the farmers was only natural mating. Artificial insemination (AI) has been introduced to the farmers by the Livestock Services, however this technology did not apply yet due to various reason. Regarding estrus signs of the buffalo, most of the farmers have good knowledge that usually they
recognized to breed their buffalo with buffalo bull. However, once the buffalo cow/heifer is breed, the farmers believe that their buffalo will become pregnant. Furthermore, there was no special attention to record the time of estrus as well as the time of breeding.

![Figure 2. Buffalo population in Mamasa Regency, West Sulawesi Province from 2007 to 2011 (BPS, 2013)](image)

Application of reproductive management of buffalo as mentioned above indicates some hopes that potentially could be improve in the future. Several things would deliver our understanding to improve reproductive management in buffalo in this area. Following articles have been well written as reference for improvement of buffalo such as reproductive cycles of buffalo (Perera, 2011), reproduction in water buffalo (Presicce, 2007), nutritional management for buffalo production (Sarwar et al., 2009), and reproductive biotechnologies for improvement of buffalo (Purohit et al., 2003).

**Future prospect for buffalo development**

For future development of buffalo in this region based on the current reproductive management applied by the farmers, it is necessary to construct a strategy, both short- and long-term strategy that is aim to regain the reproductive potential of the buffalo production. This reasonable due to that buffalo has a triple purpose animal; milk, meat, and mechanical power to mankind and a number of different products (Pasha and Hayat, 2012).

Based on the important contribution of buffalo production and their products, a summary of strategies proposed for development of buffalo in West Sulawesi Province is hereby presented in Table 1.
Table 1. Strategies to ameliorate development of buffalo in West Sulawesi Province

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<td>3. Dietary management</td>
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<td>4. Manipulation of the estrous cycle and control of ovulation</td>
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<td>5. Use of high fertility buffalo bulls (natural mating) and AI</td>
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<td>6. Crossbreeding</td>
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<td>Long term</td>
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a. Short-term strategy

**Extension to the farmers:** the farmers should know what they are going to do for their buffalo. For this purpose, all things that at least regarding how to raise buffalo in a proper manner is very important. This can be achieved by involvement of extension services regularly and extension to the farmers is constructed systemically to all aspects for buffalo production.

**Recording:** the importance of recording for buffalo production especially in managing reproduction, at least that the animals can be monitored the reproductive aspects that affect buffalo production. This is also important for genetic selection in the long term strategy.

**Dietary management:** balanced nutrition and better management can enhance buffalo productivity (Sarwar et al., 2009). Moreover they stated that low per head milk yield, poor reproductive performance such as seasonal breeding behavior, anestrous, and longer calving interval and growth rate in buffaloes have been attributed to insufficient supply of nutrients.

**Manipulation of the estrous cycle and control of ovulation:** manipulation of the estrous cycle and the control of ovulation appears as a good short-term strategy dairy cattle (Rodriguez-Martinez, 2009) however this manipulation is also suitable for buffalo. Application of methods to control the development of follicle growth, the promotion of ovulation in anestrous cows, the regression of the corpus luteum in cyclic cows and the synchronization of estrus and ovulation at the end of treatment, before AI (on spontaneous or expected estrus) or mating have been thoroughly studied (Rodriguez-Martinez, 2009; Lucy, 2007; Thatcher et al., 2006). This technique can also be applied in buffalo cows.

**Use of high fertility buffalo bulls (natural mating) and AI:** manipulation of the estrous cycle and the control of ovulation would be successfully if it is followed by the use of high-fertility buffalo bulls. Rodriguez-Martinez (2009) suggested that the use of AI with semen from sires with proven high-fertility is probably the most obvious and simple recommendation. This technique would be able to prevent the occurrence of inbreeding in the certain area due to limitation and difficulty in getting bulls in this region (Crossbreeding).
b. Long-term strategy

**Genetic selection;** for reproductive purpose, fertility is one of the most difficult and complex traits owing to low heritabilities caused by the polygenic nature of reproductive traits and the strong environmental influences on reproduction and the long generation intervals (Rodriguez-Martinez, 2009). This is a challenge that occurs in buffalo development. Another challenge is that reproductive performance of buffalo remained much lower than in cattle (Dobson and Kamonpatana, 1986). Nonetheless, efforts to improve the genetic in order to obtain high reproductive rate of buffalo through selection are not impossible. By **sustainable management improvement** that is conducted regularly along with all aspects in short-term above is hopefulness for getting better reproductive management in this region, subsequently, the growth rate and population of buffalo would be increased.

In conclusion, it is potential for future buffalo development in this area such as improvement the general knowledge of the farmers in raising buffalo and enhances the reproductive management in order to increase pregnancy rate and calving rate, and reduces mortality rate.

**References**

[Badan Pusat Statistik Republik Indonesia]. 2013.


