Diversity of plants as food supplement and medicine for livestock: Local culture in cattlemen communities

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Abstract. Diversity of plants as food supplement and medicine for livestock: Local culture in cattlemen communities. Asian J Ethnobiol 3: 23-29. Various types of plants can be used as food for livestock. In addition to its function as feed, several types of plants can also be used as medicines for livestock. The research aims to record the types of plant species that were traditionally used by farmers as feed supplements and medicines for livestock. Observations were made using a survey method in three regions in West Sumatra, namely Tanah Datar, Solok, and Limapuluh Kota District. Sampling was carried out randomly (random sampling) by picking up breeders who were considered as successful breeders (having more than five cows), and familiar with traditional medicines as a sample. Interviews were conducted to obtain information on the types of plants used as supplements or medicines. Furthermore, the plant types were recorded in their location of growing. All types of plants were documented in the form of photographs. Data were displayed descriptively, i.e., images with supporting information. The observations found more than 15 types of plants commonly used by cattlemen to increase growth, reproductive capacity, and as medicine if livestock had health problems.

Keywords: Livestock, local culture, supplement, plants medicine

INTRODUCTION

West Sumatra (Indonesia) is an agricultural area with a flat topographical structure with a moderately steep slope. The agriculture and animal husbandry sector has been developing in West Sumatra from ancient times, so there is a philosophy in the community, i.e. “Padi Manguniang Jaguang Maupiah Taranak Bakambang biak”. This means that other than growing rice and corn as a food source, the community also has livestock breeding for their savings. So agriculture is a culture of society in West Sumatra for generations.

West Sumatra has a population of 5.48 million and 255,525 farming houses in the district/city. The population of large ruminant livestock consists of 393,491 beef cattle and 110,236 buffaloes while the poultry consists of 9,222,765 laying breeds, 4,054,846 dual-purpose breeds (non-race chicken) and 26,232,909 meat breeds (broiler/race chicken) (BPS of West Sumatra, 2018). The area of West Sumatra is 42,229.64 km² with an area of cultivation land of 23,356.85 km², which strongly supports the development of the livestock sector. Geographically, the location of West Sumatra Province is 0° 54' NL - 3° 30' SL and -98° 36' WL - 101° 53' WL with a height of about 2 m to 2,912 m asl. Agro-climatically, West Sumatra has a temperate climate with temperatures ranging from 17 to 270 C and high rainfall levels ranging from 1,980 to more than 5,000 mm/year (BMKG 2019).

West Sumatra has many mountains and rivers so that the soil is fertile, and it has the potential for a diverse species of plants. West Sumatra Province is also supported by the existence of a complete institutional infrastructure to support the acceleration of animal husbandry development. Some supporting infrastructure such as Animal Husbandry and Animal Health Service, Faculty of Animal Husbandry, Snakma, BPPV Bukittinggi, BPTU Padang Mengatas, BPTP Sukarami, Quarantine, Keswan Post, Pus IB, UPTD BIB Tuah Sakato, UPTD Poultry Simpang Empat, RPH, Livestock Market, UPTD Beef Cattle Air Rundiang, Breeder Club. All of these institutions work together in a forum called the International Breeding Cattle for Center (IBCIC) in West Sumatra. In accordance with the results of the study of the Synergy Team of the Faculty of Animal Husbandry of Andalas University, that the capacity of land for the development of ruminants in West Sumatra was 3,250,000 animals.

Along with the development progress of animal husbandry, there is a demand that all production costs must be optimized to produce the expected outputs. The high cost of production, especially commercial feed and medicine, requires the finding of other alternatives to overcome the problem. In addition, the increasing public awareness on the importance of food safety can encourage the thinking to utilize a variety of plants that are traditionally used as a feed supplements and medicines.

Plant having medicinal properties is one of the alternatives in the supply of feed ingredients that has multiple functions. Part of this plant is as additional food for growth and productivity of livestock, and as a control of animal health for both poultry and ruminant animals. Some breeders already used natural ingredients for their animals. Therefore it is necessary to record and expand the use of medicinal plants available in the local area. There are many types of plants that can be used as feed supplements and medicinal materials for livestock around the local environment such as rambutan leaves, areca leaves, katuk...
leaves, moringa leaves, betel leaves, and hibiscus leaves. The use of this plant can be singly or as a mixture in various forms (powder or concoction), that can be given to poultry and ruminants. Its use is done in various ways, including by drinking water or mixed in feed as supplement food. This is local wisdom in the farming community that needs to be inventoried.

Based on the above, observations have been made which aim to record and obtain information on plant diversity as feed supplements and medicines for livestock.

MATERIALS AND METHODS

Observation location
Sampling and sources of information came from farmers in the Solok District, Tanah Datar District, Limapuluh Kota District of West Sumatra Province, Indonesia; and were conducted from January to August 2019. Map of observation locations can be seen in the picture below (figure 1). This research uses stationery, camera, GPS, and questionnaire.

Methods
The method used in this observation is a survey method. The survey was conducted to record the types of plants used by farmers by inventorying and interviewing. The interviewed farmers are farmers who have knowledge in the use of plants as medicine for livestock and are used to using these plants, even from generation to generation. At each location, one farmer was determined to be interviewed. The farmers interviewed were those who owned a livestock breeding with five cows minimum.

Data analysis
The results of observation were analyzed descriptively and displayed in tables and pictures.

RESULTS AND DISCUSSION

General description of the observation location
Plant sampling locations are at an altitude of 500 - 750 m above sea level. In the area of sampling, there are many animal husbandry locations around the valley and the foothills of the three mountains, namely Merapi, Talang, and Sago mountains. Farmers use plants as supplement food and medicine on the occasion of the livestock are in health problem. At the research location, it can be found breeders who understand these. The location of the study is actually the center of beef cattle in West Sumatra. General description of location can be seen in Table 1.

Types of plants that are used as feed supplements and medicines for livestock
The results of interviews with farmers and observations of plant species used as medicinal materials and supplements for breeders come from the types of trees and shrubs found in the area around the farm. This type of plant has been used for medicinal materials, both for humans and animals. Plant species are named according to the name of the area where they are found, which sometimes is different from the name in Indonesian (Table 2).
The function and use of plants that are used by farmers as medicine and food supplements

**Areca nut (pinang)**

Areca nut tree is a tree-shaped plant and grows in various regions in Indonesia. Its scientific name is *Areca catechu* (English: Betel palm or Betel nut tree) and it is a type of monocot plant which is classified as palm trees. Areca tree belongs to the Arecales family in the order Arecales (Heyne 1987). Areca nut is named according to its colors, such as Irian areca nut, yellow areca nut, and others. *Pinang* also has a different name in each region, such as in Aceh, it is called "*pineung*", in Batak/Toba "*pining*", in Sunda or Java it is called "*jambe*".

Areca nut has many benefits, especially in the food industry and in energy industry (as biofuel). The use of areca nuts as an ingredient, eaten with piper betel leaf, has become a custom for generations in certain regions in Indonesia, but the consumers are limited. Empirically the seed of areca nut can overcome various types of diseases. Various benefits that can be obtained from the use of seed of areca nut are as follows: as a basic need, as an energy source and as an ingredient in traditional ceremonies (i), as a substitute for cigarettes, as a digestion regulator and as an ingredient to prevent sleepiness (ii), as a cosmetic and slimming ingredient (iii), as an ingredient of standard drug (iv), and as an antiedressant (v) (Barlinna 2007).

Almost all parts of areca nut plants can be used. The functions and benefits of areca nut differ according to their intended use. Areca nuts can be used as ingredients by breeders for their livestock, such as poultry and large animals or ruminants. Ruminant breeders, for example, have used young areca leaves and ripe areca nuts as medicines for cattle (Figure 2).

Breeders assume that areca nuts are useful as an energy booster for their livestock. Breeders provide areca nut concoctions with other ingredients for cattle that have just given birth. Cattle that have just given birth are given this herb by breeders to accelerate the release of the placenta.

The way to use areca nut is by processing and adding it with other materials or plants, such as bamboo leaves, honey, duck eggs, and water. If the leaf part is to be used, then it means the young areca nut leaves. This leaf mixture was added with bamboo leaves, one duck egg, two tablespoons of honey, and ½ liter of water. This mixture is blended with a blender, after that, it is given to cattle.

Another part of the areca nut plant that is also beneficial to livestock is the ripe areca nut (Figure 2.B). The processed ripe betel nut is used as a tapeworm medicine (*Taenia saginata*) and liver worms (*Fasciola gigantica*). To use it, some ripe betel seeds are ground into areca nut powder and mixed with piladang leaves (*Solanostemon scutellaroides* (L.) Cod) at sufficiently, and ½ liter of water. After that, the mixture is squeezed and the concoction is given to the cattle three times a day in the morning.

There are so many benefits of areca nut that humans can take. Processing of ripe fruit is also a source of income for farmers. Ripe fruit is taken seeds and dried and then marketed (Kristina et al. 2007).

**Moringa**

Moringa is a type of plant from the Moringaceae tribe, with its scientific name *Moringa oleifera*. This plant can grow quickly, live long, bloom throughout the year, and withstand extreme heat conditions. Moringa is a type of shrub that can have a trunk height of 7 -11 m (Amzu 2014).

From the table, it can be seen that some plants can be used as food, medicine, or supplements for livestock. These plants have their own regional names based on the location of the plants found. Generally, all plants were found in all observation locations and were named in Minang language.

| Scientific name       | Indonesian name  | Regional name (Minang) |
|-----------------------|------------------|------------------------|
| Areca catechu         | Pinang           | Pinang                 |
| Moringa oleifera      | Kelor            | Marunggai              |
| Annona muricata       | Sirsak           | Durian Balando         |
| Manilkara zapota      | Sawo             | Saus                   |
| Carica papaya         | Pepaya           | Kalki                  |
| Toona Sureni          | Suren            | Surian                 |
| Psidium guajava       | Jambu biji       | Jambu Perawehe         |
| Bambuseae spp         | Bambu            | Batuang                |
| Hibiscus sinensis     | Kembang sepatu   | Bungo rayo             |
| Nepheilum lappaceum   | Rambutan         | Rambutan               |
| Gliciridea sepium     | Gamal            | Dadok medan            |
| Curcuma longa         | Kunir            | Kunyi                  |
| Citrus aurantiifolia  | Jeruk nips       | Asam kepah             |
| Piper betel           | Sirih            | Siriah                 |
| Tithonia diversifolia | Daun paitan      | Bungo paik             |

Table 1. General description of research locations

| Location                     | Altitude (m. asl) | Location Coordinates |
|------------------------------|-------------------|-----------------------|
| Tanah Datar, Banten          | 750-1000          | 0°20’58.8”S, 100°31’43.9”E |
| Kecamatan Salimpuang, Banten |                   |                       |
| Nagari Tanjung Lurah, Banten |                   |                       |
| Limapuluh Kota, Banda Aceh   | 450-1000          | 0°20’16.8”S, 121°44’24.2”E |
| Kecamatan Lareh Sago Halabang, Banda Aceh | | |
| Kabupaten Solok, Simalung | 402-420           | 0°46’20.0”S, 110°40’53.2”E |
| Kecamatan Kubung, Simalung  |                   |                       |
| Nagari Saok Laweh, Simalung |                   |                       |

Table 2. Types of plants used as medicinal materials and feed supplements by farmers

**Figure 2. Areca palm (A) and ripe betel nut (B)**
In the area of West Sumatra, the moringa tree is called *merunggai* which is usually planted as a border plant for hedge and yard and it has medicinal properties. Marunggai tree is not too big. The wood trunk is brittle (easily broken) and its branches are rare but it has strong roots. The leaves are oval-shaped with small sizes arranged compound in a single stalk.

In human life, moringa tree is very useful. This tree has many benefits for humans as herbal medicine which is considered to be able to overcome various types of diseases, including cancer (Mardiana et al. 2012). From the results of the analysis of nutrient content, it can be seen that the merunggai leaf has very good potential to complement the nutritional needs in the body. By consuming merunggai leaves, the nutritional balance in the body will be fulfilled. Human consuming merunggai leaves will be helped to increase their energy and endurance. In addition, merunggai leaf is also efficacious to overcome the various complaints caused by lack of vitamins and minerals such as vitamin A deficiency (visual impairment), Choline deficiency (accumulation of fat in the liver) (Amina et al. 2015).

As for livestock, Moringa can be used as high-quality feed ingredients with a complete nutritional content as well as efficacious as medicines such as improved reproduction of livestock, treating malaria, and as supplementary feeds and others. Based on the experience of farmers, almost all parts of Moringa plants can be used as nutritionally and medicinal feed for ruminants. Young leaves and twigs/leaf stems can be used as a feed supplement in the ration because they contain high nutritional elements. Even, moringa leaves can be used as a substitute for Starbio, in the manufacture of fermented feed. Moringa leaves for feed are usually added by several other elements such as *paitan* grass leaves, *gamal* leaves, *lamtoro* leaves, *rumen* contents, bran, and molasses as shown in Figure 3.

Figure 3. A. *Paitan* flower tree, B. *Marunggai*/Moringa tree, C. *Gamal* tree, D. *Paitan* leaf stalk, E. *Marunggai* tree shoot, F. *Gamal* leaf stalk, G. *Lamtoro*, H. Bran, I. Molasses
Soursop

Soursop’s scientific name is *Annona muricata* L and it is commonly called *Durian balando* in the area of West Sumatra. Soursop is a useful plant originating from Caribbean, Central America, and South America. In Indonesia, soursop can grow well at an altitude of 1000 m above sea level. Soursop trees can reach a height of 9 m.

Soursop fruit is widely consumed and used for treatment. In soursop leaves, there can be found acetogenin compounds that are useful in treating various diseases (Puspitasari 2016). An excellent benefit for the health and treatment of livestock is to reduce the body temperature of animals. Then it can also be utilized as a calming agent, especially for cattle that have just traveled or are recently moved from certain places/locations.

The way to use soursop leaves as a medicine for reducing body temperature of cattle is by adding 1 ounce of rambutan leaves (Figure 4b) into 1 ounce of soursop leaves and then added them with 3 ounces of palm sugar, ½ liter of water, and palm sugar. Give the concoction to the cattle.

**Turmeric**

Turmeric is a native plant of Southeast Asia and has its scientific name of *Curcuma domestica* Val. It is one of the Zingiberaceae plants which is widely planted in woods and gardens. The word *curcuma* is derived from the Arabic *kurkum* which means yellow (Winarto 2005). This plant is widely planted or cultivated as a supplement to herbs or medicinal herbs, although it is considered traditional, but turmeric has been studied in a laboratory to determine the content of substances and its effects on health (Ghofur et al. 2016).

In the field of animal husbandry, turmeric is used to add bright or reddish yellow color to the yolk. When mixed into chicken ration, turmeric can eliminate the smell of chicken excrement and increase chicken weight (Said 2001).

Turmeric plant parts that are used to increase appetite and flatulence in cattle are the rhizome.

The way to use it is by processing turmeric rhizome into powder and then adding other ingredients such as lime juice and one duck egg then blended with a blender. The mixture is given to cattle before breakfast for three days.

**Hibiscus.**

In Indonesian this flower is called *kembang sepatu* with the scientific name of *Hibiscus rosa-sinensis*. Hibiscus leaves (Figure 6.A) are used to reduce body heat which is a symptom of fever. It is used as a fever/fever medicine for humans and livestock. It also smoothens the process of birth and fetal growth in the uterus for livestock. To make the mixture for it, hibiscus is usually added by sweet potato leaves (Figure 6.C) and water derived from burned *kalek* banana midrib (Figure 6.B).

To prepare herbs is as follows: the stem of *kalek* banana is burned and squeezed to take water out. The water is collected in a pail. Hibiscus leaves and sweet potato leaves are added into the water then squeezed. This water is given to the livestock as drink and the pulp is given to livestock as food.

**Guava**

Guava plant’s Latin name is *Psidium guajava* or better known as *jambu paraweh* (Minang language). It can flourish in low areas up to 1200 m above sea level of height, but it cannot grow well in a too hot or too cold area. The height of this plant reaches 3-10 m (Mursito 2002). Traditionally, all parts of this plant are beneficial and have medicinal properties such as the leaves, the stems, the fruit flesh, and the roots. Ethanol extract of guava white fruit flesh has a stronger activity against *Salmonella typhi* compared to ethanol extract of red guava fruit flesh, thus ethanol extract of guava white fruit flesh could be more effective for treating diarrhea caused by *S. typhi* bacteria (Adnyana et al. 2004).

Some symptoms of disease in cattle are treated with this guava. Breeders use this plant to treat cattle suffering from indigestion with symptoms of diarrhea.

To use this fruit is as follows: the bark, the leaves, the fruit flesh and the roots added by fruit sauce/sapodilla, and enough salt are crushed/chopped and then are boiled. This mixture is drunk on sick cattle.
Figure 5.  A. Ordinary turmeric plants, B. White turmeric, C. Charcoal turmeric, D. Rhizomes of ordinary turmeric plants, E. Rhizomes of white turmeric, F. Rhizomes of charcoal turmeric (Private collection 2019; Rafikasari 2019)

Figure 6.  A. Hibiscus, B. Kalek banana, C. Sweet potato leaves

Figure 7.  A. Guava tree, B. Guava fruit, C. Sapodilla
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