

Diversity of plants as a food supplement and medicine for livestock in cattleman communities of Wonosobo, Central Java, Indonesia

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Abstract. Aprilia FN, Ardhyanti FAK, Paramesti H, Prabowo GAS, Safira RN, Nisyawati, Setyawan AD. 2025. Diversity of plants as a food supplement and medicine for livestock in cattleman communities of Wonosobo, Central Java, Indonesia. *Nusantara Bioscience* 17: 84-95. The Wonosobo community in Central Java, Indonesia mostly participates in agriculture and animal husbandry. Individuals engaged in agriculture and animal husbandry exhibit a significant reliance on local resources for the management of food production and animals. This study aimed to find plant diversity that serves as animal feed and supplements for cattle in Wonosobo. The investigation was conducted in October 2024 in the Kalibawang Sub-district of Wonosobo, Central Java, Indonesia, utilizing data gathered from four villages: Dempel, Kalialang, Karangsembung, and Mergolangu. This study included direct surveys and comprehensive interviews with 126 livestock farmers to collect data. The study documented 74 plant species from 37 families utilized as animal feed. The predominant plant families were Fabaceae, Euphorbiaceae, Asteraceae, Poaceae, and Moraceae, encompassing several plants with considerable potential for application in feed, medicine, and animal supplements, presenting a promising perspective for the future of agriculture in Wonosobo. Of the 78 species, 15 were utilized by the inhabitants of Kalibawang Sub-district for medicinal applications, including *worawari* (*Hibiscus rosa-sinensis*), *segon laut* (*Paraserianthes falcataria*), *brotowali* (*Tinospora cordifolia*), coconut (*Cocos nucifera*), papaya (*Carica papaya*), jackfruit (*Artocarpus heterophyllus*), *Gliricidia* (*Gliricidia sepium*), *sulanjana* (*Pennisetum purpureum*), cassava (*Manihot esculenta*), jenu (*Derris elliptica*), banana (*Musa x paradisiaca*), ginger (*Zingiber officinale*), turmeric (*Curcuma longa*), candlenut (*Aleurites moluccanus*), and mahogany (*Swietenia mahagoni*). The highest UV index was recorded in *Artocarpus heterophyllus* Lam and *Carica papaya* L., with a value of 0.023. The highest indices for RFC (0.37) is *Calliandra calothyrsus* Meissn and IAR (Informant Agreement Ratio) (0.94) is *Artocarpus heterophyllus* Lam; however, the highest ICF (Informant Consensus Factor) index was associated with the diarrhea (0.66).

Keywords: Animal feed, cattleman, diversity plant, food supplement, medicinal plant

INTRODUCTION

Livestock development is an integral component of country development. Livestock commodities contribute to the improvement of human resource quality by providing meat, milk, and eggs. Livestock farming helps to support household lives by providing monetary revenue and products. Indonesia has enormous potential in the livestock sector if it continues to expand, as demand for livestock products grows (Tenrisanna and Kasim 2021). Central Java is essential for Indonesia's livestock production, aiming to be a global food supplier by 2045. Demand for livestock-based foods in emerging nations is projected to quadruple by 2050 (Agus and Widi 2018).

Farmers in rural areas often rear between two and six cattle for assets and savings. One example may be located in Magelang District, Central Java, Indonesia. Magelang District has 87,750 goats, 92,100 sheep, 78,286 cows, and 5,978 buffalo (Widarni et al. 2020). Forage, which typically consists of grass and legumes, is used to provide the feed requirements of cattle. Calliandra is one of the plants that

are often used as animal feed. Calliandra is a popular feed for a variety of animals, including cattle, goats, and sheep. Its relatively high protein and mineral content make it an acceptable partial feed alternative for cattle. Furthermore, feeding Calliandra to livestock has little effect on their health or production (Aishwaryalakshmi et al. 2025).

Wonosobo, in Central Java, serves as the research site. The majority of the population of Wonosobo, Central Java, is employed as farmers and livestock breeders. Livestock management in Wonosobo is done traditionally and according to the cold highland terrain and available resources. Farmers in Wonosobo must pay more attention to the amount and quality of feed offered to their cattle. They do not feed the livestock based on their physiological state or body weight. The feed offered is mostly grass vegetation, with extra supplements provided just when needed (Hakim et al. 2019).

When coping with ailments, the community typically turns to medicinal herbs. Protozoan parasites frequently cause livestock illnesses. Parasitic illnesses have an impact on animal health and productivity. Protozoan parasites can induce fever, anorexia, anemia, and mortality in acute

infections (Maharana et al. 2016). Plants have long been utilized for health and medicinal reasons, including animal care. Plant extracts, also known as phytobiotics or phytochemicals, are gaining popularity because of their bioactive properties that can benefit cattle health. These phytobiotics are frequently employed in traditional and alternative veterinary care, particularly among small-scale farmers with limited resources (Kuralkar and Kuralkar 2021). In recent years, scientists and animal feed practitioners have been increasingly interested in phytobiotics as safe and effective natural additives (Bagno et al. 2018). Because of its accessibility and cost, herbal medicine continues to be the major treatment technique for small farmers with little resources (Mirzaei-Aghsaghali 2012). This illustrates that phytobiotics are essential in sustainable animal husbandry, both as a therapy and as an alternative to conventional antibiotics. Furthermore, the utilization of nearby flora for livestock feed has left many communities reliant on forest resources. The agricultural community, for example, is reliant on trees. Agricultural communities depend on forests, so effective livestock feed management is essential (Njurumana et al. 2020).

This research is necessary since there has been no previous research on the diversity of plants utilized as food supplements and veterinary treatment in Wonosobo's livestock community. In reality, Wonosobo's natural resources offer great promise as feed additives and veterinary medications, helping to improve feed quality, improve livestock health, and boost long-term livestock productivity.

MATERIALS AND METHODS

Study area

The study was carried out in four villages in Kalibawang Sub-district, Wonosobo District, Central Java, Indonesia.

Dempel is the first village, with coordinates of 7°30'49"S and 109°55'51"E. Karangsembung is the second village, with coordinates of 7°29'39"S and 109°55'26"E. Kalialang is the third village, with coordinates of 7°29'11"S and 109°55'51"E. Mergolangu is the fourth village, with coordinates 7°30'52"S and 109°53'11"E (Figures 1 and 2).

Wonosobo has 98,468 hectares and has a wide range of elevations, which affects temperature and rainfall. 33.33% of its area is at an altitude of 250-500 m asl., 50% at 500-1,000 m asl., and 16.67% above 1,000 m asl. (Nurlaeli 2022). The area has a tropical climate with two seasons: dry and wet, with typical daily temperatures ranging from 24 to 30°C and dropping to 20°C overnight. In July and August, nighttime temperatures can reach 12-15°C, while daytime temperatures vary from 15-20°C (Hardiko et al. 2016).

In terms of rainfall, the average number of wet days in Wonosobo between 2020 and 2022 varies by sub-district, with Wonosobo having the highest average of 247 days, followed by Kalikajar and Watumalang with 235 and 236 days, respectively. In contrast, Wadaslintang had the lowest average of 180 rainy days. From 2020 to 2022, the Kalibawang receives an average of 166 rainy days. Kalibawang receives less rain than other Sub-districts in Wonosobo on average. This data shows considerable changes in rainfall patterns between sub-districts, which are impacted by local altitude and climate (Central Bureau of Statistics Wonosobo District 2023). According to the reference, Wonosobo has an annual rainfall of 3,500-4,000 mm, which is appropriate for *Calliandra calothyrsus* growth. This species flourishes in locations with considerable rainfall, generally exceeding 1,500 mm per year. Its capacity to fix nitrogen increases soil fertility, making it advantageous to agriculture and cattle. *Calliandra* can also assist to avoid soil erosion in Wonosobo's steep terrain, which is prone to strong rains.

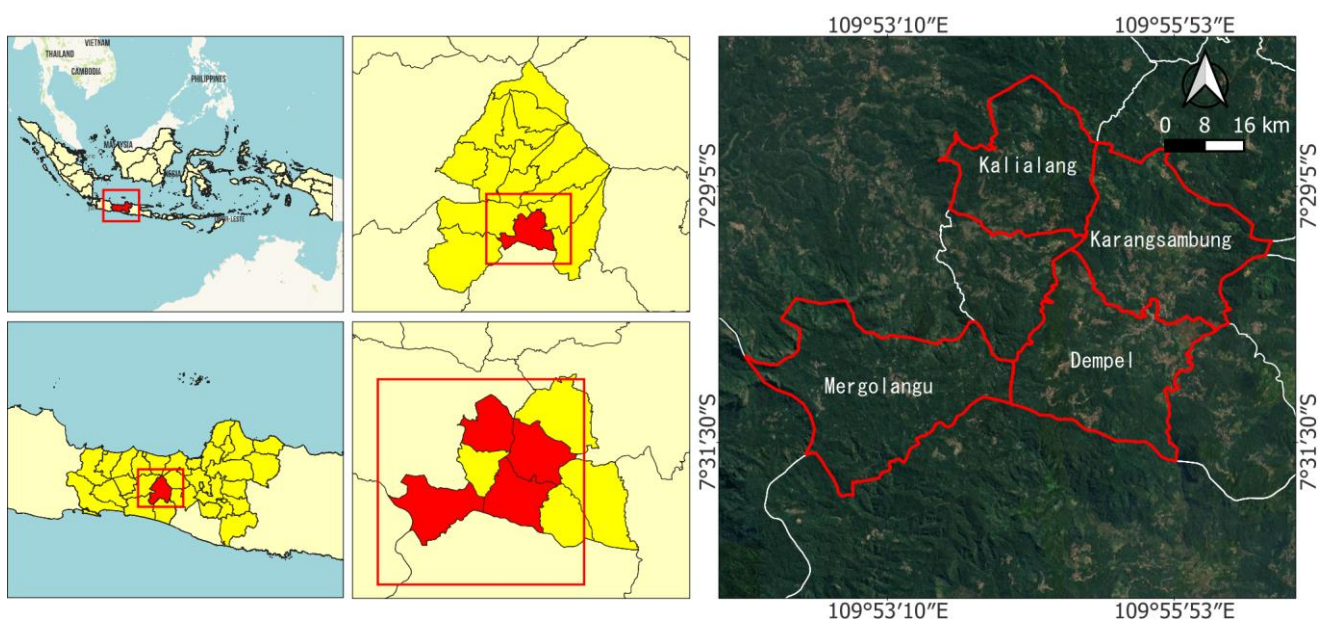


Figure 1. The administrative map of Dempel, Kalialang, Karangsembung, Mergolangu Villages in Kalibawang Sub-district, Wonosobo, Central Java, Indonesia



Figure 2. Livestock farming in Kalibawang Sub-district, Wonosobo, Central Java, Indonesia: A. Dempel Village; B. Karangsembung Village; C. Kalialang Village; D. Mergolangu Village

Procedures

Ethnobotanical data collection

This study was done using direct surveys in Kalibawang Sub-district, which was derived into four villages. The survey was conducted in the villages of Dempel, Karangsembung, Kalialang, and Mergolangu. The survey sought to personally examine the plants utilized by local communities for livestock uses such as feed, medication, and supplementation. Furthermore, field observations were carried out by strolling around the study areas to directly document the sorts of plants utilized by local inhabitants for livestock purposes, ensuring a thorough understanding of their use in natural environments. Direct field observations and conversations with villagers revealed specific information about the plant used (Amalyadi 2024). The data from the direct survey was recorded onto a tally sheet for data recap once the field survey was done. The Kalibawang Sub-district has 9,829 households, and the questionnaire was designed for the heads of families who belong to the forest farmer group (*Kelompok Tani Hutan*) (Herdananta et al. 2024). Because of the population's homogenous features, the sample number is calculated using the Slovin formula and a basic random sampling procedure with a margin of error of 0.1. Throughout the interviews, this study distinguishes between owners and laborers. We determined whether respondents were livestock owners or laborers by asking particular questions at the start of the interview. However, the vast majority of those interviewed were cattle owners. The formula used is as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where: n: sample size; N: Population size; e: Acceptable margin of error.

The approach employed was in-depth interviews with 126 participants. Respondents were chosen from among those who own animals, such as cows, goats, and sheep, as well as those who work as livestock herders. This strategy guarantees that participants have meaningful experience procuring feed for their livestock. This was accomplished by systematic interview, with one person asking the questions and another serving as the informant. Data were

also collected in a semi-structured approach, with follow-up questions asking respondents to elaborate on their responses (Knott et al. 2022). The questionnaire began with generic inquiry, and gradually included questions concerning:

- i. Name
- ii. Age
- iii. How many livestock do you own?
- iv. What types of livestock do you raise?
- v. What are the local names of plants commonly used as animal feed?
- vi. Are there variations in plant names across different areas?
- vii. What plants are commonly used as animal feed?
- viii. What are the benefits of these plants for animal health?
- ix. Are there any plants specifically used to treat livestock diseases?
- x. Which parts of the plants are typically used?
- xi. How are these plant parts processed before use?
- xii. What are the common methods of processing plants before feeding them to livestock?
- xiii. Are these plants processed into beverages, used topically, or incorporated as dietary supplements?
- xiv. What diseases commonly affect livestock in your area?
- xv. Are there any specific plants used to treat these diseases?
- xvi. How are these plants administered for treating livestock diseases?

All the information collected was then processed through data analysis to conclude.

Specimen identification

The identification of plant species is influenced by the community's local knowledge, particularly the use of local names for species that do not yet have scientific names. Identification keys are used to document specific characteristics such as leaves, fruits, flowers, and wood/stem properties. Following that, taxonomic identification is done using the Global Biodiversity Information Facility (GBIF) website (<https://www.gbif.org/species/search>).

Data analysis

This study employed a qualitative technique combined with an ethnographic approach to gain a full understanding of social phenomena from the views of participants. This technique was chosen because of its capacity to thoroughly investigate and evaluate certain social phenomena within the framework of community everyday life. The research's implementation focused on monitoring general behaviors that indicate patterns of social acts and interactions within the community as the first component investigated. The second component is investigating personal and communal experiences that influence knowledge and meaning in certain social situations (Mau and Naibili 2022).

According to Chaachouay et al. (2019), Use Value (UV) is a quantitative measure for determining the value of a plant species in a community based on how frequently informants utilize it. It is calculated with the following formula:

$$UV = \frac{\sum U_i}{N}$$

Where: U_i : Total number of uses reported by an informant for a specific species; N : Total number of informants mentioning the species.

Trotter and Logan (2019) first introduced the Informant Consensus Factor (ICF) to measure the uniformity of local knowledge. The ICF value ranges from 0 to 1. The index is calculated using the formula:

$$ICF = \frac{[Nur - Ns]}{[Nur - 1]}$$

Where: Nur : Number of use reports for each category; Ns : Number of species used for a specific category by all informants.

The Relative Frequency of Citation (RFC), proposed by Tardío and Pardo-de-Santayana (2008), serves to identify the local importance of a species. RFC has a value ranging from 0 to 1. The index is calculated using the formula:

$$RFC = \frac{Fc}{N}$$

Where: Fc : Number of informants mentioning the species use; N : Total number of informants.

The Informant Agreement Ratio (IAR) is a quantitative index used to measure the level of agreement among informants regarding the use of specific species in a particular category, such as for medicinal or other purposes (Chaachouay et al. 2019). The value for this factor ranges from 0 to 1. The IAR for each use category is calculated using the following formula:

$$IAR = \frac{Nur - Nt}{Nur - 1}$$

Where: Nur : Number of mentions in each category; Nt : Number of taxa used in each category.

RESULTS AND DISCUSSION

Socio-economics

Based on the data from the respondents' socio-economics characteristics (Table 1), which reveals males (64.29%) as the primary sources of information about plants for livestock, we can draw a link to the issue of gender inequality that persists in the livestock sector. Gender disparity in access to and control over resources and benefits continues to disproportionately affect males (Sumarti and Fuah 2015). This evidence supports this notion, as males outnumber women in terms of knowledge for cattle. Furthermore, Nadhira and Sumarti (2017) note that there is still a gender bias in livestock production, particularly in the dairy farming industry, where women are less likely to engage in training. This might explain why only 35.71% of women became resource persons, as women's access to education and training in this profession needs further expansion.

Furthermore, Kurniawati and Trisna (2019) found that education level, number of livestock industries, and position in the family economy all had an impact on gender equality in livestock business. Women's poor education and ownership of livestock resources may have contributed to their decreased participation in providing information to cattle. This data demonstrates that these challenges remain significant, and that women's participation in the cattle sector must be promoted in order to achieve more gender equality. However, after conducting the interviews, it was shown that male respondents were often better knowledgeable about cattle and pharmaceuticals. This is not to say that female respondents lacked knowledge in these areas; some women displayed considerable competence, but their numbers were comparatively low compared to males.

Table 1. Social and economic characteristics of respondents

| Parameter | Specification | Frequency | Percentage (%) |
|------------|-------------------------------|-----------|----------------|
| Gender | Male | 81 | 64.29 |
| | Female | 45 | 35.71 |
| Age | <20 | 5 | 3.97 |
| | 21 - 30 | 15 | 11.90 |
| | 31 - 40 | 19 | 15.08 |
| | 41 - 50 | 22 | 17.46 |
| | 51 - 60 | 35 | 27.78 |
| | >60 | 30 | 23.81 |
| Education | Elementary school | 102 | 80.95 |
| | Junior high school | 12 | 9.52 |
| | Senior/vocational high school | 10 | 7.94 |
| | Non-formal | 2 | 1.59 |
| Occupation | Laborer | 23 | 18.25 |
| | Farmer | 75 | 59.52 |
| | Self-employed | 9 | 7.14 |
| | Housewife | 16 | 12.70 |
| | Student | 2 | 1.59 |

Based on the age classification data in Table 1, which shows the dominance of the age group above 50 years in providing knowledge about plants for livestock, there is a strong correlation with Nurdiyansah et al. (2020), who state that farmers in the productive age range (15-56 years) have better physical abilities to run livestock businesses actively and effectively. Despite the physical advantages of the productive age group, this data reveals that categories E (51-60 years) and F (>60 years) had the biggest resource groups, with percentages of 27.78 and 23.81%, respectively.

This can be explained by the age-related drop in physical engagement in cattle activities, according to Nurdiyansah et al. (2020). As physical capacities decline, older farmers may be more useful in imparting information and experience, but their physical participation in livestock management reduces. Even if their physical engagement in the cattle sector is waning, older farmers have extensive knowledge and many years of experience, making them valuable resource persons (Indey et al. 2021).

Furthermore, May et al. (2019) suggest that younger farmers are more active in business management and development than older farmers, as seen by the comparatively low percentage of respondents in group B (21-30 years), which is just 11.90%. Although younger farmers are more physically active, older farmers' experience and skills are still valued in this livestock business. Therefore they continue to be the primary source of information.

According to the informants' education data, the vast majority (80.95%) only had elementary education, with a significantly lower fraction having secondary education (Junior High School 9.52%, Senior High School 7.94%) and very few having a non-formal education background (1.59%). This is comparable to the study made by Indey et al. (2021), who argue that education level is an essential predictor of farmers' capacity to utilize technology and innovation in livestock farming. This data demonstrates a significant obstacle in the deployment of technology among farmers with low education.

Farmers with higher education are more receptive to innovation and can better run their businesses. However, because the majority of the respondents had a poor level of education, it is likely that the implementation of contemporary technologies or innovations in the livestock industry in the Kalibawang area need further improvement. Farmers with a low education may depend more on conventional methods of conducting their livestock businesses, limiting the adoption of new technology that might boost efficiency and productivity. As a result, it is critical to expand farmers' access to non-formal education or training in the area so that they are better prepared to embrace and apply technology and innovations in their livestock activities, as suggested by Indey et al. (2021). Thus, enhanced education may play an essential role in promoting the growth of a more modern and profitable cattle industry.

According to data on the occupations of resource individuals who contributed information about plants for cattle, the majority were farmers or breeders, accounting for 75 people (59.52%). This demonstrates that knowledge of plants for livestock is mostly learnt by those who are actively involved in agricultural and livestock activities. Farmers and breeders have extensive firsthand experience, thus they play a significant role as resource individuals in this setting. The labor group is the second largest, with 23 members or 18.25%. Although laborers are not directly active in agricultural or animal husbandry, they may assist these industries and so have important knowledge of the crops used for livestock.

Housewives accounted for 16 persons, or 12.70% of those interviewed. Housewives may play an essential role in maintaining household land that supports cattle or family farming businesses, even if they do not have formal agricultural or animal husbandry credentials. The self-employed category, with nine members, or 7.14%, demonstrates that, while small, there are individuals who operate independent businesses other than animal husbandry and have expertise of livestock crops. Meanwhile, students numbered just two, or 1.59%, indicating a relatively low level of engagement by young people in giving information on livestock crops, possibly due to a lack of practical experience in the activity. Overall, this data suggests that farmers and breeders are the most knowledgeable about livestock crops, followed by other groups who play supporting roles or are indirectly connected in the livestock business.

Plant diversity

Table 2 reveals that 37 plant families are dispersed among four villages in Kalibawang Sub-district: Dempel, Karangsambung, Kalialang, and Mergolangu, each with a different number of species. The two largest families with eight species are Fabaceae and Poaceae, represented by *Albizia chinensis*, *Arachis hypogaea*, *C. calothyrsus*, *Erythrina variegata*, *Falcataria moluccana*, *Gliricidia sepium*, *Indigofera tinctoria*, *Leucaena leucocephala* for the Fabaceae family, and the Poaceae family, which is represented by ten species namely *Cenchrus purpureus*, *Digitaria ciliaris*, *Echinochloa colonum*, *Ischaemum rugosum*, *Oplismenus hirtellus*, *Oryza sativa*, *Paspalum conjugatum*, *Saccharum officinarum*, *Zea mays*, and *Pennisetum purpureum* followed by the Asteraceae family, which includes seven species: *Ageratum conyzoides*, *Acmella paniculata*, *Cosmos caudatus*, *Cyanthillium cinereum*, *Chromolaena odorata*, *Eclipta alba*, *Eclipta prostrata*. Furthermore, the Euphorbiaceae family is represented by six species: *Manihot esculenta* for local names containing *singkong* and *bodin*, *Aleurites moluccanus*, *Manihot glaziovii* for local names containing *singkong taun* and *bodin karet*, and *Sauropus androgynus* (Figure 3). Figure 4 depicts some plant species utilized as food components and animal supplements.

Table 2. Plant species diversity for livestock in the villages of Dempel, Karangsembung, Kaliajang, and Mergolangu of Kalibawang Sub-district, Wonosobo, Central Java, Indonesia

| Family | Species name | Local name | Used part | Processed | Benefit | | | | UV | RFC |
|----------------|------------------------------------------------------------------|-----------------------|------------|-----------|---------|---|---|---|-------|-------|
| | | | | | 1 | 2 | 3 | 4 | | |
| Acanthaceae | <i>Asystasia gangetica</i> (L.) T. Anders. | <i>Krompolan</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Acanthaceae | <i>Clinacanthus nutans</i> Lindau | <i>Lingser</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Acoraceae | <i>Acorus calamus</i> var. <i>americanus</i> L. | <i>Sringu</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Anacardiaceae | <i>Mangifera indica</i> L. | <i>Pelem</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Apiaceae | <i>Centella asiatica</i> (L.) Urb. | <i>Godong rendeng</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Araucariaceae | <i>Agathis dammara</i> (Lamb.) Rich. | <i>Damar</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Arecaceae | <i>Cocos nucifera</i> L. | <i>Kelapa</i> | Water | Direct | | | | ● | 0.007 | 0.007 |
| Arecaceae | <i>Johannesteijsmannia altifrons</i> (Rchb.f. & Zoll.) H.E.Moore | <i>Pajong</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Arecaceae | <i>Arenga pinnata</i> Merr | <i>Aren</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Asteraceae | <i>Ageratum conyzoides</i> L. | <i>Bandotan</i> | Leaves | Direct | | | | ● | 0.007 | 0.253 |
| Asteraceae | <i>Acmella paniculata</i> (Wall. ex DC.) R.K.Jansen | <i>Jotang</i> | Leaves | Direct | | | | ● | 0.007 | 0.111 |
| Asteraceae | <i>Eclipta prostrata</i> (L.) | <i>Arong</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Asteraceae | <i>Cyanthillium cinereum</i> (L.) H. Rob. | <i>Sawi langit</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Asteraceae | <i>Cosmos caudatus</i> Kunth. | <i>Kenikir</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Asteraceae | <i>Eclipta alba</i> (L.) L. | <i>Urang-arang</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Asteraceae | <i>Chromolaena odorata</i> (L.) King & H.E. Robins | <i>Kirinyuh</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Bombacaceae | <i>Durio zibethinus</i> Murray | <i>Durian/duren</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Bombacaceae | <i>Ceiba pentandra</i> (L.) Gaertn. | <i>Randu</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Capparaceae | <i>Cleome ruidosperma</i> DC. | <i>Ijon</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Caricaceae | <i>Carica papaya</i> L. | <i>Pepaya</i> | Leaves | Direct | | | | ● | 0.023 | 0.134 |
| | | | Leaves | Direct | | | | ● | | |
| | | | Leaves | Direct | | | | ● | | |
| Cornaceae | <i>Aucuba japonica</i> Thunb. | <i>Porin</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Cucurbitaceae | <i>Momordica charantia</i> L. | <i>Pare</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Cucurbitaceae | <i>Citrullus lanatus</i> (Thunb.) Matsum. | <i>Semangka</i> | Leaves | Direct | | | | ● | 0.007 | 0.031 |
| Cyatheaceae | <i>Alsophila glauca</i> (Bl.) J.Sm | <i>Pakis pohon</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Cyperaceae | <i>Cyperus kyllingia</i> Endl. | <i>Ijon</i> | Leaves | Direct | | | | ● | 0.007 | 0.095 |
| Euphorbiaceae | <i>Manihot glaziovii</i> Mull. Arg. | <i>Bodin karet</i> | Leaves | Direct | | | | ● | 0.007 | 0.365 |
| Euphorbiaceae | <i>Manihot esculenta</i> Crantz | <i>Bodin</i> | Leaves | Direct | | | | ● | 0.015 | 0.388 |
| | | | Fruit peel | Dried | | | | ● | | |
| Euphorbiaceae | <i>Sauropus androgynus</i> (L.) Merr. | <i>Katuk</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Euphorbiaceae | <i>Manihot glaziovii</i> Mull. Arg. | <i>Bodin karet</i> | Leaves | Direct | | | | ● | 0.007 | 0.055 |
| Euphorbiaceae | <i>Aleurites moluccanus</i> (L.) Willd | <i>Miri/kemiri</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Fabaceae | <i>Calliandra calothyrsus</i> Meissn | <i>Andra/andro</i> | Leaves | Direct | | | | ● | 0.007 | 0.515 |
| Fabaceae | <i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp. | <i>Laraside</i> | Leaves | Direct | | | | ● | 0.015 | 0.182 |
| | | | Leaves | Direct | | | | ● | | |
| Fabaceae | <i>Albizia chinensis</i> (Osbeck) Merr. | <i>Albasiyah</i> | Leaves | Direct | | | | ● | 0.007 | 0.166 |
| Fabaceae | <i>Arachis hypogaea</i> L. | <i>Kacang</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Fabaceae | <i>Leucaena leucocephala</i> (Lam.) de Wit | <i>Mlanding</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Fabaceae | <i>Indigofera tinctoria</i> L. | <i>Tarum</i> | Leaves | Direct | | | | ● | 0.007 | 0.007 |
| Fabaceae | <i>Erythrina variegata</i> L. | <i>Dadap</i> | Leaves | Direct | | | | ● | 0.007 | 0.039 |
| Fabaceae | <i>Falcataria moluccana</i> (Miq.) Barneby & Grimes | <i>Sengon laut</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Gnetaceae | <i>Gnetum gnemon</i> L. | <i>Melinjo</i> | Leaves | Direct | | | | ● | 0.007 | 0.031 |
| Liliaceae | <i>Curculigo latifolia</i> Dryand. ex W.T.Aiton | <i>Ijon</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Malvaceae | <i>Hibiscus rosa-sinensis</i> L. | <i>Wora wari</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Meliaceae | <i>Swietenia mahagoni</i> (L.) Jacq. | <i>Mahoni</i> | Leaves | Direct | | | | ● | 0.007 | 0.063 |
| | | | Leaves | Direct | | | | ● | | |
| Menispermaceae | <i>Tinospora cordifolia</i> (Willd.) Hook.f. | <i>Brotowali</i> | Leaves | Direct | | | | ● | 0.015 | 0.071 |
| | | | Leaves | Direct | | | | ● | | |
| Moraceae | <i>Ficus lyrata</i> Warb. | <i>Wiledah</i> | Leaves | Direct | | | | ● | 0.007 | 0.269 |
| Moraceae | <i>Artocarpus heterophyllus</i> Lam | <i>Nangka</i> | Fruit | Direct | | | | ● | 0.023 | 0.452 |
| | | | Leaves | Direct | | | | ● | | |
| | | | Leaves | Direct | | | | ● | | |
| Moraceae | <i>Artocarpus altilis</i> (Parkinson) Fosberg | <i>Sukun</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Moringaceae | <i>Moringa oleifera</i> Lam. | <i>Kelor</i> | Leaves | Direct | | | | ● | 0.007 | 0.023 |
| Musaceae | <i>Musa x paradisiaca</i> L. | <i>Pisang</i> | Leaves | Direct | | | | ● | 0.015 | 0.214 |
| | | | Leaves | Direct | | | | ● | | |
| Myrtaceae | <i>Psidium guajava</i> L. | <i>Jambu kluthuk</i> | Leaves | Direct | | | | ● | 0.007 | 0.031 |
| Papilionaceae | <i>Derris elliptica</i> (Wall.) Benth. | <i>Jenu</i> | Leaves | Direct | | | | ● | 0.007 | 0.015 |
| Poaceae | <i>Zea mays</i> L. | <i>Jagung</i> | Leaves | Direct | | | | ● | 0.015 | 0.023 |
| | | | Cob | Dried | | | | ● | | |

| | | | | | | | |
|------------------|------------------------------------------------------|-------------------------|--------|--------|---|-------|-------|
| Poaceae | <i>Cenchrus purpureus</i> (Schumach.) Morrone | <i>Pasp</i> | Leaves | Direct | ● | 0.015 | 0.325 |
| | | | Leaves | Direct | ● | | |
| Poaceae | <i>Ischaemum rugosum</i> var. <i>segetum</i> Salisb. | <i>Blembem</i> | Leaves | Direct | ● | 0.007 | 0.015 |
| Poaceae | <i>Oryza sativa</i> L. | <i>Damen</i> | Leaves | Direct | ● | 0.007 | 0.047 |
| Poaceae | <i>Digitaria ciliaris</i> Retz. | <i>Suket</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Poaceae | <i>Echinochloa colonum</i> (L.) Link | <i>Ijon</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Poaceae | <i>Saccharum officinarum</i> L. | <i>Tebu</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Poaceae | <i>Pennisetum purpureum</i> Schumach | <i>Sulanjana</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Poaceae | <i>Paspalum conjugatum</i> P.J.Bergius | <i>Ijon</i> | Leaves | Direct | ● | 0.007 | 0.079 |
| Poaceae | <i>Oplismenus hirtellus</i> (L.) P. Beauv | <i>Rumput keranjang</i> | Leaves | Direct | ● | 0.007 | 0.015 |
| Polygonaceae | <i>Polygonum chinense</i> L. | <i>Madhusoleng</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Polypodiaceae | <i>Diplazium esculentum</i> Swartz | <i>Pakis</i> | Leaves | Direct | ● | 0.007 | 0.015 |
| Rubiaceae | <i>Coffea arabica</i> L. | <i>Kopi/sampang</i> | Leaves | Direct | ● | 0.007 | 0.023 |
| Rubiaceae | <i>Diodia virginiana</i> L. | <i>Ijon</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Rutaceae | <i>Citrus sinensis</i> (L.) Osbeck | <i>Jeruk</i> | Leaves | Direct | ● | 0.007 | 0.023 |
| Sapotaceae | <i>Manilkara zapota</i> (L.) P. Royen | <i>Sawo</i> | Leaves | Direct | ● | 0.007 | 0.015 |
| | | | Fruit | Direct | ● | | |
| Tectariaceae | <i>Tectaria dissecta</i> (G.Forst.) Lellinger | <i>Pakis</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Thelypteridaceae | <i>Thelypteris</i> sp. | <i>Pakis</i> | Leaves | Direct | ● | 0.007 | 0.015 |
| Urticaceae | <i>Pipturus albidus</i> (Hook. & Arn.) A. Gray | <i>Terudang</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Urticaceae | <i>Pilea melastomoides</i> (Poir.) Bl. | <i>Poh-pohan</i> | Leaves | Direct | ● | 0.007 | 0.023 |
| Verbenaceae | <i>Tectona grandis</i> L.f. | <i>Kebek</i> | Leaves | Direct | ● | 0.007 | 0.023 |
| | | | Fruit | Direct | ● | 0.007 | 0.023 |
| Verbenaceae | <i>Stachytarpheta jamaicensis</i> (L.) Vahl | <i>Pecut kuda</i> | Leaves | Direct | ● | 0.007 | 0.007 |
| Zingiberaceae | <i>Zingiber officinale</i> Rosc. | <i>Jahe</i> | Fruit | Direct | ● | 0.007 | 0.007 |
| Zingiberaceae | <i>Curcuma longa</i> L. | <i>Kunyit</i> | Fruit | Direct | ● | 0.007 | 0.007 |

Note: The benefits of livestock feed are: 1: Supplement, 2: Medicine, 3: Food, 4: Mixture. ●: Present

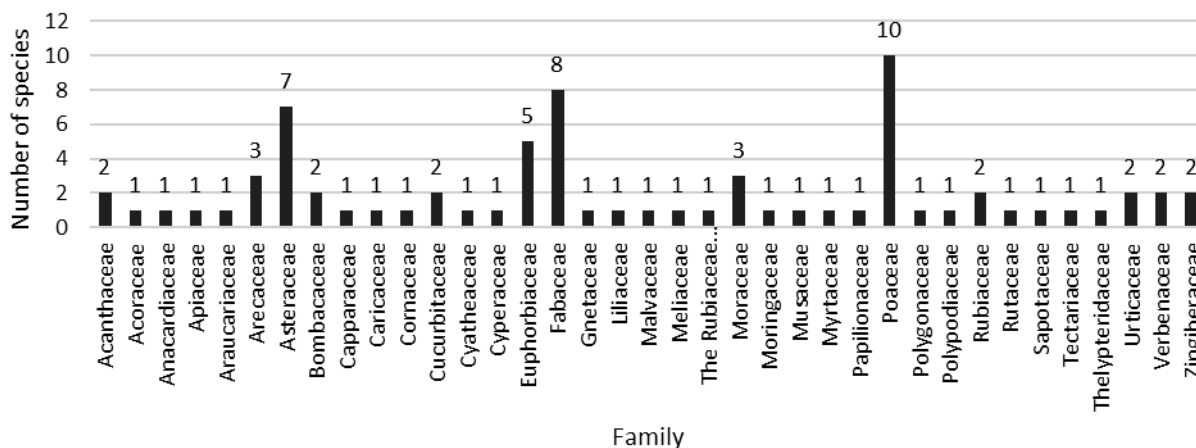


Figure 3. Number of species per family of animal feed plants in Kalibawang Sub-district, Wonosobo, Central Java, Indonesia

The Moraceae family includes three species namely *Artocarpus altilis*, *Artocarpus heterophyllus*, and *Ficus lyrata*. The Areaceae family include three species namely *Agathis dammara*, *C. nucifera*, and *Johannesteijsmannia altifrons*. There are seven families represented by two species, the The Rubiaceae family includes two species namely *Coffea arabica* (also known as kopi/sampang) and *Diodia virginiana*. The Acanthaceae family includes the species *Asystasia gangetica* and *Clinacanthus nutans*. The Bombacaceae family includes *Ceiba pentandra* and *Durio zibethinus*. The Cucurbitaceae family includes *Citrullus lanatus* and *Momordica charantia*. The species *Curcuma longa* and *Zingiber officinale* belong to the Zingiberaceae family. The Urticaceae family includes *Pipturus albidus*

and *Pilea melastomoides*. The final family represented by two species is the Verbenaceae family, which includes *Stachytarpheta jamaicensis* and *Tectona grandis*.

The data indicates that the Fabaceae and Poaceae families are the most prevalent in livestock feed. The Fabaceae family, commonly referred to as Leguminosae, is acknowledged as the legume family of plants. The Fabaceae family is positioned third in terms of plant species diversity, encompassing around 751 genera and 19,000 species. The Fabaceae family is abundant in protein and micronutrients (Asfaw and Abebe 2021). When utilized appropriately, plants from the Fabaceae family can provide a significant protein source for animals (Mabeza et al. 2018).



Figure 4. Some livestock feed plants in Kalibawang Sub-district, Wonosobo, Central Java, Indonesia. A. *Blembem* leaves (*Ischaemum rugosum* var. *segetum*); B. *Krompolan* leaves (*Asystasia gangetica*); C. *Wiledah* leaves (*Ficus lyrata*); D. *Kebek* leaves (*Tectona grandis*); E. *Melinjo* leaves (*Gnetum gnemon*); F. *Calliandra* leaves (*Calliandra calothyrsus*); G. *Sulanjana* leaves (*Pennisetum purpureum*); H. Cassava peel (*Manihot esculenta*)

The Poaceae family is positioned fifth in terms of species count. It comprises around 10,000 species that can be employed for various economic and medicinal applications in humans (Fatima et al. 2018). The family occupies a significant role among plant families owing to its diverse applications for humans, including food, feed, medicine, and industrial uses. Significant crops for human consumption in this family encompass soft wheat, corn, and rice, among various others. The significance of plants from the Poaceae family in livestock feed is well-documented (Baranovsky et al. 2019).

Utilizing plant species diversity data, UV (Use Value) and RFC (Relative Frequency of Citation) values offer significant insights into the utility and societal recognition of specific plants. This study indicates that *G. sepium* possesses a UV value of 0.015 and an RFC of 0.126. This indicates that this plant serves multiple purposes within the community and enjoys significant recognition. *M. esculenta* exhibited comparable UV and RFC values of 0.015 and 0.269, respectively. This suggests that cassava/*bodin* is a versatile plant with numerous applications, frequently referenced in the daily lives of local communities. This underscores the significance of cassava in both practical applications and indigenous understanding.

Conversely, *C. arabica* exhibited marginally lower values, recording a UV of 0.007 and an RFC of 0.023. While coffee is a widely recognized and utilized crop, its comparatively lower UV value indicates that its applications

may not be as varied as those of other crops with higher UV values. A comparable observation can be noted for *C. nucifera*, which likewise exhibits a UV value of 0.007. Nonetheless, coconut demonstrates more specialized applications in comparison to other crops, even though it is broadly acknowledged and employed.

In general, plants exhibiting elevated UV and RFC values, such as *G. sepium* and *M. esculenta*, are associated with a greater range of applications and are well-regarded within the community. In the meantime, species like *C. arabica* and *C. nucifera* are frequently referenced as sources, although their application tends to be more restricted within local contexts. A diagram illustrating a comparison of these values can effectively demonstrate the significance of these plants in communities' lives.

Plant for medicinal purposes on cattle

Fifteen species of plants have been identified as having medicinal properties for the treatment of diseases in livestock (Table 3). In Indonesia, the Arecaceae family has been extensively utilized by local communities, as nearly all parts of the plant serve distinct purposes, including applications in traditional medicine. The Zingiberaceae family includes over 1,300 species that originate from tropical Asia and are commonly found in Indonesia, thanks to the region's favorable climate. Plants from this family are well-known for their unique aromatic characteristics

and significant application in traditional medicine (Teusiit et al. 2024).

The Malvaceae family includes 78 genera and over 1,000 species, predominantly found in South America, with a presence in nearly all regions except for extremely cold areas. Members of this family are categorized as herbs, distinguished by their alternate leaf arrangement, palmate venation, and the presence of stipules. Fabaceae, also referred to as Leguminosae, is a flowering plant family that holds considerable economic importance and possesses medicinal properties advantageous for the health of both humans and livestock (Erarslan and Koçyiğit 2019).

Moraceae is found in tropical and subtropical regions and holds significant economic value as a source of food, timber, and medicine. A bibliographic review indicates that this family encompasses a variety of secondary metabolites, including flavonoids, tannins, phytosterols, and alkaloids, which exhibit properties associated with anti-inflammatory, antimicrobial, and antioxidant effects (Basnett et al. 2023). The Caricaceae family, which includes 30 species across four genera, is cultivated not only for its fruits but also possesses therapeutic potential for addressing digestive disorders, skin issues, and inflammatory conditions (Yadav et al. 2022).

Poaceae, commonly known as the grass family, ranks as the fifth-largest flowering plant family, encompassing around 50 sub-family 660 genera, and 10,000 species. A number of species from this family are employed in the treatment of hypertension, diabetes, inflammation, helminthic

infections, and gastric ulcers, and they function as diuretics and antioxidants. The Euphorbiaceae family, commonly referred to as the spurge family, exhibits a broad distribution and holds considerable promise for medicinal uses in both tropical and non-tropical areas (Fatima et al. 2018).

Papilionaceae, a deciduous rainforest tree, and Musaceae, both have a longstanding history in traditional medicine, utilized since ancient times. Different plant-parts of Papilionaceae, such as leaves, wood, bark, and seeds, along with its flour, have been utilized to tackle a variety of health concerns. Musaceae has become a focal point for the pharmaceutical industry owing to its wide range of health benefits. These encompass anti-diabetic, anti-ulcer, antioxidant, and wound healing properties, along with several additional benefits. Phytochemical compounds including alkaloids, steroids, glycosides, and flavonoids are essential to its pharmacological activities (Tchamadeu et al. 2017).

The Meliaceae family, consisting of 740 species across 58 genera, has shown considerable promise in the health sector due to its rich array of active compounds, which include alkaloids, diterpenoids, flavaglines, lignans, limonoids, sesquiterpenoids, and triterpenoids. These compounds demonstrate a range of advantageous biological activities, including anti-cancer, anti-inflammatory, antiviral, antimicrobial, and antidiabetic effects. The Meliaceae family presents a valuable opportunity for the advancement of innovative pharmaceuticals, fostering optimism within the industry (Riyadi et al. 2023).

Table 3. Utilization of plants for medicine and IAR value

| Family | Local name | Species name | Treating a disease | Part | Processed | IAR |
|----------------|-----------------------|-----------------------------------------------------|--------------------|--------|------------|------|
| Arecaceae | <i>Coconut</i> | <i>Cocos nucifera</i> L. | Diarrhea | Leaves | Drunk | 0 |
| Caricaceae | <i>Pepaya</i> | <i>Carica papaya</i> L. | Diarrhea | Leaves | For mixing | 0.81 |
| | | | Skin | Leaves | Rubbed | |
| | | | Tongue bumps | Leaves | Rubbed | |
| Euphorbiaceae | <i>Singkong/budin</i> | <i>Manihot esculenta</i> Crantz | Appetite | Leaves | For mixing | 0.93 |
| Fabaceae | <i>Sengon laut</i> | <i>Falcataria moluccana</i> (Miq.) Barneby & Grimes | Skin | Leaves | Rubbed | 0 |
| Fabaceae | <i>Laraside</i> | <i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp. | Skin | Leaves | Rubbed | 0.86 |
| Malvaceae | <i>Wora-wari</i> | <i>Hibiscus rosa-sinensis</i> L. | Skin | Leaves | Rubbed | 0 |
| Meliaceae | <i>Mahoni</i> | <i>Swietenia mahagoni</i> (L.) Jacq. | Tongue bumps | Leaves | Rubbed | 0.57 |
| Menispermaceae | <i>Brotowali</i> | <i>Tinospora cordifolia</i> (Willd.) Hook.f. | Skin | Leaves | Rubbed | 0.62 |
| Moraceae | <i>Nangka</i> | <i>Artocarpus heterophyllus</i> Lam | Skin | Leaves | Rubbed | 0.94 |
| | | | Diarrhea | Leaves | For mixing | |
| Musaceae | <i>Pisang</i> | <i>Musa x paradisiaca</i> L. | Appetite | Leaves | For mixing | 0.88 |
| Papilionaceae | <i>Jenu</i> | <i>Derris elliptica</i> (Wall.) Benth. | Skin | Leaves | Rubbed | 0 |
| Poaceae | <i>Paspa</i> | <i>Cenchrus purpureus</i> (Schumach.) Morrone | Skin | Leaves | Rubbed | 0.92 |
| Zingiberaceae | <i>Tebu</i> | <i>Saccharum officinarum</i> L. | Appetite | Fruit | For mixing | 0 |
| Zingiberaceae | <i>Jahe</i> | <i>Zingiber officinale</i> Rosc. | Appetite | Fruit | For mixing | 0 |
| Zingiberaceae | <i>Kunyit</i> | <i>Curcuma longa</i> L. | Appetite | Leaves | For mixing | 0 |

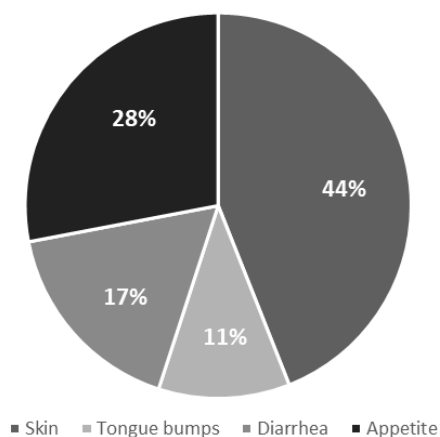


Figure 5. Number of species and their utilization

Disease cure

In our study, livestock feed plant are categorized into four groups according to their advantages. Initially, the feed utilized as a supplement serves to enhance the nutritional quality of livestock. Secondly, food that serves a medicinal purpose includes bioactive compounds that can aid in the prevention or treatment of diseases and has been utilized by local communities as a form of traditional medicine for an extended period. Third, this feed serves solely as a staple food without providing any additional benefits. Ultimately, there exists a feed that serves as a mixture, specifically a combination of various types of feed to achieve more optimal benefits. Ultimately, there exists a feed that serves as a mixture, specifically a combination of various types of feed to achieve more optimal benefits. We identified a total of 12 families exhibiting significant pharmacological potential. In the classification of diseases, four primary categories were commonly observed in livestock, with the following percentage distribution: skin diseases at 44%, appetite issues at 28%, diarrhea at 17%, and tongue nodules at 11% (Figure 5). The primary application of medicinal plants by residents is for the treatment of skin diseases in livestock, accounting for 44%. This includes families such as Caricaceae, Fabaceae, Malvaceae, Menispermaceae, Moraceae, Papilionaceae, Poaceae, which are utilized in addressing skin ailments in livestock. The presence of bioactive compounds in these families, which act as antimicrobial and anti-inflammatory agents, as well as stimulants for skin cell regeneration, indicates their promising potential in pharmacological applications (Khan et al. 2017).

Furthermore, 28% of medicinal plants are utilized by residents for first aid in cases of bloating or appetite loss in their livestock. The combination of antimicrobial, anti-inflammatory, and carminative properties of the plants is essential in addressing bloating in animals. Bioactive compounds derived from plants in the Euphorbiaceae, Musaceae, and Zingiberaceae families function by alleviating inflammation, safeguarding the mucous membrane, regulating intestinal motility, and minimizing gas, thus aiding in the normalization of digestive function and expediting recovery in animals suffering from bloating (Prabowo et al. 2023).

Residents utilize approximately 17% of medicinal plants for the treatment of diarrhea in livestock, particularly those from the Arecaceae, Caricaceae, and Moraceae families, due to their bioactive compounds that promote digestive health. Coconut leaves from the Arecaceae family possess astringent properties that assist in reducing excessive intestinal secretions while simultaneously balancing electrolyte levels, which is crucial for preventing dehydration resulting from diarrhea. Papaya leaves, belonging to the Caricaceae family, are known to contain the enzyme papain, which exhibits anti-inflammatory properties and aids in digestion. As a result, they are effective in alleviating diarrhea by normalizing intestinal activity. Furthermore, jackfruit leaves belonging to the Moraceae family contain natural antimicrobial compounds, including flavonoids, which are effective in addressing pathogens responsible for intestinal infections while also promoting the regeneration of damaged digestive tissues (Ermis et al. 2021).

Additionally, 11% of the utilization of medicinal plants is focused on treating tongue nodules in livestock. Papaya leaves from the Caricaceae family and mahogany leaves from the Meliaceae family have shown effective therapeutic properties for this condition. Among these medicinal plants, papaya leaves are known to contain papain enzymes, which have the ability to combat bacterial infections and promote tissue regeneration, thus alleviating inflammation and swelling of the tongue (Nasri et al. 2022). Mahogany leaves contain a high concentration of flavonoids and alkaloids, which possess antimicrobial and anti-inflammatory properties. These compounds contribute to the inhibition of pathogen growth and the alleviation of irritation in affected regions. Incorporating these leaves into livestock feed or engaging in direct contact with the source of the disease, such as by rubbing the affected area, is essential for farmers when their animals exhibit unusual symptoms.

IAR of medicinal plant for cattle

The calculation results indicate that the species exhibiting the highest Informant Agreement Ratio (IAR) is *A. heterophyllus* (Jackfruit), which has a value of 0.94 (Table 3). This value demonstrates that jackfruit offers medicinal advantages for livestock. A value of the IAR (Informant Agreement Ratio) that approaches 1 indicates a greater level of consensus within the community. The medicinal component of the Jackfruit is derived from its leaves. Many people assert that Jackfruit has the potential to address diarrhea and skin ailments in livestock. The prevalence of jackfruit trees in the area is a contributing factor to the utilization of this plant in medicinal applications.

Conversely, there are seven species that hold a value of 0. This value reflects a discrepancy in the responses provided by the informants. The species listed are *C. longa*, *C. nucifera*, *D. elliptica*, *F. moluccana*, *Hibiscus rosasinensis*, *S. officinarum*, *Z. officinale*. The use of these plants as feed for livestock is limited, with merely 1 to 2 people among 126 informants identifying them as medicinal for livestock.

Table 4. Disease categories index by ICF (Informant Consensus Factor)

| Type of disease | ICF |
|-----------------|-------|
| Skin | 0.416 |
| Tongue bumps | 0 |
| Diarrhea | 0.666 |
| Appetite | 0.2 |

ICF of the plant using on disease treatment by cattle community

The data presented in Table 4 indicates that the ICF (Informant Consensus Factor) value, utilized to assess the consistency of local knowledge, is highest for diarrhea, recorded at 0.666. This indicates a strong consensus among informants concerning the utilization of plant species for the treatment of diarrhea. The strong consensus suggests that the plant species utilized have been traditionally recognized for their effectiveness in treating diarrhea, as multiple informants referenced the same plant. The lowest ICF (Informant Consensus Factor) value recorded was 0 for tongue pustule disease, signifying that informants uniformly reported no plant species for the treatment of this ailment. This may result from various factors, including insufficient knowledge or experience regarding effective treatments for tongue pustules, or it is possible that traditional medicine does not frequently address this ailment. Another ailment that exhibits a low Informant Consensus Factor (ICF) value is appetite, recorded at 0.2. This indicates that there is considerable variation in the application of plants for addressing appetite issues, accompanied by a relatively low level of agreement among informants. In summary, elevated ICF (Informant Consensus Factor) values indicate a greater consensus on the application of specific plant species for particular medical conditions. Conversely, low values indicate a deficiency in consensus or potentially greater variability in traditional treatment methods.

In conclusion, the 90 species of plants documented in Kalibawang Sub-district, Wonosobo, Central Java, were derived from 37 families. Fabaceae, Euphorbiaceae, Asteraceae, Poaceae, and Moraceae are among the most frequently encountered families. These families contain numerous species that have the potential to be used as combinations of feed, medication, and livestock supplements. The highest UV and RFC values were exhibited by *G. sepium* and *M. esculenta*, which suggests that they are highly popular among the community and have a diverse utility, according to the analysis. *Artocarpus heterophyllus* demonstrated the maximum IAR (Informant Agreement Ratio) value of 0.94, indicating a robust consensus among community members regarding its medicinal advantages for livestock. The gastroenteritis treatment exhibited the highest ICF (Informant Consensus Factor) value, with a value of 0.666, indicating a firm consensus regarding the efficacy of plants in treating this condition. Seven plant species with IAR (Informant Agreement Ratio) values of 0 and tongue nodule disease with an ICF (Informant Consensus Factor) of 0 suggest that informants have minimal levels of agreement regarding the medicinal use of these plants.

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REFERENCES

- Agus A, Widi TSM. 2018. Current situation and future prospects for beef cattle production in Indonesia - A review. *Asian- Australasian J Anim Sci* 31 (7): 976-983. DOI: 10.5713/ajas.18.0233.
- Aiswaryalakshmi AR, Raj AK, Sunil AM, Carmel APT, Suwethaasri D, Bharathi KM, Niranjan MA. 2025. A Review on *Calliandra calothyrsus*: A potential fodder trees species. *Intl J Res Agron* 8 (1): 423-430. DOI: 10.33545/2618060X.2025.v8.i1f.2439.
- Amalyadi R. 2024. Keragaman hayati aneka hijauan pakan ternak (Studi kasus di BBIB Singosari Kabupaten Malang). *Jurnal Ternak Tropis* 1 (1): 18-22. [Indonesian]
- Asfaw MM, Abebe FB. 2021. Traditional medicinal plant species belonging to Fabaceae family in Ethiopia: A systematic review. *Intl J Plant Biol* 12 (1): 8473. DOI: 10.4081/pb.2021.8473.
- Bagno OA, Prokhorov ON, Shevchenko SA, Shevchenko AI, Dyadichkina TV. 2018. Use of phytobiotics in farm animal feeding. *Agric Biol* 53 (4): 687-697. DOI: 10.15389/agrobiol.2018.4.687eng.
- Baranovsky BO, Karmyzova LO, Ivanko IA. 2019. Fodder value of Poaceae Family species in the steppe zone of Ukraine. Current problems of agrarian industry in Ukraine. Oles Honchar Dnipro National University, Vancouver, Canada. DOI: 10.15421/511905.
- Basnett D, Banarjee M, Chowdhury SK. 2023. A review on medicinal values and pharmacological importance of Moraceae. *Plant Sci Today* 10 (sp2): 226-234. DOI: 10.14719/pst.2385.
- Central Bureau of Statistics Wonosobo District. 2023. Lots of rain day according to sub-district (rainy day), 2020-2022. <https://wonosobokab.bps.go.id/id/statistics-table/2/MjExIzI=/banyaknya-hari-hujan-menurut-kecamatan.html>. [Indonesian]
- Chaachouay N, Benkhniq O, Fadli M, El Ibaoui H, Zidane L. 2019. Ethnobotanical and ethnopharmacological studies of medicinal and aromatic plants used in the treatment of metabolic diseases in the Moroccan Rif. *Heliyon* 5 (10): e02191. DOI: 10.1016/j.heliyon.2019.e02191.
- Erarslan ZB, Koçyiğit M. 2019. The important taxonomic characteristics of the family Malvaceae and the herbarium specimens in ISTE. *Turkish J Biosci Collect* 3 (1): 1-7. DOI: 10.26650/tjbc.20190001.
- Ermis T, Hasanah U, Rizky CM, Nurifa N, Nasution MF. 2021. Potential jackfruit and guava in healing of diarrhea by the Sosa Housing community, Padang Lawas, North Sumatra. *J Nat Sci* 2 (2): 79-84. DOI: 10.34007/JONAS.V2I2.127.
- Fatima I, Kanwal S, Mahmood T. 2018. Evaluation of biological potential of selected species of family Poaceae from Bahawalpur, Pakistan. *BMC Complement Altern Med* 18 (1): 27. DOI: 10.1186/s12906-018-2092-1.
- Hakim FR, Arifin M, Rianto E. 2019. Growth pattern and productivity of female Wonosobo sheep in Wonosobo District, Central Java Province, Indonesia. *IOP Conf Ser: Earth Environ Sci* 247: 012044. DOI: 10.1088/1755-1315/247/1/012044.
- Hardiko, Wahyuningsih NE, Adi MS. 2016. Studi epidemiologi kejadian tuberculosis paru pada pasien HIV di Kabupaten Wonosobo Tahun 2014. *Jurnal Kesehatan Lingkungan Indonesia* 14 (1): 27-34. DOI: 10.14710/jkli.14.1.27%20-%2034. [Indonesian]
- Herdananta BY, Ibriza NM, Wardha'adlina WA, Sulon MN, Sugiyarto S, Budiharta S, Setyawan AD. 2024. Assessing social capital in community forest management in Kalibawang Sub-district, Wonosobo District, Central Java, Indonesia. *Asian J Ethnobiol* 7 (1): 50-60. DOI: 10.13057/asianjethnobiol/y070106.

- Indey S, Saragih EW, Santoso B. 2021. Karakteristik peternak sapi di sentra produksi ternak potong di Kabupaten Sorong. *Jurnal Ilmu Peternakan dan Veteriner Tropis* 11 (3): 245. DOI: DOI: 10.46549/jipvet.v11i3.257. [Indonesian]
- Khan IM, Rahman R, Mushtaq A, Rezgui M. 2017. *Hibiscus rosa-sinensis* L. (Malvaceae): Distribution, chemistry and uses. *Intl J Chem Biochem Sci* 12: 147-151.
- Knott E, Rao AH, Summers K, Teeger C. 2022. Interviews in the social sciences. *Nat Rev Methods Primers* 2: 73. DOI: 10.1038/s43586-022-00150-6.
- Kuralkar P, Kuralkar SV. 2021. Role of herbal products in animal production - An updated review. *J Ethnopharmacol* 278: 114246. DOI: 10.1016/j.jep.2021.114246.
- Kurniawati ET, Trisna. 2019. Analysis of factors affecting gender equality in layer chicken farming in Kambangan Village, Tumpang Sub-district, Malang District. [Doctoral Dissertation]. Universitas Brawijaya, Malang. [Indonesian]
- Mabeza G, Masama E, Mpofu IDT. 2018. Evaluation of browse legume diets (*Acacia angustissima*, *Leucaena trichandra* and *Calliandra calothyrsus*) on feed intake and growth of goats. *Universal J Agric Res* 5 (6): 350-354. DOI: 10.13189/ujar.2017.050606.
- Maharana BR, Tewari AK, Saravanan BC, Sudhakar NR. 2016. Important hemoprotozoan diseases of livestock: Challenges in current diagnostics and therapeutics: An update. *Vet World* 9 (5): 487-495. DOI: 10.14202/vetworld.2016.487-495.
- Mau DT, Naibili MJE. 2022. An ethnographic study of the concept of COVID-19 in the Belu Community beliefs. *Jurnal Aisyah: Jurnal Ilmu Kesehatan* 7 (3): 787-802. DOI: 10.30604/jika.v7i3.1103.
- May D, Arancibia S, Behrendt K, Adams J. 2019. Preventing young farmers from leaving the farms: Investigating the effectiveness of the young farmer payment using a behavioural approach. *Land Use Policy* 82: 317-327. DOI: 10.1016/j.landusepol.2018.12.019.
- Mirzaei-Aghsaghali A. 2012. Importance of medical herbs in animal feeding: A review. *Ann Biol Res* 3 (9): 918-923
- Nadhira VF, Sumarti T. 2017. Analisis gender dalam usaha ternak dan hubungannya dengan pendapatan rumahtangga peternak sapi perah. *Jurnal Sains Komunikasi dan Pengembangan Masyarakat [JSKPM]* 1 (2): 129-142. DOI: 10.29244/jskpm.1.2.129-142. [Indonesian]
- Nasri N, Kaban VE, Gurning K, Syahputra HD, Satria D. 2022. Antibacterial activity of ethanol extract of papaya leaf (*Carica papaya* Linn.) against *Pseudomonas aeruginosa* bacteria. *INSOLOGI: Jurnal Sains dan Teknologi* 1 (3): 252-259. DOI: 10.55123/insologi.v1i3.438. [Indonesian]
- Njurumana GN, Ginoga KL, Octavia D. 2020. Sustaining farmers livelihoods through community forestry in Sikka, East Nusa Tenggara, Indonesia. *Biodiversitas* 21 (8): 3786-3796. DOI: 10.13057/biodiv/d210846.
- Nurdiyansah I, Suherman D, Putranto HD. 2020. Hubungan karakteristik peternak dengan skala kepemilikan sapi perah di Kecamatan Kabawetan Kabupaten Kepahiang. *Buletin Peternakan Tropis* 1 (2): 64-74. DOI: DOI: 10.31186/bpt.1.2.64-74. [Indonesian]
- Nurlaely TF. 2022. Study of Geomorphouts of Geolistrical Data on Groundwater Potential in Kertek, Wonosobo. [Thesis]. Universitas Gadjah Mada, Yogyakarta. [Indonesian]
- Prabowo SA, Kartini PR, Bhagawan WS. 2023. Ethnopharmacological study of medicinal plants of the Zingiberaceae tribe on the Southern Slope of Mount Lawu, East Java. *Prosiding Seminar Nasional Program Studi Farmasi UNIPMA (SNAPFARMA)*: 168-177. [Indonesian]
- Riyadi SA, Naini AA, Supratman U. 2023. Sesquiterpenoids from Meliaceae family and their biological activities. *Molecules* 28 (12): 4874. DOI: 10.3390/molecules28124874.
- Sumarti MCT, Maria Fuah A. 2015. Women, gender equality in livestock development: Case study from Papua and Central Java. *Food and Agricultural Organizations of the United Nations*. <https://agris.fao.org/search/en/providers/122323/records/647472fb2d3f560f80ab49b1>.
- Tardío J, Pardo-de-Santayana M. 2008. Cultural importance indices: A comparative analysis based on the useful wild plants of Southern Cantabria (Northern Spain). *Econ Bot* 62: 24-39. DOI: 10.1007/s12231-007-9004-5.
- Tchamadeu MC, Dzeufiet PD, Blaes N, Girolami JP, Kamtchoung P, Dimo T. 2017. Antidiabetic effects of aqueous and dichloromethane/methanol stem bark extracts of *Pterocarpus soyauxii* Taub (Papilionaceae) on streptozotocin-induced diabetic rats. *Pharmacognosy Res* 9 (1): 80-86. DOI: 10.1016/j.jep.2010.09.035.
- Tenisanna V, Kasim K. 2021. Livestock farming income analysis of farm households in Indonesia. *IOP Conf Ser: Earth Environ Sci* 788: 012218. DOI: 10.1088/1755-1315/788/1/012218.
- Teusiit YN, Tuhumuri E, Sahertian DE. 2024. Jenis-jenis tumbuhan anggota famili Arecaceae di Desa Soya Kota Ambon dan pemanfaatannya. *Biofaal J* 5 (1): 026-033. DOI: 10.30598/biofaal.v5i1pp026-033. [Indonesian]
- Trotter RT, Logan MH. 2019. Informant consensus: A new approach for identifying potentially effective medicinal plants. *Plants and indigenous medicine and diet* (pp. 91-112). Routledge.
- Widarni NAA, Astuti A, Andarwati S, Kusumastuti TA, Putra ARS. 2020. Determinants of the mixed crop and livestock farming practice among smallholder farmers in Magelang Regency, Central Java Province. *IOP Conf Ser: Earth Environ Sci* 454 (1): 012010. DOI: 10.1088/1755-1315/454/1/012010.
- Yadav S, Nair N, Biharee A, Prathap VM, Majeed J. 2022. Updated ethnobotanical notes, phytochemistry and phytopharmacology of plants belonging to the genus *Morus* (Family: Moraceae). *Phytomed Plus* 2 (1): 100120. DOI: 10.1016/j.phyplu.2021.100120.