

Improved Knowledge of Equine Parasitic Diseases and Feed Management

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Abstract

This community service activity aimed to provide outreach through knowledge about feeding management and parasitic diseases in horses. Community service activities by the TAP&D (Tropical Animal Production and Disease) Research Group were held at the Bendi Horse Sukoharjo community group on June 25, 2023, in Sukoharjo Regency, Central Java. Data were collected using interviews and observation. All data obtained were then analyzed descriptively. The horses used are descendants of Banyuwangi horses. This bendi is used by the owner to attract or transport tourists who come to Sukoharjo Square every Monday to Sunday. The horses used are generally small, and some are even skinny. After analyzing horse faeces in the laboratory at the start of the pre-survey, it was found that 100% of the bendi horses in the association were infected with worms. Diseases in horses can also be caused by poor feed management. So, the solution is to provide education on maintaining good horse practices, especially feed management. The next problem is that the feed given to horses usually consists of long grass, so the horse doesn't eat all the parts. The solution we provide is a grass chopper. After the service activities were carried out, farmers increased their knowledge regarding parasitic diseases in horses and good feed management. This service activity concludes that horse farmers have increased knowledge about good horse care and about horse diseases.

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INTRODUCTION

Horses are animals commonly found in the community. The use of horses has been known as working livestock, bendi pullers or for riding horses or racehorses. Horses that can almost be found daily are bending horses at tourist sites in the Greater Solo area, including Sukoharjo Square (Figure 1).



Figure 1 Bendi horses at Sukoharjo square

After the COVID-19 pandemic, tourism enthusiasm has stretched again, including bendi or andong have started operating again because it cannot be denied that the impact of the COVID-19 pandemic has reduced the income of bendi pullers will affect their maintenance patterns ([Elfado et al. 2021](#)). Horses can also be used as a source of meat for the community ([Kadir, 2011](#); [Sihite et al., 2018](#)). However, horse meat is less popular than beef or goat meat. Horses are more popular as pullers of Andong or bending.

One bendi in Solo Raya is in Sukoharjo Square, namely the Sukoharjo Bendi Horse Association. This association has received attention from the Department of Transportation and Tourism but never from the Department or universities regarding livestock. The success of the horse livestock development business

is largely determined by its maintenance management (feed, stables, breeding, and health). Poor maintenance management can affect the condition. Health, one of which horses are easily infected with the disease. Diseases in horses can be divided into infectious and non-infectious diseases. Research conducted by Wenda et al. (2020) stated that 45% of horses experienced helminthiasis, 32% of horses were snotty, 14% of horses experienced hives, and 8% of digestive system diseases (diarrhoea and colic). Based on this data, worm infestation in horses is the most common disease.

Horses can become infected with helminths by eating feed contaminated with infective eggs or larvae. Strongyle worms (*Strongylus* spp., Cyathostomes), Ascarid, *Oxyuris equi* (pinworms), *Gasterophilus* spp., *Metastrongylus* spp. (lungworms), *Gastrodiscus* sp., *Pseudodiscus* sp. (leafworms), *Anoplocephala* spp. and *Paranoplocephala* sp. are worm species that can infect horses ([Shatyaayupranathasari et al., 2021](#)). Infection with multiple helminth species (92.28%) in horses is more common than infection with a single parasite (7.72%) ([Lem et al., 2012](#)).

Parasite infestation in livestock can lead to impaired health and physiological conditions and can even lead to death when the infection progresses. Horses infected with worms may show clinical emaciation symptoms or a decrease in Body Condition Score (BCS) due to a disturbance in intestinal microflora balance and nutrient absorption. Implementation of health management such as biosecurity, vaccination, and routine parasite treatment (anthelmintic administration) is necessary to reduce transmission and risk due to worm infections ([Dominguez et al., 2015](#)). This service activity aims to determine the level of knowledge of bendi horse breeders in Sukoharjo about parasitic diseases in horse livestock and good feed management. The benefits of this service activity are that it can provide knowledge transfer to breeders, facilitate the work of horse breeders, and ultimately increase horse productivity and the income of horse breeders.

METHOD

These community service activities by the TAP&D (Tropical Animal Production and Disease) Research Group use the Service Learning (SL) method, with partners being the Sukoharjo bendi paguyuban group (Figure 1). Mr. Wiyono chairs this association with 16 members. Members of this association group are spread out in several areas, including the Sukoharjo sub-district, Bendosari sub-district, and Tawang Sari sub-district. This partner group holds regular meetings every 1 month to increase the sense of kinship and improve the welfare of bendi drivers (Figure 2).

The horse breed used is Banyuwangi. These horses are small in size compared to Sandel horses or other racehorses. Their owner uses them to attract or transport tourists who come to Sukoharjo Square every Monday to Sunday from 16:00 to 21:00. On Sundays, bendi horses are also employed in the morning from 6 a.m. to 11 a.m.



Figure 2 Regular meeting of sukoharjo bendi association

Partner participation in this activity requires following all activities well and practicing them. Horse faeces for parasite observation were analyzed at the Livestock Production Laboratory of the Animal Husbandry Study Program, Faculty of Agriculture, Sebelas Maret University. Faecal observations were made before and after counselling and providing horse medicines and vitamins.

Knowledge transfer activities on horse health and feed management were carried out on June 25, 2023. After the training activities are completed, the next step is writing the publication. Data from the questionnaire results before and after the implementation of the service activities were then tabulated and analyzed. The results of the statistical analysis were then translated into a report and compared with the literature in the form of a paper. Figure 3 presents the details of the implementation of the activity.

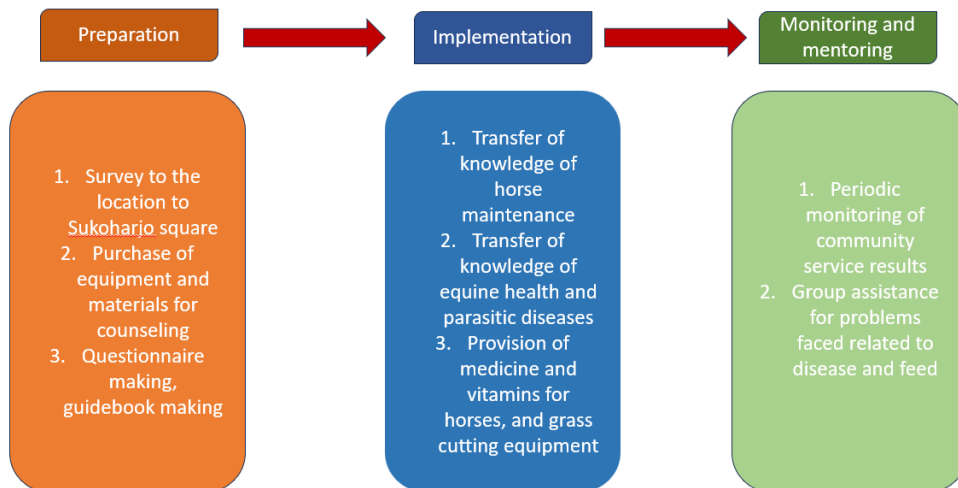


Figure 3 The Flow of activities in the bendi association in sukoharjo

RESULTS AND DISCUSSION

Community service activities are carried out on bendi horses in the Sukoharjo Bendi Association. The partners this time are the breeders or coachmen of bendi horses. Based on data obtained in the field, the age range of horse breeders is 19-60 years, which means they are in the productive age range. Of their last education, 64.28% are high school graduates. The characteristics of bendi horse breeders are presented in Table 1.

Table 1 Characteristics of bendi horse breeders in sukoharjo square

Characteristics	Breeders	(%)
Age (year)		
19-40	9	64.3
41-60	5	35.7
Gender		
Male	14	100
Female	0	0
Education		
Elementary-Middle School	5	35.7
High School	9	64.3
Ownership		
Personal	13	92.9
Rent	1	7.1

The ages of the horse breeders or bendi pullers are all within the productive age range. Productive age is when the human age can still produce goods and services, usually within the age range of 15-60 years. Bendi horse breeders in Sukoharjo are at a productive age, meaning that they still can produce or, in other words, work to earn income. The level of education of breeders will affect their mindset and willingness to develop their business, seek information, and adapt to technology. Minimum education High School is considered to understand how to get information about their livestock when facing problems, such as good feed or when their horses are sick. This is in accordance with the opinion of Yanti *et al.* (2022; 2023) that education influences farmers' decisions about their livestock problems. Most bendi horse breeders are direct owners of bendi horses; only one respondent is a special bendi horse coachman and does not own horses. This respondent only rents horses. The respondent rents a horse from a bendi horse breeder with more than one horse. According to the respondent, he does not have the capital to provide his horse and also does not have a stable to keep his horse.

Observation of the horses showed that they were emaciated (Figure 4a), with dull hair, easy hair loss, and a good appetite. Horse faeces samples were taken to check for the presence of worm eggs. Parasitic infections in horses can cause them to appear thin due to impaired food absorption. The faeces samples from Sukoharjo Square (Figure 4b) were examined in the laboratory (Figure 4c).



Figure 4 (a) The bendi horse used by the partner is skinny, (b) Fecal sampling of bendi horses, and (c) Observation of faeces samples under a microscope for worm eggs

Stool samples were examined to determine and identify worms infesting livestock through the presence of worm eggs in the faeces. Examination of faecal samples was done using a native (qualitative) test. Examining faecal samples from bendi horses in Sukoharjo

revealed eggs of Strongyle, Strongyloides, and Ascarid worms. Images of worm eggs from examining faecal samples are presented in Figure 5.

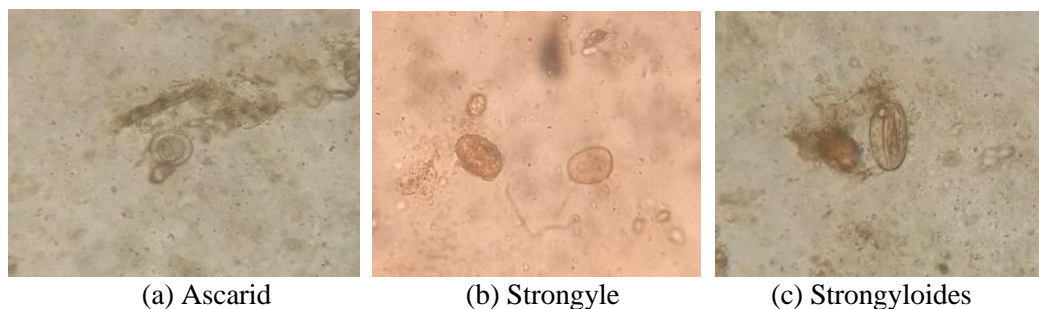


Figure 5 Observation of horse faeces under a microscope with 40× magnification containing worm eggs (a), (b), and (c)

Worm eggs in bendi horses indicate poor husbandry at horse breeders. Health and sanitation management still needs improvement so horses can grow healthy and work well. Bendi horses are workhorses, so power is the main factor in their productivity. Horse power is obtained from the feed consumed. Usually, horse breeders only provide makeshift feed without paying attention to the needs of the horse livestock.

On June 25, 2023, Focus Group Discussions, counselling on horse maintenance, and sharing knowledge about horse livestock health were carried out. Farmers enthusiastically participated in all activities (see Figure 6).



Figure 6 Photo with Sukoharjo Bendi Association during the FGD

The activities included counselling or knowledge transfer on good horse husbandry and animal welfare (Figure 7a). The Paguyuban group seemed enthusiastic about participating in the activity as evidenced by the many who asked questions during the discussion session. On that occasion, maintenance management, good feed selection, and horse health management were also conveyed. One month before the implementation of the service, horse feces had been taken and observed at the UNS animal husbandry laboratory. It was found that almost 100% of horses were infected with worm parasites. This will certainly be a problem because it can be detrimental to the productivity of the horse livestock.

This service activity was carried out, *and* solutions were shared to several problems faced by the association. Through this activity, horse breeders or bendi pullers can gain knowledge about good horse maintenance, reproduction, feed management, and health management. On this occasion, lawnmowers (Figure 7b), horse scrapers (Figure 7c), horse maintenance books and medicines (wormers) and multivitamins for horse livestock were also donated. The mower will assist horse farmers in feeding so that all can efficiently consume the feed. The horse scraper will comfort the horse and help control ectoparasites on the horse's skin.

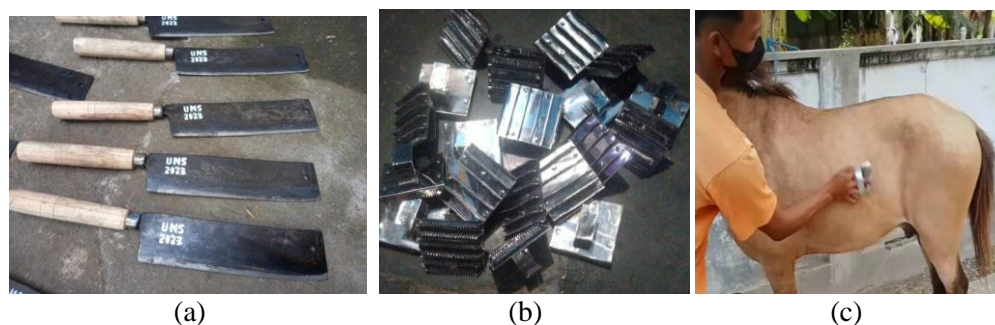


Figure 7 (a) Grass cutter or chopper, (b) Horse hair scraper or brush, and (c) partner brushing horse hair to control ectoparasites

Table 2 presents farmers' knowledge of good horse husbandry, animal welfare, and understanding of diseases.

Table 2 Improvement of horse husbandry knowledge after counselling

No.	Knowledge	Before counselling (%)	After Counselling (%)	Increase (%)
1.	Good horse maintenance	50.0	100.0	50.0
2.	Understanding the equine digestive tract	0.0	71.4	71.4
3.	Good horse feed	64.0	100.0	36.0
4.	Animal welfare	14.3	92.9	78.6
5.	Implementing animal welfare	21.4	100.0	78.6
6.	Body Condition Score	14.3	92.9	78.6
7.	Good horse health management	14.3	92.9	78.6
8.	Prevention of horse diseases	14.3	100.0	85.7
9.	Parasitic diseases	21.4	100.0	78.6
10.	Colic disease	64.3	92.9	28.6

Number of respondents: 14 people

Based on the data obtained and the processing of the questionnaire, an increase in farmers' knowledge was obtained. After participating in FGDs and gaining knowledge about horse care and health, it was found that all observed knowledge parameters had improved. Most farmers do not know how to maintain good horses and feed and do not understand animal welfare. Animal welfare, according to Indonesian Law Number 18 of 2009, is all matters relating to the physical and mental state of animals according to the size of the natural behaviour of animals that need to be applied and enforced to protect animals from any improper treatment of animals used by humans. The application of animal welfare must be comprehensive in various aspects, such as using livestock, which is related to human activities (Wahyuwardani et al., 2020).

Bendi horse breeders do not widely know body condition score commonly called BCS in horses in Sukoharjo. Through BCS, the health condition of the horse can be estimated. The BCS scale range is usually 0-5. Number 1 is the skinniest, while number 5 is the fattest. While the BCS with ideal conditions for work is 2.5-3.5.

Bendi horse breeders prevent disease in horses very simply, usually by giving traditional herbs. However, it has not been scientifically proven whether it is effective in horses and how much dosage is also unknown. Based on experience and knowledge from parents or fellow bendi horse breeders. Before counselling, farmers' knowledge of parasitic diseases in horses and colic was very low, but after counselling on equine health, their knowledge increased. Bendi horse breeders also get vitamins and dewormers from this service activity, which is expected to increase the productivity of their bendi horses. This

increase in knowledge or insight of breeders is also in line with the results of [Dewi et al. \(2023\)](#), who stated that community service activities increased the insight of breeders by 90%. [Winarso et al. \(2023\)](#) also reported that farmers' knowledge increased with service activities in training in Jember Regency's fertilizer-making.

CONCLUSION

Based on the service activities, it can be concluded that bendi horse breeders, before counselling, had low knowledge about horse maintenance and parasitic diseases. However, after counselling, the knowledge of bendi horse breeders related to horse parasite diseases, good livestock maintenance, and animal welfare increased. This service activity provides good benefits for the Sukoharjo Bendi Horse Association. Suggestions that can be given are that bendy horse breeders pay more attention to animal health and fulfil the welfare of their horses.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS STATEMENT

Conceptualization, YY and WP; methodology, YY and JR; formal analysis, AK and MC; writing preparation of the original draft, YY.

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