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Preface

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Preface

The global health crisis has occurred since the Covid-19 outbreak shocked the world for about 1.5 years. Partial and complete lockdown practiced in some countries and/or areas within a country are consequences that limit most of our regular activities. In particular to livestock-related fields, this pandemic also creates new challenges in many aspects such as food supply chain, feed availability, workers hygiene in the processing plant and foodservice, etc. At the same time, the supply of livestock and animal-based food must still be supplied every day, whatever will be. As part of our academic duty, it is our responsibility also to provide preference strategies in facing many challenges on animal production and agroecotechnology as fit with our conference theme this year. ICAPFS is the right place for us to share the latest research, viewpoints, progress, critical issues, programs, and policies to provide practical options to respond to such challenges.

The conference is the second time we present ICAPFS after the achievement of 1st ICAPFS in 2018. Unlike what we conducted four years ago, the forum is transformed offline to an online presence today. Since the covid-19 pandemic spread out to almost all world countries started last 2019, many things changed our daily activities. Somehow, the acceleration of digital technology cannot limit our academic efforts to spread the latest progress in animal science.

The 2nd International Conference on Animal Production for Food Sustainability (ICAPFS) 2021. The theme of our conference "The future challenges and strategies on animal production and agroecotechnology." We are proud to announce that this conference is held jointly organized by the Faculty of Animal Science, Universitas Andalas, and the Faculty of Animal Husbandry, Universitas Udayana. We are very grateful to partnership supports of Universitas Nusa Cendana, Universitas Mulawarman, Universitas Hasanuddin, Universitas Halulaleo, and Universitas Musamus Merauke to make the conference getting bigger and better. The 2nd ICAPFS 2021 is primary schedule to be held in offline at Universitas Udayana, Bali, Indonesia on October 14th 2020, many works were done and many participants showed their willingness to participate 2nd ICAPFS, but due to the increasing number of Covid-19 cases, the committee decided to held in online via zoom meeting at Universitas Andalas, West Sumatera, Indonesia on June, 16th , 2021.

This conference is joined by not less than 170's participants in over seven countries from Japan, Netherland, Taiwan, Nigeria, Malaysia, and Timor Leste. With Directorate General of Livestock and Animal Health Services, Ministry of Agriculture, Indonesia as keynote speakers and seven invited speakers; Prof Yimin Cai-Japan (National Institute of Livestock and Grassiand Science Nasushiobora, Tsubaka), Prof. Nurul Huda from University Malaysia Sabah, Prof. Asdi Agustar from Universitas Andalas, Indonesia, Dr. Frederick Adzitey from University for Development Studies Tamala, Ghana, Prof. Lellah Rahim from Universitas Hasanuddin,Indonesia and Prof. H (Henk) Hogaveen from Wageningen University and Research, the Netherland and Prof. Nicholas Lopes-Villalobos from Massey University, New Zealand. Continued with parallel sessions, the conference will be divided into 15 parallel sessions of oral presentation. In parallel sessions featuring 10-12 presenters, with a time duration 10-15 mins including Q&A, covers the fields of animal production, nutrition and feed, food science and technology and socio economics.

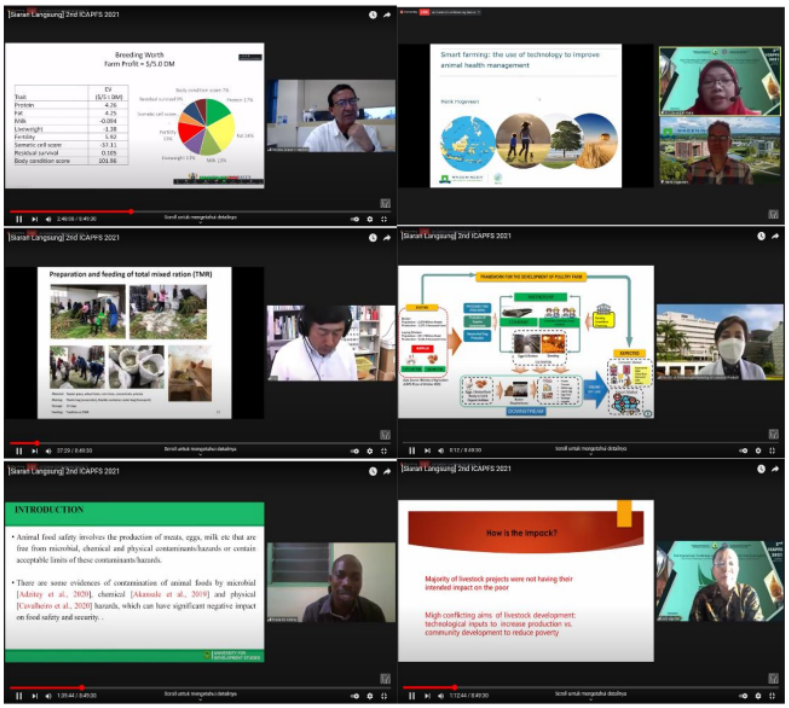
More than 160 full papers were submitted to 2nd ICAPFS 2021. After a pre-review on originality and language, peer review process was arranged by Editorial Committee and 84 manuscript were selected

for publication in IOP Conference Series: Earth and Environmental Science (EES). The Editorial Board was led by Prof. Yetti Marlida and Reviewer Prof. Nurul Huda, Prof. Jimin Cai, Prof. Lellah Rahim, Dr. Budi Rahayu Tanama Putri, Dr. Frederick Adzitey, Dr. Indri Juliyarsi, Dr. Sri Melia and Ade Sukma, Ph.D. We believe those selected 84 papers will provide in the field animal production, nutrition and feed, food science and technology and socio economics.

On behalf of the Conference Committee, we thanks to keynote speaker, invite speakers, presenters and participants, and all authors for contributions to 2nd ICAPFS 2021, as well as all the colleagues from IOP Publisher for support toward publication to Conference Proceedings.

2nd ICAPFS Organizing Committee

Below is the gallery and live streaming in Udayana TV



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Enhancing performance of Murrah Buffalo through improved probiotic feed management in Kapau Village, Agam Regency

Enhancing performance of Murrah Buffalo through improved probiotic feed management in Kapau Village, Agam Regency

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Abstract. This study aims to improve the production performance of Murrah buffalo which covers average weight gain, feed consumption, and feed conversion by increasing probiotic feed. The research was conducted on the herd of Murrah buffalo at Kelok Rambai, Kapau Village, West Sumatera, Indonesia. Fifteen Murrah buffaloes with three to five years of age were used in the research. There were three treatments conducted including P1 = basal feed + probiotics; P2 = P1 + concentrate (cassava leaf pellet); and P3 = P1 + commercial concentrate (pellet). All three treatments were also given 7 cc/head/month of probiotics. The results of the study with probiotic feeding on Murrah buffalo showed the average feed consumption of P2 (36.55), P3 (35.99), P1 (35.74) and daily weight gain (DWG) P2 (1.09 kg/head/day), P3 (0.91 kg/head/day), P1 (0.55 kg/head/day) did not show a significant difference, while in feed conversion, P2 (0.68), P1 (0.46), P3 (0. 31) it showed a significant difference ($p>0.05$). This study concludes that the provision of basal ration plus cassava leaf pellets showed significant results on feed conversion in Murrah buffalo but did not show significant differences in feed consumption and DWG. However, it showed a substantial enough average of P2 that could be used as a feed supplement in Murrah buffalo.

1. Introduction

Indonesia has enormous potential in the cultivation of buffalo livestock, wherein in 2019, the buffalo population in Indonesia reached 1,141,29 [1]. About 95 % of local buffalo in Indonesia are mud or swamp buffalo, while 5% are river buffalo/Murrah (riverine buffalo). Murrah buffalo is a dairy-type buffalo with milk production of about 6-8 liters/head/day, which is higher than the milk production of mud/swamp buffalo [2]. West Sumatra is one of the provinces in Indonesia that can cultivate buffalo, especially Murrah buffalo. The population of buffalo cattle in West Sumatra in 2019 was 84,289 [1], which are generally mud/swamp buffalo with low milk production due to the lack of knowledge of good breeders in maintenance and feed management.

The lack of feed management in terms of the amount of feed and nutritional content leads to nutritional issues, resulting in low milk production and reproductive disorders in buffaloes. One type of potential feed is cassava leaves *(Manihot utilissima)* which is widely available in rural areas. Dried cassava leaves (hay) are a source of protein and can be used as a nutritional supplement for ruminants, especially for dairy cattle, beef cattle, and buffalo [3]. Dried cassava leaves contain protein 19.5% dry matter and condensed tannins 4.0% dry matter. The administration can be direct as a feed supplement and as a source of protein in concentrate [4] or as a component of high-quality block feed ingredients [5]. Giving cassava leaves as supplementary feed as much as 1.5 kg/head/day improves production

performance by increasing hemoglobin levels, erythrocyte counts, leukocytes, hematocrit, glucose, and buffalo blood protein [6].

Furthermore, probiotics can be used to increase feed digestibility. Probiotics are different feed-in microorganisms that can digest fiber to increase livestock productivity [7], given by mouth or put into drinking water. The digestive process of ruminants is very dependent on the fermentation process by microbes found in the rumen. The fermentation process of fibrous feed in the rumen produces Volatile Fatty Acids (VFA) used as an energy source in ruminants. Feeding probiotics also creates a balance of microflora in the digestive tract to create optimum conditions for feed digestion and increase feed conversion efficiency to facilitate nutrient absorption. It also improves livestock health, shortens calving distance, accelerates growth, reduces calf mortality, and protects against pathogenic diseases. Therefore, it can increase milk or meat production [8]. The probiotics provided are isolated from buffalo milk, whose safety has been researched and can be used as a supplement for ruminants [9].

2. Material and methods

This research is an effort to improve the production performance of Murrah buffalo in Nagari Kapau, Tilatang Kamang, Agam Regency, West Sumatra through improved probiotic feed management.

2.1 Sample

The sample used is 15 female Murrah buffaloes aged 3-5 years from North Sumatra and reared in Nagari Kapau, Agam Regency.

2.2 Methods

This research is an experimental study, using 15 female Murrah buffaloes as samples divided into three treatment groups. Each treatment group was repeated five times. Data collection was based on three treatments, namely:

P1 = Basal feed + probiotics,

P2= P1+ concentrate (cassava leaf pellet)

P3 = P1+ commercial concentrate (Pellet)

for the three treatments was given probiotics as much as 7 cc/head/month.

2.3 Parameter

2.3.1 Feed Consumption. Feed consumption by calculating the difference between the amount of ration given, and the rest of the ration.

2.3.2. Daily Weight Gain (DWG). Daily weight gain estimation was carried out by measuring chest circumference using a measuring tape and calculating the formula for calculating bodyweight for large ruminants.

$$\text{Daily weight gain} = \frac{(Chest\ Size\ +22)2}{100}$$

2.3.3 Feed Conversion. Feed conversion is a value that determines the amount of ration consumed to produce body weight gain in a specific time.

$$\text{Feed Conversion} = \frac{Feed\ Consumption\ (kg)}{Weight\ Gain\ (kg)}$$

Table 1. Commercial feed analysis.

Chemical Content	KPSS pellet (%)
Water content	12
Crude Protein (Min.)	15
Crude Fat (Max.)	6
TDN (Min.)	68
Calcium (Ca)	12
Total Phosphorus (P)	0,8–1
NDF (Max.)	0,6 – 0,8
Aflatoxin (Max.)	200 ppb

Table 2. Results of proximate analysis of cassava leaf supplement feed.

Chemical Content	Results
Water content (%)	8,99
Ash (%)	29,14
Crude Protein (%)	19,78
Crude fiber (%)	17,66
Crude Fat (%)	4,28
Nitrogen Free Extract (%)	29,14
Energy (Kkal/Kg)	3718

Note: Laboratory of Nutrition and Chemistry, Padjadjaran University.

2.4. Research procedure

2.4.1. Feeding. Feeding was carried out twice a day with basal feed, cassava pellets, and commercial pellets given according to each treatment. Feeding time is around 07.00 am and in the afternoon around 03.00 pm. It also provided buffalo's water ad libitum given probiotics at the beginning of the study and in the 2nd week of the study.

2.4.2. Data collection. The data was collected during the study including feed consumption, body weight gain at the beginning and at the end of the study, and feed conversion.

2.5. Data analysis

The data obtained were processed using a Completely Randomized Design (CRD) with the Minitab 14 application.

3. Results and discussion

3.1 Feed consumption

Feed consumption of Murrah buffalo in this study can be seen in table 3.

Table 3. Feed consumption.

Treatment	Average
P2	36,55
P3	35,99
P1	35,74

Feed consumption is the amount of food consumed by livestock used to meet basic life and livestock production [10]. It can be seen from Table 3 above that the feed consumption of Murrah buffalo in treatment P2 (36.55) has the highest value, and the lowest value is P1 (35.74). The results of the analysis

of variance showed that there was no difference between the treatments given. It can be caused by the feed provided has been able to meet the needs of Murrah buffalo, but the provision of basal feed and cassava leaf pellet concentrate (P2) showed the highest average consumption of 36.55. The high average feed consumption in treatment P2 was due to better palatability/liking of livestock to the feed compared to treatments P1 and P3. Similarly, the opinion of [11], states that palatability/liking is an essential factor that determines the level of feed consumption in terms of texture, taste, smell, and temperature. Also, [12] added that feed consumption is influenced by palatability and digestibility, race, sex, age, and health condition of livestock.

Graph of feed consumption of Murrah buffalo fed probiotic feed, can be seen in the following Figure 1.

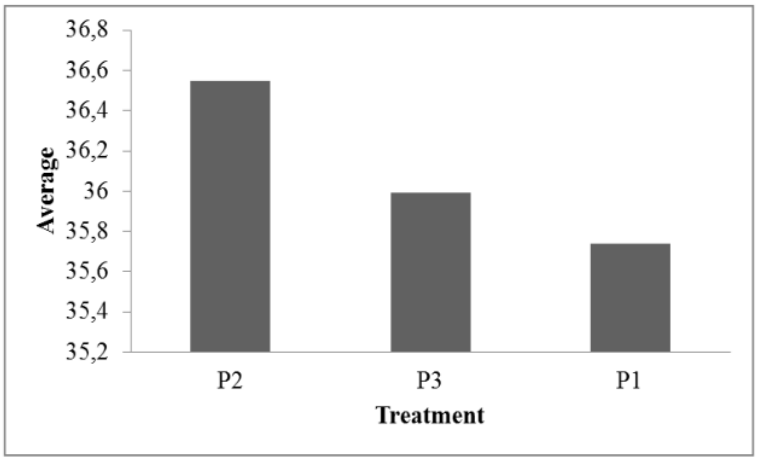

Figure 1. Feed consumption.

3.2 Daily weight gain

Daily weight gain of Murrah buffalo in this study can be seen in table 4.

Table 4. Daily weight gain.

Treatment	Average (Kg)
P2	1,09
P3	0,91
P1	0,55

Daily weight gain (DWG) is a complex process, including daily weight gain and the formation of all body parts evenly [13]. Based on table 4, the highest DWG is at P3 (1.29), and the lowest is at P1 (0.55). The analysis of variance showed no difference between the treatments. Also, body weight gain is generally influenced by the level of feed consumption [14]; the higher the feed consumed, the higher body weight increased. In addition, the BK for buffalo feed given still does not meet their needs, so the results of the body weight gain obtained do not show a significant difference. Furthermore, [15] explained that cattle that received BK intake more minor than the requirement could not show optimal productivity.

The study results on DWG were higher than the study results of [16], where the increase in DWG of Murrah buffalo by feeding fermented coffee fruit flesh skin using local microorganisms ranged from 0.46 kg - 0. 67 kg. The graph of DWG of Murrah buffalo fed probiotic feed can be seen in the following Figure 2.

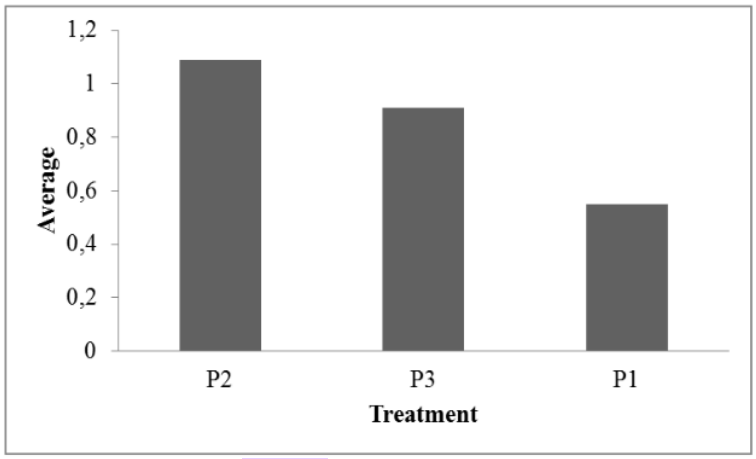

Figure 2. Daily weight gain.

3.3 Feed conversion

The feed conversion of Murrah buffalo in this study can be seen in table 5.

Table 5. Feed conversion.

Treatment	Average
P2	0,68 [a]
P1	0,46 [b]
P3	0,31 [b]

Note: Different superscripts [(a,b,c)] in the same line show significant differences (P>0.05).

Feed conversion is the ability of livestock to convert feed into meat [17]. As seen in Table 5 above, it is found that there is a significant difference. The highest feed conversion average is at P2 (0.68), and the lowest is at P3 (0.31). This is due to the high nutrient content of cassava leaf pellet feed (Table 2), resulting in small feed conversion. Feed conversion is one of the technical indicators that can show the level of feed efficiency, where the lower the feed conversion, the more efficient the feed is [12]. In addition, several factors affect feed conversion, including the ability of livestock to digest feed ingredients, the adequacy of feed substances for bare life, growth and body functions, and the nutritional content of feed [18]. The better the feed quality, the better the efficiency of energy formation and livestock production [19].

The feed conversion obtained was lower than the study results [16], where the conversion of cheap buffalo feed by feeding fermented coffee fruit flesh skin using local microorganisms ranged from 10.53-14.29. Feed conversion graph of Murrah buffalo fed probiotic feed can be seen in the following Figure 3.

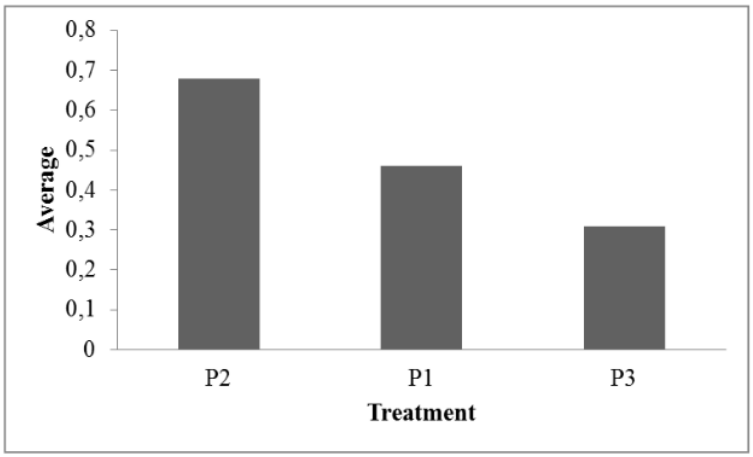

Figure 3. Feed conversion.

4. Conclussion

The provision of basal rations added with cassava leaf pellets showed significant results on feed conversion in Murrah buffalo, but it did not show a substantial difference in feed consumption and daily weight gain. However, it showed a reasonably high average, indicating that P2 could be used as supplementary feed in Murrah buffalo.

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