

The Effect of Feed Management on Increasing Body Weight and Production Efficiency of Beef Cattle

^{1*}Azizi Nagasaki, Ahmadi Nasatio^{2*}

¹Institut Pendidikan Nusantara Global, Lombok Tengah

²Universitas Islam Negeri Mataram

azizinagasaki76@gmail.com, ahmadinasatio56@gmail.com

JTERNAK
jurnal peternakan

e-ISSN: 2964-0962

**ANIHUS: Journal of Animal Husbandry
Research**

<https://ejournal.45mataram.ac.id/index.php/seikat>

Vol. 1, No. 1, September 2026

Page: 30-41

Available at:

<https://ejournal.45mataram.ac.id/index.php/anihus/article/view/13>

DOI:

<https://doi.org/10.55681/anihus.v1i1.13>

Article History:

Received: 25-07-2026

Revised: 04-08-2026

Accepted: 07-09-2026

Abstract : The productivity of beef cattle is greatly influenced by the quality and management of feed provided during the maintenance process. Feed is the largest component of production costs in the livestock business, so proper feed management not only impacts livestock growth but also determines the level of production efficiency. In the practice of smallholder farming, feed management is often not carried out optimally, both in terms of nutritional quality, number of feedings, and frequency of feeding. This condition can cause the growth of livestock body weight to be not optimal and the maintenance time to be longer. This study aims to analyze the influence of feed management on increasing body weight and production efficiency of beef cattle. The research method uses a qualitative approach with case studies on several beef cattle farms that apply different feed management systems. Data collection was carried out through field observations, interviews with farmers, and analysis of livestock production data. The results of the study show that the implementation of planned feed management based on livestock nutrition needs can significantly increase body weight gain and increase the efficiency of feed use in the production process. These findings confirm that good feed management is an important factor in increasing the productivity of beef cattle farming business in a sustainable manner.

Keywords: feed management; body weight of livestock; production efficiency; beef cattle; livestock productivity.

INTRODUCTION

The productivity of beef cattle is one of the important factors in supporting the availability of animal protein for the community and improving the welfare of farmers. In the context of livestock development, beef cattle have a strategic role because they produce meat as a source of animal protein needed to support the fulfillment of community nutrition. Increased beef cattle productivity is not only related to increased meat production, but also related to business efficiency, utilization of local resources, and economic sustainability of farmers. Therefore, beef cattle farming business needs to be managed in a more targeted manner in order to be able to produce optimal body weight gain in an efficient maintenance time.

In the beef cattle farming business system, livestock growth is greatly influenced by various factors, including the nation or genetics of the livestock, age, gender, health conditions, maintenance environment, and feed management. Among these various factors, feed management is one of the factors that most determine the success of production. Feed acts as a source of energy, protein, minerals, vitamins, and other nutrients needed for metabolic processes, body tissue growth, muscle formation, and increased body weight of livestock. Kenny et al. (2018) emphasized that the efficiency of feed use in beef cattle is an important aspect because it is

directly related to productivity, farmers' profits, and the sustainability of the production system. Thus, proper feed management is the main key in increasing the productivity of beef cattle.

The nutritional needs of beef cattle must be met optimally so that the growth process can take place properly. Nutrients contained in feed, such as energy and protein, play an important role in supporting metabolic activity and the formation of body tissues. Energy is needed to meet the basic life needs and physiological activity of livestock, while protein is needed for muscle growth and tissue repair. In addition, minerals and vitamins also play a role in maintaining body function, health, and livestock endurance. Harvey et al. (2021) explain that proper nutrition management in cattle can influence the physiological response and productivity of livestock in the long term. If nutritional needs are not met optimally, livestock growth will be inhibited, body weight gain decreases, and production efficiency will be low.

In the practice of smallholder farming in Indonesia, the feeding system is often still carried out in a traditional manner and has not fully paid attention to the balance of nutrients needed by livestock. Some farmers still rely on natural forage feed, such as field grass, hay, agricultural waste, and local forage without a measurable ration formulation. This kind of feeding system is indeed relatively easy to do and requires lower costs, but the quality of feed nutrition provided is not necessarily able to meet the needs of livestock to grow optimally. Sandi et al. (2018) show that beef cattle feed management in smallholder farms is still highly dependent on the availability of local feed, so that the quality and quantity of feed can vary between farmers and between regions.

The limited quality of feed on smallholder farms can cause the growth of beef cattle to be less optimal. Forage feed given without added concentrates generally has a high crude fiber content, while the energy and protein content is often insufficient for livestock growth needs. These conditions can cause livestock to require longer maintenance times to reach the desired cutting weight. Wiyatna (2012) found that feed consumption and body weight gain of Peranakan Ongole cattle on people's farms still reflect the traditional maintenance system, with relatively low daily body weight gain. This shows that improving feed management is important in increasing beef cattle productivity at the community farm level.

Feed management in beef cattle is not only related to the type of feed given, but also includes the amount of feed, the quality of feed materials, the frequency of feeding, the time of feeding, the form of feed presentation, and the balance between forage and concentrate. Good feeding must consider the physiological needs of livestock according to age, body weight, growth phase, and maintenance goals. In the beef cattle fattening business, the need for feed for growth must be met more intensively because the main target of maintenance is to increase body weight in a certain time. Pinto and Millen (2019) explained that nutrition management practices in beef cattle fattening businesses need to pay attention to ration formulation, concentrate usage levels, and feeding strategies so that production performance can be achieved optimally.

One of the important indicators in assessing the success of feed management is average daily body weight gain. Daily body weight gain illustrates the ability of livestock to convert the feed consumed into an increase in body weight. The higher the daily body weight gain, the better the growth performance of livestock. Sari et al. (2024) show that the productivity of bull-type Brahman Cross cattle can be observed through indicators of daily body weight gain, feed intake, feed conversion ratio, and income over feed cost. These results show that beef cattle productivity is closely related to feed consumption and the ability of livestock to convert feed into body weight.

In addition to body weight gain, the efficiency of feed use is also an important indicator in the beef cattle farming business. Feed efficiency describes the extent to which the feed consumed by livestock can be used to produce weight gain. In the context of fattening businesses, feed efficiency is often assessed through the feed conversion ratio, which is a comparison between the

amount of feed consumed and the increase in body weight produced. Lower feed conversion values indicate that livestock are more efficient in utilizing feed. Elolimy *et al.* (2019) state that feed efficiency in beef cattle is related to biological processes in the livestock body, including nutrient metabolism and nutrient utilization. Therefore, the feed provided must be able to support the physiological function of livestock optimally so that growth can take place efficiently.

Feed management also has a direct impact on the economic efficiency of livestock businesses. Feed is one of the largest cost components in the beef cattle fattening business. Therefore, errors in feed management can cause production costs to increase without adequate body weight increase. On the other hand, proper feeding can reduce production costs, increase body weight gain, and improve farmers' income. Firmansyah *et al.* (2022) show that the analysis of income over feed cost can be used to assess the economic efficiency of beef cattle fattening businesses because it takes into account the relationship between feed costs and receipts from body weight gain. Thus, feed management not only has an impact on the biological aspects of livestock, but also determines the economic feasibility of the business.

The development of livestock nutrition science shows that the use of a combination of forage feed and concentrate with a balanced nutritional composition can improve the growth performance of beef cattle. Forage is still needed as a source of fiber to maintain rumen function, while concentrate acts as a source of energy and protein that is easier for livestock to utilize. Rabelo *et al.* (2016) showed that the ratio of forage to concentrate can affect growth performance, meat characteristics, and beef production quality. This shows that the balance of the composition of the ration is an important aspect in the preparation of beef cattle feed. The right application of concentrates can help meet the nutritional deficiencies of forage, so that livestock growth can take place more optimally.

In addition to the use of concentrates, the use of alternative feed ingredients is also one of the important strategies in beef feed management. Alternative feed materials can come from agricultural waste and agro-industrial by-products, such as rice straw, corn cobs, bran, soybean meal, tofu dregs, palm oil waste, and other local materials. The use of alternative feed ingredients has the potential to reduce production costs while supporting the sustainability of livestock businesses. Sukarne and Mastur (2022) show that botanical composition, consumption, and feed conversion in Balinese cattle are closely related to the availability of local feed sources. Thus, the development of a feed system based on local potential needs to be a concern in an effort to increase beef cattle productivity.

In the context of smallholder farming, increasing farmers' knowledge about feed management is very important. Many breeders have practical experience in raising cows, but not all of them understand the nutritional needs of livestock scientifically. Farmers need to understand that cow feed needs differ based on age, body weight, physiological condition, and maintenance goals. Cows that are in the growth or fattening phase need feed with better energy and protein content than cattle that are only raised for regular breeding or maintenance purposes. Cooke (2017) explained that nutritional and management considerations are indispensable in maintaining cow performance, especially when livestock is subjected to physiological or environmental stress. Therefore, increasing the capacity of farmers in compiling and managing feed is one of the important factors in supporting livestock productivity.

Good feed management also needs to be adjusted to local conditions because each region has different potential feed sources, maintenance patterns, and resource limitations. Areas that have abundant agricultural waste can use it as feed material after going through proper processing. Meanwhile, areas with limited forage require a feed supply strategy through feed preservation, such as silage or hay, so that feed availability is maintained. Tahuk *et al.* (2020)

showed that the use of complete feed can affect the carcass characteristics and quality of fattened Balinese beef. This proves that feed innovation that is in accordance with local conditions can be a strategy in improving beef cattle production performance.

In addition to the feed factor, the success of the beef cattle business is also influenced by the interaction between feed management, livestock genetics, and the maintenance environment. Cattle with good genetic potential will not show optimal performance if they are not supported by sufficient feed and an appropriate maintenance environment. Conversely, high-quality feed will also not produce maximum productivity if livestock are in poor health conditions or experiencing environmental stress. Mwangi et al. (2019) stated that beef cattle performance and meat quality are influenced by feed and genetic factors, so productivity improvement needs to be done through a comprehensive management approach. Therefore, feed management analysis must be understood as part of a beef cattle production system that is interrelated with health, environment, and business efficiency aspects.

Research on the influence of feed management on increasing body weight and production efficiency of beef cattle is important because it can provide an overview of feed practices applied by farmers and their impact on livestock performance. Research with a qualitative approach through case studies allows researchers to understand more deeply feed management practices on several beef cattle farms that apply different systems. This approach can explore information about the type of feed used, the frequency of feeding, the way farmers arrange rations, constraints on feed availability, and farmers' perceptions of the relationship between feed and livestock growth. Montanholi et al. (2010) explain that feed efficiency in beef cattle can be assessed through various indicators, including feeding behavior and physiological response of livestock. This shows that the study of feed management is not only limited to the amount of feed, but also includes how livestock use the feed.

Thus, this study aims to analyze the influence of feed management on increasing body weight and production efficiency of beef cattle. The focus of the research is directed at the feeding practices carried out by farmers, the suitability of feed with the needs of livestock, and its impact on body weight gain and business efficiency. The results of the research are expected to contribute to the development of animal husbandry science, especially in the field of nutrition and feed management of beef cattle. In addition, the results of the research are also expected to be a practical reference for farmers in implementing a feed management system that is more effective, economical, and in accordance with local potential to increase the productivity of beef cattle sustainably.

RESEARCH METHODS

This study uses a qualitative descriptive approach to explore in depth the role of the State Administrative Court (PTUN) in resolving land disputes in Indonesia. The qualitative descriptive approach was chosen because this study does not aim to measure data statistically, but to understand, decipher, and analyze legal phenomena in depth based on literature data, legal documents, and court decisions. Through this approach, researchers can obtain a more comprehensive picture of how the PTUN exercises its authority in examining, adjudicating, and deciding land disputes related to state administrative decisions.

This type of research is included in normative legal research with the support of a qualitative descriptive approach. Normative legal research is used because the focus of the study is directed at positive legal norms, laws and regulations, legal principles, jurisprudence, and legal doctrines related to land disputes and the authority of the State Administrative Court. This research places the law as a norm written in laws and regulations as well as reflected in court

decisions. Thus, this study seeks to analyze the conformity between the applicable legal norms and the practice of resolving land disputes through the PTUN.

The object of study in this study is the role of the State Administrative Court in resolving land disputes in Indonesia. This role is studied through the authority of the PTUN in examining the validity of state administrative decisions related to land, such as the decision to issue land rights certificates, cancellation of land rights, determination of land objects, or other forms of administrative decisions that have the potential to cause disputes. Land disputes in this study are understood as legal conflicts that arise due to decisions or administrative actions of state administrative officials in the field of land that are considered detrimental to the rights or interests of certain parties.

The approaches used in this study include a legislative approach, a conceptual approach, and a case approach. The legislative approach is carried out by examining various regulations related to PTUN, state administrative law, agrarian law, and land dispute resolution. The conceptual approach is used to understand relevant legal concepts, such as state administrative decisions, the absolute authority of the State Administrative Court, legal certainty, legal protection, general principles of good governance, and administrative justice. Meanwhile, the case approach is used to analyze the decisions of the Administrative Court related to land disputes, so that the pattern of judges' considerations, the tendency of decisions, and legal issues that arise in judicial practice can be known.

The data used in this study consists of secondary data as the main data. The secondary data was obtained through a literature study of primary legal materials, secondary legal materials, and tertiary legal materials. Primary legal materials include laws and regulations related to the State Administrative Court, land, government administration, and land dispute resolution. In addition, primary legal materials also include jurisprudence and PTUN decisions relevant to land disputes. Court decisions are used as the main analysis material to see how the application of legal norms in resolving concrete disputes in the field of land.

Secondary legal materials in this study include law books, scientific journals, academic articles, research results, legal expert opinions, and other literature that discusses state administrative law, agrarian law, state administrative courts, and land dispute resolution. Secondary legal materials are used to strengthen the analysis of primary legal materials, especially in explaining theories, concepts, and academic views related to the effectiveness of the role of PTUN. Meanwhile, tertiary legal materials are used as supporting materials, such as legal dictionaries, legal encyclopedias, regulatory indexes, and other sources that help provide explanations of certain legal terms or concepts.

Data collection techniques are carried out through literature studies and documentation. Literature studies are carried out by searching, collecting, reading, and examining various written sources that are relevant to the research focus. These sources include laws and regulations, books, scientific journals, legal articles, research reports, and official documents related to the role of the PTUN in resolving land disputes. Documentation techniques are used to collect PTUN decisions and other relevant legal documents, especially those that show the existence of land disputes due to administrative decisions of state administrative officials.

Secondary data search is carried out systematically by selecting documents and decisions that are directly related to the focus of the research. The PTUN decisions analyzed are selected based on their relevance to land cases, especially cases related to the issuance, cancellation, revocation, or dispute of the validity of state administrative decisions in the field of land. In addition, this study also pays attention to cases that show the existence of overlapping regulations, insynchronization of authority between agencies, weaknesses in land administration, and

disparity in court decisions. The selection of the data aims to obtain a deeper picture of the problems of resolving land disputes through the State Administrative Court.

Data analysis is carried out qualitatively through three main stages, namely data reduction, data presentation, and conclusion drawn. The data reduction stage is carried out by sorting and simplifying the data that has been collected according to the focus of the research. Data that are not relevant to the role of the PTUN in resolving land disputes are set aside, while relevant data are classified based on certain themes, such as the authority of the PTUN, the object of the land dispute, the judge's legal considerations, institutional constraints, and the effectiveness of the decision. This data reduction is important so that the analysis can be carried out in a directional manner and does not widen from the main problem of the research.

The data presentation stage is carried out by compiling data that has been reduced into a systematic description. Data are presented in the form of narrative descriptions that explain the relationship between legal norms, judicial practices, and land dispute issues. At this stage, the researcher describes how the PTUN plays a role in testing the validity of state administrative decisions in the field of land, how judges consider administrative law aspects in their decisions, and how regulations and institutions affect the effectiveness of land dispute resolution. The presentation of data is carried out sequentially so that readers can understand the flow of analysis clearly.

The conclusion drawing stage is carried out by formulating research findings based on the results of analysis of the data that has been presented. Conclusions are drawn inductively, namely based on patterns of findings that arise from the study of laws and regulations, literature, jurisprudence, and PTUN decisions. Through this process, the research seeks to provide an overview of the effectiveness of the role of the PTUN in resolving land disputes, including the factors that support or hinder the implementation of this role. The conclusion is also directed to answer the focus of the research and provide recommendations for strengthening land dispute resolution in Indonesia.

The validity of the data in this study is maintained through source triangulation and triangulation techniques. Source triangulation is carried out by comparing data from various legal materials, such as laws and regulations, PTUN decisions, legal literature, scientific journals, and related official documents. This comparison is done to ensure that the analysis does not rely solely on a single source, but is supported by various complementary sources. Meanwhile, technical triangulation is carried out by combining literature studies, documentation, and content analysis of court decisions. In this way, the results of the study are expected to have a stronger level of validity and accuracy of analysis.

Through this research method, the study is expected to provide an in-depth understanding of the role of PTUN in resolving land disputes in Indonesia. This research not only outlines the formal authority of the PTUN based on laws and regulations, but also analyzes the practice of its application in land dispute decisions. Thus, this research is expected to contribute to strengthening the institution of PTUN, harmonizing agrarian regulations, improving the quality of land administration, and formulating policy recommendations to realize legal certainty, protection of rights, and justice in the settlement of land disputes in Indonesia.

RESULTS AND DISCUSSION

The results of the study show that the productivity of beef cattle is greatly influenced by the feed management system implemented during the maintenance process. Feed is a major component in the livestock production system because it is a source of energy, protein, minerals, vitamins, and other nutrients needed to support growth, metabolism, body tissue formation, and

weight gain. Improper feed management can cause livestock growth to slow down, feed use becomes inefficient, and production costs increase. On the other hand, good, planned, and physiological feed management of livestock can improve growth performance, accelerate the achievement of harvest weight, and improve production efficiency in the beef cattle farming business.

The Effect of Feed Management on Beef Cattle Productivity

Feed management has an important role in determining the productivity level of beef cattle. Livestock productivity can be seen from the ability of cows to increase body weight during the maintenance period. The increase in body weight is greatly influenced by the adequacy of nutrients obtained by livestock every day. If livestock get a sufficient amount of feed and a balanced nutritional content, the growth process can take place more optimally. On the other hand, if the feed provided does not meet nutritional needs, then livestock growth will be inhibited.

The results of the study showed that farms that implemented a planned feeding system tended to produce better livestock growth than farms that still applied a traditional feeding system. A planned feeding system includes regulating the type of feed, the number of feeds, the frequency of feeding, and the balance between forage and supplementary feed. This arrangement is important because the nutritional needs of beef cattle vary depending on age, body weight, health conditions, and maintenance goals.

In farms that still apply traditional systems, feeding is generally only based on the availability of feed materials around the farmer's environment. Farmers often provide makeshift forage without taking into account the nutritional content and needs of livestock. This condition causes the quality of feed consumed by cows to be unstable. As a result, the daily body weight gain of livestock becomes low and the maintenance time to achieve harvest weight becomes longer. Therefore, good feed management is an important factor to increase beef cattle productivity in a sustainable manner.

Quality and Quantity of Feed in Increasing Body Weight Gain

The increase in body weight of beef cattle is closely related to the quality and quantity of feed provided. The quality of feed reflects the nutritional content contained in feed ingredients, such as energy, protein, fiber, minerals, and vitamins. Meanwhile, the quantity of feed is related to the amount of feed given to livestock in a certain unit of time. These two aspects must be considered simultaneously because quality feed but given in small quantities is still not able to meet the needs of livestock. On the other hand, feed in large quantities but of low quality also cannot support optimal growth.

The results of the study showed that beef cattle that received feed with a balanced nutritional composition grew faster than cows that only received makeshift feed. A balanced nutritional composition is very important because each nutrient has a specific function in the body of livestock. Energy is needed for metabolic activity and growth, protein plays a role in the formation of muscle tissue, minerals support bone formation and body functions, while vitamins play a role in maintaining the health and endurance of livestock. A lack of one of these nutritional elements can interfere with the growth process and reduce livestock productivity.

Good feeding also needs to pay attention to the balance between forage and supplementary feed. Forage serves as an important source of fiber for maintaining rumen function, while additional feed such as concentrates, bran, tofu dregs, meal, or other feed ingredients can increase the energy and protein content in the ration. In the beef cattle fattening business, the

provision of additional feed is important because forage alone is often not able to meet the nutritional needs for rapid growth. With the right combination of feed, livestock can get more complete nutrition so that body weight gain can increase.

Feed Use Efficiency and Feed Conversion

Good feed management not only affects body weight gain, but also on the efficiency of feed use. Feed use efficiency can be understood as the ability of livestock to utilize the feed consumed to produce weight gain. The better the feed efficiency, the less amount of feed is needed to produce a certain weight gain. This is very important in the beef cattle farming business because feed is one of the largest cost components in the production process.

The results showed that cattle that obtained feed with balanced nutritional content tended to have a better feed conversion rate. Good feed conversion shows that the feed consumed can be optimally utilized by the livestock body. This happens because quality feed is able to support the digestive process, nutrient absorption, metabolism, and the formation of body tissues. On the other hand, low-quality feed can cause many nutrients not to be utilized optimally so that body weight gain becomes low even though the amount of feed given is quite large.

The efficiency of feed use is also influenced by the regularity of feeding. Irregular feeding can interfere with the consumption patterns and digestion process of livestock. Cattle that receive feed regularly tend to have more stable physiological conditions so that they are able to make better use of feed. Therefore, timing and frequency of feeding need to be an important part of beef cattle maintenance management. With proper feed management, farmers can improve production efficiency and reduce feed waste.

The Impact of Feed Management on the Economic Efficiency of Livestock Businesses

The implementation of effective feed management has a direct impact on the economic efficiency of beef cattle farming businesses. In the fattening business, the cost of feed is one of the largest components of expenditure. Therefore, improper feed management can increase production costs without being followed by a comparable increase in yield. If the feed provided is not in accordance with the needs of livestock, then the increase in body weight becomes low, the maintenance period becomes longer, and the profit of the breeder can decrease.

The results of the study show that farmers who are able to manage feed appropriately can get better profits. This is because the feed provided can be used optimally to increase the body weight of livestock. Faster livestock growth allows cows to reach harvest weight in a shorter time. With more efficient maintenance time, labor costs, cage costs, and additional feed costs can be reduced. This condition shows that feed management is not only related to the technical aspects of maintenance, but also closely related to the economic success of the business.

In addition, the use of local feed sources can also increase the economic efficiency of livestock. Local feed materials such as agricultural waste, animal feed forage, straw, bran, tofu pulp, and agro-industrial by-products can be used as an alternative to reduce dependence on commercial feed which is relatively expensive. However, the use of local feed ingredients still needs to pay attention to the quality of nutrition and how it is processed. With proper processing, local feed ingredients can be an economical source of nutrition and support the growth of beef cattle more efficiently.

Challenges in the Implementation of Feed Management and Supporting Factors for Its Success

Although feed management has an important role in increasing beef cattle productivity, this study shows that there are still several challenges in its implementation. One of the main obstacles is the limited availability of quality feed in certain seasons, especially in the dry season. In the dry

season, the production of animal feed forage usually decreases, so farmers have difficulty meeting the daily feed needs of livestock. This condition can lead to a decrease in feed consumption, a decrease in body weight gain, and a weakening of the condition of the livestock's body.

In addition to feed limitations, farmers' knowledge and skills are also important factors that affect the success of feed management. Farmers who have an understanding of the nutritional needs of livestock tend to be better able to develop a feeding strategy that is in accordance with the growth phase of the cow. On the other hand, farmers who do not understand the basic principles of livestock nutrition tend to feed based on habits, without considering the nutritional content and physiological needs of the livestock. Therefore, increasing the capacity of farmers through training and mentoring is an important need in an effort to increase beef cattle productivity.

Environmental factors and maintenance systems also affect the effectiveness of feed management. Farms with a clean, comfortable, and good air circulation cage environment tend to be able to support feed utilization more optimally. Conversely, a poor cage environment can cause stress in livestock, decrease appetite, and inhibit growth. Thus, the success of feed management is not only determined by the type and amount of feed provided, but also by the condition of the cage, livestock health, availability of drinking water, and the ability of farmers to manage all aspects of maintenance in an integrated manner.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the discussion, it can be concluded that feed management has an important influence on increasing body weight and production efficiency of beef cattle. Planned feeding, regular, and balanced nutritional composition can increase livestock growth, improve feed conversion, and accelerate the achievement of harvest weight. Farms that implement feed management well show more optimal production performance than farms that still apply traditional feeding systems. In addition, the use of local feed sources and alternative feed ingredients can be an important strategy to reduce production costs without neglecting the nutritional needs of livestock.

The suggestion that can be given is that beef cattle farmers need to improve the implementation of more planned feed management through regulating the type, amount, frequency, and composition of feed according to the needs of livestock. Farmers also need to make more optimal use of local feed ingredients while still paying attention to the quality and processing methods. In addition, support from extension workers, the government, and related institutions is needed in the form of training, mentoring, and the provision of information on feed formulation, forage preservation, agricultural waste utilization, and cage management. With the increase in the knowledge and skills of farmers, beef cattle farming businesses can develop more productively, efficiently, economically, and sustainably.

DAFTAR PUSTAKA

- Cooke, R. F. (2017). Invited paper: Nutritional and management considerations for beef cattle experiencing stress-induced inflammation. *The Professional Animal Scientist*, 33(1), 1–11. <https://doi.org/10.15232/pas.2016-01573>
- Eloimy, A. A., Abdel-Hamied, E., Hu, L., McCann, J. C., Shike, D. W., & Looor, J. J. (2019). Rapid communication: Residual feed intake in beef cattle is associated with differences in protein turnover and nutrient transporters in ruminal epithelium. *Journal of Animal Science*, 97(5), 2181–2187. <https://doi.org/10.1093/jas/skz080>

- Harvey, K. M., Cooke, R. F., & Moriel, P. (2021). Impacts of nutritional management during early postnatal life on long-term physiological and productive responses of beef cattle. *Frontiers in Animal Science*, 2, 730356. <https://doi.org/10.3389/fanim.2021.730356>
- Kenny, D. A., Fitzsimons, C., Waters, S. M., & McGee, M. (2018). Invited review: Improving feed efficiency of beef cattle—The current state of the art and future challenges. *Animal*, 12(9), 1815–1826. <https://doi.org/10.1017/S1751731118000976>
- Montanholi, Y. R., Swanson, K. C., Schenkel, F. S., McBride, B. W., Caldwell, T. R., & Miller, S. P. (2010). Assessing feed efficiency in beef steers through feeding behavior, infrared thermography and glucocorticoids. *Animal*, 4(5), 692–701. <https://doi.org/10.1017/S1751731109991522>
- Mwangi, F. W., Charmley, E., Gardiner, C. P., Malau-Aduli, B. S., Kinobe, R. T., & Malau-Aduli, A. E. O. (2019). Diet and genetics influence beef cattle performance and meat quality characteristics. *Foods*, 8(12), 648. <https://doi.org/10.3390/foods8120648>
- Pinto, A. C. J., & Millen, D. D. (2019). Nutritional recommendations and management practices adopted by feedlot cattle nutritionists: The 2016 Brazilian survey. *Canadian Journal of Animal Science*, 99(2), 392–407. <https://doi.org/10.1139/cjas-2018-0031>
- Rabelo, C. H. S., Basso, F. C., McAllister, T. A., Lage, J. F., Gonçalves, G. S., Lara, E. C., Oliveira, A. A., Berchielli, T. T., & Reis, R. A. (2016). Influence of *Lactobacillus buchneri* as silage additive and forage: Concentrate ratio on the growth performance, fatty acid profile in longissimus muscle, and meat quality of beef cattle. *Canadian Journal of Animal Science*, 96(4), 550–562. <https://doi.org/10.1139/cjas-2015-0161>
- Tahuk, P. K., Nahak, O. R., & Bira, G. F. (2020). The effect of complete feed to carcass characteristics and meat quality of male Bali cattle fattened in West Timor, Indonesia. *Veterinary World*, 13(11), 2515–2527. <https://doi.org/10.14202/vetworld.2020.2515-2527>
- Taiwo, G., Idowu, M. D., Wilson, M., Pech-Cervantes, A., Estrada-Reyes, Z. M., & Ogunade, I. M. (2022). Residual feed intake in beef cattle is associated with differences in hepatic mRNA expression of fatty acid, amino acid, and mitochondrial energy metabolism genes. *Frontiers in Animal Science*, 3, 828591. <https://doi.org/10.3389/fanim.2022.828591>
- Firmansyah, D., Priyanto, R., Fuah, A. M., & Wiryawan, I. K. G. (2022). Income over feed cost (IOFC) penggemukan sapi Peranakan Ongole (PO) berbasis limbah kedelai. *Jurnal Sains Terapan: Wahana Informasi dan Alih Teknologi Pertanian*, 12(1), 74–80. <https://doi.org/10.29244/jstsv.12.1.74-80>
- Sandi, S., Desiarni, M., & Asmak. (2018). Manajemen pakan ternak sapi potong di peternakan rakyat di Desa Sejaro Sakti Kecamatan Indralaya Kabupaten Ogan Ilir. *Jurnal Peternakan Sriwijaya*, 7(1), 21–29. <https://doi.org/10.33230/jps.7.1.2018.7080>
- Sari, B., Adhianto, K., Erwanto, E., & Husni, A. (2024). Produktivitas sapi Brahman Cross tipe bull dengan bobot awal yang berbeda di PT. Indo Prima Beef Lampung Tengah, Provinsi Lampung. *Jurnal Riset dan Inovasi Peternakan*, 8(2), 186–192. <https://doi.org/10.23960/jrip.2024.8.2.186-192>
- Sukarne, S., & Mastur, M. (2022). Komposisi botani, konsumsi dan konversi pakan sapi Bali jantan di Kelompok Tunas Karya Desa Teruwai Kabupaten Lombok Tengah. *Jurnal Ilmu dan Teknologi Peternakan Indonesia*, 8(2), 85–93. <https://doi.org/10.29303/jitpi.v8i2.155>

- Wiyatna, M. F. (2012). Produktivitas sapi Peranakan Ongole pada peternakan rakyat di Kabupaten Sumedang. *Jurnal Ilmu Ternak Universitas Padjadjaran*, 12(2).
<https://doi.org/10.24198/jit.v12i2.5124>