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POTENTIAL OF *CORYPHA UTAN* LAMK. AS AN ALTERNATIVE FEED RESOURCE: A REVIEW

Potensi *Corypha utan* Lamk. sebagai Sumber Bahan Pakan Alternatif: Tinjauan Literatur

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Abstract

Limited availability of forage and the increasing demand for feed ingredients have encouraged the exploration of local resources as alternative feed materials in livestock production systems. *Corypha utan* Lamk. is a tropical palm species widely distributed in Southeast Asia and has potential to be utilized as a feed resource. This review article aims to examine scientific literature on the nutritional potential and bioactive compounds of *Corypha utan*, as well as to identify research gaps related to its utilization as an alternative feed ingredient. The study was conducted through a literature review by analyzing various scientific publications discussing the botanical characteristics, nutritional composition, and secondary metabolites found in different parts of *C. utan*. The review indicates that several parts of the plant, including the stem, pith, and other tissues, contain nutritional components and secondary metabolites that may support its use in livestock feeding systems. However, the currently available studies remain limited and do not yet provide a comprehensive understanding of its application in animal production systems. Therefore, further research is required to strengthen the scientific basis for the development and utilization of *C. utan* as a locally based alternative feed resource.

Keywords: *Corypha utan*, alternative feed resource, feed nutrition, bioactive compounds, local resources, livestock feed.

Abstrak

Keterbatasan ketersediaan hijauan pakan serta meningkatnya kebutuhan bahan pakan mendorong pemanfaatan sumber daya lokal sebagai bahan pakan alternatif dalam sistem produksi ternak. *Corypha utan* Lamk. merupakan tanaman palma tropis yang tersebar luas di wilayah Asia Tenggara dan memiliki potensi untuk dimanfaatkan sebagai sumber bahan pakan. Artikel review ini bertujuan untuk meninjau berbagai literatur ilmiah terkait potensi

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nutrisi serta keberadaan senyawa bioaktif pada *Corypha utan*, serta mengidentifikasi kesenjangan penelitian yang berkaitan dengan pemanfaatannya sebagai bahan pakan alternatif. Metode yang digunakan dalam kajian ini adalah studi literatur dengan menelaah berbagai publikasi ilmiah yang membahas karakteristik botani, kandungan nutrisi, serta senyawa metabolit sekunder dari berbagai bagian tanaman *C. utan*. Hasil kajian menunjukkan bahwa beberapa bagian tanaman *C. utan*, seperti batang, empulur, dan bagian lainnya, dilaporkan mengandung komponen nutrisi dan metabolit sekunder yang berpotensi mendukung pemanfaatannya dalam sistem pakan ternak. Namun demikian, informasi ilmiah yang tersedia masih terbatas dan belum memberikan gambaran yang komprehensif mengenai pemanfaatannya dalam sistem produksi ternak. Oleh karena itu, penelitian lebih lanjut diperlukan untuk memperkuat dasar ilmiah dalam pengembangan dan pemanfaatan *C. utan* sebagai bahan pakan alternatif berbasis sumber daya lokal.

Kata kunci: *Corypha utan*, bahan pakan alternatif, nutrisi pakan, senyawa bioaktif, sumber daya lokal, pakan ternak

INTRODUCTION

Feed availability is one of the key factors in the success of livestock farming, as feed plays a crucial role in supporting livestock growth and productivity. However, in practice, farmers often face various challenges in securing feed, such as limited forage—especially during the dry season—a decline in the availability of natural feed sources, and rising prices for commercial feed. These conditions necessitate that farmer seek alternative feed sources to meet their livestock's nutritional needs. Utilizing alternative feed sources that are readily available, have sufficient nutritional value, and can be used sustainably is one approach that can be taken to address these issues (Anwar *et al.*, 2021; Hadi *et al.*, 2022). One biological resource with the potential to be used as an alternative feed is the gebang plant (*Corypha utan Lamk.*), which has already been utilized by local communities in some regions as livestock feed.

Corypha utan Lamk. is a tropical palm species in the Arecaceae family that is widely distributed throughout Southeast Asia, including eastern Indonesia. This species is known as a large palm with a sturdy single trunk and fan-shaped (costapalmate) leaves, and it has a monocarpic life cycle, meaning it flowers once before eventually dying. In Indonesia, *C. utan* has various local names, such as gewang and putak in Timor and surrounding areas, gebang in parts of Java and Bali, and siwalan hutan in certain regions and coastal areas; in the Philippines, it is known as the buri palm, while in India it is often called the talipot palm (Witono *et al.*, 2018; Lalel *et al.*, 2022)

The utilization of *C. utan* is not limited to traditional food but also holds potential as an alternative feed ingredient for livestock. Several studies have reported the use of putak flour in feed formulations for both fish and ruminant livestock, yielding relatively positive growth results (Hanmina *et al.*, 2021; Nalle *et al.*, 2021; Lazarus *et al.*, 2025). In addition to its high carbohydrate content, this plant is also reported to contain various secondary metabolites such as flavonoids, saponins, tannins, and glycosides that have the potential to provide additional bioactive effects (Lalel *et al.*, 2022).

Several studies have reported the potential of *C. utan* as a source of energy and starch for animal feed; however, studies that integrate information on nutritional composition, secondary metabolite content, and the ecological and sustainability aspects of its utilization remain relatively limited. One aspect that has not been widely discussed is the relationship between the plant's physiological age, its biomass production potential, and its nutritional quality. This is important given that this species is monocarpic and its utilization in nature

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must take into account the sustainability of the resource. These information gaps highlight the need for a more comprehensive literature review to understand the potential of *C. utan* as a sustainable alternative feed ingredient. Therefore, this review article aims to comprehensively review the literature on the nutritional potential and bioactive compounds of *C. utan*, as well as to identify research gaps that can serve as a foundation for its future development and utilization.

RESEARCH METHODS

This article was prepared using a literature review approach, involving a systematic search of scientific databases such as Google Scholar and ScienceDirect, as well as national and international journals, covering the years 2015–2026. The keywords used include *C. utan*, pith, proximate composition, feed fermentation, secondary metabolites, and ruminant feed. The included articles are original research studies containing primary data related to nutritional composition, secondary metabolite profiles, or their biological implications for the digestive system of livestock, while articles that were irrelevant or not fully accessible were excluded from the analysis. The data obtained were then analyzed descriptively and comparatively to identify the potential use of *C. utan* as an alternative feed ingredient and to identify research gaps that still need to be addressed.

DISCUSSION

Bioecological profile *Corypha utan*

In Indonesia, *C. utan* is known by various local names, such as gewang and putak in Timor and the surrounding areas, gebang in some parts of Java and Bali, and siwalan hutan in some coastal regions (Lalel & Rubak, 2024). Outside Indonesia, this species also has different local names depending on its distribution area (Dransfield *et al.*, 2008). As a member of the Arecaceae family, *C. utan* is a tropical palm capable of growing in various soil types, ranging from sandy to clayey (Dransfield *et al.*, 2008). Its natural habitat generally includes dry lands, savannas, and coastal areas with high sunlight intensity (Kusuma & Witono, 2020). Its ability to adapt to relatively dry environmental conditions allows this species to be distributed across various tropical regions of Southeast Asia, including eastern Indonesia (Lalel & Rubak, 2024). Taxonomically, this plant is classified under the kingdom Plantae, division Magnoliophyta, class Liliopsida, order Arecales, family Arecaceae, genus Corypha, and species *C. utan* (Witono *et al.*, 2018; Lalel *et al.*, 2022). This species is known as a large palm with a sturdy single trunk, reaching a height of about 10–30 meters, and a fairly large trunk diameter. Its leaves are fan-shaped (*costapalmate*), broad, and arranged to form a large crown at the top of the trunk. In addition, *C. utan* has a monocarpic life cycle, meaning it flowers only once; after flowering and fruiting, the plant dies, with a lifespan that can reach approximately 30–40 years (Prasetiyo *et al.*, 2008).

As a monocarpic plant, *C. utan* undergoes a very long vegetative phase, which can last for several years before entering the generative phase. During this vegetative phase, the plant accumulates biomass and carbohydrate reserves in the stem pith in preparation for the formation of a large inflorescence. After flowering and fruit formation are complete, the plant undergoes physiological death. This growth pattern results in the progressive accumulation of starch in the pith leading up to the flowering phase; consequently, the plant’s physiological lifespan and harvest time are critical determinants of the nutritional quality of the feedstock (Witono *et al.*, 2018; Lalel *et al.*, 2022).

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Nutrition Profile *C. utan*

The life cycle of *C. utan* is monocarpic; that is, the plant flowers only once in its lifetime before eventually dying. This plant undergoes a very long vegetative phase, which can last approximately 30–60 years before entering the reproductive phase. At the end of its life cycle, *C. utan* produces a large-scale inflorescence before eventually dying after the flowering and fruit-setting processes (Witono *et al.*, 2018; Lalel *et al.*, 2022).

The part of the *C. utan* plant commonly used as a feed ingredient is the stem pith, known as "putak" (Witono *et al.*, 2018). Both putak and the flour produced from it are reported to have nutritional content that makes them potential alternative feed sources (Owa & Jasman, 2022; Lalel *et al.*, 2022). Several studies have shown that putak contains carbohydrates as the dominant component, along with protein, fat, and crude fiber in varying amounts (Hanmina *et al.*, 2021; Owa & Jasman, 2022). The high carbohydrate content, primarily in the form of starch, serves as the main energy source in the diet (Lalel *et al.*, 2022), while the protein and fiber fractions influence digestibility and the efficiency of nutrient utilization by livestock and fish (Yanza *et al.*, 2021). The nutritional content of *C. utan* pith (both fresh and processed) as reported in various studies is shown in Table 1.

The protein content in fresh pith is relatively low compared to fermented or processed pith (from which flour has been extracted). This is because pith is a tissue that functions as a store of energy reserves in the form of starch, resulting in a dominant carbohydrate content. This characteristic explains why pith serves more as an energy source than a protein source in feed formulations.

The nutritional content of fresh putak and fermented putak differs slightly. In fermented putak, the protein content is slightly lower than in fresh putak. Conversely, the carbohydrate content is slightly higher than in fresh putak. Theoretically, fermentation can cause complex compounds (such as fiber) to break down into simpler compounds, and the loss of mass from other components (such as protein) can increase the percentage of carbohydrates and total dry matter. In general, fermentation increases protein content relatively through the formation of microbial biomass (single-cell protein). However, this increase is highly dependent on the type of inoculum, dosage, and incubation time. If microbial growth is suboptimal or nitrogen degradation occurs during fermentation, the final protein content may remain low. The dynamics of nitrogen during fermentation have been extensively reported in livestock nutrition studies (Yanza *et al.*, 2021; Kholif *et al.*, 2024).

In powdered form, the protein content reported by (Hanmina *et al.*, 2021; Odjan *et al.*, 2023) shows higher values compared to fresh pith. This increase is related to the drying and milling processes, which reduce the moisture content of the material, resulting in a proportional increase in nutrient concentration on a dry matter basis. Thus, variations in protein content across studies more accurately reflect differences in material form and drying treatments prior to analysis, which cause changes in nutrient concentrations on a dry-matter basis, rather than changes in the biological composition of the material itself.

The low fat content of the pith indicates that the primary energy source is stored in the form of starch. This composition supports its use as an energy source in ruminant diets, as materials with low fat content tend not to disrupt rumen fermentation stability (Yanza *et al.*, 2021). Meanwhile, the relatively moderate fiber content indicates a lower level of tissue lignification compared to other vegetative parts such as sheaths or leaves.

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Profile of Secondary Metabolites in *Corypha utan*

Secondary metabolites are bioactive compounds that play a role in plants' defense mechanisms and physiological adaptation to environmental stress. Unlike primary metabolites, which are directly involved in growth and basic metabolism, this group of metabolites generally does not play a direct role in growth processes but exhibits various biological activities that can affect other organisms that consume them. In the context of livestock nutrition, the presence of secondary metabolites such as phenolics, flavonoids, tannins, saponins, alkaloids, and terpenoids is known to produce specific physiological effects depending on their type and concentration (Jayanegara *et al.*, 2018; Yanza *et al.*, 2021).

Several groups of secondary metabolites have been reported to possess antioxidant and antimicrobial activities, as well as the ability to modulate fermentation processes in the ruminant digestive system. These activities may play a role in improving nutrient utilization efficiency, maintaining the balance of rumen microflora, and supporting overall livestock health (Oskoueian *et al.*, 2013; Patra *et al.*, 2017). However, at certain concentrations, some bioactive components may also interact with proteins or digestive enzymes, potentially affecting digestibility and nutrient utilization. Therefore, the identification and characterization of secondary metabolites in alternative feed ingredients are crucial for assessing the balance between functional benefits and their potential impact on nutritional efficiency. A summary of secondary metabolite groups, along with examples of specific compounds, their biological activities, and their implications in ruminant nutrition systems, is presented in Table 2.

In general, secondary metabolites in plants play an important role in maintaining plant physiological functions and modulating interactions with other organisms, including rumen microbes in livestock. These compounds exhibit bioactive potential that can support nutrient balance and livestock health. Information regarding the content of secondary metabolites in *C. utan* is still relatively limited. Phytochemical screening results from various plant parts indicate the presence of components such as tannins and saponins, which were detected through qualitative analysis (Reku *et al.*, 2019). The presence of these bioactive components suggests that this plant not only possesses basic nutritional value but also has the potential for biological activity that can influence fermentation processes and nutrient metabolism within the livestock digestive system.

In the ruminant nutritional system, metabolites such as tannins and saponins are known to influence rumen microbial activity and feed fermentation patterns. Several studies have reported that these components play a role in modifying nitrogen utilization by rumen microbes and can affect the composition of the microbial population at certain concentrations (Jayanegara *et al.*, 2018; Yanza *et al.*, 2021). Therefore, the presence of secondary metabolites in *C. utan* is a crucial aspect in evaluating its potential as an alternative feed ingredient or as a source of bioactive compounds in livestock nutrition systems.

The Role of Secondary Metabolites in Livestock Nutrition Systems

Tannins and Their Implications for Protein

Tannins are a group of phenolic compounds capable of forming complexes with proteins through hydrogen bonding and hydrophobic interactions. In the ruminant digestive system, tannins can bind to dietary proteins, thereby reducing their excessive degradation by rumen microorganisms. This mechanism can increase the fraction of protein that escapes rumen

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degradation (rumen-undegradable protein) and is available for absorption in the small intestine as bypass protein (Jayanegara *et al.*, 2018).

Several studies have shown that moderate tannin supplementation can improve nitrogen retention and protein utilization efficiency in ruminant livestock. However, at excessively high concentrations, tannins can reduce dry matter and protein digestibility due to the formation of tannin–protein complexes that are difficult for digestive enzymes to break down (Aguerre *et al.*, 2016).

Saponins and Modulation of Rumen Fermentation

Saponins are glycosides composed of a triterpenoid or steroid aglycone bound to a sugar moiety. In the rumen, these compounds are known to possess antiprotozoal activity that can reduce protozoal populations. Protozoa play a role in protein degradation and the predation of rumen bacteria; therefore, a reduction in their population can enhance the efficiency of microbial protein synthesis (Patra *et al.*, 2017).

Experimental studies have shown that supplementation with plant saponins can improve nitrogen utilization efficiency and reduce nitrogen loss in the form of ammonia in the rumen. Furthermore, a reduction in protozoan populations has also been reported to potentially lower enteric methane production in the ruminant digestive system (Yanza *et al.*, 2021). Therefore, the presence of these components in feed ingredients has the potential to contribute to improved rumen fermentation efficiency.

The Role of Phenolic Compounds and Flavonoids in Livestock Feed Metabolism

Phenolics and flavonoids are groups of secondary metabolites known for their strong antioxidant activity. In livestock nutrition, these components play a role in maintaining the stability of metabolic processes by protecting cells from oxidative damage and influencing the activity of digestive microorganisms.

Feed metabolism in ruminants involves fermentation by rumen microorganisms that break down carbohydrates, proteins, and other nutrient components into simpler compounds such as volatile fatty acids, ammonia, and microbial biomass, which are then utilized by the animals as sources of energy and protein (Patra *et al.*, 2017). In this process, phenolics and flavonoids can interact with microbial activity and digestive enzymes, potentially affecting nutrient utilization efficiency (Oskoueian *et al.*, 2013).

Several studies have reported that supplementing ruminant diets with plant-derived flavonoids can have positive effects on nutrient metabolism and the physiological condition of livestock. The antioxidant activity of these compounds also plays a role in reducing oxidative stress, which can disrupt metabolic processes and livestock production performance (Kholif *et al.*, 2024).

However, to date, research specifically examining the presence of phenolics and flavonoids in *C. utan* and their effects on feed metabolism and livestock performance remains very limited. Therefore, further research is needed to identify the bioactive potential of this plant more comprehensively and to evaluate its implications for livestock nutrition systems.

Potential for Use as an Alternative Feed Ingredient

The use of *C. utan* as an alternative feed ingredient can be analyzed based on available information regarding its nutritional composition and secondary metabolite profile. The stem pith (putak) is reported to have a high carbohydrate content with a relatively low protein content, making it a potential energy source in livestock feed formulations (Lalel *et al.*, 2022). In addition, processing methods such as drying and fermentation have been reported to

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modify the nutrient composition of the material; in some cases, this can increase the relative protein concentration due to changes in moisture content or microbial activity during fermentation (Hanmina *et al.*, 2021; Lalel *et al.*, 2022).

In other vegetative parts such as leaves, leaf sheaths, and fruit juice, phytochemical analysis reveals the presence of several secondary metabolites, including tannins, saponins, flavonoids, and phenolic compounds (Reku *et al.*, 2019). The presence of these compounds indicates that, in addition to being a source of nutrients, *C. utan* also possesses bioactive potential that supports its use in livestock feed systems. Based on available data, the potential for utilizing various parts of the *C. utan* plant as alternative feed ingredients is shown in Table 3.

Based on the results of studies as shown in Table 3, various parts of the *C. utan* plant have different potentials in livestock feed systems. The stem pith is the most widely utilized part because it contains high levels of starch and carbohydrates, making it a potential energy source in feed formulations. Meanwhile, vegetative parts such as leaves and leaf sheaths generally contain structural fiber and secondary metabolites that can provide additional functions in feed systems, particularly for ruminants, which are capable of digesting fibrous material through rumen microbial fermentation. Furthermore, the presence of bioactive compounds such as saponins and tannins—which have been reported in leaves and leaf sheaths—has the potential to influence rumen fermentation dynamics and nitrogen utilization by rumen microorganisms (Jayanegara *et al.*, 2018).

The pith of *C. utan* stems, known as “putak,” is a local starch-based feed ingredient with potential for use as an energy source in livestock rations. The carbohydrate content in the pith is relatively high, while protein and fat levels tend to be low; therefore, this material is more appropriately categorized as an energy source rather than a protein source (Lalel *et al.*, 2022). These characteristics make *C. utan* pith a suitable partial substitute for conventional energy sources such as corn or rice bran in feed formulations, particularly in livestock systems that rely on local resources in tropical regions.

When compared to other starch-producing palms such as Metroxylon sagu and Arenga pinnata, the pith of *C. utan* exhibits similar nutrient composition characteristics, namely a predominance of carbohydrates as the primary component. The sago palm itself has long been utilized as an alternative energy source in livestock and fish feed due to its high starch content and abundant availability in tropical regions (Ehara *et al.*, 2018; Karim *et al.*, 2008). Compared to these palm species, the use of *C. utan* as a feed ingredient remains relatively limited; therefore, further research is needed to evaluate its nutritional value, digestibility, and utilization efficiency in livestock feeding systems.

In livestock farming practices, feed ingredients with high carbohydrate content are generally utilized as an energy source for ruminants through fermentation by rumen microorganisms. This fermentation process produces volatile fatty acids, which serve as the primary energy source for livestock. In addition to ruminants, the use of putak flour has also been reported in poultry and fish on a limited scale, with results indicating fairly good utilization potential (Hanmina *et al.*, 2021; Nalle *et al.*, 2021). In non-ruminant animals such as poultry and fish, the utilization of starch-based materials relies more heavily on enzymatic digestion in the digestive tract (Adeyemi *et al.*, 2020).

In addition to nutritional composition, palatability is also a key factor in the utilization of alternative feed ingredients. Palatability refers to the extent to which livestock prefer a particular feed ingredient, which can influence overall feed intake. Several studies have shown that the presence of certain secondary metabolites, such as tannins or saponins, can

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affect the taste and aroma characteristics of feed ingredients, potentially influencing consumption levels if their content is relatively high (Jayanegara *et al.*, 2018). Therefore, evaluating consumption levels and livestock response to *C. utan* pith-based feed ingredients is essential for their further development.

Improving the nutritional quality of pith-based feed materials can also be achieved through processing, one of which is fermentation. The fermentation process, which utilizes specific microorganisms, can increase relative protein content through the formation of microbial biomass and improve the digestibility characteristics of the feed ingredients (Adeyemi *et al.*, 2020). Research conducted by Lalel *et al.* (2022) showed that the fermentation of *C. utan* pith can increase relative protein levels as a result of microbial activity that utilizes carbohydrate substrates during the fermentation process.

Other research findings indicate that the fermentation of putak using a mixed culture of *Trichoderma reesei* and *Aspergillus niger* can increase the crude protein content to 23.62%, with soluble protein at 14.92%. This increase results from the activity of microorganisms that produce cellular biomass and hydrolytic enzymes, which aid in the breakdown of carbohydrate substrates during the fermentation process (Hilakore *et al.*, 2019).

The use of *C. utan* pith as a feed ingredient should also be considered in the context of the availability of alternative energy sources compared to conventional feed ingredients such as corn, cassava, and rice bran. Corn is the primary energy source in livestock rations because it has a high metabolizable energy content and good digestibility. However, the use of corn often faces challenges in the form of competition with human food needs and price fluctuations in the market. Under these conditions, the use of local starch-based feed ingredients such as *C. utan* pith can be a potential alternative, especially in regions with abundant palm resources (Adeyemi *et al.*, 2020; Lalel *et al.*, 2022; Foni *et al.*, 2025).

Although several studies have reported the nutritional composition and the presence of secondary metabolites in various parts of the *C. utan* plant, its use as an alternative feed ingredient still faces a number of scientific limitations. Most of the available research has focused on basic chemical composition analysis and qualitative phytochemical testing, while studies that directly evaluate the use of *C. utan* pith in feed formulations remain very limited. Information regarding nutrient digestibility, palatability levels, and the effects of its use on livestock performance parameters—such as weight gain, feed conversion efficiency, and rumen fermentation response—has also not been widely reported. Furthermore, quantitative data on the concentrations of secondary metabolites such as tannins and saponins remain limited, so safe limits for their use in feed formulations cannot yet be clearly determined. These conditions indicate that the utilization of *C. utan* as an alternative feed ingredient is still in the exploratory stage and requires further experimental research to ensure its effectiveness and safety in livestock production systems.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on a synthesis of the various literature reviewed in this article, the use of *C. utan* as an alternative feed source shows promise for the development of feed systems based on local resources. The literature review also indicates that the available scientific information remains fragmented and does not yet provide a comprehensive picture of the plant's functional value within livestock production systems. This situation points to a knowledge gap that still needs to be bridged to support the more targeted development and utilization of *C. utan* in the future.

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Suggestions

Research on the use of *C. utan* as an alternative feed ingredient remains limited and has largely focused on basic chemical composition analysis and phytochemical testing. Therefore, future research should focus on biological evaluation through in vitro and in vivo testing to determine nutrient digestibility, palatability, and its effects on livestock performance. In addition, studies on processing techniques, such as fermentation or combination with other feed ingredients, are also needed to improve nutritional quality and its utilization in feed formulations.

REFERENCES

Adeyemi, J. A., Peters, S. O., Donato, M. De, Cervantes, A. P., & Ogunade, I. M. (2020). Effects of a blend of Saccharomyces cerevisiae -based direct-fed microbial and fermentation products on plasma carbonyl- metabolome and fecal bacterial community of beef steers. *Journal of Animal Science and Biotechnology*, *5*, 1–10. https://doi.org/https://doi.org/10.1186/s40104-019-0419-5

Aguerre, M. J., Capozzolo, M. C., Lencioni, P., Cabral, C., & Wattiaux, M. A. (2016). Effect of quebracho-chestnut tannin extracts at 2 dietary crude protein levels on performance , rumen fermentation , and nitrogen partitioning in dairy cows. *Journal of Dairy Science*, 1–11. https://doi.org/10.3168/jds.2015-10745

Anwar, R., Wibowo, T. A., & Untari, D. S. (2021). Manajemen Pemberian Pakan Ternak Sapi Potong Di Kecamatan Pasir Sakti , Kabupaten Lampung Timur The Feed Management of Beef Cattle in Pasir Sakti Sub District , Lampung Timur District. *Science and Technology*, *01*(02), 190–195.

Dransfield, J., Baker, W. J., Harley, M. M., & Lewis, C. E. (2008). *Genera Palmarum: The Evolution and Classification of Palms (2nd ed)*. Richmond, UK: Kew Publishing.

Ehara, Johnson, D. V, & Livelihoods, S. (2018). *Sago Palm: Multiple Contributions to Food Security and Sustainable Livelihoods.* Singapore: Springer Singapore.

Foni, L., & Isma Sandune Paembonan. (2025). Potensi Putak (Corypha utan Lamk) sebagai sumber pati lokal untuk binder wafer pakan: kajian literatur terhadap sifat kimia dan aplikasinya. *Agrivet : Jurnal Ilmu-Ilmu Pertanian Dan Peternakan (Journal of Agricultural Sciences and Veteriner)*, *13*(2), 437–433. https://doi.org/10.31949/agrivet.v13i2.16642

Hadi, S., Prayuginingsih, H., Suroso, B., & Warisaji, T. T. (2022). Pembuatan Pakan Alternatif Ternak Sapi Melalui Fermentasi Gedebog Untuk Cadangan Musim Kemarau Salah satu dusun di Desa Pakem Kecamatan Pakem adalah Dusun Batu Putih yang. *Jurnal JiIWAKERTA*, *3*(1), 57–73. https://doi.org/https://doi.org/10.32528/jiwakerta.v3i1.8041

Hanmina, Y. Linggi, Y. J. (2021). Pemanfaatan tepung putak (Corypha utan) sebagai pakan pengganti tepung dedak (Oryza sativa) terhadap pertumbuhan ikan bandeng (Chanos chanos Forskal). *Jurnal Akuatik*, *4*(1), 23–33. https://doi.org/http://ejurnal.undana.ac.id/jaqu/index 23

Hilakore, M. A., Suryahadi, & Wiryawan, K. (2019). Penerapan Kultur Campuran Trichoderma reesei dan Aspergillus niger dalam Meningkatkan Kualitas Putak sebagai Pakan. *Jurnal Veteriner*, *20*(36), 87–92. https://doi.org/10.19087/jveteriner.2019.20.1.87

Hilda van owa, J. (2022). PENGARUH KONSENTRASI PUTAK DAN LAMA FERMENTASI MENGGUNAKAN Trichoderma reesei TERHADAP KANDUNGAN GIZI. *Jurnal Science and Biotechnology*, *1*(1), 63–68.

Jayanegara, A., & Kreuzer, M. (2018). *Silage quality as influenced by concentration and type* *of tannins present in the material ensiled : A meta - analysis*. *April*, 1–10. https://doi.org/10.1111/jpn.13050

Karim, A. A., Tie, A. P., Manan, D. M. A., & Zaidul, I. S. M. (2008). Starch from the Sago (Metroxylon sagu) Palm Tree — Properties , Prospects , and Challenges as a New Industrial Source for Food and Other Uses. *Food Science and Food Safety*, *7*(1977).

Kholif, A. E., Gouda, G. A., Fahmy, M., & Vargas-bello-pérez, M. M. A. E. (2024). Fennel seeds dietary inclusion as a sustainable approach to reduce methane production and improve nutrient utilization and ruminal fermentation. *Journal Animal Science*, *4*(November 2023), 1–9. https://doi.org/https://doi.org/10.1111/asj.13910

Kusuma, Y. W. C., & Witono, J. R. (2020). Population Structure, Dispersion Pattern and Seedling Growth of Gewang Palm (Corypha utan Lam.) In Timor Island, Indonesia. *Biotropia*, *27*(1), 33–40.

Lalel, H. J. D., Kaho, N. P. L. B. R., & Lince Mukkun, D. (2022). Kajian Sebaran dan Kondisi Lingkungan Pohon Gewang (Corypha utan Lamk.) Di Kabupaten Kupang. *11*(1), 10–18.

Lalel, H. J. D., Mahayasa, I. N. W., Mukkun, L., Abidin, Z., & Ata, A. R. B. (2022). Physicochemical and organoleptic properties of gebang (Corypha utan) starch-based analogous rice with dolichos bean (Lablab purpureus) flour supplementation. *International Journal of Tropical Drylands*, *6*(2), 45–49. https://doi.org/10.13057/tropdrylands/t060201

Lalel, H. J. D., & Rubak, Y. T. (2024). Gebang (Corypha utan Lamk) Tree as A Food Resource for Timorese People. *EAS Journal of Nutrition and Food Sciences*, *6*(01), 1–5. https://doi.org/10.36349/easjnfs.2024.v06i01.001

Lazarus, E. J. L., & Lawa, E. D. W. (2025). Gas Production Characteristics and in Vitro Digestibility of Slow-Release Urea Based on Gewang (Corypha Utan Lamk.) and Tapioca Stem Meal. *IOP Conference Series: Earth and Environmental Science*, *1482*(1). https://doi.org/10.1088/1755-1315/1482/1/012014

Nalle, C. L., Helda, Masus, B., & Malo, J. (2021). Nutritional Evaluation of Sago of Gebang Tree (Corypha utan Lamk) from Different Locations in West Timor - Indonesia for Broilers. *Tropical Animal Science Journal*, *44*(1), 48–61. https://doi.org/10.5398/tasj.2021.44.1.48

Odjan, G. S., Tobuku, R., & Tjendanawangi, A. (2023). Efektivitas Putak Yang Difermentasi Terhadap Pertumbuhan Ikan Bandeng (Chanos chanos , Forsskal). *JVIP*, *4*(1), 42–48.

Oskoueian, E., Abdullah, N., & Oskoueian, A. (2013). Effects of Flavonoids on Rumen Fermentation Activity , Methane Production , and Microbial Population. *BioMed Research Internasional*, *2013*. https://doi.org/http://dx.doi.org/10.1155/2013/349129

Patra, A., Park, T., Kim, M., & Yu, Z. (2017). Rumen methanogens and mitigation of methane emission by anti-methanogenic compounds and substances. *Journal of Animal Science and Biotechnology*, 1–18. https://doi.org/10.1186/s40104-017-0145-9

Prasetiyo, K. W., Subyakto, & Naiola, B. P. (2008). Sifat Fisik dan Mekanik Batang Gewang (Corypha utan Lamk .) dari Nusa Tenggara Timur. *Tropical Wood Science and Technology*, *6*(1), 20–25.

Reku, T. U., Ndaong, N. A., & Almet, J. (2019). Uji potensi ekstrak etanol daun gewang (Corypha utan lamk) sebagai antihelmintik terhadap cacing Ascaris suum secara in vitro. *Veteriner Nusantara*, *2*(1), 11–15.

Terakreditasi Nasional Sinta 4, berdasarkan Keputusan Direktur Jenderal
Pendidikan Tinggi, Riset, dan Teknologi No. 158/E/KPT/2021

Witono, J. R., Wahyu, Y., Kusuma, C., & Naiola, B. P. (2018). Traditional utilization and processing of gewang palm (Corypha utan Lam.) starch in Timor island, Indonesia. *Journal of Biological Researches*, *23*(2), 95–100. https://doi.org/http://dx.doi.org/10.23869/bphjbr.23.2.20188

Yanza, Y. R., Fitri, A., Suwignyo, B., Hidayatik, N., Nur, Rochmah, K., & Agung, I. (2021). The Utilisation of Tannin Extract as a Dietary Additive in. *Animal*, *11*, 1–25. https://doi.org/https://doi.org/10.3390/ani11113317

Tables

Table 1. Nutritional Content *C. utan*

No.	Part	Compotition (%)				Source
		Protein	Fat	Carbohidrate	Fibers	
1	Putak (trunk core)	3,56	0,11	80	5,21	Owa & Jasman (2022)
2	Fermentation Putak	2,18	NR	87,88	NR	Lalel *et al.* (2022)
3	Putak Flour	17,77	NR	NR	NR	Hanmina *et al.* (2021)
		9,79	NR	NR	NR	Odjan *et al.* (2023)

Note: NR= Not Reported

Table 2. Profile of Secondary Metabolites and Their Potential in Livestock Nutrition Systems

Secondary Metabolites	Compotition	Fungtion	Implications for Livestock Nutrition Systems	Source
Tannin	Catechins, Gallic Acid, Proanthocyanidins	Forms complexes with proteins; antioxidant	Reduces excessive protein degradation in the rumen → increases bypass protein; at high levels, it reduces dry matter and protein digestibility	Jayanegara *et al.* (2019); Aguerre *et al.* (2016)
Saponin	Aglikon triterpenoids (oleanolic acid, hederagenin), steroid saponins	Antiprotozoa, antimikrobial	Reduces the rumen protozoa population → increases the efficiency of microbial protein synthesis; reduces nitrogen loss and enteric methane production potential	Patra *et al.* (2017); Yanza *et al.* (2021)
Fenolic and Flavonoid	Quercetin, Kaempferol, Myricetin, Flavonol	Antioksidant, antimikrobial	Protects cells from oxidative damage; modulates microbial activity and digestive enzyme activity → potentially improves nutrient metabolism efficiency	Patra & Saxena (2009); Oskoueian *et al.* (2015); Kholif *et al.* (2020)
Tannin and Saponin	A combination of phenolic compounds and glycosides	Fermentation modulator	Plays a role in maintaining the balance of rumen microflora and the efficiency of nutrient utilization	Jayanegara *et al.* (2019); Yanza *et al.* (2021)
Other bioactive compounds	Alkaloids, Terpenoids, Isoprenoids	Specific biological activity	Potential to influence nutrient metabolism and microbial activity	Reku *et al.* (2020)

Table 3. The Use of *C. utan* as an Alternative Feed Ingredient

Part of tree	Main compotition	Benefits in the Feed System	Source
Trunk core	High in starch and carbohydrates	Has the potential to serve as an energy source in animal feed, particularly as a partial substitute for conventional energy sources such as corn or cassava flour	Nalle *et al.*, 2021; Ehara *et al.*, 2018
Leaves	Dietary fiber, phenolic compounds, and flavonoids	As a source of fiber in ruminant feed and with the potential to provide antioxidant activity	Lalel *et al.*, 2022
Fruit juice	Saponin and tannin	Has the potential to modulate rumen fermentation and influence nitrogen utilization by rumen microbes	Reku *et al.*, 2020

Figures

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2

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Figure 1. A *Corypha utan* tree that has reached maturity before being harvested (1); *Corypha utan* trunk that has been felled and cut into several sections to facilitate the processing of the pith (2); the process of splitting the *Corypha utan* trunk to extract the pith, which is used as a source of starch and has potential as an animal feed ingredient (3).