

Narratives of the Farmers' Treasure: Blood, sweat, and milk

Denver Josh D. Baldos

Saint Louis University
Baguio City, Philippines

Marilyn L. Balmeo, PhD*

Saint Louis University
Baguio City, Philippines
Email: mlbalmeo@slu.edu.ph

Kathleen Kaye L. Biay, MA SS

Saint Louis University
Baguio City, Philippines

ABSTRACT

The use of carabao milk in the dairy product industry has emerged in recent decades in Asingan, Pangasinan, Philippines, yet it remains relatively unexplored. The dearth of literature in the municipal library reflects its limited recognition, as many people associate dairy products with cow's milk rather than carabao's milk. This study employs a narrative approach to explore the experiences of individuals involved in the production of carabao milk-based dairy products. Data was collected through informal interviews with individuals engaged in this industry. The participants' narratives reveal four key themes: (1) dairy products as a lifeline, highlighting the significance of dairy products; (2) symbolic value, showing its meanings to producers; (3) resilience amid challenges, reflecting the struggles faced and overcome in sustaining this practice; and (4) sustaining the tradition, emphasizing efforts to continue the tradition. This study contributes to a broader understanding of the role of carabao's milk in dairy production and its potential for wider recognition.

Keywords: dairy products, cow's milk, agriculture, farming, carabao's milk

Date Submitted: August 1, 2025
Date Accepted: September 4, 2025
Date Published: October 3, 2025

*Corresponding author
DOI: <http://doi.org/10.69651/PIJHSS0404495>

Recommended citation:

Baldos, D. J. D., Balmeo, M. L., & Biay, K. K. L (2025). Narratives of the Farmers' Treasure: Blood, sweat, and milk. *Pantao (The International Journal of the Humanities and Social Sciences)* 4 (4), 5346-5357.
<http://doi.org/10.69651/PIJHSS0404495>

INTRODUCTION

Agriculture is the science, art, and business of cultivating the soil to produce crops and raise livestock, which is useful to humankind. This activity makes the vast majority of the world's food supply (History of Agriculture | Food System Primer, n.d.; Madsen, 1995). Rooting its origin around 12,000 years ago, cities and civilizations were developed because of agriculture (Naithani, 2021). This adaptive activity of humans in the early times caused changes in society and the way in which people lived, which has been called the "Neolithic Revolution". Hunting and gathering were swept aside in favor of permanent settlement, and people started relying on the food supply they got from cultivating the land (National Geographic Society, 2024).

As time passed, humans also began domesticating animals to develop characteristics in organisms that increase their utility, which could be advantageous for them. Domesticated animals have been selectively bred and genetically adapted over generations to live alongside humans (Daly, 2019). The origin can be traced back to when the Mesopotamians domesticated plants. People in Mesopotamia began to tame animals for meat, milk, and hides. Hides, or the skins of animals, were used for clothing, storage, and to build tent shelters (Rutledge et al., 2024). These domesticated animals are more accepting of control or instructions than their wild counterparts and often produce more resources than usual. They have also been used for the convenience of humans, like transportation, assistance, and companionship (Nair et al., 2024).

Farming plays a role in securing basic necessities and food security in the Philippines. As an agricultural country with farms making up one-half of its total land area, farming is the Filipinos' main livelihood source (Lozada, 2018). Farming areas in the country are usually found in plains, valleys, and at the foot of the mountains, where farmers tirelessly cultivate the farmlands to plant agricultural products and raise livestock for family consumption or sell these goods to the market. Farming systems in the country are complex, multi-faceted, and geared to promote efficient production and a steady source of income (Briones, 2005). As of 2023, agricultural workers in the Philippines had an average daily basic wage of about 322.23 Philippine pesos (Balita, 2024).

Agriculture, one of the leading sectors in the Philippine economy, provides 40 to 45 percent of the total national income and about 75 to 80 percent of the country's exports (Cagasan & Dogello, 2021). Its major agricultural products include rice, coconuts, corn, sugarcane, bananas, pineapples, and mangoes (Balakrishnan, n.d.). However, despite having these plentiful resources, the World Bank (2020) has issued a comprehensive report that outlines the sector's decline over time. From 1940 to 1950, agricultural productivity was high, and the country was one of the largest exporters of rice and other agricultural commodities (Briones, 2020). Unfortunately, trade policies and global economic patterns have altered the Philippines' agricultural fate. Fast forward to the 21st century, trade deficits in the agricultural sector have steadily widened as imports increased exponentially from USD 3.1 billion to USD 13.7 billion between 2001 and 2018, showing that they have been growing faster than exports (with 3.6 percent annual growth; Evangelista et al., 2022).

In the Philippines, the carabao, considered the country's national animal, is a domesticated animal that helps farmers in their everyday life on the farm. It is a swamp-type domestic water buffalo that was probably introduced to the Philippines by the Malay immigrants around 200-300 BCE (Isabela State University, 2019). This farmer's best friend, who helps in

tilling the soil and is a source of nutritious milk, also helps the agriculture sector become a major sector of the country (Balita, 2024).

Behind every harvest of every farmer is a hardworking agricultural helper, the carabao. According to D.F. Doeppers (2004), the carabao is the best animal suited for work in muddy, swampy environments and thrives on poor-quality browse. Without it, preparing the land for planting would be a challenging task. Also, it is no surprise that some provinces in the Philippines hold festivals to honor this beast of burden, the farmer's friend (Dolcevitalux, 2017). These festivals indicate that carabaos are deeply embedded in our culture as they symbolize strength, power, and hard work for Filipinos, especially farmers. In return, farmers take care of carabaos very well, and they usually provide a nipa hut where carabaos can rest at night. They are also very well fed and bathed.

Asingan, also known as the “vegetable bowl of Pangasinan”, is a municipality situated in the eastern part of the coastal province of Pangasinan, Philippines. With a land area of 6,759 hectares, its fertile flatland is rich, giving the town the perfect conditions for agriculture, enabling people to grow rice, corn, and vegetables abundantly (The Official Website of the Province of Pangasinan, 2023). This makes the town the top 7 in 2019 and top 9 in 2020 for most palay (rice grains) producers in the province (Local Economy - Pangasinan Provincial Planning and Development Office, 2021). This agricultural success is brought by the hardworking farmers who tirelessly cultivate the land, alongside their partner in farming, the carabaos, a symbol of strength and resilience, who, amidst technological advances, are still important for the farmers because they play a vital role in traditional farming, from plowing fields to transporting harvests. Beyond their roles in the fields, the carabao emerges as a significant contributor to the town's economy through its milk production, with Asingan being the largest producer of carabao milk in Pangasinan and known for producing its own key ingredients in the local dairy industry (Regional News Group Luzon, 2023).

At the heart of Asingan lies a multi-purpose cooperative which processes and produces these dairy products. In 1973, farmers from Asingan formed a group named “Samahang Nayon” (village association) to avail of the annual cash benefits and acquire technology of high-yielding variety seeds, subsidized fertilizer, low-priced pesticides, and herbicides from the government program called “Masagana 99” (Abundant 99 Program; Mateo, 2024; Hamias, 2024). In 1991, the group became a Multi-Purpose Cooperative named “Bantog Samahang Nayon (Bantog Village Association) Multi-Purpose Cooperative” (BSNMPC) with the help of the Department of Trade and Industry (DTI), Philippine Carabao Center (PCC), and the Local Government Unit (LGU) of Asingan (Asingan Pangasinan, 2013), but they focused on vegetable farming. In 2005, their brand, “Dairy Box,” was born when PCC gave them 25 heads of Carabaos (Mateo, 2024; Milestones, n.d.). And finally, in 2007, they started processing their first dairy product, which is pasteurized milk (Hamias, 2024). Today, the Dairy Box also produces chocolate milk, flavored yogurts, pastillas (milk candy), espasol (Filipino rice cake), and polvoron (shortbread cookie) using carabao milk (Hamias, 2024).

Statement of the problem

While the dairy industry, especially with the carabao milk production, is thriving in Asingan, Pangasinan, not much is known about the carabao milk production and consumption, especially the farmers' experiences throughout the process, as studies on the topic remain scarce. This dearth of knowledge about the subject shows a lack of recognition of the use of carabao milk in the dairy industry, since cows' milk is widely known and used compared to carabao milk.

Hence, this study aimed to explore the experiences of farmers involved in producing carabao milk and related dairy products through their narratives. By studying their narratives, this investigation hopes to contribute more knowledge on the role of carabao milk in dairy production. Moreover, this study will help contribute to a broader acknowledgement of the potential of carabao milk for developing the agricultural sector.

METHODOLOGY

The study employed a qualitative research design, specifically narrative research, to explore the lived experiences and insights of individuals directly involved in carabao-based dairy production in Asingan, Pangasinan. Narrative research, as described by Creswell (2013, as cited in Mahoney & Khwaja, 2016), focuses on collecting and interpreting stories to derive meaning collaboratively between the researcher and the participants. Such an approach allows for a deeper understanding of human experiences within their social and cultural contexts. By drawing from the participants' narratives, the study sought to capture the richness of their personal accounts, thereby offering a comprehensive picture of the socio-cultural and economic significance of dairy production in the locality.

Three participants were purposefully selected for this study based on their direct engagement and experience with carabao farming and dairy production. All participants were residents of Asingan, Pangasinan, and were chosen for their first-hand knowledge of the processes, challenges, and cultural meanings attached to the production of dairy products. To ensure confidentiality, the participants were assigned pseudonyms. Grace, one of the original members of the cooperative, shared her experiences from its humble beginnings to its current operations, particularly in managing the processing unit. Fred, a young cooperative manager, represented the continuity of traditional practices by choosing to remain in his hometown despite opportunities elsewhere. Lastly, Wani, a farmer and carabao owner, provided valuable perspectives on the realities of agricultural labor and the role of carabaos in sustaining farm productivity.

Data were gathered primarily through semi-structured interviews supported by field notes. The interview questions were designed to elicit narratives about the history of dairy production using carabao's milk, the importance of these products to the community, and their symbolic meanings within local culture. The participants were also asked to share their challenges in maintaining production and to provide recommendations for sustaining and promoting the industry, particularly among the younger generation. Interviews were conducted in locations chosen by the participants to ensure comfort and authenticity in their responses. Each session lasted approximately 30 to 45 minutes, and all interviews were audio-recorded with the participants' consent. The recordings were later transcribed and translated into English, and

participants verified the accuracy of the translated transcripts to maintain the integrity of their narratives.

Ethical considerations were strictly observed throughout the research process. Participants were fully informed about the purpose of the study and their voluntary participation. They were assured that they could withdraw from the study at any time without consequence and that all information shared would remain confidential and be used solely for academic purposes. The study was self-financed, and the researchers declared no conflict of interest to maintain impartiality and ethical integrity in the conduct of the research.

For data analysis, the study adopted Riessman's thematic analysis strategy (as cited in Duque, 2010), which focuses on identifying recurring themes and patterns within narratives. The analysis involved deriving themes from the interview data, research questions, and relevant theoretical frameworks. A priori codes were developed to categorize the participants' experiences, values, and attitudes, allowing the researchers to systematically interpret the meanings embedded in their stories. This analytical approach facilitated a comprehensive understanding of how traditional dairy production practices reflect not only economic activity but also cultural continuity, community identity, and personal agency among the people of Asingan.

RESULTS AND DISCUSSION

This study gathered insights from three participants—Grace, Fred, and Wani—who are members of the Bantog Samahang Nayon Multi-Purpose Cooperative (BSNMPC) in Asingan, Pangasinan. As discussed in the methodology, the research employed a qualitative narrative approach to explore how carabao-based dairy production has influenced the lives of the people involved in it. Semi-structured interviews with these participants provided rich data that reflected their unique experiences and perspectives. Grace, a veteran member, shared her wisdom as one of the cooperative's founders; Fred, a young leader, narrated his experiences as the current manager; and Wani, a farmer and milk supplier, discussed how carabaos contribute to his family's livelihood. Their stories highlight the economic, cultural, and symbolic value of carabao milk production and how this tradition continues to shape the identity of Asingan.

Grace: A loving mother

Grace has been a devoted member of the cooperative since its inception in 1973. For over fifty-one years, she has been an active contributor to the development and expansion of the organization. She was one of the first farmers who joined the group Samahang Nayon to benefit from the Masagana 99 program of the government. Over time, she witnessed its transformation into a multi-purpose cooperative and the establishment of its own brand, the "Dairy Box." Through the cooperative, she was able to provide a better life for her family. Her six children received education through the income she earned from dairy production—one now resides in New Zealand, another completed law school, three are currently pursuing degrees in agriculture, and one is still in high school. She proudly shared that the cooperative's dairy business not only

supported her family but also improved the lives of fellow farmers who could now afford basic needs and education for their children.

Grace also detailed the process of dairy production, beginning with the collection of carabao milk from farmer-members. Each batch is tested and classified into three categories. Class A milk, of the highest quality, is used for liquid products such as pasteurized milk, choco milk, and yogurt. Class B milk is slightly lower in quality and is used for solid dairy products including pastillas de leche, espasol, polvoron, and kesong puti. Class C milk is rejected and returned to farmers due to contamination. Among these, pasteurized milk remains the most popular product because it is simple to process—heated to 72°C, cooled, and packaged for sale.

Grace views the carabao as more than just a farm animal. To her, it is a “three-in-one package” that sustains life in multiple ways: it provides calves for continuity in farming, waste matter for organic fertilizer, and nutritious milk that can be sold or consumed. She recalled that in 2005, the Philippine Carabao Center (PCC) donated 25 heads of carabaos to their cooperative. Initially, they struggled to find a market for the milk, leading to spoilage. Instead of discarding it, they distributed the milk to students, bakers, senior citizens, and victims of calamities, including those affected by a volcanic eruption. Despite financial losses, they continued the effort for the benefit of their community.

Grace also emphasized the importance of involving the youth in sustaining dairy production. The cooperative employs out-of-school youth and provides them opportunities to earn income. During the pandemic, many young people participated in their feeding programs, gaining work experience and financial support. She encourages them to return to school when possible, knowing that the opportunity to work in the cooperative is temporary but can serve as a stepping stone toward a better future.

Fred: A young leader

Fred began his career in the cooperative in 2020 and has been serving as its manager for four years. Growing up with parents who were members of the cooperative, he was exposed to the industry from a young age, attending meetings and learning the ropes before officially joining the organization. His leadership, despite his youth, has been a source of inspiration for the members, demonstrating that commitment and competence matter more than age.

Fred shared how the cooperative has become a source of pride for Asingan. Whenever the municipality receives visitors from other provinces, the local government showcases their dairy products as a highlight of the town's achievements. The cooperative also partners with the Department of Education (DepEd) in Pangasinan to supply dairy products for school feeding programs, expanding their reach and promoting children's nutrition.

On a personal level, Fred stated that the cooperative allowed him to grow professionally and develop leadership skills. He takes pride in how his fellow members trust him and how this motivates him to learn more and perform better. For the community, dairy production provides livelihood and employment opportunities. During the pandemic, the cooperative hired 128 people to maintain operations, showing its resilience and social responsibility. They also conducted medical missions, supported by proceeds from dairy production.

Fred believes that their source of milk—the carabao—makes their town unique. Unlike other municipalities that rely on cows, Asingan's dairy industry thrives on carabao milk, a fact

that often surprises outsiders. He proudly mentioned that in 2024, Asingan celebrated its first-ever Kalabaw Food Festival to honor this distinctive aspect of their culture and livelihood.

He also recounted several challenges he faced as a young leader. At first, he struggled to gain the trust of older members, but he earned their respect through hard work and consistency. Technical issues also posed problems, such as a major incident when faulty freezers caused the cooperative to lose around one million pesos worth of milk. They addressed this by hiring experts for regular maintenance and improving coordination with power suppliers to avoid outages. Another setback occurred in 2023 when a planned feeding program was canceled, leaving tons of unsold milk. To minimize losses, they collaborated with nearby producers to sterilize the milk and sold it to Indian nationals in town who preferred raw milk. Despite efforts, some products still spoiled. However, through assistance from the Department of Trade and Industry (DTI) and the PCC, the cooperative received funding for a retort machine that now allows them to sterilize milk and extend its shelf life from one month to up to a year.

Fred also prioritizes youth employment, hiring out-of-school youth and students seeking to fund their education. While the cooperative limits employment to legal-aged applicants, they are exploring ways to support underage youth who show interest in the trade, reflecting their commitment to youth empowerment and education.

Wani: A grateful farmer

Wani, a farmer and carabao owner, joined the cooperative in 2014 after being encouraged by a fellow farmer. Since 2015, he has been selling milk from his carabaos and is deeply grateful for the financial stability it has brought his family. The income from dairy production allows him to pay household bills, buy food, and support his children's education. With children in both college and high school, Wani recognizes the growing expenses his family faces and values the steady income that carabao milk provides.

To Wani, the carabao symbolizes hard work and resilience. He compares the endurance of the carabao under the scorching heat of the fields to the determination of the people of Asingan, who continue to strive despite hardships. The carabao, he explained, embodies the same values that define their community—perseverance, humility, and dedication.

Health issues among carabaos pose a common challenge for farmers. Illness affects their performance and the quality of milk, which sometimes leads to the classification of their product as Class C, resulting in financial setbacks. When this happens, the farmers consume the milk at home rather than wasting it. To prevent losses, they ensure their carabaos are well-nourished and seek assistance from experts when health problems arise. Wani also encourages the youth to pursue farming, showing them that agriculture offers fulfillment and service to the community. He proudly shared that in 2023, the town held its first Kalabaw Food Festival, symbolizing the importance of carabaos in the local culture and economy.

Discussion of narratives

The narratives of Grace, Fred, and Wani reveal interconnected themes reflecting livelihood, symbolism, resilience, and continuity. Despite differences in age, experience, and

role, all participants emphasized how dairy production significantly improved their quality of life and strengthened their community.

Dairy products as a lifeline

For the participants, dairy products serve as a vital source of livelihood. Grace and Wani testified that their involvement in the cooperative enabled them to meet their families' financial needs and provide education for their children. Fred, on the other hand, gained professional growth and fulfillment through his work as a young manager. As noted by the Department of Agriculture Undersecretary Deogracias Victor Savellano, raising carabaos on a commercial scale offers Filipino farmers sustainable livelihood opportunities (Austria, 2024). Their experiences mirror this reality. Beyond farming, carabao-based dairy production has become an alternative means of income generation and community development in Asingan.

Symbolic value

The carabao carries deep symbolic meaning for the participants. Grace describes it as a “three-in-one package” that sustains generations through calves, fertilizers, and milk. Fred underscores its uniqueness as a source of dairy products that distinguishes Asingan from other municipalities using cow's milk. Wani views the carabao as a symbol of endurance and determination—traits reflective of the people of Asingan themselves. This perspective aligns with Roque's (2015) assertion that carabaos have evolved from being seen as “beasts of burden” to “beasts of fortune.” Scientifically, carabao milk's nutritional superiority reinforces this symbolic value, being high in protein, calcium, and fat while low in cholesterol—making it one of the most complete foods available (Ramos, 2019).

Resilience amid challenges

All three participants demonstrated resilience in the face of adversity. Grace recalled moments when milk production exceeded market demand, leading to spoilage, yet she chose to donate the surplus to communities in need. Fred faced leadership and technical difficulties, including financial losses, but overcame them through initiative and collaboration with government agencies. Wani coped with livestock health challenges by ensuring proper care and consulting experts. Their perseverance reflects the cooperative spirit that sustains BSNMPC's success. In 2022, the cooperative produced and distributed 52,800 bottles of fresh milk and 52,800 milky buns daily for the Department of Education's feeding programs (Sotelo, 2022), demonstrating their adaptability and social commitment.

Sustaining the tradition

The continuation of dairy production depends on engaging the younger generation. The cooperative actively hires and mentors youth, particularly out-of-school individuals, providing them with valuable skills and income. The 2024 Kalabaw Food Festival, supported by the local government, served as a platform to celebrate this cultural and economic heritage. Farmers,

cooperatives, and government agencies have also collaborated to expand production, as shown by local farmer Rolly Mateo Sr., who earned ₱4 million in 2023 from silage and dairy-related ventures (Canute, 2024). These initiatives reflect the enduring spirit of Asingan—one that values tradition while embracing innovation.

Indeed, the carabao remains the “farmer’s best friend” and a symbol of hope, resilience, and sustenance. Through the narratives of Grace, Fred, and Wani, it is evident that carabao-based dairy production not only provides livelihood and nourishment but also strengthens the community’s cultural identity. The people of Asingan have transformed this humble animal into a pillar of economic stability and cultural pride, ensuring that the legacy of dairy production will continue to thrive for generations to come.

CONCLUSION

In today's society, where technological advancements are evident, dairy product producers and farmers remind people that there is no harm in embracing technology because, indeed, it improves lives and makes work a lot easier and faster. The narratives shared by the respondents are constant reminders that farmers and their carabaos play a significant role in today's modern world because they are the ones who produce food and milk that people consume every day. The respondents of this study prove that tradition and modernity are not two opposite forces fighting over who is better; they have proven that these two forces can bring positive and significant changes if used accordingly. Farmers already have their technological equipment, which can make their work easier, but still, they choose to keep their carabaos because they see their value on the farmland and as another source of livelihood. The carabao’s milk, as a vital ingredient for producing nutritious dairy products, is also an ingredient for success for the people of Asingan.

The humble town of Asingan in the province of Pangasinan, Philippines, may not be a land of honey, but surely, it is a land of flowing milk. The experiences of farmers and producers of dairy products teach people that everything starts from small beginnings. Hard work and perseverance result in both individual and community success. The carabao is a very significant farm animal that plays a significant role in the lives of farmers.

Based on the discussion, it is highly recommended that the Local Government Unit of Asingan ensure that the town's Carabao Festival will continue in the following years. This will ensure that the production of dairy products will continue in the long run and that this success will be widely known, not just in the town of Asingan but also in other towns and all over the Philippines in the future. It is also recommended that the Local Government Unit, the Bantog Samahang Nayon Multi-Purpose Cooperative, and the farmers of Asingan passionately inspire the young generations to continue this tradition through unending support and care.

REFERENCES

Asingan Pangasinan. (2013, September 19). Balitang Asingan: Carabao milk processing center binuksan na [Video]. YouTube. <https://www.youtube.com/watch?v=ktoVpaNCOgo>

Balakrishnan, R. (n.d.). Women in agriculture, environment and rural production. Food and Agriculture Organization of the United Nations. <https://www.fao.org/4/ae946e/ae946e03.htm#bm3>

Balita, C. (2024). Average daily basic wage and salary of agricultural workers Philippines 2016–2023. Statista. <https://www.statista.com/statistics/1321358/philippines-average-daily-wage-of-agricultural>

Balita, C. (2024). Topic: Agriculture in the Philippines. Statista. <https://www.statista.com/topics/5744/agriculture-industry-in-the-philippines/>

Briones, N. (2005). Environmental sustainability issues in Philippine agriculture. AgEcon Search. <https://ageconsearch.umn.edu/record/165781?v=pdf>

Briones, R. (2020). The unfinished agenda of trade liberalization in Philippine agriculture: Assessing the impact of reducing tariff and nontariff barriers. Philippine Institute for Development Studies. <https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2042.pdf>

Cagasan, U., & Dogello, J. (2021, December 22). A review on the status of crop production innovations of the Philippines. <https://dergipark.org.tr/en/pub/ejar/issue/66343/972896>

Canute, R. C. (2024, August 22). Pangasinan carabao farmer turns into a multimillionaire from silage-making. Philippine Carabao Center. <https://www.pcc.gov.ph/pangasinan-carabao-farmer-turns-into-a-multimillionaire-from-silage-making/>

Climate Change Commission. (n.d.). Agriculture. NICCDIES. <https://niccdies.climate.gov.ph/mitigation/agriculture>

Daly, N. (2019). Domesticated animals, explained. National Geographic. <https://www.nationalgeographic.com/animals/article/domesticated-animals>

Doeppers, D. (2004). Beef consumption and regional cattle husbandry systems in the Philippines, 1850–1940. In P. Boomgaard & D. Henley (Eds.), *Smallholders and stockbreeders: History of foodcrop and livestock farming in Southeast Asia* (pp. 307–324). KITLV Press.

Dolceitalux. (n.d.). The farmer's friend. Flickr. <https://www.flickr.com/photos/11541098@N06/>

Evangelista, J., Estrella, N., & Suin, A. (2022). Trade liberalization: Reaping its effects on the agricultural performance of the Philippines. *Journal of Economics Finance and Accounting Studies*, 4(1), 131–149. <https://doi.org/10.32996/jefas.2022.4.1.9>

Food System Primer. (n.d.). History of agriculture.
<https://foodsystemprimer.org/production/history-of-agriculture>

Fronda, J. G. (2022). The supply chain of vegetable production in the Philippines: The case of Nueva Ecija farmers. *Open Journal of Social Sciences*, 10, 16–27.
<https://doi.org/10.4236/jss.2022.1013003>

Isabela State University. (2019, July 29). Special projects. <https://isu.edu.ph/special-projects/#:~:text=The%20carabao%20is%20a%20swamp,national%20animal%20of%20the%20Philippines>

Local Economy - Pangasinan Provincial Planning and Development Office (PPDO). (2021, August 2). Pangasinan provincial planning and development office (PPDO). [https://ppdo.pangasinan.gov.ph/planners-and-researchers-kiosk/provincial-ecological-profile-2020/local-economy/#:~:text=The%20top%20ten%20\(10\)%20palay,\(2018\)%20to%20116%2C182.78%20MT](https://ppdo.pangasinan.gov.ph/planners-and-researchers-kiosk/provincial-ecological-profile-2020/local-economy/#:~:text=The%20top%20ten%20(10)%20palay,(2018)%20to%20116%2C182.78%20MT)

Madsen, E. L. (1995). Impacts of agricultural practices on subsurface microbial ecology. In *Advances in agronomy* (pp. 1–67). [https://doi.org/10.1016/s0065-2113\(08\)60897-4](https://doi.org/10.1016/s0065-2113(08)60897-4)

Milestones. (n.d.). Philippine Carabao Center. <https://www.pcc.gov.ph/index.php/milestone/2/>

Naithani, S. (2021, June 8). The origins of agriculture. Pressbooks. <https://open.oregonstate.education/cultivatedplants/chapter/agriculture/>

Nair, K., Fussell, G. E., Gray, A. W., Mellanby, K., Rasmussen, W. D., Ordish, G., & Crawford, G. W. (2024, November 22). Origins of agriculture | History, types, domestication, techniques, & facts. *Encyclopedia Britannica*. <https://www.britannica.com/topic/agriculture>

National Geographic Society. (2024). The development of agriculture. <https://education.nationalgeographic.org/resource/development-agriculture/>

Peralta, M., Jr. (2024, April 25). 1st Kalabaw food festival features Asingan co-op's 'nuang-derful' journey. Philippine Carabao Center. <https://www.pcc.gov.ph/1st-kalabaw-food-festival-features-asingan-co-ops-nuang-derful-journey/>

Ramos, J. (2019, July 28). Why is carabao milk the most complete food? GMA Entertainment. <https://www.gmanetwork.com/entertainment/celebritylife/food/53256/why-is-carabao-milk-the-most-complete-food/story>

Regional News Group Luzon. (2023, November 29). Carabao milk and dairy products in Asingan, Pangasinan (GMP episode 8) [Video]. YouTube. <https://www.youtube.com/watch?v=5-BjXrsBUTI>

Roque, A. S. (2015, September 11). Carabao rises to new-found importance as farmers' 'beast of fortune'. Philippine Carabao Center. <https://www.pcc.gov.ph/carabao-rises-to-new-found-importance-as-farmers-beast-of-fortune/>

Rutledge, K., McDaniel, M., & Teng, S. (2024). Domestication. National Geographic. <https://education.nationalgeographic.org/resource/domestication/>

Sotelo, Y. (2022, July 24). Dairy farms help feed kids, fight poverty in Pangasinan. Inquirer News. <https://newsinfo.inquirer.net/1633067/dairy-farms-help-feed-kids-fight-poverty-in-pangasinan>

The Official Website of the Province of Pangasinan. (2023, June 14). Asingan. <https://www.pangasinan.gov.ph/city-municipalities/asingan/#:~:text=Asingan's%20fertile>

Tugade, L. (2020). Re-creating farms into agritourism: Cases of selected micro-entrepreneurs in the Philippines. African Journal of Hospitality, Tourism and Leisure. <https://www.semanticscholar.org/paper/Re-creating-farms-into-Agritourism%3A-Cases-of-in-the-Tugade/284f8f638ef822c51051a629dd0ec69b5b56cf69>

World Bank. (2020). Transforming Philippine agriculture during COVID-19 and beyond. <https://openknowledge.worldbank.org/bitstream/handle/10986/34012/Transforming-Philippine-Agriculture-During-COVID-19-andBeyond.pdf?sequence=4&isAllowed>