PRODUCTION AND ECONOMIC PERFORMANCE OF BROILER CHICKEN (*Gallus domesticus*) FED WITH LACTIC ACID BACTERIA SERUM FERMENTED COPRA MEAL

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CERTIFICATE OF PANEL APPROVAL

This research paper, entitled **"PRODUCTION AND ECONOMIC PERFORMANCE OF BROILER CHICKEN *(Gallus domesticus)* FED WITH LACTIC ACID BACTERIA SERUM FERMENTED COPRA MEAL"**, prepared and submitted by SHANE P. EDULLANTES, MAE L. MAISA, ELVIC RYR T. PUROL, in fulfillment of the requirements for the degree of **Bachelor of Science in Agriculture,** has been examined and is recommended for acceptance and approval.

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DEDICATION

This research was dedicated to their beloved family members and parents, whose unending sacrifices, love, and encouragement formed the bedrock of their success. Whenever they doubted themselves, their family always believed in their dreams, and that steadfast faith inspired them to achieve what once seemed impossible. To their family, who instilled in them the values that shaped who they had become, the researchers expressed their deepest gratitude for imparting the importance of hard work and perseverance.

To their classmates and friends, the researchers also expressed their sincere appreciation for the constant support and understanding they received. Their peers had been a source of comfort during difficult times, standing by them in moments of stress and celebrating even their smallest achievements. They dedicated this entire thesis to this shared experience, considering it a testament to the bonds they had formed; this paper belonged to all of them.

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ABSTRACT

This study evaluated the effects of different inclusion levels of fermented copra meal using lactic acid bacteria serum on the growth performance of broiler chicken (*Gallus domesticus*). Specifically, it aimed to evaluate initial and final weight, weight gain, feed consumption, feed conversion ratio, feed conversion efficiency, carcass traits, and economic performance. The experiments were conducted at Misamis University, Bañadero Farm, from January to February 2026. The experiment was laid out in a Completely Randomized Design (CRD) with three replications using a factorial arrangement. Factor A consisted of different days of fermentation: A1 – 0 days, A2 – 5 days, and A3 – 10 days; and four inclusion levels of fermented copra meal: B1 – 0%, B2 – 5%, B3 – 10%, and B4 – 15%, giving twelve treatment combinations. Statistical results showed that fermentation duration and inclusion levels of fermented copra meal had no significant effect ($p\text{-value} < 0.05$) on growth performance and feed utilization. However, carcass traits and economic performance were significantly influenced ($p\text{-value} > 0.05$) by copra meal fermentation, with higher inclusion levels tending to reduce carcass yield and profitability. It is concluded that fermented copra meal using lactic acid bacteria serum can be utilized as a feed ingredient for broiler chickens at low to moderate inclusion levels without adversely affecting growth performance.

Keywords: dressing characteristics, economic performance, feed efficiency ratio, feed utilization, fermented copra meal.

INTRODUCTION

Background of the study

In Philippine agriculture, the chicken industry was essential to both the country's economy and food security (Moniño, 2023). Particularly in underdeveloped nations where access to meat was essential for preventing malnutrition, chicken was a staple protein source because it was frequently less expensive than other meats. (Sakhno, Salkova,2021). As part of larger agricultural research projects, some farmers raised chickens to improve farm productivity, optimize resource use, and create better management techniques (Habane et al, 2026).

However, the industry was faced with challenges due to high feed costs and reliance on imports. The global chicken business confronted difficulties, which led to research into alternative feed sources. With the potential to replace 27% of fishmeal imports worldwide, 16% of oilseed meal, and 19% of cereal, substituting indigenous food system byproducts for imported feeds could have improved food system resilience (Sandström et al., 2024). And based on availability, cost, and nutrient content, local items were grouped; certain groupings offered adequate nutrition at reduced prices (Sathyaruban et al., 2022). Investigating new protein sources was necessary due to the rising cost of feed ingredients brought on by the growing demand for animal proteins (Zaid et al., 2023).

However, alternative feed ingredients for broiler chickens were investigated recently in an effort to combat growing costs and advance sustainable production. Numerous unconventional components have demonstrated promise as nutritional sources, such as agricultural wastes and by-products (Babatunde et al., 2021; Ahmad et al., 2023). Although its low lysine content and digestibility limit its application (Kaninde et al.,2023).

Alternative feeds, such as copra meal, were viable ways to lower the expenses of raising chicken and increase farmers' profits (Sugiharto, 2019; Diarra et al., 2019; Sajib et al., 2023; Punzalan & Rosentrater, 2024). However, compared to conventional feeds, these alternatives had higher levels of fiber and lower nutrient content, making them difficult to formulate (Sugiharto, 2019).

Copra meal, a by-product of coconut oil production, has long been recognized as a valuable protein source in animal feed (Punzalan & Rosentrater, 2024). Recent research highlights its potential to improve feed digestibility and nutrient utilization across various animal species. For example, supplementing fermented copra meal (FCM) with crude cellulase derived from Trichoderma viride has been shown to boost protein and crude fiber digestibility, as well as apparent metabolizable energy in broiler chickens (Hatta et al., 2020). In addition, mixed solid-state fermentation of copra meal with probiotics has improved feed conversion ratios, enhanced gut morphology, and favored ileal microbiota in broilers (Hsiao et al., 2022).

The fermentation of copra meal by Lactic Acid Bacteria (LAB) serum was an invaluable step in broiler chicken feeding. It was shown that chickens supplied with fermented copra meal can achieve better feed efficiency and growth performance. This conversion through fermentation improved protein availability and reduced fiber content (Kårlund et al., 2020; Hatta et al., 2020). Broilers that were fed fermented diets were reported to have a favorable weight gain because feed efficiency was improved (Xin Zhu et al., 2023). Moreover, Karlund et al., (2020) indicated that fermented copra meal had growth-promoting properties, improved weight gains and feed efficiency, and helped suppress pathogenic microbes.

Lactic Acid Bacteria serum was also recognized for its advantages as a feed additive. According to studies, LAB enhances immune responses, improves gut health, and positively contributes to production performance (Sugiharto & Ranjitkar, 2019). Probiotics, especially *Lactobacillus casei and Lactococcus lactis*, were proven to enhance the performance of broilers with increased weight gain and feed conversion ratios (Sari & Akbar, 2019).

Moreover, lactic acid bacteria were considered probiotics in the broiler chicken industry. Various studies indicated that supplementation with LAB improves growth performance, feed conversion efficiency, and intestinal health in broilers. They also reduced the levels of blood enzymes related to liver function, increased serum calcium and phosphorus levels, and increased the height of the intestinal villi (Adli et al, 2010; Deraz et al, 2019). Furthermore, LAB supplementation enhanced the population of beneficial bacteria while decreasing that of the pathogenic bacteria, which led to enhanced antioxidant levels and improved cecal microbiota (Deraz et al, 2019). The results suggested that Lactic Acid Bacteria Serum was an effective alternative to antibiotics in broiler chicken production while maintaining intestinal health, feed conversion efficiency, and growth parameters in chicks (Adli et al, 2010).

However, there was growing interest in poultry meat due to its high quality and relatively high demand. To satisfy these needs, efforts were made to explore other potential feed resources to improve further the growth performance and meat quality of broiler chickens. Copra meal, which was obtained from the coconut oil industry, was usefully added to the feed. Nevertheless, its high fiber content compromised nutrient digestibility and absorption. Using copra meal as a protein source, emphasizing its practicality and citing Punzalan & Rosentrater (2024). The use of copra meal as a protein source was enhanced through fermentation with lactic acid bacteria serum; however, the optimal levels of inclusion and their effects on growth performance were not well established. In this context, factors such as supplementation of fermented copra meal at various levels influenced growth traits, feed conversion ratio, and essential quality attributes in broiler chicken meat. Such understanding helped in formulating sustainable feeding strategies to improve broiler production, thereby enhancing efficiency and meat quality in the poultry sector.

Objectives of the Study

The study evaluated the effectiveness of using Copra Meal fermented using Lactic acid bacteria serum on the growth performance of broiler chickens (*Gallus domesticus*). Specifically, the study aimed to:

1. determine the growth performance in terms of initial weight, final weight, and weight gain of broiler chicken fed with different levels of copra meal fermented using lactic acid bacteria serum;
2. determine the feed utilization of broiler chicken fed with different levels of copra meal fermented using lactic acid bacteria serum;
3. determine the carcass trait of broiler chicken fed with different levels of copra meal

fermented using lactic acid bacteria serum;

4. determine the economic performance of broiler chicken fed with different copra meal fermented using lactic acid bacteria serum; and
5. determine the interaction between days of fermentation and different levels of copra meal fermented using lactic acid bacteria serum.

Hypothesis

This study proved the following hypothesis:

Null Hypotheses (Ho)

1. There is no significant difference in the growth performance of broiler chickens fed with varying levels of copra meal fermented with lactic acid bacteria serum.
2. There is no significant difference in the feed utilization of broiler chicken fed with different levels of copra meal fermented using lactic acid bacteria serum.
3. There is no significant difference in the carcass traits of broiler chickens fed with different levels of copra meal fermented using lactic acid bacteria serum.
4. There is no significant difference in the economic performance of broiler chickens fed with different levels of copra meal fermented using lactic acid bacteria serum.
5. There is no significant difference in the interaction between days of fermentation and different levels of copra meal fermented using lactic acid bacteria serum.

Significance of the Study

One major challenge farmer faced was commercial feeds. This was mainly due to the high cost associated with broiler production, where farmers paid very high expenses. The utilization of other locally available feed resources, such as copra meal, offered a possible solution to this problem. However, substitute feeds were usually of lower nutritional quality than commercial feeds.

The study undertook the fermentation of copra meal using Lactic Acid Bacteria serum with the aim of improving its nutritional qualities and determining its impact on the growth performance of reared broiler chickens. It sought to identify how low-cost, locally available feed ingredients could be made to result in better growth and improved production efficiency in broiler chickens.

Economically, this fermented copra meal was expected to be beneficial to farmers in reducing dependence on expensive commercial feeds and therefore lowering production costs. This was based on cost reduction and profitability improvement among small-scale and commercial poultry farmers. It added to the scientific literature on sustainable feed production techniques, as Lactic Acid Bacteria serum could ferment copra meal with improved benefits for animal nutrition. Such research contributed to more sustainable agricultural practices, in which costs were reduced while food security was enhanced.

Furthermore, findings from this study also fed into agricultural policy regarding innovative, environmentally friendly feed options that improved the sustainability and productivity of the poultry industry.

Scope and Limitation of the Study

The study aimed to determine the effects of Fermented copra meal with lactic bacteria serum on the growth performance of broiler chicken (*Gallus domesticus).* The study was conducted at Banadero Farm in Misamis Occidental, the experiment focused on four main areas: growth performance, carcass traits, feed efficiency, and economic results. The experiment used a 4x3 factorial design and included a control group, with all treatments arranged in a Completely Randomized Design (CRD) and repeated three times. The main variables were the length of fermentation with lactic acid bacteria serum (Factor A) and the different feed mixes, which combined commercial feed with varying levels of the fermented copra meal (Factor B). The study specifically aimed to: (1) measure growth by recording starting and ending weights and overall weight gain on the different diets; (2) assess how these feed changes influenced feed consumption and efficiency; (3) examine differences in carcass quality; (4) analyze economic outcomes; and (5) determine if there was any interaction between fermentation length and inclusion level. The copra meal was fermented for either 0, 5, or 10 days before being mixed into the feed, and broiler chickens were fed these diets for 20 days while their progress was closely tracked.

Definition of Terms

This section provides a clear definition of specialized terminology and concepts, helping readers understand the specific terminologies used in the research.

Alternative feed ingredients are non-traditional components added to livestock diets to boost nutrition, cut costs, or enhance sustainability.

Body weight gain refers to the increase in weight of broilers during the specific period, typically measured in kilograms.

Broiler chickens are a breed of chicken fed primarily for meat production. Known for their plump bodies and tender meat, they are a popular choice for poultry consumption.

Carcass percentage in broiler chicken is the proportion of the chicken carcass weight to its body weight, expressed as a percentage.

Carcass traits are indicators of growth, yield, and fat deposition, can be measured indirectly on the live animal by means of Real-time Ultrasound (RTU) scanning or directly by means of physically measuring on the carcass.

Commercial feeds are specially formulated products designed to provide balanced nutrition for livestock, poultry, and aquaculture.

Conventional feeds are traditional sources of animal nutrition primarily made up of grains, forages, and protein meals.

Copra meal, a byproduct of coconut oil extraction, is made from the dried meat of coconuts. It’s high in protein and fiber, making it a great feed option for broiler chickens.

Feed conversion ratio (FCR) is a crucial metric in animal husbandry that measures how efficiently livestock convert feed into body mass. It's calculated by dividing the amount of feed consumed by the weight gain achieved over a certain period.

Final weight refers to the weight of a broiler chicken at the end of the growth cycle, typically when it reaches market weight.

Growth performance is an important measure of how well animals turn feed into body mass. Several factors play a role in this, including genetics, diet, environment, and management practices.

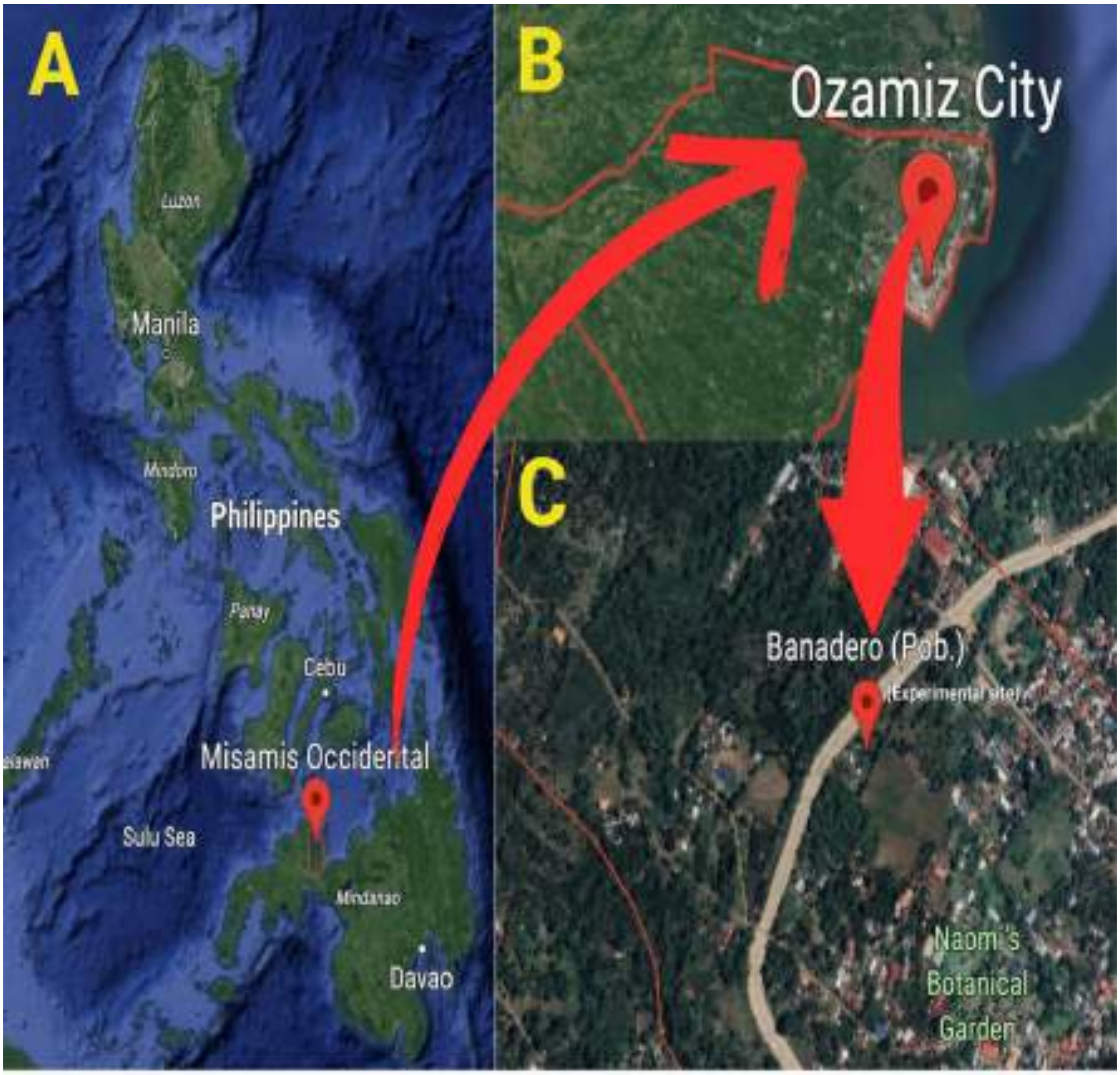
Lactic acid bacteria (LAB) are microorganisms that ferment sugars into lactic acid. They are found in many places, including dairy products and fermented vegetables, and are important for food preservation and promoting probiotic health benefits.

Lactobacillus is a well-known group of lactic acid bacteria recognized for its positive effects in fermentation and human health.

MATERIALS AND METHODS

Place and Date of the Study

The experimental study was conducted at Misamis University, Bañadero Farm, Ozamis City, Misamis Occidental from January to February 2025. (Fig. 1)



(A) Map of the Philippines with Misamis Occidental province highlighted.
(B) Section of the Misamis Occidental map indicating Ozamis City.
(C) Aerial image of the experimental area.

Materials

The materials used in the study included one hundred eighty (180) broiler chicks, commercial feeds, and feed ingredients such as copra meal. Other materials included vitamins, antibiotics, a poultry house, a brooding cage, and rearing cages. Lactic acid bacteria serum was used for the fermentation process._Additional equipment included a weighing scale, waterers, a record book and pen, measuring cups, plastic pails, plastic basins, a metal drum, and other necessary laboratory equipment.

Methods

Experimental Design and Treatments

The experiment used a 4×3 factorial design, structured as a Completely Randomized Design (CRD) with three replications. The main factors were the number of days the copra meal was fermented with lactic acid bacteria serum (Factor A) and the different feed mixes that combined commercial feed with various amounts of fermented copra meal (Factor B). In total, 180 broiler chickens were used, with five birds assigned to each treatment in every replication.

For Factor A, the fermentation periods were set at 0, 5, and 10 days. For Factor B, the feed was supplemented with four levels of fermented copra meal: 0%, 5%, 10%, and 15%. Throughout the 30-day feeding trial, the broilers received their designated diets, and their growth was tracked and recorded for the duration of the study. The two factors produced 12 treatment combinations (T1–T12), coded from A1B1 to A3B4.

Treatments, Treatment Combinations, and Treatment Codes

Table 1. Treatment, treatment combinations, and treatment codes of the study on the copra meal fermentation using Lactic acid bacteria serum on the growth performance of broiler chicken (*Galllus domisticus*).

Feed Fermentation (Factor A)	Feed Formulations (Factor B)	Treatment Combinations	Treatment Code	Treatment #
A1 – 0 days	B1 – 0% CF	WLabs–0% CF,0 DoF	A1B1	T1
	B2 – 5% FCM	WLabs–5% FCM, 0 DoF	A1B2	T2
	B3 –10% FCM	WLabs–10%FCM,0 DoF	A1B3	T3
	B4 –15% FCM	WLabs–15%FCM,0 DoF	A1B4	T4
A2 – 5 days	B1– 0% CF	WLabs – 0% CF, 5 DoF	A2B1	T5
	B2 – 5% FCM	WLabs– 5% FCM, 5 DoF	A2B2	T6
	B3– 10% FCM	WLabs–10%FCM,5 DoF	A2B3	T7
	B4– 15% FCM	WLabs–15%FCM,5 DoF	A2B4	T8
A3 – 10 days	B1– 0% CF	WLabs – 0% CF, 10 DoF	A3B1	T9
	B2 – 5% FCM	WLabs – 5% CF, 10 DoF	A3B2	T10
	B3– 10% FCM	WLabs–10% CF, 10 DoF	A3B3	T11
	B4– 15% FCM	WLabs–15% CF, 10 DoF	A3B4	T12

Factor A = feed fermentation duration (A1 = 0 days, A2 = 5 days, A3 = 10 days); Factor B = feed formulations (B1 = 0% CM, B2 = 5% FCM, B3 = 10% FCM, B4 = 15% FCM). WLabs = with Lactic Acid Bacteria Serum; CF = Commercial Feed; FCM = Fermented Copra Meal; DoF = Days of Fermentation.

Experimental Layout

The study utilized 180 heads of broiler chickens for a 4×3 factorial experiment with three (3) replications arranged in a Randomized Complete Block Design. Each block consisted of 12 treatment combinations, with five (5) broiler chickens assigned to each treatment. The layout of the study is presented in Appendix A.

Experimental Procedure

Procurement of Copra Meal

The collection of copra meal was successfully carried out through a systematic and a well-planned process. Initially, the researcher identified reliable suppliers, including Osamco and Jomie, who are recognized for providing high-quality copra meal. This involved conducting market assessments and establishing communication with these companies, as well as other potential sources. After identifying suitable suppliers, the researcher determined the required quantity of copra meal and negotiated key terms, including pricing, payment conditions, and delivery or pickup arrangements. In cases where copra meal was unavailable or out of stock, the researcher expanded the search to suppliers located in other towns or provinces and traveled when necessary to secure the needed supply.

Upon receipt of the copra meal, a thorough inspection was conducted to ensure that it met the required standards in terms of quantity, quality, and overall condition. This step was crucial in preventing potential issues during its use in feeding broiler chickens. Additionally, accurate records were maintained, including invoices, delivery details, and inventory levels, to support proper documentation and effective monitoring of supply requirements. To ensure continuity of supply, contingency measures were also implemented. These included maintaining a list of alternative suppliers and preparing strategies for the rapid sourcing of copra meal when needed. Through these procedures, the researcher ensured a consistent, reliable, and sufficient supply of copra meal throughout the study.

Fermentation of Copra Meal using Lactic Acid Bacteria Serum

Fermentation of copra meal using the lactic acid bacteria serum was conducted by thoroughly mixing the copra meal with the serum in a 1:1 ratio to initiate the fermentation process. The resulting mixture was then divided into three equal portions, and each portion was labeled to indicate the intended fermentation duration. The containers were placed in a controlled environment to allow fermentation to proceed.

To evaluate the effects of different fermentation durations, one portion was maintained at 0 days (no fermentation), another portion was fermented for 5 days, and the final portion was fermented for 10 days. Throughout the process, the fermentation progress was closely monitored to ensure that the copra meal reached an optimal condition suitable for feeding broiler chickens.

Feeding Fermented Copra Meal

The fermented copra meal was then incorporated into the dietary composition of broiler chickens. The researcher conducted a feeding trial where part of the commercial feed was replaced with fermented copra meal at varying levels—0%, 5%, 10%, and 15%—using a 1:1 mix with lactic acid bacteria serum for the 5%, 10%, and 15% groups. The 0% group served as the control and didn't receive any lactic acid bacteria serum. This setup allowed the team to see which amount worked best for the chickens' growth, feed intake, and meat quality. Each group of birds received their specific diet throughout the study, and they always had access to clean, fresh water.

The main goal was to find out how different amounts of fermented copra meal with lactic acid bacteria serum would affect weight gain, feed consumption, and overall development. The study also aimed to show that using local resources in this way could be

Both affordable and sustainable—offering benefits to poultry producers and the wider community alike.

Care and Management Practice of Broiler Chicken

Procurement of Broiler Chick

A total of one hundred eighty (180) day-old broiler chicks were sourced from La Purita breeding farm in Ipil, Zamboanga, Sibugay. To ensure consistency, all the chicks used in this study were hatched on the same day. Each chick was thoroughly checked to make sure they were healthy and free from diseases or infections that could interfere with the experiment.

Preparation of the Brooding Area

Upon the arrival of the broiler chicks, extra care was taken to help them settle in comfortably. The brooding cage was thoroughly cleaned and disinfected beforehand to protect the chicks from germs. The floor was lined with clean, dry rice hulls to give them a soft place to rest. Right after arrival, the chicks were given water with brown sugar to help them recover from the stress of transport and give them a quick energy boost. After about an hour, they were offered commercial starter feed. The brooding area was kept well-ventilated to avoid drafts and reduce the risk of respiratory issues. During rainy weather or at night, cement sacks were lowered around the cage to keep out the cold, then raised during the day to allow fresh air in. The chicks stayed in the brooding area until they reached 11 days old, ensuring they had a safe and comfortable beginning.

Rearing Management

When the broiler chicks reached eleven days old, they were carefully placed into rearing cages to start the experimental phase. In total, thirty-four cages were prepared, each housing five birds. With each cage measuring 6.4 feet by 12.8 feet, every chick had about one square foot of space, plus additional room for feeders and waterers. This setup made sure that each bird had enough space for healthy growth and easy access to food and water throughout the study. The cage dimensions ensured adequate ventilation and prevented overcrowding, which could cause stress and increase disease susceptibility. The rearing cages were cleaned daily to maintain a healthy environment and minimize the risk of disease. The chickens were reared under these conditions for thirty (30) days, which corresponded to the duration of the experimental period.

Lighting Management

Proper lighting management was absolutely essential for the overall health, physiological well-being, and rapid growth of the birds. During the critical brooding phase, three (3) 50-watt incandescent bulbs were used to provide sufficient warmth and illumination for one hundred eighty (180) day-old chicks. For the subsequent rearing phase, one 25-watt bulb per cage was consistently provided to maintain visibility. Initially, the chicks had continuous lighting during the brooding phase to keep them warm, active, and comfortable, ensuring they had constant access to essential feed and water, which effectively promoted early growth and development. After the first week, the lighting schedule was carefully adjusted from 24 hours of illumination down to 16 hours of light, and then further reduced to 8 hours of dedicated nighttime lighting. This gradual, strategic change mimicked natural environmental conditions and supported healthy, normal growth patterns for the broilers. Throughout the entirety of the experimental phase, the 8-hour nighttime lighting schedule was strictly maintained until the very end of the study for consistent results.

Feeding Management

The birds had continuous access to feed to support healthy growth. During the brooding period, they received a commercial starter feed. As they transitioned to the rearing stage, their diet was gradually shifted from the starter feed to a range of specially formulated and fermented feeds specific to each experimental group. This gradual change helped prevent digestive issues. Feeders were cleaned regularly to maintain hygiene, and daily records of feed consumption were kept for accurate monitoring.

Water Management

Clean, fresh water was provided freely to ensure the chicks stayed hydrated. Water dispensers were cleaned and sanitized thrice (3X) a day to prevent the spread of diseases. every other day, electrolytes, vitamins, and antibiotics were added to the water from the brooding phase until the end of the rearing phase. Water consumption was monitored and adjusted as needed. Shade and ventilation were provided to reduce water loss. Water stress was avoided by maintaining a consistent supply. This practice was intended to reduce stress, prevent diseases, and promote hydration and optimal growth. For vitamins VitMin

Pro was administered together with the water management interval with 3 days followed with normal clean water.

Disease Prevention, Treatments, and Control

Prevention of disease outbreaks was ensured through strict biosecurity measures. These measures included the use of clean clothing, boots, and equipment, which were regularly washed, and restricted access to the brooding and rearing areas. Equipment and footwear were disinfected, and the environment was maintained in a clean condition. The chicks were immunized with standard vaccines according to their specific ages.

Table 2. Vaccination and Deworming Program Schedule.

AGE	**VACCINE**	**MODE OF APPLICATION**
Day 11	IBD Vaccine	Intra ocular
Day 14	IBD Vaccine	I/O or I/N
Day 21	RDV La Sota	Via drinking water

Routine deworming was also conducted to prevent internal parasite infections. Regular health check-ups were carried out to monitor any signs of illness. Affected chicks were immediately removed and treated based on the identified pathogens to reduce the spread of disease. Detailed records of health status, treatments administered, and mortalities were maintained throughout the experimental period.

Data Gathered

The following data were gathered for the statistical analysis with their corresponding formulas:

A. Growth Performance of Broiler Chicken Fed with Copra Meal Formulated using

Lactic Acid Bacteria Serum. Parameters such as initial, final body weights, and

B. weight gain were monitored to evaluate the effectiveness of the different feed treatments on chickens' growth performance.

1. Initial Body Weight- Measured by weighing the birds at the start of the experiment.
2. Final Body Weight- Measured by weighing the birds at the end of the experiment.
3. Weight Gain- Calculated by subtracting the initial body weight from the final body weight.

$$\text{Weight Gain} = \text{Final Body Weight} - \text{Initial Body Weight}$$

C. Feed Utilization of Broiler Chicken Fed with Copra Meal Formulated using Lactic Acid Bacteria Serum. This includes the evaluation of the feed consumption, feed conversion ratio (FCR), and feed conversion efficiency (FCE).

1. Feed Consumption (g). This was determined by measuring the total amount of feed consumed per bird throughout the study period. Feed intake was recorded daily and summed over the entire experiment to assess the birds' feed consumption per treatment.
2. Feed Conversion Ratio (FCR). This was computed by dividing the total feed intake by the total weight gain. A lower FCR indicates better feed efficiency, meaning the birds required less feed to gain a unit of weight.

$$\text{Feed Conversion Ratio (FCR)} = \frac{\text{Feed Consumption (g)}}{\text{Weight Gain (g)}}$$

3. Feed Conversion Efficiency. This was determined as the reciprocal of the Feed

Conversion Ratio (FCR). It represents the efficiency with which the birds convert feed into body weight. A higher FCE indicates better feed utilization.

$$\text{Feed Conversion Efficiency (FCE)} = \frac{\text{Weight Gain (g)}}{\text{Feed Consumption (g)}}$$

D. Carcass Traits of Broiler Chicken Fed with Copra Meal Formulated using Lactic Acid Bacteria Serum. The carcass traits of Broiler chickens were evaluated by analyzing carcass weight and dressing percentage. These parameters were used to determine the impact of different feed treatments on meat yield and overall carcass quality.

1. Carcass Weight (g). This was measured by weighing the dressed carcass of Broiler chickens after slaughter. Following the standard marketing practice for Broiler Chickens in the local market, only the feathers were removed, while the head, feet, and internal organs remained intact.

2. Carcass Percentage- Calculated as the proportion of carcass weight to live weight: This will be calculated through the following formula:

$$\text{Carcass Percentage} = \frac{\text{Carcass Weight}}{\text{Live Weight}} \times 100$$

3. Dressing Percentage (%). This represents the proportion of the carcass weight relative to the live body weight of the chickens. It was calculated using the following formula:

$$\text{Dressing Percentage} = \frac{\text{Carcass Weight}}{\text{Live Weight}} \times 100\%$$

E. Economic Analysis. The economic analysis evaluated the cost-effectiveness and profitability of feeding strategies for Broiler chickens. The parameters include calculations for feed cost, total production cost, revenue, net income, and return on investment (ROI).

1. Feed Cost (₱). The total feed cost was determined by summing the feed expenses incurred from the beginning to the end of the experiment.
2. Total Production Cost (₱). This was calculated by adding all production-related expenses, including housing, feed, chicks, healthcare, labor, and other operational costs.
3. Revenue (₱). This was computed based on the total income generated from selling the chickens at a standard market price of ₱220 per kilogram (carcass weight).
4. Net Income (₱). The net income was derived by subtracting the total production cost from the gross sales, as shown in the formula:

$$\text{Net Income} = \text{Gross Sales} - \text{Total Production Cost}$$

5. Return on Investment (ROI, %). ROI measures the profitability of the production system by comparing net income to total production costs. It was calculated using the following formula:

$$\text{Return on Investment (ROI)} = \frac{\text{Net Income}}{\text{Cost of Production}} \times 100$$

Statistical Analysis

Descriptive statistics, including mean and standard deviation, were used to summarize growth performance, feed utilization, carcass traits, and economic indicators of broiler chickens fed copra meal formulated with lactic acid bacteria serum. A two-way analysis of variance (ANOVA)under a factorial Complete Randomized Design (CRD) was used to determine the main effect of the fermentation duration and copra meal inclusion level, as well as their interaction ,on initial weight, final weight, weight gain, feed consumption, feed conversion ratio (FCR), feed conversion efficiency (FCE), carcass weight, carcass percentage, dressing percentage and economic parameters(feed cost, total production cost, revenue, net income, and return on investment[ROI]). Tukey's HDS was applied for post hoc comparisons where significant differences were found.

RESULTS AND DISCUSSION

Growth Performance of Broiler Chicken

The growth performance of broiler chickens (*Gallus domesticus*) fed diets containing lactic acid bacteria (LAB)-fermented copra meal is shown in Table 3, focusing on initial weight, final weight, and weight gain. Overall, statistical analysis revealed no significant differences ($p > 0.05$) among treatments in all measured growth parameters across fermentation durations (0, 5, and 10 days) and inclusion levels (0%–15%).

Table 3. Growth Performance of Broiler Chicken (*Gallus domesticus)* fed with different levels of Copra Meal fermented using Lactic Acid Bacteria Serum.

TREATMENTS	INITIAL WEIGHT (g)	FINAL WEIGHT(g)	WEIGHT GAIN(g)
Feed Fermentation			
A_1 - 0 days	267.68 ±23.14735	1524.50 ±121.82352	1256.82 ±110.64770
A_2 - 5 days	259.73 ±19.06111	1520.45 ±127.70045	1260.72 ±117.00628
A_3 - 10 days	269.78 ±18.77086	1585.27 ±102.50546	1315.48 ±96.54416
F-Test	.461	.335	.351
Different Levels of FCM			
B_1 – CF + 0% CM	270.73 ±31.67791	1612.29 ±147.23067	1341.56 ±127.15218
B_2 - 5% FCM WLabs	261.31 ±18.91669	1533.98 ±100.22108	1272.67 ±90.05476
B_3 - 10% FCM WLabs	264.71 ±10.94309	1529.24 ±109.83464	1264.53 ±111.01644
B_4 -15% FCM WLabs	266.18 ±16.50680	1498.11 ±97.34116	1231.93 ±89.06907
F-Test	.807	.230	.211
A x B	.305	.612	.679

[a,b,c,d] Means with different superscripts differ significantly. F-test = probability value of treatment effects (*p* < 0.05; **p** < 0.01; ***p*** < 0.001; NS = Not Significant). Values are presented as mean ± SD. IW = Initial Weight; FW = Final Weight; WG = Weight Gain; A1 = 0 days, A2 = 5 days, A3 = 10 days fermented copra meal; B1 = 0% CM, B2 = 5% FCM, B3 = 10% FCM, B4 = 15% FCM with Lactic Acid Bacteria Serum; A × B = interaction effect between treatments.

Although birds subjected to 10 days of fermentation (A3) consistently showed the highest final weight and weight gain, these improvements were not statistically significant. Likewise, broilers fed 0% copra meal (B1) recorded the highest weight gain numerically, while increasing levels of fermented copra meal showed a gradual decline; however, these differences were not significant. The interaction effect between fermentation duration and diet inclusion level (A × B) was likewise not significant.

These results indicate that fermented copra meal, within the tested levels, did not negatively affect broiler growth performance. This aligns with Zaazaa et al. (2023), who reported that copra meal can be included in poultry diets at moderate levels without impairing weight gain. Ahmed et al. (2025) also noted that fermentation of plant-based feed ingredients can improve nutrient availability and may offer health benefits, although this does not always translate into measurable growth performance improvements.

However, contrasting findings were reported by Adli et al. (2024), who observed significant improvements in broiler growth when fermented diets were used, likely due to differences in fermentation methods, microbial strains, or diet formulations. Additionally, Punzalan and Rosentrater (2024) highlighted that the high fiber content of copra meal may limit nutrient utilization unless properly processed, which could explain the lack of a significant growth response in this study.

The feed utilization results of broiler chickens (*Gallus domesticus*) fed lactic acid bacteria (LAB)-fermented copra meal are presented in Table 4, focusing on feed consumption, feed conversion ratio (FCR), and feed conversion efficiency (FCE). Overall, statistical analysis showed no significant differences ($p > 0.05$) among treatments in all feed utilization parameters across fermentation durations (0, 5, and 10 days) and inclusion levels (0%–15%).

Table 4. Feed Utilization (Feed Consumption, Feed Conversion Ratio, and Feed Conversion Efficiency) of Broiler Chicken Fed with Fermented Copra Meal using Lactic Acid Bacteria Serum.

TREATMENTS	FEED CONSUMPTION	FCR	FCE
Feed Fermentation			
A_1 - 0 days	2234.11 ±56.61844	1.79 ±.14167	56.24 ±4.54992
A_2 - 5 days	2222.08 ±62.45437	1.77 ±.14444	56.71 ±4.71991
A_3 - 10 days	2214.61 ±104.55631	1.69 ±.13994	59.50 ±4.88570
F-Test	.806	.232	.241
Different Levels of FCM			
B_1 - CF + 0% CM	2256.25 ±90.53569	1.69 ±.12036	59.39 ±4.22877
B_2 - 5% FCM WLabs	2191.17 ±81.70912	1.73 ±.14469	58.18 ±5.11827
B_3 - 10% FCM WLabs	2234.15 ±76.47758	1.78 ±.16811	56.66 ±5.9986
B_4 -15% FCM WLabs	2212.83 ±41.62619	1.80 ±.13902	55.70 ±4.36215
F-Test	.293	.385	.424
A x B	.214	.766	.822

[a,b,c,d] Means with different superscripts differ significantly. . F-test results show whether treatment effects are statistically meaningful, with p-values indicating the level of significance ($p < 0.05$, $p < 0.01$, $p < 0.001$, or NS for not significant). Values are shown as mean ± standard deviation. FC stands for Feed Consumption, FCR for Feed Conversion Ratio, and FCE for Feed Conversion Efficiency. A1, A2, and A3 represent copra meal fermented for 0, 5, and 10 days. B1, B2, B3, and B4 refer to diets with 0%, 5%, 10%, and 15% fermented copra meal plus lactic acid bacteria serum. A × B indicates the combined effect of these treatments.

Although not significant, birds fed diets fermented for 10 days (A3) showed the most favorable numerical results, with the lowest FCR (1.69) and highest FCE (59.50), indicating improved feed efficiency. Feed intake also showed a slight decreasing trend as fermentation duration increased, but this was not statistically meaningful. Similarly, birds fed 0% copra meal (B1) recorded the best numerical feed efficiency, while increasing inclusion levels of fermented copra meal tended to slightly reduce performance, though differences remained non-significant. No significant interaction effect between fermentation duration and inclusion level was observed.

These findings suggest that fermented copra meal did not negatively affect feed utilization and may still support acceptable feed efficiency in broilers. This supports the findings of Sun et al. (2022), who reported that fermented feed ingredients can improve broiler performance and maintain efficient nutrient utilization.

However, Xin Zhu et al. (2023) noted that the effects of fermented diets on feed efficiency can vary depending on microbial strains and fermentation conditions, which may explain the lack of significant improvement in this study. In addition, Peng et al. (2026) emphasized that the fiber content of copra meal may limit nutrient digestibility, potentially contributing to the slight decline in feed efficiency observed at higher inclusion levels.

The carcass characteristics of broiler chickens (*Gallus domesticus*) fed lactic acid bacteria (LAB)-fermented copra meal are presented in Table 5, focusing on carcass weight and dressing percentage. Results showed that fermentation duration did not significantly affect carcass weight ($p > 0.05$), but significantly influenced dressing percentage ($p < 0.05$). Birds under the 10-day fermentation treatment (A3) recorded the highest numerical carcass weight (1285.27 g) and dressing percentage (81.01%), while the lowest values were observed in the 0-day fermentation group (A1), suggesting a possible improvement in carcass yield with longer fermentation.

Table 5. Carcass Traits (Carcass Weight and Dressing Percentage) of Broiler Chicken Fed with Fermented Copra Meal using Lactic Acid Bacteria Serum.

TREATMENTS	CW	DP
Feed Fermentation		
A_1 - 0 days	1168.98 ± 175.83483	76.58^{a} ± 8.54867
A_2 - 5 days	1220.43 ± 127.71602	80.14^{ab} ± 1.63003
A_3 - 10 days	1285.27 ± 102.50546	81.01^{b} ± 1.17744
F-Test	.087	.018
Different Levels of FCM		
B_1 - CF + 0% CM	1312.29^{b} ± 147.23067	81.25^{b} ± 160.14038
B_2 - 5% FCM WLabs	1233.96^{ab} ± 100.25172	80.37^{b} ± 1.25517
B_3 - 10% FCM WLabs	1229.24^{ab} ± 109.83464	80.29^{b} ± 1.40045
B_4 -15% FCM WLabs	1124.09^{a} ± 160.14038	75.06^{a} ± 9.43594
F-Test	.029	.007
A x B	.312	.010

[a,b,c,d] Means with different superscripts differ significantly. F-test gives the probability that treatment effects are significant, with p-values showing the level of significance ($p < 0.05$, $p < 0.01$, $p < 0.001$, or NS for not significant). Results are presented as the mean plus or minus the standard deviation (SD). CW stands for Carcass Weight and DP for Dressing Percentage. A1, A2, and A3 refer to copra meal fermented for 0, 5, and 10 days. B1, B2, B3, and B4 refer to diets containing 0%, 5%, 10%, and 15% fermented copra meal with lactic acid bacteria serum. A × B shows the interaction between these treatments.

For feed mixture, significant differences ($p < 0.05$) were observed in both carcass weight and dressing percentage. The 0% copra meal group (B1) showed the highest carcass weight (1312.29 g) and dressing percentage (81.25%), while the 15% inclusion group (B4) recorded the lowest values, indicating that higher inclusion levels may reduce carcass quality. The interaction effect was not significant for carcass weight but was significant for dressing percentage.

These findings are consistent with Peng et al., (2022), who reported improved carcass yield from fermented diets due to better nutrient utilization. Ahmed et al., (2025) also noted that fermentation enhances the feeding value of plant-based ingredients, supporting improved carcass traits.

However, the decline in carcass performance at higher copra meal levels aligns with

Xiao Peng et al., (2026) who explained that high fiber content and increased inclusion of copra-based feeds can limit nutrient utilization and reduce carcass yield.

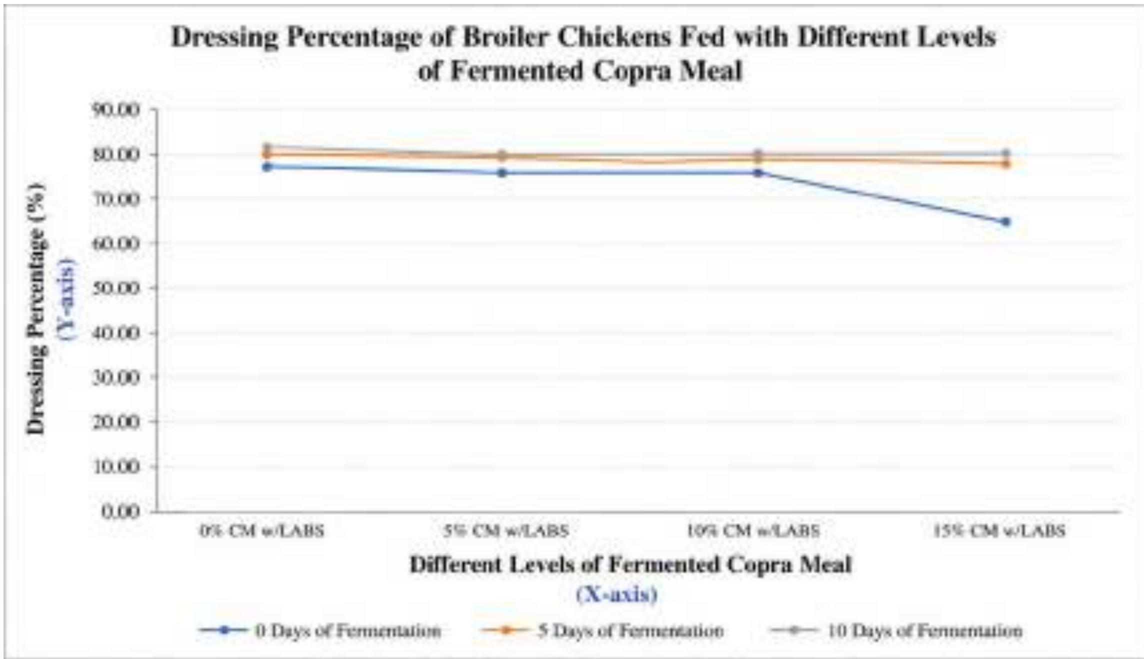


Figure. Dressing Percentage of broiler chickens fed with different levels of fermented copra meal and fermentation duration.
X-axis: Different levels of fermented copra meal (0% CM w/LABS, 5% CM w/LABS, 10% CM w/LABS, 15% CM w/LABS)
Y-axis: Dressing Percentage (%)

Figure 2. Interaction between the different feed mixtures (A) and the fermentation method (B) on the dressing percentage of Factor A, the Days of Fermentation (0,5,10 days), and Factor B, which consisted of different inclusion levels of FCM with Labs (0%,5%10%,15%).

The DP of broiler chickens fed with LAB-fermented copra meal was evaluated across different fermentation durations and levels of inclusion showed in figure 2. Overall, the results showed that dressing percentage was influenced by both how long the feed was fermented and how much copra meal was included in the diet.

Broiler chickens that were fed feed fermented for 10 days generally had slightly higher and more consistent dressing percentages compared to the other treatments. In contrast, the group with no fermentation (0 days) showed a clear drop in dressing percentage when copra meal was increased to 15%. The 5-day fermentation group, on the other hand, remained fairly stable across all inclusion levels, showing less variation. When looking at copra meal inclusion, dressing percentage stayed fairly steady at 0% to 10% across all fermentation treatments, averaging around 80%.

However, at the highest inclusion level (15%), a sharp decline was observed in the non-fermented group, dropping to about 65%. Interestingly, the fermented groups (5 and 10 days) were able to maintain higher values, around 79–81%, even at this higher inclusion level. This suggests that fermentation helps protect carcass yield when copra meal is included at higher levels. Overall, moderate levels of copra meal did not negatively affect dressing percentage, especially when fermentation was applied. This supports the findings of Zaazaa et al., (2023) who reported that copra meal can be safely included at moderate levels in broiler diets without harming carcass traits.

The better performance seen in longer fermentation treatments is in line with Peng et al., who explained that fermentation improves nutrient availability and leads to better feed utilization, which can enhance carcass yield. Similarly, Ahmed et al., (2025) found that fermenting plant-based feed ingredients improves their feeding value and contributes to better carcass characteristics.

However, the drop in dressing percentage at 15% inclusion in the non-fermented group agrees with Xian jing Tang et al., (2024), who noted that high fiber levels can reduce nutrient absorption and negatively affect carcass development. This also supports Ragaza et al. (2022), who highlighted that excessive use of copra-based feed ingredients may reduce overall performance efficiency.

The economic analysis of broiler chickens (*Gallus domesticus*) fed with formulated and fermented locally sourced feed ingredients is presented in Table 6. The parameters evaluated included feed cost, production cost, revenue, net income, and return on investment (ROI). Results showed that fermentation duration (0, 5, and 10 days) did not significantly affect ($p > 0.05$) production cost, revenue, net income, and ROI. Numerically, broilers under the 10-day fermentation treatment (A3) yielded the highest revenue (₱1413.79), net income (₱298.96), and ROI (26.78%), indicating a favorable economic trend; however, these differences were not statistically significant.

In contrast, feed mixture had a significant effect on revenue ($p < 0.05$), net income ($p < 0.05$), and ROI ($p < 0.05$), although production cost was not significantly affected ($p > 0.05$). Birds fed with 0% copra meal (B1) generated the highest revenue (₱1443.52), net income (₱339.06), and ROI (30.57%), while increasing levels of fermented copra meal resulted in a decline in profitability, with the lowest values observed in B4 (15% inclusion). The interaction between fermentation duration and feed mixture (A × B) was not significant for all economic parameters.

The non-significant effect of fermentation duration on economic returns suggests that extending fermentation time alone may not substantially influence profitability. This is consistent with the findings of Adebo et al., (2022) who reported that although fermentation can improve nutrient quality; it does not always lead to significant economic gains. Similarly, Islam et al., (2026) observed that improvements in performance due to fermentation do not always translate into statistically significant economic benefits.

Table 6. Economic Analysis of Broiler Chicken Fed with Formulated and Fermented Locally Sourced Feed Ingredients.

TREATMENTS	FC (₱)	PC (₱)	R (₱)	NI (₱)	ROI (%)
Feed Fermentation					
A_1 - 0 days	419.47 ± .28266	1105.82 ± 15.05577	1285.88 ± 193.41831	180.06 ± 191.73186	16.27 ± 17.26384
A_2 - 5 days	422.95 ± .31232	1109.31 ± 20.25413	1342.48 ± 140.48762	233.17 ± 128.56625	20.92 ± 11.33637
A_3 - 10 days	428.48 ± .52351	1114.83 ± 10.02151	1413.79 ± 112.75601	298.96 ± 107.45568	26.78 ± 9.49382
F-Test	.393	.393	.087	.085	.086
Different Levels of FCM					
B_1	418.11 ± .45221	1104.46 ± 16.71846	1443.52^{b} ± 161.95374	339.06^{b} ± 149.62683	30.57^{b} ± 13.29748
B_2	419.55 ± .40890	1105.90 ± 19.25715	1357.35^{ab} ± 110.27689	251.45^{ab} ± 93.91726	22.64^{ab} ± 8.11870
B_3	429.23 ± .38415	1115.59 ± 13.59628	1352.17^{ab} ± 120.81810	236.58^{ab} ± 110.96353	21.14^{ab} ± 9.75321
B_4	427.64 ± .20743	1113.99 ± 11.58014	1236.50^{a} ± 176.15442	122.51^{a} ± 171.97101	10.95^{a} ± 15.37827
F-Test	.363	.363	.029	.011	.009
A x B	.619	.619	.312	.276	.273

[a,b,c,d] Means with different superscripts indicate that the differences are significant. F-test shows the probability that treatment effects are statistically significant, with results marked as $p < 0.05$, $p < 0.01$, $p < 0.001$, or NS if not significant. Data are presented as the mean plus or minus the standard deviation (SD). FC refers to Feed Cost, PC to Production Cost, R to Revenue, NI to Net Income, and ROI to Return on Investment. A1, A2, and A3 represent copra meal fermented for 0, 5, and 10 days. B1, B2, B3, and B4 indicate diets with 0%, 5%, 10%, and 15% fermented copra meal, all with lactic acid bacteria serum. A × B represents the interaction between these treatments.

The significant decline in revenue, net income, and ROI at higher inclusion levels of fermented copra meal aligns with the observations of Punzalan & Rosentrater, (2024) who noted that excessive inclusion of copra-based feed ingredients may reduce overall performance and economic efficiency. This may be associated with reduced growth and feed efficiency at higher fiber levels, as supported by Adebo et al., (2025).

For fermentation duration (Factor A), there was a steady increase in economic performance as fermentation time lengthened. Net income and return on investment (ROI) rose from ₱180.06 and 16.27% at 0 days to ₱298.96 and 26.78% at 10 days. A similar upward trend was also observed in production revenue, which increased from ₱1,285.88 to ₱1,413.79.

For FCM inclusion levels (Factor B), profitability showed a declining pattern as inclusion increased. Birds fed with 0% FCM achieved the highest net income (₱339.06) and ROI (30.57%), while those given 15% FCM recorded the lowest values (₱122.51 net income; 10.95% ROI). The 5% and 10% inclusion groups produced intermediate economic results. No significant interaction was found between factors A × B for all economic parameters ($p > .05$), indicating that fermentation duration and FCM level influenced outcomes independently of each other.

The increase in ROI with longer fermentation is consistent with studies showing that fermentation improves nutrient availability, enhances digestibility, and reduces anti-nutritional components in feed, thereby supporting better growth efficiency and profitability (Katu et al., 2025). The highest returns observed at 10 days suggest that extended fermentation may enhance microbial breakdown of complex carbohydrates, improving feed utilization.

On the other hand, higher inclusion of FCM led to reduced profitability, likely due to increased fiber content and residual anti-nutrient factor that can impair nutrient absorption and feed efficiency.

CONCLUSION AND RECOMMENDATION

1. The initial weight, final weight, and weight gain of broiler chickens were not significantly influenced ($p > 0.05$) by how long the copra meal was fermented or by the amount of fermented copra meal included in the diet with lactic acid bacteria serum. This means that these dietary changes did not have an impact on the chickens' overall growth performance.
2. Feed consumption, feed conversion ratio (FCR), and feed conversion efficiency (FCE) in broiler chickens were not significantly affected ($p > 0.05$) by the length of fermentation or by different amounts of copra meal fermented with lactic acid bacteria serum. There was also no significant interaction between these factors, showing that these dietary treatments did not impact how efficiently the chickens used their feed.
3. The amount of fermented copra meal in the diet had a significant effect on the carcass traits of broiler chickens, while the length of fermentation mainly influenced dressing percentage. Higher levels of fermented copra meal generally led to lower carcass quality, while chickens fed diets without copra meal showed better results. The combination of fermentation duration and inclusion level did not significantly affect carcass weight, but it did have an impact on dressing percentage.
4. The amount of fermented copra meal in the chickens' diet affected their economic performance, with higher levels leading to lower profits. Although longer fermentation times showed a slight numerical improvement in economic returns,

these changes were not statistically significant. There was also no meaningful interaction between fermentation duration and the amount of fermented copra meal, meaning each factor influenced economic outcomes on its own.

5. There was no significant interaction (A × B) between feed fermentation duration and different levels of fermented copra meal on growth performance, feed efficiency, and economic returns of broiler chickens, whereas a significant interaction effect was observed only on dressing percentage, indicating that the combined treatments influenced carcass yield but not the other measured parameters.
6. Fermented copra meal using lactic acid bacteria serum may be used as an alternative feed ingredient in broiler diets without negatively affecting growth performance.

Recommendations

Based on the findings and conclusion of the study the following recommendation are:

1. Inclusion levels should be carefully regulated, as higher levels may reduce feed utilization, carcass quality, and economic returns.
2. Low to moderate inclusion levels are recommended to maintain optimal production performance and efficiency.
3. A fermentation period of up to 10 days may be considered, as it showed favorable numerical trends in performance and profitability.
4. Further studies are recommended to determine the optimal combination of

fermentation duration and inclusion level for improved production outcomes.

5. Producers should conduct cost-benefit analyses before large-scale use of fermented copra meal to ensure economic viability.

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APPENDIX A

Experimental Layout

Cage 1 **T3R3**	Cage 2 **T4R3**	Cage 3 **T3R1**	Cage 4 **T2R2**

Cage 5 **T8R3**	Cage 9 **T8R1**	Cage 13 **T9R3**	Cage 17 **T2R3**
Cage 6 **T12R3**	Cage 10 **T6R2**	Cage 14 **T9R1**	Cage 18 **T7R1**
Cage 7 **T11R3**	Cage 11 **T11R2**	Cage 15 **T12R2**	Cage 19 **T6R3**
Cage 8 **T5R3**	Cage 12 **T1R2**	Cage 16 **T3R2**	Cage 20 **T4R2**

Cage 21 **T9R2**	Cage 25 **T6R1**	Cage 29 **T5R2**	Cage 33 **T4R1**
Cage 22 **T1R1**	Cage 26 **T10R2**	Cage 30 **T10R3**	Cage 34 **T8R2**
Cage 23 **T2R1**	Cage 27 **T12R1**	Cage 31 **T11R1**	Cage 35 **T1R3**
Cage 24 **T7R2**	Cage 28 **T7R3**	Cage 32 **T5R1**	Cage 36 **T10R1**

Appendix Figure 3. Experimental Layout of the Study Using a Completely Randomized Design (CRD) with Three (3) Replications.

DATA TABLES

APPENDIX B

Table 7. Data on the Growth Performance of Broiler Chicken Fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Days of Fermentation	Different levels of FCM	Initial Weight	Final Weight	Weight Gain
1	1	303.20	1762.00	1458.80
1	1	211.20	1395.00	1183.80
1	1	268.80	1653.80	1385.00
1	2	266.60	1454.60	1188.00
1	2	243.40	1526.80	1283.40
1	2	287.40	1635.20	1347.80
1	3	270.60	1392.40	1121.80
1	3	267.60	1603.40	1335.80
1	3	271.80	1381.20	1109.40
1	4	259.60	1484.60	1225.00
1	4	283.80	1571.20	1287.40
1	4	278.20	1433.80	1155.60
2	1	258.80	1408.00	1149.20
2	1	232.40	1581.60	1349.20
2	1	286.60	1671.00	1384.40
2	2	232.60	1411.20	1178.60
2	2	257.80	1467.40	1209.60
2	2	287.60	1707.40	1419.80
2	3	279.40	1498.40	1219.00
2	3	276.20	1730.40	1454.20
2	3	256.40	1532.00	1275.60
2	4	247.80	1470.20	1222.40
2	4	254.60	1328.60	1074.00
2	4	246.60	1439.20	1192.60
3	1	303.80	1686.60	1382.80
3	1	288.00	1531.00	1243.00
3	1	283.80	1821.60	1537.80
3	2	245.00	1610.20	1365.20
3	2	265.00	1443.80	1178.80
3	2	266.40	1549.20	1282.80
3	3	258.80	1557.20	1298.40
3	3	254.40	1470.40	1216.00
3	3	247.20	1597.80	1350.60
3	4	256.20	1588.20	1332.00
3	4	290.00	1655.80	1365.80
3	4	278.80	1511.40	1232.60

DATE TABLES

APPENDIX B

Table 8. Data on the Feed Utilization of Broiler Chicken Fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Days of Fermentation	Different levels of FCM	Feed Consumption	FCR	FCE
1	1	2215.60	1.52	65.84
1	1	2155.06	1.82	54.93
1	1	2350.62	1.70	58.92
1	2	2232.46	1.88	53.21
1	2	2172.06	1.69	59.09
1	2	2283.40	1.69	59.03
1	3	2204.46	1.97	50.89
1	3	2291.86	1.72	58.28
1	3	2200.60	1.98	50.41
1	4	2202.60	1.80	55.62
1	4	2219.00	1.72	58.02
1	4	2281.60	1.97	50.65
2	1	2109.60	1.84	54.47
2	1	2269.60	1.68	59.45
2	1	2230.60	1.61	62.06
2	2	2151.60	1.83	54.78
2	2	2215.40	1.83	54.60
2	2	2215.60	1.56	64.08
2	3	2340.00	1.92	52.09
2	3	2260.00	1.55	64.35
2	3	2261.00	1.77	56.42
2	4	2211.00	1.81	55.29
2	4	2150.60	2.00	49.94
2	4	2250.00	1.89	53.00
3	1	2284.40	1.65	60.53
3	1	2291.80	1.84	54.24
3	1	2399.00	1.56	64.10
3	2	2000.00	1.46	68.26
3	2	2200.00	1.87	53.58
3	2	2250.00	1.75	57.01
3	3	2100.60	1.62	61.81
3	3	2298.00	1.89	52.92
3	3	2150.80	1.59	62.80
3	4	2200.00	1.65	60.55
3	4	2160.00	1.58	63.23
3	4	2240.70	1.82	55.01

APPENDIX B

Table 9. Data on the Carcass Traits of Broiler Chicken Fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Days of Fermentation	Different levels of FCM	Carcass Weight	Dressing Percentage
1	1	1462.00	82.97
1	1	1095.00	78.49
1	1	1353.80	81.86
1	2	1154.60	79.38
1	2	1226.80	80.35
1	2	1335.20	81.65
1	3	1092.40	78.45
1	3	1303.40	81.29
1	3	1081.20	78.28
1	4	884.80	59.60
1	4	904.80	57.59
1	4	1133.80	79.08
2	1	1108.00	78.69
2	1	1281.60	81.03
2	1	1371.00	82.05
2	2	1111.00	78.73
2	2	1167.40	79.56
2	2	1407.40	82.43
2	3	1198.40	79.98
2	3	1430.40	82.66
2	3	1232.00	80.42
2	4	1170.20	79.59
2	4	1028.60	77.42
2	4	1139.20	79.16
3	1	1386.60	82.21
3	1	1231.00	80.40
3	1	1521.60	83.53
3	2	1310.20	81.37
3	2	1143.80	79.22
3	2	1249.20	80.64
3	3	1257.20	80.73
3	3	1170.40	79.60
3	3	1297.80	81.22
3	4	1288.20	81.11
3	4	1355.80	81.88
3	4	1211.40	80.15

Days of Fermentation: 0 days (1); 5 days (2); 10 days (3)
Different levels of FCM: 0% FCM (1); 5% FCM (2); 10% FCM (3); 15% FCM (4)

APPENDIX B

Table 10. Data on the Cost and Return Analysis of Broiler Chicken Fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Days of Fermentation	Different levels of FCM	Feed Cost	Production Cost	Revenue	Net Income	ROI
1	1	412.77	1099.12	1608.20	509.08	46.32
1	1	397.67	1084.02	1204.50	120.48	11.11
1	1	434.21	1120.56	1489.18	368.62	32.90
1	2	412.00	1098.35	1270.06	171.71	15.63
1	2	400.82	1087.17	1349.48	262.31	24.13
1	2	452.24	1138.59	1468.72	330.13	28.99
1	3	406.81	1093.16	1201.64	108.48	9.92
1	3	422.99	1109.34	1433.74	324.40	29.24
1	3	419.95	1106.30	1189.32	83.02	7.50
1	4	424.95	1111.30	973.28	-138.02	-12.42
1	4	427.99	1114.34	995.28	-119.06	-10.68
1	4	421.21	1107.56	1247.18	139.62	12.61
2	1	389.23	1075.58	1218.80	143.22	13.32
2	1	418.84	1105.19	1409.76	304.57	27.56
2	1	419.21	1105.56	1508.10	402.54	36.41
2	2	397.00	1083.35	1222.10	138.75	12.81
2	2	408.81	1095.16	1284.14	188.98	17.26
2	2	446.05	1132.40	1548.14	415.74	36.71
2	3	433.36	1119.71	1318.24	198.53	17.73
2	3	451.94	1138.29	1573.44	435.15	38.23
2	3	432.06	1118.41	1355.20	236.79	21.17
2	4	426.51	1112.86	1287.22	174.36	15.67
2	4	405.33	1091.68	1131.46	39.78	3.64
2	4	447.09	1133.44	1253.12	119.68	10.56
3	1	421.58	1107.93	1525.26	417.33	37.67
3	1	426.66	1113.01	1354.10	241.09	21.66
3	1	442.80	1129.15	1673.76	544.61	48.23
3	2	429.88	1116.23	1441.22	324.99	29.11
3	2	412.59	1098.94	1258.18	159.24	14.49
3	2	416.55	1102.90	1374.12	271.22	24.59
3	3	445.79	1132.14	1382.92	250.78	22.15
3	3	424.10	1110.45	1287.44	176.99	15.94
3	3	426.10	1112.45	1427.58	315.13	28.33
3	4	436.02	1122.37	1417.02	294.65	26.25
3	4	435.61	1121.96	1491.38	369.42	32.93
3	4	424.03	1110.38	1332.54	222.16	20.01

APPENDIX C

ANOVA Tables

Table 11. ANOVA on the Initial Weight of Broiler Chicken Fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	674.460	2	337.230	.799	.461
Factor B	412.187	3	137.396	.326	.807
Factor A * Factor B	3229.620	6	538.270	1.276	.305
Error	10124.373	24	421.849		
Total	2556552.000	36			

a. R Squared = .299 (Adjusted R Squared = -.022)

Table 12. ANOVA on the Final Weight of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	31640.762	2	15820.381	1.144	.335
Factor B	63773.283	3	21257.761	1.538	.230
Factor A * Factor B	62633.620	6	10438.937	.755	.612
Error	331806.293	24	13825.262		
Total	86245479.480	36			

a. R Squared = .323 (Adjusted R Squared = .012)

Table 13. ANOVA on the Weight Gain of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	25825.502	2	12912.751	1.094	.351
Factor B	57337.310	3	19112.437	1.619	.211
Factor A * Factor B	47082.800	6	7847.133	.665	.679
Error	283375.600	24	11807.317		
Total	59181688.280	36			

a. R Squared = .315 (Adjusted R Squared = .001)

APPENDIX C

ANOVA Tables

Table 14. ANOVA on the Feed Consumption of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	2323.325	2	1161.663	.217	.806
Factor B	21106.534	3	7035.511	1.314	.293
Factor A * Factor B	48842.884	6	8140.481	1.521	.214
Error	128470.997	24	5352.958		
Total	178199123.244	36			

a. R Squared = .360 (Adjusted R Squared = .067)

Table 15. ANOVA on the Feed Conversion Ratio of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	.068	2	.034	1.552	.232
Factor B	.069	3	.023	1.059	.385
Factor A * Factor B	.072	6	.012	.549	.766
Error	.524	24	.022		
Total	111.088	36			

a. R Squared = .285 (Adjusted R Squared = -.043)

Table 16. ANOVA on the Feed Conversion Efficiency of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	74.651	2	37.326	1.510	.241
Factor B	71.867	3	23.956	.969	.424
Factor A * Factor B	70.125	6	11.687	.473	.822
Error	593.352	24	24.723		
Total	119772.903	36			

a. R Squared = .267 (Adjusted R Squared = -.068)

APPENDIX C

ANOVA Tables

Table 17. ANOVA on the Carcass Weight of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	81489.109	2	40744.554	2.713	.087
Factor B	161105.177	3	53701.726	3.575	.029
Factor A * Factor B	113516.847	6	18919.474	1.260	.312
Error	360480.987	24	15020.041		
Total	54729782.520	36			

a. R Squared = .497 (Adjusted R Squared = .266)

Table 18. Tukey HSD Analysis of Carcass Weight Fed with Fermented Copra Meal w/ Labs

Factor B	N	Subset	
		1	2
15% Copra Meal w/ labs	9	1124.0889	
10% Copra Meal w/ labs	9	1229.2444	1229.2444
5% Copra Meal w/ labs	9	1233.9556	1233.9556
0% Copra Meal w/ labs	9		1312.2889
Sig.		.254	.489

Means for groups in homogeneous subsets are displayed. Based on observed means. The error term is Mean Square(Error) = 15020.041. a. Uses Harmonic Mean Sample Size = 9.000. b. Alpha = .05.

Table 19. ANOVA on the Dressing Percentage of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	131.922	2	65.961	4.776	.018
Factor B	214.654	3	71.551	5.181	.007
Factor A * Factor B	302.267	6	50.378	3.648	.010
Error	331.434	24	13.810		
Total	227044.073	36			

a. R Squared = .662 (Adjusted R Squared = .507)

APPENDIX C

ANOVA Tables

Table 20. Tukey HSD Analysis of Dressing Percentage Fed with Fermented Copra Meal w/ Labs

Factor A	N	Subset	
		1	2
15% Copra Meal w/ labs	12	76.5825	
10% Copra Meal w/ labs	12	80.1433	80.1433
5% Copra Meal w/ labs	12		81.0050
0% Copra Meal w/ labs		.068	.838
Sig.	12	76.5825	

Means for groups in homogeneous subsets are displayed. Based on observed means. The error term is Mean Square(Error) = 13.810.a. Uses Harmonic Mean Sample Size = 12.000.b. Alpha = .05.

Table 21. Tukey HSD Analysis of Dressing Percentage Fed with Fermented Copra Meal w/ Labs

Factor B	N	Subset	
		1	2
15% Copra Meal w/ labs	9	75.0644	
10% Copra Meal w/ labs	9		80.2922
5% Copra Meal w/ labs	9		80.3700
0% Copra Meal w/ labs	9		81.2478
Sig.		1.000	.947

Means for groups in homogeneous subsets are displayed. Based on observed means. The error term is Mean Square(Error) = 13.810.a. Uses Harmonic Mean Sample Size = 9.000.b. Alpha = .05.

Table 22. ANOVA on the Feed Cost of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	495.210	2	247.605	.971	.393
Factor B	851.490	3	283.830	1.113	.363
Factor A * Factor B	1139.504	6	189.917	.745	.619
Error	6119.710	24	254.988		
Total	6469310.791	36			

a. R Squared = .289 (Adjusted R Squared = -.037)

APPENDIX C

ANOVA Tables

Table 23. ANOVA on the Total Production Cost of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	495.210	2	247.605	.971	.393
Factor B	851.490	3	283.830	1.113	.363
Factor A * Factor B	1139.504	6	189.917	.745	.619
Error	6119.710	24	254.988		
Total	44362762.926	36			

a. R Squared = .289 (Adjusted R Squared = -.037)

Table 24. ANOVA on the Revenue of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	98601.822	2	49300.911	2.713	.087
Factor B	194937.264	3	64979.088	3.575	.029
Factor A * Factor B	137355.384	6	22892.564	1.260	.312
Error	436181.994	24	18174.250		
Total	66223036.849	36			

a. R Squared = .497 (Adjusted R Squared = .266)

Table 25. Tukey HSD Analysis of Revenue Fed with Fermented Copra Meal w/ Labs

Factor B	N	Subset	
		1	2
15% Copra Meal w/ labs	9	1236.4978	
10% Copra Meal w/ labs	9	1352.1689	1352.1689
5% Copra Meal w/ labs	9	1357.3511	1357.3511
0% Copra Meal w/ labs	9		1443.5178
Sig.		.254	.489

Means for groups in homogeneous subsets are displayed. Based on observed means. The error term is Mean Square(Error) = 18174.250.a. Uses Harmonic Mean Sample Size = 9.000.b. Alpha = .05.

APPENDIX C

ANOVA Tables

Table 26. ANOVA on the Income of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	85149.750	2	42574.875	2.733	.085
Factor B	213593.364	3	71197.788	4.571	.011
Factor A * Factor B	125805.179	6	20967.530	1.346	.276
Error	373809.657	24	15575.402		
Total	2827306.546	36			

a. R Squared = .532 (Adjusted R Squared = .317)

Table 27. Tukey HSD Analysis of Income Fed with Fermented Copra Meal w/ Labs

Factor B	N	Subset	
		1	2
15% Copra Meal w/ labs	9	122.5100	
10% Copra Meal w/ labs	9	236.5856	236.5856
5% Copra Meal w/ labs	9	251.4522	251.4522
0% Copra Meal w/ labs	9		339.0600
Sig.		.154	.325

Means for groups in homogeneous subsets are displayed. Based on observed means. The error term is Mean Square(Error) = 15575.402.a. Uses Harmonic Mean Sample Size = 9.000.b. Alpha = .05.

Table 28. ANOVA on the ROI of Broiler Chicken fed with Copra Meal Fermented using Lactic Acid Bacteria Serum.

Source	SS	DF	MS	F	P-value
Factor A	665.564	2	332.782	2.720	.086
Factor B	1754.290	3	584.763	4.780	.009
Factor A * Factor B	992.975	6	165.496	1.353	.273
Error	2936.284	24	122.345		
Total	22719.462	36			

R Squared = .538 (Adjusted R Squared = .326)

APPENDIX C

ANOVA Tables

Table 29. Tukey HSD Analysis of ROI Fed with Fermented Copra Meal w/ Labs

Factor B	N	Subset	
		1	2
15% Copra Meal w/ labs	9	10.9522	
10% Copra Meal w/ labs	9	21.1344	21.1344
5% Copra Meal w/ labs	9	22.6356	22.6356
0% Copra Meal w/ labs	9		30.5756
Sig.		.141	.293

Means for groups in homogeneous subsets are displayed. Based on observed means. The error term is Mean Square(Error) = 122.345 a. Uses Harmonic Mean Sample Size = 9.000.b. Alpha = .05.

APPENDIX D

Income Statement

Table 30. Overall Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	180	45	8100
	Booster	3	2015	6045
	Starter	2	1970	3940
	Finisher	3	1940	5820
	Vitamins	4	23	92
	Bulb	36	23	828
	Antibiotics	1	70	70
	Dewormer	2	21	42
	Disinfectant	1	20	20
	Copra Meal	40.00	20	800
	Water and Electricity Bills			3,852
	Lactic Acid Bacteria Serum	2	650	1,300
	Formulated Feeds	400.26	37.02	14,818
	Total			45726.625
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1,103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				46,032.65
Gross Sales	Dressed Chicken (220/kg)	1.2	180	47520
Net Income	Production Cost			1487.35
				15344.2166

APPENDIX D

Income Statement

Table 31. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 32. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 33. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 34. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales- Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 35. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 36. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 37. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 38. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 39. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 40. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 41. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX D

Income Statement

Table 42. Income Statement on Growth Performance of Broiler Chicken Fed with Copra Meal using Lactic Acid Bacteria Serum.

Expenses		Items	Qty	Price
Operating Expenses				
	Chicks	15	45	675
	Booster	0.25	2015	503.75
	Starter	0.16	1970	
	Finisher	0.25	1940	
	Vitamins	0.33	23	7.66
	Bulb	3	23	69
	Antibiotics	0.08	70	5.83
	Dewormer	0.16	21	3.5
	Disinfectant	0.08	20	1.67
	Copra Meal	3.33	20	66.67
	Water and Electricity Bills			321
	Lactic Acid Bacteria Serum	0.17	650	108.33
	Formulated Feeds	33.36	37.02	
	total			1762.41
Capital Expenses				
	Receptable	36	21	756
	Wire	20	45	900
	Trapal	4	70	280
	Housing	9	1103.33	9930
				11866
Depreciation Cost	10 years			296.65
Total Production Cost				2059.06
Total Production Cost /R				686.3533333
Gross Sales	Dressed Chicken (220/kg)	1.2	15	3960
Net Income	Gross sales-Production Cost			1900.94
				686.3533

APPENDIX E

Crude Protein Analysis

REGIONAL STANDARDS AND TESTING LABORATORIES
DEPARTMENT OF SCIENCE AND TECHNOLOGY - X
J.V. Seriña Street, Carmen, 9000, Cagayan de Oro City
Republic of the Philippines

PAB ACCREDITED TESTING LABORATORY PNS ISO/IEC 17025:2017 LA-2019-[illegible]

CHEMICAL TESTING LABORATORY

REPORT OF CHEMICAL ANALYSIS

Customer's Name	:	*SHANE P. EDULLANTES*
Address	:	*Aguada, Ozamis City, Misamis Occidental*
Submitted by	:	*Ms. Shane P. Edullantes*
Address	:	*Aguada, Ozamis City, Misamis Occidental*
Date Submitted	:	06 May 2025
Request Number	:	R10-052025-CHE-0218

Sample Description	Parameter(s)	Method Used	Date of Analysis	Result
Feed, coded as Copra Mill w/ Labs (Day 0) *Sample Prepared on: April 24, 2025* Sample code: CHE-0219	Crude Protein	Method 991.20, OMA AOAC, 21st Edition / Automated Kjeldahl Method	14 – 15 May 2025	22.73 g/100g

The result(s) given in this report [illegible] Laboratories-X.

ANALYZED BY/ CERTIFIED BY:
SHENNA GRACE P. ERAN, RCh
Science Research Specialist II
PRC Reg. No. 0013234

CHECKED BY:
MARL ANDRIAN PATRICK H. DALINAO,
Registered Chemical Technician
Project Technical Specialist I
PRC Reg. No. 0007246

ISSUED UNDER THE AUTHORITY OF:
ENGR. DELWIN M. BALANAY, JR.
Officer-in-Charge, RSTL Section

Certificate No.: 2025-0246C
Date Issued: 16 May 2025
Page 1 of 1

OP-006-F4
Revision 12
Effectivity Date: 11 November 2024

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Email: [illegible]
DOST Central URL: [illegible]
DOST-X URL: [illegible]

Appendix Figure 4. Laboratory Test Result on Chemical Analysis Coded Copra Mill w/ Labs (Day 0)
Conducted by the Department of Science and Technology - Regional Standards and Testing Laboratories (DOST-RSTL) Region 10.

APPENDIX E

Crude Protein Analysis

REGIONAL STANDARDS AND TESTING LABORATORIES
DEPARTMENT OF SCIENCE AND TECHNOLOGY - X
J.V. Seriña Street, Carmen, 9000, Cagayan de Oro City
Republic of the Philippines

CHEMICAL TESTING LABORATORY

PAB ACCREDITED
TESTING LABORATORY
PNS ISO/IEC 17025:2017
LA-2019-[illegible]

REPORT OF CHEMICAL ANALYSIS

Customer's Name	:	*SHANE P. EDILLANTES*
Address	:	*Aguada, Ozamis City, Misamis Occidental*
Submitted by	:	*Ms. Shane P. Edillantes*
Address	:	*Aguada, Ozamis City, Misamis Occidental*
Date Submitted	:	06 May 2025
Request Number	:	R10-052025-CHE-0320

Sample Description	Parameter(s)	Method Used	Date of Analysis	Result
Feed, coded as Copra Mill w/ Labs (Day 5) *Sample Prepared on: April 24, 2025* Sample code: CHE-0221	Crude Protein	Method 991.20, OMA AOAC, 21st Edition / Automated Kjeldahl Method	14 – 15 May 2025	22.21 g/100g

The result(s) given in this report is/are those obtained at the time of examination and refer only to the particular sample submitted and is/are of no value for advertising or sales promotions. All information written in italics were provided by the customer. RSTL is not responsible for the validity of these information. This report shall not be reproduced except in full without the written approval of the Regional Standards and Testing Laboratories-X.

ANALYZED BY/
CERTIFIED BY:

SHENNA GRACE P. ERAN, RCh
Science Research Specialist II
PRC Reg. No. 0013234

CHECKED BY:

MARL ANDRIAN PATRICK H. DALINAO,
Registered Chemical Technician
Project Technical Specialist I
PRC Reg. No. 0007246

ISSUED UNDER THE
AUTHORITY OF:

ENGR. DELWIN M. BALANAY, JR.
Officer-in-Charge, RSTL Section

Certificate No.: 2025-0248C
Date Issued: 18 May 2025
Page 1 of 1

OP-026-F4
Revision 12
Effectivity Date: 11 November 2024

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Email: [illegible]
DOST Central URL: [illegible]
DOST-X URL: [illegible]

Appendix Figure 5. Laboratory Test Result on Chemical Analysis Coded Copra Mill w/ Labs (Day 5)
Conducted by the Department of Science and Technology - Regional Standards and Testing Laboratories (DOST-RSTL) Region 10.

APPENDIX E

Crude Protein Analysis

REGIONAL STANDARDS AND TESTING LABORATORIES
DEPARTMENT OF SCIENCE AND TECHNOLOGY - X
J.V. Serina Street, Carmen, 9000, Cagayan de Oro City
Republic of the Philippines
CHEMICAL TESTING LABORATORY

PAB ACCREDITED TESTING LABORATORY
PNS ISO/IEC 17025:2017
LA-2019-368B

REPORT OF CHEMICAL ANALYSIS

Customer's Name : *SHANE P. EDULLANTES*
Address : *Aguada, Ozamis City, Misamis Occidental*
Submitted by : *Ms. Shane P. Edullantes*
Address : *Aguada, Ozamis City, Misamis Occidental*
Date Submitted : 06 May 2025
Request Number : R10-052025-CHE-0219

Sample Description	Parameter(s)	Method Used	Date of Analysis	Result
Feed, coded as Copra Mill w/ Labs (Day 10) *Sample Prepared on: April 24, 2025* Sample code: CHE-0220	Crude Protein	Method 991.20, OMA AOAC 21st Edition / Automated Kjeldahl Method	14 – 15 May 2025	21.59 g/100g

ANALYZED BY/ CERTIFIED BY: **SHENNA GRACE P. ERAN, RCh**
Science Research Specialist II
PRC Reg. No. 0013234

CHECKED BY: **MARL ANDRIAN PATRICK H. DALINAO,**
Registered Chemical Technician
Project Technical Specialist I
PRC Reg. No. 0007246

ISSUED UNDER THE AUTHORITY OF: **ENGR. DELWIN M. BALANAY, JR.**
Officer-in-Charge, RSTL Section

Certificate No.: 2025-0267C
Date Issued: 16 May 2025
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OP-026-F4
Revision 12
Effectivity Date 11 November 2024

Appendix Figure 6. Laboratory Test Result on Chemical Analysis Coded Copra Mill w/ Labs (Day 10)
Conducted by the Department of Science and Technology - Regional Standards and Testing Laboratories (DOST-RSTL) Region 10.

APPENDIX F

Documentation

Appendix Figure 7. Formulation and Fermentation of Copra Meal Fermented using LABS.

APPENDIX F

Documentation

Appendix Figure 8. Procurement of Broiler Chicks from La Purita breeding farm in Ipil, Zamboanga, Sibugay.

APPENDIX F

Documentation

Appendix Figure 9. Doing eye drop vaccination (IBD)

APPENDIX F

Documentation

APPENDIX F

Documentation

Appendix Figure 10. Mixing and Formulation of Different Copra Meal Fermented using Labs.

APPENDIX F

Documentation






APPENDIX F

Documentation

Appendix Figure 11. Preparation of the Rearing Cages and the Poultry House for the Experiment.

APPENDIX F

Documentation

APPENDIX F

Documentation

Appendix Figure 12. Growth Performance Data Collection on Broiler Chickens (Initial Weight and Weekly Weight).

APPENDIX F

Documentation

APPENDIX F

Documentation

Appendix Figure 13. Growth Performance Data Collection on Broiler Chickens (Weekly Weight and Final Weight)

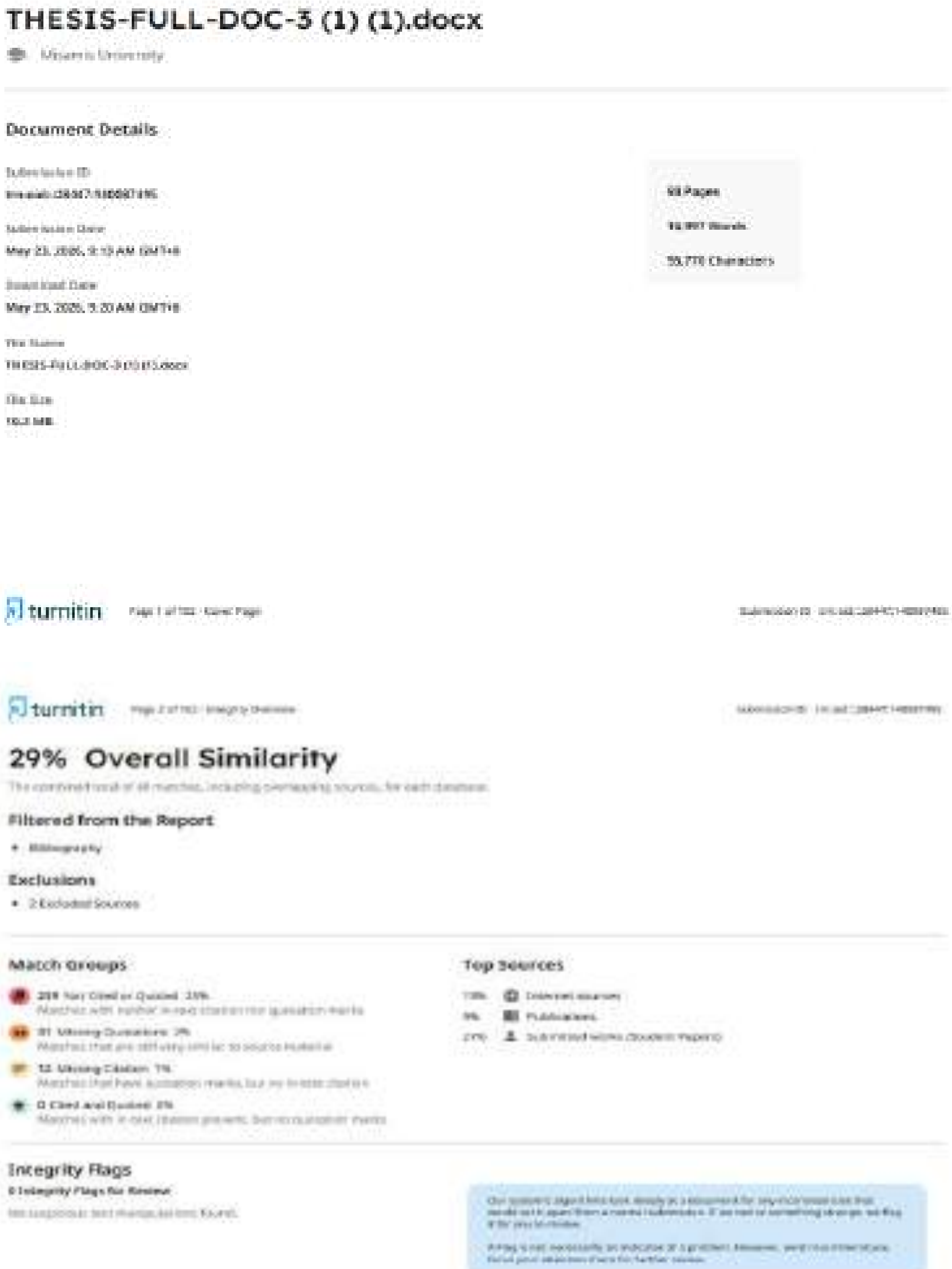
APPENDIX F

Documentation

Appendix Figure 14. Slaughtering of broiler chicken.

APPENDIX G

TURN IT IN



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Appendix Figure 15. Turn It in Result

APPENDIX G

GRAMMARLY

Appendix Figure 16. Grammarly Result.

CURRICULUM VITAE

Name : Shane P. Edullantes

Address : Lower Campo 5, Ramon Magsaysay,
Zamboanga del Sur

Date of Birth : October 26, 2004

Place of Birth : Campo 5, Ramon Magsaysay, Zamboanga del Sur

Age : 21

Nationality : Filipino

PERSONAL PARTICULAR

Civil Status : Single

Religion : Roman Catholic

Name of Parents : **Mother:** Lourdes P. Edullantes

: **Father:** Renaldo S. Edullantes

EDUCATIONAL ATTAINMENT

Elementary : Campo V, Elementary School (2015-2016)

: Campo 5, Ramon Magsaysay, Zamboanga del Sur

Junior High School : Molave Vocational Technical School

: Molave Zamboanga del Sur (2019 - 2020)

Senior High School : Molave Vocational Technical School

: Molave Zamboanga del Sur (2021 - 2022)

College: : Misamis University

: Ozamiz City, Misamis Occidental (2025 - 2026)

CURRICULUM VITAE

Name : Mae L. Maisa

Address : Purok 3 Nailon, Tudela,

Misamis, Occidental

Date of Birth : October 26, 2001

Place of Birth : Nailon, Tudela, Misamis, Occidental

Age : 24

Nationality : Filipino

PERSONAL PARTICULAR

Civil Status : Single

Religion : IFI

Name of Parents : **Mother:** Juliet L. Maisa

: **Father:** Mansueto L. Maisa (deceased)

EDUCATIONAL ATTAINMENT

Elementary : Osamis Elementary School

: Cabol-anonan, Tudela, Misamis, Occidental (2015-2016)

Junior High School : Clarin National High School

: P-1 Clarin, Misamis, Occidental (2019-2020)

Senior High School : Misamis University

: Ozamiz City, Misamis Occidental (2021 - 2022)

College: : Misamis University

: Ozamiz City, Misamis Occidental (2025 - 2026)

CURRICULUM VITAE

Name : Elvic Ryr T. Purol

Address : Purok -3 Centro Napu , Tudela ,
Misamis Occidental

Date of Birth : February 23, 2001

Place of Birth : Purok 3 Centro Napu , Tudela , Misamis Occidental

Age : 25

Nationality : Filipino

PERSONAL PARTICULAR

Civil Status : Single

Religion : Roman Catholic

Name of Parents : **Mother:** Elvie T. Purol

: **Father:** Victor M. Purol (deceased)

EDUCATIONAL ATTAINMENT

Elementary : Tudela Central School

: Centro Napu, Tudela Misamis Occidental (2013 - 2014)

Junior High School : San Isidro Academy of Tudela Inc.

: Upper Centro, Tudela , Misamis Occidental (2017-2018)

Senior High School : San Isidro Academy of Tudela Inc.

: Upper Centro, Tudela , Misamis Occidental (2019-2020)

College: : Misamis University

: Ozamiz City, Misamis Occidental (2025- 2026)