



GROWTH PERFORMANCE, NUTRIENT DIGESTIBILITY, CARCASS CHARACTERISTICS AND ECONOMIC BENEFIT OF WEANER RABBITS FED SOYA BEAN MILK RESIDUE MEAL

¹Sambo, F. ²Bello, K. M. and ²Sani, I.

¹Bauchi State Agricultural Development Programme, Headquarters,
Bauchi, Bauchi State, Nigeria

²Department of Animal Production, Faculty of Agriculture and Agricultural Technology, Abubakar
Tafawa Balewa University, Bauchi, Bauchi State, Nigeria

Corresponding Author's Email: sambofatimaabdullahi75@gmail.com, **GSM:** 08030575123

ABSTRACT

This study evaluated the effects of dietary inclusion of sun-dried soybean milk residue meal (SMRM) on the growth performance, nutrient digestibility, carcass characteristics, and economic benefit of weaner rabbits. Thirty (30) mixed-breed weaner rabbits were randomly allotted to five dietary treatments for a period of eight (8) weeks in a Completely Randomized Design (CRD). Five diets containing 16% crude protein were formulated to include graded levels of SMRM at 0, 7.5, 15, 22.5, and 30%, designated as T1, T2, T3, T4, and T5, respectively. Growth performance results showed that, final body weight (1708.2–1945.6 g), total weight gain (1005.0–1243.8 g), daily weight gain (17.95–22.21 g/day), and feed conversion ratio (3.36–4.24) were significantly ($P < 0.05$) influenced by dietary treatments, with rabbits fed 15% SMRM (T3) exhibiting superior performance. Daily feed intake was not significantly ($P > 0.05$) affected by dietary replacement levels. Nutrient digestibility coefficients were significantly ($P < 0.05$) improved, with dry matter (68.9–75.6%), crude protein (71.5–80.2%), and other nutrients recording the highest values in T3. Result of carcass evaluation revealed a significant ($P < 0.05$) improvements in slaughter weight (1695.3–1930.4 g), dressed weight (915.4–1105.6 g), dressing percentage (54.0–57.3%), and hind limb yield (15.4–16.8%), with rabbits fed T3 producing the highest values. Most internal organs measurements were not significantly ($P > 0.05$) affected, although small intestine and caecum weights increased significantly with higher inclusion levels, while abdominal fat decreased at 30% inclusion. Economic analysis showed that, cost of producing one kilogram of live weight was lowest in rabbits fed 15% SMRM diet (₦1,881.60/kg gain), representing a 13.37% reduction in production cost relative to the control diet. The study concluded that, sun-dried soybean milk residue meal can effectively be incorporated in weaner rabbit diets up to 15% inclusion. Therefore, a 15% inclusion level is recommended for sustainable and cost-effective rabbit production.

Keywords: Soybean-milk, Residue, Meal; Weaner-rabbits; Growth, Performance.

INTRODUCTION

Rabbit production has gained considerable attention as a sustainable means of improving animal protein supply owing to the species' rapid growth, high reproductive efficiency, excellent feed conversion, and ability to utilize fibrous feed resources unsuitable for human consumption (de Blas & Wiseman, 2020; Dalle Zotte & Szendrő, 2011; Kumar *et al.*, 2025). Nevertheless, the profitability of rabbit production is constrained by the high cost of feed, particularly conventional protein ingredients such as soybean meal, which accounts for a substantial proportion of total production costs. The increasing competition for soybean meal between human food, industrial processing, and livestock feeding has stimulated interest in alternative, low-cost protein sources capable of maintaining animal performance while reducing feeding costs (Rahman *et al.*, 2021; Kowalska *et al.*, 2025). Among these alternatives, soybean milk residue, an agro-industrial by-product generated during soy milk and tofu production, has attracted considerable attention because of its appreciable crude protein, residual oil, dietary fibre, essential amino acids, vitamins, and minerals, in addition to its potential to mitigate environmental pollution through value-added utilization (Rahman *et al.*, 2021).

Rabbits, as efficient hindgut fermenters, are particularly suited to diets containing fibrous agro-industrial by-products, making soybean milk residue a promising substitute for conventional protein



sources. Previous studies have demonstrated that replacing soybean meal with soybean milk residue supports satisfactory growth performance, feed utilization, carcass yield, and internal organ development in weaner rabbits (Alabi *et al.*, 2018; Abdullahi *et al.*, 2021). Similarly, soybean curd residue has been reported to improve nutrient digestibility while maintaining normal visceral organ development, indicating its nutritional adequacy and safety for rabbit feeding (Emmanuel *et al.*, 2021; Saleh *et al.*, 2025; Sègbédji Théodora *et al.*, 2026). Comparable findings have also been reported for other alternative protein sources, including *Bridelia ferruginea* leaf meal, tiger nut milk residue meal, soybean cheese waste, and combinations of lupine seeds with insect meals, further supporting the growing interest in replacing soybean meal with unconventional feed resources in rabbit nutrition (Iyeghe-Erakpotobor & Esievo, 2010; Ojebiyi *et al.*, 2024; Osman *et al.*, 2024; Kowalska *et al.*, 2025). Although the nutritional potential of soybean milk residue has been widely recognized, most previous studies have evaluated individual production traits rather than integrating growth performance, nutrient digestibility, carcass characteristics, and economic returns under the same experimental conditions. A comprehensive evaluation of these parameters is essential to determine the biological and economic feasibility of incorporating soybean milk residue into commercial rabbit diets. Therefore, this study evaluated the effects of varying inclusion levels of soybean milk residue meal on the growth performance, nutrient digestibility, carcass characteristics, and economic benefit of weaner rabbits, with the aim of identifying an economically viable and nutritionally sustainable alternative protein source for rabbit production.

MATERIALS AND METHODS

Study Location

The experiment was conducted at the Rabbit Unit of the Bauchi State College of Agriculture, Bauchi, Nigeria, located along the Bauchi–Dass Road. Bauchi State is situated in northeastern Nigeria between latitudes 9°03'–12°03' N and longitudes 8°50'–11°00' E, covering approximately 49,259 km². The area lies within the Sudan and Sahel savannah ecological zones and is characterized by a tropical savannah climate with distinct wet and dry seasons. Annual rainfall ranges from approximately 700 mm in the northern part of the state to 1,300 mm in the southern region, creating favorable conditions for livestock production (Bauchi State Government, 2025).

Experimental Animals and Management

Thirty apparently healthy mixed-breed weaner rabbits were used for the eight-week feeding trial. Prior to the commencement of the experiment, the rabbits were acclimatized for one week during which they received prophylactic medication against common diseases. The rabbits were housed individually in well-ventilated wire-mesh cages equipped with feeding troughs and drinkers. Feed and clean drinking water were provided *ad libitum* throughout the experimental period. Routine sanitation and general management practices were maintained to ensure good health and welfare of the animals.

Experimental Diets

Five experimental diets were formulated to contain graded levels of soybean milk residue meal (SMRM) at 0, 7.5, 15.0, 22.5, and 30.0% designated as T1, T2, T3, T4, and T5, respectively. The diets were formulated to contain approximately 16% crude protein with metabolizable energy ranging from 2,270.4 to 2,393.4 kcal/kg. Ingredient composition and calculated nutrient composition of the experimental diets are presented in Table 1.



Table 1: Ingredients and Proximate Composition of Experimental Diets Containing Graded Levels of Soybean Milk Residue Meal

Ingredients	Diets				
	Inclusion levels of SMRM				
	D1 (0%)	D2 (7.5%)	D3 (15%)	D4 (22.5%)	D5 (30%)
Maize	33.8	33.8	31.8	30.7	29.4
Soybean Meal	13.5	13.5	15.6	16.7	17.8
SMRM	0.0	7.5	15.0	22.5	30.0
Wheat Offal	30.0	22.5	15.0	7.5	0.0
Groundnut Haulms	20.0	20.0	20.0	20.0	20.0
Bone Meal	2.0	2.0	2.0	2.0	2.0
Premix	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10	0.10
Methionine	0.10	0.10	0.10	0.10	0.10
Total	100	100	100	100	99.90
Calculated Analyses					
Crude Protein (%)	16.00	16.00	16.00	16.00	16.00
Metabolizable Energy (Kcal/kg)	2270.40	2305.40	2332.40	2367.00	2393.40
Crude Fibre (%)	9.87	9.95	10.04	10.13	10.22

Experimental Design

The experiment was conducted using a completely randomized design (CRD). The thirty rabbits were randomly allotted to five dietary treatments, with three replicates per treatment and two rabbits per replicate.

Data Collection

Growth Performance

Rabbits were weighed individually at the beginning of the experiment and subsequently at weekly intervals until the end of the feeding trial. Feed offered and feed refusals were recorded daily to determine feed intake.

Daily feed intake was calculated as:

$$\text{Daily feed intake} = \text{Total quantity of feed given} - \text{Leftover}$$

Daily weight gain was calculated as:

$$\text{Daily weight gain} = \frac{\text{Final weight} - \text{Initial weight}}{56 \text{ days}}$$

Feed conversion ratio (FCR) was determined as:

$$\text{Feed Conversion Ratio} = \frac{\text{Quantity of feed consumed}}{\text{Weight gain}}$$

Apparent Nutrient Digestibility

A digestibility trial was conducted during the final week of the feeding experiment. Total faeces voided were collected daily from each rabbit over a five-day collection period. The feces were dried, weighed, pooled for each rabbit, thoroughly mixed, and representative samples were analyzed for proximate composition.

Apparent nutrient digestibility coefficients were calculated using the following equation:

$$\text{Apparent digestibility} = \frac{\text{Nutrient intake} - \text{Nutrient voided}}{\text{Nutrient intake}} \times 100$$

Carcass Evaluation

At the end of the feeding trial, three rabbits were randomly selected from each treatment for carcass evaluation. The rabbits were weighed prior to slaughter, humanely slaughtered, skinned, and



eviscerated. Carcass weight and the weights of selected internal organs were recorded. Dressing percentage was calculated as:

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

Economic Analysis

Economic indices were determined to evaluate the cost-effectiveness of including soybean milk residue meal in rabbit diets. Feed cost per kilogram was calculated based on the prevailing market prices of feed ingredients during the study.

The following economic parameters were computed:

Total feed cost per rabbit (₦):

Total Feed Cost = Total Feed Consumed (kg) × Cost of Feed (₦/kg)

Feed cost per kilogram weight gain (₦):

Feed Cost/kg Weight Gain = Feed Cost (₦/kg) × Feed Conversion Ratio (FCR)

The economic advantage of dietary *Saccharomyces cerevisiae* supplementation was assessed by determining the feed cost savings relative to the control diet (0% *Saccharomyces cerevisiae*). Feed cost savings per kilogram of weight gain and the corresponding percentage feed cost savings were calculated using the following equations:

Feed cost savings (₦/kg gain) = Feed cost/kg weight gain (Control) – Feed cost/kg weight gain (Treatment)

Cost reduction relative to the control (%):

$$\text{Cost Reduction (\%)} = \frac{\text{Feed Cost/kg Gain of Control} - \text{Feed Cost/kg Gain of Treatment}}{\text{Feed Cost/kg Gain of Control}} \times 100$$

Proximate Analysis

The proximate composition of the experimental diets and fecal samples was determined according to the standard procedures of the Association of Official Analytical Chemists (AOAC, 2019). All analyses were conducted in triplicate.

Statistical Analysis

Data collected on growth performance, nutrient digestibility and carcass characteristics were subjected to one-way analysis of variance (ANOVA) using the General Linear Model (GLM) procedure of IBM SPSS Statistics (version 25). Where significant treatment effects were detected, treatment means were separated using Duncan's Multiple Range Test (DMRT) at a 5% probability level ($P < 0.05$).

RESULTS AND DISCUSSIONS

Growth Performance of Weaner Rabbits Fed Diets Containing Graded Levels of Soybean Milk Residue Meal

The results as presented in Table 2 showed that the graded inclusion of soybean milk residue meal (SMRM) significantly influenced the growth performance of weaner rabbits affecting final body weight, weight gain, daily weight gain, and feed conversion ratio ($P < 0.05$), whereas initial body weight and feed intake remained unaffected ($P > 0.05$). The uniform initial body weights indicated that, differences in performance were attributable to dietary treatments. Rabbits fed 15% SMRM achieved the highest final body weight, total weight gain, daily weight gain, and the most efficient feed conversion ratio, suggesting that this inclusion level provided an optimal balance between dietary protein, energy, and fibre. Similar improvements in growth performance have been reported in rabbits fed soybean milk residue or soybean curd residue by Alabi *et al.* (2018), Abdullahi *et al.* (2021), Sudik *et al.* (2020), and Saleh *et al.* (2025), they attributed enhanced growth to the favourable nutrient composition and digestibility of soybean processing by-products. However, the decline in growth performance at 30% SMRM inclusion indicates that excessive inclusion of byproduct may increase fibre content and residual anti-nutritional factors, thereby reducing nutrient availability and growth efficiency.



Feed intake was not significantly affected by dietary treatment, indicating that SMRM did not impair diet palatability or voluntary feed consumption. Consequently, the observed differences in growth performance were likely due to variations in nutrient utilization rather than feed intake. The significantly improved feed conversion ratio at 15% SMRM further confirms superior nutrient utilization at this inclusion level, whereas the poorer feed conversion observed at 30% SMRM suggests reduced efficiency of converting feed into body weight gain. Comparable improvements in feed efficiency have been reported by Abdullahi *et al.* (2021), Saleh *et al.* (2025), and Adimas *et al.* (2022), who observed enhanced feed conversion in rabbits fed soybean residue-based diets. Overall, the findings indicate that soybean milk residue meal is a valuable alternative protein source for rabbit production, with 15% dietary inclusion representing the optimum level for maximizing growth performance and feed utilization.

Table 2: Growth Performance of Weaner Rabbits Fed Diets Containing Graded Levels of Soybean Milk Residue Meal

Parameters	Treatments Inclusion levels of SMRM					SEM	P-value
	T1 (0%)	T2 (7.5%)	T3 (15%)	T4 (22.5%)	T5 (30%)		
Initial Weight (g)	702.50	705.30	701.80	704.60	703.20	4.21	0.99
Final Weight (g)	1825.40 ^{ab}	1906.80 ^a	1945.60 ^a	1834.70 ^a	1708.20 ^b	35.44	0.02
Total Weight Gain (g)	1122.90 ^{ab}	1201.50 ^a	1243.80 ^a	1130.10 ^{ab}	1005.00 ^b	32.15	0.03
Daily Weight Gain (g/day)	20.05 ^a	21.46 ^a	22.21 ^a	20.18 ^a	17.95 ^b	0.57	0.03
Daily Feed Intake (g/day)	72.50	73.80	74.60	75.20	76.10	1.12	0.41
Total Feed Intake (g)	4060.00	4132.80	4177.60	4211.20	4261.60	62.30	0.39
Feed Conversion Ratio	3.62 ^a	3.44 ^a	3.36 ^a	3.73 ^a	4.24 ^b	0.13	0.01

Note: ^{a, b} means within a row bearing different superscripts differ significantly ($p < 0.05$); SEM = Standard Error of Mean; NS = not significant ($P > 0.05$).

Apparent Nutrient Digestibility (%) of Weaner Rabbits Fed Soybean Milk Residue Meal

The nutrient digestibility result presented in Table 3 showed that, graded inclusion of soybean milk residue meal (SMRM) significantly ($P < 0.05$) influenced the apparent digestibility of all measured nutrients. The rabbits fed 15% SMRM consistently recording the highest digestibility coefficients for dry matter, crude protein, crude fibre, ether extract, ash, and nitrogen-free extract, while the 30% inclusion produced the lowest values. These findings indicate that moderate inclusion of SMRM enhanced nutrient utilization, whereas excessive inclusion likely reduced digestive efficiency due to increased dietary fibre (Table 3) and residual anti-nutritional factors. Similar improvements in nutrient digestibility following moderate inclusion of soybean processing by-products have been reported by Iyeghe-Erakpotobor *et al.* (2006), Emmanuel *et al.* (2021), Ayandiran and Adekunle (2023), Adimas *et al.* (2022), and Saleh *et al.* (2025), who attributed the enhanced digestibility to the high-quality protein, fermentable carbohydrates, and favourable nutrient composition of soybean residues.

The superior crude protein and fibre digestibility observed at 15% SMRM suggests improved amino acid availability and enhanced caecal microbial fermentation, resulting in better nutrient utilization and energy extraction. Conversely, the marked decline in digestibility at 30% inclusion indicates that excessive soybean milk residue may increase indigestible fibre fractions and reduce nutrient accessibility, thereby limiting digestive efficiency. These findings agree with previous reports that soybean processing by-products are effective alternative feed ingredients for rabbits when included at moderate dietary levels but may impair nutrient utilization when incorporated excessively (Alabi *et al.*, 2018; Abdullahi *et al.*, 2021; Emmanuel *et al.*, 2021; Saleh *et al.*, 2025; Sègbédji Théodora *et al.*, 2026). Overall, the results demonstrate that 15% SMRM represents the optimum inclusion level for maximizing nutrient digestibility and supporting efficient rabbit production.



Table 3: Apparent Nutrient Digestibility (%) of Weaner Rabbits Fed Soybean Milk Residue Meal

Parameters	Treatments					SEM	P-value
	Inclusion levels of SMRM						
	T1 (0%)	T2 (7.5%)	T3 (15%)	T4 (22.5%)	T5 (30%)		
Dry Matter	72.80 ^a	74.50 ^a	75.60 ^a	73.40 ^a	68.90 ^b	1.25	0.04
Crude Protein	76.40 ^a	78.80 ^a	80.20 ^a	77.60 ^a	71.50 ^b	1.11	0.01
Crude Fibre	55.30 ^b	58.60 ^{ab}	61.40 ^a	60.20 ^a	56.80 ^b	1.45	0.03
Ether Extract	71.20 ^a	72.50 ^a	73.80 ^a	72.10 ^a	69.40 ^b	0.98	0.04
Ash	60.80 ^b	63.20 ^{ab}	65.40 ^a	63.80 ^{ab}	59.70 ^b	1.34	0.03
Nitrogen Free Extract	78.50 ^a	80.10 ^a	81.40 ^a	79.80 ^a	74.60 ^b	1.17	0.02

Note: ^{a, b} Means within a row bearing different superscripts differ significantly ($p < 0.05$); SEM = Standard Error of Mean; NS = not significant ($P > 0.05$).

Carcass Characteristics of Weaner Rabbits Fed Graded Levels of Soybean Milk Residue Meal

The carcass analysis result as presented in Table 4 demonstrated that, graded inclusion of soybean milk residue meal (SMRM) significantly ($P < 0.05$) influenced slaughter weight, dressed weight, dressing percentage, hind limb yield, small intestine, caecum, and abdominal fat, while most carcass cuts and visceral organs remained unaffected ($P > 0.05$). Rabbits fed 15% SMRM recorded the highest slaughter weight, dressed weight, dressing percentage, and hind limb proportion, indicating superior muscle deposition and carcass yield at this inclusion level. These findings agree with Alabi *et al.* (2018), Saleh *et al.* (2025), and Magaji *et al.* (2024), who reported improved carcass traits in rabbits fed soybean processing by-products, although Abdullahi *et al.* (2021) observed no significant effect on dressing percentage, suggesting that responses may vary with processing methods, diet composition, and inclusion levels.

The absence of significant differences in the weights of the liver, kidney, heart, lungs, spleen, and stomach indicates that SMRM did not adversely affect the physiological status of the rabbits, confirming its safety as an alternative protein source. However, the increased proportions of the small intestine and caecum at higher inclusion levels likely reflect adaptation to increased dietary fibre, while the reduced abdominal fat at 30% SMRM suggests lower dietary energy utilization and leaner carcass deposition. Overall, the results indicate that 15% SMRM optimizes carcass yield without compromising organ integrity, whereas excessive inclusion (30%) may reduce carcass performance due to diminished nutrient utilization. These findings corroborate previous reports that moderate inclusion of soybean processing by-products enhances carcass characteristics while maintaining normal organ development in rabbits (Abdullahi *et al.*, 2021; Emmanuel *et al.*, 2021; Saleh *et al.*, 2025; Sègbédji Théodora *et al.*, 2026).

Table 4: Carcass Characteristics of Weaner Rabbits Fed Graded Levels of Soybean Milk Residue Meal

Parameters	Treatments					SEM	P-value
	Inclusion levels of SMRM						
	T1 (0%)	T2 (7.5%)	T3 (15%)	T4 (22.5%)	T5 (30%)		
Slaughter Weight (g)	1805.20 _a	1888.60 ^a	1930.4 ^a	1821.8 ^a	1695.3 _b	33.81	0.02*
Dressed Weight (g)	1002.50 _a	1068.40 ^a	1105.6 ^a	1023.8 ^a	915.4 ^b	21.45	0.01*
Dressing Percentage (%)	55.50 ^a	56.60 ^a	57.30 ^a	56.20 ^a	54.00 ^b	0.83	0.04*
Pelt (%)	12.60	12.40	12.20	12.50	12.80	0.21	0.63NS
Head (%)	8.40	8.20	8.10	8.30	8.50	0.16	0.58 NS
Fore Limb (%)	7.80	7.90	8.00	7.80	7.70	0.13	0.72 NS
Hind Limb (%)	15.80 ^b	16.20 ^{ab}	16.80 ^a	16.10 ^{ab}	15.40 ^b	0.24	0.03*
Tail (%)	1.10	1.08	1.05	1.07	1.12	0.03	0.69 NS
Liver (%)	3.20	3.10	3.00	3.20	3.40	0.09	0.27 NS
Kidney (%)	0.78	0.76	0.74	0.77	0.81	0.03	0.36 NS
Heart (%)	0.35	0.34	0.33	0.34	0.35	0.01	0.72 NS
Lungs (%)	0.62	0.61	0.60	0.62	0.64	0.02	0.44 NS
Spleen (%)	0.12	0.11	0.11	0.12	0.13	0.01	0.55 NS
Stomach (%)	4.50	4.40	4.30	4.50	4.70	0.11	0.48 NS
Small Intestine (%)	3.90 ^b	3.80 ^b	3.70 ^b	4.10 ^{ab}	4.40 ^a	0.12	0.04*
Large Intestine (%)	1.80	1.70	1.70	1.80	1.90	0.06	0.33 NS
Caecum (%)	5.20 ^b	5.40 ^b	5.60 ^b	6.00 ^{ab}	6.40 ^a	0.19	0.02*
Abdominal Fat (%)	1.80 ^a	1.90 ^a	2.00 ^a	1.70 ^{ab}	1.40 ^b	0.09	0.03*

Note: ^{a, b} Means within a row bearing different superscripts differ significantly ($p < 0.05$); SEM = Standard Error of Mean; NS = not significant ($P > 0.05$).

Economic Analysis of Weaner Rabbits Fed Graded Levels of Soybean Milk Residue Meal

The economic analysis (Table 5) demonstrated that, increasing dietary inclusion of soybean milk residue meal (SMRM) progressively reduced feed cost, with the cost per kilogram of feed declining from ₦600.00 in the control diet to ₦520.00 at 30% SMRM inclusion. This reduction reflects the lower cost of soybean milk residue compared with soybean meal and highlights its potential as an economical alternative protein source. Similar reductions in feed cost have been reported by Saleh *et al.* (2025) and Magaji *et al.* (2024), who observed that replacing conventional protein sources with soybean processing by-products improved the economic sustainability of rabbit production. However, despite the lower feed cost at higher inclusion levels, rabbits fed 15% SMRM achieved the lowest feed cost per kilogram of weight gain owing to their superior feed conversion efficiency and growth performance, indicating that biological efficiency, rather than feed price alone, determines overall profitability.

Although the 30% SMRM diet was the least expensive to formulate, its poorer feed conversion ratio and lower weight gain reduced its economic advantage, resulting in a higher cost of production per unit of weight gain. Consequently, rabbits fed 15% SMRM recorded the greatest reduction in production cost, demonstrating the best balance between feed cost, nutrient utilization, and growth performance. These findings agree with Osman *et al.* (2024) and other studies on agro-industrial by-products, which concluded that moderate replacement of conventional protein sources improves profitability without compromising animal performance. Overall, the results indicate that 15% SMRM is the optimum inclusion level for achieving maximum economic returns and sustainable weaner rabbit production.

Table 6: Economic Analysis of Weaner Rabbits Fed Graded Levels of Soybean Milk Residue Meal

Parameter	Treatments				
	Inclusion levels of SMRM				
	T1 (0%)	T2 (7.5%)	T3 (15%)	T4 (22.5%)	T5 (30%)
Cost of feed/kg (₦)	600.00	580.00	560.00	540.00	520.00
Total feed consumed (kg)	4.060	4.133	4.178	4.211	4.262
Total feed cost/rabbit (₦)	2,436.00	2,397.02	2,339.46	2,274.05	2,216.03
Feed Conversion Ratio (FCR)	3.62	3.44	3.36	3.73	4.24
Feed Cost per kg Weight Gain (₦)	2,172.00	1,995.20	1,881.60	2,014.20	2,204.80
Cost Saving	-	176.80	290.40	157.80	-32.80
Cost Reduction Relative to Control (%)	-	8.14	13.37	7.27	-1.51

CONCLUSION AND RECOMMENDATION

From the study it can be concluded that, soybean milk residue meal is a suitable and cost-effective alternative protein source for weaner rabbits and can be included in diets at up to 15% without compromising growth performance, nutrient digestibility, carcass characteristics, or economic returns. Rabbits fed the 15% soybean milk residue meal diet achieved the highest final body weight, weight gain, feed conversion efficiency, crude protein digestibility (80.2%), dressing percentage (57.30%), and the lowest feed cost per kilogram of weight gain (₦1,881.60), representing a 13.37% reduction in feed cost compared with the control. However, increasing the inclusion level to 30% adversely affected growth performance, nutrient utilization, and feed efficiency.

Based on these findings, it is recommended that soybean milk residue meal be included at 15% in the diets weaner rabbit to optimize biological performance and profitability. Further studies should investigate the effects of processing methods, enzyme supplementation, or fermentation on improving the nutritional value of soybean milk residue at higher inclusion levels.

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