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REVIEWER'S REPORT

Manuscript No.: IJAR-55022

Title: Characteristics of feed production for intensive broiler breeding in Burkina Faso: the case of the of OUAGADOUGOUÂ's city

Recommendation:
Accept as it is

Rating	Excel.	Good	Fair	Poor
Originality		√		
Techn. Quality			√	
Clarity		√		
Significance			√	

Reviewer Name: Dr. Manju M **Date: 30-11-2025**

Detailed Reviewer's Report

Context and Rationale

Peri-urban poultry farming in Burkina Faso faces significant productivity constraints, largely due to poor nutritional quality of broiler feeds. The study was initiated to generate scientific data on the real composition of locally manufactured broiler feeds and support improvements in feed quality control.

Objectives of the Study

The investigation aimed to:

- Characterize the nutritional quality (bromatological and mineral composition) of broiler feeds produced by peri-urban feed mills around Ouagadougou.
- Identify the different types of feeds manufactured (starter, grower, finisher).
- Assess whether energy, protein, mineral, and trace-element contents meet recommended standards.
- Highlight potential nutritional imbalances affecting broiler performance.
- Document feed production practices and quality-control measures used by feed mills.
- Provide reference data to guide feed industry improvement and regulatory oversight.

Survey and Feed Mill Selection

- Structured surveys were conducted among eight major feed manufacturers to document production practices, types of feed produced, equipment used, and quality-control strategies.
- Only feed mills registered and compliant with the Ministries of Animal Resources and Commerce were included.

Documentation of Production Characteristics

Surveys collected information on:

- Feed formulations and software used.

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- Storage time (typically 7–10 days).
- Physical form (pellet vs. powder).
- Packaging sizes (25–50 kg).
- Demographic and educational profile of feed mill managers.

Sampling Strategy

- A standardized sampling protocol was applied using clean ladles, gloves, and labelled Ziplock bags to avoid contamination.
- A total of **83 broiler feed samples** were collected, covering the three physiological stages:
  - Starter
  - Grower
  - Finisher

Laboratory Analytical Methods

Nutrient Analyses

Organic matter components analyzed included:

- Dry matter (DM)
- Crude protein (CP)
- Fat matter
- Crude cellulose
- Crude ash

Mineral and Trace Element Determination

- Calcium (Ca), phosphorus (P), zinc (Zn), copper (Cu), iron (Fe) were analyzed using atomic absorption spectrophotometry (AAS).

Standardized Methods

- AOAC procedures, Soxhlet extraction (ISO-659), and Kjeldahl nitrogen methods were used.
- Energy values (GE and ME) were calculated using equations from Schiemann et al. and Sibbald (1982).

Multi-laboratory Approach

Samples were distributed across three specialized laboratories (LaRePSA, LBTA, BUNASOL) to enhance accuracy and cross-validation.

Data Processing

Descriptive statistics (means, SD, minima, maxima) were computed using Excel and SPSS.

Results

Crude Protein Content

- **Starter:** 21.13 ± 3.63 %
- **Grower:** 17.61 ± 5.64 %
- **Finisher:** 20.43 ± 4.41 %

CP values were generally higher or inconsistent relative to recommended standards, indicating possible over-formulation or poor ingredient control.

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Metabolizable Energy (ME)

- **Starter:** 3745.67 kcal/kg DM
- **Grower:** 3704.92 kcal/kg DM
- **Finisher:** 3704.92 kcal/kg DM

These ME values exceed typical broiler requirements (3000–3200 kcal/kg), indicating energy-dense formulations.

Mineral Composition (Ca and P)

Phosphorus:

- 4.78 ± 2.16, 5.35 ± 1.97, 4.63 ± 1.79 g/kg DM

***Calcium*:**

- 11.38 ± 2.29, 8.15 ± 3.75, 8.94 ± 3.25 g/kg DM

Both minerals appeared in higher-than-recommended levels, disturbing optimal Ca:P ratios.

Trace Elements

Zn, Cu, and Fe levels were often above requirements, suggesting overuse of premixes and mineral supplements.

Variability and Quality Control Issues

High standard deviations across nutrient categories indicated:

- inconsistent feed formulation
- uneven mixing
- inadequate ingredient quality monitoring

Interpretation of Nutritional Risks

Identified nutrient imbalances may contribute to:

- bone deformities (Ca/P imbalance)
- metabolic disorders and lameness
- excessive fat deposition (high ME)
- reduced growth performance
- higher mortality
- poor carcass quality

These issues align with challenges reported in peri-urban poultry farms.

Industrial and Regulatory Implications

The findings provide:

- A reference dataset for regulatory agencies overseeing feed quality.
- Practical guidance for feed mills to adjust formulations.
- Support for veterinarians and extension workers advising farmers. The results highlight the need for improved quality control systems and stricter regulatory enforcement.

Applications of the Study

- The study provides reference nutrient values that regulatory agencies can use to monitor, inspect, and enforce quality standards in commercial broiler feeds.

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- Feed manufacturers can use the results to adjust protein, energy, mineral, and trace-element levels, improving formulation accuracy and reducing over- or under-supplementation.
- Extension agents, veterinarians, and broiler producers can rely on the findings to identify high-quality feeds, avoid nutritionally unbalanced products, and improve flock performance.
- The data serve as a scientific benchmark for designing policies, training programs, and industry support initiatives aimed at enhancing poultry productivity in Burkina Faso

Limitations of the study

- The study focused only on peri-urban feed mills around Ouagadougou and included eight manufacturers, which may not fully represent feed quality across other regions of Burkina Faso.
- Despite using standardized methods, samples were analyzed across multiple laboratories and collected at single time points, which may introduce analytical variability and may not capture seasonal or batch-to-batch fluctuations in feed quality.

Recommendations

- Strengthen nutrient monitoring and enforce routine laboratory analyses in feed mills.
- Adjust protein, energy, calcium, phosphorus, and trace-mineral levels to match broiler requirements in tropical conditions.
- Provide continuous training for feed mill staff.
- Enhance government oversight to ensure proper formulation and responsible use of mineral supplements.

Conclusion

Proper feed formulation is essential for optimal broiler growth and health. The study revealed significant variations in protein, energy, and mineral content in commercial feeds, with many exceeding recommended levels. Regular quality checks, improved formulation practices, and better regulatory control are crucial to support healthier, more productive flocks and strengthen Burkina Faso's poultry sector.