



**EVALUATION OF FLOOR SPREADS ON BROODING EFFICIENCY
AND PERFORMANCES OF BROILER CHICKS**

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CERTIFICATION

This is to certify that this research was conducted by Abdulqodir muslimat wuraola (HND/22/AGT/FT/0010) and has been read, certified and approved as meeting the requirements for the award of Higher National Diploma (HND) in Agricultural technology (Animal production Unit) from the department of Agricultural Technology. Institute of Applied Science. Kwara State Polytechnic, Ilorin.

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DEDICATION

This project work is dedicated to God Almighty allah and my parents

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I give all praises, "honors", and thanks to Almighty allah, the Author and the finishers of all things, the one who made it possible for me to witnesses the end of this academy season, Glory and Adoration be unto GOD

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ABSTRACT

The evaluation of floor spreads plays a significant role in the brooding efficiency and performance of broiler chicks. However, it is important to note that the evaluation of floor spreads should not be limited to chicken performance alone. The type of floor spread used can greatly impact the overall success of broiler chick brooding.

Wood shavings, control, grounded maize cobs, saw dust, and rice husk are commonly used as floor spreads in broiler chick brooding. Each type offers its own unique benefits and features that contribute to the overall brooding efficiency and performance of the chicks.

Wood shavings are known for their absorbent properties, making them an ideal choice for keeping the brooding area dry and clean. The control group, on the other hand, allows for a comparison of performance between the different types of floor spreads. Grounded maize cobs offer a non-toxic and renewable option that can also help in reducing heat stress in broiler chicks. Saw dust is another

commonly used floor spread, which provides good insulation and helps in controlling moisture levels. Lastly, rice husk offers good absorbency and is also known for its anti-bacterial properties.

The evaluation of floor spreads on brooding efficiency and performance of broiler chicks is crucial in ensuring a successful and healthy brood. Therefore, it is important to carefully consider the type of floor spread used and its impact on the overall performance of the chicks.

CHAPTER ONE

1.0 INTRODUCTION

The poultry industry has in recent years occupied a leading position among agricultural industries in many parts of the world. This may be due to the attractive attributes of poultry which include the ability to adapt easily, high economic value, rapid generation time and a high rate of growth that can result in the production of meat within 8 weeks (Smith, 2002).

However, with the increasing concentration of poultry in Nigeria, it has become essential to appreciate the influence of litter materials on which these birds are reared. In Nigeria, broilers and cockerels are mostly reared on the floor spread with litter materials. Litter material in any dry form material used on the floor of chicken houses on which chicken dropping will fall. It is known as

litter material because it combines with the droppings and undergoes a bacterial breakdown process, thus preventing a smelly and unsanitary condition (Demirulus, 2006). Various types of litter materials are used in different countries. The common types of litter used in poultry houses throughout the world are sawdust, rice husk, by products, wood shavings, corn cobs, oat hulls, dried leaves, coffee husk (Rao, 1986). In Southwestern Nigeria, wood shavings are easily obtained from sawmills at little or no cost and used as litter. The use of this material has been hinged purely on their availability and price, without any consideration for the comfort of the birds. Few available reports on the effect of litter on the performance of birds are contradictory and showed a need for validation (Oliveira .1974). According to Awojobi (1999), types of litter had no significant effect on birds' performance. Whereas Popolizio.(1979), Poyraz.(1990) and Anisuzzaman and Chowdhury (1996) reported that rice husk was the best litter for broiler chickens. Based on these premise, it becomes imperative to evaluate wood shaving and other locally available litter materials in Nigeria such as sawdust ,rice husks, ground corn cobs and Bare floor on the performance of broiler chickens.

This study is vital for improving broiler chicken production by evaluating the impact of different floor spreads on various aspects of broiler management. Previous research has highlighted the significance of brooding conditions on chick survival and early growth (Alhamad .2017). Understanding how floor spreads influence brooding efficiency can lead to better management practices, reducing mortality and enhancing productivity (Muir, 2011).

In addition, the study will explore the effects of floor spreads on broiler growth rates and health, with previous studies suggesting that environmental conditions, such as floor material, significantly affect bird welfare and disease risk (Dawood. 2019). Evaluating these parameters will offer insights into reducing health issues

and improving overall flock vitality (Cymerys .2018).

The economic impact of floor spreads will be assessed, as cost-effective production practices are essential for maintaining profitability in the poultry industry (Jahan . 2020). By analyzing the costs and benefits of different floor spreads, this study will provide practical recommendations for optimizing both production efficiency and economic outcomes.

1.1 PROBLEM STATEMENT

The efficiency and profitability of broiler chicken production are heavily influenced by various management practices, including the choice of floor spreads used in rearing systems. However, limited research has been conducted to comprehensively understand the impact of different floor spreads on critical parameters such as brooding efficiency, growth rates, health outcomes, behavior, and economic viability. The lack of clear guidelines on the most suitable floor spreads poses challenges for poultry farmers in optimizing productivity while ensuring animal welfare and reducing costs.

So this study we aims to address this gap by systematically evaluating the effects of various floor spreads on broiler chickens to provide evidence-based recommendations for sustainable and cost-effective poultry farming practices.

1.2 SIGNIFICANT OF THE STUDY

This study is significant because it aims to improve broiler production by assessing the impact of different floor spreads on brooding efficiency, growth, and health. Identifying the best floor spreads can enhance survival rates and growth performance, leading to more productive flocks

Economically, these study will examines the cost-effectiveness of different floor spreads, helping farmers make informed decisions that improve

profitability while maintaining high animal welfare standards. The findings could guide more sustainable and ethical farming practices in the poultry industry.

Additionally, the research explores how floor spreads affect broiler health and welfare. By evaluating disease incidence, mortality, and behavior, the study provides insights into minimizing stress and promoting better welfare for the birds.

1.3. OBJECTIVE

1. Assessing the impact of different floor spreads on brooding efficiency,
2. Evaluating the influence of floor spreads on the growth rate
3. Investigating the effects of various floor spreads on the health parameters of broiler chickens, including disease incidence and mortality rates.
4. Comparing the behavior patterns of broiler chickens raised on different floor spreads to understand their welfare and stress levels.
5. Analyzing the economic implications of using different floor spreads in terms of cost effectiveness and return on investment in broiler production.

1.4 JUSTIFICATION

This study is important because it examines how different floor spreads affect brooding efficiency, which is crucial for chick survival and early growth. By understanding these effects, producers can improve brooding conditions, reduce mortality, and enhance overall production efficiency.

The study also focuses on the impact of floor spreads on broiler growth rates and health. It will explore how various spreads influence factors such as cleanliness, comfort, and disease risk, helping farmers make better decisions to improve bird health and reduce mortality.

Also the research will justify the economic implications of using different floor spreads. By evaluating their cost-effectiveness and impact on productivity, the study will provide recommendations for optimizing production practices, ensuring better profitability and animal welfare in broiler farming.

CHAPTER TWO

LITERATURE REVIEW

2.1 HISTORICAL BACKGROUND

The use of floor spread materials in poultry production has evolved over the decades as part of a broader effort to improve brooding efficiency, chick health, and overall performance. Historically, floor management in poultry housing was rudimentary, with early poultry systems relying heavily on bare floors or simple earth floors. These systems were often plagued with problems such as poor

sanitation, high disease incidence, and low productivity (Adene & Oguntade, 2008).

Before the commercial broiler industry gained momentum in the mid-20th century, most poultry were raised in small backyard systems. During this period, Birds were commonly raised on bare ground or clay floors, with little attention to bedding or litter and this cause of Disease outbreaks, particularly those caused by parasites and bacteria, were common due to direct contact with feces and moisture accumulation (Smith et al., 2017).

Litter Material With the rapid expansion of commercial poultry farming is adopted from the years 1950s _1970s especially in the United States and Europe, the importance of managing the poultry house environment became evident.

Brooding efficiency improved significantly as farmers observed better chicks survival, more stable temperatures, and reduced disease (Atkins et al., 2018).

Scientifically During this period of Research and Performance Metrics in the years 1980s–2000s detailed studies began to emerge comparing different bedding

materials and their impact on:

- Growth rate
- Feed conversion ratio (FCR)
- Mortality

- Footpad health and litter quality

And the Key developments included:

- Comparative studies between sawdust, rice husk, peanut shells, and wood shavings—especially in tropical regions (Abdullahi et al., 2015).
- Recognition of the role of bedding in ammonia control, bacterial growth, and bird behavior (Johnson et al., 2021).
- Introduction of alternative materials like paper pellets, corn cobs, and recycled products (Ibrahim et al., 2019).
- Modern Innovations and Sustainable Practices (2010–Present)

And in Recent years increased have seen focus on:

- Sustainable and cost-effective materials, such as ground corn cobs, cocoa husks, and recycled newspaper (Oke et al., 2020)
- The economic impact of floor spread choices, especially for small-scale and rural poultry producers (Umar& Musa, 2017).
- Behavioral and welfare assessments of broilers on different bedding types to ensure ethical farming practices.
- Use of technology and sensors to monitor litter moisture and ammonia, guiding decisions on litter replacement and ventilation (Atkins et al., 2018).

In developing countries like Nigeria, India, and Bangladesh, emphasis has been placed on locally available materials such as rice husk, groundnut shells, and plant waste, which provide affordable and effective alternatives to imported bedding (Oke et al., 2020).

2.2 IMPORTANT OF FLOOR MANAGEMENT IN BROODING

Floor spread materials, also known as bedding or litter materials, serve several important functions in poultry houses. They help in moisture absorption, insulation, odor control, and waste management. An ideal floor spread material should be:

- Highly absorbent
- Non-toxic and dust-free
- Comfortable and thermally insulating
- Economical and readily available
- Easy to dispose of or recycle

Improper floor materials or bare floors can lead to issues such as footpad dermatitis, high ammonia levels, increased mortality, and poor weight gain (Atkins et al., 2018).

2.3 COMMON FLOOR SPREAD MATERIALS IN POULTRY BROODING

2.3.1 SAWDUST

Sawdust is one of the most widely used bedding materials in poultry farming. It is highly absorbent and relatively cheap. However, if not properly dried or sourced from treated wood, it may lead to respiratory issues or caking. Proper management of sawdust improves chick comfort and minimizes disease risks (Smith et al., 2017).

2.3.2 WOOD SHAVINGS

Wood shavings provide good cushioning and insulation for broiler chicks. They are bulkier than sawdust and allow for better aeration. Studies have shown

that birds raised on wood shavings tend to have better body weight gain and lower incidences of breast blisters (Olomu, 2016).

2.3.3 RICE HUSK

Rice husk is a common by-product of rice processing and is used in poultry farming, especially in rice-producing regions. Although less absorbent than saw dust, rice husk provides a good balance of insulation and airflow. It also supports microbial fermentation that helps in breaking down droppings, reducing ammonia build-up (Oke et al., 2020).

2.3.4 GROUND MAIZE COBS

Ground maize cobs are an underutilized by-product in poultry bedding. They have moderate absorbency and decompose slowly, making them suitable for longer production cycles. Limited studies suggest that broiler chicks raised on ground corn cobs show comparable growth performance to those on traditional litters, though care must be taken to avoid mold contamination (Ibrahim et al., 2019).

2.3.5 BARE FLOOR (NO LITTER)

The use of bare floors is discouraged in commercial brooding because it offers no cushioning, poor thermal insulation, and minimal moisture absorption. Chicks brooded on bare floors are more prone to stress, cold, foot injuries, and infections such as coccidiosis. Performance metrics such as feed conversion ratio and average daily gain are often lower on bare floors (Adene & Oguntade, 2008).

2.4 FLOOR SPREAD AND BROODING EFFICIENCY

Brooding efficiency involves optimal chick comfort, temperature maintenance, and low mortality rates. Floor spread materials play a pivotal role

by providing insulation and reducing direct heat loss. Chicks raised on appropriate bedding materials demonstrate:

- Quicker adaptation to the environment
- Uniform growth
- Reduced heat stress
- Improved survival rates

(Johnson et al., 2021) showed that poor litter leads to poor brooding conditions which affect chick behavior and energy balance.

2.5 FLOOR SPREAD AND GROWTH PERFORMANCE

Performance indicators such as weight gain, feed conversion ratio (FCR), and mortality are closely linked to the quality of litter. Well-managed floor spreads contribute to:

- Better feed intake
- Higher weight gain
- Reduced disease incidence

Broiler chicks raised on sawdust and wood shavings typically outperform those raised on rice husk or bare floors in terms of final live weight and FCR (Abdullahi et al., 2015).

2.6 HEALTH IMPLICATIONS OF FLOOR SPREAD MATERIALS

Poor floor spread management can lead to excessive moisture buildup, leading to bacterial and fungal growth, increased ammonia levels, and respiratory problems. Ideal floor spreads reduce microbial load and minimize the risk of

diseases like aspergillosis, coccidiosis, and pododermatitis.

2.7 ECONOMIC CONSIDERATIONS

The cost and availability of floor spread materials affect their choice, especially in rural or low-resource areas. While sawdust and wood shavings might be ideal, in some regions, rice husk or even corn cobs are more economical. The bare floor is the least expensive but has high long-term costs due to increased mortality and poor growth performance (Umar & Musa, 2017).

CHAPTER THREE

3.1 STUDY AREA

The research is carried out at Agricultural technology garden located in KWARA STATE POLYTECHNIC ILORIN, KWARA STATE.

3.2 EXPERIMENTAL DESIGN AND TREATMENT

The experiment is comprise of treatment viz. Sawdust, Rice husks, Wood shaving, ground corn cob shaft, and bare floor. These floor materials were selected based on their availability and prior studies. The experiment is laid down in a completely randomized design (CRD) and replicated three times

3.3 SAMPLE PROCEDURE AND SIZE

Three (3) broilers chicks was used per treatment, and replicated three times (3x5x3) given a sample size of 45 chicks

The design is include five (5) treatment Groups i.e the four floors spread and the bare floor (control).

Replicates: Each treatment is replicated thrice to give a sample size of 45

days old broiler chicks: Those chicks was randomly distributed into the experimental units.

3.4 MANAGEMENT OF EXPERIMENTAL BIRDS

- Housing: The brooding pens measured is provide a sufficient space per bird
- Feeding: A nutritionally balanced starter diet formulated to standards is be provided ad libitum.
- Lighting and Temperature: lighting is provided daily during the brooding phase, and temperatures is maintained gradually
- Vaccination: Birds is vaccinated against castle Disease and Infectious Bursal Disease following
- Biosecurity Measures: Strict hygiene protocols is implement to prevent disease outbreaks

3.5 Data collection

Data is taken at interval, of live weight, feed intake, feed conversion ratio, mortality, Litter moisture, and temperature.

At the end of the experiment, the data taken is subjected to Analysis of Variance (ANOVA), and were separated using Duncan Multiple Range Test.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1 NUMBER OF DAYS REQUIRED TO REPLACE THE FLOOR SPREAD

Table 4.1

FLOOR SPREAD	AVERAGE DAY(S) (GROUP)
Wood Shave	7(a)
Saw Dust	5 (b)

Control	1 (c)
Rice husk	4 (b)
Ground Maize Cobs	7 (a)
F. Value	82.0

Table 4.1 presents the mean number of days associated with different types of floor spread materials used in the experiment. The results show significant variation among the treatments, as indicated by a high F-value of 82.0, suggesting that the type of floor spread used has a substantial effect on the measured outcome (e.g., microbial growth, moisture retention, or duration before deterioration).

Among the treatments, Wood Shave and Ground Maize Cobs recorded the highest average days (7 days each), and are grouped under “a”, indicating no significant difference between them. This implies that these materials were the most effective in prolonging the duration, possibly due to better aeration, moisture absorption, and microbial inhibition properties (Adebiyi et al., 2019).

Saw Dust and Rice Husk, grouped under “b”, showed moderate effectiveness with average durations of 5 and 4 days respectively. Though less effective than wood shave and maize cobs, these materials still provided better performance compared to the Control, which had the lowest mean value of 1 day and was grouped under “c”. This highlights the importance of using floor spread materials, as the absence of any spread (Control) significantly reduced the duration, potentially due to direct exposure to environmental stressors and rapid microbial activity.

The grouping letters (a, b, c) reflect the results of a post-hoc comparison (e.g., Tukey’s HSD), demonstrating statistically significant differences ($p < 0.05$)

among the treatments.

These findings align with the work of Onu et al. (2017), who reported that organic floor bedding materials such as wood shavings and maize cobs improve litter quality and reduce bacterial load in poultry environments, thereby enhancing hygiene and extending usability.

4.2 EFFECT OF FLOOR SPREADS ON WEIGHT GAIN (g)

Table 4.2

TREATMENT	FRC @ 2WEEKS (GROUP)	FRC @ 3WEEKS (GROUP)	FRC @ 4WEEKS (GROUP)
Wood Shave	252 (b)	514 (b)	796 (b)
Saw Dust	267 (a)	496 (c)	742 (c)
Control	273 (a)	536 (a)	810 (a)
Rice husk	253 (b)	485 (d)	714 (d)
Ground Maize Cobs	268 (a)	475 (e)	699 (e)
F. Value	27.9	162.7	841.9

Table 4.2 illustrates the Feed Conversion Ratio (FCR) of birds reared on different floor spread materials over a period of four weeks. The data clearly show that floor spread type significantly influenced feed efficiency, with statistically significant differences indicated by the high F-values recorded at **2 weeks (27.9)**, **3 weeks (162.7)**, and **4 weeks (841.9)**.

At **2 weeks**, the **Control group** had the highest FCR (273), indicating the superior feed efficiency, followed closely by **Ground Maize Cobs (268)** and **Saw Dust**

(267)—all grouped under “a”. In contrast, **Wood Shave (252)** and **Rice Husk (253)** were grouped under “b”, showing significantly better feed conversion ($p < 0.05$). This suggests that the presence of organic bedding materials may have promoted better early feed intake and nutrient utilization (Oke et al., 2017).

At 3 weeks, **Ground Maize Cobs (475)** had the lowest FCR, followed by **Rice Husk (485)** and **Saw Dust (496)**, indicating low feed efficiency. These treatments were assigned different statistical groupings (e, d, and c, respectively), showing their performance. The Control again had the highest FCR (**536, group a**), while **Wood Shave (514)** was moderate (group b). The differences highlight the ability of specific bedding types to create a more conducive environment for bird growth, as supported by Nworgu et al. (2018).

By 4 weeks, the same trend continued. **Ground Maize Cobs** has the poorest FCR (**699, group e**), followed by **Rice Husk (714, group d)**. **Control (810, group a)** and **Wood Shave (796, group b)** remained the distinction efficient. The drastic difference in FCR values, supported by the extremely high F-value of 841.9,

The findings show that **wood shave** and **control** offer superior benefits in enhancing feed conversion efficiency conversely, the **rice husk** and **ground maize cobs** consistently resulted in poor feed conversion ratio

These results corroborate the findings of Adebisi et al. (2019) and Nworgu et al. (2018), who reported that the use of appropriate organic bedding materials promotes bird comfort, reduces microbial activity in the litter, and supports better feed-to-weight gain efficiency

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

This study was conducted to evaluate the effect of different floor spread materials on the brooding efficiency and performance of broiler chicks. The floor spread materials used included **Wood Shave, Saw Dust, Rice Husk, Ground**

Maize Cobs, and Control (no bedding). The research focused on two key parameters: **Clean-Out Score (COS)** as a measure of litter durability, and **Feed Conversion Ratio (FCR)** as an indicator of chick performance and efficiency during brooding.

The results from Table 4.1 showed that **Wood Shave and Ground Maize Cobs** achieved the highest **average day(s) (7 days)**, grouped under **“a”**, suggesting they were the most effective in maintaining clean litter conditions during the brooding period. **Saw Dust and Rice Husk** had moderate effectiveness, while the Control group had the poorest result (1 day), indicating rapid litter deterioration.

In terms of FCR (Table 4.2), which was recorded at **2, 3, and 4 weeks**, **Ground Maize Cobs and Rice Husk** resulted in lower FCR values, in which indicate poorer feed utilization and brooding performance. **Control and Wood Shave** had higher FCR values, demonstrating superior feed efficiency and brooding performance. **saw dust** also has superior feed efficiency and brooding performance but contrary to **control and wood shave**

The significant **F-values (27.9, 162.7, and 841.9)** across all time points confirmed that floor spread material had a statistically significant impact on both litter quality and brooding performance of chicks.

5.2 CONCLUSION

Based on the findings of this study, the following conclusions were drawn:

1. **The type of floor spread material significantly influences brooding efficiency,** as seen in the clean-out score and feed conversion results.

2. **Ground Maize Cobs** and **wood shave** were identified as the most effective bedding materials, improving litter durability, chick comfort,
3. **Control, wood shave and sew dust** is effective in feed utilization during the brooding phase.
4. **Rice husk** and **Ground maize cobs** are less effective in brooding stage
5. **The absence of floor spread (Control)** resulted in the worst outcomes in litter management
6. Effective litter management through appropriate floor spread selection contributes significantly to the overall health, welfare, and productivity of broiler chicks during the brooding period.

5.3 RECOMMENDATIONS

In light of the findings and conclusions, the following recommendations are proposed:

- **Poultry farmers, especially during the brooding phase, should adopt the use of Ground Maize Cobs or wood shave** as bedding materials due to their superior performance in maintaining dry litter
- **Avoid brooding chicks on bare floors**, as seen in the Control treatment, to prevent rapid litter deterioration, high microbial load, and reduced brooding efficiency.
- **Training and sensitization programs** should be organized for poultry farmers and farm attendants on the importance of bedding materials in brooding management and how to source or prepare them locally.
- **Agricultural extension services and research institutes** should promote further studies into cost-effectiveness, availability, and reuse potential of floor

spread materials for sustainable poultry production.

- **Further research** is also encouraged to explore the interaction of floor spreads with environmental conditions such as humidity and temperature, which are critical during brooding.

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