

## Compliance with Feed Mill Regulations: An Assessment of Operators in Oyo State

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### Background

The demand for high-quality animal products in Nigeria's livestock sector is on the rise, emphasizing the crucial need to improve the production of safe and nutritious animal feed '(Chiaka et al., 2022). Enhancing production levels requires feed mills to adhere strictly to animal welfare, product safety, environmental protection, and biodiversity conservation standards (Akinmusire et al., 2019). These regulations are essential for producing top-quality feed and enhancing production performance, including animals' growth, reproduction, and overall health. Moreover, they contribute to minimizing the cost of animal production by improving feed utilization and reducing waste.

The regulations for feed milling operations in Nigeria, published by the Nigerian Institute of Animal Science, were crafted to ensure compliance among feed mill operators (Nigerian Institute of Animal Science, 2017). The regulations are designed to:

- Ensure the utilization of exclusively approved ingredients in feed production,
- Guarantee compliance with international best practices and standards for feed safety in Nigeria's animal products, and
- Enhance the production of wholesome livestock products and by-products.

### Highlights

1. The study found that 55.6% of feed mill operators were aware of regulations and understood the rules governing their activities.
2. Compliance with feed mill regulations was marginal at 55.46%, with notable adherence to proper building maintenance and equipment calibration but low compliance with packaging, labeling, and monitoring processes.
3. Resource constraints, complex regulatory frameworks, and financial burdens were identified as key reasons for non-compliance among feed mill operators.
4. Operators with higher awareness of feed mill regulations and longer years of establishment demonstrated significantly better compliance levels.
5. Female feed millers were found to be more compliant than their male counterparts.

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Despite the existence of these regulations, adherence to feeding standards in Nigeria still lags behind (Okunlola, 2020). Hence, there is a need to assess the level of awareness of feed mill regulations among feed millers and determine their level of compliance.

### Methodology

This study covered feed millers operating in Oyo State, Nigeria. The state was chosen based on its significant contribution to livestock feed production in Southern Nigeria. A comprehensive list comprising 128 feed millers from the 33 Local Government Areas (LGAs) of Oyo State was compiled to ensure a representative sample of respondents.

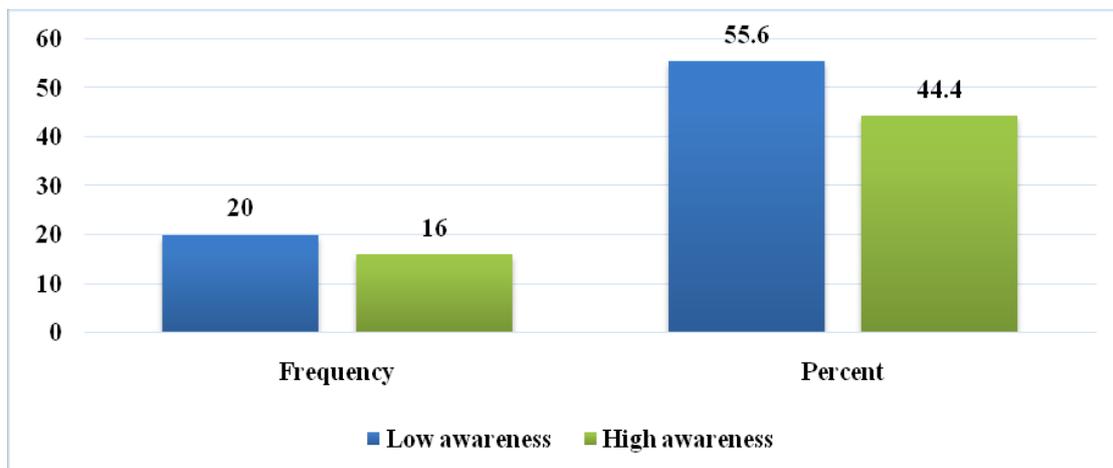
A random sample of thirty-six feed millers was drawn from the list using a systematic random sampling technique. A workshop was conducted for the sampled feed millers to deliberate and share information and knowledge on various aspects of feed mill operations. The workshop discussions covered processes and challenges in feed mill management and production, including:

- Regulation for feed mill operation
- Procurement of high-quality ingredients at competitive prices
- Management of hazards associated with feed milling
- Quality control and marketing, etc.

The feed millers actively participated in these discussions. A structured questionnaire, serving as the main instrument for data collection for the study, was distributed and completed by the feed millers during the workshop. Respondents were subsequently contacted for follow-up telephone interviews. The data obtained was analyzed using a linear regression model to ascertain the drivers of feed millers' compliance with regulations.

### Findings:

The findings of the study are presented below:



**Figure 1: Awareness of regulations for feed-milling activities**

A high proportion of respondents demonstrated a robust understanding of the regulatory requirements associated with the enterprise compared to those with little or no understanding (Table 1). This suggests that feed mill operators have a commendable level of awareness and knowledge of the rules and regulations necessary for the conduct of their business enterprise within the limit of the existing legal framework.

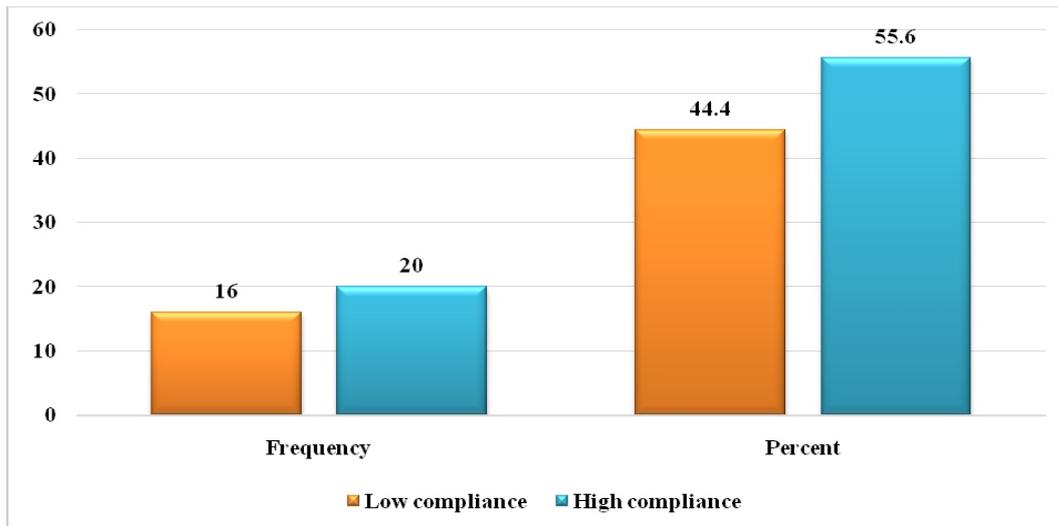
**Table 1: Awareness of regulations for feed-milling activities**

Statements	Yes (Freq %)	No (Freq %)
Nobody shall apply for the registration of a feed business unless it is set up according to guidelines prescribed by the institute/state	21 (58.3)	15 (41.7)
No person shall operate a feed mill business without adequately registering the premises with the state.	21 (58.3)	15 (41.7)
No person shall market any animal feed that is not manufactured or formulated in an acceptable and registered establishment.	24 (66.7)	12 (33.3)
Every feed business shall have at least one registered animal scientist.	21 (58.3)	15 (41.7)
Every feed mill shall have a documented plan	26 (72.2)	10 (27.8)
Every feed mill shall be in polluted areas prone to flooding, pest infestation, and waste.	26 (72.2)	10 (27.8)
Buildings shall have adequate space and lighting	33 (91.7)	3 (8.3)
Building, equipment, and grounds shall be adequately maintained	33 (91.7)	3 (8.3)
All equipment shall be well-designed and accurate for its intended use.	30 (83.3)	6 (16.7)
No feed mill shall use any feed ingredients not listed in the current listing of approved feed ingredients for feed in Nigeria	19 (52.8)	17 (47.2)
All incoming raw materials shall be tested for good quality, and records maintained	20 (55.6)	16 (44.4)
Establish a procedure to monitor the manufacturing process.	20 (55.6)	16 (44.4)
Each personnel shall have access to relevant documents for control procedures	17 (47.2)	19 (52.8)
The feed safety policy shall be reviewed and implemented by the top management of the feed mill and communicated to each employee.	21 (58.3)	15 (41.7)
Proper packaging and labelling for traceability and other label regulatory requirements	24 (66.7)	12 (33.3)
Performance evaluation and customer complaint forms shall be kept to enhance customer feedback. (customer's complaint box)	18 (50.0)	18 (50.0)
Every feed business entity shall maintain a Document stating the job description, responsibilities, and skills of its employees	21 (58.3)	15 (41.7)
Every feed business entity shall have its quality assurance unit supervised by a registered animal scientist.	22 (61.1)	14 (38.9)
The feed mill should be located not less than 200M from a livestock production area of the farm in case of an on-farm mill.	25 (69.4)	11 (30.6)

Source: Authors' computation from field workshop, 2022

## 2. Compliance with feed mill regulations by operators

Figure 2 shows the level of compliance by feed mill operators with regulations. It indicates marginal compliance (55.46%), though this varied across different aspects of the regulations (Table 2). The level of awareness (55.60%) matches the level of compliance, suggesting that awareness of feed mill regulations is a key driver of compliance (55.46%) among feed mill



**Figure 2: Compliance with feed mill regulations**

Table 2 shows that 69.4% of the respondents fully complied with ensuring adequate spacing, building lighting, and regular equipment calibration for accuracy. Also, 67.7% of the feed mill operators complied with maintenance of their buildings and equipment, designing equipment to suit their intended purpose, and keeping proper records of raw material received. However, the level of compliance with some regulations was low. A high proportion of the feed mill operators (44.4%) did not comply with proper packaging and labeling of feeds for traceability. Also, 38.9% and 38.8% did not establish procedures to monitor the production process and test for raw materials quality (Table 2).

**Factors contributing to low compliance include:**

- Resource constraints,
- Diverse interpretations of regulations, or
- Implementation challenges.

**Table 2: Compliance with feed milling regulations by operators**

Statements	Total compliance	Partial compliance	None	Mean
Application for the registration of a feed business according to guidelines	5 (13.9)	22 (61.1)	9 (25.0)	0.89
Operates feed mill business with proper registration of the premises with the state	9 (25.0)	14 (38.9)	13 (36.1)	0.89
Have at least one registered animal scientist as a technical officer	11 (30.6)	14 (38.8)	11 (30.6)	1.00
Have a documented plan	14 (38.8)	11 (30.6)	11 (30.6)	1.08
Feed mills shall be located in polluted areas prone to flooding, pest infestation, and the presence of wastes	22 (61.1)	8 (22.2)	6 (16.7)	1.44
Buildings shall have adequate space and lighting	25 (69.4)	6 (16.7)	5 (13.9)	1.55
Building, equipment, and grounds shall be adequately maintained	24 (66.7)	8 (22.2)	4 (11.1)	1.55
All equipment shall be regularly calibrated for accuracy	25 (69.4)	5 (13.9)	6 (16.7)	1.52
All equipment shall be well-designed and accurate for its intended use	24 (66.7)	4 (11.1)	8 (22.2)	1.44
Non-usage of feed ingredients not listed in the current listing of approved feed ingredients for feed in Nigeria	15 (41.7)	10 (27.7)	11 (30.6)	1.11
Testing of raw materials for quality by the quality assurance department and records maintained	11 (30.6)	11 (30.6)	14 (38.8)	0.92
Keep a record of origin, date of receipt, and quantities of each raw material received	24 (66.7)	5 (13.9)	7 (19.4)	1.50
Maintain a record of the results of samples of incoming raw materials to ensure compliance	13 (36.1)	13 (36.1)	10 (27.8)	1.08

Establish a procedure to monitor the manufacturing process	10 (27.8)	12 (33.3)	14 (38.9)	0.89
Have minimum good manufacturing processes	16 (44.4)	12 (33.3)	8 (22.2)	1.22
Each personnel shall have access to relevant documents for control procedures	10 (27.8)	13 (36.1)	13 (36.1)	0.92
Feed safety policy shall be reviewed and implemented by top management of the feed mill and communicated to each employee	16 (44.4)	8 (22.2)	12 (33.3)	1.11
Proper packaging and labeling for traceability and other label regulatory requirements	12 (33.3)	8 (22.2)	16 (44.4)	0.89
Performance evaluation form and customers' complaint form shall be kept to enhance customers' feedback	12 (33.3)	11 (30.6)	13 (36.1)	0.92
Every feed business entity shall maintain a document stating the job description, responsibilities, and skills of its employees	13 (36.1)	12 (33.3)	11 (30.6)	1.06
Every feed business entity shall have its quality assurance unit supervised by a registered animal scientist	14 (38.9)	10 (27.8)	12 (33.3)	1.06
Anyone who contravenes the regulations is guilty of an offence and liable to conviction	6 (16.7)	9 (25.0)	21 (58.3)	0.58
The feed mill should be located not less than 200M from a livestock production area of the farm in case of an on-farm mill	16 (44.4)	7 (19.4)	13 (36.1)	1.08

Source: Authors' computation from field workshop, 2022

### 3. Reasons for non-compliance with feed mill regulations

Most often adduced reasons for non-compliance include:

- The intricate nature of the regulations and
- The financial implications involved.

Most feed mill operators encountered challenges navigating the complex regulatory framework and perceived additional costs associated with compliance standards (Figure 3). The intricate nature of the regulations made it difficult for mill operators to understand, interpret, and apply, creating unintentional non-compliance. Compliance with regulatory standards frequently requires significant financial investments in infrastructure, equipment, training, and operational processes. These investments, though necessary, may not yield immediate direct economic returns. Some mill operators indicated that they encounter financial constraints, making it challenging to allocate resources for expenses related to compliance. The perceived absence of immediate monetary benefits may discourage operators from prioritizing and investing in compliance efforts.

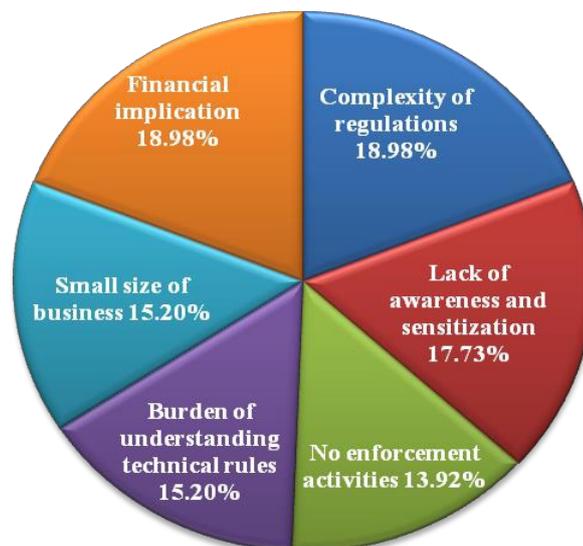


Figure 3: Reason for non-compliance to regulations by feed mill operators.

#### 4. Factors influencing compliance with feed mill regulations

The statistical analysis indicated that compliance with feed mill regulations was significantly related to the year of establishment of the enterprise, level of awareness of mill regulation by the operator, and gender (at 1% and 5% levels, see Table 3). This suggests that long years of experience enhanced compliance. Also, the level of awareness of feed mill operators was positively related to compliance with regulations. On the other hand, the study showed a negative correlation between gender (male/female) and compliance with feed mill regulations. Female feed millers proved to be more compliant than their male counterparts, although the reasons behind this effect require further investigation.

**Table 3: Factors influencing compliance with feed mill regulations**

Variables	Coefficients	T-value	P-value
Age	-4.570	-0.510	0.614
Sex	-14.941**	-2.239	0.034
Educational status	-13.121	-1.428	0.165
Length of establishment	5.993**	2.328	0.028
Number of staff	0.882	0.393	0.697
Income	1.788	1.069	0.295
Member of an association	1.219	0.231	0.819
Had training before	-4.204	-0.460	0.650
Awareness of feed mill regulations	11.891***	4.147	0.000
Constant	-1.988	-0.052	0.959

**Note:** \*\* Significant at 5%, \*\*\* Significant at 1%, Number of observations: 36;  $F(9, 26) = 4.688$ ;  $\text{Prob}>F = 0.001$ ;  $R^2 = 0.619$ ; Adjusted  $R^2 = 0.487$

Source: Authors' computation from field workshop, 2022

#### Recommendations:

The study identified several factors that impact feed millers' adherence to regulations, most notably:

- The duration in years of feed mill establishment and
- The level of awareness of feed mill operators.

Recognizing the importance of compliance with feed mill regulation in advancing the growth of the livestock sector, the study suggests the following recommendations:

1. Feed mill operators and critical stakeholders in the feed mill enterprise should prioritize widespread awareness raising through training/skill development, campaigns, and similar initiatives for feed mill operators and associated staff. Awareness is a significant determinant of compliance with feed mill regulations.
2. Regulatory agencies develop simple and easily understandable guidelines and regulations to reduce the complexity of interpretation that feed mill operators face. Clear and concise regulatory instructions can enhance comprehension and facilitate compliance

3. Government and relevant stakeholders should provide support mechanisms, such as grants or low-interest loans, that will enhance compliance and performance by small and medium-scale feed mill operators. Financial assistance can alleviate the burden of compliance-related expenses and encourage proactive adherence.
4. Develop effective collaboration/synergy between regulatory agencies, industry experts, and feed mill operators. Create a symbiotic support network/mechanism to promote regular interaction, dialogue, and feedback between all stakeholders, providing valuable insights, addressing concerns, and enabling a cooperative approach to compliance.
5. Provide incentive programs, such as tax benefits or certifications, for feed mills that consistently demonstrate compliance. Recognizing and rewarding compliance efforts can motivate mill operators to prioritize adherence.
6. Policy stakeholders should conduct periodic reviews of the regulatory framework to identify and address unnecessary complexities in the regulation.
7. Regular updates will ensure that regulations remain relevant, realistic, and aligned with industry needs.
8. Invest in capacity building of staff of regulatory agencies to effectively monitor and enforce compliance.
9. Provide adequate resources for regulatory agencies to enable them to contribute to a more robust and consistent implementation of feed mill regulations.
10. Finally, sustainable practices should be promoted, and gender-specific barriers should be addressed to facilitate feed mill operators' compliance.

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