

A Study on Procurement Challenges and Industry Impact in Animal Feed Manufacturing

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Abstract—The animal feed manufacturing industry is a crucial part of agriculture, providing balanced nutrition to livestock and poultry through raw materials such as maize, soybean meal, rice bran, wheat bran, and oil cakes, supplemented with vitamins and minerals. Since feed accounts for nearly 60–70% of farming costs, procurement efficiency and feed quality directly influence animal growth, farmer income, and food supply. This study examines the major challenges in feed manufacturing, including raw material price fluctuations, supply shortages, adulteration, storage and transportation issues, high production costs, disease outbreaks, regulatory compliance, sustainability concerns, financial risks, competition, technology gaps, farmer dependency, and environmental regulations. It further explores the effects of procurement efficiency and feed quality across different livestock sectors poultry, cattle, pigs, fish, goats, and sheep highlighting their impact on productivity, profitability, food security, and industry growth. The findings emphasize that procurement efficiency is the backbone of feed manufacturing, shaping farmer livelihoods, national food supply, and sustainable agricultural development.

Index Terms—Animal feed manufacturing, Procurement efficiency, Feed quality, Livestock productivity.

I. INTRODUCTION

The animal feed manufacturing industry is a vital part of agriculture that prepares food for livestock and poultry using raw materials such as maize, soybean meal, rice bran, wheat bran, and oil cakes, along with vitamins and minerals. Its main purpose is to provide balanced nutrition that helps animals grow well, stay healthy, and produce more milk, meat, and eggs. Since feed accounts for nearly 60–70% of farming costs, its quality and efficiency directly affect farmer income and food production.

Supplying safe and nutritious feed improves farm efficiency, reduces wastage, and increases profitability

for farmers. It also ensures food security by maintaining a steady supply of animal products for society. The industry is not just about mixing ingredients; it is the backbone of the poultry, cattle, pig, and aquaculture sectors. By supporting animal health and productivity, feed manufacturing plays a key role in rural development, national food supply, and the overall economy.

The industry continues to evolve with better technology, improved quality standards, and innovations in nutrition. Modern feed mills use automation, precision batching, and strict quality control to ensure consistency. New trends such as organic feed, probiotics, and alternative proteins are emerging to meet sustainability goals. In this way, animal feed manufacturing contributes to sustainable farming, supports farmer livelihoods, and strengthens food security for society.

II. OBJECTIVES OF THE STUDY

1. To study the challenges faced in animal feed manufacturing
2. To understand the effect of procurement efficiency and feed quality on animal growth, farmer income, and overall food supply.

III. NEED OF THE STUDY

Feed is the biggest cost in livestock and poultry farming, so procurement challenges directly affect farmers. Inefficient procurement lowers feed quality, which reduces animal growth, milk, meat, and egg production. Raw materials like maize and soybean meal face price changes, adulteration, and seasonal shortages, making procurement risky. Efficient procurement keeps feed affordable, supports farmer income, and ensures food security. In short,

procurement efficiency is the backbone of feed manufacturing and influences farmer income, food supply, and industry growth.

IV. REVIEW OF LITERATURE

1. R. Srinivasa Rao (2015): His study on poultry industry trends highlighted rapid growth driven by urbanization, rising incomes, and technology. He pointed out challenges like rising feed costs, disease outbreaks, and weak infrastructure. The paper emphasized bio-security, government support, and investment as key to improving feed efficiency and meeting consumer demand.
2. Ren, Zhang et al. (2023): This research explored converting poultry waste into valuable products such as fertilizer, biogas, and animal feed using technologies like anaerobic digestion, pyrolysis, and microbial conversion. It stressed sustainability, reducing greenhouse gases, and improving soil quality. The authors called for regional research, stakeholder involvement, and supportive policies to commercialize waste-to-wealth solutions.
3. Demissie Negash (2022): His study in Ethiopia showed that feed accounts for 60–70% of livestock production costs. Feed quality directly impacts animal growth, health, and productivity. Procurement challenges like seasonal shortages, price fluctuations, and competition from food industries raise costs. He suggested local sourcing, long-term supplier ties, and modern feed production methods (automation, hygiene, quality control) to stabilize supply and pricing.
4. Mehta and Nambiar (2007): Their work described India's poultry sector as a success story, growing at 8% annually compared to 2% in crops. Growth was driven by genetics, disease control, and integrated broiler systems. While integration improved efficiency and lowered costs, it also excluded smallholders and raised sustainability concerns. The study highlighted the dual nature of growth modernization and efficiency versus inclusivity and balanced development.
5. John and Manoj (n.d.): They reviewed modernization in India's cattle feed industry, noting the rise of compounded and pelleted feeds due to urbanization, shrinking grazing lands, and improved cattle breeds. Farmers prefer branded pelleted feeds for quality and digestibility. The

industry is projected to grow steadily at 4% annually, with adoption influenced by price competitiveness, dealer trust, and proven performance in milk yield. This modernization aligns India's dairy sector with global standards.

V. RESEARCH METHODOLOGY

Secondary data were collected from websites.

VI. CHALLENGES IN ANIMAL FEED MANUFACTURING

1. Raw Material Price Fluctuations One of the biggest challenges is the constant change in prices of maize, soybean meal, rice bran, and oil cakes. These ingredients form the bulk of feed cost, and their prices vary due to seasonal harvests, climate changes, currency shifts, and global trade demand. For example, soybean meal prices rise sharply when export demand increases, making feed more expensive for farmers.
2. Supply Shortages Feed manufacturers often face shortages of raw materials because of droughts, floods, poor harvests, or competition with human food industries. When maize is diverted for flour or oil cakes for cooking, the feed industry struggles to secure enough supply. This forces companies to buy at higher prices or reduce production, affecting feed availability.
3. Adulteration and Quality Risks Another serious issue is adulteration, where some suppliers mix low-quality or harmful substances to reduce costs. Contamination from mycotoxins, pesticides, or poor hygiene lowers feed safety. This directly harms animal health, reduces productivity, and increases veterinary expenses for farmers.
4. Storage and Transportation Issues Improper storage often leads to nutrient loss, mold growth, and spoilage. Weak transport infrastructure adds delays and contamination risks during transit. For instance, moisture during transport can damage maize and reduce its nutritional value, making the feed less effective.
5. High Production Costs Beyond raw materials, the costs of energy, labor, packaging, and processing are high. Modern feed forms like pellets require machinery and electricity, which add to expenses. These rising costs increase feed prices and reduce affordability, especially for small farmers.

6. **Disease Outbreaks** Outbreaks such as avian influenza or foot-and-mouth disease reduce demand for feed because farmers cut livestock numbers. These outbreaks also disrupt supply chains and create uncertainty in production planning, making the industry unstable.

7. **Regulatory Compliance** Governments impose strict safety and quality standards, requiring manufacturers to conduct testing, maintain records, and follow labeling rules. While these regulations are essential for consumer safety, they increase costs and demand skilled manpower, which smaller feed mills often struggle to manage.

8. **Sustainability Concerns** Feed production contributes to greenhouse gas emissions and deforestation, especially from soybean cultivation. The industry faces growing pressure to adopt eco-friendly practices such as insect meal, algae, and precision nutrition. Although these solutions are costly, they are essential for long-term sustainability.

9. **Credit and Financial Risks** Farmers often buy feed on credit, delaying payments and straining cash flow for manufacturers. Poor credit management can escalate into larger financial risks for the industry.

10. **Competition in the Market** Large companies dominate the market with stronger networks and branding. Smaller feed mills struggle to compete, leading to price wars and shrinking profit margins.

11. **Technology Gaps** Many feed mills lack modern automation, digital monitoring, and precision feeding systems. This reduces efficiency, consistency, and competitiveness in feed quality.

12. **Farmer Dependency** Feed companies rely heavily on contract farmers. Payment delays, poor feed quality, or supply disruptions can damage trust and weaken long-term relationships.

13. **Environmental Regulations** Strict rules on waste management and water usage require costly investments in treatment plants and eco-friendly systems. Non-compliance can lead to penalties and reputational damage.

VII. EFFECT OF PROCUREMENT EFFICIENCY AND FEED QUALITY

1. **Poultry Growth and Egg Production:** Efficient procurement ensures poultry feed is balanced with protein, energy, and minerals, which improves chick

growth, egg size, shell strength, and flock uniformity. Poor procurement reduces hatchability and meat yield.

2. **Cattle Milk Yield and Quality:** Quality procurement provides cattle with compounded feed rich in protein and vitamins, leading to higher milk yield and better fat content. Weak procurement causes nutrient deficiencies and lower milk output.

3. **Pig Growth and Meat Quality:** Balanced pig feed requires maize, soybean meal, and oil cakes. Efficient procurement ensures steady supply, resulting in faster weight gain and better carcass quality. Poor procurement slows growth and reduces meat value.

4. **Fish Feed and Aquaculture Productivity:** Aquaculture depends on protein-rich feed like fishmeal and soybean meal. Efficient procurement improves survival rates, growth speed, and harvest size. Poor procurement reduces water quality and fish health.

5. **Goat and Sheep Productivity:** Procurement of quality fodder and concentrates improves wool quality, meat yield, and reproductive performance in goats and sheep. Weak procurement reduces growth rates and farmer income from small ruminants.

6. **Farmer Income Stability:** Feed is the largest cost in farming. Efficient procurement keeps feed affordable, reduces expenses, and increases farmer profit. Poor procurement raises costs and creates financial stress.

7. **Cost Control and Risk Reduction:** Strong procurement practices minimize wastage, transport delays, and adulteration. This reduces unnecessary expenses and protects farmers from sudden market risks.

8. **Food Supply Security:** Quality feed ensures steady production of milk, meat, eggs, fish, and wool, supporting food security. Inefficient procurement disrupts supply chains and creates shortages in the market.

9. **Industry Growth and Competitiveness:** Efficient procurement strengthens feed companies, improves competitiveness, and encourages innovation. Poor procurement weakens industry growth and limits the ability to meet rising demand.

10. **Sustainability and National Economy:** Procurement efficiency supports sustainable farming by enabling eco-friendly practices like alternative proteins and precision nutrition. It also strengthens rural livelihoods and contributes to national economic growth.

VIII. DISCUSSION

The study highlights that the animal feed manufacturing industry is central to agriculture, as feed accounts for nearly 60–70% of farming costs. Procurement efficiency emerges as the backbone of this sector, directly influencing feed quality, farmer income, and food supply. The challenges identified such as raw material price fluctuations, supply shortages, adulteration, and high production costs show that feed manufacturers operate in a highly volatile environment. Disease outbreaks, regulatory compliance, and sustainability pressures further complicate operations, while financial risks, competition, and technology gaps weaken smaller feed mills.

The effect of procurement efficiency and feed quality is evident across all livestock sectors. Poultry feed quality improves chick growth and egg production, cattle feed enhances milk yield, pig feed ensures better carcass quality, and fish feed supports aquaculture productivity. Similarly, goats and sheep benefit from quality fodder, improving wool and meat yield. Efficient procurement not only stabilizes farmer income but also ensures food supply security, reduces risks, and strengthens industry competitiveness. Weak procurement, on the other hand, leads to poor animal performance, higher costs, and reduced profitability, which ultimately affects national food security and rural livelihoods.

IX. FINDINGS

1. Feed costs account for 60–70% of livestock and poultry farming expenses, making procurement efficiency the most critical factor in profitability.
2. Raw material price fluctuations in maize, soybean meal, rice bran, and oil cakes are the biggest challenge, directly affecting feed affordability for farmers.
3. Supply shortages caused by droughts, floods, poor harvests, and competition with human food industries disrupt feed availability and raise costs.
4. Adulteration and contamination lower feed safety, harming animal health, reducing productivity, and increasing veterinary expenses.
5. Storage and transportation issues lead to nutrient loss, mold growth, and spoilage, weakening feed quality and effectiveness.

6. Procurement efficiency directly improves animal growth, farmer income, food supply security, and industry competitiveness, while weak procurement reduces productivity and profitability.

X. SUGGESTION

1. Build multiple supplier networks, use imports when local harvests fail, and explore alternative proteins like insect meal or algae.
2. Invest in laboratory testing, supplier audits, and strict batch checks to prevent adulteration and contamination.

XI. CONCLUSION

The study shows that the animal feed manufacturing industry is the backbone of livestock and poultry farming, as feed accounts for the largest share of production costs. Procurement efficiency plays a decisive role in ensuring feed quality, which directly affects animal growth, milk yield, meat quality, egg production, and aquaculture productivity. Challenges such as raw material price fluctuations, supply shortages, adulteration, and high production costs make procurement complex and risky. Disease outbreaks, regulatory compliance, and sustainability pressures further add to industry instability. The findings confirm that efficient procurement reduces costs, improves feed safety, stabilizes farmer income, and ensures food supply security. It also strengthens industry competitiveness, supports innovation, and contributes to sustainable farming practices. Weak procurement, on the other hand, leads to poor animal performance, higher expenses, and reduced profitability, which ultimately affects rural livelihoods and national food security. Procurement efficiency is not just a technical process but a strategic necessity for the growth of the feed industry, the prosperity of farmers, and the sustainability of agriculture.

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