

Chapter 9

Boosting Poultry Farm Profits Through Blockchain Technologies, AI, IoT, and Machine Learning

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ABSTRACT

The foundation of a trustworthy brand has been extensively researched in the FMCG industry. Establishing the proper culture and discipline and conducting a continuous cycle of improvement based on continuous feedback are critical success factors. Increasing agricultural output is one of several projects supported by nearly every administration. The creation of a sustainable methodology for managing demand and supply is a difficult but necessary obligation for these brands. The government's regulations and policies serve to balance its citizens' health risks. Many businesses determine their target customer approach by evaluating customer categories based on their income and spending capacity. These businesses maintain credibility by adhering to international quality standards for chicken products, measured by designated lab test results, customer experience, and brand campaign marketing and publicity. Higher prices for producing high-quality farm products, and uncertainty around quantity, are two of the most significant challenges in the industry of consumable farm products.

INTRODUCTION

South Africa does not produce enough boiler meat to meet overall demand, hence the shortage is mainly imported from Brazil. Poultry farming is one of the sector which can generate employment and support local economy. To be able to meet south African poultry demand locally, existing local challenges need a scientifically proven solution, and be robust enough to take out failures (*South Africa Overview*, 2022). The purpose of this article is to examine the processes involved and existing challenges in the production

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and distribution of South African poultry. Also, provide a model which can be treated as solution which increases poultry output that is predictable, automated, quality as per market standards and advanced.

The method presented here could be used for demonstration and practical implementation in the future.

MAIN FOCUS OF THE CHAPTER

The main focus of the chapter is to identify the root causes of the challenges faced by the South African poultry sector, and to provide strategies and solutions to address those issues. Solutions will be explored in terms of cost reduction, improved quality control, increased efficiency, access to reliable sources of raw materials, and improved working conditions. Additionally, the chapter will discuss the need for improved collaboration between farmers and industry stakeholders, as well as the potential for leveraging technology (Pise, Yoon, and Singh, 2023) to improve production processes.

Problem Statement

As per National Agricultural Marketing Council of South Africa, the major challenges faced in South African poultry sector are listed below:

1. Inconsistency in output
 - a. Disease outbreak
 - b. Slower weight gain
2. Market competition
 - a. Import penetration
 - b. Quality of farm produce
3. Higher production cost
 - a. Rising electricity tariff
 - b. Access to reliable supply
 - c. Transport cost

The ability to achieve economies of scale, coordinate production⁶, invest at various points along the value chain, and purchase raw materials at competitive prices all contribute to the poultry industry's competitiveness. In-depth analysis reveals that the main cause of these issue arises from feed waste, unsanitary working conditions, unskilled labor, improper temperature and ventilation control, decisions that are not based on facts, and a lack of quick response to issues.

EXISTING SITUATION

Few Tier-1 South African institutions like Rainbow and Woolworth poultry companies have matured their supply chains with traditional, known methods that are more manpower oriented, and experience based. These brands struggle with the challenges mentioned above; having said that, due to years of experience, they can still address major risks. But the solutions are expensive and impact their return on investment (ROI) negatively.

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