Chapter 9

IT Applications in Poultry Production

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Abstract

This chapter aims to introduce and use of information technology applications in various poultry enterprises. Various inventory control systems, data management systems and summarization systems. There are various software solutions for poultry farming, hatchery, milling and delivery systems for poultry and poultry products. Poultry performance prediction and evaluation systems and their types are discussed. Expert systems and decision support systems solutions for poultry enterprises and work done in Pakistan is discussed.

Keywords: Computer software in poultry operations, Inventory control, data management, expert systems, decision support systems.

9.1   Introduction

Computer is being used in even sphere of life. Its uses are increasing day by day. It seems that after a few years life style will be more dependent on use of computers. There is not even a single field that is beyond computer grip. It is because of this invention that world has become a global village. Wars are won and lost from computer's keyboard. It is also used in manufacturing, welding and painting cars and buses. This revolutionary development has decreased mental and physical

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burden of mankind. Computers are everywhere in our lives nowadays including poultry industry. From accounting to waste management and everything in-between, there are many programs which helps in collection and store right information, make calculations, summarize results, predict future needs and schedule most efficient ways to get things done, all done to produce a better more efficient product with minimum cost or maximum profit.

When size of a business increases, data on every aspect increases and requires a system that can efficiently utilize that data and produce easy to understand and summarized results for easy decision making. Computer is doing its job in every business. Regardless of industry, some problems are universal; for example, resource allocation, scheduling and routing, competition, inventory, searching for requirements, replacement and maintenance. A manager in any field has a modern "toolbox" of decision assisting programs at hand, including, for example, inventory control software, statistical analysis, simulation models, forecasting, "genetic" algorithms, and business analysis. Interactive models greatly enhance poultry industry efficiency. They utilize a strategic module for long-term questions and to answer "what if" situations. A tactical module contains all kinds of statistical soft wares such as that for projecting egg production, assisting site planning, linear programming, econometric models, and so on. An operational module provides day-to-day advisement about hot day. It provides flock, processing plant and shift planning for efficient business operations. Decision making software that can project current production for future and assess profit or loss and in case of loss steps to avoid that loss are the need of world of business. One thing for sure that only properly interpreted data is of any benefit in these situations otherwise "Garbage in Garbage out" would be true.

With technology advancements competition among poultry industry is increasing at this time, future will be of that company that will be reducing losses from different sources and producing poultry meat and eggs at minimum cost. It will be possible when there will be well managed data management system for different enterprises of poultry business, well manners data makes a very efficient decision making system that can analyze even minute change in inputs of industry. Future planning should include alternatives to linear programming for feed formulation, better nutrient prediction, assisted disease diagnosis, more accurate price forecasting and supply chain optimization. Topics such as simulation, artificial intelligence and dealing with complexity will receive greater attention as technology advances.

9.2 Computerized Record Keeping of Various Enterprises of Poultry

9.2.1 Data Collection and Management

Data collection and management systems are major infrastructure requirements for any modern business, poultry producing enterprises also require data storage and manipulation capabilities especially on computers. General accounting software can be used for poultry business data however specialized computer software developed for various poultry enterprises are available. Computer software used by

most of poultry enterprises are normally ready made inventory control software. Feed mills and breeder farms mostly use specialized software developed for their specific data storage.

9.2.2   Poultry Farm Data Collection

Environment control house data collection can be linked with computer software systems to maintain and monitor environment impact in layer and broiler houses. Sensors can directly send data regarding temperature, ventilation, ammonia or carbon dioxide levels and relative humidity in poultry farms. These controllers/soft wares may also monitor function of environment systems i.e. air flow, water flow, and electric flow leakages. Data regarding biological performance can also be monitored in house parameters like egg count, live weight of birds and feed intake. Such software can be operated and monitored through internet.

9.2.3   Feed Mills and Feed Delivery Software

Computer software are more extensively used in feed mills and feed delivery. Mainly feed formulation software is used for feed formulation moreover feed delivery is mainly handled by inventory control software. However, specialized feed mill management software which can handle both feed formulation, batch management, batch mixing and inventory control of input ingredients, storage bin and mixer management and output management of various forms of feed (mash, crumbs and pellets) along with tracking of various types of rations to different consumers. In large integrations, these feed mill software can be linked to farms and other operations.

9.2.4   Poultry Software

Various types of poultry software are used worldwide which can be categorized as flock performance, single and multiple flock projections, economic analyses of performance, replacement pullet costs, egg size distribution and egg value.

9.3   Enterprise Optimization

Computers have capabilities much more than just clerical work of data collection and summarization various performance models are available and can be developed for broiler growth and layer production for prediction, comparisons and use of this software is growing in poultry operations. Various types of programming models being used in poultry performance software are as under

1. Linear Programming Models
2. Stochastic Programming Models
3. Expert Systems
4. Decision Support Systems

9.4   Poultry Management System

Numerous poultry management systems have been used in poultry operations which range from just inventory control system to highly specialized expert systems. Juliana (2009) defined expert system as a software computers that have the knowledge base to solve problems and uses inference reasoning resembles an expert or experts in a particular field to solve a problem. Developed application was made aiming to assist patients in diagnosing disease earlier and to facilitate serving our chicken breeders without leaving house which can help early treatment. Schmisseur and Pankratz (1989) developed an expert system (Xlayer) to help layer farmers in trouble shooting and assistance of managemental problems on economic grounds. Analysis of commercial layer data provides decisions on 80 managemental problems based on size and scale of layer operations. Raju and Rao (2006) developed poultry expert system which is less complex, provides greater utility and moderate compatibility. It provides technical feasibility of various parameters and is user friendly. Kalentzi1 (2003) used linear programming for broiler farmers in development of a decision-making system. Rose (2003) developed a decision-support system for assessment of the risk regarding contamination of broiler flocks by Salmonella. Data for development of this system was obtained from 85 broiler flocks in western France. Sensitivity was 97.8% and specificity 64.3%.

9.5   Work done in Pakistan

First information management system for handling of poultry performance data was introduced for M.Sc.(Hons.) Poultry Husbandry degree requirement at Poultry Research Centre (PRC), Department of Poultry Science, University of Agriculture, Faisalabad (Rehman, 2002). Three modules were developed under umbrella of one main system modeling various types of data generated at PRC. First module deals with government poultry farm model dealing with a fixed budget for inputs and outputs were submitted in government account. Second module deals with commercial project account which has revolving account i.e. inputs are purchased from an account owned by the chairman, of the department and outputs' generated revenue is deposited in same account for reuse. Third module deals with student research in which performance data generated by M.Sc.(Hons.) students can be recorded (Rehman, 2002).

9.5.1   Poultry Management System

Poultry management system was developed under Pakistan Science Foundation Project No. PSF/NSLP/P-AU(167) entitled "Development of Information Management System for commercial broiler and layer farm data". A computer based management system is developed first time in Pakistan history in Government Sector for broiler, layer and breeder farmers using information communication technology. Poultry management system offers following flock records;

1. Financial record management (including purchases, sales and bank account management)
2. Employee record management (salary, farm entry, exit and visitor records)
3. Farm building record management (poultry sheds, stores, offices and labour colonies)
4. Farm stock record management (consumable, non-consumable and repair/maintenance)
5. Flock performance record management (growth, feed, medicine, vaccination and other expenses).

Poultry management system is also capable of providing daily tips, comparison of flock performance with strain standards and future resource forecasting for purchases and performance predictions based on Artificial Intelligence based algorithms. Poultry management systems is available in following modules keeping in view farmer types

1. Broiler flock control system
2. Layer flock control system
3. Breeder flock control system
4. Broiler and layer flock control system
5. Broiler and breeder flock control system
6. Layer and breeder flock control system
7. Broiler, layer and breeder flock control system

Conclusion

Poultry operations in modern day poultry units are mostly controlled by computers. Software's and related applications are helping hands nowadays requiring less labour input and are more efficient and economical in long term production. These systems play a vital role in successfully operating mechanized poultry units.

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