Chapter 27
Digitalization, Robotics, and Genomic Research in Livestock Development

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ABSTRACT

The article explores the scientific, innovative, and technological trends of livestock development, such as digitization, robotics, and genomic research. The authors highlighted the restraining factors of the widespread introduction of digitalization and peculiarities impact of genomic research on the development of livestock products. Also they analyzed the evolution of technological stages of introduction the innovative technologies for maximum automation and robotics of all technological processes. This approach provides the farms with the necessary tools and leverage to make the decisions to improve milk quality, manage the herd, increase cow productivity, and profitability of production, outlining the overall synergistic effect.

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1. INTRODUCTION

The scientific and technological progress that underpins the evolutionary changes of technics, technology, organization and management of production processes is an integral part of modern economic development of any society. Technological updates as the process of production and management, acting basis effective functioning of the economic system and guarantee increasing the competitiveness of the latter in a changing market environment. The level of technology has integrated impact on economic, technical, technological, social and environmental aspects of agricultural enterprises activity. To improve the sustainability and competitiveness of livestock production in Ukraine it is necessary to distinguish the following current world trends: digitalization, robotics and genomics. These processes are spreading to an increasing number of processes and phenomena occurring in agribusinesses, which require relevant research and make them relevant.

Digitalization of agriculture is needed to improve the efficiency and sustainability of its operations by changing the quality management of technological and decision-making processes at all levels of the hierarchy, based on modern production methods with the using of information on the current state and forecasting of possible changes of control elements and subsystems, as well as economic conditions in agriculture. The best practices and experience of successful domestic farmers show that the use of modern digital technologies allows us to form optimal conditions that ensure a significant increase in animal and labor productivity, reducing material costs for fuel, electricity, veterinary drugs, other types of costs, conservation of soil fertility and environmental protection.

2. LITERATURE REVIEW ON ERP DEPLOYMENT

The first stage of the introduction of computer and electronic equipment for the management of agricultural complex was called automation. It was quite a long period of creation of various automated control systems and automated process control systems.

The second phase involved the emergence of personal computers and fairly efficient electronic sensors in the early 1980s. At the suggestion of GDR leader E. Honnecker, the process of introducing these devices was officially called electronics.

From the mid-1990s began the third stage of development called informatization. Technically, it is related to the proliferation of personal computers and the Internet. Together with computers came a variety of software, including not only accounting systems but also ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), SCM (Supply Chain Management), EAM (Enterprise Asset Management), etc.

Unfortunately, nowadays there are some factors in Ukraine that are holding back the digitalization of the agricultural economy in general and livestock production in particular:

- Lack of a unified approach to the standardization of processes, forms and formats for collecting, storing and transmitting complete and up-to-date information on land, natural factors, available resource base, labor market, capital involved in agricultural production;
- High deficit on the labor market specialists able to work effectively with innovative digital technologies;

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