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The Use of Digital Technologies in the Modernization of Animal Husbandry.

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Abstract: The article focuses on the results of studies on the effectiveness of digital technologies and their use as one of the factors that play a role in the sustainable development of pasture livestock. In addition, the development of the livestock sector, its role in ensuring food security, the opinions of scientists were analytically studied, and scientific proposals and recommendations were developed in comparison with the livestock sector of our republic. At the same time, priority tasks and existing problems of using digital technologies in pasture breeding were studied and proposals were made for their solutions.

Key words: Smart farming, Digital transformation, Sustainable development, Blockchain, Artificial intelligence in agriculture, Information technologies

INTRODUCTION to global climate change and worsening of the epidemiological situation, it may become difficult to meet the population's demand for food, especially livestock products, as the volume of production decreases. Because 30% of the planet's surface, 70% of agricultural crops and 8% of irrigation water are used for livestock production[1]. This creates the need to save resource consumption in animal husbandry, to widely introduce intensive technologies and innovative developments into the industry. Reducing the amount of resources used in production, on the one hand, creates the basis for reducing the cost of products, and on the other hand, reduces the consumption of resources used during production.

At the moment, the economic reforms carried out in order to develop the livestock sector in our country are showing their positive results. But the process of modernization of the network, i.e., late application of digital technologies, is significantly behind. In the future, special attention will be paid to breeding in such areas as poaching, fishing, and poultry breeding, and new mechanisms of state support will be implemented[2]. For this reason, it is becoming urgent to approach the issue of digitization of the livestock sector, including the development of recommendations on the use of modern methods of organizational and economic stimulation of technical and technological updating.

[1] United Nations Food and Agriculture Organization (FAO), Livestock's Long Shadow: Environmental Issues and Options, 2006. www.brightergreen.org
[2] Address of the President of the Republic of Uzbekistan to the Oliy Majlis. January 25, 2020. https://uza.uz

The decision of the President of the Republic of Uzbekistan dated January 29, 2020 No. PQ-4576 "On additional measures of state support for the livestock industry" and the implementation of tasks set in the relevant state programs to use digital technologies in the field high efficiency can be achieved by using

According to researches, most of the meat products grown in our republic today, i.e. more than 70 percent, are grown by farmers. Also, farms specializing in meat production are mainly reared with livestock in a traditional way. On the one hand, this provides employment to the population, and on the other hand, livestock is their source of additional income. However, today, the development of animal husbandry in this form is not highly effective, because on the one hand, it accelerates the degradation of pastures, and on the other hand, it requires the development of production only through extensive factors. It also limits the possibility of applying digital technologies to the industry.

Today, farms are achieving high productivity from animal husbandry not only by strengthening a strong feed base, but also by using digital technologies in the field and intensifying production. In our opinion, high efficiency on the livestock farms depends on several factors such as sheep farms also which are located in the pastures area:

1) strengthening the feed base, strengthening a strong feed base for livestock, and reducing feed costs by growing high-yielding forage crops. In this case, planting crops with high nutritional value at the expense of relatively low costs, abandoning the supply of nutrients grown in the traditional way;

2) structure of livestock complex. In this case, the creation of sufficient conditions for livestock, as well as the creation of a microclimate system. It is also advisable to use smart technologies widely in monitoring these processes. Currently, in the experience of developed countries, automatic monitoring of all processes not only limits costs, but also becomes of great importance in assessing the current situation.

3) organization of automatic monitoring of production of livestock products, supply of feed, as well as storage and transportation of manufactured products.

4) strong dependence of pasture yield on natural factors, including annual rainfall. Therefore, in order to increase the productivity of pastures, first of all, it is necessary to ensure accurate monitoring of the level of degradation and to assess the level of degradation.

According to research, the use of digital technologies in the field of animal husbandry relies on several scientifically based research results[3]. That is, taking into account the live existence of livestock, the processes are carried out directly in a variable state. This requires simultaneous research in zoology and plant science for digitization in the field. Secondly, it is necessary to record changes in livestock numbers over a certain period of time, analyze the collected information, draw conclusions from the results of analysis and use the most modern technologies in forecasting. It should not be forgotten that it is difficult to achieve high efficiency in animal husbandry without the use of industrial technologies. In our opinion, it is appropriate to fully take into account all processes in the algorithm of using smart technologies in animal husbandry complexes 1 picture.

[3] Terrasson G, Llaria A,Marra A & Voaden S 2016. Accelerometer based solution for precision livestock farming: geolocation enhancement and animal activity identification. IOP Conference Series: Materials Science and Engineering 138, 012004.

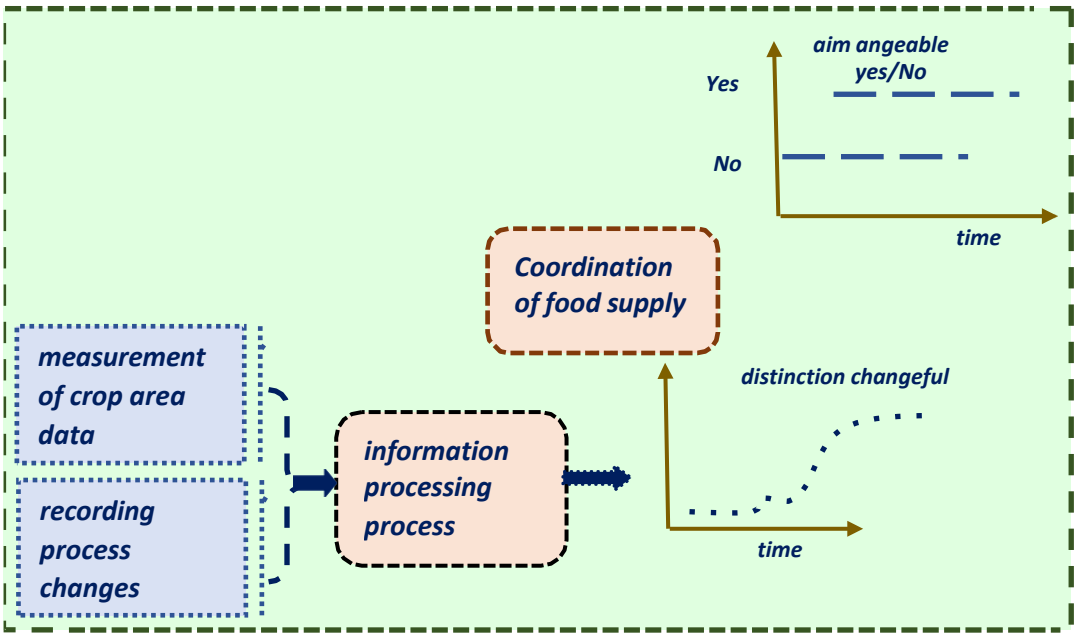

Figure 1. Receiving and analyzing information through digital technology in the livestock

We can see from Figure 1 that it is important to monitor not only feed supplies, but also all processes, collect information and analyze the received information. Through digital technologies, not only livestock feed, but also diseases are analyzed through microchips embedded in them. This process, on the one hand, accelerates the fight against the disease, and on the other hand, it allows collecting information on existing diseases.

In fact, diseases of livestock are different and have a seasonal character. Therefore, it is possible to strengthen the system of combating these diseases by forming a data bank on the spread of diseases. Also, through online monitoring of livestock, their behavior is analyzed and divided into different groups. The goal is to achieve relatively high efficiency by first categorizing goods and organizing maintenance accordingly. Secondly, the aggressive molars can be separated and thereby limit the negative actions of the choirva molars towards each other.

Today, cattle breeding in our republic is divided into groups according to the nature of the animals, but in this process, due to the fact that the internal characteristics of the animals are not fully taken into account[4]. Also, it is advisable to analyze their internal diseases or susceptibility to vaccination through the microchips installed on livestock and group them according to the results of the analysis.

According to monographic observations, cattle are cared for in two ways in pasture livestock farming of our republic. First of all, breeding farms mainly breed breeding cattle, and the main focus is on creating a new breed and increasing the number of factory-type cattle. In the second category, high priority is given to the production of livestock products by growing commodity products. However, these processes, that is, allocation of cattle for breeding or commodity farms, are carried out relying on manual labor.

[4] Huang WJ, Zhu WX, Ma CH, Guo YZ and Chen C 2018. Identification of grouphoused pigs based on Gabor and Local Binary Pattern features. Biosystesms Engineering 166, 90–100

In our opinion, by digitalizing the processes of sorting livestock into types in pasture farms, while ensuring that the breeding stock is at the level of demand, it will also sharply reduce labor costs and ultimately create a basis for increasing efficiency. At the same time, it is important to divide the number of animals into groups according to their characteristics.

Nowadays, a lots of engaged in pasture livestock breeding are aimed at constantly selecting the best livestock for breeding and removing unfit ones from the herd, strengthening their genetic characteristics, and increasing the correct mating that gives quality products.

- in the course of breeding work, the tasks of using various mating methods, proper care of lambs, breeding of breeding rams to meet the demand and in sufficient quantity should be carried out in connection with each other.

- additional assessment of young cattle separated for breeding at the age of 1-3 days, and at the age of 15-20 days of adult cattle left for breeding, using important methods of selection of breeding cattle.

In our opinion, the main tasks of breeding farms operating in the pasture economy include:.

- Improvement of breeding and productivity qualities of factory-type cattle, breeding of high-yielding sheep and, first of all, delivery of breeding rams to breeding and commodity farms.

A special type of factory should be created in the breeding factory, the number of sheep should be 12-20 thousand, and the weight of sheep should be 60-65 percent. The breeding part of sheep should consist of no less than 50 percent of sheep belonging to the same type.

Breeding consists of breeding, rearing and selling high-yielding rams and sows from factories to commercial farms.

Assessing, controlling the breeding value, heredity, and productivity of sheep in the herd, and establishing their delivery to livestock farms and their targeted use;

- To keep an accurate account of the origin of Karakol sheep used in the selection process, to ensure their productivity and other qualities;

- Testing the generation of breeding sheep according to their quality and determining directions for their effective use;

- To provide scientific and methodological support in order to increase the quality of breeding and productivity of sheep of the product breed and to increase their speed;

- Systematic organization of breeding and artificial insemination works on a scientific basis;

- In order to improve breeding and productivity qualities of purebred sheep, their breeding, keeping and rational use in breeding;

- Supporting the application of research results to selection and breeding work.

The development of online livestock monitoring programs for pasture farmers will increase the opportunity to select quality breeding cattle, as well as provide accurate information on the health of

livestock. Also, with the help of the developed programs, large-horned and small-horned cattle are simultaneously monitored, and a separate data bank is formed on both types of livestock.

In our opinion, the use of water supply or well water in pasture livestock farming has affected the productivity of livestock at different levels. Today, strong degradation is observed in most of the pastures of our republic, and it depends on the water supply of livestock. Therefore, online monitoring of herd movement allows to determine the level of water supply of pastures, as well as to assess the effect of drinking water on their productivity.

In fact, the purpose of monitoring the condition of pastures is that the degradation that starts in one farmer's area quickly spreads to other areas. Because the main feed supply of cattle in the pasture depends on the productivity of the pasture. As a result, pasture degradation in one area quickly spreads to another area. As a result, along with the decrease in the productivity of pastures, the productivity of pasture livestock will decrease.

Digital monitoring of pastures is an activity aimed at reducing potential adverse events by processing data collected from pastures. That is, today the condition of existing pastures in our republic was monitored in the past 4-5 years, and the condition of pastures is constantly monitored through digital technologies. This monitoring allows farmers to make smart and quick decisions and implement timely interventions, increase agricultural productivity, save time and costs, and protect the environment.

In our opinion, although the digitalization of pasture management gives a high level of efficiency, there are a number of problems for the full transition to this process. We can divide these problems into five parts. The first is the lack of communication networks or the need for large amounts of money to install and operate digital technologies. The second is that today more than 500,000 breeding sheep and more than 10,000,000 commercial sheep are fed in the pastures of our republic, as well as large horned cattle are also fed in seasonal pastures. will be done. The third is the problems in the infrastructure of supporting the software system for digital technologies, that is, there is not enough software engineers. The fourth is the problems related to the energy supply of devices installed in pastures. The fifth is to ensure cyber security. While the full implementation of the system will greatly contribute to the development of the livestock industry, it is important to ensure digital technologies are cyber-secured at various levels.

In conclusion, the use of digital technologies in pasture breeding, being safe for livestock, is of great importance in obtaining information, processing and forming a database in livestock breeding. It also increases the possibility of obtaining analytical information on the number, types and prospective changes of existing livestock and livestock, and speeds up data analysis processes. The information obtained in the field is checked using computational techniques to identify trends and existing problems, as well as effective analysis of interactive data on pasture productivity and annual precipitation is achieved.

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