

ANALYSIS OF THE MAIN TRENDS IN THE PRODUCTION OF THE MOST IMPORTANT TYPES OF LIVESTOCK PRODUCTS

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Abstract: *This article is devoted to the study of the theoretical foundations of the system of statistical indicators for assessing the economic efficiency of livestock farming. The article analyzes livestock statistics, types of economic indicators and the principles of their systematization. It also shows the possibilities of increasing the economic efficiency of livestock farming and the effective use of resources through a systematic approach. The results of the article are of practical importance in developing strategies for managing and developing livestock farming.*

Keywords: *Livestock, livestock statistics, economic efficiency, indicator system, resource use, statistical analysis, dynamic series.*

INTRODUCTION

From the point of view of the development of the industry, it is important to analyze, model and forecast the development of the main indicators of livestock production in time.

Modeling the dynamics of the main indicators of livestock production can be carried out using various models, such as the main trend, trend-seasonal series and linked series of dynamics. The implementation of each of the above methods is possible only in the presence of a specific information base.

The construction of main trend models is based on the analysis of one-dimensional series of dynamics, that is, series of dynamics of specific statistical indicators characterizing the production of a particular type of product. The construction of these models is based on the view that any series of dynamics is influenced by a number of theoretically distinguishable factors.

RESEARCH METHODOLOGY

This article uses theoretical-analytical and comparative methods to study the system of statistical indicators for assessing the economic efficiency of livestock farming. The study used official state statistics, scientific literature and advanced practical experience as a basis. Data were collected on the number of livestock, productivity, volume of production and financial indicators and divided into basic and extended indicators. Through this system, the economic efficiency of livestock farming is analyzed, compared over time and by region, and recommendations are developed to improve efficiency.

ANALYSIS AND RESULTS

In scientific literature, these factors are called components of dynamic series. From the point of view of dividing the series of dynamics into components, this is a theoretical

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abstraction, because this separation is a purely mathematical procedure and is carried out on the basis of statistical methods.

ANALYSIS AND DISCUSSION OF RESULTS

Despite the conditional nature of the actual levels of the dynamics series, this method can be quite useful in solving various problems of analysis and forecasting. All components of the dynamics series are interconnected and can be represented in the following form of models:

Additive model: $Y = T + K + S + E$.

Multiplicative model: $Y = TKSE$.

Combined model: $Y = TKS + E$.

where T is the main component characterizing the general trend of the series (trend); K - periodic trend; S - seasonality component; E-random component.

Building models with a seasonal component is possible only if the initial series of dynamics includes data presented monthly or quarterly. If the initial series of dynamics is built on the basis of data presented annually, the model covers only the trend and the random component. Building a trend model of one-dimensional series of dynamics with a non-seasonal component is carried out in several stages:

1. Analysis of dynamics series a priori (not based on experience).
2. Testing the hypothesis of the existence of a main trend in the series of dynamics being studied.
3. Identifying the main trend and parameters of the relevant model.
4. Random component analysis.
5. Building a generalizing model.

Now we will analyze the dynamics of the production volume of the main types of livestock products from 2015 to 2025. The choice of 2015 as the starting point for the analysis is due to the fact that by this time the period of decline in the production volume of the considered types of livestock products will end and a change in the direction of the trend will occur.

At the first stage, we will perform a priori analysis of the researched series of dynamics and analysis of analytical and average indicators of the series of dynamics. The following analytical indicators are used to assess the dynamics of socio-economic events and the process of events:

- amount of absolute additional growth (decrease);
- relative growth (decrease) rates;
- additional growth (decrease) rates;
- the absolute value of an additional one percent increase.

Each of these indicators comes in three forms: chained; basic; average. The basis for calculating these indicators of dynamics is the comparison of the levels of the periodic series. If the comparison is made with a single level taken as the basis for comparison, these indicators are called basic indicators. As the basis for comparison, either the initial level of the dynamic series or the level from which a new stage of development begins is chosen.

Table 1.

Dynamics of gross milk yield in Kashkadarya region for 2015-2025

Years	Gross milk yield, thousand tons	Absolute additional growth (decrease), thousand tons		Relative growth (decrease) rates, %		Additional growth (decrease) rate, %	
		basic	chained	basic	chained	basic	chained
2015	443,1	81,0	12,3	122,3	102,8	22,3	2,8
2016	454,6	92,5	11,5	125,5	102,5	25,5	2,5
2017	476,2	114,1	21,6	131,5	104,7	31,5	4,7
2018	508,2	146,1	32,0	140,3	106,7	40,3	6,7
2019	567,6	205,5	59,4	156,7	111,6	56,7	11,6
2020	625,0	262,9	57,4	172,6	110,1	72,6	10,1
2021	672,8	310,7	47,8	185,8	107,6	85,8	7,6
2022	706,4	344,3	33,6	195,0	104,9	95,0	4,9
2023	750,2	388,1	43,8	207,1	106,2	107,1	6,2
2024	781,5	419,4	31,3	215,8	104,1	115,8	4,1
2025	809,9	447,8	28,4	223,6	103,6	113,6	3,6

Manba: Viloyat statistika boshqarmasi ma'lumotlari asosida muallif tomonidan ishlab chiqilgan.

If the comparison is carried out on a variable basis and each subsequent level is compared with the previous one, the indicators calculated in this way are called chain indicators.

Absolute growth is equal to the difference between the two compared levels and characterizes the value of the change in the indicator over a certain period of time. In general, absolute growth (decrease) can be represented as follows:

The obtained indicators of dynamics indicate the presence of extremely unstable dynamics, in which periods of decline alternate with periods of growth.

The absolute additional growth during the period under review amounted to 473.8 thousand tons, or 2.3 times. The overall negative trend is associated with the ongoing reduction in the number of dairy cows.

At the next stage of the analysis, it is advisable to proceed to the study of the trend. For this purpose, a hypothesis (hypothesis) about the existence of a trend is put forward and tested. Currently, there are many criteria for checking the existence of a trend, differing in the power and complexity of the mathematical apparatus. These methods allow you to determine both the general trend in the development of the main indicators of livestock production in time, and the trend-average and dispersion trend by species.

One of the methods that allows you to reveal the general existence of a trend and its

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material expression - the cumulative T-criterion. This method is based on the calculation and analysis of the statistical characteristic of the series Y_1 , which is calculated as the cumulative sum of deviations from the average level of Y and the ratio between these deviations themselves. The hypothesis is put forward that there may be no trend in the studied series of dynamics, which can be checked based on the T-criterion. Based on the data obtained on the series of dynamics of livestock production (Table 2.3), the hypothesis of the absence of a trend is rejected at $\alpha=0.05$, which means that there is a trend.

Table 2

A one-dimensional criterion

	Мезон қиймати = 0					
	Stand ard variables	t	2- dimensiona l	Avera ge job	Confidence interval equal to the mean	
					lower	high
Gross milk yield (thousand)	13,700	16	2,000	504,89	427,276	582,513
Meat production	14,003	16	3,000	108,40	92,9854	123,826
Egg production	9,724	16	1,000	157696	123317,70	192074,8873

Table 3

In the volume of production of livestock products

the results of the implementation of the cumulative T-criterion in assessing the presence of a trend

Indicators	Unit of measurement	The unit of account of the T-criterion	The existence of a trend
Whole milk extraction	thousand	13,790	exists
Breeding live weight cattle and poultry for slaughter	thousand tons	14,903	exists
Egg production	million	9,724	exists

In practice, trends in three forms - averages, variances and since autocorrelations are distinguished, it is necessary to check the initial series of dynamics for the presence of each manifestation of trends.

It is possible to check the series of dynamics of the main indicators of livestock products for the presence of average and dispersion trends, the method of comparing the average levels of the series and the Forster-Stewart method.

The method of comparison of means is based on comparing the averages of the series and variances. In this case, the time series (time series) is divided into two parts that are approximately equal in number of members. Each of them is considered as an independent sample set with a normal distribution. If the time series has a trend, the means and variances calculated for each set should differ significantly from each other. Thus, checking the

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presence of a trend in the series under study leads to testing the hypothesis that the means of two normally distributed sets are equal.

Conclusion. This article is devoted to the study of the theoretical foundations of the system of statistical indicators in assessing the economic efficiency of livestock farming. The results of the study showed that the system of statistical indicators serves as an important tool in the effective management and development of livestock farming. Through a systematic analysis of the number of livestock, productivity, volume of produced products and financial indicators, changes in production efficiency and profitability over the years were determined.

In 2015–2017, production efficiency in livestock farming was relatively low, and production volumes showed a tendency to slow growth. In 2018–2020, as a result of attracting investments and applying advanced technologies, productivity and production efficiency increased significantly. In 2021–2024, the growth in the economic efficiency of livestock farming was stable, with a steady increase in net profit and profitability. At the same time, regional analysis made it possible to identify differences in the level of development of livestock farming and the efficient use of resources.

The results of the analysis show that for the economically effective development of livestock farming, a system of statistical indicators should be systematically used. This system is important not only for increasing production volumes, but also for rational use of resources, reducing production costs and ensuring economic stability. Also, a systematic approach provides practical assistance in planning, managing livestock farming and making strategic decisions.

In general, the system of statistical indicators is a key tool in improving the economic efficiency of livestock farming, which allows for optimal resource allocation and increased production efficiency not only at the national but also at the regional level. Therefore, it is recommended that the role of this system be further expanded in the development of livestock development strategies in the future.

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