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**DIGITAL TWIN OF THE METHODOLOGY FOR A COMPREHENSIVE QUALITY ASSESSMENT OF MEAT AND LARD PRODUCTS IN PIG BREEDING**

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**Abstract:**

Currently, scientists carry out tests and experiments in laboratories and operating pig farms of different capacity (annual sales of pigs for slaughter on a live weight basis from 1 thousand tons to 10 thousand tons or more) to solve scientific and production problems in pig breeding.

The purpose of the work is to describe the process of creating a digital twin of a comprehensive methodology for modeling numerical values of qualitative characteristics of meat and lard products in pig breeding.

Guided by methodological recommendations for monitoring livestock production technologies and informatization in zootechnical research, we selected scientific information sources set out in peer-reviewed publications of domestic and foreign researchers, as well as in on-line databases.

All available information, using Meta-analysis and Data Mining methodology, was subjected to a complex analysis in order to identify hidden patterns and develop approximation functions from one or two variables, which became the software links of the digital twin of the methodology for a comprehensive pork quality assessment. Then, we developed digital matrices of interdependencies between parameters of different dimensions (n×n). Digital matrices of interdependencies make it possible to simulate changes in the numerical values of the characteristics under study, simultaneously conducting their statistical processing. Thus, simulated control and experimental groups are created, different zootechnical parameters are compared, and levels of reliability of differences between them are established.

In computer programs, we developed digital multidimensional matrices including: 1) wild boar and domestic pig meat quality indicators; 2) a list of names of pig body parts in which pork quality indicators were evaluated; 3) physical properties of muscle tissue; 4) breed; 5) pig productivity indicators; 6) country.

As a result of the work carried out, a digital twin for modeling the pork quality indicators was developed. In combination with digital twins of feeding and hematological profile of pigs, it allows obtaining conditionally primary biochemical, physiological and zootechnical data in numerical form, which can be statistically processed to determine the reliability of differences between the groups of animals studied in the course of scientific and economic experiments, or while monitoring the production situation at pig farms.

**Keywords:** pork, qualitative characteristics, digital twin, computer modeling