Features of introduction of innovative means in production activity of the agricultural enterprise

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Abstract. This article discusses the features of the use of innovative tools, their significance and impact on the production process. The author suggests the company to introduce an innovative RFID system, with the help of which further development of the enterprise is possible. The arguments presented in the article are formulated in a clear logical relationship, have consistency and validity, and can be useful in the production activities of a rural enterprise.

1. Introduction
Any agricultural enterprise must move forward, developing its production activities, otherwise it may lose its competitive advantage, thereby losing the main markets for the sale of products [1]. It is for this reason that every company tries to introduce new ideas into its production activities that will help it stay at the proper competitive level.

An innovation should be understood as an object that is introduced into production activities, obtained through scientific research or discovery, which differs in a number of characteristics from the previous analog. Innovation is characterized by a higher technological level, new consumer qualities of a product or service compared to the previous product.

The purpose of this study is to study the impact of innovative solutions on the effective operation of the enterprise.

When performing this study, the following tasks were set:

- To study the theoretical aspects of innovation activity;
- Analyze and assess the current state of the enterprise;
- To justify the importance of introducing innovative products into production activities.

The innovation process includes a cycle from the moment of the idea's origin to its final stage-implementation.

Therefore, the relevance of the research topic and its significance are related to the development of innovative measures to achieve better results, in particular, to increase the competitiveness of both the enterprise itself and its products in the market [2-3].

2. Materials and methods
Modern agricultural enterprises and livestock complexes have to process a large amount of tasks in order to ensure decent production growth and meet their industry affiliation [4].

The main difficulties are:
In the quality control and safety of movement of livestock animals;
In the control of nutrition and timely activity of animals;
Difficulty of collecting data on the health status of animals;
Accounting for the consumption of feed and other related products;
The complexity of the fact of vaccination, collection and transmission of data to the relevant authorities;
Weak system of personal identification of animals.

Increasing the efficiency of production of agricultural products and products of its processing can be achieved through the introduction of RFID-marking of farm animals and their products into production.

Agricultural products marked with an RFID tag can be tracked throughout the entire production cycle. RFID tags are used to monitor the production cycle, warn about errors at an early stage and quickly detect theft.

Products receive electronic marking (radiolabel) at the early stages of production. If the original label cannot be saved for some reason, the original label data is automatically transferred to the new label, and the information is not lost.

In the case of animal labeling, a radio frequency tag is used, embedded in the ear non-removable tag or pasted on such a tag. The tag is used for automatic and semi-automatic identification of animals throughout their life, and also allows you to track and automate the entire process of raising an animal. Thanks to the RFID system, data on the feed used, vaccinations made, diseases suffered, and the speed of weight gain are recorded. Further, already at the slaughterhouse, these animal tags are transferred to the tag of the hook for hanging the half-carass. These labels are supplemented with information about actions performed or changes to properties. At the end of the production cycle, the information in the hook label is reset to zero, and it is returned to the beginning of the conveyor to hang a new half-carass. When packing meat in containers or bags, the data from the hook label is transferred to the packaging label. Continuity of product tracking is maintained.

We propose to apply this innovative solution to the enterprise of MSP "Muzhevskoe", which is located in the Shuryshkarsky district, in the western zone of the Yamalo-Nenets Autonomous District [5]. This company was not chosen by chance, as it covers a wide range of livestock products [6]. The size of the enterprise and the structure of marketable products are presented in tables 1 and 2.

**Table1.** Indicators that characterize the size of the enterprise.

| Indicators                                      | Data    |
|------------------------------------------------|---------|
| Gross output at current prices, thousands of rubles | 82887   |
| Commercial products, thousands of rubles          | 69989   |
| Cost of fixed assets of the main activity thousands of rubles | 68944 |
| Average annual number of workers, people.         | 175     |
| Total land area, hectare                          | 427758  |
| Energy capacity, hp                               | 805     |

**Table2.** Composition and structure of commercial products, thousands of rubles.

| Product type             | Thousands of rubles | %  |
|--------------------------|---------------------|----|
| Milk                     | 2257.2              | 6,3|
| Deer meat                | 21235.8             | 58,9|
| Meat of bovine animals   | 2659.9              | 7,4|
| Fish products            | 9896.1              | 27,4|
| Total                    | 36049.0             | 100|
The largest share in revenue, the company receives from the sale of venison meat and fish products. The livestock industry is represented by dairy products and cattle meat. These industries are in a loss-making state. To reduce losses and increase economic efficiency, the use of new innovative technology in the livestock industry will allow the company to bring to a new level, a new type of quality products and have a positive impact on further production activities.

3. Results

The main advantages that the company can get when introducing such innovative products as RFID-marking of animals into production are presented in figures 1 and 2.

**Figure 1.** Advantages of using an RFID system in the enterprise.

The capabilities of the RFID system will bring a number of advantages to the enterprise

- Technological processes are optimized, thereby increasing the transparency of production
- Reduces the number of errors in production
- Control of the origin of products and the entire technological chain of its processing is carried out
- The accuracy of the information is protected by an electronic signature at all stages

**Figure 2.** Expected economic impact.

The expected economic effect on the part of the enterprise will be as follows

- Cost reduction in accounting and inventory management
- Improving the efficiency of the enterprise by selling high-quality products
- Increasing the competitiveness of the enterprise in front of foreign manufacturers-competitors
- Protection of consumers from buying substandard products
- Increasing the potential significance of the enterprise in the regional aspect

The creator and developer of this tag is "PCT-Invent", located in the city of St. Petersburg, is the main manufacturer of domestic production of RFID tags and equipment.
Thus, with the introduction of RFID-marking into production, the probability of an error that can be made by a human resource is reduced, the information received is processed quickly, and the probability of detecting bad heredity is reduced. Radio frequency identification is a technology of the future, which can only have a positive impact on the activities of an agricultural enterprise [7].

4. Discussion
The production of agricultural products consists of a certain set of technological processes. The main ones are: production-processing-sales. The application of RFID systems in agricultural production is diverse. The most popular, in the application of RFID systems, are the crop and livestock industries, let's take a closer look at figure 3.

![Fig 3](image_url)

**Figure 3.** Application of RFID systems in agricultural production.

Innovative technologies come to the aid of modern agriculture [8]. The use of an RFID system will allow agricultural enterprises to get their share of benefits from the introduction of high-tech innovative solutions into their production process [9-10].

5. Conclusion
The specialization of the studied enterprise is based on the reindeer husbandry industry and on the production of fish products. The share of cattle accounts for a small part of the industry affiliation. Let's consider the application of the new technology on the example of cattle meat production. Economic calculations are presented in table 3.

Analyzing the data in the table, it can be seen that with the introduction of radio tags into production, there is an increase in the volume of products sold, sales prices, and therefore an increase in revenue from products sold, this will happen due to improving the quality of cattle meat. The company's loss will be reduced, which, of course, is a positive point.

The use of the RFID system will increase the degree of digitalization of the industry, the process of monitoring the state of the entire livestock population at enterprises and organize decent conditions for better and more efficient operation of enterprises specializing in livestock products.
Table 3. Economic efficiency of RFID-marking of farm animals and products at the enterprise.

| Indicators                             | The fact | the project |
|---------------------------------------|----------|-------------|
| Animals on cultivation and fattening, heads. | 69       | 69          |
| Gross growth, centners                 | 95.0     | 95.0        |
| Sold, centners                         | 128      | 134.4       |
| Cost of 1 centner, rubles              | 65589.4  | 65589.4     |
| Sale price of 1 centner, rubles        | 23881.6  | 25075.6     |
| Sales revenue, thousand                | 3057     | 3370        |
| Profit (loss), thousand rubles         | -5338    | -5025       |
| Cost recovery, rubles                  | 0.36     | 0.40        |

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