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## **Application of BAT in the Dairy Industry of the Republic of Belarus**

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The dairy industry is one of the priority sectors for the development of the economy of the Republic of Belarus. It is planned to reach the production of 9.2 million tons of milk per year by 2021, which means that productivity will increase almost 1.3 times without expanding the dairy population.

The dairy industry of Belarus is dominant in the processing industry, as it produces the most important food products for the country's population. The largest enterprises in the industry are: Savushkin Product, Babushkina Krynka, Bellakt, Berezovsky Cheese-Making Plant, Slutsk Cheese-Making Plant, Glubokoye MKK, etc. Figure 1 shows the production volumes [1].

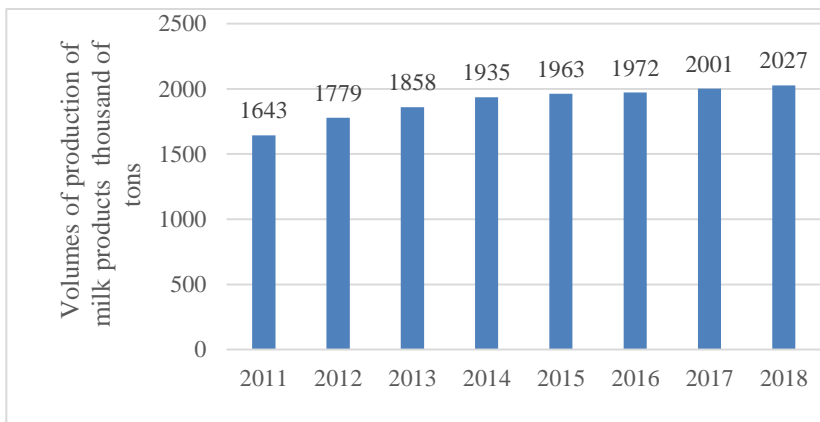


Figure 1. Volumes of production of milk products (in terms of milk) in the Republic of Belarus

The production activity of dairy enterprises is a source of impact on the atmospheric air in the form of emissions of pollutants, the formation and pollution of waste water, as well as the generation of waste. Wastewater from factories is relatively polluted, especially with organic compounds. The concentration of organic compounds in wastewater is mainly due to the loss of raw materials and dairy products during production (milk, curd mass, whey, etc.). After cleaning equipment and premises wastewater contains a significant amount of organic pollutants and is classified as industrial wastewater. It must be treated. When 1 m<sup>3</sup> of untreated waste water is discharged, 40-60 m<sup>3</sup> of natural water is contaminated [2].

The main sources of air pollution in the main production are the following equipment and workshops:

- 1) production of whole milk powder and skimmed milk,
- 2) cheese making shop,
- 3) steam power equipment, etc.

In addition to the impacts resulting from water consumption and emissions into the atmosphere, production wastes are generated directly at the dairy industry. The main ones are packaging of polyethylene, polystyrene, polypropylene, worn tires, waste technical oils, waste of ferrous and non-ferrous metals, etc.

The formation of solid organic waste at milk processing enterprises is mainly related to the nature of technological processes. In addition, waste is generated as a result of product packaging, storage and sale. The main waste of the dairy industry is sour whey, which is obtained as a result of the processing of whole and skim milk into cheese, cottage cheese and technical casein

The main reasons for the incomplete use of whey are a sharp seasonality in its production, rapid spoilage and insufficient stability of the products produced from it, the remoteness of raw materials from the points of sale of these products, the relatively high cost of a feed unit of whey and difficulties associated with its transportation [3].

In the context of integration into the world economic community, the task of increasing the competitiveness of various spheres and types of activity is especially urgent, which is due to the presence of negative consequences of the instability of the external environment, which significantly weaken their positions in the domestic and foreign markets.

*Green economy* is a new direction for Belarus, associated with sustainable use of natural resources and social approval of newly created projects [4]. The implementation of the principles of *green economy* is aimed at increasing the potential of the Belarusian economy, regional development, and improving the quality of environmental components. One of the tools for realizing *green economy* can be the introduction of the best available technical methods.

The BAT (Best available techniques) concept is widely used in Europe and the Russian Federation. BAT in the context of European Union regulations is a tool for monitoring and preventing negative impact on the environment, taking into account the specifics of a particular industry. The experience of the European Union in identifying, implementing, evaluating the effectiveness of BAT in various industries for all aspects of production is summarized in the relevant BAT reference manuals.

Based on the definition of BAT, the following areas can be distinguished: optimization of energy consumption; use of resource-saving methods in production; reduction of waste generation and their use as secondary raw materials.

It is assumed that the use of BAT makes it possible to ensure: use of cleaner production methods to prevent and minimize, where possible, emissions discharges to air, water and soil, including the generation of hazardous and solid waste; reduction of discharges emissions based on the use of the most appropriate equipment for the treatment of waste streams in all components of the environment; use of the most appropriate methods for the disposal of solid and hazardous waste after analyzing the possibility of recycling waste; unconditional consideration of the economic efficiency of the considered means, bearing in mind that the method should not cause excessive costs for the enterprise.

Examples of BAT are well-planned production schedules and identification of prevention and mitigation options. Well-planned production schedules minimize the number of switchings from one product to another and reduce waste generation, water consumption and wastewater generation.

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