4. Formation of extra inflows in sewage networks of the enterprise: permeate, steam, detergents and disinfecting solutions.

5. Availability of repeated water supply systems (the use of water after the last rinsing of equipment for the first washing of equipment.

Therefore, development of the ITS of water use for dairy industry enterprises can be carried out in accordance with several schemes.

**Scheme 1.** At the stage of designing the enterprise it is recommended that the ITS of water use should be developed per 1 ton of the processed raw materials with the account of receiving line capacity and planned operation mode of the enterprise.

**Scheme 2.** Several approaches to development of the ITS of water use are possible for the operating enterprise:

2.1. When 1–2 types of products are output (for example, cheese and concentrated (dry) whey), it is recommended that it should be developed per 1 ton of the processed raw materials.

2.2. When the product is output in a large assortment, it is recommended that it should be developed per 1 ton of each type of the finished product (butter, cheese, cream, kefir).

2.3. Development is possible for each production shop (section) per 1 ton of processed raw materials delivered to every shop.

2.4. When only primary milk procession takes place (separation, pasteurization, cooling) and milk transfer for further processing to another enterprise, individual of the ITS of water use should be calculated for the given volume of milk.

Also, quality of waste waters formed during the production process is an important aspect in standardization of the use of water. The present worked out methods of standardization of the use of water at enterprises of the dairy industry will make it possible to take into consideration the following components: volume of raw materials, volume and assortment of output products, volume of water consumption and disposal depending on the used production processes.

## HEAVY METAL HYPERACCUMULATORS AND THE DEVELOPMENT OF URBAN SOIL REMEDIATION STRATEGIES

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In the conditions of soil culture the possibility of use of phytoremediation of urban soils with shepherd's purse and alfalfa blue was investigated. It was found that when grown on sod-podzolic soils: sandy loam and loamy, nickel accumulates in large quantities in the rhizosphere, as a shepherd's purse and alfalfa blue, and removal of nickel from loamy soil investigated plant species is 2–3 times more effective than from sandy loam. With the joint cultivation of a shepherd's purse with legumes (synthesizing polysaccharides), the availability of heavy metals in the rhizosphere and their extraction from the soil increases. The results will serve as a basis for the development of recommendations for the treatment of contaminated areas of heavy metals, and the proposed method of soil purification from heavy metals will reduce their accumulation in food and improve the economic and social efficiency of agricultural production.

*Keywords:* phytoremediation, rhizosphere, heavy metals, vegetative organs, bacteria.

The purpose of the work is to study the possibility of using herbaceous plants of alfalfa blue (Medicago sativa L.) and – a shepherd's purse (Capsella bursa-pastoris) for phytoremediation of agricultural soils (sod-podzolic: sandy loamy and loamy). To assess the toxic effect of nickel ions on plant growth and development, germination energy, laboratory germination and growth of both the hyperaccumulator plant and the legume plant synthesizing exogenous polysaccharides were taken into account. As a control, seeds germinated on tap water were used.

As a result of the conducted research, the absence of the primary toxic effect of nickel ions in a concentration of 0,05; 0.1 and 0,3 mg / l on the viability of the shepherd's purse and alfalfa blue seeds. The toxic effects of nickel are not detected in the early stages of plant ontogenesis, and therefore meristematic cells do not cease to divide, and the plant continues to grow and accumulate vegetative mass.

Under the conditions of soil culture, the photoreductive properties of the shepherd's purse and alfalfa blue were investigated. It has been established that when growing hyperaccumulators on sod-podzolic soils: sandy and loamy, nickel accumulates in large quantities in the rhizosphere (for both variants). It was found that the removal of nickel from loamy soil by the studied plant species occurs more efficiently than from sandy loam. When the shepherd's purse with leguminous plants (synthesizing polysaccharides) is grown together, the availability of heavy metals in the rhizosphere and their extraction from the soil increases, which is of great interest when training future specialists of the agricultural industry in the application of technologies for cleaning contaminated land to improve the quality of agricultural products, economic and social production efficiency. This is especially true for the areas adjacent to large livestock complexes.

The results will allow developing recommendations for the cleaning of areas contaminated with heavy metals. The proposed method of cleaning soils from heavy metals will reduce their accumulation in food products and increase the economic and social efficiency of agricultural production [1]. Research on increasing the accumulation of heavy metals by hyperaccumulator plants when co-cultivated with leguminous plants is very important, but more in-depth research is needed to find out the mechanisms of metal hyperaccumulation and the role of bacterial polysaccharides in these processes, as well as phytoremediation of contaminated areas.

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## WIND ENERGY DEVELOPMENT IN REPUBLIC OF BELARUS

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This work highlights the development of wind energy in the Republic of Belarus. Efficiency and environmental friendliness of wind generators, their industrial and private use are considered.

*Keywords:* alternative energy sources, wind energy, wind generator.

Currently, human life is largely dependent on the provision of electricity. There are always geographically difficult places where there are problems with a stable supply of electricity: mountains, sea, swamp, yachts, agricul-tural facilities. You can solve the problem by supplying electricity or installing a source of low energy, as in every-day life people consume a small amount of it. The largest distribution of alternative, received solar and wind energy sources, which is associated with their inexhaustibility and environmental safety. The first simple wind turbines were used to lift water or grind grain into flour in ancient Egypt, and the sail to create an auxiliary driving force on carts in ancient China. The mill and sail greatly facilitated the hard work. Over time, people began to use this system to ob-tain clean electricity, directing it further on their own needs.

By 2020, the share of wind generation among renewable sources will be 20 % (in 2015 it was 0,6 %), by 2020, according to the website of the Ministry of Energy of the Republic of Belarus, more than 200 MW of new capacities will appear. For the development of wind energy, a whole project of international technical assistance has been created "Removing barriers to the development of wind energy in the Republic of Belarus."

The wind generator converts the kinetic energy of the wind flow into mechanical energy, followed by its conversion into electrical energy. Wind generators can be divided into three categories: industrial, commercial and domestic (for private use. The Novogrudok Upland turned out to be an ideal place for placing an industrial wind turbine (323 meters above the Baltic Sea level). The wind turbine has impressive dimensions: height and diameter of the wingspan – 82 meters (height 30 storey building) and is visible for 9 kilometers from Lida (near the village of Grabniki). The installed capacity utilization factor for the operation period of the wind turbine was 33 percent. The power of modern wind generators reaches 8 MW and depends on the power of the air flow, determined by the wind speed, and swept area. Small wind energy includes installations with a capacity