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STATE OF THE SPHERE OF WASTEWATER TREATMENT OF FOOD INDUSTRY ENTERPRISES IN UKRAINE

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Most of the enterprises of food industry dump their wastewater into centralized sewer network, but due to the fact that this liquid waste may contain high concentration of pollutants, their effluents in city sewers are limited to requirements. Acceptance of wastewater in sewer systems is carried out in accordance with "Rules of acceptance of wastewater enterprises in municipal and departmental sewage of cities and settlements of Ukraine" [1].

For example, maximum permissible discharge standards of Kyiv stock water comprise approximately 500 mg O_2/dm^3 for the indicators of contamination (COD), while indices of stock water of dairy enterprises exceed these standards in several times.

At the beginning it is necessary to consider the basic principles of wastewater treatment for the food industry. There is a comprehensive technology that ensures the complete limination of contaminants from the food industry wastewater. It combines mechanical, physico-chemical and biological principles. The latest include anaerobic methane fermentation and aerobic oxidation in aerotanks.

Methane fermentation usually filters all or only the most concentrated part of it because a few of the highly contaminated water is diluted in the common flow. Pre-treated water after methane fermentation is sent to the general runoff, which typically is cleared by the aeration [2].

Moreover, the concept of "pre-treatment" refers to a sequence of process, not to its auxiliary character. As the level cleaning of methane fermentation is the main component stage of the chain in all cases, it can reduce the concentration of pollutants by 60 - 95% depending on the substrate (especially its saturation with biogenic elements) and the conditions of the process [3].

Anaerobic technology has a number of significant advantages over aerobic one which is generally accepted.

Nowadays, the enterprises of food and processing industry of almost all developed countries use the methanogenesis as primary stage of purification of concentrated wastewater.

Methane fermentation greatly expands the range of wastewater that is suitable for biological cleaning. It allows effective purification of the wastewater with COD over 2000 mg O_2/dm^3, whereas the aerobic fermentation suits only for the water with a BOD no more of 2000 mg O_2/dm^3.

The anaerobic process is carried out with less use of biogenic elements, which is important when processing wastewater [4].

Anaerobic fermentation allows obtaining economically valuable biogas which contains 50 - 80% of the gaseous fuel methane [5]. One of the simplest ways of applying the biogas is to burn it.

More promising is the use of biogas to produce electrical energy, which can lead to the formation of our own energy base, which covers 40 - 50% of total energy costs [6].

This is especially significant under conditions of the contemporary energy crisis in Ukraine. In particular it will improve the financial state of the food enterprises that will reflect respectively on the decrease of the cost price of their production.

Comparison between aerobic and anaerobic methods of cleaning showed that anoxic treatment of organic pollution can provide 94 - 96% of biogas in the form of methane and carbon dioxide and only 4 - 6% are converted into biomass. While during the aerobic processing - about 80% of the organic pollutants are converted into biomass and 20% are oxidized to carbon dioxide. There is also destruction of significant amounts of nutrients [7].

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