

Environmental issues



BAROMEMBRANE PROCESSES IN SOLVING ECOLOGICAL PROBLEMS OF MEAT PROCESSING PLANTS

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INTRODACTION

The actual problems of the environmental protection for the meat processing industry are closely connected with development of low-wasted and waste ess technological processes, complex raw material processing and waste utilization the reeguipment of the main and auxitiary processes ensure the reduction of tehnogenic load on the enveropment.

Specific tehnology of meat cattle processing is revealed in large-tonnage consuption of drinking water. The industrial influences produced at different stages of chemical and biochemical substances able to form colloid suspension with different agregative and sedimentation stabylity. While they are not intermixed with domestic influences the latter represent a substance valuable raw material.

Thus from one hand a rich set of lipids, proteins, vitamins and mineral substanses make the application of those industrial effluences expedient. But on the other hand getting info the ponds and soil bid components of animal and vegetable origin accumulated in the effluences cause the change of biocenosis in soils and we violating the total ecological ballance. Besides this the danger of pollution increases due to tertorial concentration of industry plants in the areas of relatively high level of wastes of abiogenetic character from different plants info the enveronments of biological ballance.

A wide spectrum of wastes of meat processing plants reguives a certain number of varions processis and the equipment components suited for industrial processing as well as converting the unseparated part info a simple chemical compound have for the enveronment.

Fraditional ways means dicigned and used or waste-waters treatment of industrial plants and for utilization of value impuvities are low efficient due to high energy consumption, destruction and irreversibility of change of raw material and value of separated products [1,2,3].

For the last decade the boromembrane processes in the scheme of complex purification of waste-waters of food plant have proved their efficiency a ssure the priority of development for these processe.

The outlook of baromembrane technology is characterised by the development of the closed circulating technological of with a high rate of ecological safety and by the simplicity of technological schemes and apparatuses.

Despite the obvious adrantages of this method of water purification the industrial realization of the ultrafiltration method by the insufficient scientific fase of the process that take place during the ultrafiltration of protein-diphatic system and lack of worked-out conditions of rational use of separated streams.

Our aim is the development of way and means for purification of industrial waters of meat processing plants with subsequent utilization of wastes. The ecological efficiency is achived by maximum utilization of useful components of wastes which traditionally lost in the main industrial cycle.

DISCUSSION OF RESULTS

The meat processing plants sewage consists of froms formed at different production stages. The sewage analisis of processing plants of central Chernozem zone of russia (with a capacity from 50 to 100 tons per shift) after statistic analysis of a received allows to aduce the average data obtained in experiments: temperature: from 13 to 26 degrees C; odour up to 5 but colour: reddish-brown; fraction of total mass of suspended particles: 2000 mg/cubic dm; fatr content: 1000-3000 mg/cubic dm; hardness: 10 mg*equi/cubic dm; carbonate hardness: 10 mg*equi/cubic dm; total alkali: 10 mg*equi/cubic dm; salt content: mg/cubic dm; Ca⁺²: 75 mg/cubic dm; Mg²⁺: 50 mg/cubic dm; Cl⁻; 900 mg/cubic dm; So⁻: 500 mg/cubic dm; free Co⁺²: 100 mg/cubic dm; total Fe: 20 mg/cubic dm; total N⁺: 150 mg/cubic dm; phosphorus (in terms of P20₅): 60 mg/cubic dm; NH₄⁺: 30 mg/cubic dm; No⁺³: 0,02 mg/cubic dm; NO⁺²: 0,05 mg/cubic dm; active chlorine - 0; BRK: 800 mg0₂/ cubic dm; HPK - 200 mg0₂/cubic dm⁻.

By the way of experimental investigation we established that in the process of ultrafiltration cleaning the pollution decret to 2 or 3 levels, the quality of water improves from the point of view of sanitaric and hygienic characteristics.

The permeate formed is a liquid of light-rose colour with specific smell of blood and of stable physical and chell composition, practically freed from any microbes, without any content of toxines as a result of high quality of selection of permeable membranes in respect to bacterial and veast mocroflora.

Analysis of the whole chemical composition of ultrafiltration concentrate shows that this system is rich in protein^{5, lip} minerals and is a complex binary mixture.

The fraction of total mass of protein in the concentrate allows to have an optimal level of animal protein in mixed feed, protein fraction of the concentrate conditioned by its aminic acid composition is biologicaly full valuable. In calculation is substance (mg/gm): lysine - 16,86; histidine - 1,96; arginine - 20,99; threonine - 14; serine - 12,05; proline - 13,21; glycine - alanine - 23,96; valine - 22,94; methyonine - 10,04; leucine - 18,94; isoleucine - 5,38; tyrosine - 8,86; phenylalanine - 11,10; aspellacid - 32,37; glutaminic acid - 36,55.

The mineral composition of ultrafiltration protein and fat concentrate (UPFC) shows that it was formed with $m_{k}^{(m)}$ components of water and mineral component of wastes of meat. It is represented by (mkg %): Si - 6,0; He - 91,0; Me - 9,5; Na K⁺ - 0,44; for bloody meal, respectfully, (mkg %) Si - 7,2; He - 102; Mp -97; Na⁺ - 0,85; K⁺ - 0,18.

The analisys of UPFC fatty acid composition carried out with use of chromotgraphic method and in comparison with and pig's acids proves that there are mainly the following acids: unmaximum fatty acids with double link C18:1 including in olienic - 38,37; maximum fatty acids: (in %) - C12:0 lauric - 3,8; C14:0 - myristic - 2,3; C16:0 - palmitic - 26,5; C18:0 - 26,5 C18:0 - 26,5 C18:0 - 26,5 C18:0 - 26,5 C18:0 - 20,2. If determined that UPFC fatty acid composition is identical to fatty acid composition of pig's fat.

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CONCLUSION

The use of baromembrane methods of separation allows to solve a complex task of cleaning and rational usage of products of ^{separation}. The mass content and the mass relation of food components in extracted concentrate, theirs fractional composition ^{prove} the utility of producing protein food products with high feed and biological value.

REFERENCE

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