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Multielectrode Electrochemical System for Antibiotics Detection in Raw Milk

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The article suggests using cyclic voltammetry and machine learning methods to determine the presence of antibiotics in milk. A new electrode system was developed, and a database was compiled for the subsequent determination of the presence of antibiotics in milk.

Introduction. The presence of an antibiotic in food can cause serious risks for consumers' health including toxic lesions of the liver, kidneys, hematopoietic organs, neuritis of the auditory nerve, allergies, tendon ruptures, etc. There are many ways to classify, but electrochemical biosensors have several advantages. They are portable, reliable, and highly sensitive. That is why they were used by us to determine the presence of antibiotics in raw milk.

Main part. We propose to use volt-ampere characteristics (VAC) to determine different concentrations of antibiotics. An electrode consisting of 7 parts was developed: 2 nickel wires, 2 carbon fiber wires, and 3 copper wires. With its help, voltammograms of milk solutions containing antibiotics were taken by cyclic voltammetry. The next step was to use machine learning methods to obtain the accuracy of determining the concentration of antibiotics.

Conclusions. A database of voltammograms of antibiotic solutions in milk was collected. This allows you to determine the presence of antibiotics in milk with a probability higher than 90%.

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