B-7405 was grown on a mixture of 3.25% technical glycerol and 0.,75% of fried oil (volume ratio 1:0.2), and was higher than in case when the monosubstrates was used in equimolar carbon concentration (2.4–4 g/l).

Conclusions. Thus, as a result of this work, the possibility of the use of mixture of toxic industrial waste for synthesis of surfactant by *N. vaccinii* IMV B-7405 has been shown. The highest concentration of surfactant was observed when the inoculum was grown on technical glycerol. It has been established that using mixture of fried sunflower oil and technical glycerol as a substrate for biosynthesis of the surfactants by *N. vaccinii* IMV B-7405 will allow not only to utilize toxic industrial waste, but also increase the concentration of the biosurfactant to 18-52% compared to the monosubstrates.

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AUTOMATED FEEDING SYSTEM FOR AQUATIC ANIMALS IN THE CLOSED ENVIRONMENT

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Just like all other animals, fish require food in order to grow and propagate. It provides energy to maintain metabolic processes and, besides that, contains everything necessary for the growth and development of tissues. Fish differ from other vertebrates in relative amount of nutrients they need.

Keywords: automated feeder, stepping engine, microcomputer, microcomputer, automated system, feed.

In the wild fish consume different feed, thereby, considering the diversity of it, in the closed environment such as aquarium it must get constant supply. It's highly important to provide all inhabitants with sufficient amount of food. There are three main types: processed, fresh and frozen feeds. It is not always possible to feed them with proper amount of food at proper time. For that reason there are feeding systems (feeders). To exclude the human factor while feeding the fish, there are special automated systems.

Automated system based on the Arduino microcontroller was developed during this work. Arduino is a small processor board with memory. The board contains contacts for connecting needed components. The most popular microcontroller is Arduino Nano, which has 14 digital inputs/outputs (6 of them can be used as PWM outputs), 6 analog inputs, quartz resonator (16 MHz), Mini-USB connector, power connector, connector for in-circuit programming (ICSP) and a reset button.

Automated feeder moves above the aquarium by stepping rail, attached to glass vessel walls. The feeder includes stepping engine, moving it; rails, on which the system is located, two part feed compartment (upper and lower). When the feeding time comes, the food falls from the upper compartment to the lower, where all necessary gets to the aquarium. The feeder distributes the food evenly over the entire length.

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