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EFFECT OF A LOW-CALORIE DIET ON LIFESPAN AND MITOCHONDRIA IN RATS

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Abstract

This article discusses human lifespan problems and scientific research for their solution, methods of ageing problem research, a decrease in the adaptation of the organism in ontogenesis and the features of the metabolic state of adaptation strategies**.**

Keywords: gerontology, membrane, physiology, biophysics, biochemistry, genetics, molecule.

Introduction

Currently, a number of researchers consider that ageing may be more closely related to mitochondrial function, which may play a key role in lifespan. In this regard, a study was carried out on the effect of a low-calorie diet on the energy processes of mitochondria, on microsomal oxidation and lipid peroxidation. However, the results obtained by different authors contradict each other since the experiments were carried out under different conditions. Considering the above circumstances, we also carried out research in this direction. We used a low-calorie diet in the rats' ontogenesis. Under these conditions, changes in body and liver weight in rat pups, the energetics of liver mitochondria, and the level of free radicals at different age periods in growing animals were studied. The obtained results showed that with a low-calorie diet, the accumulation of animal body weight decreases by about four times, and the liver weight decreases twice compared to the indicators in rats with a normal diet.

It was shown that with a low-calorie diet, in isolated mitochondria the rate of oxidation of the succinate in the 3 metabolic state visibly (up to 30%) decreases compared to the control group of animals. This difference is observed in 2 months to 30 months old rats. A change in this number does not significantly affect the ADP/O ratio. These feeding conditions do not disrupt mitochondrial membrane permeability. With a low-calorie diet, the level of peroxide compounds is increased over a long period of ontogenesis. As shown in the obtained data, a low-calorie diet especially strongly reduces body and organ mass.

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