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Theoretical study of the effect of optical radiation energy on the animal organism

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Based on the analysis of the effect it photoreactivation in biophysics and regulations set out a methodical approach to energy management action beam on the animals in their cultivation.

Fotoreaktyvation, animals, the mechanism of action of optical radiation.

The rapid development of modern technologies for animal products involves the use of innovative methods, including electrotechnologies, among which are among the leaders optical radiation (infrared heating, lighting and ultraviolet radiation). Effective implementation of optical electrotechnologies impossible without studying the mechanism of optical energy to the animal organism.

The purpose of research - theoretical foundation principles of management of power effect of optical radiation on the animal-based solution of scientific problems:

- identify ways of penetration of optical radiation in the animal body;
- justification and explanation of the interaction energy of optical radiation from perceiving body structures.

Materials and methods research. The primary mechanism of absorption and transformation of energy optical radiation in the animal body and theoretical foundation principles of energy management action of optical radiation sufficiently explained on the basis of theoretical research fotoreaktyvations phenomenon.

Fotoreaktyvations phenomenon appearing in vivo in reducing the manifestation of short optical radiation from its long-wave radiation followed by more, is one of the possible environmental impact methods of quantitative regulation of optical radiation on biological object, that is a promising method for performance management process photobiological given quality.

Get practical confirmation explains the mechanism of biological action fotoreaktyvation specific spectral optical radiation can be experimentally determined by this method .

- After the initial exposure of the studied biological object shortwave optical radiation (radiation that causes the expected biological effect) to measure its spectrum forced luminescence;

- One after the first exposure, perform second exposure managed object more long-wave radiation, changing the time range and intensity of this radiation reaktyvuyuchoho, and then measure the luminescence characteristics of the spectrum;

- In the case of two-photon absorption process, the spectrum of luminescence is observed shift of the maximum emission intensity in a short-wave region (compared with the luminescence spectrum of the primary radiation).

It should be noted that the main difficulty of these experiments is the need for the use of radiation sources, working both in continuous and in pulsed mode, and duration of pulses should be compatible with duration of intermolecular processes /

Conclusions

When the structure known organic structures in biological objects and define their optical characteristics, absorption, reflectance, luminescence etc .; with a reasonable degree of accuracy can quantify the impact of this biological object specific spectral optical radiation.

This can enhance or diminish this effect more long-wave radiation. So, are prerequisites for optical control specific photo-biological process (eg regulation process lystyautvorennya or kvitkoutvorennya plants, for a period of maturation). In animal organisms affect most active ultraviolet radiation.

According to the above mechanism fotoreaktyvations exposure (dose) ultraviolet irradiation of animals can be reduced by reducing of fotoreaktivation effect of visible light (in practice ultraviolet irradiation is carried out simultaneously with the lighting livestock buildings).

If you use ultraviolet irradiation of animals with minimal light (eg, in the evening - no lighting) its efficiency is higher. Such exposure is economically beneficial as it reduces energy cos