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**ON THE QUESTION OF CONNECTION BETWEEN SICKNESS RATES OF
LARGE CATTLE LEUCOSIS AND NATURAL MAGNETIC FIELD OF THE
EARTH**

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Annotation: Dependence of development of sickness rates of large cattle leucosis on space-temporal peculiarities of the Earth's magnetic field in different regions of the climate-geographical belt of Ukraine. Statistical calculations of space correlation show that there is some insignificant connection between them.

Key words: The Earth's magnetic field, large cattle, leucosis, connection.

Environmental effect on biosphere specifies all the variety of phenomena and process that occur under its influence. We assume that the Earth's magnetic field (EMF) may be referred to as a defining factor. Firstly, geomagnetic field is one of the geophysical factors of the planet historically defining a course and development of natural processes in inert and bionert systems, and, secondly, its multiple aspects have been

studied on a level indispensable for cross-disciplinary research [1, p. 58; 2, p. 1013; 3, p. 158; 4]. Accordingly, analysis on existence of possible connection between sickness rates of large cattle (LC) leucosis and space-temporal peculiar properties of the Earth's magnetic field (EMF) in the climate-geographical belt of Ukraine was fulfilled by us.

In the works [5. 127] essential dependence of epidemic development of a flu process on space-temporal storminess of EMF was shown. It was established by them that there is a direct connection between the amount of the sick cattle being down with influenza, acute respiratory diseases and space-temporal storminess of the magnetic field, as well as more complex dependence with its temporary patches of storminess. Preliminary explanation of this kind of dependency is the following: either viruses appear to be more active in the high magnetic field or the whole immune system of an organism appears to be weakened. Therewith, both viruses and the immune system are so-called 'flexible substances' which react to one or another external influences quickly, in lightning speed. So, the question arises if all the viruses react to the raise of magnetic field equally.

If possible connection of physiological reaction of cows and the Earth's magnetic field is viewed, the latest data referring to their certain orientation during pasturage depending on the general magnetic field, their orientation to the magnetic pole, in particular, was shown [6, p. 59; 7, p. 147]. That is why, detection of physiological reaction of cows to absolute data values of the Earth's magnetic field are of great interest.

Space-temporal structure of the Earth's magnetic field density **B** is defined by a sum of fields from different sources:

$$\mathbf{B} = \mathbf{B}_n + \mathbf{B}_a + \mathbf{B}_e,$$

Where \mathbf{B}_n — normal (main) Earth's field which is generated by the processes in the liquid core and at the edge of the Earth's mantle, and which also defines global space and temporal structure of the planet's field;

Ba — anomalous magnetic field (lithosphere field) is defined by magnetization strength of rocks mainly; Be — external field dependent on the influence of solar and cosmic radiation as well as magnetic fields of the sun and near-Earth space. [1, p. 55]. On the territory of Ukraine in the Institute of Geophysics NASU for a period from 1988 to 2004, a range of maps of modules of the Earth's field density B (with an interval of five years) was developed. A short analysis of space-temporal characteristic of EMF on the territory of Ukraine shows significant changes in space (data values of EMF for different regions change within $100 \div 1900$ nTl) and in time (more than 1300 nTl) that is an essential factor as to its possible influence on biosphere in general as well as the world of viruses, in particular [8, p. 204].

The data on changes of EMF were compared with the information on sickness rates of large cattle leucosis. An epizootic peculiarity of large cattle leucosis is its global and spotty diffusion in countries and some separate territories. An epizootic situation of the following infection is changing both in space and time constantly due to implementation of preventive and health-improvement measures as well as agricultural migration of animals. [6, p. 12]. It should be noted that the year 1988 becomes critical in reference to intravital diagnostic techniques of large cattle leucosis as serologic diagnosis of the disease is introduced. When defining a coefficient of epizootic situation within every Ukrainian region a diversity in duration and intensity of an epizootic process is detected. In Ukraine in one of the regions a coefficient of the epizootic situation was 0,6 (Volyn, Transcarpathian, Ivano-Frankovsk, Lvov, Rovno and Chernovtsy regions) and in the others — 0,9 (Khmelnitskiy region). In 18 regions leucosis remains a stationary infection. The data on intravital diagnostics of the following infection over a period of 1988-2004 years give evidence of the fact that for the first four-year period (an average figure of sickness rates on 100000 large cattle heads) made up $1227,8 \pm 114,7$ for a year; for the second — $199,7 \pm 55,4$; for the third — $1582,6 \pm 206,4$; for the fourth — $1158,72 \pm 170,9$; and for the fifth — $503,4 \pm 67,6$. [7, p. 213].

Temporal connection between the main magnetic field of the Earth and sickness rates of large cattle leucosis is shown (on 100000 large cattle heads) on a fig. 1.

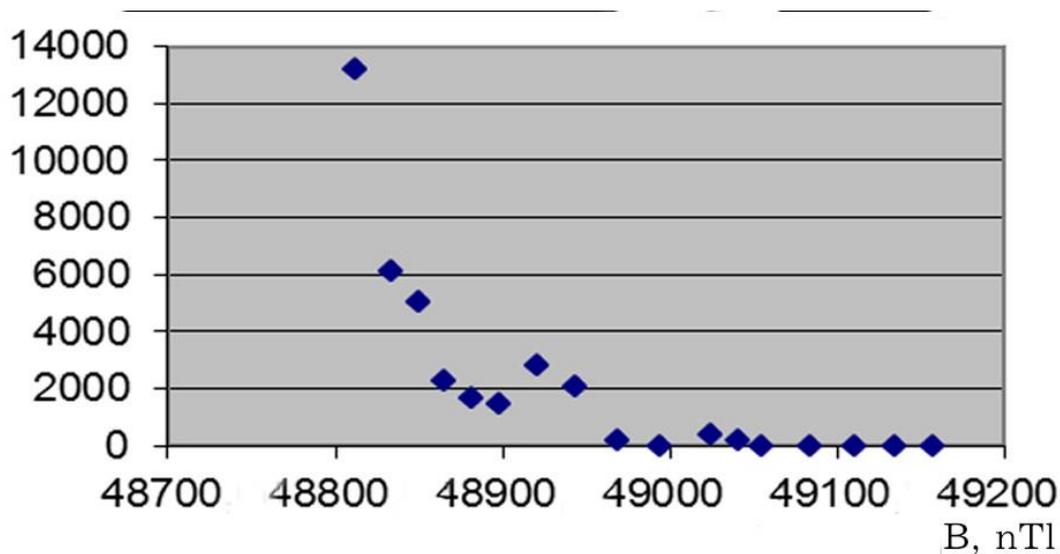


Fig. 1. Temporal dependency between the main magnetic field of the Earth and sickness rates of large cattle leucosis.

Statistical calculations of space correlation (r) over a period from 1988 to 2004 show insignificant connection between L_{KPC} and EMF of Ukraine which is changing from $r = 0,03$ (2000 year) to $r = 0,53$ (2003 year). From 1988 to 1991 years a decrease of correlation coefficient is marked, however, from 1992 to 1999 years a correlation coefficient is becoming close to nothing, and over a period of 2000-2004 years it increases to the values - $r = 0,4-0,5$.

With reference to temporal dependency of sickness rates of large cattle leucosis its expected decrease from 1988 to 2004 years from 14360 to 1306 for 100000 large cattle heads is shown. During this period the Earth's magnetic field density B increased from 49241 to 49678 nTl. A correlation coefficient for the researched period of time makes up $r = -0,93$.

Conclusions:

1. It is entirely possible that there are some other space-temporal factors existing which operate in tune with the magnetic field and they should be studied later on.
2. The obtained results referring to correlation coefficient changing are planned to be studied on the territory of Belarus by us as well, for defining if there is a consistent pattern in influencing the magnetic field on sickness rates of the animals.

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