

Irina A. Lebedeva,

Ph.D., Doctoral Candidate, the Urals Research Institute of Veterinary

Yekaterinburg, tel.8-922-2066998

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PROBIOTIC "MONOSPORIN" STIMULATES PROTEIN SYNTHESIS IN CELLS

Monosporin, the probiotic preparation, used in the poultry industry almost always leads to increase of live weight and preservation of poultry. Young birds rapidly gain live weight and display increased uniformity of the flock. Poultry slaughter and anatomy cutting reveal higher yield of breast muscle and less abdominal and subcutaneous fat. Inflammation levels in the body of birds decrease and mortality due to diseases of the gastrointestinal tract declines. And quite the reverse, under intense use of antibiotics the leg muscle fibers degenerate into adipose tissue, bird mortality is observed due to enteritis, hepatitis and cloacae inflammation, livestock rates are found below the standard level.

The technology of modern intensive poultry production involves large quantities of poultry in confined areas. In order to effectively prevent disease in birds the most promising trend is a combination of antibiotics and probiotics. No similar studies have been found in the available literature.

The studies were conducted in the Laboratory of Molecular Technologies of the Russian Academy of Medical Sciences, Ural State Medical Academy (Yekaterinburg). A cell line previously derived from embryonic chicken broiler breeders has been used as a model.

Earlier studies have traditionally used such model experiments with birds and animals (*in vivo*). At the same time, the method of cell culture meets the demand of modern requirements at the best since it is possible to observe *in vivo* cell metabolism. The cells remain viable throughout the experiment. The genetic homogeneity of the cells population, the constancy of their growth conditions allowed us to estimate the impact of various factors on cell growth.

For the first time the influence of life products of *Bac.subtilis* (forming the basis of probiotic Monosporin) and antibiotics, as well as their combinations on the processes of protein molecules synthesis in chicken embryonic cells (ECC) has been shown (Figure 1).

Depending on the concentration and in the absence of antibiotic the life products of *B.subtilis* have a stimulating effect on protein synthesis of embryonic cells from 54 to 17% (see diagram 1: columns 2 – 5 and the first column of figures in the table).

The antibiotics added to cell cultures lead to the inhibition of cells protein synthesis (reduction from 38% at the antibiotic minimum concentration to 78% at its maximum concentration, see diagrams II-V) subject to rate. Protein synthesis in embryonic cells is blocked in direct ratio: with the increased rate of antibiotics (0.1, 0.25, 2.5, 25 µg/ml), the protein synthesis reduces (-38%, -55%, -64%, -76%).

The use of *B.subtilis* life products in some cases allows you to keep stimulating protein synthesis (6%) only at the lowest (0.1 µg/ml) concentrations of the antibiotic in the medium (diagram II, columns 2, 3, 4).

Conclusion

In all cases, the life products of microorganisms *Bac.subtilis* have a stimulating effect on protein synthesis.

The antibiotics subject to their rate have an inhibitory effect on the synthetic parameters of the cells. The dependence is linear. The value of inhibitory effect is directly proportional to rate.

In vitro testing of probiotics effects on cells of the embryo chicken explains why the chicken grown in commercial poultry with probiotics added to feed have along with the best zootechnical and economic parameters also the best meat quality characteristics, especially protein.

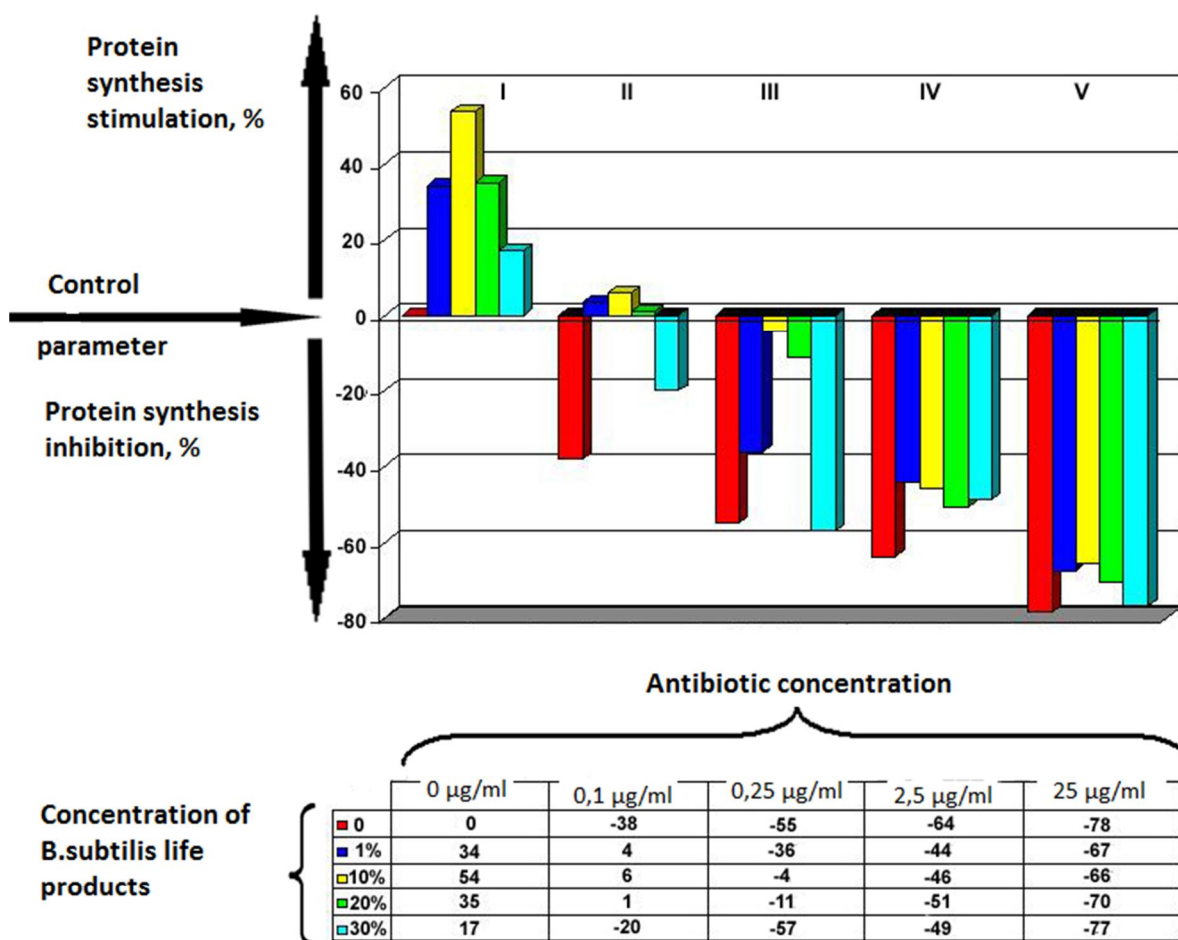


Figure I. Dynamics of protein synthesis under impact of *B.subtilis* life products and antibiotic.

Data are presented as percentage of control