



Optimization of parameters of the production of short-chain peptide from the whey protein concentrate

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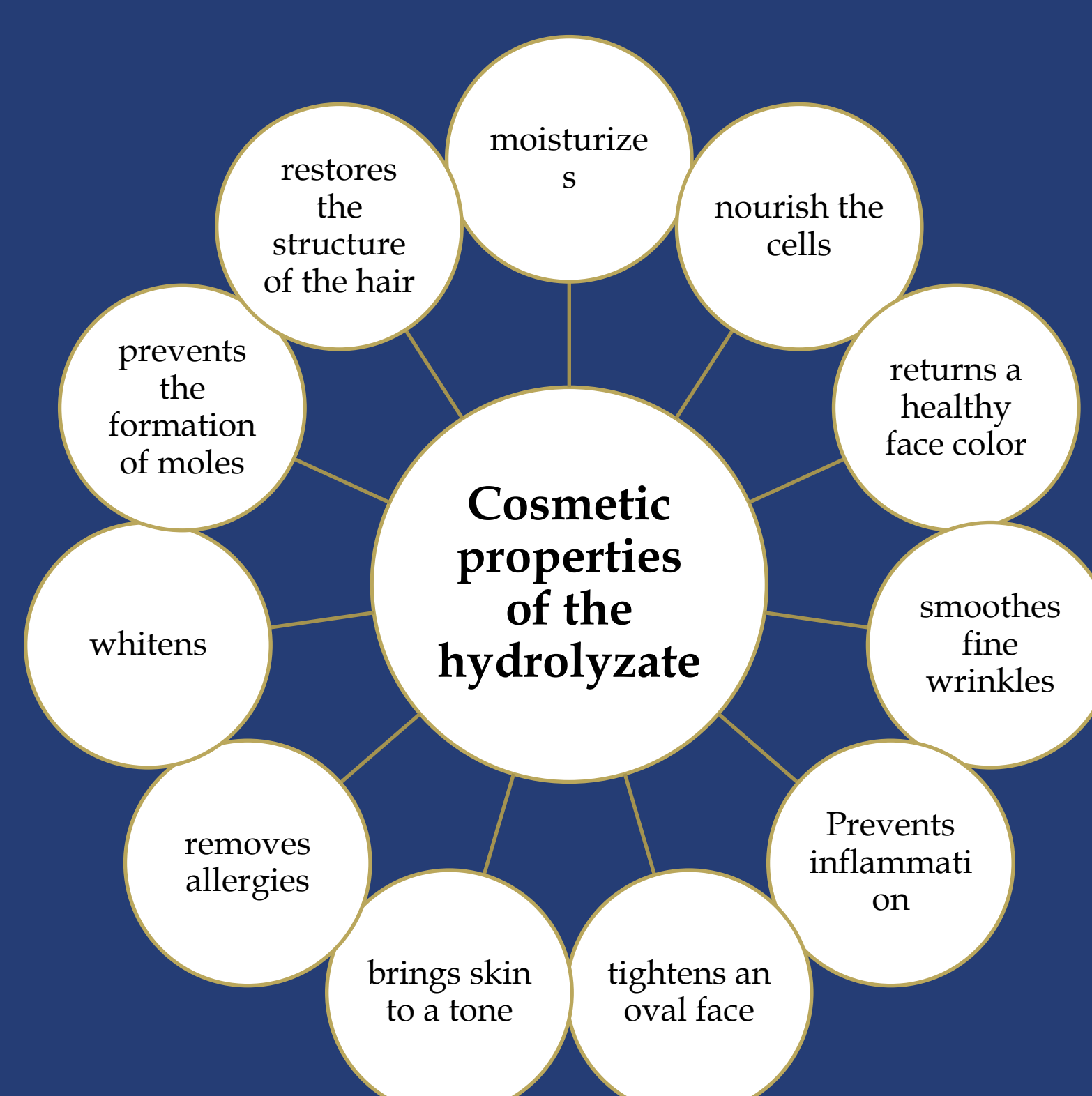
The purpose of these studies is to: identify and justify the optimal regimens for fermentation of serum protein concentrate, to obtain the product with the highest possible content of short chain peptides.

The benefit of whey is determined by its unique composition of vitamins, minerals and other substances. Harmful sugar in this product is replaced by lactose, which is very quickly absorbed by the body, without causing any harm, as well as it positively affects the work of the stomach. Given the fact that serum has almost no fat, it can be used as a drink for weight loss.

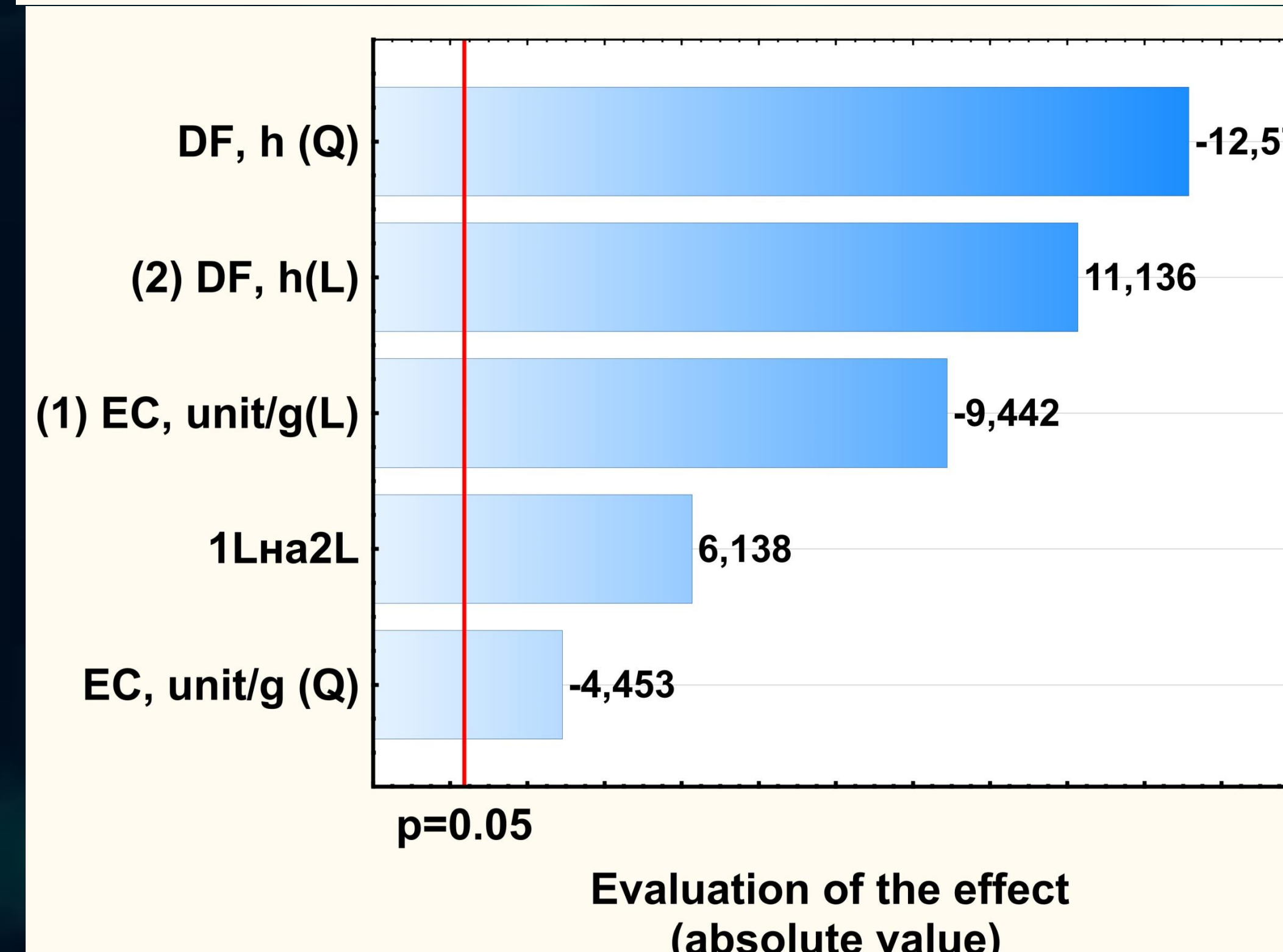
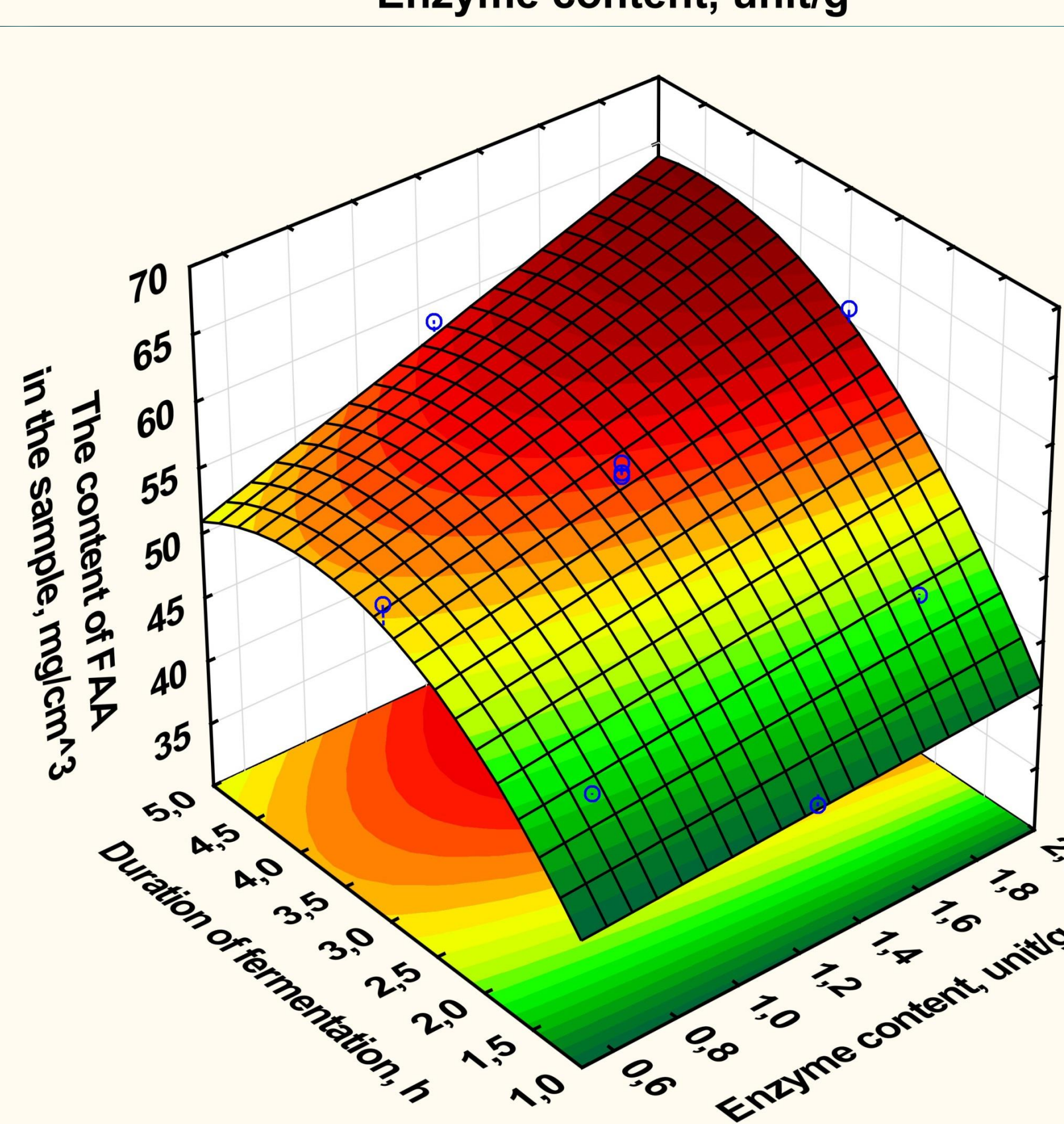
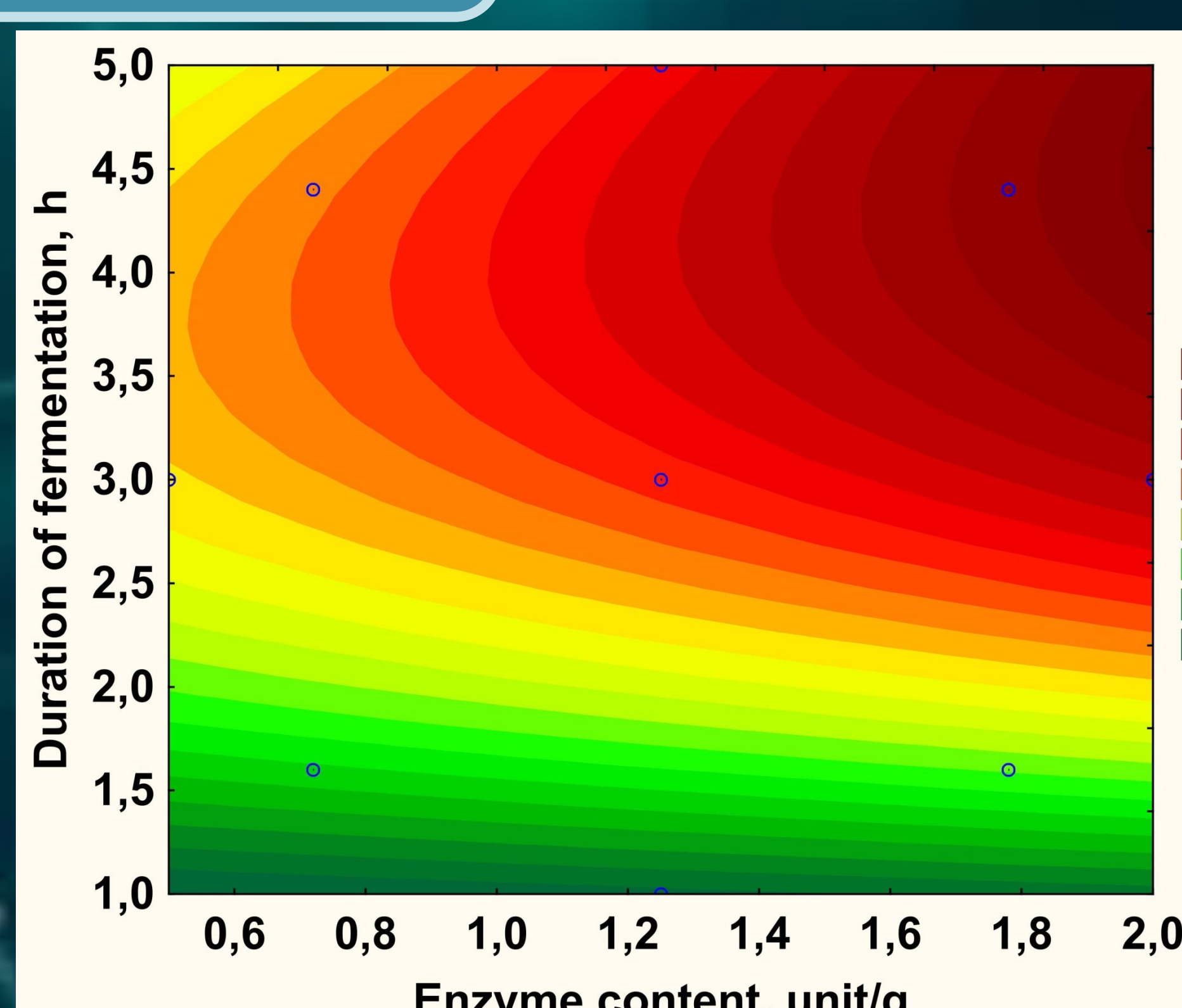
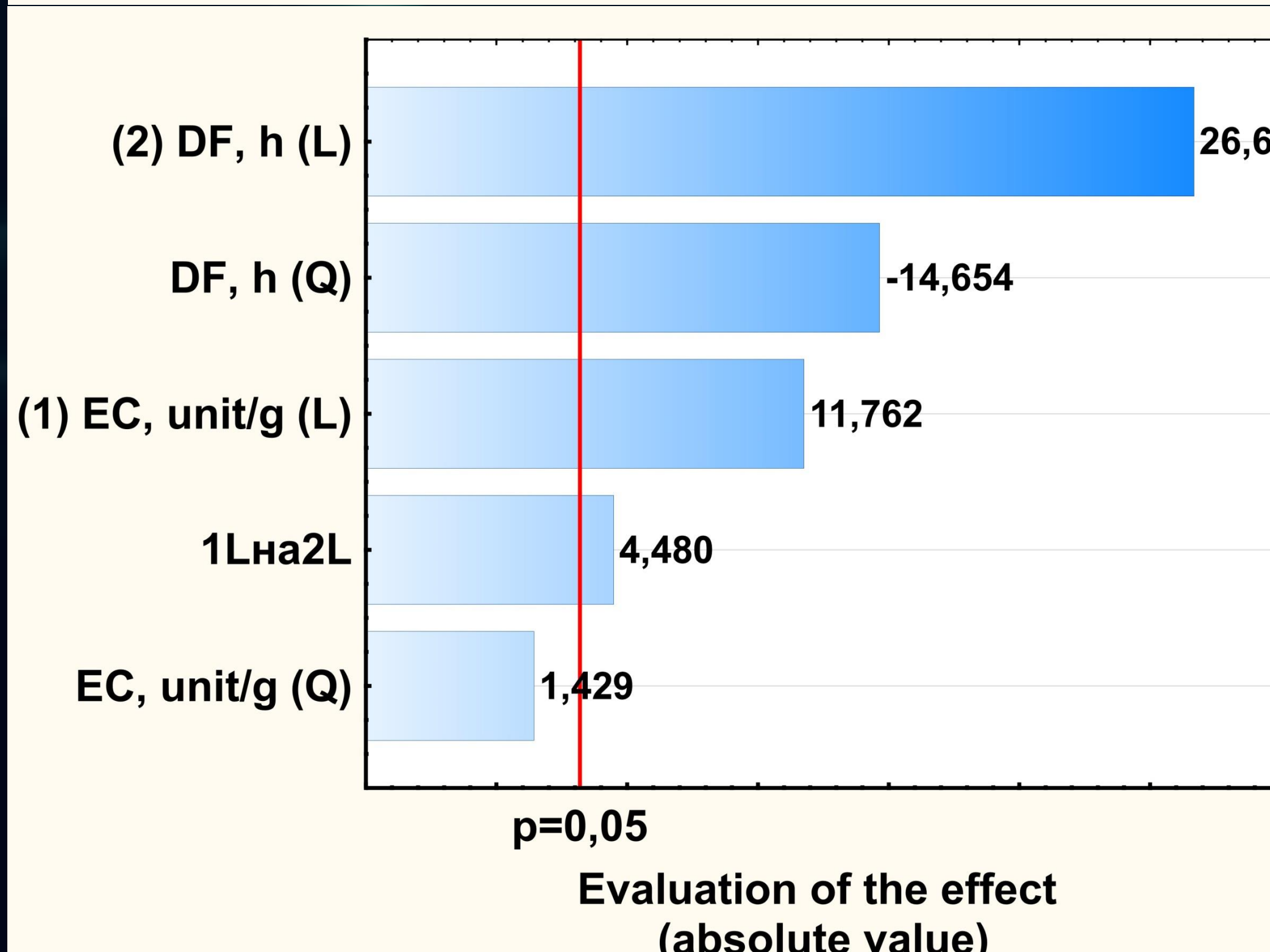
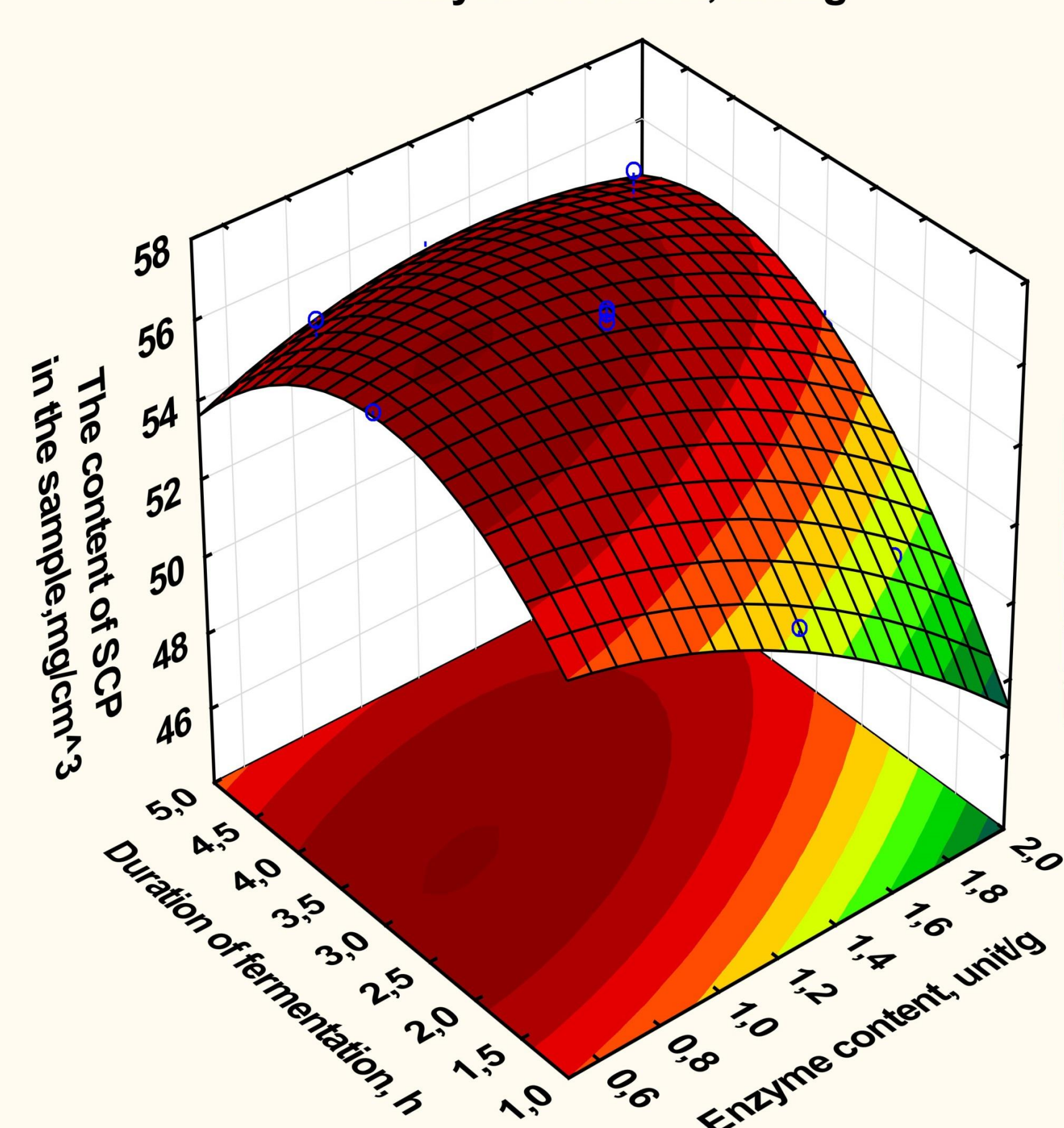
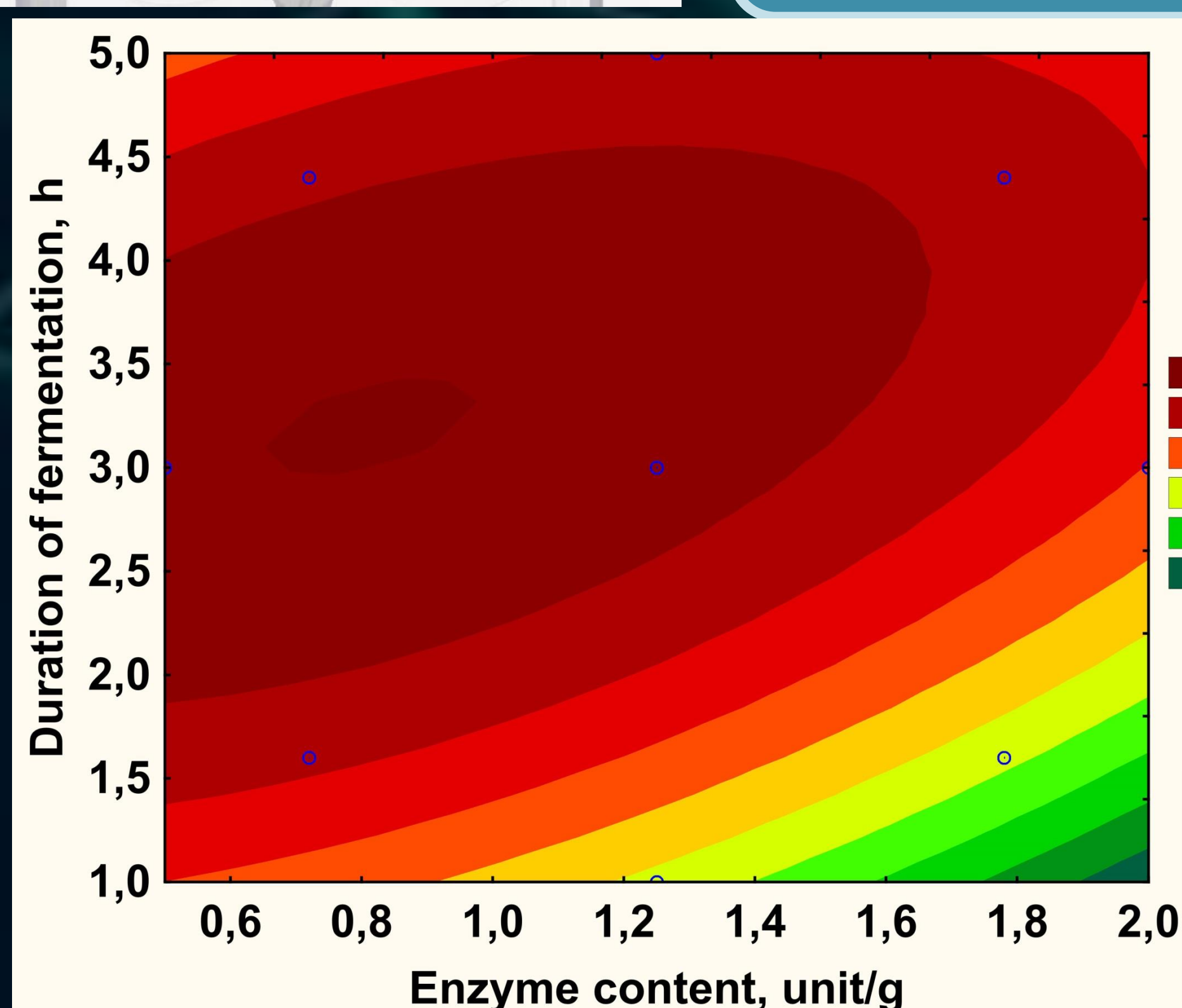
This product has also found its application and is widely used for cosmetic purposes. Dairy protein and milk serum - the main ingredients of milk - are known for their softening, moisturizing, restorative, anti-allergenic and anti-inflammatory properties. Milk proteins contain all eight essential amino acids (which are not produced in our body) that are responsible for the nutrition of the skin, because they are involved in the process of producing keratin, collagen and elastin. In addition to essential amino acids, milk proteins also contain other biologically active components, including enzymes, immunomodulators, cytokines (growth factors that stimulate cell division processes) and special antimicrobials.

For the more effective exposure of the Serum and its proteins to the skin and hair, it is recommended to use milk products hydrolyzate in cosmetic products.

Hydrolyzate of milk proteins is a biologically active ingredient derived from milk protein by the method of protein fermentolysis. Hydrolyzed protein consists of short chains of amino acids, the molecular weight of which allows you to penetrate the deep layers of the skin. Milk hydrolyzate is a real healing elixir for irritated, damaged, dry skin.



Results of analyzes



Conducting researches

Optimization was carried out in two factors: the duration of fermentation and the concentration of the enzyme.

The optimization criteria is the number of peptides and free amino acids.

We have been chosen to carry out the fermentation of reconstituted to 20% of dry matter of KSB using neutral peptidase of bacterial origin.

The enzyme of the domestic producer - the Enzim company - was used.

The activity of the enzyme for proteolysis of serum proteins is from 0.5 to 2 units / cm³, which was recommended by the manufacturer. The fermentation time is from 1 to 5 hours.

In order to stop the fermentation, we inactivated the enzyme by heating up to 57 ° C. After this, the samples were cooled to a temperature of 4-6 ° C and stored at the same temperature.

To determine the content of short-chain peptides, the technique was used "Quantitative determination of peptides with a molecular weight of 700-1500 Da with a Benedict reagent" The content of free amino acids was carried out in the presence of a phenolic reagent.

Results from 12 samples were processed using Statistics

Conclusions

As a result of statistical processing of the obtained data, the optimum fermentation regime was determined:

Concentration of the enzyme is 0.78 g / g
The duration of fermentation is 3.17 hours

Thus, this mode can be used in the development of production technology of short chain peptides from serum proteins concentrate.

As a result, two problems will be resolved partially:

1. Use of whey as a secondary raw material of the dairy industry
2. Introduction on the market of ingredients for probiotic cosmetics of domestic production



$$C_{scp} = 5,137717 - 0,116310 \cdot C_f - 0,185083 \cdot T_f + 0,382979 \cdot T_f^2 - 0,076067 \cdot T_f^3 + 0,128032 \cdot C_f \cdot T_f$$

$$C_{faa} = 3,090930 - 0,473824 \cdot C_f + 0,159201 \cdot C_f^2 + 1,246332 \cdot T_f - 0,177207 \cdot T_f^2 + 0,188679 \cdot C_f \cdot T_f$$