MODEL OF OPTIMIZATION OF THE SUSTAINABLE DIET INDICATORS

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Abstract

The emphasis within this paper will be on creating a mathematical model, called three-factor model for optimal definition of indicators of a sustainable diet. Three-factor model is a statistical design of experiments (DoE) as a powerful tool for optimizing processes. This model is a systematic method to determine the relationship between factors affecting a process and the output of that process. In other words, it is used to find cause-and-effect relationships. This information is needed to manage process inputs in order to optimize the output. The aim of this research was to present a three-factor model as a mathematical tool to find sustainable indicators as a factor of obesity. From the result, we will decide which factor has the most influence and which has less influence on the response. In other words, we will realize which factor is an indicator as a reason and which one is just a consequence of it.

The identification and quantification of severe to morbid obesity will be carried out by applying general and specific objectives according to a specially prepared program conducted on 56 obesity patients in the dietetics and nutrition counseling company "Protektal" in Skopje. Patients were put on a very low calorie diet with a minimum input of 800 - 900 cal. daily, in small but frequent meals, of functional food (the protein food that contains bioactive peptides and proteins and rich in vitamins and minerals). They were monitored under strict medical supervision aimed at the treatment of obesity. In this scientific research, additional tests were performed for the practical application of three-factor experimental design related to morbid body mass. This system of indicators was performed on three samples in which the three parameters were monitored: glucose, ALT enzyme and total cholesterol. This type of analysis was performed at the Faculty of mechanical engineering in Skopje with the help of regression equations. This system of indicators is called a three-factor experimental design with two levels of variation (2^3) for the process of reducing body weight.

The result obtained from these analyses using the three-factor experiment was the same in all these fifteen respondents. By applying this model, it was shown that the greatest effect is the third factor-glucose, the effect of the second factor - total cholesterol is smaller, and the first factor - the ALT enzyme has no effect at all.

Using this model in the future will present a new system and indicator for calculating body weight. Therefore, by applying the regression equations in natural units, the desired body mass of the patients can be predicted within glucose values as a parameter that should be in order to reach that desired mass at a constant value for cholesterol.

Key words: *Mathematical modeling, Obesity, Medical care, Balanced diet, Nutrition.*