

Comparative Study of the Blood Amino Acid Content with Some Fattening Parameters of Duroc Breed Boars

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Introduction: Amino acid content of animal tissues is among the most important objects in meat science. [1]. This is due to the great biological value of amino acids in the animal metabolism [1,2]. The unique biological functions of amino acids are linked to process of organism growth and development, i.e. they are „irreplaceable in all life processes“ [1-3]. The relevance of this work is associated with the increased demand of modern society to obtain healthy food products. For example, pork can be considered as one of the most demanded animal product in Russia, as well as in the whole world. The aim of this work was to study the content of major amino acids (AAs) in the pig blood serum and their correlations with some biochemical and fattening indicators.

Materials and Methods: Blood samples from Duroc breed boars (n=68) were taken from the ear vein during fattening. The experimental protocols (concerning these animals) are approved by the Ethical Committee of our Federal Research Center. All experiments and conditions (animal care, feeding, biological material sampling, etc.) are fulfilled in accordance with the applicable regulations (internationally recognized guidelines and Statement of the ethical treatment of animals used in research). Biochemical parameters of these samples were measured as described elsewhere [2]. Amino acid content of blood serum of the Duroc breed boars was measured by high performance liquid chromatography system LC-20 Prominence (Shimadzu, Japan) equipped with a reaction module for post-column derivatization with ninhydrin ARM-1000 (Sevko & Co, Russia). The results of these measuring were statistically processed [3] using the MS Excel program.

Results:

1. By amino acid analysis of 68 blood samples from Duroc breed boars the following data were obtained (average values in g/100 g): glutamic acid - 0.98 ± 0.03 , aspartic acid - 0.62 ± 0.02 , threonine - 0.38 ± 0.01 , serine - 0.39 ± 0.01 , glycine - 0.25 ± 0.01 , alanine - 0.50 ± 0.02 , valine - 0.45 ± 0.01 , isoleucine - 0.25 ± 0.01 , leucine - 0.73 ± 0.03 , tyrosine - 0.41 ± 0.01 , phenylalanine - 0.45 ± 0.02 , histidine - 0.25 ± 0.01 , lysine - 0.67 ± 0.02 , arginine - 0.44 ± 0.01 , proline - 0.31 ± 0.01 .
2. Correlation analysis carried out to identify the relationship between the AA content in the studied samples and the main fattening indicators of Duroc boars. For example, the correlation coefficient between alanine content and the carcass weight (normalized to a weight of 100 kg) was $r=0.4$ that indicated a moderate positive relationship between these important parameters.
3. Strong correlations were found in the case of AA and biochemical analysis of the Duroc breed blood. In particular, a positive correlation (coefficient $r=0.5$) was found between the alanine content and the total protein of the blood serum.

Conclusions: Thus the correlations of the content of particular AA (such as alanine) in the pig blood serum with some fattening and biochemical indicators are important for further application in the animal husbandry.

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Literature:

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