

**THE LEVEL OF THYROID
HORMONES IN BLOOD SERUM OF PIGS
IN RELATION TO THE BREEDING FOR
IMPROVED PRODUCTIVITY**

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Modern approaches to breeding, raising and efficient industrial maintenance of farm animals demand objective scientific methods of evaluation.

Hormones of thyroid gland produce biological affect upon most physiological functions of organism. Thyroid hormones control growth and development of animals, the rate of basal metabolism, the exchange of proteins and fats. The key hormones of thyroid gland's follicular part are thyroxin (T_4) and triiodtyronin (T_3).

The experiment was made on Precocious Meat pigs (SM-1) of Novosibirsk breeding on the experimental training farm "Tulinskoye" of Novosibirsk State Agrarian University.

The experimental animals were in control fattening. Their age was 6 months. The data was processed statistically through computer programs MS Excel 2000, Statsoft Statistica 6.

The controls in the experiment were the progenies from 6 SM-1 boars. The content of thyroid hormones (T_3 , T_4) was explored as well as the amount of total protein and triglycerides in the blood serum of the pigs.

While exploring the value of thyroid hormones in the animals' blood in relation to meat productivity it was found that the concentration of thyroxin and triiodtyronin was higher in the pigs of longer carcasses.

The relation between hormone activity and productive traits of the animals was determined during the calculations of correlation coefficients. The correlation between T_3 and the weight of the back third of a half-carcass was equal to 0.435 ($p < 0.01$). The correlation between T_4 and fat thickness ($r = - 0.305$; $p < 0.05$) was opposite and less.

As a result of the experiment it was revealed that the progeny of the Svetly 1704 and the Soviet 1618 had the higher content of hormones in thyroid gland, the higher level of

protein and the lower number of triglycerides in blood serum.

The data obtained is the evidence of higher concentrations of thyroid hormones in the blood of pigs with improved productivity traits, they activating protein synthesis and inhibiting the mobilization of fats in organism.

The article is admitted to the International Scientific Conference "Actual Problems of Science and Education", Cuba, 2007, March 20-30; came to the editorial office on 08.12.06.

**SYSTEM ORIENTED MANAGEMENT
OF ENVIRONMENTAL SAFETY**

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Everyone as a consumer and producer faces to some ecological situations in the everyday life or work activity. He must know what he consumes and produces from a position of environmental safety. And it is impossible to obtain this result without development of ecological culture for modern specialists and training of industrial personnel. In Russia a complete discrepancy between the level of environmental culture of industrial personnel and requirements of supporting and management of ecological safety of workers was being created. This gives a possibility to consider the development of ecological culture between students of a University and industrial personnel to be a very urgent for every metropolis nowadays, especially for Togliatti city well-known for its greatly developed ecologically destructive production.

At the Togliatti State University the students of the Chair of quality control, standardization and certification and the Chair of management for industrial and ecological safety interviewed the industrial personnel at the three major plants (**300 people**). The head count showed:

- 0,7 % know what is ecology and environmental education and realize its targets;
- 97% don't know what to do in a certain common (everyday) and manufacturing situation;

– 30% of respondents consider ecology to be connected only with environmental pollution, excluding their own participation;

– 99,9% do not realize that the environmental mess rises from “a piece of paper dropped in the street”.

During the training of modern specialists at the University we worked out and adopted a test material for diagnostics of structural components of ecological culture. Herewith the level of standardization and unification of elements and the legal, aesthetic, technological, ergonomic rates of ecological culture forming among the students of the University are being observed there. The evaluation system in the projecting of technological realization of ecological culture development by an example of the University is determined with the quality of chosen control characteristics, diagnostic methods, and strategies of control testing and the processing of results. There is a necessity of concrete criteria to be controlled during the process of ecological culture development. One of such criterion is an entry level which is found by testing. To get a guaranteed result of training and to determine the level of ecological culture the new kinds of test procedures, suggested by Yu.K. Chernovaya and V.V. Schipanov, were applied. The controlled characteristics consist of the quality level of the content (the quality of information advertised, consistency, advance coefficient and the parameters of categorical direction, and the parameters of functioning (competency, overwork). All the used diagnostic methods applied for the forming of ecological culture among the students were standard, and consequently, these methods meet the case of validity, reliability and efficiency. As a valuation we used mathematical expectation offering these properties. For the factors of use it is necessary to work out a system of criteria of relation to one of the levels to interpret the findings.

The description of the measuring object lets to find out relatively categorical connections between the given measuring object and its conceptual features. To organize the system evaluation we chose the ecological competency of a specialist – as an out parameter, and the level of ecological culture development – as a controlled factor. The ecological thinking and competency are being observed by us constantly

with the help of the tests. The description of the measuring object can be calculated and measured through the system of quality levels and by marking conceptual features. This exact way of the measuring object lets to find out relatively categorical connections between the given measuring object (the feature of empirical object) and its conceptual features. We set a problem to observe the process of forming of ecological culture. In order to provide the effectiveness of our diagnostics we used tests and methodic of the known authors which are widely used in the pedagogical and psychological practice. The ecological competency Y was described by the tests of V.I. Sivoglazov, T.S. Suhov and T.A. Kozlov.

The ecological culture is defined by 5 components: ecological competency Y; ability to recognize the ecological situation among all variety S; ecological thinking, ecological philosophy F; ability to use all the diversity of methods of ecology M; reflexive abilities R.

These components are divided on two groups, one of them can be measured by objective methods – these are objective rates, the other – only by subjective or expert methods – these are subjective rates. Among the objective are S and F rates. For the measure of these rates a group of 4 experts was organized. This group was to allot the mark by the five point system.

Each expert noted down the results of his estimation in a special report form. After that the results of all the experts were averaged, then divided by the maximum possible point (5), and we had got the relative parameters S and F, which were noted into the table. The competency and ability to mark the ecological situation are determined by the achievement test results as a position of the amount of the points of this test to the maximum possible. The reflexive abilities as a complex formation, including some components (reflexive thesaurus, evaluative abilities, readiness to the self-evolution), are measured on the basis of the known reliable and valid methods. The received differentiated rates of the reflexive abilities based on the additive pooling (summing) made R. The data of the table was objected to a statistical analysis. Here all the data in each column were examined for the correspondence to the normal probability law, the average rate of dispersion parameters was here

also determined and the integrative rate of ecological culture of the convolution of Y, S, F, M, R by the formula:

Ecological culture (EC) = $1/5 (Y + S + F + M + R)$, (1)

The average rate (number) for all the class of the population is calculated by the formula:

$EC_{average} = 1/5 (Y_{av} + S_{av} + F_{av} + M_{av} + R_{av})$, (2)

The root-mean-square deviation σ and the estimation through EC_{av} are used for the plotting of the tolerance interval of the ecological cultures:

$(EC_{av} - 2\sigma\sqrt{n}, EC_{av} + 2\sigma\sqrt{n})$, (3)

where n – is an amount of the respondents.

In this formula a coefficient 2 preceding a fraction σ/\sqrt{n} is a real approximate value of Student's test, when the confidence level $\alpha=0,05$ and the amount of people that defines the amount of the number of degrees of freedom distribution.

The necessary and sufficient conditions for the development of the ecological culture of a student are:

a) the orientation towards the awareness of the notion „the environmental quality” in the daily activities that supposes an exceeding the bounds of the adopted techno stereotypes;

b) the development of the ecological culture based on the suggested measures;

c) the forming of motivation and ability to use concrete ecological situations for the development of the practical work of the production industry.

The worked out technology of the ecological culture forming is meant for the mentality establishing of a person, in the context of the educational approach. To organize the complex of control actions we marked the most important factors and the permissible limits of their

variation for stability. We also examined the projecting of the controlled parameters based on a mathematical model, where the system connections between the mechanisms of projecting, functioning and quality control on the basis of the offline methods. For the estimation of the process of ecological culture development we suggested the method of evaluation of its forming.

The foregoing allows to say that the system-oriented control under the ecological safety and favour to an understanding of priority of the ecological thinking and the philosophy of the ecological culture in all the occurrent situation, that confirms the statements of the suggested hypothesis. During the organized research the main scientific results and some directions of the following working of this problem were defined. The main features of the ecological culture is considered to be a conceptual and activity thesaurus, ability to mark the ecological situation from all the variety of situations in the environment, herewith using the special methods and means, reflexive abilities. Because for a human of the future, these components put in the mind the psychological inconsistency of production management with 'don't care' attitude to the facts of misuse of the environment in all the agricultural spheres.

The article is admitted to the International Scientific Conference “Modern Education. Problems and Solutions”, Thailand, 2007, January 17-28; came to the editorial office on 14.11.06..