

THE CONTENT OF NUCLEIC ACIDS IN TISSUES AND PIG PRODUCTIVITY

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New methods to evaluate animals require the study in interior indexes in relation to meat traits.

The improvement of breed and productive traits of pigs is largely determined by biochemical tests which reflect metabolism intensity in animal organisms.

Nucleic acids accomplish the storage and transfer of genetic information and are involved in realization of the information through the synthesis of all proteins.

Methionine plays an essential part in protein metabolism; it is the only amino acid that initiates the protein synthesis.

Proteins provide multiversity of functions in organisms and phenotypic characters. They are molecular instruments which accomplish the realization of hereditary information. Proteins make up about a half of dry weight of living organism. Muscular tissue contains around 72 – 80% water, dry matter largely composed of proteins making up 20 – 28%.

The experiment was carried out on the experimental training farm “Tulinskoye” of Novosibirsk State Agrarian University. The object of research was Precocious Meat pigs (SM-1) which are well adapted to local natural and climatic conditions.

The research was done in the 6 month animals in control fattening. The pigs were kept according to the technology provided for complexes and farms. The data was processed statistically through computer programs MS Excel 2000, Statsoft Statistica 6.

The progeny from 6 boars of Precocious Meat breed were under control in the experiment. Individual variation of methionine content in blood serum, DNA, RNA and liver protein in progenies from different boars were explored. Liver was chosen for the exploration because it was regarded as the organ with the expressed function of protein synthesis.

It was established that the pigs different in economically valuable characters differentiated

by the explored biochemical indexes. The animals with improved meat productivity were revealed to have higher DNA and RNA content. Protein level in liver was determined to vary with meat traits and to be higher in the individuals with higher ham weight (11.06%, $p < 0.01$). Gilts of longer carcass exceeded those of the same age for the concentration of methionine in blood serum (8.73%, $p < 0.05$).

The higher content of DNA, RNA, methionine and protein was identified in the blood serum and liver of the progenies from the Svetly 1704 and the Soviet 1618 and this testifies to the higher intensity of protein biosynthesis in the tissues of the pigs with improved productive traits.

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THE FEATURES OF THE 2ND TYPE DIABETES MELLITUS IN ABORIGINAL POPULATION OF THE NORTH

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In the Republic of Sakha (Yakutia) the 2nd type of diabetes mellitus (DM 2) is the most wide-spread pathology of endocrine system. (P.M.Ignatiev, M.A.Fedorova, 2004). For the last decades DM 2 disease incidence has increased more than 2 times. Considerable and fast growth of DM 2 disease has been observed especially among aboriginal population of the North. Undoubtedly the spread of this "metabolic" epidemic is closely connected with urbanization of the North, deformation of traditional food of natives and other factors. Nowadays observation of indigenous inhabitants with DM 2 gives us an opportunity to analyze the features of their disease process, compensation, late complications etc.

Materials and methods. We examined 68 Yakuts (49 women and 19 men) with DM 2 who

were on hospitalization in endocrinological department of Republican hospital № 2 of Emergency Medical Care Centre during the period 2002 - 2005 (group 1). Average age of patients was $58,16 \pm 1,12$ years. Diabetes duration was $8,4 \pm 1,36$ years. For comparison we examined 32 Russian patients (21 woman and 11 men) with DM 2 of the same age (group 2). In this group diabetes duration was $11,8 \pm 1,52$ years. They were put diagnosis DM 2 on the basis of classification and diagnostic criteria of the WORLD ORGANIZATION OF PUBLIC HEALTH (1999). Anthropometrical parameters of research included weight, growth, dimensions of waist and hips as well as calculation of the index of body weight (IBW) and ratio of waist and hips (W/H). All the patients filled in the form for revealing social data, anamnesis of chronic diseases and uses of medicines. This form also contained questions about food (dietetical interview), physical activity, ischemic disease of the heart heredity and harmful habits (smoking and alcohol). All the patients gave their consents to participate in research, including biochemical analyses conduction.

Laboratory methods of research included:

Definition of blood sugar within a day (glycemia profile) by glucose oxidant method with automatic biochemical analyzer "Eos-bravo" of Hospitax-diagnostics (Switzerland - Italy) in biochemical laboratory of Republican Hospital № 2 (EMCC). Definition of glycosylated hemoglobin - HbA1c by liquid chromatography under pressure (normal level of 4,5-6,2 %) in a laboratory of polyclinic №1 in Yakutsk. Glycemia and HbA1c were evaluated according to WORLD ORGANIZATION OF PUBLIC HEALTH specifications, 1999.

Definition of lipid spectrum in blood serum by diagnosticum in vitro method (TC, HDL, TRG, LDL, non-HDL, TC/HDL) with the help of standard cartridges on the device CHOLESTECH LDX (USA) after the 14 hours night starvation period and 3 days with no alcohol. Classification ATP III was put on a basis of lipoproteins levels interpretation.

Clinical examination included arterial tension measurement by A.S.Korotkov's method, electrocardiogram, ultrasonic research of abdominal cavity, echocardiogram.

All patients were examined by internist, oculist, neuropathologist, podiatrician (the expert on diabetic foot) and surgeon.

Statistical data processing was carried out by means of BIOSTAT 3.03 and Microsoft Excel Programs (version 7.0). In cases of distribution close to normal the data are presented as $M \pm SD$ (M is an average arithmetic, SD - standard deviation). Quality data are presented as absolute quantity of examinations and percentage (%) of the patient's quantity according to the sample or the appropriate group. In case of distribution close to normal we applied Student's t-criterion for two samples comparison. Distinctions were statistically significant at $p < 0,05$. The correlation analysis was carried out with the use of Spirman's rank correlation.

Results and their discussion. The analysis of the basic anthropometrical data in 2 groups has revealed lower parameters of growth and weight in group 1 in comparison with group 2. 23 Yakuts (33,8 %) with DM 2 suffered from expressed obesity ($IBW > 30 \text{ kg/m}^2$). The percentage of Russian patients with obesity was a bit higher (53,1 %). According to dietetical interview 35,2 % of people of the group 1 mainly feed on dishes of national kitchen compared to 15,6% of group 2. Most patients (group 1) with obesity (60,9 %) preferred the European meal. More than 30 % of respondents of both groups estimated their physical activity as hypodynamia (35,3 % и 31,25 %). According to HbA1 level compensation of DM 2 was observed with 19 people (27,9 %) in group 1 and 10 (31,2 %) in group 2. Decompensation was marked with 24 (35,3 %) patients in group 1 and 11 (34,4 %) in group 2. The comparison of DM duration revealed that more than a half patients of group 1 (76,6 %) had suffered from the disease for less than 10 years, 54,4 % of them – about 5 years. In group 2 the percentage of people suffering from DM for more than 10 years was 43,8%. Nevertheless, the frequency of late complications in both groups was mainly identical. We found out that patients had diabetic angioretinopathy (79,4 % and 71,8%), neuropathy (72 % and 71,8), nephropathy (57% and 59,3 %), fat hepatosis (52,9% and 53,1%), diabetic foot (13,2% and 12,5%) and dislipidemia (60,2% and 68,7 %). 36,7 % of the

1st group patients and 62,5 % of the 2nd had ischemic disease of the heart . In the 1st group there were 5 patients with infarct of myocardium, 3 of them had "muted" form, and 4 had arrhythmia. 42 % of patients of group 1 and 62 % of patients of group 2 were put a diagnosis aorta atherosclerosis with transition to the base of velum of aorta and mitral valves. 60% and 65% accordingly suffered from arterial hypertension (Blood pressure > 140/90 mm.Hg). Ultrasonic research of abdominal cavity revealed signs of pancreatitis with 84 % of the 1st group patients and 61 % of people of group 2. Approximately identical quantity of patients had signs of cholecystitis, gallstone, pyelonephritis, urolithic illness. Biochemical parameters revealed authentic distinctions of lypoproteid level ($p < 0,05$) of high density (HDL). The 1st group patients had higher level of HDL (1,42+0,12 ммоль/л) in comparison with parameters in group 2 (0,76+0,13 ммоль/л).

CONCLUSIONS. The examination of Yakuts showed that diabetic microangiopathia of various degrees is diagnosed with the duration of disease up to 10 years. Thus, searches of the various genetic factors providing higher or lower susceptibility of microvascular bed of target organs to the influence of metabolic factors are proved. As for macrovascular complications, the ischemic disease of the heart incidents among native people of the North are revealed more rarely than among Russians, possibly due to protective action of high level of high density lipoproteins. Clinical features of ischemic disease of the heart with Yakuts suffering from DM indicate that they have autonomical neuropathy.

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THE INFLUENCE OF A NEW ANTIOXIDATIC PREPARATION ON THE REPRODUCTIVE FUNCTION OF MALE-RATS

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In the group of N₉ – substituted of Imidazobenzimidazoles it has been revealed a new antioxidant substance, surpassing of an antioxidant preparation of mixidol (V.A.Kosolapov, 2003) in efficiency. Toxicological researches proved that this substance is less toxic. LD₅₀ is 1680 mg/kg, the therapeutic index is 336 c.u., in intragastric administration, but a safe diapason of therapeutic activity is 12 c.u. in which the dose of 5 mg/kg corresponds to the lower level of safe therapeutic action, and a dose of 60 mg/kg - to the top level. Thus, the gonadotrophic properties of this substance were subjected to investigation in further researches.

The purpose of the present research was to study the influence of a new antioxidant substance on the generative function of male-rats.

The experiments are carried out on 90 male-rats (60 males and 30 females) with the mass of 180 gramm, keeping the rules of the International convention on the protection of the vertebrates (Strasbourg, 1986).

During the researches the males have been subdivided into 3 equal groups. The investigated substance was introduced per os in a doses of 5 and 60 mg/kg, (1 and 2 group) for 2 months, the 3-rd group was intact. A sexual behavior, the spermiogramme have been studied and a gonad morphometry was performed. The duration of latent period and sexual activity, the number of approaches of male to female and number of coupling with intact female-rats were studied. To investigate the male's spermiogramme male-rats were subjected to ether narcosis. The testicles and epididymis were extracted. The spermatid substance from epididymis was taken to calculate number of normal and pathological forms of spermatozoons and period of their motility. Testicles were subjected to histological