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ТҮЙІН

Бұл мақалада қазақтың ақбас тұқымының асыл тұқымды бұқашықтарының тұтынылмаған азық қалдығының әсерін (бұдан әрі RFI-RFI) бағалау үшін Қазақстанның солтүстік өңірінің етті ірі қара мал шаруашылығында Grow Safe канадалық цифрлық технологиясын қолдану нәтижелері берілген.

GrowSafe технологиясы үздіксіз бұқашықтардың тірі салмақ пен азықтандыру технологиясын қысқа мерзімде өсіп-жетілуіне жауап беруге және түзетулер енгізуге, жабдық пен бағдарламалық қамтамасыз етуді пайдалана отырып, тәулік бойы сенімді деректерді алуға мүмкіндік берді.

GrowSafe жүйесін сынақ барысында пайдаланатын 128 бұқашық 1 кг өсіміне шаққандағы азық шығымы орташа есеппен 7,95 кг құрғақ затты, 1 кг-ға 0,90 жем бірлігін немесе метаболикалық энергияның 10,6 МДж мөлшерін құрады.

Тұтынылмаған азық қалдығына өнімділіктің әсерін бағалау, негізінен (80%) өсудің тұтынылатын құрғақ затқа қатынасын бағалаумен сәйкес келді, ал кейбір бұқашықтардың тірі салмағы орташа тәуліктік өсім бойынша ауытқуларды көрсетті.

Асыл тұқымды бұқашықтарды өсірген кезде 1 кг тірілей салмақ өсімін алу үшін азықтандырудың тиімділігін бағалаумен және жемшөп шығындарын бағалаумен салыстырғанда, қалдық жемді қабылдауды бағалау малдың өнімділігін бағалаудың объективтілігін арттырады, алайда, тұтынылмаған азық қалдығы RFI -0,81-ден 3,82-ге дейін ауытқытынын көрсетті.

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BIOCONVERSION PROTEIN AND ENERGY IN FEED INTO MEAT PRODUCTIVITY OF THE YOUNG SHEEP

ANNOTATION

Satisfying the physiological need of body for nutrients in strict accordance with medical standards is an important task to improve the structure of nutrition and its energy value. The level of providing a person with protein animal origin is only 65% established norm. Therefore, the problem of increasing volume its production is considered relevant for nutriciology. In this regard, breeders pay special attention to identifying animal genotypes that meet these requirements, and for this it is necessary to conduct a comprehensive assessment quality of the meat productivity, taking into account transformation main nutrients feed into edible parts of the body.

Evaluation of the efficiency animal transformation feed nutrients into body tissues is based on the use of exchange energy feed, and stored energy in form protein and fat. The study of their bioconversion into meat products makes it possible to develop rational technologies for directed rearing, pasture feeding and intensive fattening young sheep.

This article presents results of the analysis accumulation nutrients in body and energy bioconversion with protein into the meat products of young sheep Akzhaik breed in conditions sharply continental climate of the Western region Kazakhstan. The established pattern of changes protein content in body experimental individuals is due to a decrease in the intensity of its synthesis and activation process fat deposition. According to our information, with the age of young animals, the coefficient bioconversion of feed energy into energy edible parts carcass increased to 28%, while protein, on contrary, decreased to 89%.

Key words: *meat productivity, energy value, animal protein, fat deposition, bioconversion, rational nutrition, physiological norms.*

Introduction. One of the key factors in increasing economic efficiency agricultural sector and ensuring country's food security is the solution of problems associated with a qualitative increase in sheep breeding production. Mutton, incl. lamb, due to its nutritional properties, is in great demand among the inhabitants of Central Asia, the coastal countries of Persian Gulf and all Islamic States.

At present, most urgent task facing world community is to solve problems related to rational nutrition. It is known that, for example, the reserves of complete protein in human body are practically absent, and new ones can be synthesized only from amino acids that come with food or from decaying proteins body tissues [1-3].

Proteins from animal products are complex substances consisting amino acids, which are an invariable part of the ration. This is the main building material, without which growth of muscles and tissues in general is impossible.

Of most the substances that make up carbohydrates and fats, proteins are not formed, which leads to their deficiency in body. The production of enzymes and, accordingly, the absorption of essential nutrients are disrupted, and this entails detrimental consequences for almost entire body. And with a lack complete protein, absorption some vitamins, healthy fats and many trace elements worsens. Due to the fact that hormones are protein structures, a lack of protein can also lead to serious hormonal disorders [4-5].

Fats – organic compounds that are responsible for the “reserve fund” of energy in body, have protective functions during periods nourishment deficiency or illness. They are part of cell membranes and many active substances, being a solvent for vitamins such as A, D, E, F, and most importantly, they are necessary for the elasticity blood vessels, so that beneficial elements penetrate tissues and cells faster, helping to normalize their condition [6-9].

At same time, daily ration, according to the recommendations of dieticians, should vary on average within 12-13 mJ metabolic energy necessary for normal life, work and rest. The scientifically based norm of total amount protein for a person per day is 100-105 g., 100-110 g. of fat and 400-410 g. of carbohydrates. The fact is that 60-65 g. of them should be proteins animal origin.

In connection with foregoing, it is necessary to use all reserves increase production this valuable component of the diet, but potential for increasing production mutton in sheep breeding of the Kazakhstan is not fully used.

It is known that each breed of sheep has biological properties inherent only to it, the implementation which is possible only when animals are provided with optimal conditions for keeping and feeding. Breeds that distinguished by high productive qualities and adaptive plasticity are further developed and expand their distribution area. It is necessary to comprehensively study the economically useful traits of young sheep bred in a particular region, taking into account qualitative and quantitative features of the meat products obtained from them [10].

Mutton is a dietary food product, characterized by a balanced protein and fat composition of the carcass, and the low content of cholesterol in this type meat increases its popularity among all segments of the country's population. Also, sheep are less demanding on feed and have a higher degree of biotransformation feed nutrients into meat production [11-15].

Features of the transformation nutrients and energy in feed by animals into meat products are genetically determined. At time, effectiveness realization of the genetic potential meat productivity is due to influence a complex paratypical factors. The efficiency of deposition nutrients in body reaches its maximum value when growing animal reaches about a quarter of the mass an adult individual. Additionally, the value of bioconversion coefficient is significantly influenced by age, gender, physiological state, usefulness and balance ration. For example, it has been found that with the age of animal, efficiency use nutrients for the synthesis of production begins to decrease [16-20].

At present, a comprehensive assessment of the meat productivity sheep, taking into account both its quantitative and qualitative indicators, in view transformation process converting some compounds into others with the participation of enzyme systems living organisms, makes it possible to develop rational techniques growing meaty young animals.

Materials and methods of research. To determine the nature of bio-conversion/transformation protein and energy in different types feed into meat production, an experiment was conducted on semi-fine-wool sheep of the Akzhaik breed of the combined meat-wool productivity on base “Akzhaik” experimental farm (West Kazakhstan region, Taskala district, Atameken village). During the experiment, single lambs of early spring lambing (end of February – beginning of March) obtained by artificial insemination queens with deep-frozen sperm highly productive producers were selected. The experimental offspring of sheep was divided by age into 2 groups, depending on sex, 30 heads each: group I – ♂ (rams) and group II – ♀ (ewes).

The conditions of care, feeding and maintenance for animals all groups were identical and fully complied with the requirements of conducting zootechnical experiments. From birth to 4-4.5 months, suckling young animals were kept in lightweight premises with a walking area, after weaning from queens – in separate fenced areas with the organization of detailed feeding with a balanced feed mixture recipe, and in summer they were grazed on a cultivated pasture.

Sheep of this enterprise receive a general farm ration consisting hay the steppe forbs cereal-legume association and crushed barley grain. In the experimental groups, grain of crushed barley was replaced in terms nutritional value with developed feed mixture recipe, which included: barley mash – 30%, PVM supplements – 25%, wheat – 19%, sunflower cake – 15%, wheat bran – 7.4%, fodder chalk – 1.2%, whole milk replacer – 1%, monocalcium phosphate – 0.8%, trusted salt – 0.6%.

In feed mixture used, total gross energy per 1 animal head was 12.33 MJ, energy feed units (EFU) – 10.2 per 100 kg of live weight, crude protein – 18.25%, crude fat – 4.97%, crude fiber – 6.97%, which corresponded to detailed norms for feeding farm animals, developed by A.P. Kalashnikov and etc. (Moscow, 2003).

The control slaughter of young sheep was carried out according to generally accepted VIZh (All-Russian Research Institute of Livestock) method. Why, from each group, 3 heads animals were selected, representing analogues in terms of average peers, in which at 4-4.5 months, 7.5-8 months and one year old, the following parameters were taken into account:

- mass of steam carcass with internal subcutaneous fat;
- slaughter yield – the ratio of slaughter weight to pre-slaughter;
- morphological composition (pulp, fat, bones, etc.) – according to the results of carcass deboning;
- organoleptic indicators of meat (appearance, color, consistency, smell, transparency and flavor of the broth) – according to ST RK 1731-2007;
- chemical composition of meat (moisture, dry matter, protein, fat, ash and calorie content 1 kg meat) – according to generally accepted methods;
- concentration of copper, lead, zinc, cadmium – according to the method atomic absorption spectroscopy with electrothermal atomization, modification MVI M 04-64-2017.

Evaluation animals in terms of bioconversion efficiency, taking into account the transformation main nutrients feed into edible parts of the body, was carried out according to methodological recommendations (M.: VASKHNIL, 1983). At same time, yield of the main nutrients was calculated on basis of the yield muscle tissue, raw internal fat, blood and by-products of the 1st category suitable for use in food, as well as according to their chemical composition.

Results and its discussion. The data obtained during of study and their analyzes indicate an increase level protein (1.30-4.12 kg) and fat (0.55-2.93 kg) in body with the age of young sheep. Same trend is observed in terms of the energy – 45191-162687 kJ (table 1).

Table 1 – Bioconversion protein, fat and energy in feed

Index		Young rams			Young ewes		
		4-4.5 months	7.5-8 months	12 months	4-4.5 months	7.5-8 months	12 months
Content, kg	Protein	1.85	3.78	4.12	1.30	2.57	3.19
	Fat	0.73	1.46	2.64	0.55	1.61	2.73
Concentration, kJ	Energy	57350	120862	162687	45191	107388	145946
Coefficient bioconversion, %	Protein	10.4	9.9	7.5	9.8	8.0	5.2
	Energy	5.7	5.3	6.1	5.4	6.6	6.9

Increase level protein in body rams for entire period of the rearing was 2.27 kg (122.7%), and ewes – 1.89 kg (145.4%). In all age periods, rams were characterized by the highest concentration of protein in carcass. They surpassed their peers at 4-4.5 months by 0.55 kg or 42.3%, at 7.5-8 months – 1.21 kg or 47.1% and 12 months – 0.93 kg or 29.2% (Fig. 1).

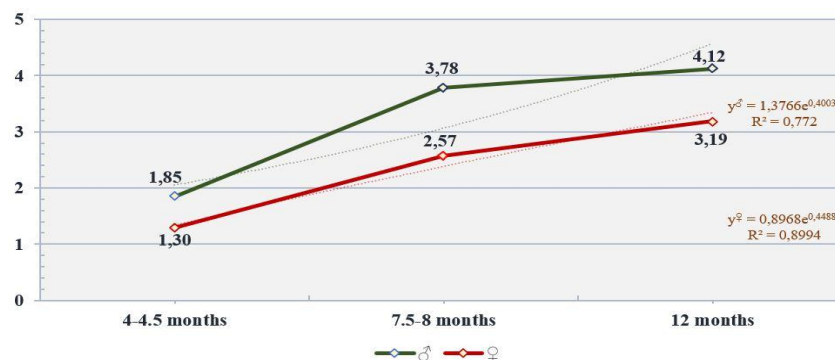


Figure 1 – Dynamics of the protein index

Fat content in body rams increased over 12 months by 1.91 kg (261.6%), and ewes – 2.18 kg (396.4%). According to level content of the extractable fat in body tissues young sheep, a different picture was observed. So, if superiority rams manifested itself at the time of weaning, then ewes in a more adult state still had the highest fat content, i.e. 1.61 kg at semiannual and 2.93 kg at one year old. Advantage in terms of the value studied indicator over rams was 10.3 and 3.2%, respectively (Fig. 2).

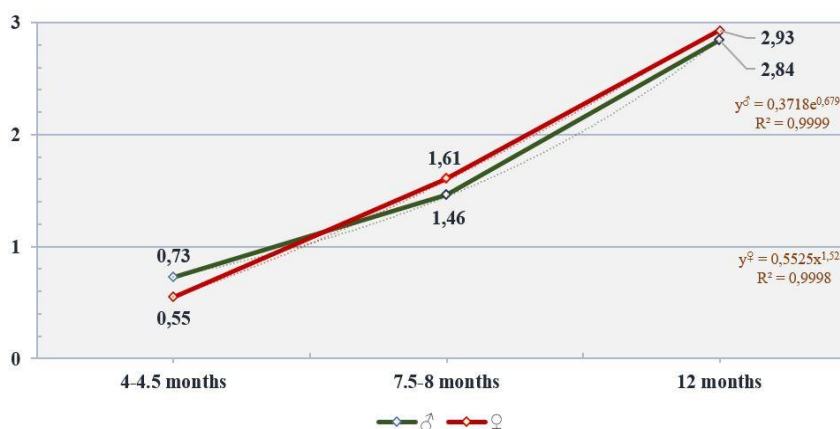


Figure 2 – Dynamics of the fat index

Although ewes were superior to rams in terms of the mass fraction fat in meat products, the dynamics of absolute indicators was not equivalent, which led to their advantage in content extractable fat tissues in localized areas body.

Due to increase in content protein and fat in body young animals, also increases with age the concentration of energy in its edible parts. At rams, this increase of the period from 4 to 8 months was 63512 kJ, i.e. 2.1 times, and ewes – 62197 kJ or 2.4 times. From 8 to 12 months, similarly – 41825 and 38558 kJ (by 1.4 times), respectively (Fig. 3).

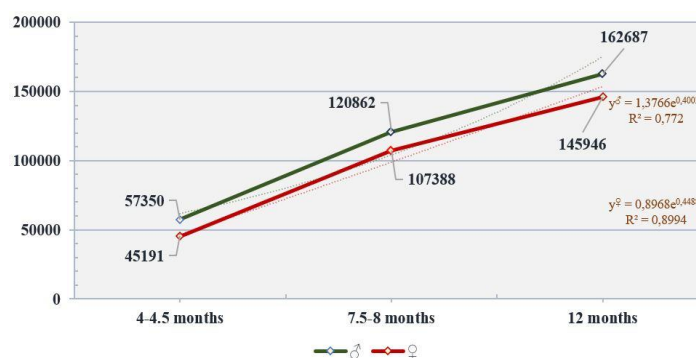


Figure 3 – Dynamics of the energy indicator

The age trend of protein accumulation in body and intergroup differences its absolute mass determined the unequal value of coefficient bioconversion feed protein into food protein meat products. Best ability to transform protein in feed into protein of meat production was found in young animals when slaughtered at 4-4.5 months. And in subsequent age periods, there was a decrease in the studied indicator. So, in period from 4 to 8 months, value of the studied coefficient decreased by 0.5% in rams, 1.8% in ewes, from 8 to 12 months. – 2.4 and 2.8% respectively. Rams surpassed their peers in terms value of the studied indicator by 0.6, 1.9, 2.3% at three ages.

The pattern variability of protein parameters in body young sheep is due to a decrease in the intensity of its synthesis as they grow older and activation of the process localization fat layer along entire body. In this regard, the bioconversion coefficient of feed energy into energy meat production also underwent a change.

It should be noted that value of the studied indicator in age aspect did not always have an unambiguous upward or downward trend. Maximum grade in all studied groups were noted in older individuals, i.e. replacement young animals (6.1 and 6.9%), an intermediate position was noted for the milk period of postnatal ontogenesis (5.3 and 6.6%) and, accordingly, lambs that were at fattening after weaning them from their mothers had a low level (5, 7 and 5.4%).

So, in general, the coefficient bioconversion of feed energy at rams increased by 0.4% over the entire period of study, and 1.5% in ewes. At same, the coefficient of rams in 4-4.5 months was higher than that ewes by 0.3%, and at 7.5-8 and 12 months, on contrary, by 1.3 and 0.8%, respectively, lower, i.e. yielded to females in terms value analyzed indicator.

Conclusion. Thus, studies have established a high ability to transform feed nutrients into meat productivity young Akzhaik sheep.

The nature of synthesis in organism and accumulation nutrients in body of young sheep, depending on the physiological state, determined the age-related dynamics coefficient of protein bioconversion and feed energy into food elements edible parts.

Undoubtedly, intergroup differences, established by the value of transformation coefficients, are expressed by the biological characteristics of young sheep and are determined by sex, since conditions keeping and feeding technology were identical.

Thus, in current economic conditions, a promising method for increasing the production of high-quality meat (mutton) is rational use of the biological capabilities and genetic potential productivity sheep of the studied breed. In this way the use of two biotechnological features is achieved: firstly, the ability of young sheep to grow intensively during the first year of life, and secondly, an increased utilization rate nutrients and feed energy by animals, as well as a high payment for feed by products. In this regard, the main element of sheep breeding technology is organization intensive rearing, which contributes to the manifestation of genetic potential meat productivity young sheep.

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ТҮЙІН

Дененің қоректік заттарға физиологиялық қажеттілігін медициналық стандарттарға сәйкес қатаң түрде қанағаттандыру тамақтану құрылымы мен оның энергетикалық құндылығын жақсартудың маңызды міндеті болып табылады. Адамды жануарлардан алынатын ақуызбен қамтамасыз ету деңгейі белгіленген норманың небәрі 65% құрайды. Сондықтан оны өндіру көлемін ұлғайту мәселесі нутрициология үшін өзекті болып саналады. Осыған байланысты селекционерлер осы талаптарға жауап беретін жануарлардың генотиптерін анықтауға ерекше назар аударады және бұл үшін жемнің негізгі қоректік заттарының жеуге жарамды дене бөліктеріне айналуын ескере отырып, ет өнімділігінің сапасын кешенді бағалау қажет.

Жануарлардың жемшөп қоректік заттарын дене тініне айналдыру тиімділігін бағалау жемшөптің метаболикалық энергиясын және ақуыз мен май түрінде сақталған энергияны пайдалануға негізделген. Олардың ет өнімдеріне биоконверсиясын зерттеу жас қойларды мақсатты өсірудің, жайылымдық азықтандырудың және қарқынды бордақылаудың ұтымды технологияларын жасауға мүмкіндік береді.

Бұл мақалада Қазақстанның батыс өңірінің күрт континенттік климаты жағдайында Ақжайық тұқымды жас қойлардың ет өнімдеріне ағзадағы қоректік заттардың жинақталуын және ақуызбен энергияның биоконверсиясын талдау нәтижелері келтірілген. Сынақ

субъектілерінің ағзасындағы ақуыз құрамының өзгеруінің белгіленген заңдылығы оның синтезінің қарқындылығының төмендеуіне және майдың тұндыру процесінің белсендірілуіне байланысты. Біздің ақпаратымыз бойынша, жас жануарлардың жасына қарай Жем энергиясының ұшаның жеуге жарамды бөліктерінің энергиясына биоконверсия коэффициенті 28% - ға дейін өсті, ал ақуыз, керісінше, 89% - ға дейін төмендеді.

РЕЗЮМЕ

Удовлетворение физиологической потребности организма в питательных веществах в строгом соответствии с медицинскими стандартами является важной задачей для улучшения структуры питания и его энергетической ценности. Уровень обеспечения человека белком животного происхождения составляет всего 65% от установленной нормы. Поэтому проблема увеличения объемов его производства считается актуальной для нутрициологии. В связи с этим селекционеры уделяют особое внимание выявлению генотипов животных, отвечающих этим требованиям, а для этого необходимо провести комплексную оценку качества мясной продуктивности с учетом превращения основных питательных веществ корма в съедобные части тела.

Оценка эффективности преобразования животными питательных веществ корма в ткани организма основана на использовании обменной энергии корма и запасенной энергии в виде белка и жира. Изучение их биоконверсии в мясные продукты позволяет разработать рациональные технологии направленного выращивания, пастбищного кормления и интенсивного откорма молодняка овец.

В данной статье представлены результаты анализа накопления питательных веществ в организме и биоконверсии энергии с белком в мясные продукты молодняка овец акжайкской породы в условиях резко континентального климата Западного региона Казахстана.

Установленная закономерность изменения содержания белка в организме подопытных особей обусловлена снижением интенсивности его синтеза и активацией процесса отложения жира. По нашей информации, с возрастом молодняка коэффициент биоконверсии энергии корма в энергию съедобных частей туши увеличился до 28%, в то время как белок, наоборот, снизился до 89%.

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THE INTENSITY OF GROWTH OF YOUNG KALMYK BREED IN THE CONDITIONS OF LLC «MOSKOVSKY»

ANNOTATION

In the Republic of Kazakhstan, in recent years, the Kalmyk breed has been noted for its products in the meat direction in the development of meat cattle breeding. It is known that the