

## AMINO ACID COMPOSITION OF SHEEP MILK OF DIFFERENT GENOTYPES

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**Annotation.** The growth, development and preservation of lambs depend on the milk yield of their mothers, the chemical composition of milk and its biological value. Research has established that the breed improving of sheep is bulls-intensive meat breeds. High milk yield of ewes in combination with a good feed base makes it possible to obtain more precocious young stock that can exist independently after separation at the age of 2.5 months.

**Key words:** *Milk productivity, amino acid composition of milk, ewes, Askanian meat-wool breed, texel, olibs.*

**Introduction.** The main condition for the normal development of lambs in the suckling period is regular and sufficient feeding of breast milk. There are nutrients that come with the blood and are converted into components of milk in the breast. The most biologically valuable component of milk is protein.

Energy value (caloric content) of 1 gram of milk protein in the body of the animal is 4.1 kilocalories, and their digestibility in the body reaches 96-98%.

Amino acids are the building blocks that protein structures are built of. The body uses them for its own existence, recovery, strengthening and synthesis of various hormones, antibodies and enzymes.

The number of individual groups of amino acids in proteins is due to breed dependence, individual characteristics of animals, lactation stage, season and other factors that affect the physicochemical and technological properties.

**Material and methods of research.** Experimental studies were conducted on the basis of LLC "Charollais Sheep" Novomoskovsk district of Dnipropetrovsk region. The Dnipropetrovsk-type Askaniya meat-wool breed of Dnipropetrovsk-type females (AMD) were crossed with Olib and Texel breeding rams. We obtained second-generation crosses of the breed Olibs (F<sub>2</sub>O1) and Texel (F<sub>2</sub>T) by using transform crossbreeding.

We analyzed the amino acid composition of sheep's milk of different genotypes in order to determine the completeness of milk productivity of ewes.

We determined the milk yield of ewes as the difference in live weight of lambs before and after suckling once in 10 days during the whole suckling period (120 days). At the same time, we took average samples to determine the biochemical composition of milk. The amino acid content of milk was determined using an ion exchange analyzer T-339.

**Research results.** High-milk ewes provide better growth and development of lambs in the first month of lactation. Therefore, it is especially important during this period to provide lambs with whole milk. Significant nutritional value of milk proteins is characterized by a high degree of their assimilation in the body and amino acid composition.

We have established the dynamics of the content of essential amino acids in the milk of sheep of different genotypes.

The analysis of sheep's milk of different genotypes showed that the level of essential amino acids in the milk proteins of local ewes was slightly higher compared to purebred peers of the Askanian meat-wool breed of Dnipropetrovsk type.

Each amino acid of milk determines its completeness by protein milk content and plays its function in the body of lambs, especially in the first month of lactation.

Thus, phenylalanine is required for insulin synthesis and promotes the excretion by the kidneys and liver of metabolic products. Its amount in the milk of experimental ewes was in the range of 3.6-4 mg % depending on the origin.

Threonine is required for the synthesis of immunoglobulins and antibodies. This amino acid is an important component of collagen, elastin. The amount of threonine in the milk of local ewes by texel and olibs is almost the same level and is 4.8 and 4.6 mg %, which is 17.1 ( $P < 0.01$ ) and 12.2 % more than in purebred Askanian ewes meat of wool breed.

The essential amino acid Lysine ensures proper absorption of calcium, and is involved in the formation of collagen, antibodies, hormones and enzymes. Most of this amino acid is in the milk of local ewes by olibs. In purebred queens of Askanian meat-wool breed in comparison with mixtures of texel and olibs lysine content by 25.0 ( $P < 0.001$ ) and 9.1 %, respectively, less.

Isoleucine is a source of energy and plays an important role in the formation of muscle tissue. The level of isoleucine in the milk of purebred ewes is 2.7 mg %. According to this indicator, the mixture of texel and olibs is likely to be dominated by purebred peers by 40.7 ( $P < 0.001$ ) and 29.6 ( $P < 0.01$ ) %, respectively.

The normal functioning of the nervous system and digestion of newborn lambs depends on the level of valine and leucine in milk. Valine increases muscle coordination and reduces the body's sensitivity to pain, low and high temperatures.

Its number in the milk of purebred ewes of Askanian meat-wool breed of Dnipropetrovsk type by 22.2 ( $P < 0.001$ ) and 13.3% ( $P < 0.05$ ) is probably less compared to the milk of texel and olibs crossbreeds. The same trend applies to the content of leucine, which is needed to strengthen the immune system of lambs - 14.3 ( $P < 0.05$ ) and 11.0 % less, respectively.

Methionine prevents disorders of metabolic processes in the formation of wool. Its content in the milk of local ewes is 2.1 mg %, which is probably 50.0 % higher ( $P < 0.01$ ) than in the milk of purebreds.

The presence of substitute amino acids in milk is also an advantage on the part of local ewes.

Aspartic acid is actively involved in the excretion of ammonia that is harmful to the central nervous system. There is by 15.3 % ( $P < 0,001$ ) probably less of Aspartic acid in the milk of purebred ewes than in the milk of ewes by texel and 9.7 % ( $P < 0,001$ ) – by olibs.

Serine is a necessary component for the accumulation of glycogen in muscle tissue. It forms protective "covers" around the nerve fibers. In the milk of local livestock, texel and olibs of this amino acid are probably than in the milk of purebred peers by 23.4 ( $P < 0.001$ ) and 12.5 % ( $P < 0.05$ ).

Glutamine is important for normalizing blood sugar levels. Its in the milk of purebred ewes by 39.9 % ( $P < 0.001$ ) is probably less than in the milk of crossbred texels and 31.5 % ( $P < 0.001$ ) – by olibs.

Functioning of ligaments and joints, ensuring long-term use of the animal is not possible without Proline. Its amount in milk of local livestock by texel and olibs by 10.3 % ( $P < 0.01$ ) and 5.9 % ( $P < 0.05$ ) is probably higher compared to purebred livestock.

Glycine is actively involved in providing oxygen to the process of new cell formation and is an important stimulator for the formation of hormones that are responsible for strengthening the immune system. Glycine in the milk of purebred ewes is 1.1 mg %, which is 63.6 % ( $P < 0.001$ ) and 21.4 % ( $P < 0.05$ ) is probably less than in the milk of local ewes by texel and olibs.

Alanine is an important source of energy for muscle tissue. It strengthens the immune system by producing antibodies and is actively involved in the metabolism of sugars and organic acids. Alanine in the milk of local ewes by olibs by 57.1 % ( $P < 0,001$ ) is probably higher than in purebreds. In the milk of ewes by texel this amino acid is probably higher than in purebred peers by 76.2 % ( $P < 0.001$ ).

Cystine is a sulfur-containing amino acid that is required for hair growth and formation. In the milk of local livestock for texel and olibs of this amino acid 0.9

and 1.1 mg %, which is 57.1 ( $P < 0.01$ ) and 28.6 % more than in the milk of purebred ewes.

The amount of tyrosine in the milk of purebred ewes is probably lower by 127.3 ( $P < 0.001$ ) and 118.2 % ( $P < 0.001$ ) than in the milk of texel and olibs. This amino acid is necessary for the normal functioning of the adrenal glands, thyroid gland and pituitary gland, the creation of red and white blood cells.

The amino acid histidine is almost 60% absorbed through the intestine and plays an important role in protein metabolism, in the synthesis of hemoglobin, red and white blood cells, and promotes tissue growth and repair. Its amount in the milk of local ewes by texel and olibs is 3.3 and 3.2 mg %, which is 37.5 ( $P < 0.001$ ) and 33.3 ( $P < 0.001$ ) % probably more than in the milk of purebred peers.

Arginine, participating in the secretion of growth hormone, strengthens the immune system and promotes muscle growth and reduced body fat. The amount of this amino acid in the milk of purebred ewes and local olibs is at the same level and is 3.1 mg %. This figure is slightly higher by 12.9 ( $P < 0.05$ ) % in local ewes by texel.

Analyzing the amino acid composition of milk throughout the lactation period, it should be noted that lambs are better provided with whole milk for 1-2 months of lactation. Thus, the total amount of all essential amino acids in the milk of purebred ewes by the end of lactation decreased by 39.3 %, in local ewes by texel and olibs by 39.6 and 40.4 %, respectively.

A significant decrease in the milk of purebred ewes of Askanian meat-wool breed of Dnipropetrovsk type was observed for such vital amino acids as leucine (by 59.3 %), valine (by 37.8 %), threonine (by 64.5 %), phenylalanine (47.2 %). At the same time, there is an increase in lysine content – by 9 %.

The total amount of replacement amino acids in the milk of purebred ewes also decreased by 43.3 %.

In comparison with purebred Askanian Meat-and-Wool breeds of the Dnipropetrovsk Type (AMD) milk of local ewes by texel and olibs during the whole lactation period differs in its completeness. In the second month of lactation, the total amount of essential amino acids in the milk of crossbreeds by 21.8 ( $P < 0.001$ ) and 12.6 % ( $P < 0.01$ ) is probably higher than in purebred peers, in the third month of lactation – by 20.4 ( $P < 0.01$ ) and 11.6 %. It should be noted that the amount of lysine in the milk of local ewes by texel and olibs is probably higher by 21.7 ( $P < 0.001$ ) and 13.0 % ( $P < 0.01$ ) in the second month and by 18.8 ( $P < 0.001$ ) and 14.6 % ( $P < 0.01$ ) in the third month of lactation than in the milk of purebred AMD.

After analyzing the data obtained, we can conclude that local ewes are not only high levels of milk productivity, but also the full value of milk produced, which provides accelerated growth and development of lambs.

**Conclusion.** Our research has established that sheep-breeders of intensive meat breeds – olibs and texels are not only in terms of milk productivity, but also in terms of the quality of milk produced are the best ones. The milk yield of ewes with high amino acid content in combination with a good feed base makes it possible to obtain more precocious young and to wean them at the age of 2-2.5 months.

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## **PECULIARITIES OF PRODUCTION OF SOUR MILK PRODUCTS FROM MILK**

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Yogurt is the most famous and most popular in the world of all fermented milk products, which is made of the milk of cows, sheep and goats. The highest consumption of yogurt is observed in the Mediterranean countries, Asia and Central Europe.

Yogurt is an ancient craft that originated thousands of years ago, possibly as soon as cows, goats and sheep were domesticated. Although there is no exact