# WAYS TO IMPROVE PRODUCTIVE TRAITS IN FINE-FLEECED SHEEP FARMING

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*The article presents the results of research aimed at increasing productive traits in fine-fleeced sheep breeding through the use of interbreeding. The aim of the work was to establish the effectiveness of using ram charolais sheep in crossing with ewe of the ascanian fine-fleeced breed of the Tauride type to improve the level of meat productivity and quality of lamb.*

*In the course of the research, a comparative analysis of the growth and development of young animals was carried out based on the determination of live weight, growth coefficients, absolute and average daily increments in purebred and local peers of different gender and age groups.*

*It was found that local young animals ($F_1$) outnumbered purebred peers by live weight by 18.8-40.3% at weaning and 16.9–17.6% at 12 months of age. and it was characterized by higher growth rates and uniform development of the musculoskeletal system.*

*Local young animals ($F_1$) are characterized by higher growth rates at weaning by 6.98-8.8%, at 12 months the difference is 4.2-7.6%. according to the average daily growth rates, there is a difference in the range of 20.8 -21.8% at weaning, followed by a decrease to the age of one year, depending on gender..*

*The intensity of growth and development of young animals can be determined by appropriate indices. Indices of formation intensity, stress and growth uniformity are higher in local young animals*

*The manifestation of the heterosis effect led to an increase in assimilative activity, which contributed to a more intense accumulation of muscle tissue and the formation of more pronounced meat forms. Balanced feeding and optimal conditions of keeping ensured the realization of the genetic potential of growth and development of crossbreeds, as indicated by the results obtained.*

*It is proved that the use of ram charole sheep on ascanian fine-fleeced ewe is an effective biotechnological technique that allows obtaining highly productive young meat and wool without compromising the quality of wool raw materials.*

*The research results confirm the feasibility of introducing systematic interbreeding in the conditions of the Dnieper region to increase the profitability of production and competitiveness of the sheep breeding industry in Ukraine.*

**Keywords.** Ascanian fine-fleeced breed (As), $F_1$, local young animals, live weight, growth coefficient. growth intensity indices.

# ШЛЯХИ ПОКРАЩЕННЯ ПРОДУКТИВНИХ ОЗНАК В ТОНКОРУННОМУ ВІВЧАРСТВІ

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*У статті наведено результати досліджень, спрямованих на підвищення продуктивних ознак у тонкорунному вівчарстві шляхом застосування міжпородного схрещування. Метою роботи було встановлення ефективності використання баранів породи шароле у схрещуванні з матками асканійської тонкорунної породи таврійського типу для покращення рівня м'ясної продуктивності та якості баранини.*

*У ході досліджень проведено порівняльний аналіз росту та розвитку молодняку на основі встановлення живої маси, коефіцієнтів росту, абсолютних і середньодобових приростів у чистопородних та помісних однолітків різних статевовікових груп.*

*Встановлено, що помісний молодняк (F₁) переважав чистопородних однолітків за живою масою на на 18.8-40.3% при відлученні та 16.9–17.6 % у 12-місячному віці.та характеризувався вищими темпами росту та рівномірним розвитком скелетно-м'язової системи.*

*Помісний молодняк (F₁) характеризуються вищими коефіцієнтами росту при відлученні на 6.98-8.8%, В 12 місяців різниця становить 4.2-7.6% За показниками середньодобових приростів спостерігається різниця в межах 20.8 - 21.8% при відлученні з подальшим зниженням до річного віку в залежності від статі..*

*Інтенсивність росту і розвитку молодняку можна визначати відповідними індексами. Індекси інтенсивності формування, напруги та рівномірності росту вище у помісного молодняку*

*Прояв ефекту гетерозису зумовив підвищення асимілятивної активності, що сприяло інтенсивнішому накопиченню м'язової тканини та формуванню більш виражених м'ясних форм. Збалансована годівля й оптимальні умови утримання забезпечили реалізацію генетичного потенціалу росту і розвитку помісей на що вказують отримані результати.*

*Доведено, що використання баранів породи шароле на асканійських тонкорунних матках є ефективним біотехнологічним прийомом, який дозволяє отримувати високопродуктивний молодняк м'ясо-вовнового напряму без погіршення якості вовнової сировини.*

*Результати досліджень підтверджують доцільність упровадження системного міжпородного схрещування в умовах Придніпровського регіону для підвищення рентабельності виробництва та конкурентоспроможності галузі вівчарства України.*

**Ключові слова.** Асканійська тонкорунна порода (АС), F₁, помісний молодняк, жива маса, коефіцієнт росту. індекси інтенсивності росту.

**Introduction.** At all stages of society's development, the main thing is to provide the population with high-quality and complete food products. This problem can be solved only by increasing the production of all types of livestock products. A significant place in this is occupied by purposeful breeding work, taking into account its methods and techniques that are focused on improving the breeding and productive qualities of animals (Poshil, V. I. et al., 2021; Maksym, V et al. 2022).

As an integral part of agro-industrial production in Ukraine, sheep farming remains one of the least intensive industries, the development of which is based mainly on the use of cheap natural pastures and coarse feed with minimal involvement of concentrates. Traditionally, separate zones of specialization have been formed on the territory of the country, differing in the direction of sheep productivity: fine-fleeced, semi-fine-fleeced, semi-coarse-wool and coarse-wool. This division is determined by the climatic, feed and economic conditions of each region (Binkevich, V. Ya., & Yatsenko, I. V., 2015; Ibatullin, I. I. et al., 2014; Pokhyl, V. I., & Mykolajchuk, L. P., 2020).

Different agroecological zones are dominated by local breeds and intra-breed types of sheep, which for a long time were formed under the influence of natural selection and adapted to specific living conditions. Such animal populations remain genetically stable until new requirements for the level of productivity or economic factors determine the needs of society for improving production efficiency (Ibattulin, M., & Svinous, N., 2022).

Using various breeding methods, new types of animals are created that, in accordance with specific agroecological conditions of feeding and keeping, are able to produce competitive high-quality and cheap products. Only under the conditions of scientifically based introduction of new farming methods and breeding approaches is it possible to improve and increase or change the direction of productivity. (Hovhannisyan, V. S., 2018).

Taking into account current trends in the development of World sheep breeding, there is an increase in the economic share of lamb and mutton in the structure of the industry's products. In most countries, revenue from meat sales accounts for more than 90% of the total cost of sheep products, while the share of wool does not exceed 10 %. This leads to a reorientation of production in the direction of meat and meat-wool directions.. At the same time, the share of lamb in the meat balance of the industry is growing, since the population's demand for it is higher than for Lamb obtained from older sheep (Pokhil, V. I. et al., 2021; Owens, F. N. et al., 1993).

According to economic indicators, the most appropriate areas of productive use of sheep in Ukraine are meat and meat-wool, which provide an optimal ratio between the quality of wool and live weight gain. At the same time, increasing the production of lamb and mutton is a way to contribute to the economic activity of the region, ensuring its food security, support sheep farmers, while preserving the environment in this regard, increasing the meat productivity of various breeds, including fine – fleeced ones, characterized by less intensive growth, is one of the priority tasks in breeding work (Iovenko, V. M., & Nezhlukchenko, N. V., 2017; Yefremov, D. V., & Svistula, M. M., 2021).

Improvement of the productive characteristics of domestic sheep breeds of various production directions, especially meat, is carried out by attracting the best global gene pool in this direction. The purpose of its use is to increase the level of meat content in animals of local populations, form a meat type of body structure, and improve its technological qualities (AL-Jaryan, I. L. et al., 2023; Yakovchuk, V. S., & Gorlova, O. D., 2017).

Sheep productivity indicators are important signs for the profitability of any sheep farming, and an increase in their level can be achieved through many methods, such as increasing the percentage of lambs, increasing their weight at weaning, higher quality or more efficient use of feed resources (Alves, Â. G. C. et al., 2018; Zharuk, P. G., & Atanovskaya-Maslyuk, O. I., 2021).

One of the ways to increase the level of sheep productivity is to introduce a crossbreeding system and use the desired characteristics of two or three breeds. The combination of these features improves the maternal or terminal characteristics of the breed, which is improved by the heterosis effect, also known as hybrid energy (strength).(Slavkova, O. P., & Kovaleva, O. M., 2017; Turinsky, V. M. et al., 2020; Behan et al., 2021).

The most effective tool for targeted changes is the use of interbreeding of local sheep with "improving" breeds. This measure helps to increase the level of productivity of native livestock to the indicators of highly productive breeds or create new types of animals that combine the desired properties of the original forms (Sheridan, R. et al., 2003; Zaruba, K. V., & Drozd, S. L., 2018).

The size of an adult is usually considered as the point of maximum muscle mass at which the process of increasing the level of fat deposition begins, and animal growth is defined as an increase in body weight achieved by hypertrophy and hyperplasia to mature size, accompanied by changes in body conformation (Owens et al., 1993; Iovenko, V. M., & Gladiy I. A., 2021).

Although genotype is one of the main factors in assessing the growth and development potential of lambs, its rate can vary under the influence of environmental and feeding factors (Suprun, I. O. et al., 2021).

Heterosis, or hybrid energy, is defined as the increased productivity of the offspring obtained as a result of crossing, compared to the average of the parent forms. Lambs tend to be more resilient at birth, have higher retention rates, and often grow faster. In addition, repair livestock reaches sexual maturity earlier and is more productive. This is especially important for producers who want to breed terminal lambs. All received young animals of the current year of birth are sold (Boyko, N. V. et al., 2022; Herman, Yu. I., & Herman, A. I., 2019).

There are different models of using crossbreeding in sheep breeding. But the practice of interbreeding sheep also has its own regional characteristics. Industrial crossing is a generally recognized effective method for obtaining animals that are genetically and morphologically adapted to a specific complex of ecological and economic conditions. Crossbreeds often have better indicators of viability, growth and productivity compared to purebred animals, especially when moving the latter to other agroecological zones. At the same time, the effectiveness and directions of crossing depend on many factors, including the level of development of the sheep breeding industry itself in a particular region, its resource feed base and breeding policy (Kitaeva, A., & Novichkova, A., 2022; Banks, R., 2022).

Depending on the zonal breeding conditions, the choice of breeds for crossing should be based on scientifically based criteria for the combined ability of the initial genotypes, ensuring further achievement of maximum productivity while maintaining adaptive qualities.

The practice of research in sheep breeding indicates that increasing the profitability of the industry can be directly related to the implementation of programs aimed at increasing the meat productivity of sheep by crossing Queens with producers of intensive meat breeds (Zytvun,I. A. et al., 2018).

During interbreeding, in order to obtain certain desired meat characteristics in crossbreeds, some breeds of sheep are intensively used.. Suffolk, Hampshire, Charolais, Dorper, Southdown and Texel are known for their intensive growth and development, as well as excellent meat characteristics of the carcass. They are generally called Terminal rocks (Yakovchuk, V. S., & Stolbunenko, S. G., 2021; Pokhil V. I. et al., 2022).

The Dnieper region is traditionally dominated by fine-fleeced sheep breeding, which is represented by the ascanian fine-fleeced breed of combined wool and meat productivity. This breed has historically been the basis for the production of merino wool in most farms of the steppe and forest-steppe zones of Ukraine. However, despite its high wool qualities, the level of intensity of morphophysiological processes associated with meat productivity remains insufficient for modern requirements for animal productivity. This, in turn, leads to a gradual reduction in the number of merino-type sheep in farms of various forms of ownership. (Kravchuk, V. et al., 2020; Pokhil V. I. et al., 2021; Bolormaa, S. et al., 2017).

Given this, the actual direction of scientific research is to improve the ascanian fine-fleeced breed by improving its meat qualities without compromising wool productivity. Such studies are conducted on the basis of the Dnipro state agrarian and economic University, where breeding approaches aimed at combining high meat fattening capacity with traditionally good wool quality are developed and tested. The implementation of this direction is important both for restoring the competitiveness of the sheep industry and for increasing its profitability in a market economy.

The aim of the research was to establish the effectiveness of interbreeding ewe of ascanian fine-fleeced sheep and ram charolais sheep producers and to assess the influence of the genotype on the intensity of growth and development of young animals. This area of research has not only an industrial, but also a significant scientific perspective.

**Research material and methodology.** 100 sheep of the ewe ascanian fine-fleeced breed were selected for research. Sheep were similar in origin, and in groups by age in lambs, live weight were in the same conditions of keeping and feeding. Artificial insemination was performed with sperm with an activity of at least 8 points with their concentration in the ejaculate at the level of 1.9 billion. in 1 ml. and the volume of sperm dose is 0.12 – 0.15 ML.

The object of research was young animals of experimental groups: Group I – purebred ascanian merinos (As), n=20; II – crossbreeds ($F_1$), n=20.

The study of the growth and development of young animals on the basis of comparative analysis was carried out during key periods of postnatal ontogenesis by periodic individual weighing of animals for 12 months. At the same time, all experimental animals were kept in the same conditions that met the requirements for sheep of this area of productivity. Feeding was carried out according to typical diets, balanced in basic nutrients in accordance with the age and physiological state of the animals.

The relative increase was estimated by the formula proposed by Mayonnaise and improved by S. Brody

$$\text{B} = \frac{W_1 - W_0}{0.5 \cdot (W_1 - dW_0)} \cdot 100 \cdot \qquad (1)$$

where B is the relative increment, %;
$W_1$-final live weight, kg;
$W_0$-initial live weight, kg;
t-Period, days.

**111**

In order to select criteria for evaluating the growth patterns of young sheep in early ontogenesis, indicators of the intensity of formation were determined according to the method of Yu. K. Svechin using the formula

$$\Delta t = \frac{W_1 - W_0}{0,5 \cdot (W_2 + W_4)} - \frac{W_6 - W_4}{0,5 \cdot (W_4 + W_6)} \tag{2}$$

where $\Delta t$ is the intensity of animal formation;
$W_2$, $W_4$, and $W_6$ are live weight at 2, 4, and 6 months of age, respectively.
Indicators of growth stress ($I_n$) and uniformity index ($I_r$) were studied according to the method of V. P. Kovalenko et al. (Kovalenko, V. P., & Nezhlukchenko, T. I., 2008).

$$I_n = \frac{\Delta t}{VP} \cdot SP \tag{3}$$

$$I_r = \frac{1}{1 + \Delta t} \cdot SP \tag{4}$$

where VP is the relative increment, %;
SP-average daily growth, G.
Biometric data processing was performed using MS Excel software using statistical functions.

**Research results.** The animal's body is an integral biological system that undergoes a consistent chain of quantitative and qualitative changes in the process of growth and development.

In modern scientific practice, considerable attention is paid to the study of the regularities of these processes under the influence of hereditary factors, conditions of maintenance and the level of feeding. A comprehensive study of such factors makes it possible to carry out early diagnostics of potential productivity, select animals with high reproductive and reproductive qualities, and predict the level of the main breeding characteristics in the livestock.

Postembryonic development of the body is characterized by uneven growth rate of individual tissues and organs in different age periods, as well as constant changes in their morphofunctional ratios. The genetically determined growth program undergoes certain adjustments under the influence of environmental factors, in particular the level of feeding, microclimate and conditions of maintenance.

The productivity potential, which is due to hereditary factors, can be realized only under favorable growing conditions. The influence of paratypical factors during the period of active growth and development of young animals can either stimulate the formation of a highly productive type of animals, or, conversely, inhibit the realization of their hereditary potential.

One of the most informative criteria for assessing growth and development is live weight and the nature of its changes in animals of different gender and age groups. It is this indicator that integrally reflects the intensity of Morphoforming processes that occur in the body at different rates depending on the physiological state. Variations in live weight, in turn, reflect the efficiency of metabolic processes and the ability of the animal to accumulate muscle tissue.

As part of the work, the regularities of growth and development of young sheep of different gender and age groups of the ascanian fine-fleeced breed and crossbreeds of the first generation ($F_1$) obtained from crossing ewe sheep (As) with sheep-producers of the fertile ram charolais breed were studied. This made it possible to make a comparative

assessment of growth rates, developmental energy, and the influence of genotype on live mass formation.

*Table 1*

**Dynamics of live weight of experimental ram**

| Age, month | Genotype | | | |
|---|---|---|---|---|
| | As | | F₁ | |
| | x±Sx | growth rate | x±Sx | growth rate |
| At birth | 4,3±0,11 | | 4,7±0,13 | |
| 1 | 9,9±0,61 | 2,23 | 12,1±0,35 | 2,57 |
| 2 | 15,8±0,45 | 3,67 | 18,9±1,14 | 4,02 |
| 3 | 20,15±0,65 | 4,68 | 24,7±1,25 | 5,25 |
| 4 | 24,9±0,84 | 5,79 | 29,6±1,67 | 6,30 |
| 6 | 31,6±1,12 | 7,35 | 37,9±1,45 | 8,06 |
| 8 | 37,8±1,71 | 8,79 | 44,8±2,15 | 9,53 |
| 12 | 47,7±2,14 | 11,09 | 56,1±2,65 | 11,94 |

The results of studies indicate that the live weight of ram ascanian fine-fleeced Lambs is significantly lower compared to local peers for all age periods of development. At birth, there is an advantage of local young animals – the difference is 9.3%, ($p \leq 0.05$) due to the influence of genetic factors of the charolais meat breed.

In the future, the intensity of accumulation of live mass increases more pronounced in cross sheep, which is confirmed by a significant difference in the range of 17.6–22.6%, depending on age. , ($p \leq 0.05$)

An expert assessment of young animals at 12 months of age revealed a 17.6% preference for crossbreeds by live weight ($p \leq 0.05$) relative to purebred peers. This result reflects the increased activity of assimilative processes associated with an increase in live weight. This pattern indicates a pronounced effect of heterosis, which manifests itself during interbreeding.

Local young animals are characterized by increased growth energy and large body measurements, which indicates the harmonious development of the musculoskeletal system. In such animals, there is a more intense and proportional formation of muscle tissue, so that meat forms are more clearly expressed.

To assess the uniformity of development of lambs of experimental groups, the growth coefficient was used, which is an informative indicator of the intensity of growth processes in different age periods and allows you to objectively control the growth rate and the effectiveness of compliance with technological requirements during the cultivation of young animals, which is of great practical importance for improving feeding and breeding methods

Analysis of the dynamics of changes in the growth coefficient Indicator shows that in all age periods of postnatal ontogenesis, a stable dominance of local young animals with the participation of the charole breed over purebred peers of the ascanian fine-fleeced one was observed. By the age of one month, local young animals in this indicator predominate purebred peers by 15.2%, followed by a decrease in the level to 7.6% at the age of 12 months. This indicates a more intensive course of metabolic processes in crossbreeds, which are directly related to the formation of live weight and the overall growth rate of the body. Consequently, the genetic combination of a meat breed with a fine-fleeced one leads to an improvement in metabolic parameters, which is reflected in the increased growth energy of animals.

Full-fledged reproduction of the herd and stable functioning of sheep farms is possible only if there is a high-quality repair reproductive livestock that can ensure the restoration of a productive resource. During interbreeding, there are noticeable differences in the exterior profile of crossbreeds of different age and gender groups. These differences are due to the increased live weight of crossbreeds, which is explained by the heterozygosity of their genotype and more efficient implementation of the hereditary growth potential.

The revealed phenotypic differences between the experimental animals are also due to the manifestation of sexual dimorphism, which manifests itself in more pronounced growth parameters of males and differences in the rate of muscle mass accumulation between the Sexes. This confirms that the genetic combination of different breeds contributes to an increase in the variability of morphological traits, while maintaining the general tendency to improve the level of live weight and subsequent meat productivity.

Based on the results of a study of the dynamics of live weight of experimental yarochki (table. 2) it was found that the use of interbreeding in order to improve meat qualities made it possible to maintain a stable difference in live weight between local and purebred animals in the range of 16.9–22.5%, depending on age. This indicates a positive influence of hereditary factors of producers of improving meat-type breeds on the growth rate and development of young animals obtained from crossing.

The dominance of local ravines over purebred peers was also observed by the growth coefficient, which indicates their higher physiological activity and better intensity of live mass accumulation. The level of preference for this indicator is in the range of 9.25% by the age of 30 days (p≤0.05). In the future, there is a gradual decline to 4.2% at the annual age. The increased growth rate of local ravines leads to the production of more developed reproductive young animals, which are characterized by a harmonious body structure, balanced measurements and favorable phenotypic characteristics that will be taken into account when forming flocks for further reproduction.

So, summarizing the results obtained, it can be argued that under the same conditions of keeping and feeding, local young animals significantly predominate over purebred peers in terms of the main growth indicators throughout the entire growing period. This confirms the expediency of using interbreeding as an effective tool for increasing the meat productivity of fine-fleeced sheep without significant loss of wool characteristics.

*Table 2*

**Dynamics of live weight of experimental yarochki**

| Age, month | Genotype | | | |
|---|---|---|---|---|
| | As | | $F_1$ | |
| | x±Sx | growth rate | x±Sx | growth rate |
| At birth | 4,1±0,16 | | 4,6±0.14 | |
| 1 | 9,3±0,46 | 2,27 | 11,4±0,44 | 2,48 |
| 2 | 14,8±0,65 | 3,61 | 18,1±1,29 | 3,93 |
| 3 | 19,1±0,95 | 4,66 | 23,2±1,65 | 5,04 |
| 4 | 23,5±1,25 | 5,73 | 28,2±1,72 | 6,13 |
| 6 | 29,4±1,35 | 7,17 | 34,6±1,91 | 7,52 |
| 8 | 34,8±1,92 | 8,49 | 41,2±2,35 | 8,95 |
| 12 | 44,9±1,75 | 10,95 | 52,5±2,54 | 11,41 |

Among the main indicators used in zootechnical analysis, the leading place is occupied by the average daily increase in live weight – a relative value that is often considered as a linear function. However, this relationship does not fully reflect the relationship between the age of animals and their growth rates, since it does not take into account fluctuations in the intensity of development in different periods of postembryonic ontogenesis.

For a more objective assessment of the growth intensity of experimental animals based on known live weight indicators, absolute and average daily increments were determined. These parameters are important indicators of growth rates and are used as the main elements of a lifetime assessment of sheep meat productivity. The analysis of these indicators allows us to establish patterns of live mass formation and evaluate the effectiveness of realizing the hereditary growth potential depending on the genotype and conditions of maintenance.

Analysis of the results obtained shows that live weight gains in local young animals ($F_1$) significantly exceed the indicators of the original ascanian fine-fleeced breed. The average daily growth of crossbreeds in the period (0-4) is in the range of 207.5 G. which is 20.8% higher than their purebred peers. Such features are also observed in terms of the level of absolute increments. In the future, by the age of 12 months, the dominance decreases to the level of 18.3%.These patterns can also be traced in reproductive young animals .where local yarks dominate in terms of growth over purebred ones in the period (0-4) in the range of 21.6%, followed by a decrease of 17.3% to 12 months.

The results confirm that merino is a late-maturing breed that is known for its wool productivity, not meat productivity, and therefore shows lower growth and development characteristics compared to crossbreeds.

Assessment of the intensity of growth and development of young sheep, as well as their breed differences, can be carried out by determining the appropriate indices. Indexes help you understand how actively an animal is gaining weight, especially during postnatal ontogenesis. The main ones are: the intensity of formation Δt, the growth Stress Index, $I_n$, growth uniformity index, $I_r$ (Table 3).

Studies have established that the maximum intensity of formation falls on the age period from birth to four months for all genotypes studied and is in the range of 1.0-1.07.

In the period from birth to 8 months of age, its level increases to a value of 1.33-1.40. during this period, the intensity of forming processes is higher in sheep, with the overall advantage of crossbreeds over purebred peers in this indicator. Crossbreeds are marked by a faster type of formation and have a higher value of this indicator.

Therefore, it can be stated that the intensity of formation is associated with differentiation processes, during which the growth and development of young sheep depends on the genotype of the original breeds.

*Table 3*

**Indices of growth intensity of young animals, age**

| Indicators | Genotype | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | As | | | | F₁ | | | |
| | ram | | yarochki | | ram | | yarochki | |
| | 0-4 | 0-8 | 0-4 | 0-8 | 0-4 | 0-8 | 0-4 | 0-8 |
| Formation intensity Δt | 1,00 | 1,36 | 1,01 | 1,33 | 1,04 | 1,40 | 1,07 | 1,36 |
| Growth stress index, $I_n$ | 1,21 | 1,19 | 1,16 | 1,07 | 1,48 | 1,44 | 1,46 | 1,29 |
| Growth uniformity index, $I_r$ | 0,85 | 0,59 | 0,80 | 0,55 | 1,01 | 0,82 | 0,95 | 0,65 |

The growth stress index in agriculture, in particular when raising animals (young sheep), indicates the intensity and intensity of growth of the animal in certain age periods. High values may indicate the maximum use of growth potential, which may be due to various factors, such as the genotype of the animal.

When determining the growth stress index, general patterns were established for all genotypes, where the level of this indicator decreases with age. High indicators of this index are marked by crossbreeds that have an advantage in terms of growth intensity and intensity over their peers (As). It is also noted that the growth stress in any period of ontogenesis depends on the average daily growth.

The growth uniformity index in experimental young animals decreases with increasing age of the animals, which indicates an earlier achievement of puberty in reproductive young animals compared to other farm animals

The proposed analysis of the indices allows us to obtain new data on the patterns of growth and development of young sheep of various origins. It is the growth indices that can be considered as an additional breeding feature.

The results of comprehensive studies confirm that the use of sheep-producers of the fertile ram charolais breed in the system of interbreeding with ewe of the ascanian fine-fleeced breed is an effective method of increasing the productivity of fine-fleeced sheep. This combination of genotypes provides a significant increase in live weight gain in crossbreeds and the formation of more pronounced meat forms.

**Discussion.** From the point of view of practical breeding of farm animals, forecasting of growth and development parameters is of particular importance, which are closely related to the breeding methods used and the influence of environmental factors, primarily the level and quality of feeding. (Zvidun, I. A. et al. 2018).

In the period from birth to weaning, the highest growth rate is observed, which is due to both the manifestation of the heterosis effect and the high level of milk production of sheep. This stage of development is characterized by the active formation of muscle tissue and the axial and peripheral skeleton, which provides local lambs with an advantage in the rate of accumulation of live mass compared to purebred peers. (Alves, Â. G. C., at al, 2018, Iovenko, V. M., & Gladiy I. A. 2021)

After weaning, under the influence of external factors – in particular, changes in the conditions of detention, a decrease in the level of energy availability of the diet and the transition to independent feed consumption – the growth rate slows down somewhat. However, in the future, this process stabilizes, and the growth of local young animals becomes uniform, physiologically balanced, which indicates the high adaptability of animals and the effective realization of the hereditary potential of meat productivity. (Zharuk, P. G., & Atanovskaya-Maslyuk, O. Y. 2021, AL-Jaryan, I. L at al., 2023).

When carrying out interbreeding, the optimal level of feeding of lambs in the period from birth to 12 months of age ensured intensive growth, harmonious development of animals and the formation of pronounced meat productivity in them, which reflects the effectiveness of realizing the genetic potential in local young animals (Owens, F. N.,. at al., 1993, Pokhil, V. I., and others 2021)

Our studies confirm the literature data on the effectiveness of industrial crossbreeding in sheep breeding. When carrying out such works, it is necessary to constantly monitor the intensity of growth and development of the obtained young animals at different stages of postnatal ontogenesis and, if necessary, influence the level of assimilative processes in the body, while interbreeding in sheep breeding can act not only as an effective breeding tool, but also as an important biotechnological technique that allows simultaneously improving meat productivity and preserving the quality of

wool, increasing the overall profitability of the industry and its competitiveness in modern production conditions.

**Conclusions.**

1. The use of ram charolais sheep in crossing with ewe of the ascanian fine-fleeced breed provides an increase in the live weight of local young animals by 18.8–40.3% at weaning and 16.9-17.6% at 12 months of age.

2. Local young animals ($F_1$) are characterized by higher growth rates at weaning by 6.98-8.8%, at 12 months the difference is 4.2-7.6% according to the average daily growth rates, there is a difference in the range of 20.8 -21.8% at weaning, followed by a decrease to the age of one year, depending on gender.

3. The intensity of growth and development of young animals can be determined by appropriate indices. The indices of formation intensity, stress, and growth uniformity are higher in local young animals.

4. The use of sheep-producers of the ram charolais breed in the system of interbreeding with ewe of the ascanian fine-fleeced breed is an effective method of increasing the productivity of fine-fleeced sheep.

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