

THE GROWTH and DEVELOPMENT FEATURES of the LAMBS OBTAINED by the COMMERCIAL CROSSING

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Aim. To study the growth and development features of young sheep the Ascanian Karakul breed (AK) and its hybrids obtained from commercial crossing ewes (AK) with rams of specialized meat productivity breed Dorper (D). **Methods.** Selection, populative genetic, biometric. **Results.** The dynamics of live weight and the average daily gain in lambs of different genotypes and sexes from birth to 6 months of age have been studied. Body indices for different age periods were calculated. As a result, the advantage of hybrids youngsters of different sexes in terms of live weight at birth relative to purebred animals has been established, it is: for ewe lambs – 5.1% ($P > 0.95$), and at 6 months old – 16.2% ($P > 0.999$); for ram lambs, 4.8% ($P > 0.95$) and 11.3% ($P > 0.95$), respectively. It was noted that crossbred animals at birth and after weaning have a more developed physique than purebred ones. **Conclusions.** The commercial crossing contributed to an increase in a number of productive indicators in the offspring of the 1st generation, in particular, live weight and latitudinal measurements of the body structure, which confirms the advisability of using cross breeding of specialized meat breed Dorper rams with Ascanian Karakul ewes.

Keywords: purebred lambs, crossbreeds, commercial crossing, live weight, average daily gain, body measurements and indices of physique.

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ОСОБЛИВОСТІ РОСТУ ТА РОЗВИТКУ ЯГНЯТ, ОДЕРЖАНИХ ЗА ПРОМИСЛОВОГО СХРЕЩУВАННЯ

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Мета. Дослідити особливості росту та розвитку молодняку овець асканійської каракульської породи (АКП) та помісей, одержаних від схрещування вівцематок (АКП) з баранами спеціалізованої м'ясної породи дорпер (Д). **Методи.** Селекційні, популяційно-генетичні, біометричні. **Результати.** Досліджено динаміку живої маси та величину середньодобових приростів у ягнят різних генотипів та статей від народження до 6-ти місячного віку. Розраховано індекси будови тіла у різні вікові періоди. В результаті встановлено перевагу помісного молодняку різних статей відносно чистопорідного за показниками живої маси при народженні: по ярочках на 5,1% ($P>0,95$) та у 6-ти місячному віці на 16,2% ($P>0,999$), по баранцях – на 4,8% ($P>0,95$) та 11,3% ($P>0,95$) відповідно. Відмічено, що помісні тварини при народженні та після відлучення мають більш розвинені статі будови тіла порівняно з чистопорідними. **Висновки.** Промислове схрещування сприяло підвищенню ряду продуктивних показників потомства I покоління, зокрема, живої маси та широтних промірів будови тіла, що дають підставу стверджувати про доцільність використання схрещування баранів спеціалізованої м'ясної породи дорпер з вівцематками асканійської каракульської породи у вівчарстві.

Ключові слова: чистопорідні ягнята, помісі, промислове схрещування, жива маса, середньодобовий приріст, проміри та індекси будови тіла.

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ОСОБЕННОСТИ РОСТА И РАЗВИТИЯ ЯГНЯТ, ПОЛУЧЕННЫХ ПРИ ПРОМЫШЛЕННОМ СКРЕЩИВАНИИ

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Цель. Исследовать особенности роста и развития молодняка овец асканийской каракульской породы (АКП) и помесей, полученных от скрещивания овцематок (АКП) с баранами специализированной мясной породы дорпер. **Методы.** Селекционные, популяционно-генетические, биометрические. **Результаты.** Исследовано динамику живой массы и величину среднесуточных приростов у ягнят разных генотипов и пола от рождения до 6-ти месячного возраста. Рассчитаны индексы строения тела в различные возрастные периоды. В результате установлено превосходство помесного молодняка разных полов над чистопородными животными по показателям живой массы при рождении: по ярочкам на 5,1% ($P>0,95$) и в 6-ти месячном возрасте на 16,2% ($P>0,999$), по баранчикам - на 4,8% ($P>0,95$) и 11,3% ($P>0,95$) соответственно. Отмечено, что помесные животные при рождении и после отъема имеют более развитые стати тела в сравнении с чистопородными. **Выводы.** Промышленное скрещивание способствовало повышению ряда продуктивных показателей потомства I поколения, в частности, живой массы и широтных промеров строения тела, что дает основание утверждать о целесообразности использования скрещивания баранов специализированной мясной породы дорпер с овцематками асканийской каракульской породы.

Ключевые слова: чистопородные ягнята, помеси, промышленное скрещивание, живая масса, среднесуточный прирост, промеры и индексы телосложения.

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Formulation of the problem. Increasing the sheep breeding competitive and effective development under the modern conditions is due to its meat productivity. The greatest demand in the domestic and foreign markets is mutton and lambs' meat. The experience of the world developed countries, including the USA, China, New Zealand, etc., in which sheep are used mainly for meat production, confirms that the in-

come received from its sale is higher than from other sheep breeding products. So, the problem of the survival of sheep breeding in our country can be solved precisely by increasing meat productivity, since an increase in the meat quality of young sheep in a market economy is an important factor ensuring the necessary economic effect of the industry. However, the reorientation of the industry to the meat sector requires specialized meat breeds of sheep, which are not yet in Ukraine, so creating them is an urgent task for sheep breeders [1].

Analysis of recent researches and publications. One of the methods for creating meat productivity animals in sheep breeding is commercial crossing, the effectiveness of which depends on their source breeds tissues connective ability. As the parent breed, it is desirable to use local breeds, and improving ones, sheep of specialized meat breeds of the world gene pool. Maximizing the effect of heterosis in the offspring will increase the efficiency of the industry and the production of sheep breeding products, since crossbreeding animals obtained in most variants of industrial crossbreeding have an increased growth energy compared to purebred ones. A number of scientists in individual farms in order to improve the sheep meat productivity used different variants of crossbreeding. At the same time, the results obtained indicate that the meat productivity of crossbreeding young animals can be increased by 0.6-3.2% [2, 3, 4, 5, 6].

In this context, we selected sheep of the meat breed Dorper for crossbreeding with the local ewes of the Ascanian Karakul breed in order to study the characteristics of the resulting offspring growth and development.

The aim of the article. To study and analyze the Ascanian Karakul breed (AK) young sheep growth and development features and hybrids obtained from crossing ewes (AK) with sheep of the meat breed Dorper (D) at different age periods.

Material and methods of researches. The study was conducted in the state enterprise "EF IABSR "Ascania Nova" - NSSGCSB" of the Chaplynka district of the Kherson region on pure-bred lambs of the Ascanian Karakul breed and crossbred obtained by commercial crossing of AK ewes with Dorper meat productivity rams. To study the growth dynamics of different genotypes lambs, they were individually weighed at birth, weaning, and at 6 months of age. Based on the weighting data, the average daily gains were calculated according to the generally accepted methodology. The exterior of the animals was studied by taking the basic measurements of the physique: height at the withers and sacrum, depth and circumference of the chest, oblique length of the body, circumference of the metacarpus and width in the points of hips. On the

basis of these parameters for a animals' comparative assessment, body indices were calculated: long legs, stretch, chest, overgrowing, fatness, bony, and pelvic-chest.

Biometric processing of the obtained data was carried out according to the algorithms of N. A. Plokhinsky using the Excel computer program [7].

Research results. To determine the live weight of different genotypes lambs, depending on gender, commercial crossing was carried out (Table 1).

Table 1. Dynamics of young animals live weight, kg

Genotype	Sex			
	ewe lambs		ram lambs	
	$\bar{X} \pm S\bar{x}$	lim	$\bar{X} \pm S\bar{x}$	lim
at birth				
Purebred	3,9±0,09	2,5-6,0	4,2±0,09	2,8-6,0
Hybrids (AKxD)	4,1±0,06*	2,5-6,2	4,4±0,06*	2,8-6,3
at weaning				
Purebred	21,2±0,27	16-28	22,7±0,31	16-30
Hybrids (AKxD)	22,0±0,62	17-30	23,0±0,73	18-34
in 6 months age				
Purebred	24,7±0,41	20-30	28,4±0,76	20-38
Hybrids (AKxD)	28,7±0,99***	22-38	31,6±0,98*	24-37

Note: * $P \geq 0.95$; *** $P \geq 0.999$ the probability of the difference is given between purebred and hybrid lambs.

As a result, it was found that the average live weight of purebred ram lambs at birth was 4.2 kg, ewe lambs 3.9 kg, crossbreds 4.4 kg and 4.1 kg, respectively. Significant superiority of crossbreds animals was noted ($P \geq 0.95$). During weaning, the live weight of young animals was almost at the same level. Although already at the age of 6 months, there is a significant advantage of crossbred animals, namely, 4.0 kg ($P \geq 0.999$) - by ewe lambs and 3.2 kg ($P \geq 0.95$) - by ram lambs. Live weight ranged in animals of different genotypes from 2.5 to 6.3 kg at birth, from 16.0 kg to 34.0 kg at weaning, and from 20.0 to 38.0 kg at 6 months.

In accordance with the change in the live weight of the lambs during the suckling period, the average daily gain also changed, the value of which, along with the live weight, is the most objective indicator of assessing their growth and development (Table 2).

From the above data, it is seen that the highest average daily growth rates were from birth to weaning in both purebred and crossbred lambs. However, for this growing period, the corresponding indicator in crossbred animals was higher, namely, 8.5% for ram lambs, but this difference was unreliable; and by 13.5% - by ewe lambs ($P \geq 0.999$). In the fu-

ture, during the period of growing from weaning up to 6 months age, the advantage of crossbreds over purebreds' animals remains. In particular, the difference was 36.5% for the ram lambs ($P > 0.95$), and 57.4% for the ewes ones ($P > 0.99$).

Table 2. Average daily gains in live weight young animals at different ages, g

Genotype	Sex			
	ewe lambs	max	ram lambs	max
since birth to weaning				
Purebred	129,0±2,29	185,9	138,8±2,66	196,6
Hybrids(AKxD)	146,4±4,32***	208,3	150,6±5,80	228,0
since weaning to 6 months age				
Purebred	60,1±4,85	101,7	88,7±5,90	152,5
Hybrids(AKxD)	94,6±10,39**	203,4	121,1±11,63*	186,4
since birth to 6 months age				
Purebred	106,0±2,14	132,6	122,5±3,89	181,8
Hybrids(AKxD)	127,1±4,45***	167,5	142,2±4,76**	179,8

Note: * $P \geq 0,95$; ** $P \geq 0,99$; *** $P \geq 0,999$ the probability of the difference is given between purebred and hybrid lambs.

The maximum daily average growths were also established at different periods of cultivation, in particular, from birth to weaning: for ram lambs 196.6 g for purebreds, and 228.0 g for crossbreds; for ewe lambs - 185.9 and 208.3 g, respectively. Since the period of weaning to 6 months of age, these indicators were 152.5, 186.4 g, 101.7, and 203.4 g, respectively.

The most objective method of studying the animals' external forms is their measurement. The analysis of the obtained measurements of body parts showed that with age all the basic measurements of the animals' physique increase, however, this process is uneven, namely, the intensive development of these parameters occurs from birth to weaning (Table 3).

At birth, the measurements of physique between purebred and crossbred lambs of different sexes showed a significant difference in ram lambs on the metacarpal circumference ($P \geq 0.95$), the width points of hip ($P \geq 0.99$), the chest width ($P \geq 0.99$); and at ewe lambs on the chest girth - ($P \geq 0.95$) in favor of crossbreds animals. At weaning, the advantage of crossbred young in width points of hip is preserved, both in ram lambs and in ewe lambs ($P \geq 0.99$). At 6 months of age, crossbred ram lambs have an advantage in chest width and in points of hip ($P \geq 0.95$), and ewe lambs have an advantage in width points of hip ($P \geq 0.95$).

Table 3. Indicators of body measurements the ewe lambs and ram lambs at different ages, cm

Index	Period		
	at birth	at weaning	6 months age
ram lambs AK			
Height at the withers	37,2±0,30	57,0±0,36	60,6±0,31
Chest width	8,4±0,16	16,5±0,30	17,8±0,35
Chest depth	12,8±0,15	24,9±0,28	25,7±0,47
Chest girth	39,6±0,40	68,3±0,71	77,1±1,22
Oblique body length	32,7±0,32	55,5±0,38	60,8±0,61
Metacarpal circumference	6,4±0,05	7,5±0,09	7,7±0,09
Width points of hip	8,7±0,12	11,9±0,12	14,3±0,46
Sacral height	38,0±0,27	58,1±0,38	60,9±0,31
Hybrids AK x D			
Height at the withers	37,8±0,44	58,1±0,52	60,7±0,71
Chest width	9,0±0,13**	17,0±0,44	19,0±0,42*
Chest depth	12,9±0,17	24,9±0,47	26,5±0,49
Chest girth	40,6±0,50	69,7±1,16	77,4±1,52
Oblique body length	33,1±0,28	55,8±0,63	62,0±0,82
Metacarpal circumference	6,6±0,07*	7,3±0,11	7,6±0,13
Width points of hip	9,1±0,13**	13,1±0,35**	15,6±0,47*
Sacral height	38,2±0,42	59,3±0,49	61,1±0,67
ewe lambs AK			
Height at the withers	36,3±0,46	55,9±0,28	59,7±0,38
Chest width	8,4±0,15	16,0±0,19	16,7±0,29
Chest depth	12,5±0,16	23,9±0,21	24,2±0,31
Chest girth	39,1±0,41	66,4±0,54	73,2±0,87
Oblique body length	31,9±0,32	54,3±0,43	60,1±0,47
Metacarpal circumference	6,1±0,08	7,1±0,07	7,2±0,11
Width points of hip	8,3±0,11	11,7±0,13	13,6±0,26
Sacral height	37,1±0,42	57,1±0,28	59,8±0,39
Hybrids AK x D			
Height at the withers	36,8±0,42	55,8±0,61	59,9±0,77
Chest width	8,8±0,15	16,3±0,35	16,5±0,21
Chest depth	12,8±0,19	24,0±0,25	24,5±0,48
Chest girth	40,5±0,51*	67,2±1,25	73,5±1,03
Oblique body length	32,6±0,43	54,7±0,64	60,7±0,80
Metacarpal circumference	6,4±0,09*	7,1±0,09	7,3±0,10
Width points of hip	8,9±0,14**	12,4±0,22**	14,4±0,19*
Sacral height	37,4±0,39	56,8±0,61	60,0±0,76

Note: *($P \geq 0,95$), **($P \geq 0,99$) the probability of the difference is given between purebred and hybrid lambs of different sexes in the respective periods.

Indices of the physique were calculated based on the body's parts measurements (Table 4).

Table 4. The indexes of body indices the ewe lambs and ram lambs, %

Index	Period		
	at birth	at weaning	6 months age
purebred ram lambs			
Long legs	65,7±0,34	56,2±0,45	57,6±0,84
Stretch	88,0±0,71	97,4±0,46	100,4±0,88
Chest	65,9±1,11	66,4±0,99	69,5±2,21
Overgrowing	102,2±0,53	102,0±0,17	100,4±0,17
Fatness	121,0±0,90	123,2±1,07	127,9±1,91
Bone	17,1±0,14	13,2±0,16	12,7±0,13
Pelvic-and-chest	96,9±1,47	138,6±2,30	125,8±3,75
crossbred AK x D			
Long legs	65,8±0,53	57,1±0,68	56,3±0,58
Stretch	87,9±0,90	96,1±1,31	102,2±1,34
Chest	70,5±0,87**	68,5±2,18	71,7±0,55
Overgrowing	101,1±0,43	102,0±0,20	100,6±0,27
Fatness	122,6±1,04	124,8±1,23	125,0±2,94
Bone	17,5±0,22	12,6±0,19	12,6±0,21
Pelvic-and-chest	99,3±1,29	130,3±1,88*	122,0±3,13
purebred ewe lambs			
Long legs	65,4±0,48	57,1±0,38	59,4±0,49
Stretch	88,3±0,91	97,1±0,70	100,6±0,56
Chest	67,5±1,06	67,2±0,88	69,0±1,07
Overgrowing	102,5±0,61	102,2±0,13	100,1±0,08
Fatness	122,6±1,01	122,6±1,21	121,8±1,16
Bone	16,9±0,27	12,7±0,14	12,0±0,21
Pelvic-and-chest	101,3±1,64	137,3±2,01	123,0±1,93
crossbred AK x D			
Long legs	65,2±0,61	57,3±0,64	59,0±0,71
Stretch	88,8±1,32	98,0±0,72	101,5±0,66
Chest	69,4±1,01	68,7±1,63	67,7±1,56
Overgrowing	101,8±0,50	101,7±0,15	100,2±0,16
Fatness	124,3±1,09	122,9±1,61	121,0±1,24
Bone	17,4±0,24	12,8±0,22	12,2±0,15
Pelvic-and-chest	99,3±1,21	131,4±2,29	115,4±1,24*

Note: *($P \geq 0,95$), **($P \geq 0,99$), ***($P \geq 0,999$) the probability of difference is shown between young animals of different sexes in relation to animals with black coloration.

At birth, the body indices between purebred and crossbred lambs also showed a significant advantage of the latter, namely, in the chest index of ram lambs ($P \geq 0,99$). When weaning, an advantage was established in respect to the pelvic-and-chest index in crossbreeds ($P \geq 0,95$), and at 6 months of age - in ewe lambs ($P \geq 0,95$).

Conclusions. It was established that the Ascanian Karakul breed sheep crossing with sheep of the Dorper breed rams contributed to an increase in a number of productive indicators of the 1st generation offspring, in particular, live weight at 6 months of age by 3.2 kg ($P > 0.95$) in ram lambs and 4,0 kg ($P > 0,999$) - in ewe lambs. It was noted that crossbred animals at birth and after weaning have a more developed body structure, in particular latitudinal indicators, compared with purebred animals, which indicates more pronounced meat forms.

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