

RESEARCH ARTICLE • PEER-REVIEWED • OPEN ACCESS • SERIES C • HAC/OAK 06.00.00 —
AGRICULTURAL SCIENCES • UDC: 636.3.082.12

Formation of skin thickness indicators in offspring obtained from different mating variants of Sur-coloured sheep

Sur rangli qo'ylarni turli variantlarda juftlashdan olingan avlodlarda teri qalinligi ko'rsatkichlarining shakllanishi**Формирование показателей толщины кожи у потомства, полученного при различных вариантах подбора овец окраски сур****B.S. MAMATOV^{1,*}**¹ Research Institute of Karakul Sheep Breeding and Desert Ecology, Samarkand, Uzbekistan* Corresponding author: bshms@mail.ru

ARTICLE INFO

ARTICLE TYPE

Research Article

LANGUAGE OF FULL TEXT

O'zbekcha (UZ)

SCIENTIFIC FIELD / OAK

☒ 06.00.00 – Agricultural Sciences
Qishloq xo'jaligi fanlari
HAC Presidium decision No. 382/5, 05.03.2026
Series C

UDC / UDK

636.3.082.12

ARTICLE HISTORY

Received: 2026-09-09**Revised:** 2026-09-18**Accepted:** 2026-09-24**Published:** 2026-09-30

DOI

<https://doi.org/10.66073/ReFocus.V5I9.0911>

CONTACT

ReFocusJournal@gmail.com

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AUTHOR, TITLE AND ABSTRACT METADATA (EN / UZ / RU)

ENGLISH

B.S. MAMATOV^{1,*}¹ Research Institute of Karakul Sheep Breeding and Desert Ecology, Samarkand, Uzbekistan

Abstract. The article analyzes the skin thickness parameters of offspring obtained from various variations of matching Sur Karakul sheep, taking into account their color types (silvery, diamond, golden). According to the research results, it was found that the selection of parental pairs has a differential effect on the distribution of lambs into groups with thin, thickened, and thick skin. In particular, statistical analysis proved that the highest rate of thin skin (75.0%) in offspring was recorded in the homogenous matching variant of rams and ewes of the diamond color type.

Keywords: Karakul farming; Sur color; silvery; diamond; golden; matching variants; offspring; skin thickness; scoring

O'ZBEKCHA

B.S. MAMATOV^{1,*}¹ Qorako'lchilik va cho'l ekologiyasi ilmiy-tadqiqot instituti, Samarqand, O'zbekiston

Annotatsiya. Maqolada sur rangli qorako'l qo'ylarini turli rangbaranglik (kumushsimon, olmos, tillasimon) guruhlari bo'yicha variantli juftlashdan olingan avlodlarning teri qalinligi ko'rsatkichlari tahlil qilingan. Tadqiqot natijalariga ko'ra, ota-onalik shakllarini tanlab juftlash avlodlarning teri qoplamlarining yupqa, qalinlashgan va qalin guruhlarga taqsimlanishiga differensial ta'sir ko'rsatishi aniqlangan. Xususan, olmos rangbarangligiga mansub qo'chqor va sovliqlarni o'zaro gomogen juftlash variantida eng yuqori yupqa terilik ko'rsatkichi (75,0%) qayd etilganligi statistik tahlillar yordamida isbotlangan.

Kalit so'zlar: qorako'lchilik; sur rang; rangbaranglik; kumushsimon; olmos; tillasimon; juftlash variantlari; avlod; teri qalinligi; bonitirovka

РУССКИЙ

Б.С. МАМАТОВ^{1,*}¹ Научно-исследовательский институт каракулеводства и экологии пустынь, Самарканд, Узбекистан

Аннотация. В статье проанализированы показатели толщины кожи у каракульских ягнят, полученных от различных вариантов подбора каракульских овец окраски сур различных расцветок (серебристая, алмазная, золотистая). По результатам исследований установлено, что подбор родительских пар оказывает дифференцированное влияние на распределение ягнят по группам с тонкой, утолщенной и толстой кожей. В частности, статистически доказано, что при гомогенном подборе баранов и маток алмазной расцветки зафиксирован наибольший показатель выхода потомства (75,0%) с тонкой кожей.

How to cite / Iqtibos keltirish / Как цитировать: MAMATOV, B.S. (2026). Formation of skin thickness indicators in offspring obtained from different mating variants of Sur-coloured sheep. Research Focus International Scientific Journal, 5(9), 92–95. <https://doi.org/10.66073/ReFocus.V5I9.0911>

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HAC / OAK: On the HAC list of national scientific publications (Academy of Sciences of the Republic of Uzbekistan) for 06.00.00 Agricultural Sciences and 16.00.00 Veterinary Sciences. O'zbekiston Respublikasi FA huzuridagi OAK ro'yxatida: 06.00.00 – Qishloq xo'jaligi fanlari; 16.00.00 – Veterinariya fanlari.

Ключевые слова: каракулеводство; расцветка сур; серебристая; алмазная; золотистая; варианты подбора; потомство; толщина кожи; бонитировка

1. KIRISH

Introduction

Qorako'lichilik nafaqat qishloq xo'jaligining mustaqil tarmog'i, balki cho'l va yarim cho'l hududlarining ekstremal ekologik sharoitlaridan unumli foydalanishning yagona iqtisodiy samarali yo'nalishi hisoblanadi. O'zbekiston Respublikasida chorvachilik tarmoqlarini jadal rivojlantirish, naslchilik ishlarini tubdan takomillashtirish hamda eksportbop maxsulot turlarini ko'paytirish davlat siyosatining ustuvor vazifalaridan biri etib belgilangan.

Qorako'l qo'ylarining ko'p sonli populyatsiyalari orasida sur rangli hayvonlar o'zlarining rang va rangbarangligi, qorako'l terilar yaltiroqligi va ipaksimonligi bilan alohida ajralib turadi. Sur qorako'l terilarining tovarlik qiymatini va jahon auksionlaridagi raqobatbardoshligini belgilovchi eng muhim seleksion belgilaridan biri – bu yangi tug'ilgan qo'zilarining teri qalinligidir. Teri qalinligi jun qoplami to'qimalarining gistologik tuzilishi, kollagen tolalari va yog'-ter bezlarining rivojlanishi bilan uzviy bog'liq bo'lib, u tayyor qorako'lning yengilligi, egiluvchanligi va mustahkamligini kafolatlaydi.

Sur rangli qo'ylarni urchitishda kumushsimon, olmos va tillasimon kabi rangbarangliklarini tizimli ravishda kombinatsiya qilish (juftlash) orqali teri qalinligining optimal parametrlariga ega avlodlarni shakllantirish mumkin. Biroq, rangbaranglik guruhlarining o'zaro ta'sirida teri qatlamlarining irsiylanish tabiati yetarli darajada tizimlashtirilmagan. Bu esa ushbu yo'nalishdagi genetik-seleksion tadqiqotlarning ko'lamini kengaytirish va amaliy tavsiyalar ishlab chiqish dolzarbligini belgilaydi.

1.1. Tadqiqotning maqsadi

Sur rangli qorako'l qo'ylarini turli rangbaranglik guruhlari bo'yicha o'zaro juftlash variantlarining yangi tug'ilgan avlodlar (qo'zilar) teri qoplamining qalinligi ko'rsatkichlariga ko'rsatadigan ta'sirini ilmiy jihatdan baholash va optimal juftlash kombinatsiyalarini aniqlashdan iborat.

Tadqiqotning vazifalari:

- Sur rangli qorako'l qo'ylari orasida ota-onalik shakllarining rangbaranglik xususiyatlariga ko'ra (kumushsimon, olmos, tillasimon) ilmiy asoslangan juftlash variantlarini tashkil etish;
- Har bir juftlash variantidan olingan yangi tug'ilgan avlodlarning teri qalinligini (yupqa, qalinlashgan va qalin) qiyosiy o'rganish;

1-jadval

Juftlash variantlarining avlodlar teri qoplamining qalinligiga ta'siri, % / **Table 1.** Effect of mating variants on the skin thickness of offspring, %

Juftlash variantlari		n	Teri qalinligi		
♂	♀		yupqa	qalinlashgan	qalin
Kumushsimon	Kumushsimon	120	70,8±4,15	17,5±3,46	11,7±2,93
	Olmos	65	72,3±5,55	21,5±5,09	6,2±2,99
	Tillasimon	45	71,1±6,75	17,8±5,70	11,1±4,68
Olmos	Kumushsimon	86	73,2±4,77	16,3±3,98	10,5±3,30
	Olmos	72	75,0±5,10	13,9±4,07	11,1±3,70
	Tillasimon	43	72,1±6,83	16,3±5,63	11,6±4,88

Jadval ma'lumotlaridan ko'rinib turibdiki, barcha kombinatsiyalarda ham yupqa terili avlodlarning ulushi yuqori darajada saqlanib qolgan bo'lib, bu ko'rsatkich 70,8 foizdan 75,0 foizgacha bo'lgan diapazonni tashkil etdi.

Eng yuqori yupqa terilik ko'rsatkichi ♂**Olmos** × ♀**Olmos** gomogen juftlash variantida qayd etilib, 75,0±5,10 foizni tashkil

- Olingan raqamli ma'lumotlarni variatsion statistika usullarida tahlil qilib, seleksiya ishlari uchun eng samarali juftlash tizimlarini tavsiya etish.

2. TADQIQOT USULLARI

Materials and methods

Ilmiy-tadqiqot ishlari sur rangli qorako'l qo'ylarini urchitishga ixtisoslashgan "Yangikazgan nurli diyor" MChJ xo'jaligi sharoitida olib borildi. Tajriba obyekti sifatida turli rangbaranglik (kumushsimon, olmos va tillasimon) guruhlariga mansub bo'lgan qorako'l qo'ylari hamda ulardan olingan avlodlar (qo'zilar) tanlab olindi.

Rangbarangliklar bo'yicha ota-onalik shakllarini o'zaro juftlash maqsadida 6 ta asosiy juftlash varianti shakllantirildi:

1. ♂ Kumushsimon × ♀ Kumushsimon (n=120)
2. ♂ Kumushsimon × ♀ Olmos (n=65)
3. ♂ Kumushsimon × ♀ Tillasimon (n=45)
4. ♂ Olmos × ♀ Kumushsimon (n=86)
5. ♂ Olmos × ♀ Olmos (n=72)
6. ♂ Olmos × ♀ Tillasimon (n=43)

Yangi tug'ilgan qo'zilar terisining qalinligini baholash S.Yu. Yusupov va boshqalar (2015) tomonidan ishlab chiqilgan «Qorako'lichilikda naslchilik ishlarini yuritish va qo'zilar baholash (bonitirovka qilish) bo'yicha qo'llanma»si asosida amalga oshirildi. Qo'zilar terisining qalinligi vizual va palpatsiya usullari yordamida yupqa, qalinlashgan va qalin guruhlariga ajratilgan holda baholandi.

Tadqiqotlardan olingan biometrik ma'lumotlar N.A. Ploxinskiy (1969) uslubi bo'yicha variatsion statistika metodlarida qayta ishlandi. Tahlillar jarayonida har bir variantdagi avlodlar soni (n), o'rtacha arifmetik qiymat ($\bar{X}$) hamda o'rtacha qiymatning xatoligi ($S\bar{x}$) aniqlandi.

3. TADQIQOT NATIJALARI VA ULARNING MUHOKAMASI

Results and discussion

Olib borilgan ilmiy kuzatuvlar shuni ko'rsatdiki, tanlab juftlash variantlari yangi tug'ilgan qo'zilar teri qoplamining qalinligiga sezilarli darajada ta'sir ko'rsatadi (1-jadval).

etdi. Ushbu variantda qalinlashgan terili qo'zilar ulushi eng kam qiymatni (13,9±4,07%) ko'rsatdi. Kumushsimon rangbaranglikka mansub qo'chqorlarni xuddi shu guruhdagi sovliqlar bilan gomogen juftlanganda (♂**Kumushsimon** × ♀**Kumushsimon**) yupqa terili avlodlar 70,8±4,15% ni, qalin terili qo'zilar esa 11,7±2,93% ni tashkil etgan.

Geterogen juftlash variantlari tahlil qilinganda, ♂ **Kumushsimon** × ♀ **Olmos** kombinatsiyasida olingan avlodlar orasida qalin terili qo'zilarining salmog'i minimal darajada, ya'ni $6,2 \pm 2,99$ bo'lganligi e'tiborga loyiqdir. Aksincha, ♂ **Olmos** × ♀ **Tillasimon** kombinatsiyasida qalin terili avlodlar ko'rsatkichi bir qadar yuqori bo'lib, $11,6 \pm 4,88$ ni tashkil qildi.

Ushbu qonuniyatlar shuni ko'rsatadiki, olmos rangbarangligi genotipi teri qoplamining elastikligi va yupqaligini ta'minlovchi genetik determinantlarning barqaror uzatilishiga xizmat qiladi.

4. XULOSALAR

Conclusions

1. Sur rangli qorako'l qo'yalarini turli rangbaranglik guruhlarini bo'yicha variantli tanlab juftlash olingan avlodlarning teri qalinligi gistotipiga differensial ta'sir ko'rsatadi.

2. Yupqa va nafis terili yuqori sifatli qorako'l elitlarini yetishtirishda ♂ **Olmos** × ♀ **Olmos** kombinatsiyasidan foydalanish yuqori seleksion samara beradi (yupqa terili avlodlar 75,0%).

3. Qalin terili qo'zilar tug'ilishini kamaytirish va barqaror tovarbop mahsulot olish uchun ♂ **Kumushsimon** × ♀ **Olmos** geterogen juftlash variantidan foydalanish maqsadga muvofiq hisoblanadi (qalin terilik atigi 6,2%).

DECLARATIONS

Declarations

Author contributions *CRedit*

Conceptualization; Methodology; Investigation; Writing – original draft; Writing – review & editing. The author has read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Ethics approval

The work with animals was carried out within routine zootechnical practice of breeding and evaluating Karakul sheep on the farm, in accordance with the veterinary and zootechnical requirements in force in the Republic of Uzbekistan.

Informed consent

The author has read and approved the final version of the manuscript and has given his consent to its submission and publication. The study involved no human participants and no personal data.

Data availability statement

The data obtained in the study are presented in the table of this article; the primary records are available from the author on reasonable request.

Conflict of interest

The author declares no conflict of interest.

Generative AI disclosure

Generative AI (Claude, Anthropic) was used in the editorial preparation of this article: for language editing, translation of the title, abstract and keywords between Uzbek, Russian and English, preparation of the extended English summary from the author's text, and formatting of the reference list. No data, results or conclusions were generated by AI. The author is responsible for the content of the publication.

EXTENDED SUMMARY IN ENGLISH

Kengaytirilgan inglizcha xulosa / Расширенный реферат на английском языке

Purpose and research problem

Karakul sheep breeding is not only an independent branch of agriculture but also the only economically efficient way of using the extreme ecological conditions of desert and semi-desert areas, and the accelerated development of livestock breeding, the improvement of breeding work and the expansion of export products are priorities of

state policy in Uzbekistan. Among the numerous populations of Karakul sheep, Sur-coloured animals stand out for the colour and colour types of their pelts and for their lustre and silkiness. One of the most important selection traits that determines the commercial value of Sur pelts and their competitiveness at international auctions is the skin thickness of newborn lambs, which is closely related to the histological structure of the skin, the development of collagen fibres and of sebaceous and sweat glands, and determines the lightness, flexibility and strength of the finished pelt. Systematic combination of the silvery, diamond and golden colour types makes it possible to obtain offspring with optimal skin thickness, but the inheritance of skin layers in the interaction of colour-type groups has not been sufficiently systematised. The aim of the study was to evaluate the effect of mating variants of Sur Karakul sheep by colour-type groups on the skin thickness of newborn lambs and to identify optimal mating combinations.

Materials and methods

The study was carried out at the Yangikazgan Nurli Diyor LLC farm, which specialises in breeding Sur Karakul sheep. Karakul sheep of the silvery (kumushsimon), diamond (olmos) and golden (tillasimon) colour types and their offspring were selected, and six main mating variants were formed: silvery × silvery (n=120), silvery × diamond (n=65), silvery × golden (n=45), diamond × silvery (n=86), diamond × diamond (n=72) and diamond × golden (n=43), where the first type refers to rams and the second to ewes. The skin thickness of newborn lambs was assessed according to the guide on breeding work and evaluation (grading) of lambs in Karakul sheep breeding by S.Yu. Yusupov et al. (2015): visually and by palpation, the skins were classified as thin, thickened or thick. The biometric data were processed by variation statistics according to N.A. Plokhinsky (1969), with the number of offspring in each variant (n), the arithmetic mean and its standard error calculated.

Results and discussion

Mating variants had a marked effect on the skin thickness of newborn lambs. In all combinations the proportion of offspring with thin skin remained high, ranging from 70.8% to 75.0%. The highest proportion of thin-skinned lambs was recorded in the homogeneous diamond × diamond variant ($75.0 \pm 5.10\%$), which also had the lowest proportion of lambs with thickened skin ($13.9 \pm 4.07\%$). In the homogeneous silvery × silvery variant thin-skinned offspring accounted for $70.8 \pm 4.15\%$ and thick-skinned lambs for $11.7 \pm 2.93\%$. Among heterogeneous variants, the silvery ram × diamond ewe combination gave the smallest proportion of thick-skinned lambs ($6.2 \pm 2.99\%$), whereas in the diamond ram × golden ewe combination this proportion was somewhat higher ($11.6 \pm 4.88\%$). In the other variants thin-skinned offspring accounted for 71.1–73.2%, thickened-skin offspring for 16.3–21.5% and thick-skinned offspring for 10.5–11.1%. According to the author, these regularities indicate that the diamond colour-type genotype contributes to the stable transmission of genetic determinants ensuring the elasticity and thinness of the skin.

Conclusion and contribution

Selective mating of Sur Karakul sheep by colour-type groups has a differential effect on the skin thickness histotype of the offspring. For breeding high-quality Karakul elites with thin and fine skin, the diamond × diamond combination gives a high selection effect, with 75.0% of offspring having thin skin. To reduce the birth of thick-skinned lambs and to obtain stable marketable products, the heterogeneous mating of silvery rams with diamond ewes is advisable, as it yields only 6.2% of thick-skinned lambs.

ADABIYOTLAR RO'YXATI

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