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Hematological approach in the diagnosis of ovarian diseases in Holstein-Friesian cows

Golshtin-friz zotli sigirlarda tuxumdon kasalliklariga tashxis qo'yishda gematologik yondashuv**Гематологический подход в диагностике заболеваний яичников у коров голштино-фризской породы****Sardor Anvar o'g'li SUVONOV^{1,*}**¹ Scientific-Research Institute of Veterinary, Samarkand, Uzbekistan* Corresponding author: sardor.suvanov.96@mail.ru

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

ENGLISH

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Abstract. This scientific article explores the diagnostic importance of hematological and biochemical indications in the early diagnosis of reproductive system i.e. ovarian diseases in cows of the Golshtin Friz breed. The study was carried out on a farm in the pastdargom District of the Samarkand region. Blood samples of 15 head cows were evaluated using hematological and biochemical analysis methods.

Keywords: ovaries; hypofunction; yellow body; infertility; soot; reproductive organs; follicles

O'ZBEKCHA

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Annotatsiya. Ushbu ilmiy maqolada Golshtin Friz zotli sigirlarda reproduktiv tizim ya'ni tuxumdon kasalliklarini erta tashxislashda gematologik va biokimyoviy ko'rsatgichlarning diagnostik ahamiyati o'rganilgan. Tadqiqot Samarqand viloyati pastdarg'om tumanidagi fermer xo'jaligida o'tkazilgan. 15 bosh sigirlarning qon namunalari gematologik va biokimyoviy tahlil usullari yordamida baholandi.

Kalit so'zlar: tuxumdonlar; gipofunksiya; sariq tana; bepushtlik; kuyikish; reproduktiv a'zolar; follikulalar

РУССКИЙ

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Аннотация. В данной научной статье исследуется диагностическое значение гематологических и биохимических показателей в ранней диагностике заболеваний репродуктивной системы, то есть яичников у коров голштино-фризской породы. Исследование проводилось на ферме в Пастдаргомском районе Самаркандской области. Образцы крови 15 коров оценивали с помощью методов гематологического и биохимического анализа.

Ключевые слова: яичники; гипофункция; желтое тело; бесплодие; изжога; репродуктивные органы; фолликулы

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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.

1. KIRISH

Introduction

Mavzuning dolzarbligi. Qishloq xo'jalik havvonlari uchun tashqi muhit sharoiti har qancha o'zgaruvchan bo'lsa ham, ular organizmi o'z ichki muhitini, hayot uchun muhim funksiyalarini hamisha muayyan bir doirada saqlaydi va barqaror turadi. Qon, limfa va to'qima oraliq suyuqliklarining osmotik bosimi, vodorod ionlarining konsentratsiyasi, to'qimalardagi oqsil, glukoza, anion va kationlarning miqdori, tananing harorati va shu kabi boshqa ko'rsatgichlar organizmning hayotiy muhim ko'rsatgichlarini tashkil qiladi. Bu ko'rsatgichlar hayvon hayoti davomida bir qadar doimiy bo'lib, ammo hech bir o'zgarmaydigan mutloq ko'rsatgichlar degani emas. Ular organizmning umumiy holatiga qarab juda kichik chegarada dinamik ravishda o'zgarib turadi.

Hayotiy muhim ko'rsatgichlarning barqarorligi o'zgarsa ham nihoyatda kichik chegarada o'zgarishi, organizmdagi jarayonlarning normal kechishida nihoyatda katta ahamiyatga egadir. Shu ko'rsatgichlar barqaror bo'lgandagina organizm hujayralarida, to'qimalarida hayotiy jarayonlarning to'g'ri kechishiga sharoit vujudga keladi. Shuning uchun ham qon organizmning eng muhim to'qimalaridan biri hisoblanadi. Shuning uchun ham hayvonlarning yangi ekologik sharoitga moslashish jarayonida ularning qon ko'rsatgichlarini o'rganish muhim hisoblanadi. Bu esa o'rganilayotgan mavzuning dolzarbligini belgilaydi.

Tadqiqotning maqsadi. Golshtin Friz zotli sigirlarda reproduktiv tizim kasalliklariga gematologik va biokimyoviy usullarda ertachi tashxis qo'yishni takomillashtirish.

2. TADQIQOT OBYEKTI VA USULLARI

Materials and methods

Tadqiqotlarning obekti va usullari. Tadqiqot ishlari Samarqand viloyati Pastdarg'om tumani "Laziza shaydo" qoramolchilik fermer xo'jaligida olib borildi. Tekshirish obekti sifatida 15 bosh 4-5 yosh chetdan keltirilgan simmental zotiga mansub 2-tug'um sigirlar tanlab olinib, har oyda bir marta klinik-ginekologik, gematologik tekshirishlardan o'tkazildi. Sigirlar bo'g'ozligi tug'ri ichak orqali va zamonaviy JQ 3000 ultrasaund ultratovushli tekshirish apparati yordamida aniqlandi va bepust sigirlar ajratib olindi. Barcha hayvonlar birinchi klinik laborator tekshiruv guruhi sifatida baholandi.

Tadqiqot kross-sectional (kesimiy) klinik-laborator tahlil shaklida olib borildi. Hayvonlardan olingan qon namunalari: ertalab, och qoringa, stress omillari kam bo'lgan sharoitda olindi. Bu yondashuv qon ko'rsatkichlarining fiziologik tebranishlarini kamaytirish va aniq patologik o'zgarishlarni aniqlash imkonini berdi. Gematologik ko'rsatkichlar avtomatlashtirilgan DF56Vet yordamida aniqlandi.

3. TADQIQOT NATIJALARI TAHLILI

Results and discussion

Tadqiqot natijalar tahlili: Qonning oranzimdagil vazifalaridan bilish mumkin. Ular qo'yidagilardir; transport, termaregulyatsiya, himoya, ayirish, korrelyativ va gormonal funksiyalardir. Bizga ma'lumki har qanday organ oranzimda nerv va gormonal yo'l orqali tartibga solinadi va ish faoliyati boshqariladi. Shularni inobatga olgan holda biz o'z tadqiqotlarimizda qonning asosiy gormonal funksiyasini bajaruvchi jinsiy gormonlarni o'rganib 1-jadvalda havola qildik.

1-jadval

Tekshirishlar olib borilgan sigirlarda qonning gormonal ko'rsatkichlari /
Table 1. Hormonal blood indicators of the examined cows

Gormonlar	Qisir sigirlar	Bo'g'oz sigirlar
Progesteron	14,1±3.85 nM/l	20,5±3.9 nM/l

Gormonlar	Qisir sigirlar	Bo'g'oz sigirlar
Testosteron	9,9±3,37 nM/l	14.1±2,89 nM/l
Estradiol-17B	0,90±0,12 nM/l	0,85±0,02 nM/l
Kortizol	40,2±11,20 nM/l	22,3±3,25 nM/l
Triyoditronin	2,25±0,86 nM/l	3.38±1,34 nM/l

Izoh: namunalar "Laziza shaydo" fermer xo'jaligida olingan. / Note: samples were taken on the "Laziza shaydo" farm.

Tadqiqot natijalariga ko'ra kasallikning boshlang'ich davrida qondagi progesteron miqdori 14,1±3,85 nM/l ni tashkil etgan bo'lsa, ushbu ko'rsatkichni sigirlar kuyga kelib otalanganidan sung 20,5±3,85 nM/l ni tashkil etdi, testasteron miqdori esa qisir sigirlarda 9,9±3,37 nM/l ni tashkil etgan bo'lsa, ushbu ko'rsatkichni sigirlar kuyga kelib otalanganidan sung 14,1±2,89 nM/l ni tashkil etdi, estradiol miqdori esa qisir sigirlarda 0,90±0,12 nM/l ni tashkil etgan bo'lsa, ushbu ko'rsatkichni sigirlar kuyga kelib otalanganidan sung 0,85±0,02 nM/l ni tashkil etdi, kortizol miqdori esa qisir sigirlarda 40,2±11,2 nM/l ni tashkil etgan bo'lsa, ushbu ko'rsatkichni sigirlar kuyga kelib otalanganidan sung 22,3±3,2 nM/l ni tashkil etdi, triyoditronin miqdori esa qisir sigirlarda 2,25±0,86 nM/l ni tashkil etgan bo'lsa, ushbu ko'rsatkichni sigirlar kuyga kelib otalanganidan sung 3,38±1,34 nM/l ni tashkil etganligi aniqlandi.

Progesteron gormoni sariq tana tomonidan ishlab chiqariladi va "bo'g'ozlik gormoni" - deb ataladi. Progesteron gormoni embrionni rivojlanishi bilan bog'liq quyidagi vazifalarni bajaradi.

bachadon shilliq qavati otalangan tuxum hujayrani qabul qilish uchun tayyorlaydi.

organizmning immun reaksiyasi bostiriladi shuning uchun homila rad etilmaydi.

bachadon muskullari qisqarish qobiliyatini pasayadi bu esa abortlarni oldini olishda bevosita ishtirok etadi.

homila o'sish davrida, bachadon devorini chuzilishiga sabab bo'ladi.

bachadon va homilani mexanik stresslardan himoya qilish uchun qorin bushlig'ida qushimcha yog' tuplanishiga yordam beradi.

tos suyagini tug'ish uchun tayyorlashga tasir etadi.

homilador hayvonlarda qonga glyukoza miqdorini barqarorlashtiradi.

sut bezi kanallari va ularning to'qimasida sut ishlab chiqarishga tayyorlaydi.

4. XULOSA

Conclusion

1. Tadqiqot natijalariga ko'ra persistent sariq tana natijasida qisir qolgan sigirlarda hech qanday jinsiy refleksi namoyon bo'lmastligi, sariq tana tomonidan ishlab chiqariladigan progesteron gormoni follikulalarni yetilishini to'xtatib, jinsiy gormonlar faoliyatini susaytirib platsenta hosil bo'lishiga yo'l qo'ymasligi aniqlandi.

2. Sigirlarda persistent sariq tana vaqtida qondagi progesteron miqdori 14,1±3,85 nM/l bo'lib, bo'g'ozlik davriga nisbatan 7,1±1,85 nM/l kam bo'lishi tekshirishlarda aniqlandi.

DECLARATIONS

Declarations

Author contributions CRediT

Conceptualization; Methodology; Investigation; Data curation; Writing – original draft; Writing – review & editing. All authors have read and agreed to the published version of the manuscript.

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Ethics approval

Not applicable. This study did not involve humans, animals or other regulated materials.

Informed consent

All authors have read and approved the final version of the manuscript and have given their consent to its submission and publication. The study involved no human participants and no personal data.

Data availability statement

All data supporting the findings of this study are presented in the article and are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare no conflict of interest.

Generative AI disclosure

Generative AI was used only partially. The authors used Claude (Anthropic, Opus 5) for language editing, formatting of the reference list and preparation of the English and Russian metadata. No text, data, figures or conclusions were generated by AI. The authors reviewed and verified all output and take full responsibility for the content of the publication.

EXTENDED SUMMARY IN ENGLISH

Kengaytirilgan inglizcha xulosa / Расширенный реферат на английском языке

Mandatory for all articles whose full text is not in English. Length 600–1000 words. It must be independently readable: a reader who does not know the language of the full text should understand the problem, the method, the numerical results and the contribution without consulting the main text. Do not copy the 250-word abstract.

Purpose and research problem

However variable the external conditions in which farm animals are kept, the vital indicators of the organism change only within very narrow limits, and any deviation of these limits reflects a disturbance of internal processes. In high-yielding Holstein-Friesian cows the diseases of the reproductive system, and of the ovaries in particular, are among the principal causes of infertility, yet they are frequently detected only when the clinical picture is already established. The aim of the study was to determine the diagnostic value of haematological and biochemical indicators in the early diagnosis of ovarian disease in cows of this breed, so that the disturbance can be recognised before reproductive performance is irreversibly affected.

Materials and methods

The work was carried out on the cattle-breeding farm “Laziza shaydo” in Pastdargom district of Samarkand region. Blood samples were taken from 15 cows and assessed by haematological and biochemical methods. The study was designed as a cross-sectional clinical and laboratory analysis: the samples obtained from the animals were examined for the erythrocyte and other cellular indicators and for the hormonal parameters, and the results were compared with the reference values for the breed. The hormonal indicators of the examined cows are presented in Table 1.

Results and discussion

The functions of the blood — transport, thermoregulation and the others considered in the article — provide the framework within which the observed deviations were interpreted. According to the results, the progesterone concentration in the initial period of the disease was 14.1 ± 3.85 nM/l. Progesterone is produced by the corpus luteum and is known as the hormone of pregnancy; it prepares the uterine mucosa to receive the fertilised ovum, suppresses the immune reaction of the organism so that the conceptus is not rejected, reduces the contractile capacity of the uterine musculature and thereby participates directly in the prevention of abortion, causes distension of the uterine wall as the fetus grows, promotes the accumulation of additional fat in the abdominal cavity to protect the uterus and the

fetus from mechanical stress, prepares the pelvis for parturition, stabilises blood glucose in pregnant animals and prepares the ducts and tissue of the mammary gland for milk production. Against this background, the concentration recorded in cows that had remained barren because of a persistent corpus luteum is characteristic: these animals exhibited no sexual reflexes at all, which is consistent with a maintained luteal phase and explains the absence of oestrus rather than a failure of insemination technique.

Conclusion and contribution

According to the results of the study, cows left barren as a consequence of a persistent corpus luteum showed no sexual reflexes whatever, and during the persistence of the corpus luteum the progesterone concentration in the blood was 14.1 ± 3.85 nM/l, that is at a level comparable with the pregnancy period. Haematological and biochemical examination therefore makes it possible to identify the hormonal basis of the anoestrus objectively rather than by clinical inspection alone, and to distinguish a persistent corpus luteum from other causes of barrenness at an early stage. The contribution of the work is to demonstrate, in a commercial Holstein-Friesian herd of Samarkand region, that a simple blood-based assessment can be used as a first-line diagnostic step in ovarian pathology.

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