МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
БІЛОЦЕРКІВСЬКИЙ НАЦІОНАЛЬНИЙ АГРАРНИЙ УНІВЕРСИТЕТ
ДНУ «ІНСТИТУТ МОДЕРНІЗАЦІЇ ЗМІСТУ ОСВІТИ»
СЛОВАЦЬКИЙ УНІВЕРСИТЕТ СІЛЬСЬКОГО ГОСПОДАРСТВА (СЛОВАЦЬКА РЕСПУБЛІКА)
ЧЕСЬКИЙ УНІВЕРСИТЕТ ПРИРОДНИЧИХ НАУК (ЧЕХІЯ)
ПОМОРСЬКА АКАДЕМІЯ В СЛУПСЬКУ (ПОЛЬЩА)



Міжнародна науково-практична конференція

АГРАРНА ОСВІТА ТА НАУКА: ДОСЯГНЕННЯ, РОЛЬ, ФАКТОРИ РОСТУ

Сучасний розвиток ветеринарної медицини

14 вересня 2026 року

Біла Церква
2026

УДК 636.09'06

РЕДАКЦІЙНА КОЛЕГІЯ:

Шуст О.А., д-р екон. наук, ректор.
Варченко О.М., д-р екон. наук.
Скиба В.В., д-р с.-г. наук.
Димань Т.М., д-р с.-г. наук.
Крауютієне І., д-р філософії.
Мамедова К.Х., д-р філософії.
Царенко Т.М., канд. вет. наук.
Козій Н.В., канд. вет. наук.
Василенко О.І., д-р філософії.
Мостипан О.В., відповідальний секретар.

Відповідальна за випуск – **Мостипан О.В.,** начальник редакційно-видавничого відділу.

Сучасний розвиток ветеринарної медицини: матеріали міжнародної науково-практичної конференції. 14 вересня 2026 р. Білоцерківський НАУ. 108 с.

Збірник підготовлено за авторською редакцією доповідей учасників конференції без літературного редагування. Відповідальність за зміст поданих матеріалів та точність наведених даних несуть автори.

©БНАУ

6. Casas C., Dye C. Comparison of Thames Medical CAT+ Doppler and SunTech Vet 20 oscillometric devices for non-invasive blood pressure measurement in conscious cats. *Journal of Feline Medicine and Surgery*. 2024. Vol. 26, № 2. DOI:10.1177/1098612X231216350.

7. Ward J. L., Guillot E., Domenig O. et al. Circulating renin-angiotensin-aldosterone system activity in cats with systemic hypertension or cardiomyopathy. *Journal of Veterinary Internal Medicine*. 2022. Vol. 36, № 3. P. 897–909. DOI:10.1111/jvim.16401.

8. Bugbee A., Rucinsky R., Cazabon S. et al. 2023 AAHA Selected Endocrinopathies of Dogs and Cats Guidelines. *Journal of the American Animal Hospital Association*. 2023. Vol. 59, № 3. P. 113–135. DOI:10.5326/ JAAHA-MS-7368.

UDC 636.39.09:616.39:612.12

SAKHNIUK V.V., doctor of veterinary sciences, **HOTSULIAK M.M.,** PhD
Bila Tserkva National Agrarian University

METABOLISM OF TOTAL CALCIUM AND ITS FRACTIONS IN PREGNANT GOATS WITH HYPOCALCAEMIA

The dynamics of total calcium metabolism and its individual fractions were studied in pregnant goats at 75–90 and 120–140 days' gestation. Hypocalcaemia was diagnosed in 36.0 % of the pregnant goats examined, specifically in 33.1 % at 75–90 days' gestation and in 39.3 % at 120–140 days' gestation. The condition was characterised by a statistically significant reduction in the concentration of total calcium and its ultrafiltrated, ionised and neutral fractions.

Keywords: goats, hypocalcaemia, metabolism, total calcium, ultrafiltrated calcium, ionised calcium, neutral calcium, protein-bound calcium.

In recent years, Ukraine has seen a steady upward trend in the growth of the dairy goat population, and consumption of goat's milk and goat milk products is on the rise. The growth in herd size, goat productivity and their health status depend to a large extent on housing conditions, the adequacy of their diet and proper veterinary care [1–3]. At the same time, an imbalance in the diet in terms of dry matter, metabolisable energy, protein, macro- and micro-nutrients, and vitamins can lead to metabolic disorders and the development of metabolic diseases. One of the most common metabolic disorders in dairy goats is hypocalcaemia [4–6].rum of pregnant goats sufferMaterials and methods. The study was conducted on dairy goats aged 2–5 years. The study subjects were animals at various stages of pregnancy (75–90 and 120–140 days of gestation). Total calcium, ionised calcium and protein-bound calcium were determined in the blood serum of pregnant goats using standardised methods and a Stat Fax 4500+ semi-automatic biochemical analyser (Awareness Technology Inc, USA). The concentration of ultrafiltrable calcium was determined as the difference between the concentration of total calcium and its protein-bound fraction. The concentration of neutral calcium was calculated as the difference between the concentrations of the ultrafiltrable and ionised fractions of this macroelement [7].

The results obtained from the laboratory blood tests were analysed using statistical methods with the "Statistika-12" software [8].

Goat ewes with a total serum calcium concentration of less than 2.20 mmol/L and an ionised calcium concentration of less than 0.47 mmol/L were considered to have subclinical hypocalcaemia [6].

We investigated the metabolism of total calcium and its individual fractions in 82 pregnant goats with hypocalcaemia at 75–90 and 120–140 days of gestation. It was found that the concentration of this macroelement in the blood serum of the entire study population of pregnant animals (both clinically healthy and those suffering from hypocalcaemia) ranged from 1.60 to 2.79 mmol/L (2.25±0.016 mmol/L; n=228). Hypocalcaemia was diagnosed in 36.0% of the goats examined, with serum calcium levels ranging from 1.60 to 2.19 mmol/L. In particular, between the 75th and 90th days of gestation, subclinical hypocalcaemia was diagnosed in 33.1% of the goats examined (1.60–2.19 mmol/L).

The total calcium concentration in the blood serum of goats at 120–140 days' gestation ranged from 1.68 to 2.79 mmol/L and showed a marked downward trend compared with animals from the previous study period ($p<0.05$). Hypocalcaemia was diagnosed in 39.3% of the goats in

this group, with concentrations ranging from 1.68 to 2.18 mmol/L.

The concentration of ultrafiltrated calcium in pregnant goats with hypocalcaemia ranged from 0.84 to 1.76 mmol/L (60.7 % of total Ca), which is 1.17 times lower than the group average ($p<0.001$). In particular, in affected animals at 75–90 days of pregnancy, the concentration of this calcium fraction ranged from 0.92 to 1.76 mmol/L, which was significantly lower than the group mean ($p<0.05$). In 81.8% of the affected does in the group, its concentration was within the physiological range at a ratio of 0.65:1 to total calcium. In a further 11.2% of the animals, a reduction in its concentration to 0.92–1.07 mmol/L was observed.

On days 120–140 of pregnancy, the concentration of the ultrafiltrated form of calcium in the blood serum of goats ranged from 0.84 to 2.02 mmol/L and showed a slight downward trend compared with the previous study period. The level of this calcium fraction in affected does ranged from 0.84 to 1.41 mmol/L and was slightly lower than in affected animals at 75–90 days of pregnancy.

The concentration of the ionised fraction of calcium in all pregnant animals studied fell within a wide range – from 0.25 to 1.29 mmol/L (52.7 %/Ca ultrafiltration; 34.0 %/Ca total). In cases of hypocalcaemia, it fluctuated between 0.25 and 1.03 mmol/L (49.6 %/Ca ultrafiltrate; 31.2 %/total Ca), and was 1.24 times lower than the group mean ($p<0.001$). In particular, the concentration of this calcium fraction in the blood serum of affected animals on days 75–90 of gestation ranged from 0.25 to 0.84 mmol/L and was significantly lower than the group mean ($p<0.001$). On days 120–140 of gestation, the level of free calcium in the blood serum of goats ranged from 0.25 to 1.29 mmol/L and was significantly higher compared with the previous period of gestation ($p<0.001$). In does with hypocalcaemia, its concentration ranged from 0.25 to 1.03 mmol/L, which is 32.1% higher than the mean value in affected animals at 75–90 days of gestation, and its proportion in the composition of ultrafiltrated calcium and total calcium was 57.3% and 35.7%, respectively. The optimal values for this fraction (0.47–1.03 mmol/L) were observed in 92.9% of the affected does in the group, whilst in a further 7.1%, its level was found to be reduced to 0.28–0.46 mmol/L.

The serum calcium levels of all pregnant goats studied ranged from 0.13 to 1.26 mmol/L (43.8 %/ultrafiltrated Ca; 28.0 % total Ca), whilst in cases of hypocalcaemia it ranged from 0.13 to 1.26 mmol/L (45.6 %/ultrafiltrated Ca; 27.7% of total Ca) and was 10.9% lower than the group mean ($p<0.05$). In particular, its concentration in the blood serum of pregnant goats on days 75–90 of gestation ranged from 0.13 to 1.26 mmol/L. The physiological content of this fraction was observed in 90.9% of the goats.

The level of this calcium fraction in the blood serum of goats on days 120–140 of pregnancy ranged from 0.17 to 1.23 mmol/L and showed a slight downward trend (by 11.8%) compared with the first stage of pregnancy. The neutral calcium content in affected does ranged from 0.29 to 1.03 mmol/L and was 20.0 % lower compared with the previous study period. Optimal levels of this macroelement isoform were observed in 100% of the affected animals. The proportion of this fraction in the composition of ultrafiltrated calcium and total calcium was 42.6% and 25.6%, respectively.

The concentration of the protein-bound fraction of calcium in the blood serum of the pregnant goats studied ranged from 0.41 to 1.38 mmol/L (36.2 % of total Ca), whilst in cases of hypocalcaemia, it ranged from 0.41 to 1.27 mmol/L (39.3 % of total Ca). In particular, the concentration of protein-bound calcium in the blood serum of affected goats on days 75–90 of pregnancy was in the range 0.41–1.27 mmol/L. In 90.9% of affected does, this concentration fell within the physiological range at a ratio of 0.36:1 to total calcium.

On days 120–140 of pregnancy, the concentration of this form of calcium in the blood serum of affected goats ranged from 0.57 to 1.25 mmol/L and did not differ statistically from the mean value for the group of lactating goats during the previous stage of pregnancy ($p<0.5$). Optimal levels of this fraction were observed in 94.1% of the affected goats.

Conclusions. 1. Subclinical hypocalcaemia was diagnosed in 36.0% of the pregnant goats examined, specifically in 33.1% between days 75 and 90 of pregnancy and in 39.3% between days 120 and 140 of pregnancy.

2. In the blood serum of goats with hypocalcaemia, there were significant changes in the fractional composition of calcium: the concentrations of ultrafiltrated, ionised and neutral calcium were significantly lower than the group mean ($p<0.001$; $p<0.001$; $p<0.05$). The level of protein-bound calcium in these animals did not differ statistically from the mean value for the group.

REFERENCES

1. Managing sheep and goats for sustainable high yield production / J. Simões et al. Animal. 2021. P. 100293. DOI:10.1016/j.animal.2021.100293

2. Update of nutritional requirements of goats for growth and pregnancy in hot environments / I. A. M. A. Teixeira et al. Animal. 2024. P. 101219. DOI:10.1016/j.animal.2024.101219

3. Pugh D. G. Trace Minerals Nutrition in Goats. Veterinary Clinics of North America: Food Animal Practice. 2023. DOI:10.1016/j.cvfa.2023.05.006

4. Simões J., Margatho G. Metabolic Periparturient Diseases in Small Ruminants: An Update. Applied Sciences. 2024. Vol. 14, no. 21. P. 10073. DOI:10.3390/app142110073

5. Hotsuliak, M. M., & Sakhniuk, V. V. Hipokaltsiiemiia kitnykh i laktuiuchykh kiz (poshyrennia, etiolohiia, metody diahnostyky) [Hypocalcaemia in pregnant and lactating goats (distribution, etiology, diagnostic methods)]. Scientific Messenger of LNU of Veterinary Medicine and Biotechnology, 26(115). 2024. P. 101–111. (in Ukrainian). DOI:10.32718/nvlvet11515

6. Hotsuliak, M., Sakhniuk, V. Metabolizm kaltsiiu ta yoho fraktsiinoho skladu u klinichno zdorovykh kiz [Calcium metabolism and its fractional composition in clinically healthy goats]. Scientific Bulletin of Veterinary Medicine, (192). 2024. P. 28–42. (in Ukrainian). DOI:10.33245/23104902-2024-192-2-28-42

7. Levchenko, V.I., Holovakha, V.I., Kondrakhin, I.P. Metody laboratornoi klinichnoi diahnostyky khvorob tvaryn [Methods of laboratory clinical diagnosis of animal diseases]. Kyiv, Agrarian Education. 2010. 445 p. (In Ukrainian). ISBN:978-966-7906-77-1

8. Petrovska I. R., Salyha Yu. T., Vudmaska I. V. Statystychni metody v biolohichnykh doslidzhenniakh [Statistical methods in biological research]: Study guide. Kyiv: Agrarian Science. 2022. 172 p. (in Ukrainian). ISBN 978-966-540-551-1

УДК 636.209:616.34:612.57

ГРИЦАЙ В.В., магістрант, **ВОВКОТРУБ Н.В.,** канд. вет. наук
Білоцерківський національний аграрний університет

ІНТЕГРАЦІЯ СИСТЕМ АВТОМАТИЗОВАНОГО МОНІТОРИНГУ РУМІНАЦІЇ ТА СТАНУ КИШКОВОГО МІКРОБІОМУ ДЛЯ РАННЬОГО ВИЯВЛЕННЯ ПАТОЛОГІЙ ПЕРЕДШЛУНКІВ У ВЕЛИКОЇ РОГАТОЇ ХУДОБИ В УМОВАХ ТЕПЛОВОГО СТРЕСУ

У роботі висвітлено сучасні діагностичні підходи до раннього виявлення патологій передшлунків за умов теплового стресу в корів і телят. Обґрунтовано діагностичну цінність комплексного застосування автоматизованих датчиків румінації та молекулярно-генетичного аналізу мікробіому як інструментів предиктивного моніторингу в молочному скотарстві.

Ключові слова: тепловий стрес, датчики румінації, мікробіом, передшлунки, велика рогата худоба.

HRYTSAI V.V., Master's student, **VOVKOTRUB N.V.,** candidate of veterinary sciences
Bila Tserkva National Agrarian University

INTEGRATION OF AUTOMATED RUMINATION MONITORING SYSTEMS AND INTESTINAL MICROBIOME ASSESSMENT FOR THE EARLY DETECTION OF FORESTOMACH PATHOLOGIES IN CATTLE UNDER HEAT STRESS

The paper presents modern diagnostic approaches for the early detection of forestomach pathologies under heat stress conditions in cows and calves. The diagnostic value of the combined application of automated rumination sensors and molecular genetic analysis of the microbiome as tools for predictive monitoring in dairy farming is substantiated.

Keywords: heat stress, rumination sensors, microbiome, forestomachs, cattle.

Рання діагностика функціональних розладів травного тракту та негативного впливу теплового стресу є критичною передумовою збереження продуктивності молодняка та дорослого поголів'я ВРХ [1, 2]. Традиційні клінічні методи оцінки часто виявляють патологічні зміни лише на етапі вираженого клінічного перебігу захворювання (атонія передшлунків, дегідратація, діарея), коли лікувальні заходи потребують значних витрат та залучення антимікробної терапії. У зв'язку з цим сучасна ветеринарна діагностика орієнтується на використання комбінації предиктивних цифрових технологій та біомаркерів стану шлунково-кишкового тракту [3–5].

Центральне місце в ранній діагностиці посідає безперервний автоматизований моніторинг румінації та рухової активності за допомогою акселерометричних систем