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APPLICATION OF STEVIA AS AN ALTERNATIVE THERAPY IN BUFFALOES IN MODERN VETERINARY MEDICINE

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Abstract

Under conditions of increasing restrictions on the use of antimicrobial agents in animal husbandry, growing interest is being directed toward natural bioactive substances as alternatives for maintaining health status and metabolic balance in young animals. Among these, Stevia rebaudiana Bertoni extract stands out due to its proven antioxidant, hepatoprotective, and metabolism-regulating properties. The aim of the present study was to evaluate the effect of stevia extract on hematological and biochemical blood parameters in newborn buffalo calves. In the experimental design, newborn calves received a 5% extract of Stevia rebaudiana Bertoni at a dose of 20 mL per day, administered with milk over a 30-day period. Hematological and biochemical blood parameters were monitored at the beginning of the experiment and on day 31. A statistically significant increase in hemoglobin (HGB) concentration by 21.8% ($p \leq 0.01$) was observed, along with a tendency toward increased values of white blood cells (WBC - 17.8%), lymphocytes (LYM - 10.1%; LYM%), monocytes (MON - 2.43%), granulocytes (GRA - 8.45%), red blood cells (RBC - 15.7%), and platelets (PLT - 34.4%). A statistically significant decrease in alanine aminotransferase (ALAT) activity by 52.11% ($p \leq 0.001$) was also recorded. Blood glucose concentration decreased significantly at the end of the experiment ($p \leq 0.01$). Total cholesterol and LDL-cholesterol levels were significantly reduced ($p \leq 0.01$ and $p \leq 0.001$, respectively). Statistically significant differences in triglyceride levels were observed on day 31 ($p \leq 0.01$), as well as a significant decrease in urea concentration at the end of the experiment ($p \leq 0.01$). The obtained results indicate a pronounced hematopoietic and hepatoprotective effect of stevia and confirm its potential as a natural agent for supporting metabolism and overall health status in animals.

Key words*: antibiotic resistance, calves, hematological indicators, stevia.*

INTRODUCTION

Guided selection towards high growth intensity leads to the creation of precocious breeds and hybrids. Such physiological asynchrony often results in an attenuated immune system and suboptimal homeostatic regulation, predisposing the organisms to a spectrum of idiopathic pathologies and systemic metabolic dysregulation. They lead to both direct losses and impaired technologies, reproductive performance and susceptibility of the animal body to infectious and parasitic diseases. Neonatal hypoglycemia, anemia, enteritis, parasitosis, septicemia, respiratory diseases and omphalitis are common pathological conditions that can lead to serious health complications in newborn animals and are critical for their survival in the first 1 to 3 days. They have low glycogen reserves with which to initiate glycolysis and gluconeogenesis, as well as an underdeveloped liver. These conditions lead to neurological damage, reduced growth, high mortality and a weakened immune system. Oxidative stress has been shown to play an important role in the pathophysiology of diseases, suggesting that antioxidant-rich plants may offer therapeutic benefits (Nenova et al., 2024). *Stevia rebaudiana* Bertoni, often called the sweet herb of Paraguay, is a perennial shrub of the Asteraceae family, native to South America, specifically Paraguay and Brazil (Pirgozliev et al., 2022; Enchev and Kikindonov, 2023). The bioactive components derived from stevia possess a wide range of therapeutic potential for various diseases. Among its medicinal benefits are antihypertensive, antitumor, antidiabetic, and antihyperlipidemic. In recent years, there has been a significant paradigm shift toward the investigation of biogenic therapeutic agents derived from botanical resources. Among these, *Stevia rebaudiana Bertoni* has gained substantial recognition as a multifaceted natural matrix possessing diverse secondary metabolites with documented physiological

benefits (Takahashi et al., 2001; Shivanna et al., 2013; Bender et al., 2015; Lemus-Mondaca et al., 2018; Ntalli et al., 2020; Enchev et al., 2025).
The presented study demonstrates a way to limit the use of antibiotics in newborn calves, alternative strategies for improving animal health, the use of natural bioactive substances of plant origin, stevia and its positive impact on hematological parameters and general health.

MATERIALS AND METHODS

Animals, breeding and feeding

The experimental population of buffaloes was raised at the buffalo farm of the Agricultural Institute, Shumen (Northeastern Bulgaria, latitude: 43.28N, longitude: 26.93E). The feed ration included - whole milk 6 l, distributed in three rations per day. The study included 30 buffalo calves (n), matched by age and origin. 20 ml of 5% stevia extract were added to the milk of animals from the experimental group (n-15), for 30 days.

Blood samples

Blood samples for determining the indicators of hematological status were obtained from the *v. jugularis* using a vacuum container on the day of the beginning of the experiment and on the 31st day of the experiment. Subsequently, they were centrifuged and the serum was stored at -20°C until biochemical analysis was performed, hematological analysis was performed immediately.

Research Methods

Analytical procedures for blood tests were performed with an automatic biochemical and hematological analyzer EXICO C200 and EXICO H400 (Sweden) in accordance with the manufacturer's instructions. We monitored changes in the following hematological parameters - ASAT /aminotransferase/, ALAT (alanine aminotransferase), GLUCOSE, UREA, CHOLESTEROL, TRIGLYCERIDES, LDL hol (high-density lipoproteins), LDL cal (cholesterol concentration in low-density lipoproteins), WBC (leukocytes), LYM (lymphocytes), LYM% (lymphocytes), MON (monocytes), MON% (monocytes), GRA (granulocytes), GRA% (granulocytes), HGB (hemoglobin), MCH (mean hemoglobin concentration in one erythrocyte), MCHC (mean hemoglobin concentration in erythrocytes), RBC (erythrocytes), MCV (measures the average volume of red blood cells (erythrocytes) in the blood), HCT (hematocrit), RDWa (red blood cell distribution width), RDW%, PLT (platelets), MPV (mean platelet volume).
The stevia extract was obtained by the green extraction method with water + membranes (López-Carbón et al., 2019). The leaves were ground, the extraction was performed with pure water (without organic solvents). This was then followed by membrane filtration (to remove unwanted substances and concentrate glycosides). The concentration of the extract we worked with was 5%.

Statistical analysis

The primary data were analyzed using Statistica version 7.0 (StatSoft Inc., USA). To compare values between Day 0 and Day 31, a one-way repeated measures ANOVA was applied. Biochemical and hematological parameters quantified in the study are presented in detail in the accompanying tables. Statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSIONS

A statistically significant increase in the concentration of HGB (Hemoglobin) 21.8% was found on the 31th day of the experiment and a tendency to increase the values of WBC (17.8%), LYM (10.1%), MON (2.43%), GRA (8.45%), RBC (15.7%) and PLT (34.4%).
A statistically significant decrease in the values of ALAT (52.11%) ($p \leq 0.001$) was found. A statistically significant decrease was reported in the concentration of GLUCOSE at the end of the experiment ($p \leq 0.01$). In the values of CHOLESTEROL and LDL, statistically high reliability is observed, as they were significantly reduced with a level of significance of $p \leq 0.01$ and $p \leq 0.001$, respectively. In the concentration of TRIGLYCERIDES, statistically significant differences were reported on the 31 day, respectively day 0 - 0.137 and day 31 - 0.620 ($p \leq 0.01$). Statistically significant differences are observed in relation to Urea ($p \leq 0.01$), as the

results demonstrate a decrease in its values at the end of the experiment (Tables 1, 2)

In the results of the control group of animals, no statistically significant differences or trends in blood parameters were found.

A complex interplay exists between mitochondrial bioenergetics, oxidative stress, and metabolic adaptation during nutritional transitions, often manifesting as a functional decline in mitochondrial respiratory chain complexes within hepatic and intestinal tissues. The current investigation demonstrates that the administered extract exerts a systemic restorative effect on these metabolic pathways. Specifically, the data indicate that *Stevia rebaudiana* facilitates erythropoietic modulation, evidenced by a physiological increase in erythrocyte count, and exhibits potent anti-anemic properties by elevating hemoglobin concentrations. Furthermore, the extract appears to enhance systemic respiratory efficiency and cellular oxygen utilization in the experimental animals.

Table 1. Complete blood count of buffalo calves in the presence of stevia

Indicators	Day 0			Day 31		
	$\bar{x}$	$S\bar{x}$	C	$\bar{x}$	$S\bar{x}$	C
WBC g/L	7.774	0.749	22.12	9.160	0.702	24.23
LYM *x10^12/L*	5.740	0.796	44.84	6.320	0.740	37.04
LYM%	53.210	5.799	34.46	53.130	4.878	29.04
MON *x10^12/L*	0.820	0.042	16.06	0.840	0.092	34.69
MON%	8.390	0.496	18.69	7.600	0.397	16.52
GRA *x10^12/L*	4.140	0.676	51.67	4.490	0.653	46.01
GRA%	38.330	4.771	47.61	39.000	4.778	38.74
HGB g/L	125.800**	4.791	12.04	153.300**	6.893	14.20
MCH pg	14.710	0.455	9.78	15.160	0.616	12.85
MCHC g/L	393.900	19.006	15.26	426.400	23.098	17.13
RBC *x10^12/L*	9.026	0.796	27.87	10.451	0.786	23.79
MCV fL	37.970	1.880	15.66	36.720	1.850	15.93
HCT l/l	0.365	0.026	22.25	0.346	0.018	16.12
PLT g/L	424.300	80.539	60.03	570.600	48.189	26.71
MPV fL	9.750	0.971	45.48	6.730	0.903	42.44

** – $p \leq 0.01$

Table 2. Biochemical parameters in buffalo calves in the presence of stevia

Indicators	Day 0			Day 31		
	$\bar{x}$	$S\bar{x}$	C	$\bar{x}$	$S\bar{x}$	C
ALAT	10.800***	0.573	16.79	7.100***	0.674	30.02
ASAT	61.100	2.681	13.88	61.400	4.238	21.83
GLUCOSE mmol/L	2.880**	0.275	30.17	1.770**	0.177	31.63
UREA mmol/L	3.550**	0.463	41.23	1.570**	0.304	61.24
LDL mmol/L	1.234***	0.078	19.91	0.685***	0.089	41.11
CHOLESTEROL mmol/L	1.614***	0.131	25.70	0.593***	0.064	34.39
HDL mmol/L	0.863	0.065	23.88	0.828	0.196	74.86
TRIGLYCERIDE mmol/L	0.137**	0.024	54.30	0.620**	0.161	82.20

*** – $p \leq 0.001$, ** – $p \leq 0.01$

The regulatory influence of *S. rebaudiana* on the hematological profile of newborns may be due to the pleiotropic effects of its various phytochemical constituents. This physiological modulation is mediated by a complex of bioactive secondary metabolites, including steviol glycosides, iminosugars, and a potent polyphenolic fraction consisting of tannins and flavonoids, as well as volatile essential oils (Debnath, 2008; Abou-Arab & Abu-Salem, 2010; Lemus-Mondaca et al., 2012; Mali et al., 2015; Abdel-Rahman et al., 2015). These

directly or indirectly affect the oxygen-transporting function of hemoglobin. Stevia may increase hemoglobin levels in some experimental models, although this effect is not fully understood, but has been linked to several potential mechanisms of action based on the biochemical properties of the plant. Antioxidant activity - Stevia contains flavonoids, phenolic compounds, vitamin C, carotenoids, and other antioxidants that reduce oxidative stress in bone marrow and erythropoietic tissue, which supports erythropoiesis (red blood cell formation). Our results are consistent with a study by Kurek et al. (2021), which found that in rats with induced diabetes, high doses of stevioside (~2500 mg/kg body weight) significantly increased hemoglobin (HGB) and hematocrit (HCT). These results are consistent with our previous studies on the effect of stevia in sows (Nenova and Enchev, 2022). Some biologically active components in stevia may act as mitogens, substances that stimulate cell division. This enhances the proliferation and differentiation of erythroid cells in the bone marrow and leads to increased hemoglobin and erythrocyte production. In some studies, stevia improves liver function, intestinal absorption and microbiome, which may lead to better absorption of iron, vitamin B12, folic acid - essential cofactors for hemoglobin synthesis. Better iron absorption leads to more hemoglobin. Some studies have found an indirect effect of stevia on hematopoiesis through glucose regulation. In animals with insulin resistance or diabetes, anemia associated with oxidative stress and inflammation is observed. Stevia improves glycemic control and reduces metabolic stress, which indirectly improves hematopoiesis. In a study in which albino rats were given an aqueous extract of stevia (at doses of 200, 300, 400 and 500 ppm/kg body weight for 8 weeks), various hematological parameters increased significantly - including RBC, HGB, HCT, MCV, MCH and MCHC. This indicates that under these conditions, the number of erythrocytes and their associated parameters in the blood increases (Ahmad et al., 2020). In comparison, there are also studies that show the opposite effect. For example, in albino mice, prolonged use of stevia leads to a decrease in RBC, HGB and HCT. This highlights that the effect may be variable and dependent on the dose, form of stevia, animal species and duration (Farid et al., 2020). In the experimental buffalo calves, a quantitative increase in total leukocyte count was observed, increasing from 7.774 g/L on day 0 to 9.160 g/L by day 31. Although these values remain within the established physiological reference range, this upward trend suggests a potential immunomodulatory effect of the *S. rebaudiana* extract. This bioactivity is likely mediated by the presence of specific flavonols, namely quercetin, kaempferol and isorhamnetin, which are known to interact with immune signalling pathways and cellular defense mechanisms. Some authors note (Lillehoj et al., 2018) that these compounds promote the rapid proliferation of bone marrow cells and the release of young blood cells into the bloodstream. Stevia has an immunomodulatory (stimulating) effect on cells of the immune system. Stevioside stimulates both humoral and cellular immune responses. In studies on mice, it increased phagocytic activity, hemaglutination titer, and proliferation of B and T cells (Sehar et al., 2008). Kizhina et al. (2023) found in mice treated with stevia (10 mg/g body weight), an increased content of glycogen in leukocytes - an important substrate for phagocytosis. At the same time, the neutrophil/lymphocyte ratio (NLR) increased, indicating activation of phagocytic cells (granulocytes) (Kizhina et al., 2023). The authors found that chronic use of stevia (in the diet of mice) led to an increase in the number of $CD3^+$ T cells, $CD19^+$ B cells, and IgA^+ plasma cells in the walls of intestinal lymphoid structures (Peyer's patches and lamina propria), as well as changes in the levels of cytokines such as IL4, IL10, and TNFα. These effects promote local and systemic immune activity, which is reflected in blood parameters. (Rosales-Gómez et al., 2018; Noosud et al., 2017; Escoto et al., 2021).

When analyzing the results, an upward trend in platelet counts was observed. This is usually a reactive thrombocytosis related to the immune response, antioxidant effects and effects on the bone marrow. Stevia has anti-inflammatory and antioxidant properties that can alter the production of cytokines such as IL-6, which

stimulates thrombopoiesis by increasing thrombopoietin (TPO). Stevia reduces oxidative stress and damage to hematopoietic cells. This can lead to increased platelet production, especially in animals with previous hematological damage. Jeppesen et al. (2003) found in an experiment with rats with induced diabetes that high doses of stevioside (2500 mg/kg) were associated with an increase in platelets (PLT) in the blood, along with an increase in Hemoglobin and Hematocrit.

Shivanna et al. (2013) observed in albino rats with a diabetic model a moderate increase in PLT, probably related to the antioxidant effect of stevia and the improvement of the bone marrow. Analysis of the biochemical results revealed a statistically significant decrease in ALAT values (52.11%) ($p \leq 0.001$). The blood glucose concentration recorded at the end of the experimental period (1.77 mmol/L) requires careful interpretation with respect to the physiological range for neonatal calves. According to published reference values, normal blood glucose concentrations in healthy calves generally range between approximately 2.5 and 6.0 mmol/L, with mean values around 5.0-5.6 mmol/L (Knowles et al., 2000; Constable et al., 2013). In hospitalized neonatal calves, plasma glucose concentrations below 2.0 mmol/L have been defined as severe hypoglycaemia and have been associated with adverse clinical outcomes and increased mortality risk (Trefz et al., 2016).

The glucose value observed in the present study therefore falls below the commonly reported physiological range and approaches the threshold used to define hypoglycaemia. However, it is important to note that considerable physiological variability exists in glucose metabolism during the early postnatal period in ruminants, influenced by age, feeding regime, and metabolic adaptation after birth (Constable et al., 2013). In the current experiment, the reduced glucose concentration was not accompanied by clinical signs of hypoglycaemia or deterioration in general health status. On the contrary, improvements in hematological parameters and a marked reduction in hepatic enzyme activity were observed, suggesting a favorable metabolic adaptation rather than a pathological condition. Nevertheless, the obtained glucose values warrant cautious interpretation and should be discussed in the context of age-specific reference ranges and clinical observations, highlighting the need for further studies to better define physiological glucose limits in buffalo buffalo calves. Statistically high reliability was observed for cholesterol and LDL values, as they were significantly reduced, respectively, with a reliability level of $p \leq 0.01$ and $p \leq 0.001$. Statistically significant differences were observed for triglyceride concentrations at day 31, day 0 - 0.137 and day 31 - 0.620, respectively ($p \leq 0.01$). Statistically significant differences were observed for urea ($p \leq 0.01$), as the results showed a decrease in its values at the end of the experiment.

The addition of stevia (*Stevia rebaudiana* Bertoni) to the milk of buffalo calves has a positive effect on the biochemical parameters of the blood. The changes that occurred within 30 days in the experimental group indicate a hepatoprotective and antianemic effect of the plant, which is consistent with the findings of Ramos-Tovar et al. (2018) and Chang (1976). A decrease in ALAT values ($p \leq 0.01$) was observed in the animals of the experimental group. This is due to the antioxidant and anti-inflammatory effect through the activation of Nrf2 and the suppression of NFκB. In models of chronic liver injury, stevia prevents the increase in ALT by increasing the activity of Nrf2, which regulates antioxidant enzymes and provides protection against oxidative stress. It preserves the levels of glutathione (GSH) and GPx, thus reducing lipid peroxidation (4-HNE, MDA). Inhibits NFκB, resulting in reduced production of inflammatory cytokines (TNFα, IL1β, IL6). This is reflected in a significant decrease in serum ALAT and preservation of liver tissue (Ramos-Tovar et al., 2018). Latha et al., (2017) found that in acute liver injury in rats, both stevia aqueous extract and stevioside significantly restored elevated serum ALAT and ASAT levels, while simultaneously alleviating oxidative and inflammatory damage in the liver. In a study on diabetic rats, stevia significantly reduced ALAT (by about 62%) and other liver markers, while also reducing MDA levels. It increased GSH and improved the histological structure of liver tissue, including by increasing antioxidant and apoptosis regulators (Abdelwahab et al., 2017).

In the present study, a change in lipid status was found. In the values of Cholesterol and LDL, statistically high reliability was observed, as they were significantly reduced, respectively, with a level of reliability $p \leq 0.01$ and $p \leq 0.001$. In the concentration of Triglycerides, statistically significant differences were reported on the 31 day, respectively day 0 - 0.137 and day 31 - 0.620 ($p \leq 0.01$). An increase in triglyceride values has been found, which is due to a change in lipid metabolism: Steviol glycosides (mainly stevioside and rebaudioside A) are metabolized by the intestinal microflora to steviol, which can affect hepatic enzymes responsible for lipid synthesis and degradation (Chatsudthipong & Muanprasat, 2009). Improved insulin sensitivity has been observed in animals receiving stevia. Insulin stimulates lipogenesis in the liver and adipose tissue, which can lead to a transient increase in triglycerides (Jeppesen et al., 2003). In some experiments, low doses of stevia have been shown to reduce lipid levels, while at higher doses or with prolonged use, an increase in triglycerides may be observed due to adaptive mechanisms of hepatic metabolism (Melis, 1999). The effect depends on the animal species: in rodents, changes in serum lipids are often observed, while in ruminants (cows, sheep) the effect is more complex due to microbial fermentation in the rumen. The rumen microbiota can metabolize stevia components in a way that increases the production of volatile fatty acids, especially acetate – a major precursor for lipogenesis in ruminants (Bergman, 1990; Bauman & Griinari, 2003). In some conditions, stevia can reduce glucose utilization and increase lipid catabolism, which in short-term manifests as increased circulating triglycerides. In most cases, it is considered a hypoglycemic and hypolipidemic agent, but under certain conditions it can lead to reduced glucose utilization and compensatory increased lipid catabolism, which in the short-term manifests as increased circulating triglycerides (Melis, 1999; Kurek et al., 2020). This increase can be considered a positive effect, as higher triglyceride concentrations in the blood of buffaloes/cows reflect enhanced energy availability and improved metabolic function, which is particularly important for optimizing lactation and maintaining physiological balance. It is important to emphasize that the reported increase in triglycerides remains within the physiological reference values for the species, which excludes a pathological interpretation and supports its consideration as a functional metabolic adaptation.

Dietary supplementation with *S. rebaudiana* appears to enhance the hepatic biochemical profile and positively modulate lipid and carbohydrate metabolism, thereby mitigating hepatic steatosis. The liver and kidneys exhibit the highest gluconeogenic capacity within the organism. In accordance with the Cori cycle, lactate is translocated from skeletal muscle to the liver, where it serves as a primary substrate for gluconeogenesis. Through the catalytic activity of lactate oxidase, lactate is converted into pyruvate, which, along with glycogenic amino acids, facilitates the formation of alpha-keto acids for entry into systemic metabolic pathways. They are transformed into oxaloacetate, which is converted into glucose or glycogen in the reverse pathway of the glycolytic chain. With protected liver function, as in the present study, a reduced synthesis of glucose is observed.

Stevia and its main compounds (stevioside, rebaudioside A, etc.) lower blood glucose through several interrelated mechanisms - on the pancreas, liver, muscles and intestines. Stevioside and rebaudioside A act directly on β-cells in the pancreas. They activate TRPM5 calcium channels, which increases intracellular Ca^{2+} and stimulates insulin release. The effect is glucose-dependent - i.e. it increases secretion only at high glucose levels, which reduces the risk of hypoglycemia (Jeppesen et al., 2003; Philippaert et al., 2017) Stevioside enhances signaling along the PI3K/Akt pathway in muscle and adipose tissue. This leads to increased expression and transport of GLUT4 glucose transporters to the cell membrane and more glucose is taken up by the tissues. (Chatsudthipong & Muanprasat, 2009). Stevia inhibits key enzymes such as phosphoenolpyruvate carboxykinase (PEPCK) and glucose-6-phosphatase. This limits the production of new glucose by the liver and leads to lower levels in the blood. (Shivanna et al., 2013). Stevia can partially inhibit Na^{+}-dependent glucose transporters (SGLT1) in the

small intestine and leads to a slower and lower rise in blood glucose. (Abudula et al., 2004). Oxidative stress and chronic inflammation damage β-cells and cause insulin resistance. Stevioside reduces the production of TNF-α, IL-6 and improves antioxidant defenses, better preserved pancreatic function and leads to better glucose homeostasis. (Lemus-Mondaca et al., 2012).

Jeppesen et al. (2003) found that stevioside directly stimulates pancreatic β-cells to secrete insulin in diabetic rats. This leads to a significant decrease in glucose. Shivanna et al. (2013) found that treatment with an extract of stevia reduces the expression of liver enzymes and glucose-6-phosphatase, which leads to lower production of endogenous glucose and a decrease in glycemia. Urea is a nitrogenous product, and its content in the blood depends on the protein supply of the body. A decrease in its value within the normal range was observed, which indicates that the carbamidosynthesis function of the liver of the animals is optimized, as also proven in the experiments of Borisova et al. (2018). Our results also confirm the conclusions of the study by Algendy et al. (2023) that metformin, as well as stevia as monotherapy or combination significantly improved the glycemic profile along with balancing the redox status and alleviating the inflammatory response in male albino rats with diabetes. The effect of stevia on urea is less discussed compared to glucose and lipids, but there is evidence that it lowers serum urea in animal models and in some clinical settings. This is explained by its effect on renal function, protein metabolism and antioxidant protection. Stevioside and extracts of *Stevia rebaudiana* reduce oxidative stress and inflammation in the kidneys. This improves glomerular filtration and reduces the accumulation of nitrogenous metabolites (urea, creatinine). Our results are in line with the studies of Shivanna et al. (2013) who explain the decrease in urea and creatinine in diabetic rats with antioxidant and nephroprotective effects similar to Sharma et al. (2018), Pari & Satheesh (2004).

Statistically significant differences in the values of CHOLESTEROL and LDL under the influence of the supplement are observed, which correlates with the hypocholesterolemic effect of the herb, proven in the studies of Akhtar et al. (2018), related to the reduction of hepatic cholesterol and this function is mainly due to the improved bioavailability mediated by fats and/or by inhibiting the absorption of dietary cholesterol. The diterpene glycosides of stevia, in addition to helping to normalize the concentration of blood sugar, also have the property of supporting the function of the pancreas and pancreatic juice. This leads to lower values of lipid indicators in the blood, which could also affect the biochemical analysis of meat and should be further studied. Clinical studies show that stevia can be used as a means of lowering cholesterol (Nassuato et al., 1991; Tang et al., 2010). By suppressing hepatic cholesterol biosynthesis and attenuating systemic levels through the inhibition of intestinal absorption, *S. rebaudiana* may effectively modulate lipid metabolism and the subsequent fatty acid composition of meat and milk. This reduction in circulating lipids is likely driven by the interference of steviol glycosides with micellar formation within the gastrointestinal tract, thereby influencing the partitioning of adipose tissue and the lipid profile of bovine secretory products. When comparing the changes in the biochemical parameters of experimental animals, the hematopoietic and hepatoprotective function of Stevia (*Stevia rebaudiana* Bertoni) was established. The results are consistent with those established by Borisova et al. (2018), Algendy et al. (2023), Schonfeld et al. (1997), Tang et al. (2010) Shivanna et al. (2013), Sharma et al. (2018), Pari & Satheesh (2004).

CONCLUSIONS

The addition of 5% extract of *Stevia rebaudiana* Bertoni in a dose of 20 ml for a period of 30 days in the milk of newborn buffalo calves has a beneficial effect on their metabolism and general health. This is confirmed by the statistically significant changes in the main biochemical parameters of the blood (HGB, ALAT, GLUCOSE, CHOLESTEROL, LDL, TRIGLYCERIDES, UREA), which are consistent with the results published in previous scientific studies. The results established demonstrate the hepatoprotective and hematopoietic function of Stevia.

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