Summary

Nutritional-metabolic monitoring and adjustment processes in populations of sheep in pastoral ecosystems of Bacau County

KEYWORDS:

Sheep, biodiversity, metis, management, immunomodulatory, pasture, yield, pastorale ecosystems, monitoring nutritional-metabolic.

The thesis named "**Nutritional-metabolic monitoring and adjustment processes in populations of sheep in pastoral ecosystems of Bacau County"** expands on 174 pages and is structured in two parts.

The first part named the "The bibliographic study" represents about 30 % off the paper and exposes news about biodiversity, adaptation processes, the welfare of the sheep and short presentations of the sheep breeds. The second part representing 70 % off the paper presents the results of nutritional-metabolic monitoring in 72 tables and 119 figures and about 130 titles.

Part II, personal research is structured in three chapters: The research purpose, material and methods, results and discussion.

The research was conducted on the following dates:

In 2013-2015, the research was conducted at the "Research and Development Station for sheep and goats farming Secuieni-Bacau (S.C.D.C.O.C.) which has the headquarter in Letea Veche commune, Holt Village, Bacau County. The main objectives of the thesis in this location were: Climatic and Soil Studies in order to get to know the context of acclimation and the adaptation of the sheep hybrids, specializing in milk production in Bacau County; Nutritional-metabolic monitoring of the local population of sheep and the crossbred sheep that are the result of controlled pairing for milk production, created in S.C.D.C.O.C. Secuieni-Bacau; in 2014-2015 the research was conducted at a micro-farm of sheep in the Margineni commune, Podis village (hilly county of Bacau); in 2015-2016, the research was done in Pricopie Dumitru Costinel farm, in the sub-mountainous area of Bacau County. The purpose of the nutritional and metabolic monitoring is the assessment of health status or pathological conditions that can be diagnosed following metabolic correlation made based on the values obtained. To this there has to be a system of reporting the benchmarks, so

there must be a national referral system for each species, age, sex, breeding systems etc. Therefore, the values obtained in the research carried out in other works are known values and can be considered benchmarks for sheep breeds(Awasi X Tsigae Ruginie; Tsigae Sârbească; Tsigae, Awasi X Tsigae; Awasi X Tsurcana etc.) reflecting the real state of things.

1. Monitoring nutritional-metabolic sheep population from SCDCOC Secuieni; monitored sheep breeds were crossbred Awasi X Țsigae: Țsigae sarba, Țsigae (local breed).

S.C.D.C.O.C. Secuieni, Holt village, Bacau region is in the North - Eastern; It has two locations: Holt (500-600 sheep) and Izvorul Berheciului (2000 sheep).

A. *Metabolic monitoring (hematologic and biochemical) in crossbreed (Awasi X Țigaie Ruginie).* We took blood samples from sheep following the next categories: 1) lactating sheep, age 1.5 years; 2) youth male 1.5 months; 3) young females, two months. The essence of this research is to present the values obtained from nutritional-metabolic monitoring by race, age, sex etc., without the metabolic correlations resulting from these values; for the development of the metabolic correlations is imperative to have the reference system; interpretations can be established based on scientific data, clinical examination and correlations with all the biochemical parameters analyzed. The biochemical parameters for which we have not achieved interpretations and correlations we will consider them normal, or variations plus or minus depending on the system of benchmarks, or in connection with the maintenance condition with clinical symptoms.

For lactating crossbreed sheep (Awasi X Tigaie ruginie); age 1,5 years we found: Biochemical: hypercholesterolemia, hypoproteinemia, hepatic enzyme hyperactivity, hypocalcaemia.. Hematologic: eritropenie, leukopenia, low Hb and Ht, normal MCV; low CHEM. In young male 1.5 months: Biochemical: hypoglycemia, hypercholesterolemia, hyperproteinemia, hypocalcemia, hypophosphatemia. Hematologic: eritropenie, no. WBC normal, low Hb, increased MCV; low CHEM. In young female 2 months: Biochemical: hypoglycemia, hypercholesterolemia, hyperproteinemia, hypocalcemia and moderatehypophosphatemia. Hematologic: increased Hb, decreased MCV, increased MCHC, leukopenia.

Hyperproteinemia in youth sheep is moderate; the metabolic pathways and the liver function as expected; hypoproteinemia observed in adult sheep can be induced by a decreased level in albumin, due to decreased biosynthesis in the liver, poor digestion and absorption,

insufficient protein intake, etc. Regarding enzymatic activity in adult sheep, the increased GPT combined with increased GGT suggest liver issues, such as hepatic lipidosis; increased GGT denotes chronic liver disease. Liver enzymes (GOT, GPT, GGT in lambs have low activity, which is why test results are inconclusive. In ruminants in general, blood glucose has lower values than in other species because they do not absorb glucose directly from food. Hypoglycemia with other changes in the current energy situation, can lead to pregnant sheep a separate entity, particularly in sheep with twin gestation or sheep toxemia pregnancy.

In sheep, especially in young ones, rickets is determined by the decrease of phosphorus; in this case you can not make a paraclinically diagnosis of rickets because it does not correlate with clinical symptoms; These values may be due to some digestive processes; some of the lambs had diarrhea and hypocalcemia may occur due to gastrointestinal disorders accompanied by loss of body fluids (diarrheal states). Hematological, if in an adult sheep you find low Hb and Ht it's justified to find also a decrease CHEM; for VEM, the value obtained is normal because the interpretation it is calculated based on Ht and eritremiei. In young male eritropenia denotes a carential state diverse in nature; a higher VEM - means higher erythrocyte volume, and we believe that it is a process of adaptation to functional needs of the body.

B. *Metabolic monitoring (biochemical and hematological) to the indigenous skillet of Tigaie Sarba from Secuieni;* it is raised to Izvoru Berheciului, to hybridization with other sheep specialized in milk production. Biochemical findings, that at the adult sheep Awassi X Tigaie ruginie skillet, exists hypercholesterolemia which leads us to the conclusion that regardless of the actual race, the sheep meat is "fat".

C. *Nutritional-metabolic monitoring of the skillet sheep (local breed) from Secuieni*; Biochemically at the pregnant sheep, Ţigaie race, age 2 years, we have achieved: moderate hypoglycemia, normal cholesterol, hypoproteinemia, hypocalcemia, hepatic enzyme hyperactivity. Sheep, lactating hypoglycemia, normal cholesterol, hypoproteinemia, hypo-calcemia, enzyme hypoactivity. Nutritional-metabolic monitoring at the sheep in different physiological states, shows the same states, in agreement with clinical signs (pregnancy, lactation), with small differences in terms of liver enzyme activity.

D*. Research regarding on hematologic status in crossbreed sheep with parasitic diseases (AWAS X Tigaie ruginie) from SCDCOC Secuieni and the results obtained after treatment with an immunomodulatory herbal extract.* In the study area, we found the existence of a bio-diversity endo-parasitical in sheep; hematological at sheep with endo-parasitical we found: leukopenia, eritropenie, decreased hemoglobin, decreased Ht, normal

MCV, low CHEM, thrombo-cytopenia. anemia due to toxic action of adult beams but it is possible that young beams may cause bleeding, due to abnormal hemoglobin synthesis. In this study we used a phytopreparation (found during testing and send to submission for certification); we point out that the extract used doesn't have antiparasitic action but immunomodulatory as noted in the analyzes made. After the treatment we obtained: leukocytosis; normal eritremie; decreased hemoglobin; decreased Ht normal VEM; normal HEM; low CHEM normal number of platelets.The fitoterapeutical extract used improved the health of sick animals; even if we used a single dose; if it would have been done a treatment with vitamins, minerals, proteins produced by chemical synthesis, the treatment should have been long-term, required additional effort and additional costs.

***E**. Assessment of health at half-breeds (Awassi x Ţigaie ruginie) in immunological research.* At crossbreed Awassi X Ţigaie ruginie, with poor maintenance we injected subcutaneously same therapeutic extract immunomodulatory and determined: the phagocytic capacity of neutrophils to entrapping particles of carbon (IF = phagocytic index) and the capacity of blastic lymphocytes stimulating through the test of transforming, testing was performed on populations of lymphocytes T (test code - TTL / LT). It has been observed an increased in phagocytic index that may be a result of nonspecific stimulation, which has happened in this case. The values obtained in the second test indicate a low participation of lymphocyte populations in the mechanism of immune response analyzed. The followed nonspecific stimulation is addressed to a lesser extent to the immune cellular response of lymphocytes administered. Correlating the results of tests we can say that the cell phagocytosis mainly stimulates is the neutrophil.

2. Nutritional-metabolic monitoring and processes of adaptation and biodiversity of the Mărgineni ecosystem, pastoral village Plateau, Bacau County. Margineni farm, was established in 2013; it is a core of mitigation and adaptation, because it has its own genetic. The firm is growing: Tsurcana; Tsigae; Suffolk; crossbreed: Suffolk X Tsurcana; Suffolk X Tsigae. We note that based on morpho-productive and the adaptability to environmental conditions, the owner opted for hybrids obtained between Suffolk X Tsigae. The creossbreed Suffolk X Tigaie skillet are superior in live weight and the weight of the butcher products; Nutritional metabolic monitoring for crossbreed Suffolk X Tsigae; Biochemical we obtained: hypercolesterolemia ; normal proteinemia; normal albumin; normal globulinemie; normal urea; normal creatinine; increased liver transaminases (GOT and GGT); normal serum calcium. Hematologic: normal no. leukocytes, normal no.

erythrocytes, normal hemoglobina, low hematocrit:all this denotes a state of dehydration; VEM is small because there exists hemoconcentration, increased HEM, greatly increased CHEM. Normal thrombocythemia (but the lower end; no one can talk about a state of microcytic anemia, while the HEM and CHEM are increased; rather it can be discussed about hemodynamic due to reduced consumption of water, on the other hand it can be about the adaptive function processes, the oxygen concentration (oxygen is sparse at high altitude) and the oxigen uptake by the blood cells, in a small cell volume we noticed that there is a large amount of hemoglobin that sets increased amounts of oxygen. necessary to the adaptation of walking daily,to average altitudes and the application required by the state of pregnancy.

Metabolic nutritional monitoring at crossbreed sheep Suffolk X Turcana pregnant (110 days of gestation) age of 1.5 years; Biochemical: moderate hypoglycemia; moderate hyperproteinemia, moderate hypo-albumin, normal urea and creatinine; enzymatic hyperactivity, hypocalcaemia. Hematological, I obtained: normal no. WBC; normal no. erythrocytes, normal hemoglobin, normal hematocrit, low VEM; normally HEM; greatly increased CHEM. So: at the crossbreed Suffolk X Tsigae: hypercholesterolemia, enzyme hyperactivity; and at the crossbred Suffolk X Turcană: moderate hypoglycemia; marked hypercholesterolemia, enzyme hyperactivity ; hypocalcemia; hypercholesterolemia is present at these breeds and crossbred.

3. Nutritional-metabolic monitoring of Turcana sheep from the pastoral ecosystem Magura, Bacau County. The health of the sheep in pastoral ecosystems was and is the result of continuous adaptive process to unite macro and micro-climate changes; "Grazing terrier" ensures Turcan the well-being of populations; it can be said that we are talking about a Mioritic system of raising Turcan sheep, ensuring their health, this Mioritic system must be respected; This system includes ancestral elements and current contemporary “elements”. Monitoring Ţurcana (lactating), grazing summer, from Magura Bacau, I found: normal blood sugar levels, hypercholesterolemia, normal proteinemia, normal serum calcium. Monitoring Ţurcanelor (pregnant 115 days gestation indoors) in winter, from Magura Bacau, we found: hypoglycemia, hypercholesterolemia, hypoproteinemia, hypocalcemia. So, nutritional-metabolic monitoring Turcana from Magura Bacau depending on the physiological state, nutrition, macroclimat, it has highlighted the main change in biochemical parameters in calves, not the pasture.