ABSTRACT

The knowledge of the relationship between physiological status of bovines and meat quality is important through the consequences that are manifested on consumers.

The physiological status influence high quality products obtaining. Interventions on bovines through the growth system (diet, environmental factors) and slaughter causes changes at the level of physiological status and metabolic profile with influences on meat quality.

Structurally, the thesis consists of two distinct parts. The first part is written on 66 pages covering 3 chapters of literature synthesis on the ontogenesis and muscle tissue development in bovines, muscle biochemistry, physiological status and its implications for meat quality, synthesis sustained by 156 bibliographic titles.

The second part contains personal researches and it is extended on 111 pages. The raw data were sorted into a database, being afterwards subjected to statistical calculation.

The specialty literature reveals the existence of incomplete areas regarding the physiological characteristics of bovines before slaughter and their influence on meat quality.

This paper aims to provide new data on the relationship physiological status – meat quality, for this there were identified metabolic profile indices in correlation with physicochemical properties of meat.

In order to achieve the proposed objectives there were studied four bovines breeds, Fleckvieh breed, Pinzgauer, Black Spotted Romanian and Holstein breed, which are often slaughtered in specialized unit.

Quantitative meat production was assessed in terms of live weight and slaughter yield.

The metabolic profile before slaughter of these bovines was monitored on blood samples collected on anticoagulant, respectively on plasma. Also measurements on weight and slaughter yield were made.

From each bovine muscle samples were taken to determine the physical (pH value) and chemical (protein, fat, water content) properties. The analyzed muscles were: *Triceps brachial*

muscle, *Gluteus* muscle, *Semimembranosus* muscle, *Rhomboiudeus* muscle, *Trapezius thoracis* muscle, *Longissimus dorsi* muscle and *Intercostales* muscle.

The hem – leukocytes profile (total number of erythrocytes; quantity of hemoglobin; hematocrit; mean corpuscular volume; mean erythrocyte hemoglobin quantity; mean erythrocyte hemoglobin concentration; total number of white blood cells; blood platelets) was determined by automatic analyzer ABX Micros VET ABC and the biochemical profile with Accent 200 analyzer. Acidity was determined on matured bovine meat through Hanna digital pH meter. Gross chemical composition (protein, fat, water content) was studied using Food-Check automatic analyzer.

The results on the body development of bovines showed a poor quality of the obtained carcasses for sale as cut portions.

The biochemical research performed has shown that amount of blood proteins varied significantly between the females of Pinzgauer (9.38 g/dL) and Fleckvieh race (12.99 g/dL) and significantly distinct between the Pinzgauer and Black Spotted Romanian race (12.37 g/dL). Albumin varied significantly distinct at the Black Spotted Romanian race and very significantly at Fleckvieh race between the sexes due to the high values found in males. Bovines that have high concentrations of total protein and blood albumin blood had a lower percentage of muscle proteins in most cases.

The cholesterol and blood triglycerides showed lower values in mixed breeds compared with milk breeds, females showing generally, higher values than males, the same thing being observed in the case of muscle lipid content, with two exceptions observed in *Rhomboideus* and *Intercostales* muscles.

The energetic biochemical profile characterized by glucose concentration, uric acid and urea showed insignificant variations at the two sexes based on race.

High amounts of some enzyme profile indicators of blood collected from the races specialized for meat and milk production indicated the presence of some more active muscles from a metabolically point of view, resulting a lower chemical composition of proteins compared with other races in which the aspartate aminotransferase and alanin aminotrasnferase ranged within normal limits.

Serum calcium quantities were significantly lower in Black Spotted Romanian breed females (8.57 mg/dL) compared with males of the same race (10.61 mg/dL). Blood magnesium concentration ranged from 2.83 mg/dL in Holstein females breed and 4.40 mg/dL in Pinzgauer males race. The phosphorus quantities were significantly higher in Pinzgauer males (10.13 mg/dL) compared with the females of the same breed (5.64 mg/dL).

The results of metabolic profile revealed that the number of erythrocytes was significantly higher in males than females in all studied races. The amount of hemoglobin and hematocrit were higher in males (12.57 g/dL, respectively 38.3% at Fleckvieh breed) than females (9.23 g/dL respectively 29.77%). Mean corpuscular volume was significantly increased in Fleckvieh females (53.67 μm3) than males (45 μm3). The mean erythrocytes hemoglobin concentration varied insignificantly between the sexes based on race and between the breeds of the same sex.

The total number of leukocytes recorded values that ranged from 6.76 x 10^3/mm^3 (Black Spotted Romanian breed) and 9.47 x 10^3/mm^3 (Fleckvieh breed) in females and 8.4 x 10^3/mm^3 (Fleckvieh breed) and 9.56 x 10^3/mm^3 (Pinzgauer breed) in males.

Blood platelets showed low values, ranging from 73.50% x 10^3/mm^3 (males from Black Spotted Romanian breed) and 445.33 x 10^3/mm^3 (females from Fleckvieh breed).

The values determined for blood cellular components showed variations from the species normal mainly due to malnutrition, dehydration and stress.

The highest pH level was measured in the muscle *Triceps brachial* of the Pinzgauer males (6.26), while the minimum value (5.64) was observed at the *Trapezius thoracis* muscle from Holstein females and *Longissimus dorsi* muscles harvested from Fleckvieh females.

The tests on the chemical composition of *Triceps brachial* muscle revealed a protein content ranged between 21.8% (males belonging to the Black Spotted Romanian breed) and 21.24% (Holstein breed females). The lipid content varied insignificantly between the sexes based on race. The comparison of the pairs of females of Holstein and Black Spotted Romanian breed and the ones from Holstein and Pinzgauer breeds showed significant differences in terms of protein content. Also the pair of females from Black Spotted Romanian and Holstein breed showed significant differences in lipid content. The water content of *Gluteus* muscle showed significantly higher values in females (75.83%) than males (74.73%) at Fleckvieh breed. The muscle protein content of *Semimembranosus* muscle varied in restricted limits, ranging between 21.32% (Holstein breed females) and 21.84% (Pinzgauer breed females). The chemical parameters that define the chemical composition of *Semimembranosus* muscle varied insignificantly. *Rhomboideus* muscle protein content has presented a minimum of 20.26% (Holstein breed females) and the maximum of 21.77% (Black Spotted Romanian breed females). The females from Fleckvieh breed had a protein content (22.03%) significantly increased compared with males (21.67%). The chemical composition of *Longissimus dorsi* muscle varied slightly between the sexes based on race. The Black Spotted Romanian breed showed significantly higher values of water content in females (73.59%) than males (69.25%) in *Intercostales* muscle.

Considering the data presented on bovines design for slaughter and the properties of the analyzed muscles it can be observed the very poor quality of meat for sale. This suggests the need to reform the animals before slaughter, since the animals are purchased due to their low productivity.