

ADF ratio raised, daily growth linearly increased ($P=0.05$) and feed intake decreased ($P<0.001$) and, thus, feed conversion improved ($P<0.001$); the digestibility of dry matter (50.8 to 71.5%), gross energy (50.3 to 70.7%) and fibre fractions linearly increased ($P<0.001$); at caecum, the concentration of total volatile fatty acids (VFA) raised (63.0 to 78.5 mmol/L; $P=0.02$), whereas the proportion of propionate decreased (4.0 to 3.5 mol/100 mol VFA; $P=0.04$). When the dietary protein increased, feed conversion improved (3.47 to 3.37; $P<0.001$) and the digestibility of dry matter increased; (60.3% to 61.6%; $P<0.001$) at caecum, the N ammonia level tended to decrease ($P=0.07$), whereas total VFA production and VFA molar proportions were not affected. The increase of the (soluble fibre+starch)-to-ADF ratio reduced the mortality rate (15.8%, 4.5% and 4.9%; $P=0.02$), whereas the dietary protein level did not affect rabbit health. In conclusion, the contemporary increase of dietary soluble fibre and starch at the expense of ADF increased digestive feed utilization and growth performance, and enhanced fermentation activity at caecum and health status. The increase of dietary protein moderately improved productive results and did not affect health status.

C-102

Effects of two different concentration of dimethylsulfoxide on the quality of turkey semen cryopreserved in straws over liquid nitrogen vapor

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The poultry semen cryopreservation is important both for the value of this technique as fundamental to the practice of artificial insemination, and as an essential tool for the conservation of genetic resources in cryobanks. The choice of the cryoprotectant (CPA) and its concentration is certainly among the most important factor involved in the cryopreservation process. The packaging of frozen semen in straws would optimize the cryopreservation process by a better identification and safety of frozen semen doses useful particularly in cryobanking. Therefore the aim of this study was to evaluate the effect of two different concentration of dimethylsulfoxide (DMSO) as CPA on the post-thaw quality of turkey semen cryopreserved in straws above the liquid nitrogen vapor. Seven pools of semen (9-12 ejaculates/pool) were collected from Hybrid Large White toms, an aliquot from each pool was taken for the analysis of fresh semen, the remaining part of pooled semen was cooled at 5°C for 25 minutes. Each pool was divided into 2 semen samples that were diluted 1:1 (v:v) with the freezing medium composed by Tselutin extender containing DMSO (final concentration of 4% or 10% of DMSO). Thus the semen diluted was aspirated into 0,25 mL plastic straws, equilibrated at 5°C for 20 min, frozen by exposure to liquid nitrogen vapour and then plunging into liquid nitrogen for storage (-196°C). The samples were thawed at 50°C for 10 sec-

onds. Sperm mobility (phase contrast microscopy), viability and osmotic-resistance (SyBr-PI staining) were examined on fresh and post-thawed spermatozoa. The results obtained showed that the cryopreservation impaired the post-thaw quality of turkey spermatozoa respect to fresh semen. However the quality the frozen semen was affected differently in relation to the DMSO concentration. In fact, the cryopreserved semen quality was better with the concentration of 10% of DMSO, compared to the 4%, however only the motility and viability resulted significantly higher (36.92 ± 1.69 vs 21.92 ± 2.10 ; 42.09 ± 1.50 vs 33.48 ± 2.41 ; $P\leq 0.05$) respectively. In conclusion, these data shows clearly that the higher concentration of penetrating CPAs protect better from cryopreservation damages.

C-103

Magnitude of emerging meat quality defects in breast fillets of different commercial meat-type chicken hybrids

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Selection for fast-growing and increasing breast meat yield may negatively impact muscle structure and meat quality traits. In the last years, two emerging meat defects have been arisen in breast fillets of fast-growing chicken hybrids: white striping characterized by white parallel striations in the direction of the muscle fibers and poor cohesion of muscle structure with fibers bundles which can be easily pulled away by fingers. A trial was conducted to compare productive performances, cut up yields and incidence of white striping and poor cohesion (absence=normal, presence classified in 2 levels as moderate and severe) in four of the most representative commercial chicken hybrids which were classified as either standard (SBY1 and SBY2) or high (HBY1 and HBY2) breast-yield. A total of 2,160 1-day-old male chicks were equally divided into four experimental groups of 9 replications each, raised in the same experimental conditions and fed the same commercial diets. Birds were slaughtered at about 3.6 kg live weight reached at 48 (SBY1 and HBY2) and 51 d of age (SBY2 and HBY1), respectively. Both HBY1 and HBY2 had a lower daily feed intake if compared with SBY1 and SBY2 (120 and 124 vs 131 and 130 g/day, $P<0.01$). On the other hand, feed conversion rate was not significantly modified. As expected, HBY1 and HBY2 had higher breast yields than both SBY birds (30.9 and 31.5 vs 28.6 and 28.5%). The total occurrence (moderate and severe) of white striping in all the genotypes was remarkably high (>87%). However, HBY birds had an incidence of about 96% white striped fillets, while its occurrence in SBY groups did not exceed 90%. The overall incidence (moderate and severe) of muscle structure with poor cohesion also resulted extremely high (>90%). Indeed, only 10% of breast fillets from SBY1 birds resulted unaffected by this defect, while 40% of

breast fillets from HBY2 showed poor cohesion with severe degree. In conclusion, from this study emerged that all the modern chicken hybrids here tested are affected by a high incidence of breast muscle defects which are particularly pronounced in high breast-yield birds.

C-104

Effect of white striping on quality traits of raw and marinated chicken breast meat

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The appearance of white striping or striations parallel to muscle fibres on the surface of chicken breast fillets (pectoralis major muscles) is a new emerging poultry meat quality issue. It has been already demonstrated that white striping noticeably decreased consumer acceptance of pre-packaged breast meat, however few information are still available on its impact on technological traits of the meat. The purpose of this study was to characterize raw and marinated meat quality properties of fillets showing different degrees of white striping. To pursue this aim, 153 fillets were selected based on white striping degree (normal, moderate and severe) after the breast-deboning area in a commercial processing plant. Samples were used to evaluate ultimate pH, colour, drip loss, cook loss and AK-shear force on non-marinated meat as well to determine marinade uptake, purge loss, cook loss, total yield and AK-shear force after marination with a solution containing sodium tripolyphosphate and sodium chloride. The ultimate pH of severe white striped breast fillets was significantly higher than in normal and moderate groups (5.95 vs 5.86 and 5.88; $P < 0.01$). There were no differences in the lightness (L^*) of meat, but moderate and severe samples showed a significant ($P < 0.01$) increase in redness (a^*) and yellowness (b^*). As for non-marinated meat, cook losses increased as the degree of white striping increased from normal to severe groups (21.27 vs 23.20 vs 26.74%; $P < 0.01$). Moreover, the severe white striping resulted in significantly ($P < 0.01$) lower shear values if compared with moderate and normal groups. With regard to marinated meat, there was a decrease in the marinade uptake as the degree of white striping increased from normal to severe (12.67 vs 10.97 vs 7.92%; $P < 0.01$). In addition, severe group had higher ($P < 0.01$) purge loss, cook loss and lower total yield if compared with moderate and normal groups. Finally, severe white striped fillets had lower AK-shear force values. In conclusion, this study evidenced that white striping had a remarkable detrimental effect on breast meat quality attributes by mainly reducing ability of the meat to hold and bind liquids during processing and storage.

C-105

Effect of dietary thymol supplementation on lipid oxidation of chicken legs as related to storage conditions

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The aim of this research was to evaluate the effect of dietary thymol supplementation on lipid oxidation of chicken leg meat during refrigerated shelf-life. Chickens belonging to Ross 308 hybrid were raised under experimental conditions up to 3 kg of live weight, using three dietary treatments: control (without supplementation, C), treatment 1 (C+0.1% w/w thymol supplementation, T1) and treatment 2 (C+0.2% w/w thymol supplementation, T2). After slaughtering, the chicken legs with skin were stored under conventional (CON) and modified atmosphere (MAP) at temperature of 2-4°C for 14 days. Lipid oxidation was monitored by the determination of primary (peroxide value, PV) and secondary (thiobarbituric acid reactive substances, TBARs) products at 3, 7, 10 and 14 days of storage under both CON and MAP conditions and compared with values found on fresh meat. The three different dietary treatments did not significantly affect the lipid oxidation parameters. PV ranged between 0.5-13.0, 0.7-13.0 and 1.0-11.0 meq O₂/kg of lipid in poultry meat obtained with C, T1 and T2 diets, respectively. TBARs varied between 0.1-0.7, 0.1-0.6 and 0.2-0.5 mg MDA/kg of meat in poultry meat obtained with C, T1 and T2 diets, respectively. On the other hand, interaction effect of diets and storage conditions were significant ($P \leq 0.05$) in PV formation, as it was delayed under MAP (maximum PV level after 2 and 5 days of storage in C and thymol-containing diets, respectively) with respect to conventional storage (PV apex after 2 days of storage). However, not significant differences ($P \geq 0.05$) were found on TBARs level as related to storage conditions. In conclusion, this study demonstrated that dietary thymol supplementation coupled to MAP storage conditions delay lipid oxidation of chicken legs with skin, thus improving their shelf-life.