Effect of finishing on concentrate and hay or by grazing on performance, carcass characteristics and meat quality of Moroccan Timahdite-breed lambs

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ABSTRACT

In the Moroccan Middle Atlas, changes are occurring in the production system because of the disappearance of great transhumance, the sedentarisation of stockbreeders, the appropriation of land, the extension of crops at the expense of pasture, etc. Knowing that quality of lamb meat depends on the diet, it was considered important to evaluate performance, carcass characteristics and meat quality of lambs raised on grass compared to those fed partially or completely on concentrate and hay. Two experiments were carried out on two consecutive years (2006, Experiment 1, and 2007, Experiment 2). In Experiment 1, 18 entire male lambs, of about 6 months of age and about 16 kg liveweight, were used, whereas the experiment 2 involved 39 lambs of about 6 months of age. Three diets were compared: pasture (PP), oat hay (50%) and concentrate (50%) (CC), and pasture and hay and concentrate (PC). In Experiment 2, feed intake was adjusted for CC and PC groups to achieve similar growth rate to PP group. Animals were slaughtered at the end of the trials. Information collected at slaughter included carcass characteristics and semi-membranous fatty acid composition. In Experiment 1, average daily gain (ADG) decreased (P = 0.001) with increasing level of pasture in the diet (64, 18, -31 g/d for CC, PC, and PP groups respectively), consequence of the scarcity of grass supply at this period of the year (i.e. July and August), but was similar for the three groups in Experiment 2 (average of 193 g/d; P = 0.20), as it was designed through intake adjustments. Changing diet from concentrate and hay to pasture resulted in lower feed efficiency (6.61, 6.83 and 7.01 kg DM/kg of gain), due to the lower energy content of PP diet, and the higher demand for energy required for the activity of pasture fed animals. Dressing percentage, muscle conformation, and omental and kidney fat decreased from concentrate-fed to pasture-fed animals. Fat deposition followed the trend that faster gaining animals deposited more fat. This likely reflects the lower priority for partitioning feed energy into omental and kidney fats vs. other tissues until greater rates of gain are achieved. Meat from outdoor raised animals (PP and PC groups) was found more favorable for human health because of the lower C16:0 percentages (30.1, 27.5 and 24.1%), higher PUFA percentages (10.4, 13.8, and 18.6%), higher n 3 FA content in muscle (1.37, 2.66, and 4.35%), and better n 6:n 3 PUFA ratio (6.0, 3.7 and 3.1) for CC, PC and PP groups respectively. Thus, growth performance and carcass characteristics were improved with increasing concentrate and hay in the diet. However, the decrease in animal performance for pasture-fed animals was compensated by the better quality of meat and probably the lower cost of production which makes the advantage of animal supplementation a liability.
Liveweight estimation from body measures in “Nero di Parma” pigs

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ABSTRACT

In the past, predictive equations have been applied to the calculation of body weight from body measures of several species and breeds. Their employment is an important aspect in herd management, most of all for the outdoor rearing system. In fact, in such conditions it's difficult to use a balance and, moreover, the “wild” aptitude of animals and the dangerousness of their handling must be considered. The weighing is a stress for animals, while body measuring is much more less invasive, even it involves the capture of the animals. Moreover, body measures can also be taken by image analysis. The aim of the research was to define accurate and easy-to-use equations for the prediction of body weight from body measures in “Nero di Parma” pig, a local genetic type suitable for outdoor rearing system typical of different areas of Northern Italy, particularly of the Emilia-Romagna region. The trial was carried out on the weights of 1023 pigs between 1 and 1585 d of age (532 females, 32 males and 459 castrated males), group reared in 18 herds and fed commercial standard diets given ad libitum and integrated with pasture in the brushwood. During weighing, the hearth girth (HG) was also measured on all the animals by a tape measure, while on 190 pigs the height at withers (HW) and at rump (HR), the length of the body (LB), the fore-rear length of the thigh (LT) and the width of the rump (WR) were also recorded. Data were submitted to stepwise regression analysis, by introducing the independent variables (body measures and age) in the linear, quadratic and cubic form. The ability of the models to fit the raw data was evaluated by means of R² and SE of the dependent variable. Two equations for live weight (LW) estimation have been calculated: the first one by submitting to analysis all the body measures and age (n = 190) and the second one by using HG (n =1023) only.

Equation 1:

\[
LW = 9.035 + 0.006696 \times HG^2 - 0.454 \times HR + 0.000120884 \times HR^3 + 0.00159 \times LB^2 - 0.172 \times HW
\]

(SE = 2.39 kg; R² = 0.995; P<0.001)

Equation 2:

\[
LW = 3.483 - 0.342 \times HG + 0.010998 \times HG^2
\]

(SE = 1.95 kg; R² = 0.988; P<0.001)

Both equations have shown high R² values and low SE of the dependent variable. The real and the estimated weights by applying the two prediction equations resulted highly correlated (0.997 and 0.994, respectively for equation 1 e 2). In conclusion, equation 2, though slightly less accurate (lower values of R²), is more reliable (lower values of SE of the dependent variable); this could be due to the higher number of observations used for the calculation. Finally, from a practical point of view equation 2 is much more easy to apply to field conditions, because it only counts in one body measure (HG).
Housing system and meat quality in organic Podolian young bulls

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ABSTRACT

Consumer awareness of food safety issues and environmental concerns has mostly increased. Extensive rearing systems can meet most of consumers’ requirements. These systems minimise the use of chemicals and provide animals a natural production environment, with a sustainable use of natural ecosystems. In addition, finishing beef cattle on pasture, with an appropriate supplementation, could provide a cost effective alternative to finishing in confinement on diets mainly based on grain for producers located in grain-deficient regions such as southern Italy. The present study aimed to assess the influence of housing system (confined and free-range) on colour (L*, a*, b*), water holding capacity (centrifugation, thawing and cooking losses) and sensory properties of meat from Podolian young bulls. The experiment was conducted from March to July 2007 in an organic farm located in Basilicata (southern Italy) at 338 m a.s.l.. Twelve Podolian subjects, aged about 10 months at the start of the experiment (310.54 ± 18.76 kg of average live weight), were divided in two groups: confined and free-ranging. Free-ranging animals were allowed to graze on a natural fenced pasture (18 ha of grassland, 2 ha of shrub vegetation) until slaughter (14 months of age). They were supplemented with 3-4 kg of mixed flour containing 33% of oat, 33% of barley, 33% of field bean (Vicia faba minor), 1% of mineral mix. Confined subjects were kept in straw-bedded barn provided with an ample outdoor paddock and received 8 kg of the same flour and straw ad libitum. Animals were slaughtered at 14 months of age. Vacuum packaged loin from each right side were aged for 8 days at 4°C and evaluated by a trained taste panel. Although confined animals showed higher final weights (458.17 ± 19.83 vs. 433.33 ± 19.83 kg, respectively), average daily gains (1.17 ± 0.06 vs. 1.07 ± 0.06 kg, respectively) and carcass yields (56.22 ± 2.58 vs. 54.35 ± 2.58 %, respectively) than free-ranging subjects, differences were not significant. Colour was significantly (P<0.001) affected by housing system with higher L* (35.14 ± 0.47 vs. 32.79 ± 0.47) and b* (3.22 ± 0.19 vs. 1.45 ± 0.19) for meat from confined animals. Meat from beef cattle kept on pasture is often darker than beef finished indoors as a possible consequence of the greater exercise/activity of grazing animals. Water holding capacity was higher in meat from confined subjects as centrifugation (12.65 ± 0.83 vs. 21.68 ± 0.83%) and thawing losses (1.42 ± 0.32 vs. 2.80 ± 0.32%) were lower in their meat as compared with free-ranging animals (P<0.01). Odour (P<0.05), flavour (P<0.05) and salted intensity (P<0.001) were higher in meat from confined subjects. Flavour of red meat is highly dependent on diet and high-energy grains may determine an intense flavour than grass-based diets. However, meat from free-ranging young bulls was more tender than meat produced by confined animals (67.79 ± 2.00 vs. 61.48 ± 1.85, P<0.05). Although confined animals showed higher productive performances and meat quality, our results also indicate that marginal areas may be conveniently used for the production of organic beef with an adequate feeding supplementation programme.

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Genetic type and ageing effects on textural and sensory properties of beef

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Abstract

Meat acceptability is mainly affected by sensory traits, such as tenderness, flavour and colour, and by other attributes like drip and cooking losses. The present study aimed to assess the influence of the genetic types Italian Holstein (IH), Charolaise (CH) and Romagnola x Podolian (RP) throughout the meat ageing time (7, 14 and 21 days) on meat colour (L, a*, b*), water holding capacity (WHC; centrifugation, thawing and cooking losses), textural and sensory properties. Vacuum packaged loin from 18 bulls (twenty months old) were aged for 7, 14 and 21 days at 4°C and evaluated by a trained taste panel. No significant interactions genetic type x ageing were detected. Meat from CH showed the lowest redness as compared with meat from IH and RP (19.02 ± 0.59, 22.09 ± 0.57 and 23.00 ± 0.54, respectively; P<0.001). This result may be due to the fact that CH is a double muscled breed that generally shows lower muscle myoglobin contents, resulting in paler meat. No ageing effect was detected on colour parameters. Warner-Bratzler shear (WBS) force and hardness (HD) were affected (P<0.001) by genetic type with the highest values observed in the meat from IH bulls (7.46 ± 0.70 kg and 6.14 ± 0.17 kg, for WBS and HD, respectively). Meat from RP showed the lowest WBS values (5.38 ± 0.18 kg), while CH had the lowest HD (4.24 ± 0.20 kg). Ageing influenced textural properties with lower WBS and HD values at longer ageing times (P<0.001). Differences were observed between genetic types for centrifugation and cooking losses. In particular, meat from IH had the lowest centrifugation loss in comparison with RP and CH (5.58 ± 1.10, 11.24 ± 1.10 and 16.68 ± 1.18 %, respectively; P<0.001). Meat from CH showed the lowest cooking loss as compared with IH and RP (19.97 ± 2.83, 31.50 ± 2.10 and 33.03 ± 2.10 %, respectively; P<0.001). The lower cooking losses observed in CH and other double muscled breeds can be attributed to their lower collagen content. In fact, the shrinkage of the collagen fibres occurring during cooking at high temperatures generates a tension compressing the muscle fibres, which results in considerable loss of fluid. Ageing affected only thawing loss (P<0.05) that decreased with increasing maturation time. The improving of meat WHC with extending ageing is in agreement with several other studies and it is attributable to muscle structures that become looser because of degradation of myofibrillar and cytoskeletal proteins as well as intramuscular collagen. These changes enable meat to hold more water. Meat from IH showed the highest intensity of flavour, tenderness, juiciness and chewiness, whereas meat from CH showed intermediate values for the same parameters and RP meat had the lowest scores (P<0.001). The differences in tenderness between breeds may be due to different quantity, solubility and space organization of the collagen, fatness and calpain and calpastatin activity. Extending the ageing time from 7 to 21 days improved sensory profile of meat in terms of tenderness, juiciness, chewiness and flavour (P<0.001). Contrary to our expectations, ageing did not reduce the differences between genetic types for most of the sensory attributes. However, tenderness values detected for IH after 7 day of ageing were satisfactory, compared to those of CH and RP (60.4 ± 0.10, 36.1 ± 0.11 and 32.9 ± 0.10; P<0.001). The meat of these latter needed a longer ageing period (21 d) to achieve agreeable tenderness levels (52.6 ± 0.10 and 59.5 ± 0.10, for RP and CH, respectively).
Evaluation of dry-cured ham: preference mapping from different nationality panels (Italy and France)

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ABSTRACT

The aim of this study was to analyze the distribution of preferences between two panels from different countries (Italy and France), in order to establish which type of dry-cured ham represents the best degree of acceptance and to individuate different standards of assessment from different countries, using preference mapping. A consumer test by two different country panels of 100 consumers was carried out on 4 typologies of dry-cured hams, 16 months ripening: Parma ham (P), Italian not branded ham (I), hams coming from pigs (Large White x Landrace x Pietrain) reared in France (INRA, Centre de Saint Gilles) and fed a diet integrated with sunflower oil (2.5%) (S) or extruded linseed (5%) (L), which supply respectively a high content of n-6 and n-3 PUFA. The consumers were requested to report its preference judgment for 7 descriptors as appearance, fat and muscle color, smell, salty, taste, consistency and overall acceptability. Each single descriptor was evaluated by using an hedonic scale assigning a score between 1 (absence of sensation) and 9 (extremely intense). The four different dry-cured hams were sensorially well differentiated by the panels. Results from Principal Component Analysis (PCA) show that Italian consumer evaluation was very different for the 4 typologies of products. In general P received a high score for “overall acceptability” and was characterized by “smell” and “taste”, but not by “muscle color” and “salty”. S resulted characterized by the attributes of “consistency”, “aspect” and “fat color” along the first component and received a high score for overall acceptability along the second one. Results from PCA show that French consumer evaluation discriminated L from the other samples. In general I, and S received a high score for overall acceptability that was defined by “smell”, “consistency” and “salty”. L resulted the less appreciated and it was not characterized. A good discrimination and classification between the dry-cured hams (P and I vs. S and L) was obtained using the internal preference map method. The combination of PCA and internal preference mapping (MDPREF) has lead to a deeper understanding of consumer liking for dry-cured hams. In conclusion the four different typologies of dry-cured hams were sensorially well differentiated by the two country panels and omega 3 enriched dry-cured ham was not well accepted by both the Italian and French panels.
Dietary acorns vs. barley in “Nero Siciliano” pigs: effect on the volatile compounds of salamis

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ABSTRACT

Consumer’s perception of the quality of a typical product take into account the sensorial characteristics which are influenced by different factors such as breed, rearing system and ripening process. This study deals with the influence of the feeding system used during the fattening period on the volatile profile of salamis from Nero Siciliano pigs. The trial was carried out on 24 “Nero Siciliano” pigs, reared in the Nebrodi mountain areas of Sicily (Italy). During the fattening period (90 days), the animals were divided into two groups, kept in two wooded areas of 6 hectares each, appropriately enclosed, homogeneous for number (12 animals each), sex (castrated males) and body weight (BW 79.48±0.15 kg), called group A, the animals fed only with acorn (ad libitum), and group B, those fed only with germinated barley corn (2.5 kg/head/day). After slaughter (mean BW=120 kg), five salamis from each group, were prepared using the standard technology of the “Consorzio di tutela del suino Nero dei Nebrodi”. On each salami sample (subjected to 60 days of seasoning), the aromatic fraction was analysed by using SPME-GC/MS and the results, expressed as percentages of the relative peak areas, were submitted to ANOVA. Seventy-one volatile compounds were identified and quantified: 27 terpenes, 10 aldehydes, 10 alcohols, 15 hydrocarbons, 5 ketones and 4 miscellaneous. Terpenes were the most abundant desorbed volatiles. This class showed no significant differences (P=0.519) between group A (42.65%) and group B (37.62%). In both groups, limonene (A=25.00%, B=22.17%; P=0.607), δ-3-carene (A=2.57%, B=3.81%; P=0.202) and β-myrcene (A=4.46%, B=2.28%; P=0.203) were the most representative compounds, as observed in typical Sicilian salami, traceable to the spices used in the preparation phase and well-known for their nutritional and therapeutic properties. The main volatiles arising from lipid oxidation were Aldehydes. Hydrocarbons, alcohols and ketones were present in small proportions. Aldehydes showed significant (P<0.001) higher mean values in group B (43.31%) compared with group A (8.91%). The prevalent component in both groups was hexanal which showed significantly (P<0.001) higher levels in group B (28.08%), compared with group A (6.15%); hexanal is the major volatile oxidation product of linoleic acid, and its higher presence in the salamis of group B might be related to the higher content of linoleic acid in the germinated barley corn (44.13%) compared to acorn (19.81%) as well as to the presence of some isoflavones (diadzein and genistein), potent alcohol dehydrogenase (ADH) inhibitors, which, inhibiting the transformation of hexanal to hexanol, determined a store of this aldehyde. In fact, a significant difference (P=0.010) was observed for alcohols which showed a fourfold value in the salamis of group A (21.70%) compared to those of group B (4.89%), correlating with the presence of hexanol compound only in the salamis of the group A (14.45%). Another significant (P=0.024) difference was observed for the ketones, which showed higher mean values in group A (9.34%) compared to group B (1.68%). Hydrocarbons were similar (P=0.234) in both groups (A=3.41% and B=5.58%). Further investigations are needed to assess the relevance of the presence of some volatile compounds for describing the sensory characteristics of Sicilian salamis.

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Influence of rearing system on carcass traits and metacarpal bones characteristics of Italian Merino lambs

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ABSTRACT

Lambs carcass traits and metacarpal (MC) bones characteristics were studied in order to evaluate the effect of different rearing systems (pasture or stall). Twenty-four Italian Merino ram lambs (35 days old), born as singles from 3-year-old dams, were used: 12 lambs (group A) were allowed to graze a natural pasture with their dams on a farm situated at 800 m a.s.l.; 12 lambs (group B) were raised in stall, on a farm situated at 400 m a.s.l., and fed milk twice a day plus hay ad libitum, integrated with commercial feed. Lambs were slaughtered when they had reached 75 and 65 days of age, at a age/weight typical for each farm involved (at average weight of 18.2 vs. 20.3 kg for A and B respectively; P<0.05). At slaughter, MC bones were collected, cleaned of all connective tissue, and measured for length, diaphyseal diameter and weighed. Growth plate width on the distal end of the MC, the site of longitudinal bone growth, was measured after silver nitrate staining of 5 longitudinal slices 2 mm thick cut on the sagittal plane. Several linear measurements were taken on all carcasses (body length, pelvis width, chest width, half-carcass length, chest depth and pelvic limb length) and pelvic limb compactness (pelvic limb weight/pelvic limb length x 100) and carcass compactness (carcass weight/half carcass length x 100) were calculated. The right shoulder and pelvic limb were removed from the chilled carcasses (at average weight of 10.63 vs. 12.14 kg for A and B, respectively; P<0.05), weighed and their percentages on cold half-carcass weight were calculated. The shoulder was dissected into its main tissue components (lean, subcutaneous and intermuscular fat, bone and remainder) and the ratio of various tissues to total weight of shoulder was calculated. Statistical significance of the differences was determined by Student's t test. MC bones from B lambs were heavier (P<0.05), shorter (P<0.001) and with greater diameter (P<0.01) compared with bones from A lambs; while the growth plate cartilage was found to be similar between the two groups (0.46 and 0.44 mm, respectively), indicating comparable mineralization and maturity of bone. Significant differences were noted, also, in carcass measurements between two groups: fed pasture lambs had longer body (65.3 vs. 60.2 cm for A e B, respectively; P<0.001) and more chest deep (15.5 vs. 14.3 cm for A e B, respectively; P<0.001); stall lambs had higher chest width (17.5 vs. 20.1 cm for A e B, respectively; P=0.001), slightly higher pelvic limb length (32.4 vs. 33.6 cm for A and B, respectively; P=0.074), the best carcass compactness (20.09 vs. 23.19% A and B respectively; P<0.01) and slightly higher pelvic limb compactness (4.92 vs. 5.31% A and B respectively; P= 0.093). Pelvis width and half-carcass length were found to be similar between the two groups. Pelvic limb percentage did not differ between experimental groups, while shoulder percentage was higher for stabled group (16.38 vs. 17.11% A and B respectively; P<0.05). The shoulder composition resulted to be similar for bone and intermuscular fat percentages; while the results were significantly (P<0.01) higher (+2.6%) for lean percentage in A lambs and subcutaneous fat percentage in B lambs. In conclusion, the results showed that the rearing system significantly affected carcass qualitative traits and bones characteristics of Italian Merino lambs.

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The breeding of the Apulo-calabrian swine in Calabria: current technical and economical analysis and prospect of development

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ABSTRACT

Apulo-calabrian breed belong to the native swine of the Apennine areas of Southern Italy. This breed is characterized by a remarkable rusticity and a good attitude to pasture; this is a quality that renders this pigs particularly suitable to the exploitation of the marginal or sub-marginal areas of the Calabrian territory, otherwise deserted or used to woods. The breed is in a phase of recovery, especially for the PIF (Integrated Chain Plan) farm aid, paid out for the PSR (Rural Development Plan) 2007-13, which many farmers have joined in order to obtain the previewed contributions. The study was carried out from January-December 2008. According to the official information of the ANAS (Italian Association of Pig Breeders), there are 34 registered farms on the breeding register of the Apulo-calabrian swine National Registry. 28 of these farms are situated into the Calabrian territory, with particular concentration in the province of Cosenza, with 26 registered farms (of which two are inactive). Our research mainly focused on the analysis of the territory, the sampling of farms to be studied and the collection of social and economic data of selected areas. The collected data included: a) breeders’ social characteristics (age, marital status, degree of instruction, etc.); b) farm main features (land extension, number of plots, soil type, environmental constraints and opportunities related to the site, and so on); c) farms organisation and management (legal status of the farm enterprise, number of workers, carried out activities, and so on). Of the selected 26 farms, representing the 92.85% of the official registered ones, 19 are individual companies and the remaining 7 are cooperative societies, 2 of them managed by ARSSSA Calabria. 13 companies of the 19 individual ones (68.42% of the total) are managed by men, the remaining 6 by women (31.57%). The research shows that 52.94% of breeders are aged between 40 and 65 years, fewer are aged between 25-39 (31.58%) and 15.78% above 65. No farm manager was younger than 25 years of age. Most of the breeders have a medium-high educational level. The average farm surface is 22.13 ha and most of them (68.94%) are located 700 m above sea-level or higher. The semi-wild rearing is the most common breeding technique among the selected farms. This technique reduced overall farm costs as well as lowering the initial capital investment in production facilities, often limited to winter shelters and sows dedicated box. During this study 1610 Apulo-calabrian pigs registered on the ANAS National Registry were found: 421 out of them (26.14%) are breeders, 361 sows and 60 boars. The other heads are classified as young animals: 72 gilts, 709 weanlings and young growing pigs (under 90 kg) and 408 suckling piglets. At the time of this study most of selected farms were undergoing reorganization; some of them instead started their activities only in 2008. At present the Apulo-calabrian swine production growing rate is mainly governed by swine meat market development. For its characteristics Apulo-calabrian swine meat is particularly suitable for high quality cold cuts and salami production and highly in demand by the food industry. The customers’ interest for regional products is one main reason for development of Apulo-calabrian farming, helped also by the insertion of this meat among the ones foreseen by the production rules for Calabrian PDO (Protected Designation of Origin) salami and cold cuts such as: Pancetta di Calabria, Capocollo di Calabria, Saliscia di Calabria, Soppressata di Calabria.
Meat quality of Fabrianese heavy lambs

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ABSTRACT

The demand for heavy lamb meat has been recently increasing among populations of the internal areas of the Appennini mountains, although heavy lamb production is relatively limited compared to young suckling lambs. The Fabrianese is a local ovine breed reared in the Marche region; the population amounts to about 5,000 heads. Actually the Fabrianese breed is reared both for milk production and for heavy lambs meat production using mainly the males. Meat production obtained from heavy lambs can contribute to reduce the amount of imported lamb meat in Italy, and represents about 25% of lambs slaughtered in our Country. The study was performed using 20 entire male lambs of Fabrianese breed, reared in the same farm located in the area of the Sibillini mountains national park, slaughtered at four months of age and a mean fasted final body weight of 33 kg. The lambs were initially fed on their mothers’ milk, then from the 15th day they were also supplied with a commercial starter concentrate and alfalfa hay, both ad libitum. Before slaughter, animals were fasted (only water available) for about 12 hours; all the 20 carcasses were skinned and eviscerated, then stored in a cold room at a temperature of about 3°C for about four days. From the left side of the carcasses approximately 300 g of muscle sample was taken from Longissimus thoracis et lumborum (LTL), between the 12 and 13 rib. Chemical composition, cholesterol content and fatty acid composition were determined for all the samples, followed by the evaluation of mineral levels. Meat chemical composition showed a good protein content (22.1%) and a not high fat content (4.5%), confirming the high quality of meat obtained from animals reared under extensive conditions on natural pastures. Cholesterol level (63.5 mg/100 g) was similar to the values obtained in other red meats. Oleic acid (C18:1 cis9) was the most represented fatty acid (37.6% of total fatty acids), followed by palmitic acid (C16:0). The ratio between unsaturated and saturated fatty acids was 0.85. Potassium (329.5 mg/100 g) and phosphorus (285.6 mg/100 g) were the two most represented minerals, followed by sodium (68.4 mg/100 g) and magnesium (25.7 mg/100 g). Iron (3.15 mg/100 g) and zinc (3.61 mg/100 g) content demonstrated the good nutritious value of lamb meat, similarly with other kind of red meats. The present study provided data on the quality of meat obtained from Fabrianese heavy lambs, suggesting that meat from heavy lambs can be a valid alternative to red meat from other animal species, and also confirming the possibility of extending up to 120-140 days the slaughtering age for heavy male lambs.
The Apulo-calabrian swine: a successful reality with a great outlook.
The expansion and consistency of breeding in the Calabrian territory

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ABSTRACT

In the past, the Apulo-calabrian breed was very common in numerous areas of Calabria and was identified as the “Nero Calabrese”. It was differentiated in various local “types”: Reggino o Reggitano, Cosentino, Orielese, Catanzarese, etc. All these animals had in common the production of lean meat, ideal for the transformation into the typical salami and cold cuts of the Region. Starting 1930, the breed was so severely reduced, mainly because of the general preference of the white breeds, it almost got extinct. Today, thanks to the passionate and obstinate work of some breeders and technicians of this sector, the Apulo-calabrian swine can aim serenely for a wider spread over the territory and for the valorization of its products. As of the mid 90’s, an accurate monitoring by the APA (Provincial Breeders Association) started in order to find subjects that presented the maximal characteristics that led to the ancient breed. Actually, the population is constantly supervised to maintain the genetic variability and accordingly, mating plans are put, when it’s possible, in a way that respects the genetic remoteness and the homogeneous morphology of the reproducers. The characteristics of the breed are: rusticity and strength of the bone structure, with the classical conformation of the good grazer, a medium to big size (reached before the age of 24 months), black color either for the skin and for the coat, particular maternal aptitude of the sow, also a marked vigor of the boar. The aim of this study, which represents a part of our bigger research about the Apulo-calabrian swine, is to evaluate as well, the spread and numerical consistency, divided by productive categories, of all the accredited breeding farms of the Calabria Region. The study was carried out from January-December 2008 using detailed survey cards that we designed specifically for this purpose. The provinces actually interested are Cosenza, Catanzaro and Reggio Calabria, for a total of 26 farms. The first one has the major spread with 24 farms, equivalent to 92.3%; the second and third have only 1 farm which represents 3.8% each of the total. As for the provinces of Vibo Valentia and Crotone, we know at least 4 farming units and other 2 centers in Reggio Calabria but they’re still working till today on their certification status in the National Swine Registry. In the entire area of breeding, we counted 1610 Apulo-calabrian heads, from which 60 boars (3.7%), 361 sows (22.4%), 72 gilts (4.5%), 408 suckling piglets (25.3%) and 709 weanlings and young store pigs (44%). Regarding the distribution for each single province, Cosenza has the largest number of subjects in all the categories: 50 boars (83.3%), 314 sows (86.9%), 44 gilts (61.1%), 372 suckling piglets (91.1%) and 639 weanlings and young store pigs (90.1%). The provinces of Catanzaro and Reggio Calabria, even if both have only one farm, got distinguished by the numerous subjects they got in all the categories: 1 vs 9 boars, 8 vs 39 sows, 6 vs 22 gilts, 6 vs 30 suckling piglets, 0 vs 70 weanlings and young store pigs. Based on our studies, we think it’s interesting to emphasize on the fact that the real thrust for the future of the farming of this native breed is on one hand the prudent and precise choices made by the breeding farms, and the other the specific productive chain and marketing.
Present situation and prospects of a new farm located in the province of Reggio Calabria and devoted to Apulo-calabrian swine raising

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ABSTRACT

In the last years, the interest for the quality of niche productions, the protection of biodiversity and the native breeds, has very much revivified. Among Calabrian autochthonous breeds there is the swine “Nero Calabrese”, today called “Apulo-calabrese”, who has recently been recovered and revaluated. Amid the many companies from Calabria that have decided to invest on our native swine, a young reality located in “Bovesia” (the Greco-calabrian area of Reggio Calabria) has distinguished itself for the interesting results achieved in a rather short span of time and has consequently been chosen as a case study. This company embraced with enthusiasm the pig sector only in June 2007 and from a number of just 15 Apulo-Calabrian breeders and with subsequent further contributions of blood, is arrived to a current proportion of 286 heads, of which 50 breeders, gaining in few months the position of leader in Calabria for total number of heads. Based at the beginning exclusively on plein air, the management has upgraded progressively, leading to the current solution of a management diversified according to productive categories: breeders, lactating sows and piglets up to weaning and weaning in semi-intensive rearing; gilts and young boars and growing pigs, on plein air rearing; finishing pigs, in semi-wild rearing. Each category is subject to specific food treatments: breeders, stages of farrow, weaning, weanlings and growing pigs fed with commercial feed offered as meal, feedstuff and fresh forage (by company production); finishing (around 115 kg of LW) fed with commercial feed offered as meal, chestnuts, acorns and they were allowed to graze in the wood. Because of heterogeneity of growth performances which is a typical feature of this breed, that can also be seen within the single litter, the categories were formed by subjects grouped apart from their age. With reference with the reproductive parameters, the first mating happened to the weight of 100±10 kg, while for the female the first mating took place to the weight of 76±7 kg. The number farrows/year is settled on 2.1±0.7. The farrowing interval was 171±9 days (multiparous sows). The average litter size is 7.2±2.2, with a maximum number of 13 and a minimum of 2. Weaning age was 5 weeks. The number weaned piglets/sow was on average 6±2, with a peak of 10 and a least of 2. The number weaned piglets/sow/year was on average 11.3±2.8. The main causes of pre-weaning decease happened to be respiratory diseases, with a rate of 42.2%; more losses happened during the first stages of pregnancy, caused by return to heat or accidental miscarriages caused by bacteria. Fertility rate settled on percentage of 85%, thank to the brave choice of the company of maintaining a constant ratio boar/sows as 1:5.25. With reference to the productive parameters, the average weight of piglets at birth has settled on 1013±221 g, while the average daily weight gain settled on 220±6.7 g, 340±8.8 g, 390±0.1 g, 440±0.1 g, respectively for the categories of weanlings (8-35 kg), young growing pigs (36-60 kg), growing pigs (61-110 kg) and finishing (111-170 kg). Pigs were slaughtered at 160-170 kg (at 17±2 months), and they had a dressing out percentage of 84.5±2.6 % with a maximum of 87.2% and a minimum of 80.4%.
Chemical and fatty acid characteristics of meat of Podolian bulls slaughtered at different ages

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ABSTRACT

Podolian cattle represents one of the most important native Italian breed. This breed was once reared in many different Italian regions, whereas in recent years a dramatic reduction of the number of head has relegated this breed to some marginal areas of southern Italy. For meat production, calves are dam-reared on pasture for about 8-10 months and, subsequently they are fed a finishing diet in loose house conditions with external paddock. They usually are slaughtered from 14 to 18 months of age. The aim of this study was to evaluate the chemical and the fatty acid composition of sample cuts of Podolian bulls slaughtered at different ages; even if breed, age and sex related to differences in the fatty acid composition of beef cattle have been widely demonstrated (Einchhorn et al., 1986; Huerta-Leidenz et al., 1996; Malau-Aduli et al., 2000), few data are available on Podolian cattle. This trial was carried out on 12 Podolian steers, from the same farm in the Basilicata region. The subjects, at the age of about 10 months, were moved to a stall for fattening and divided into 2 homogeneous groups of 6 animals each. During the trial period, the animal were fed ad libitum with hard wheat straw and a complete pellet feed, containing barley, oats, field beans, and a vitamin-mineral integrator. The steers were slaughtered at the age of 14 months (A group) and 18 months (B group), according to veterinary police rules. The chemical composition of raw Longissimus lumborum (Ll) of the B group presented a more higher incidence of protein (22.25% vs. 21.34%; P<0.01) and a lower value of moisture (72.29% vs. 73.92%; P<0.01), data also found in the works of Cifuni et al. (2004) and Marino (2004) and Marino et al. (2006). No significant differences emerged in fat percentage between the two ages. The fatty acid composition of the fat extracted from the raw Ll was not very different into the two groups. The only significant difference was showed in the ω6/ω3 ratio, the older animals presented a higher value (7.472 vs. 5.270; P<0.05), due to the higher percentage of ω6 (2.48% vs. 2.25%) and the lower percentage of ω3 (0.35% vs. 0.47%), into their fat (Carnovale and Nicoli, 2000; Lengyel et al., 2003). The same results were found in the trials carried out by Enser et al. (1999), Elmore et al. (2004) and Descalzo et al. (2005), where the increase of percentage of ω6 and of the value ω6/ω3 are due to the cereal-based diet used to feed animals. The group B showed no increase in the percentage of intramuscular fat during the fattening period from 14 to 18 month and to maintain the fatty acid composition very similar to the group A.
Influence of organic breeding on heavy pig live performance, carcass and meat quality

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ABSTRACT

There is limited information on the performance and the quantity and quality characteristics of carcass and meat of pigs reared organically and fed soybean and/or alternative protein crops. A study was conducted in a certified organic pig farm, where upon reaching a mean weight of 45.2 ± 7.9 kg, 30 crossbred subjects were divided into a control group (CG) and a soybean group (SG). Rations contained barley, maize and faba bean (CG), or barley, maize and whole extruded soybean (SG). The CG ration provided (% as fed) DM 86.7, CP 12.5, EE 2.7, CF 4.3 and lysine 0.54, DE 3280 kcal/kg. The SG feed provided (% as fed) DM 86.6, CP 12.6, EE 4.5, CF 3.9 and lysine 0.50, DE 3290 kcal/kg. During the growing period pigs were weighed at intervals of about 45 days to compute weight gain. They were slaughtered upon reaching the desired weight for heavy pig production. The following data were obtained on carcasses: weight, % lean meat, pH 45 min post mortem on the semimembranosus muscle, and slaughter yield. The day after quartering the weight of lean cuts was determined; a sample cut steak was collected from all subjects for colour (Minolta Chroma Meter CR-200), drip-loss and chemical analyses according to ASPA guidelines. All data were subjected to analysis of variance with the JMP statistical package (SAS). Live-animal parameters did not demonstrate significant differences due to the diet effect. Age at slaughter was 178.6 ± 4.0 (CG) and 190.3 ± 4.7 (SG) days; growth over the entire period was 0.523 (CG) vs. 0.569 (SG) kg/d. Post-mortem performances were not significantly different in terms of the diet effect. Carcass weight was 149 ± 3.6 kg (CG) and 158 ± 4.2 kg (SG); ham weights were also similar (CG 16.1 ± 0.29 kg and SG 16.1 ± 0.34 kg). Slaughter yield was 83.4% (CG) vs. 83.3% (SG). The proportion of lean meat was 48.0% vs. 44.3%, and pH 45 min post mortem was also similar (6.3 vs. 6.1). As regards the colour parameters (L, a*, b*), CG samples were significantly more luminous (P<0.001) than SG ones (L: 51.8 vs. 48.2); b* was significantly higher (P<0.05) in SG than in CG samples (7.9 vs. 7.3) and the Chroma parameter was significantly higher (P<0.05) in SG meat (13.04 vs. 14.3). Meat chemical composition was not significantly different in the two groups (CG: protein 21.9%, fat 6.1%, ash 1.2%; SG: protein 22.2%, fat 6.1%, ash 1.1%). Only drip loss was lower in SG than in CG meat (2.1 vs. 3.1). It may therefore be concluded that only meat colour was influenced by feed type; in particular, the sample steak obtained from subjects fed faba beans exhibited a more abundant aqueous film on the cut surface and a lower water retention capacity.
A survey about bovine meat quality in Lazio region

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ABSTRACT

The purpose of this work is to review the current status of meat quality produced with Italian beef cattle (pure breed or crossbreed) in Lazio region. With the A.R.S.I.A.L. (Agenzia per lo Sviluppo e l’Innovazione dell’Agricoltura del Lazio) agreement, the survey was conducted during 2008 on 114 beef Longissimus thoracis (LT), sampled on animals raised in 4 Lazio provinces (Rieti, Viterbo, Frosinone and Latina). Samples were taken from the right half carcass (10th - 11th ribs) the day after slaughtering. After 7 days of ageing the following analysis were performed: pH, using pH-meter Hanna HI 98240; lightness (L), redness index (a*) and yellowness index (b*), using Minolta CM-2006d applying the light source D65; drip losses (DL) quantified as described by A.S.P.A. (1989); cooking losses (CL), determined by weighting sample before and after cooking; Warner Bratzler shear force on raw (WBsr) and on cooked (WBSc) meat, using Instron device 5543. The day after slaughtering a descriptive form of each sample was complete in order to know information about animals: breed, province, age and carcass weight. Data showed high variability for all analysed physical parameters. There were many reasons which explain this high variability level. Meat samples were taken from animals belonging to different breeds and crossbreds (68.0% crossbreds, 19.7% Maremmana breed, 6.6% Chianina breed and 5.7% Marchigiana breed); moreover, animals had different slaughtering ages (18.0±6.5) and then different carcass weights (319.2±101.8). Other aspect which explains the high variability is represented by different rearing systems used in Lazio Region; in fact we observed extensive farms, semi-extensive farms, and intensive farms. Colour parameters showed that meat produced with the lowest carcass weights (274 kg in Latina province) had higher L value and lower a* value than the others. There was high variability about water losses (DL and CL) because carcasses had a different weight, and thus different commercial maturity. Animals with high carcass weights showed the highest WBSc values; these data are explained by high percentage of Italian beef cattle pure breeds like Chianina (13.9% in Rieti province) and Maremmana (68.7% in Viterbo province), in fact, as a result of slaughtering age, rearing systems and low meat fat content, usually, these breeds have high WBS values.