



**Official Journal of
the Animal Science
and Production
Association (ASPA)**

*

ISSN 1594-4077

eISSN 1828-051X

*

**[http://www.
tandfonline.com/tjas](http://www.tandfonline.com/tjas)**

*

**Italian Journal of
Animal Science**

*

volume 16

supplement 1

2017

italian journal of animal science

ASPA 22nd CONGRESS

Perugia, June 13-16, 2017

Book of Abstracts

**Guest Editors: Massimo Trabalza-Marinucci (Coordinator),
Cesare Castellini, Emiliano Lasagna, Stefano Capomaccio,
Katia Cappelli, Simone Ceccobelli, Andrea Giontella**



Taylor & Francis
Taylor & Francis Group

for indoor feeding groups, an increase ($p < .05$) of urea content when by-products were used and higher ($p < .05$) milk production when silage was included. The results of the present work indicate that the season, the breeding program and the feeding strategy influence the production level, composition and color of sheep bulk. In turn, these changes have an impact from a technological point of view. A comprehensive knowledge of these factors is still required, in particular, a better optimization of feeding management according to the productive level of the breed.

Acknowledgements

This research was supported by project RTA2011-00057-C02-01 of the National Institute of Research and Agrarian and Food Technology (INIA) by the Government of Spain.

P111

Effect of dietary regimen and of feeding maltodextrins and dextrose on meat and fat quality of immunocastrated pigs

Anna M. Belmonte¹, Giovanna Minelli^{1,2}, Paolo Macchioni³, Francesco Mezzetti¹, Corina Scutaru², Luisa A. Volpelli^{1,2}, Domenico P. Lo Fiego^{1,2}

¹Centro per il Miglioramento e la Valorizzazione delle Risorse Biologiche Agroalimentari, University of Modena and Reggio Emilia, Italy

²Dipartimento di Scienze della Vita, University of Modena and Reggio Emilia, Italy

³Dipartimento di Scienze e Tecnologie Agro-Alimentari, Alma Mater Studiorum University of Bologna, Italy

Contact: annamaria.belmonte@unimore.it

This research aimed to verify the effects of restricted *vs ad libitum* feeding and of the dietary inclusion of maltodextrins (M) and dextrose (D) on the qualitative traits of muscle *longissimus dorsi* (LD) and on fatty acid (FA) composition of backfat lipids of immunocastrated intermediate pigs.

To this goal, 36 male pigs (Italian Duroc × Italian Large White) were used. The animals, after having received the second immunocastrating injection at 162 days of age, had been allocated for 5 weeks, till slaughtering [144.51 ± 9.70 kg live weight (l.w.)], to one of the three experimental dietary treatments: basal diet given either *ad libitum* (CL), or restricted at 7.5% l.w.^{0.75} (CR), or with M and D (3.5% + 3.5%, balanced for energy and protein levels) provided *ad libitum* (MD). At slaughter, a sample of LD muscle and backfat were collected from each left-half carcass, at the last rib level. At 24 h *post mortem* on the LD samples, pH, colour

(CIEL**a***b**, 1976) were determined, further, protein (CP) and intramuscular lipid (IMF) contents (on the fresh and cooked muscle), drip and cooking loss, oxidative stability (TBARS) and tenderness (WBSF) were measured. Moreover, FA composition of backfat was analyzed.

The data were submitted to ANOVA with the dietary treatment as independent variable. The two degrees of freedom of the treatment effect were split up *a priori* in two orthogonal contrasts: CR *vs* the average of CL + MD and CL *vs* MD. The CR pigs, compared with *ad libitum* subjects, exhibited lower IMF ($p < .05$), both in the fresh (2.75% *vs* 3.41%) and cooked muscle (3.83% *vs* 5.15%), higher CP in the fresh muscle (24.04% *vs* 23.36%, $p < .05$) and higher Hue value ($p < .05$), indicating a slightly decoloured meat. Indeed, CR group showed a higher content of polyunsaturated FA (15.50% *vs* 13.23%, $p < .01$) and a lower content of saturated FA (41.46% *vs* 42.91%, $p < .05$) in backfat lipids. The feeding regimen did not affect pH, drip loss, cooking loss, TBARS and tenderness of LD muscle. No difference was found between CL and MD pigs, except for the ω -6/ ω -3 ratio in backfat lipids, lower in MD (15.54 *vs* 16.70, $p < .01$).

Thus, in our experimental conditions, the dietary inclusion of M and D did not markedly affect meat quality characteristics and the FA composition of backfat of immunocastrated intermediate pigs fed *ad libitum*, whereas the dietary regimen exerted a considerable influence, especially on CP and IMF contents of LD and on lipid FA composition of subcutaneous adipose tissue.

Acknowledgements

The Authors thank Dr. G. Della Casa (CREA-SUI, Unità di Ricerca per la Suinicoltura - San Cesario sul Panaro – MO, Italy) for taking care of animals, and for formulating and supplying the feeds.

P112

Smart near infrared spectroscopy on frozen milk samples can discriminate grass-fed from conventional milk

Luca M. Battaglini¹, Manuela Renna¹, Carola Lussiana¹, Giampiero Lombardi¹, Massimiliano Probo¹, Giorgio Masoero^{1,2}

¹Dipartimento di Scienze Agrarie, Forestali e Alimentari, University of Torino, Italy

²Accademia di Agricoltura di Torino, Italy

Contact: luca.battaglini@unito.it

The real origin of milk is sometimes doubtful, even at the *km-zero* level for locally appreciated productions. The aim of the research was to authenticate the origin of milk on farms as

coming from cows fed grass or hay diets. For this purpose, 43 milk samples, originating from different farms in Piedmont (Italy) that use a prevalent diet of grass or hay for their dairy cows, to supply milk for milk and cheese production for the local market (G), and from more intensive farms, that adopt a total mixed ration to feed their cows for milk destined for dairies (C), were collected. The samples were frozen and the top surface of each sample was examined using a smart new NIR miniaturized web-based wireless spectrophotometer (SCIO, range 740-1030 nm), in which three spectra were retained per sample. Chemometrics of the 331-point spectra was performed using categorical discrimination, integrated within the SCIO Lab proprietary software, AKA (Also Known As) the confusion matrix, which includes a mathematical pre-treatment of the spectra, that is, SNV (Standard Normal Variate) and the 1st derivate. The reclassification capacity has been considered as the reference of the performances. The discrimination of the origin of the milk was found to be very reliable. In fact, the chemometric results showed that the AKA confusion matrix assigned an 83% reclassification ability to the G memberships and 82% to the C memberships.

The advantage of the method is represented by the small amount of sample that is needed for the analysis and the originality of the method concerns the fact that all the samples, even when fresh, were frozen before scanning, thus preventing the instrument from being damaged due to the effects of the liquids. Moreover, this preparation could substantially improve the quality in spectra scans of liquids and fluids (such as milk, oil and wastes) that are not scannable by means of NIR devices that work in transreflectance mode.

This smart instrument seems to offer several advantages, concerning the on farm authentication of milk as deriving from a prevalent grass feeding diet. On farm calibrations for raw labeling of farm cheeses (moisture and energy in particular) could be conducted, thanks to the easy processing, by providing the necessary reference analyses in concerted networks or simply using standard samples for qualitative assessments.

P113

CASTRUM project highlights that Italian PDO and PGI products with pig meat require the castration of males

Sebastiana Failla¹, Michela Contò¹, Claudia Geraci², Leonardo Nanni Costa², Luca Buttazzoni¹, Luca Fontanesi²

¹*Centro di Ricerca per la Produzione delle Carni e il Miglioramento Genetico, Consiglio per la Ricerca in Agricoltura e l'Economia Agraria, Monterotondo (RM), Italy*

²*Dipartimento di Scienze e Tecnologie Agroalimentari, Alma Mater Studiorum University of Bologna, Bologna, Italy*

Contact: sebastiana.failla@crea.gov.it

Male pig castration is mainly carried out to avoid boar taint in meat. Even if surgical castration of male piglets has been a traditional practice for centuries, in recent years the practice has been questioned based on animal welfare considerations. The CASTRUM project, including 10 project partners throughout Europe, has recently evaluated and reviewed the alternatives to surgical castration for pigs used in traditional pork products in European Union. Here we reported information recovered for the Italian pig production system focused on the analysis of the protected designation of origin (PDO) and protected geographical indication (PGI) specification rules and relevant literature. In Italy there are 22 PDO and 19 PGI based on pig meat: 28 of them explicitly require castration of male pigs. Furthermore, 34 out of 41 PDO + PGI products require a slaughter weight above 140 kg. Of the remaining 7 products, 3 require a minimum age of at least 9 months at slaughter.

At the slaughter weights and ages required for the PDO and PGI rules, male pigs usually are sexually mature, and they begin to accumulate androstenone and skatole in their adipose tissue. As consequence, typical pig products would be compromised because of meat off flavours.

This is the reason why the production rules of 90% of traditional Italian products exclude meat from entire male pigs. Literature also highlights the differences between meat from entire male pigs and meat from castrated pigs on meat quality traits important for traditional products. Lower fat thickness and higher proportion of unsaturated fatty acids make the meat more prone to oxidation, a critical factor that affects many traditional products, firstly the dry cured hams, needing firm fat and low water losses during the long maturation period.

Besides technological properties of pig meat, male pigs show aggressive behavior against conspecifics on farm and during transport, so reducing the welfare status of the group. Also, aggressive behavior at slaughtering leads to glycogen consumption, insufficient *post-mortem* drop of pH, reduced proteolytic activity, water holding capacity, tenderness and lightness.

PDO and PGI production rules and the available literature exclude the possibility to make typical products by meat from entire male pigs. Welfare concerns on surgical castration could be faced by using analgesia or local anesthesia administered by pig farmers.