

## C-058

**The effects of the traditional producing system on physicochemical, microbial and sensory properties of Caciocavallo Palermitano cheese**

Adriana Bonanno, Antonino Di Grigoli, Nicola Francesca, Raimondo Gaglio, Francesca Mazza, Francesca Vitale, Marco Alabiso, Luca Settanni

*Dipartimento Scienze Agrarie e Forestali, Università degli Studi di Palermo, Italy*

*Corresponding author: adriana.bonanno@unipa.it*

Caciocavallo Palermitano (CP) is a traditional cheese made with raw milk from cows of Sicilian local breeds fed pasture-based diets in extensive farms (EXT), processed by an artisanal technology (ART) based on wooden tools and the action of native microflora. CP is obtained also in intensive farms (INT) where milk from cows of specialized breeds fed dry diets is transformed by advanced procedures (ADV) using a stainless steel equipment and lactic acid starter cultures. This research was planned to investigate the changes in cheese properties due to production system and ripening. Milk was collected 3 times from an EXT and an INT farm and processed in ART and ADV conditions. The 12 produced CP were evaluated at 30, 60 and 120d. EXT CP showed higher yield and protein, lower fat, NaCl and soluble N, a less yellow color, a smoother paste, and a sweeter, less bitter and salty, and more acidic taste than INT CP. The pasture led to EXT CP with a beneficial FA profile to human health, richer in PUFA, n-3 FA and CLA. ART CP showed lower yield, higher fat and color indexes, lower NaCl and soluble N, a harder and more compact paste, with less holes, and at taste was less bitter, salty and acidic, and more piquant than ADV CP. During ripening, the soluble N, the yellow color and the consistency of paste increased. In ART CP, the proteolysis was slower, and the increasing of yellow color was more intense. The microbial analysis of ART CP showed that the wooden vat is a reservoir of lactic acid bacteria (LAB) inoculating milk, among which strains of *Streptococcus thermophilus* were dominant and acted as a starter culture, while undesired microorganisms were absent or very low. During ripening, all LAB decreased except enterococci. The canonical discriminant analysis of physicochemical and microbial data was able to separate CP from different productions and ripening time. Among dominant LAB, 10 species were genetically identified at strain level and some of them showed antibacterial activity. In ART CP, the comparison of polymorphic profiles of LAB strains isolated from the wooden vat with those of strains collected during maturation showed the persistence of 3 *Enterococcus* spp. strains, among which *E. faecalis* was found at dominant level till 120d. The absence of these strains in ADV CP evidenced the contribution of the wooden vat LAB during ripening. EXT and ART CP showed the best features in terms of hygienic safety, health benefits and typical sensory properties.

## C-059

**Fatty acid composition of milk from Holstein-Friesian, Brown Swiss, Simmental and Alpine Grey cattle breeds routinely predicted by mid-infrared spectroscopy**

Paolo Gottardo, Mauro Penasa, Massimo De Marchi

*Dipartimento di Agronomia Animali Alimenti Risorse Naturali e Ambiente, Università degli Studi di Padova, Legnaro (PD), Italy*  
*Corresponding author: paolo.gottardo.1@studenti.unipd.it*

Fat is an important and variable milk component influencing many physical and organoleptic properties of dairy products. Lasting years several studies have been carried out to investigate the role of fatty acids (FA) on human health and results highlighted both positive and negative associations between FA intake and the risk of cardiovascular diseases. The aim of this study was to investigate the variation of groups and major individual FA routinely predicted in milk of four cattle breeds reared in an alpine area. Individual samples ( $n=153,801$ ) of 14,301 Holstein-Friesian (HF), Brown Swiss (BS), Simmental (SI) and Alpine Grey (AG) cows from 1000 single-breed herds were analysed for traditional quality traits (fat, protein, casein and lactose contents, urea and somatic cell count) and groups and major individual FA through mid-infrared spectroscopy (MIRS). Data were analysed using a linear mixed model including fixed effects of breed, month of sampling, year of sampling, stage of lactation (DIM), parity and first order interactions between the main effects and the random factors of herd nested within breed, cow nested within breed and the residual. Breed and herd effects were the most important sources of variation for FA composition of milk, followed by DIM. Saturated FA, C14:0 and C16:0 content increased from calving until 120 DIM, while unsaturated FA and C18:1 decreased, indicating that the release of saturated FA inhibits the formation of *de novo* FA in the mammary gland during the negative energy status of the cow. The month of sampling was highly significant in explaining the variation of milk FA across seasons; in particular, the greatest content of unsaturated FA and C18:1 was found during summer, whereas the content of saturated FA, C14:0, C16:0 and C18:0 decreased in summer and increased in winter. Milk from AG cows presented the lowest content of saturated FA (68.7%), C16:0 (31.5%) and C18:0 (10.2%), and the highest content of unsaturated FA (31.3%). Milk from HF and SI was intermediate between that of AG and BS for all the FA except for C18:1, which was higher in HF (22.9%). Results from this study indicated that milk from AG exhibited better FA profile than milk from HF, BS and SI breeds.