



P109

Chemical and fatty acids composition of fish roes

Mauro Vasconi, Federica Bellagamba, Vittorio M. Moretti
*Dipartimento di Scienze Veterinarie per la Salute, la
 Produzione Animale e la Sicurezza Alimentare, University
 of Milano, Italy*
 Contact: mauro.vasconi@unimi.it

The global crisis of wild caviar production, due to the block of catch quotas granted by the CITES, caused by the steady decline of world sturgeon populations and the limited production from aquaculture, that has not made up for the caviar demand, has allowed the creation of a market for cheap caviar substitutes. Various fish species are used for the production of caviar substitutes, whose eggs shows different characteristics from a nutritional point of view. The aim of present study was to investigate the chemical composition and fatty acid profile of fish roes deriving from seven different species, collected in the Italian market. The survey involved 12 samples of salmon eggs (*Oncorhynchus keta*), 11 of lumpfish (*Cyclopterus lumpus*), 3 of rainbow trout (*Oncorhynchus mykiss*), 3 of pike (*Esox lucius*), 3 of cod (*Gadus morhua*), 3 of Alaska pollock (*Theragra chalcogramma*) and 3 of capelin (*Mallotus villosus*). The eggs proximate composition (AOAC standard methods) and fatty acid profile (GC analysis) were determined. The data were processed by SPSS 22 statistical package. Salmon eggs (217.3 ± 32.7 mg) were the biggest while the smallest resulted the cod eggs (0.16 ± 0.08 mg). Generally, eggs of greater size showed the higher protein and lipid content. Protein content ranged from the value of 29.6 ± 0.8 g/100 g of salmon to the 8.1 ± 0.6 of capelin, while lipid content ranged from 12.8 ± 0.6 of salmon to 2.8 ± 0.6 of Alaska pollock. With regard to the fatty acid composition, the fish eggs showed some peculiarities. EPA and DHA (their sum ranged from 46.6% of total fatty acid of pollock to the 20.9% of pike) were dominant in all sea species (salmon, capelin, cod, pollock and lumpfish) while pike and trout presented a higher amount of oleic acid (21.6% and 27.1% respectively). Eggs from trout, the only farmed species, presented also a significant amount of linoleic acid (9.4%) if compared with all the other species. This content probably derived from the vegetable oils utilized in feed formulation. This study contributes to the chemical characterization of caviar substitute present on the Italian market. Salmon eggs showed a chemical composition that was more similar to caviar, according to our previous results obtained from caviar samples coming from four different farmed sturgeon species. Regarding fatty acid profile, fish eggs presented a valuable content of essential fatty acids of the *n*-3 series, which were higher if compared to the more expensive caviar.

P110

Variation in composition and colour indices of sheep raw milk influenced by productive practices and feeding strategy

Lorena Jiménez Sobrino¹, Ana Isabel Garzón Sigler²,
 Andrés L. Martínez Marín², Nieves Núñez-Sánchez², Jesús
 Romero Asensio³, Gabriele Acuti⁴, Mario Román¹, María
 Dolores Pérez Guzmán¹, Ramón Arias Sánchez¹
¹Centro Regional de Selección y Reproducción Animal,
 Instituto Regional de Investigación y Desarrollo
 Agroalimentario y Forestal, Valdepeñas, Spain
²Departamento de Producción Animal, University of
 Córdoba, Spain
³Laboratorio Interprofesional Lácteo de Castilla-La
 Mancha, Talavera de la Reina, Spain
⁴Dipartimento di Medicina Veterinaria, University of
 Perugia, Italy
 Contact: lorenaj@jccm.es

Over the past few years, there has been a great development of the sheep dairy sector in Spain, and a wide variability in the production outcomes of farms has been detected, although most of the farms have similar environmental and economic constraints. Milk quality evaluation is important not only for cheese production, but also for other dairy products. Therefore, the aim of this work was to evaluate the effect of some factors on bulk milk characteristics of Manchega sheep reared in La Mancha region, with special attention to casein and urea contents and color indices. Factors of variation such as season, milk yield, the inclusion (or not) in a breeding program and the feeding strategy of breeds have been considered. The study included 77 farms distributed along La Mancha region, in Spain. Data were collected from interviews using a questionnaire that included questions properly selected to obtain a general description about production practices and feeding strategy. In total, 308 analytical determinations of milk characteristics including fat, protein, total solids, casein, lactose, pH and urea content, color indices and somatic cell count (SCC) were analyzed by automated methods. Data were analyzed with GLM procedure analysis of SAS version 9.3 to analyze the relationship between factors of variation and milk characteristics. Season showed a significant ($p < .05$) effect on the major components of milk and urea content, having lower values, and hence less luminous milk in Spring and Summer. However, it is important to remark the stability of the total casein/fat ratio of bulk milk from Manchega sheep throughout the year, which is an important factor for the cheese making process. Moreover, the inclusion in a breeding program was linked with lower values ($p < .05$) of bulk milk SCC. Besides, our study showed a decrease of the major components of milk ($p < .05$)