

protein, fat, ash, and Van Soest fiber fractions). To evaluate the state of conservation, the pH was measured, N-NH₃ and organic acids (acetic, propionic, butyric, lactic) were detected. Fermentability was determined by incubating each dry sample inside a bottle containing sheep rumen fluid at 39 °C under anaerobic conditions to evaluate the disappearance of organic matter, final products (volatile fatty acids) and fermentation kinetics. The differences between the micro-silos were evaluated with an ANOVA model. The results showed that the substrate significantly ($p < 0.01$) influenced the storage aptitude, chemical composition, and fermentation characteristics. The addition of straw or wheat bran increased silage dry matter (14.23%, 14.38, and 17.25% for PPPS, PPPB6, and PPPB12, respectively), which was the lowest for PPPA (8.84%). The use of wheat bran with PPP showed significantly higher protein percentages. Overall, the quality of the silages was excellent for the lactic/acetic acid ratio ($> 2.3\%$), for the low pH values (range 3.82–4.01), and for the N-NH₃/total N ratio (range 0.44–4.92). In addition, wheat bran silage, although more expensive, produces better quality silage.

O81

High levels of nitrate in fresh meats: does nutrition play a role?

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The 'natural' presence of quantifiable amounts of nitrate in fresh meats has been reported by several authors. The source of such presence has never been identified. The animal diet can play a role, but it has never been demonstrated.

In this work, 160 samples of animal feed were analysed for the detection of nitrite and nitrate. Samples of commercial concentrate feed for cow (23), chicken (23), swine (23) and equine (16), forage (7), alfalfa (13), hay (7), seeds of barley (7), wheat (7), corn (7), soy (7), oats (7), bran (7) and other seeds (6) were analysed. The monitoring was carried out by capillary ion chromatography with conductivity detection, and the most interesting results were 'confirmed' using another consolidated ion chromatography method. Alfalfa samples showed the highest nitrate concentrations, with mean level of 994.0 mg/kg, and the highest nitrate concentration (1321.9 mg/kg). High nitrate concentrations were also detected analysing legume and meadow hay samples (184.0 mg/kg) and forage (mean level: 401.1 mg/kg) Among processed feeds (simple, compound/complex and complementary), feeds for cow and equine showed the highest concentrations (mean levels equal to 16.5 and 39.6 mg/kg, respectively), followed by feed for swine and for chicken. This last type of feed was characterized by nitrate levels lower than those detected in other raw materials (bran, oats, soy, barley) and slightly higher than wheat and corn

samples. Regarding nitrite detection (8 samples in the range 3.7–21.8 mg/kg), the study demonstrated no correlation between nitrite amount and feed type.

The monitoring demonstrated that alfalfa is the feed that mainly contribute to nitrate intake in animals, followed by other types of grass such as forage and hay. Commercial feeds contribute to a lesser extent, and feed for chicken is characterized by very low levels of nitrate, lower than those detected in other raw materials such as oats, bran, etc.

A preliminary trial was also made by comparing meat samples obtained by introducing alfalfa in the diet of 2 livestock units of beef cattle with 2 units not fed with alfalfa. After slaughter, nitrate concentrations equal to 36.1 and 37.1 mg/kg were detected where alfalfa was used with no quantification in other 2 samples. This preliminary result confirmed a possible role of animal nutrition when nitrates are quantified in fresh meats.

Acknowledgements

Thanks to the Italian Ministry of Health who financed the Research Project IZS PB 07/20 RC.

O419

Camelina sativa and Cynara cardunculus cakes supplementation on performance and milk composition in dairy goats during the transition period

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The main aim of the research was to improve the quality of goat milk and derived milk products by exploiting the specific properties of agro-industry co-products such as camelina and cardoon cakes. Thirty-six Alpine multiparous dairy goats (age: 3.04 ± 0.85 years; average daily milk production: 3.93 ± 1.23 L) at ninetieth days of pregnancy were housed in single box and randomly assigned into four isonitrogenous and isoenergetic different diets. The groups were ($n = 9/\text{group}$): a control diet (C), without experimental supplementation; a diet supplemented with 5.4% of cardoon cake (CD); a diet supplemented with 7.6% of camelina cake (CAME); a diet supplemented with 6% of a mixture of cardoon and camelina cakes (CACD). Individual feed intake levels and milk yield were recorded daily. Live body weight (LBW) and body condition score (BCS) were recorded weekly; milk samples were collected at day 4, 7, 14, 21, 28; ruminal fluids were collected at day -28, 2, 28 and pH was measured. Collected data were analysed by mixed procedure of SAS for repeated measurements. Significant level was considered for $p < 0.05$ and tendency for

$0.05 < p < 0.1$. No significant treatment effect was observed in milk production, LBW, BCS and ruminal pH ($p > 0.05$). No differences were observed in milk protein content, caseins, urea and lactose ($p > 0.05$). Milk fat content tended to be higher in CACD compared with other treatments at day 4 (CACD 6.95 ± 0.27 , CAME 5.60 ± 0.25 , CD 5.91 ± 0.25 , C 6.16 ± 0.24 g/100 mL; $0.05 < p < 0.1$) and in C compared with CAME and CD at day 7 (C 5.84 ± 0.24 , CAME 5.05 ± 0.25 , CD 5.14 ± 0.25 g/100 mL; $0.05 < p < 0.1$). CD linear score of somatic cells count (SCC) values tended to be higher compared with other treatments ($0.05 < p < 0.1$). Moreover, unsaturated fatty acids (UFA) were significantly higher at day 4 in CACD than other groups (CACD 2.15 ± 0.11 vs CAME 1.66 ± 0.10 , CD 1.67 ± 0.10 , C 1.7 ± 0.10 g/100 g; $p < 0.05$) and at day 7 C group was higher than CD group (C 1.76 ± 0.10 vs CD 1.42 ± 0.10 g/100 g; $p < 0.05$). Camelina and cardoon are valuable sources of unsaturated fatty acids, as PUFA, and their intake can affect their content in milk, implying greater food quality and possible health benefits for consumers. In our trial, supplementation with cardoon and camelina cakes did not change performance of transition dairy goats while was able to modify fatty acid profile of their milk. Overall, these co-products could be excellent protein sources alternatives to soy also because more environmentally sustainable.

O420

Impact of maternal milk from goats fed with *Camelina sativa* and *Cynara cardunculus* cake on goat kids' growth performance and health status

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Cardoon and camelina cakes, are an excellent source of functional components, in particular polyunsaturated fatty acids (PUFA) such as omega-3, branched fatty acids and flavonoids. The aim of this project was to evaluate the effects of maternal milk from goats fed with cardoon and camelina cakes on growth performances and blood metabolic biomarkers in goat kids. Thirty-six Alpine dairy goats were enrolled and divided into four experimental groups ($n = 9$ /group) characterized by different diets: a control diet (C), without experimental integration; a diet supplemented with 5.4% of cardoon cake (CD); a diet supplemented with 7.6% of camelina cake (CAME); a diet integrated with 6% of a mix of cardoon and camelina cakes (CACD). The offspring was fed for the entire duration of the trial exclusively with milk from the goats belonging to the mother's experimental group. Goat kids were fed two times a day and housed in a common box. After birth, the quality of

colostrum was evaluated and each goat kids were fed its mother's colostrum. Live body weight (LBW) and average daily gain (ADG) were measured and calculated weekly. At the beginning and at the end of the trial, blood samples were collected from jugular vein. At the end of the experimental period, the male goat kids were sent to the slaughterhouse according to farming practices. Carcass weight and carcass yield (carcass weight/slaughter weight) were measured. Collected data were analysed by mixed procedure of SAS for repeated measurements. Significant level was considered for $p < 0.05$ and tendency for $0.05 < p < 0.1$. No significant treatment effects were observed in growth performances ($p > 0.05$). It has been observed a significant difference between sex in LBW and ADG parameters (LBW male: 7.04 ± 0.14 , female: 6.48 ± 0.14 Kg; ADG male: 0.20 ± 0.005 , female: 0.17 ± 0.005 Kg/day; $p < 0.05$). No significant differences between treatments were found in carcass weight and carcass yield ($p > 0.05$). CACD kids showed lowest values of glucose and highest values of NEFA, at day 28 compared with other treatments. Although camelina and cardoon cakes did not show significant differences in performance and health status among the experimental groups, they were able to provide goats with an adequate nutritional intake during transition period, ensuring a suitable pre- and post-natal development for the goat kids. Consequently, cardoon and camelina cakes can be considered as valuable substitutes of conventional feed protein ingredients.

O462

Effect of fennel seeds as a dietary supplement in grazing goats: preliminary results

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Fennel (*Foeniculum vulgare*) is an annual plant belonging to the family of *Apiaceae*, widely used in Mediterranean areas for its aromatic and medical properties. Fennel is well-known for carminative, digestive and galactagogue properties which