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Poster Communication Abstract – 1.67

RELATIONSHIPS BETWEEN ANTINUTRITIONAL COMPOUNDS AND THE NUTRITIONAL QUALITY OF CAMELINA SATIVA (L.) CRANTZ MEAL.

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To overcome the high demand for protein supply by the livestock industry, it is desirable to find new crops or by-products of plant cultivation or agroindustry rich in proteins. Moreover, growing concerns about the environmental impact of farming systems have increased the interest toward alternative protein crops more adapt to sustainable agro-techniques. Among these alternative crops, *Camelina sativa*, a member of the mustard family (*Brassicaceae*), is strongly attracting both sectors because camelina seeds are rich in oil and crude proteins (35-40 and 24-30%, respectively), and the plant has several agronomic advantages such as easy introduction into crop rotations, short growing season, low fertiliser requirements, tolerance to cold weather and drought. In addition, the seeds are a valuable source of raw materials for biofuel and industrial lubricants, whereas the defatted seed meal (by-product obtained after oil extraction) rich in proteins has been suggested as a new potential ingredient in livestock rations.

The aim of this study was to investigate the effect of some antinutritional compounds: trypsin inhibitors and condensate tannins on the nutritional value of the meal by measuring protein content and *in vitro* digestibility. Four spring-type camelina varieties: Pearl, Midas, Cypress and Calena were

analysed. They were grown for four consecutive years (2016-2019) in an experimental field near Bologna. Main meteorological data (temperature and rainfall quantity), were recorded during all growing seasons.

The crude protein content, in the defatted meal of the four varieties, ranged from 425 to 640 g/kg over the growing seasons. The trypsin inhibitor (TI) and condensate tannin content ranged from 8.61 to 13.98 TIU/mg and 0.99 to 5.08 µg CE/mg, respectively and they showed an opposite response to annual climatic fluctuations. Experimental evidences suggest that a lower rainfall amount in June, as it occurred in 2017 and 2019, gave rise to a higher accumulation of condensate tannins. Correlation analysis applied to all collected data showed a negative relationship between *in vitro* digestibility and TI ($p<0.06$), while one-way ANOVA evidenced a significant role ($p<0.05$) of genotype in determine the amounts of proteins, TI and condensed tannins. Finally, a significant effect ($p<0.05$) of G x E was observed for TI and condensate tannin contents. Among the tested genotypes, Calena meal exhibited the highest protein content (mean value 630 g/kg) and was the less variable genotype among the four growing seasons, while Pearl was characterised by the highest *in vitro* digestibility (71.88%) and the lowest TI (9.35 TIU/mg) and condensate tannins (1.73 µg CE/mg).

Our preliminary results indicate that nutritional quality of camelina meal is mainly influenced by the genotype which, in turn affects the main classes of antinutritionals. Therefore, a careful selection of the genotype is required for the inclusion of defatted meal in livestock rations.