P.22.- Microscopic method in PAP identification in feed : Applications of image analysis

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Processed animal proteins (PAPs) detection and identification in feedstuffs can be difficult in distinguishing among land animal, i.e. poultry and mammals. Thus the, aim of this study was to evaluate the potential application of image analysis in PAPs identification. For this purpose four reference samples containing poultry meals and four reference samples containing mammalian meat and bone meals were used. Each samples was analyzed using the microscopic method (88/98/EC). Bone fragments characterized by similar morphological features (colours, shape, lacunae shape, lacunae distribution, ect.) that made difficult to distinguish between poultry and mammals were selected. Though a digital camera and an image analysis software a total of 30 bone fragment lacunae images at X400 were obtained. For each image 29 geometric parameters related to the lacunae and 3 geometric parameters related to the canaliculae of lacunae, were measured using the image analysis software obtaining 960 observations. Obtained data were analysed using the PRINCOMP, ANOVA, and BOXPLOT procedures of SAS/STAT. Of the 32 descriptors used two, the area of the lacunae and their perimeter, were able to explain 96.15% of the total variability of the data, even though their contribution was different (83.97% vs. 12.18, respectively). These results were also supported by the variance analysis (ANOVA) for the two variables, that showed how descriptor "area poly" ($P<0.001$) was more informative than descriptor "perimeter" ($P<0.0165$). Through these two descriptors it was possible distinguish between mammalian and poultry lacunae, except in two cases (6.6%), in which poultry lacunae were wrongly classified as mammalian. This latter can be related with higher variability in the lacunae area recorded for mammals compare to poultry. On the basis of the present study, it can be concluded that image analysis represents a promising potential tool in PAPs identification, that may provide accurate and reliable results in feedstuffs characterisation, analysis and control.

Keywords
Processed animal proteins (PAPs), official microscopic method, image analysis