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Increase of the protein content of rapeseed meal by sifting technology

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Regular winter rapeseed meal (WRSM) is a locally produced, highly available source of protein for feed in France. However, protein content variability (34-40 %DM) and high fibre content (14-18 % DM) remains bottlenecks to incorporate WRSM into all poultry feeding stuff formulas. In the aim to reach a higher protein level in WRSM, industrial dehulling of rapeseed seeds before crushing was carried in France in the 90's, but the oil losses during the hulls separation lowered the economical balance and this process was abandoned. Because no loss of oil could happen when applied on de-oiled RSM, the sifting classification, a technique commonly used in cereal milling, to separate fractions according to their fibre or protein content, could be an interesting alternative approach.

Sifting technology was then tested in the framework of Vocalim project in ENILIA-ENSMIC pilot mill, on a 500 kg regular RSM batch produced by a French plant from winter cultivars (RSM protein content: 37.8 % DM). A preliminary particle size characterization carried out on a small 2 kg batch using a planschister equipment, showed that the 100-150 µm fraction was the most protein concentrated (45.2% DM) and the 500-1000 µm fraction, the less one (33.4% / DM). Using granulometry data, a simulation indicated that a binary sifting separation at 250 µm should produce with a 13% yield, RSM containing protein at 45%/DM. Verification was carried out by an experimental sifting separation scaled up on a 500 kg batch of RSM with a pilot equipment and resulted in the preparation of a 50 kg RSM fraction (44.9 %/DM protein content). The other RSM fraction (450 kg) had a lower protein content (36.8 %DM), not very different from the starting batch (-1 point). The study showed that production of graded RSM rich enough in protein (around 45%/DM) to be widely used in feeding formulation for poultry is easy. The yield (around 10%) may be considered as low, but it allows to keep in the major fraction (90%), a no significantly different protein content (only 1 point lower than the regular RSM) that should not decrease its economic value.