

The nutritional quality of rapeseed protein isolates

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Rapeseed protein is well recognized due to its well balanced amino acid composition, but conventional rapeseed meal with its high proportion of hulls has a relatively low digestibility compared to other vegetable protein sources like soybean meal. Therefore, methods to increase digestibility and functionality of rapeseed protein are highly wanted, and over the years several processes and methods have been developed in order to increase protein digestibility in rapeseed meal. The glucosinolate content may still impair the use of rapeseed to sensitive animals, and enlargement of thyroid and liver is observed if too high amounts of glucosinolate-containing rapeseed are consumed. A challenge for many of the processes developed has partly been to produce high enough purity of the economically most valuable fractions and to find relevant and economically attractive use of the side products.

Four different rapeseed protein products were obtained from Triple A, DK-8783 Hornsyld, Denmark. The protein products were made according to a patented method for isolation of soluble protein which has been invented by University of Copenhagen, Denmark. Cold-pressed rapeseed cake with 24 % protein and 27.0 % fat was dehulled and processed into four fractions with varying protein and fat content. RS1 contained 32.6 % protein and 24.1 % fat, RS2 contained 54.3 % protein and 18.9 % fat, RS3 contained 54.2 % protein and 15.0 % fat, while RS4 contained 25.4 % protein and 16.3 % fat. To assess the nutritional value of the obtained fractions a digestibility experiment with growing rats was performed and a soybean protein concentrate (Dansoy) with 76.1 % protein and 5.1 % fat was included as reference. Rapeseed and soybean respectively comprise the only protein source, as the remaining diet was a N-free standard mixture.

By processing, digestibility of protein increased from 80.2 % in the original rapeseed cake and up to 94.1 % for RS3 with the other fractions in between. Dansoy showed a protein digestibility of 97.1 %. Likewise dry matter (DM) digestibility increased from 65.2 % in the original rapeseed cake and up to 74.2 % for RS3, which also here showed the highest digestibility, not differing from Dansoy. Significant enlargement of thyroid and liver was observed in the original rapeseed cake, but there was no difference between Dansoy and the other fractions. It is concluded from the experiment, that it is possible to increase digestibility of rapeseed cake by proper processing and it is also possible to delete the anti-nutritional effect of glucosinolates by this process.