

## Investigations about the suitability of different plant and milk proteins for manufacturing cooked sausage

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Meat products in Germany contains up to the changing of the meat law on 15<sup>th</sup> December 1995 as proteincontent nearly exclusive muscleproteins. There is the question for the domestic industry, how shall they react to the legal changings in the competition. Besides meat protein it is allowed to use other proteins like milk, bloodplasma, egg proteins and plant proteins for manufacturing meat products. "Plant protein" stands often lumpsumly for "soya protein" or "protein containing soya products".

Out of regional and agricultural policy reasons it is to be favourite to use protein products from local culture plants. A plant with a high proteine content that was tested in Bavaria during cultivation tests was the sweet lupine. In the up to now carried out research and development in the "Fraunhofer Institut for Food-Technology and Packaging" (FhLV) it was possible to manufacture protein concentrates and isolates from sweet lupine. But there was no optimising for using as additive for meat products. For the common project between FhLV and BAFF in FhLV manufactured lupine protein preparations was tested in comparisation with other milk and plant proteins of their suitability for production of cooked sausage.

These investigations was made with a basic formulation for cooked sausage, by those 7,5 % lean meat was exchanged for 2 % protein powder and 5,5 % water. Also was included other milk and plant protein they was available in this time, to enhance the strength of the experiments, there the lupine isolates in developing complete with this preparations in the market.

Nearly all of the investigated proteins cause a reduction of gelly separation in comparison with the control batch in fully preserved canned sausages. Therefore the soya isolates leads to the best results in referring to the gelly separation. But there are differences between several preparations - also by one producer. By using this proteins the firmness values of the control batches was partly lower. A part of the batches shows - in dependence of the protein preparation - similar or slight higher firmness values as the control batches. Depend on the protein preparations the results of the colour brightness ( $L^*$ ) was -1,4 to +1,6 in relationship to the control batches, but mostly in the positive area. The red part ( $a^*$ ) of the batches with protein isolates was lower for 0,8 - 2,1. The yellow part ( $b^*$ ) of the batches with protein isolates varied between -0,3 to +0,6 in comparison to the control batches. Altogether the control batches were best judged in sensory evaluations. In odour and flavour the milk protein had the highest acceptance of the used foreign proteins. The evaluated soya, pea and one wheat protein as well as the isolated and roller dried lupine protein were evaluated as relative neutral in flavour. These samples distinguish from the control batch on the whole in a reduced meat flavour. One wheat protein compare badly with the control batch in taste (bitter, burning). Optical all samples including protein isolates - depend on the protein isolat preparation - look more or less light-coloured.

From the evaluated sweet lupine preparations the isolated and the roller dried lupine protein come into question, because they are quite comparable with the other protein preparations used in these evaluation in waterbinding (gelly separation), consistency and tastelessness. Something less was

judged the yellow colour of the lupine protein, they influenced the colour of the cooked sausage measurable and visible. Furthermore in comparison with for decades tested and optimized soya isolates there is any possibility to improve the waterbinding, structure and consistency forming properties. The exchange up to 7,5 % lean meat against 2 % lupine protein isolate and 5,5 % water appears possible in cooked sausage recipes and a specific spicemix, because the consumer normally has not the direct comparison with the sausage manufactured only of meat.