

## **Low and high moisture extrusion of less refined ingredients impact of processing conditions on texturization of defatted soy flour**

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High and low moisture extrusion (HME, LME) can be applied to create meat-like structures in protein rich materials. The structure of final products differs: LME forms expanded, granulate-shaped products, HME imparts non-expanded, compact structures. Besides the process conditions and the moisture content, also the raw material type has a major impact on quality and environmental impact of final products. With this regard, the use of less purified raw materials is considered to be more sustainable. Highly purified protein isolates are often mixed with starch and fiber to improve physical and sensorial characteristics of extrudates. However, defatted soy flour already contains higher amounts of different ingredients, beside the native protein. Hence, it can be assumed that this composition renders redundant any addition of other highly purified fractions. The aim of this study was to investigate the influence of extrusion conditions (temperature and water feed rate) on physical quality of extrudates, produced by HME and LME from defatted soy flour instead of using soy protein isolates. Extrudates were produced with temperatures ranging between 145 and 165°C (HME) and 170 and 190°C (LME). Water feed rates ranged from 6.1 to 8.2 kg/h. Moreover, the ratio between water- and raw material feed rate ranged from 1.8 to 2.4 (for LME) and 3.4 to 4.5 (for HME). HME products were characterized by analyzing firmness and springiness by texture profile analysis, cutting behavior and degree of texturization. LME products were analyzed by single compression testing of rehydrated, minced products. Within products of LME and HME significant differences in textural parameters were found. Temperature had a positive impact on the degree of texturization during HME. Moreover, a higher water content during HME decreased as expected the firmness of final products. Higher temperatures during LME decreased the firmness of rehydrated, minced extrudates from 11.1 to 7.4 N. The results of the study showed, that less purified raw materials are also offering good processability for LME and HME. The formation of fibrous protein structures can be highly influenced by variation of extrusion conditions which allow to tailor the process taking into account the use of less refined ingredients.