

THE EVALUATION OF FUNCTIONAL PROPERTIES OF FISH MEAL

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The raw material freshness and drying methods are determining factors of fish meal quality. The aim of this experiment was to study the effect of the drying method and raw material freshness as for its functional properties in fish meal. Blue whiting, herring and capelin meals produced in commercial fish meal processing plants in Iceland were obtained. The samples were categorized (according to the freshness of raw fish and processing technique) into three grades (low temperature (LT), Norse Mink (NSM) and standard). Freshness of raw material was assessed through the total volatile nitrogen content in fish before process. Fish meals were dried using air dryers (Dyno and Hetland) and steam dryers. Samples were tested for proximate composition, including salt content, unbound ammonia, water activity, bulk density, flow characteristics, particle size and some functional properties (viscosity, water holding capacity and solubility). Sub samples of all samples were stored at 35°C for four weeks and tested for moisture content, water activity and unbound ammonia content.

Salt content ranged from 1.8% to 4.05% in fish meal samples. The results obtained indicated that the salt content of LT meal of blue whiting (4.05%) was comparatively higher than all the others and it was significantly higher ($p=0.001$ and 0.0004) in LT meal of herring (3.92%) than in NSM (2.03%) and standard meal. Unbound ammonia content in LT meal of all three species were significantly lower ($p<0.05$) than in NSM and standard grade. Viscosity was significantly higher in LT meal of herring ($p=0.02$) and capelin ($p=0.04$) than in the other two grades while it was different in blue whiting. Viscosity was significantly higher in meals dried in Dyno air dryer than in Hetland air dryer and steam dryer ($p=0.01$ and 0.007) respectively. Water holding capacity was significantly higher ($p=0.04$) in LT meal of herring than in NSM and standard meals. Solubility was significantly lower in LT meal of herring ($p=0.001$) and capelin ($p=0.02$) than in other meals and in herring meals which was dried in Dyno air dryer ($p=0.001$) than meals dried in Hetland air and steam drier.

These results suggest that the usage of fresh raw materials, low temperature and low retention time (during drying) for fish meal processing retain functional properties to a greater extent which is useful in the fish feed industry.