

Characterization of Low-fat (< 3%) Bologna manufactured with Pork Ham Muscle, and a Blend of Konjac, Carrageenan and Soy Protein

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Emulsion-type sausages, such as frankfurter and bologna, may contain up to 30% fat in the final products. Since the dietary fat content has been shown to have significant correlation with coronary heart disease, consumers' demands for low-fat meat products have increased due to their health concerns. However, fat reduction in the formulation can cause variation in firmness, decrease juiciness and yields, and increase amount of vacuum purge. Thus, the objective of this study was to determine the effect of addition of a blend of konjac flour (KF), carrageenan(CN), and soy protein isolate (SPI) in the formulation on the physico-chemical and textural characteristics of low-fat bologna in a model system (LFB). Regular bolognas(RB) were manufactured with pork ham muscle(<4% fat) and back fat, whereas LFBs were manufactured with pork ham muscle and each or a combination of KF, CN and SPI at the ratio of 1:1:3. pH, proximate analysis, water activity(A_w), cooking yields(CY, %), expressible moisture(EM, %), color values and textural characteristics were evaluated and LFBs containing each combination were also compared to the regular or low-fat controls. LFBs had a pH range of 6.10 to 6.20 and a water activity(A_w) value of 0.95~0.96. The chemical composition of LFBs was a moisture content of 77~79%, <3% fat and a protein content of 13~15%, while RB had a pH 6.11, 62~63% moisture, 19~20% fat and 11~12% protein. LFBs containing CN and SPI alone tended to have higher EM values (%) and other combinations had similar or lower EM values than those with controls. The replacement of 6% lean meat with 1.5% SPI alone in LFB formulation increased yellowness value(b*) and reduced water holding capacity (WHC). However, the addition of a blend of KF, CN and SPI in the LFB formulation improved WHC, CY and TPA values, as compared to the low-fat control.