



Use of Stabilized Rice Bran as a Replacer of Modified Food Starch or Meat in Smoked Sausage

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Objectives

Until recently, rice bran, a by-product of rice milling was considered unfit for prolonged storage and consumption. Due to new stabilizing technology to inactivate the enzyme lipase, rice bran is no longer used as waste material. The stabilized rice bran (SRB) is an allergen-free functional ingredient which can replace some of all of the traditional binders in meat products. The SRB can be used to replace lean meat to provide cost savings. In June 2008, SRB was approved as “rice bran” by USDA as a binder/extender in comminuted meat and poultry products where binders are approved such as sausages, chicken patties, meatballs, meatloaf and meat patties where binders are permitted. The objective of this study was to evaluate quality characteristics of smoked sausage by utilizing SRB to replace modified food starch (MFS) or meat.

Materials and Methods

Four treatments of pork and turkey smoked sausages were formulated: Control with 1.9% MFS, TRT 2: 1.9% SRB replacing 1.9% MFS, TRT 3: 1.9% SRB + 1.6% MFS and 2% additional water replacing pork 72's and TRT 4: 1.9% SRB + 1.6% MFS and 4% additional water replacing pork 72's.

Pork 72's with 28% fat 12.7 mm grind, salt, sodium phosphate, sodium nitrite, sodium erythorbate and half the water/ice were mixed in a paddle mixer for no more than 3 min. The pork 42's with 58% fat 12.7 mm grind, mechanically deboned turkey, the rest of the dry ingredients and the remaining water were added and mixed for an additional 2 min. The mixture was reground through a

4.8mm plate, stuffed into 26 mm diameter cellulose casings and cooked in a smokehouse to an internal temperature of 71.7°C. The smoked sausages were stabilized following USDA Appendix B guidelines, peeled, vacuum packaged, and stored in a cooler at 4°C.

Smoked sausages were evaluated for cook yield by difference in weight before and after cooking/chilling, texture profile analysis using a Texture Analyzer equipped with a 1 cm diameter stainless steel probe and a compression cycle set at 30% of the height of the sausage. Interior color (L, a, and b values) was measured using a handheld Hunterlab color reflectance meter equipped with a D65 Optical Sensor. Purge was measured over 12 wk of refrigerated storage on vacuum-packaged smoked sausages. The study was replicated three times and statistical analysis was performed using ANOVA ($P < 0.05$) with StatView for Windows on three replications.

Results

Cook yields were significantly ($P < 0.05$) higher for TRT 2 and TRT 3 compared to the control. Cook yields were not significantly ($P > 0.05$) for TRT 4 compared to the control. The hardness, gumminess and chewiness values were significantly ($P < 0.05$) higher for TRT 2, but not significantly ($P > 0.05$) different for TRT 3 and TRT 4 compared to the control. Interior L and a values were not significantly ($P > 0.05$) different for any treatments compared to the control. Interior b values were significantly ($P < 0.05$) higher for TRT 3 and TRT 4 compared the control. Purge was significantly ($P < 0.05$) lower for all treatments after weeks 2 and 4 compared to the control.

Conclusion

SRB is a cost-effective, functional, non-GMO, non-allergen, minimally processed ingredient that can replace MFS or meat while improving yield and reducing purge in comminuted smoked sausage. SRB offers a more consumer friendly recognizable label compared to other binders that are approved for use in meat products.