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Use of Stabilized Rice Bran as a Replacer of Soy Protein Concentrate or Meat in a Beef and Binder Product

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Objectives

Until recently, rice bran, a by-product of rice milling was considered unfit for human consumption after prolonged storage. Due to recently developed stabilizing technology to inactivate the enzyme lipase, rice bran is no longer used as waste material. Stabilized Rice Bran (SRB) is an allergen-free functional ingredient which can replace some or all of the traditional binders in meat products. SRB can be used to replace lean meat to provide cost savings. In June 2008, SRB was approved as “rice bran” by the USDA as a binder/extender in comminuted meat and poultry products. Approved products where SRB can be used includes products 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 beef and binder product by utilizing stabilized rice bran (SRB) or defatted rice bran (DRB) to replace soy protein concentrate (SPC) or meat.

Materials and Methods

Five treatments of beef and binder product were formulated: Control with 2.70% SPC, TRT 2: 2.7% SRB replacing 2.7% SPC, TRT 3: 2.7% DRB replacing 2.7% SPC, TRT 4: 2% SRB replacing beef 80s and TRT 5: 2% DRB replacing beef 80s.

Beef 80's with 20% fat was ground through a 5mm plate. Textured wheat protein was hydrated with 1/2 the formulation water and held for 10 min. Beef 80s, salt, spices, textured wheat protein, the remaining dry ingredients and the rest of the water/ice were mixed in a paddle mixer and mixed for no more than 3 min. The mixture was reground through a 2 mm plate, then stuffed into 12 cm diameter fibrous casing and cooked in a smokehouse un-

der steam to an internal temperature of 71.7C. The chubs were stabilized following USDA Appendix B guidelines, sliced and vacuum packaged and stored in a cooler at 4C. The different treatments were evaluated for cook yield by difference in weight before and after cooking/chilling, sliceability (number of intact slices 1.5 mm thick using a Bizerba high speed tabletop slicer set at full speed 2/3 stroke), firmness using a Texture Analyzer equipped with a 1 cm diameter stainless steel probe and a compression cycle set at 30% of the height of a 2.54 cm thick slice and a test speed of 2mm/s. Purge was measured over 12 wk of refrigerated storage on vacuum-packaged slices. Statistical analysis was performed using ANOVA ($P < 0.05$) with StatView for Windows on 3 replications.

Results

Cook yields were significantly ($P < 0.05$) higher for TRT 3, TRT 4 and TRT 5 compared to the control. Slicing yields were significantly ($P < 0.05$) higher for TRT 3, TRT 4 and TRT 5 compared to the control. The firmness values were significantly ($P < 0.05$) higher for TRT 3, but not significantly ($P > 0.05$) different for TRT 4 and TRT 5 compared to the control. Number of intact slices were significantly higher ($P < 0.05$) for TRT 2 and TRT 3 compared to the control. Purge was significantly ($P < 0.05$) lower for all treatments after wk 2 and wk 4 compared to the control.

Conclusion

SRB is a cost-effective, functional, non-GMO, non-allergen, minimally processed ingredient that can replace SPC or meat while improving yield, sliceability and reducing purge in a beef and binder product. SRB offers a friendlier recognizable label compared to other binders that are approved for use in meat products.