Food

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7. Title

Evaluation of Ingredients and Protocol to Inhibit Melanosis in Gulf Shrimp

12. Investigator Name(s) (Last Name and Initials)

Lampila, L.; Janes, M.; Finley, J.

20. Termination Date 12/31/2014

40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

This information was shared with through the USDA Borlaug Fellow Program, with other food scientists, aquaculturists, graduate students and undergraduates. Work will be continued in Nigeria and the Southeast US.

Outcomes/Impacts:

Work conducted in this period included whether or not a black spot inhibitor would be needed depending upon the process protocol and the end product. The product evaluated was shrimp harvested from the Gulf of Mexico that had been peeled and that which had not been peeled. Heads were removed. Shrimp were dried in an infrared oven and in five different designs of solar dryers. Solar drying of shrimp in Louisiana typically took an average of three days as determined by achieving a water activity of 0.85 or less. Infrared drying took an average of three hours to achieve the acceptable water activity level. Water loss was accelerated in shrimp that were salted prior to drying. As expected, NaCl accelerated color change, presumably due to lipid oxidation as evidenced by an L* value an average of five points lower; an a* value of three points lower and a b* value of three points lower than shrimp that had not been salted. L* values were similar among peeled and unpeeled shrimp salted prior to drying, but the L* values of unsalted shrimp were higher on the unpeeled versus the peeled. One of the most interesting results of the drying studies was that melanosis occurred only on the tips of the tails on the unpeeled shrimp and not on the flesh, and there was no evidence of melanosis shrimp that were peeled. These shrimp were not treated with a melanosis inhibitor. The impact of these results is that well-chilled shrimp quickly frozen on the boat can be dried without the occurrence of melanosis during drying. In rapid drying, this would result from a surface protein denaturation that caused a case hardening thus limiting oxygen which is required for melanosis to occur. Of great interest is the fact that in slow drying, melanosis was also inhibited. If reproducible, untreated shrimp could be marketed in areas where they had been previously not been allowed due to the presence of melanosis inhibitors. These studies will be repeated in the warmer summer months to repeat the trials with solar drying.

Publications:

No Publications Reported

Participants:

Lampila, L. (PI), P.Wilson, G. Lutz, J. Shackelford, M. Cael, S.Black and A. Allnutt, LSU AgCenter; Omitoyin Siyanbola (Bowen University, Iwo, Nigeria) USDA Borlaug Fellow Program.

Target Audiences:

Cooperating Fishermen seeking alternatives to sodium metabisulfite (a barrier in some national grocery chain stores) asthmatics and consumers interested in green labeling. Some countries do not recognize the use of sodium metabisulfite and its presence would be a barrier to export.

Project Modifications:

The use of Prawnfresh was postponed since the stocks on hand were highly pigmented and the BP oil spill was fresh on the minds of consumers. A visiting Borlaug Fellow had the interest in drying shrimp by solar power, and

Riceland Foods had recently donated several pilot size food dryers to the Department of Food Science. This permitted the comparison of solar and conventional drying.

Approved (Signature)	Title	Date
Allyn A Efird		3-23-12