EXTENSION

SEGMENT TWO SEAFOOD HACCP

During the fall of 2020, the LSU AgCenter and Louisiana Sea Grant in collaboration with Virginia Tech and Virginia Sea Grant hosted two Virtual Segment Two Seafood Hazard Analysis Critical Control Points (HACCP) workshops. The first workshop was offered in Spanish on October 30th, and the second was in English on November 12 & 13. Twelve seafood processors from multiple states, field agents and specialists from Texas Sea Grant attended the workshops. Based on an impact survey completed by participants, all attendees felt their knowledge and their confidence in completing duties associated with the presented material increased.

PRESENTATIONS

1. **Watts, E.** & Xu, W. Food safety during public health emergency. LSU AgCenter Family and Consumer Sciences (FCS) Louisiana Central Region Quarterly Training. December 18, 2020.

2. **Watts, E.** González, G., & Brandao, J. Webinar Tecnologías utilizadas en el procesamiento para alcanzar indicadores de seguridad alimentaria (Spanish for "Technologies used in processing to achieve food security"). Universidad Tecnológica de Panamá, American Society for Microbiology, LSU AgCenter, Louisiana Sea Grant, Centro de Producción e Investigaciones Agroindustriales (UTP). September 21, 2020. **YouTube Video Online**

3. **Watts, E.** *COVID-19 Response for "Fisherman and Seafood Processors".* Louisiana Shrimp Task Force. Zoom meeting. May 7, 2020.

4. **Watts, E.** *COVID-19 Response for "Fisherman and Seafood Processors".* Louisiana Crab Task Force. Zoom meeting. April 22, 2020.

5. **Watts, E.** *Enhancing Seafood Shelf Life and Quality.* Beyond the Boat –Seafood Processors Conference. Kenner, LA. March 11, 2020. **Presentation PDF**

RESEARCH

ENHANCED CATFISH SKIN GELATIN COATING

Parraga, K., Songy, H., Eseose, H., R. Corsino II, and Watts E.

In the United States, catfish is the principal aquatic species commercially grown. Catfish dressing can yield from 45-70% of product, creating 30-55% byproducts such as frames, heads, skin, viscera, and small amounts of blood and fins. Catfish skin accounts for up to 6% of the byproduct based on the live weight.

Catfish skin has been used to obtain gelatin. Gelatin is widely used in different industries (food, pharmaceutical, and cosmetics). In the food industry, it is used as a coating or carrier for additives. Gelatin has been extracted principally from pork and beef sources; however, people from kosher and halal religions cannot consume this type of gelatin. This has created the necessity for a different source of gelatin.

Three types of gelatin can be obtained based on the extraction method. Acid (a.k.a. as type A gelatin), alkaline (a.k.a. type B gelatin), and enzymatic. Gelatin is converted to a soluble polypeptide from collagen. The purpose of the alkaline and acid treatment is to remove non-collagenous proteins and extract proteins, respectively. Several studies have demonstrated that fish gelatin peptides and proteins can vary based on the species. The peptides and proteins can improve food shelf life or work as antioxidants. The purpose of this study was to utilize gelatin extracted from catfish skin to enhance the quality of fresh catfish fillets.

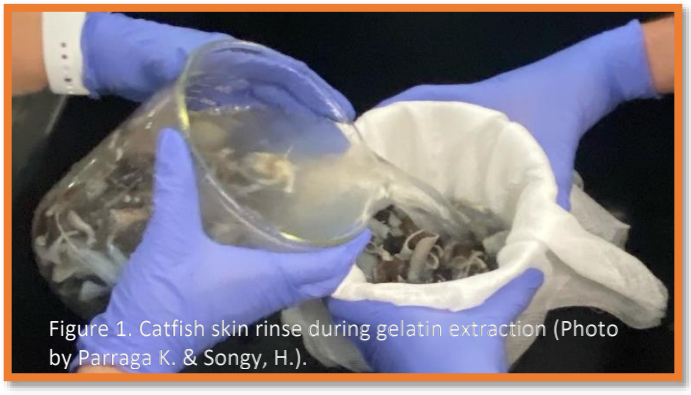

Figure 1. Catfish skin rinse during gelatin extraction (Photo by Parraga K. & Songy, H.).

Figure 2. Catfish fillet coated with gelatin (Photo by Parraga, K. & Songy, H.).

Gelatin was extracted from catfish skin using an alkaline treatment follow by an acid treatment (Figure 1). Extracted gelatin was characterized, and then enhanced with antimicrobials to improve the shelf life of fresh catfish fillets. Fresh catfish fillets were purchased at a local market and separated in four groups. Fish was treated with DI water (C), catfish skin gelatin alone (G) and in combination with potassium sorbate (PS), and lactic acid (LA). Samples were randomly assigned to the treatments, immersed for 60 seconds in the solutions, let dry for 10 minutes (Figure 2), placed in plastic bags, and stored in ice in a refrigerated unit. Samples were tested every 3 days for 30 days. Physical, chemical, and microbial activities were analyzed during the study.

The initial Aerobic Plate Count (APC) of the samples treated with gelatin in combination with LA was significantly lower than the control. Initial APC for the control group was 4.50±0.21 Log CFU/g, compared to LA with 3.55±0.03 Log CFU/g. Through the shelf-life PS presented a significant lower APC compared to other treatments. At day 30, APC was 7.17±0.10, 5.77±0.28, and 4.40±0.34 Log CFU/g for control, LA, and PS, respectively. The pH for all treatments started below 7 with no significant differences observed during the first 24 days for the control and gelatin groups. However, PS and LA, pH decreased after day 3. At the end of the study, TBARS was significantly higher for LA group (1.54±0.17 MDA equivalent/kg) compared to other groups. In conclusion, gelatin extracted from catfish skin in combination with other antimicrobials increased the shelf life 3 days for fresh catfish fillets compared to the control group (Figure 3).

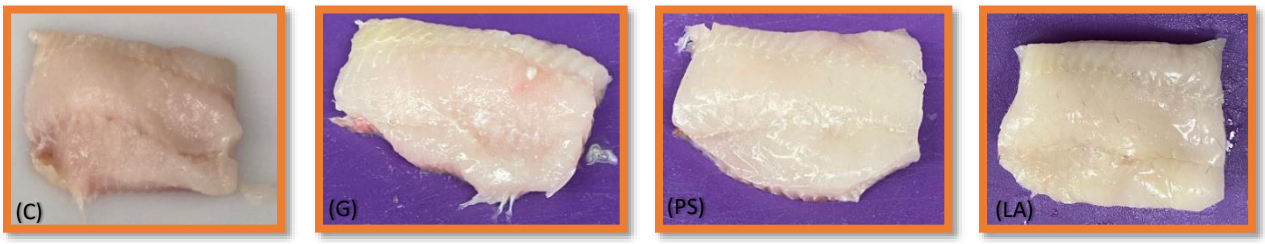

Figure 3. Catfish fillets treated with DI water (C), gelatin alone (G) and in combination with potassium sorbate (PS) and lactic acid (LA) 30 days post-treatment (Photos by Parraga, K. & Songy, H.).

POSTER PRESENTED AT PROFESSIONAL CONFERENCE

1. Eseose, H., Songy, H., Parraga, K., Morris, M., & **Watts, E**. *Effect of slurry ice and flake ice preservation techniques on the microbial and physicochemical properties of Black Drum (Pogonias cromis)*. Poster at International Association of Food Protection Annual Meeting. Virtual. October 2020. International.

2. Parraga, K., Escalante, C. & **Watts, E**. *Microbiological quality and Salmonella prevalence in wild-caught catfish from small Louisiana catfish processors*. Poster at International Association of Food Protection Annual Meeting. Virtual. October 2020. International.

PEER REVIEWED PUBLICATIONS

1. Dixon, W., **Watts, E.**, King, J., Fu, X., & Wicker, L. Shelf Stable Shrimp Quality Thermally Processed in Agitation and Static Mode. 2019. *Frontiers in Sustainable Systems -Sustainable Food Processing*. 4(569790)1-12 Doi:10.3389/fsufs.2020.569790 Online: https://www.frontiersin.org/articles/10.3389/fsufs.2020.569790/full

2. Castro, M., Cobar, J., Parraga, K., Alonso, J., & **Watts, E.** Black Drum (*Pogonias cromis)* Shelf Life Comparing Three Packaging Technologies. 2020. Journal of Aquatic Food Product Technology. *Journal of Aquatic Food Product Technology*. 29(9)925-934 doi: 10.1080/10498850.2020.1818154 Online: https://www.tandfonline.com/doi/full/10.1080/10498850.2020.1818154

3. Sharma, L., **Watts, E.**, & Singh, P. High Resolution Real-Time PCR Melting Curve Assay for Identification of Top Five Penaeidae Shrimp Species. *LWT – Food Science and Technology*. 133(2020)109983 doi:10.1016/j.lwt.2020.109983. Online: https://doi.org/10.1016/j.lwt.2020.109983

TEACHING

In Fall 2020, participated as guest lecturer in the Food Safety class (NFS 3000), presenting a one-hour lecture on “Seafood Toxins.”

UPCOMING EVENTS

Segment Two Virtual Seafood HACCP

English January 29, 2021

Spanish March 26, 2021

Oyster Remote Setting Virtual meeting

April 29, 2021

Louisiana Fisheries Forward

February 2022

LOUSIANA SEA GRANT REQUEST FOR PROPOSALS

Request for Proposals 2022-2023 Competitive Research Program
LOUISIANA SEA GRANT COLLEGE PROGRAM
Two – Year Funding Period: February 1, 2022-January 31, 2024
view the full Request for Proposals FY 2022-2023 Competitive Research Program

Statement of Interest & Full Proposal Schedule:

Early January, 2021	Request for Statements of Interest issued
January 13, 2021	RFP Question and Answer Webinar
March 8, 2021	Statements of Interest due
Mid-April 2021	Statements of Interest reviewed; PIs notified
June 4, 2021	Full proposals due
Late-August 2021	Final proposal selection; PIs notified
Late-October 2021	Omnibus research proposals submitted to NOAA
February 1, 2022	Start date of research project funding cycle
January 31, 2024	End date of research funding cycle

For more information about RFP visit Louisiana Sea Grant Website

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