PRESENTATIONS: PFT 2024
Sitka, AK, Feb. 18-21, 2024

Welcome!

John Burrows
74th PFT President
Alaska Seafood Marketing Institute

Keynote Address

Bob Gerlach,
State Veterinarian, Alaska Department of Environmental Conservation

Regulatory Update

Lisa Weddig
Chief Food Safety Officer, National Fisheries Institute

Residual chemical contaminants in fish and other seafood products: analytical technologies and regulatory roadmap

John Reuther
Eurofins Central Analytical Laboratories, New Orleans, LA, USA

John Reuther, Victoria Siegel, Sarah King

The progression of robust analytical technology for the evaluation of chemical residues in food has been very successful in supporting modern regulatory requirements over the last 20 years. Mirroring technology in environmental sample analysis, improvements in instrumental techniques such as GC-MSMS, GC-HRMS, LC-MSMS have resulted in significantly fewer interferences, better global interlaboratory precision, and better throughput efficiencies.

Regulatory concerns over residues of chemical contaminants in seafood will continue to focus on persistent organic pollutants, heavy metals, radioactivity. It is expected that regulations will continue to align with the capability of analytical methodologies to allow rugged compliance monitoring by both government and private laboratories.

Stock assessments and infographics: evolving expectations for public participation in fisheries management

Rachel Baker

Deputy Commissioner, Alaska Department of Fish and Game

Alaska's fisheries management is based on science and informed by extensive public input. We invest significant resources in world-class management programs to maintain sustainable and abundant fisheries that support fisheries participants and Alaska communities. These investments have been tremendously successful—Alaska produces 60% of the fish caught in waters off the coasts of the United States, with harvest of 5 to 6 billion pounds of seafood each year.

While fish and shellfish stocks naturally fluctuate in abundance over time, changing ocean and climate conditions are bringing long-standing fisheries challenges to the fore and creating new challenges for Alaska fisheries participants, scientists, and managers. Bycatch in commercial fisheries is one long-standing fisheries challenge that has received increased focus in recent years. Bycatch is defined as fish that are harvested in a fishery but are not sold or kept. Bycatch occurs when fishermen unintentionally catch fish, or other marine species, they do not want, cannot sell, or are not allowed to keep. All fisheries have bycatch and Alaska's fishery management programs prioritize efforts to minimize bycatch, particularly if there are potential conservation concerns. Even if bycatch is not a conservation concern, the public generally regards bycatch minimization as desirable from a social and cultural perspective. However, bycatch restrictions typically increase costs to fishery participants by limiting fishing or reducing fishing efficiency. In Alaska, fisheries managers balance conservation, economic and social factors when establishing bycatch regulations to ensure harvests are sustainable while optimizing harvests and benefits from fisheries.

Public interest in fisheries bycatch has highlighted strengths and challenges for Alaska's fishery management programs. In particular, the complexity and quantity of scientific and policy information supporting fisheries management decisions can make it difficult for the public to effectively participate in the decision-making process. This has resulted in continued requests to produce information and resources in a format that is understandable and easily accessible. In response to these requests, the Alaska Department of Fish and Game and the Alaska Seafood Marketing Institute have partnered to produce outreach and education materials for key fisheries management issues, including bycatch. We aim to produce print and web-based products that provide clear and concise information about Alaska fisheries management issues of interest to ensure that our management processes are transparent and accessible to the public.

Technological Innovation in Bycatch Reduction: Challenges, Successes, and the Future

Noelle Yochum
Sr. Manager, Fishing Innovation & Sustainability, Trident Seafoods

Technological innovation is happening all around us, from self-driving cars to refrigerators that can grocery shop. The pace of innovation on fishing vessels has been relatively slow, limited by

the challenging operating conditions. Technology on these platforms must contend with and be resilient to conditions that are wet, salty, dirty, deep (high pressure environment), and rugged. Moreover, the bespoke nature of technological requirements by fishery (and fishery sub-sectors)
results in small markets to bear the burden of research and development costs. Regardless, technological innovation is occurring in the fishing domain, including in efforts to reduce incidental unwanted catch ('bycatch'). Each phase of the fishing process, from selecting the location to deploy fishing gear to retrieving the gear, presents opportunities for technological innovation for bycatch mitigation. For example, live-feed cameras are being used to inform captains about what is going into their gear in real time. This aids their decisions on fishing duration and location to avoid bycatch. In this presentation I will share some successes in technological innovation in support of fisheries sustainability and efficiency and glimpses at innovation on the horizon.

Nutrients and Contaminants in Alaskan Commercial Fish

Christoff (Buck) Furin, Alaska Dept of Fish and Game

Alaska provides a significant portion of seafood to the U.S. and International markets. Seafood is also an important subsistence and cultural resource to many people in Alaska. Concerns about the safety and contaminant load of fish and other seafood products are growing. Analytical methods to measure elements and other more complex chemical compounds continually improve, resulting in lower detection limits and often regulatory limits follow. This can present a challenge in public perception and marketing of seafood in global markets. Marine fish provide a nutrient dense, high protein food and is also the main source of essential fatty acids such as DHA. An Alaska specific dataset of both contaminants and nutrients in seafood would benefit consumers and all parts of the seafood industry. Accessible information regarding the nutritional content and the contaminant load will be a valuable resource to increase consumer confidence and demonstrate the high quality and safety of Alaska's seafood products. This project, funded by NOAA (S-K grant), ADEC, and ASMI, evaluates several species of marine fishes for nutrient content (calories, proximate, vitamins, minerals, fatty acids, and amino acids) and contaminant load (metals, PFAS, PCBs, OC pesticides, and PBDEs). Preliminary results show low contaminant levels and high-quality nutrient content.

Seafood Superstars: Unleashing the Nutritional Potential of West Coast Groundfish

Jana Hennig, Positively Groundfish

Positively Groundfish is a broad cross-sector collaboration between fishermen, processors, environmental non-profits, and supported by academia, who have rallied around a shared mission to revitalize market demand for sustainable but severely underutilized West Coast groundfish species. In our pursuit to better promote West Coast groundfish, we wanted to leverage health and nutrition as a strategic marketing platform. Consumer insights from

previous studies highlighted "health" as a key factor influencing seafood purchases, surpassing sustainability and product origin.
Remarkably though, no species-level nutrient information existed for west coast groundfish species. Thus, we undertook a comprehensive nutrient analysis for 10 key groundfish species, which revealed exceptionally high nutrient levels, and positions these species as nutritional powerhouses, even compared to other popular seafood and marketed "superfoods." We also conducted a survey of 1,600 consumers to better understand attitudes toward seafood healthfulness, and pinpoint the most compelling communication strategies, and the most health-conscious demographics primed for engagement. Armed with newfound nutrient information and consumer insights, we crafted an extensive outreach campaign spanning PR, social media featuring a video series with nutrition experts, newsletters, conferences, fitness events, and collaborations with healthcare providers.
This project taught us that a) groundfish species have very high nutrient levels; b) that the health benefits associated with these nutrients are highly valued by consumers; c) the wider industry is interested in promoting these. With a focus on nutrition, we have the potential to captivate a new audience, foster interest in groundfish, and promote increased seafood consumption, edging closer to the USDA's dietary guidelines and contributing to public health.

Evaluation of green crab on surimi quality

Christina DeWitt, OSU

Christina A. Mireles DeWitt, Shin Young Park , Angee Hunt, Jennifer J. Perry,Denise Skonberg

"The green crab (*Carcinus maenus*), an invasive species on the Pacific and Atlantic coasts with limited marketability, was investigated as a potential value-added ingredient in surimi products. Pacific whiting surimi seafood was formulated with 0 or 3% washed raw green crab (meat and guts) mince with 2% salt (SS0 vs SS3). In addition, Pacific whiting surimi was formulated with 3, 4.5, and 6.5% raw green crab without salt, which was replaced with the following adjunct ingredients: 4% potato starch, 6% corn starch, and 2% dried egg white (SA3, SA4.5, SA6.5, respectively). Three cook treatments were employed: a water bath at 90°C for 30 minutes (WB1), a water bath at 30°C for 2 hours followed by a water bath at 90°C for 30 minutes (WB2), and ohmic heating to an internal temperature of 90°C (OH). Cooked gel moisture, color, shear stress (gel strength) and shear strain (deformability), and water retention, were measured. Moisture content ranged from 76.4-75.5%, confirming comparable solids content. All formulations had high water retention ability (0.74-0.75) and there was no significant (p>0.05) effect of formulation or cook treatment. SS0 treated by OH had significantly higher gel strength than all other treatments. In general, all OH treated formulations were higher in gel strength than WB. For all WB treated formulations SA>SS in gel strength (p<0.05). Breaking force for WB1 was similar (p>0.05) to WB2 within formulation. Deformability was not impacted by WB type. However, WB did positively enhance (p<0.05) SS0 and SS3 deformability when compared to OH. Addition of adjuncts significantly (p<0.05) decreased deformability. Level of crab had no effect (p>0.05) on deformability. While OH enhanced gel strength, WB enhanced deformability. Color was significantly influenced by addition of crab and adjuncts. Within formulation, there was no cook treatment effect on Whiteness value. Whiteness value decreased significantly from

an average of 67, 47, 39, 33, and 26 for SS0, SS3, SA3, SA4.5, and SA6.5, respectively. Addition of green crab to surimi significantly impacted color turning it a light toffee color. This suggests that products formulated with green crab would need to find a means to make the color a positive market attribute. Qualitatively, addition of crab did seem to increase crab flavor. Unfortunately, it was also noted that many gels made with green crab had inclusions suggesting the ingredient did not properly mix into the batter. To make this resource viable as an ingredient for surimi products, future efforts should first focus on preventing inclusions in the batter."

Fish Oil Refined from Fish Viscera can Enrich Surimi Seafood

Jae Park, OSU Surimi School

Supattra Supawong and Jae W. Park

Fish oil was extracted from Gourami fish (Trichopodus pectoralis) viscera and refined (degummed, neutralized, and deodorized). The yield of fish oil after refining was 32%. The total saturated and unsaturated fatty acids in the refined oil amounted to 39% and 61%, respectively. The combined omega-3 fatty acid content of the refined oil was 44.8 mg/g. The overall safety regarding heavy metals and microbial content was lower than the NSRL set according to California Proposition 65. The refined oil was added to surimi seafood paste at three levels (0, 1, and 2%) and subjected to water bath heating or high-pressure processing followed by water bath heating. The lightness of the surimi gel was improved by adding refined fish oil. The addition of refined oil at 1% did not change the texture. Although fish oil at 2% decreased the breaking force of surimi gel, the breaking force of surimi gel with fish oil was enhanced by high-pressure processing followed by heating. No difference in distance to rupture was found between the surimi gels with various fish oil contents. Fish oil addition resulted in an increased concentration of omega-3 fatty acids in surimi gel. This study demonstrated that the 1% addition of fish oil produced from fish viscera did not alter texture and color and could nutritionally enhance surimi seafood with health-beneficial omega-3 PUFAs.

Collaboration for greater value in our supply chains

Frances Bursch, BBRSDA

Introduction: In a hard year for seafood like 2023, understanding where value is lost and how to maximize it becomes paramount. Of the many factors that influence value, the PFT group is perhaps best positioned to address product quality and efficiency in the seafood supply chain. In the supply chain for wild seafood, product changes hands at least a few times and sometimes many times. Everyone involved has an interest and a value they expect in return for their role and it is in everyone’s interest. Seafood industry nonprofits are important collaborators and can plug into different points of the supply chain to share, utilize and incubate science and technology. These organizations also need the expertise of the industry members we rely on to bring our shared products to market. This presentation will explore existing partnerships and

possible opportunities to address the needs most pressing needs facing industry stakeholders in 2024.

Evaluation of the impact of raw shrimp (*Pandalus jordani*) quality on processing wastewater

Christina DeWitt, OSU

Christina A. Mireles DeWitt, Shin Young Park

The ocean pink shrimp (*Pandalus jordani*) is a crucial economic resource, commercially harvested off the west coast and supporting numerous rural fishing communities. Found from Unalaska to San Diego, its highest population density occurs off the central Oregon Coast. Typically processed as a ready-to-eat cooked and peeled product, the harvesting process, targeting mature adults, unintentionally captures juveniles, shrimp with roe, and may cause damage.
This study assessed how quality factors, such as maturity status and damage, in raw shrimp contribute to Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), and Oil and Grease (O&G) at different processing stages.
Shrimp, harvested by a commercial trawler, were stored on ice for less than 48 hours. The study involved sorting ice shrimp into treatment groups based on maturity status (control: CN, juvenile: JV, tiny juvenile TJ, shrimp with intact roe: RS) or damage (severe broken with intact exoskeleton: SB, severe broken without intact exoskeleton: SBM) for five pilot studies, exploring the impact on wastewater quality during processing.
When compared to control (CN), damage (SB) significantly (p<0.05) increased BOD, O&G, and TSS in marinade water, while lower maturity (JV) increased O&G. The presence of roe significantly increased (p<0.05) wastewater BOD when compared to CN, but not TSS; furthermore, O&G was notably lower (p<0.05). Given that roe has more oil than muscle, the increased oil from roe substantially contributes to BOD rather than O&G. Lower maturity and damaged shrimp significantly contributed to meat loss through peelers, with magnitude differences up to 4.4x from CN. Shrimp maturity and damage play a significant role in influencing wastewater characteristics during commercial cooking and peeling processes.

Cathepsin D from Dosinia white clam (*Dosinia ponderosa*) from the Gulf of California

JL Cárdenas-López

Cadena-Cadena , Ezquerra-Brauer, J.M. , Cinco-Moroyoqui, , Rouzaud- Sández
Rivero-Espejel I. A. 2 , López-Zavala, A.A. 3 , Santacruz-Ortega, H. 4 and Cárdenas-López, J.L.

Dosinia white clam (*Dosinia ponderosa*), is one of the three main clams captured in northwest Mexico, with Gulf of California states accounting for 88 % of the total 12,333 tons of captured in the country in 2020. The other two species are chocolata clam (*Megapitaria squalida*) and red clam (*Megapitaria aurantiaca*). These marine invertebrates have enzyme systems that are very active in acid pH. Cathepsin D is one of the most important aspartic enzymes, it participates in protein turnover and many metabolic processes involve this kind of acid proteolysis. Cathepsin D from hepatopancreas of white clam was purified using pepstain agarose affinity chromatography and some main characteristics were studied. The activity of the enzyme was followed in a general protease assay using acid denatured hemoglobin, and also with a cathepsin D specific assay using N-Ac-Arg-Gly-Phe-Phe-Pro-7-AFC fluorogenic substrate coupled with dipeptidyl peptidase. A 36 fold purification was achieved with 22 % yield of the original activity. The purified enzyme had an estimated molecular weight of 36 kDa and an isoelectric point of 7.2. Optimal pH was 3 and optimal temperature was 50°C. Activity remained above 50% for 2 hours up to 40°C, and at 50°C it only remained above 50% for 30 min. As for pH, 80% of activity remained up to 2 hours between pH 3 and 6. These parameters are important for the utilization of this enzyme, and also for understanding its adaptations suffered in the environment of the Gulf of California, which could be of importance for the cultivation of Dosinia white clam.

Integrating Mariculture Species into Alaska's Salmon Aquaculture Sites: A resource for aquaculture organizations, the environment, and a unique teaching tool for students in Southeast Alaska

Angela Bowers, U Alaska Southeast

Harvesting salmon and other food from the ocean is an integral part of the culture and economy in the State of Alaska. A large contributor to the state's commercial salmon harvest is its Private Non-Profit (PNP) salmon hatcheries. This program started in response to historically low salmon abundance in the early 1970s and now contributes nearly 1/3 of commercially caught salmon, with 30 hatcheries releasing 1.7 billion salmon each year. These fish are reared each spring in ocean net-pens for a few months before their release, providing the space, nutrients, and infrastructure to integrate lower trophic level species such as seaweed and shellfish. For the past 5 winters students and faculty from the University of Alaska Southeast have outplanted Sugarkelp (*Saccharina latissima*) and Ribbon kelp *(Alaria marginata*) near rearing chum (*Oncorhynchus keta*) and pink (*Oncorhynchus gorbuscha*) salmon to try to determine the feasibility and measurable benefits of this form of Integrated Multi-Trophic Aquaculture (IMTA).

Kelp growth, nitrite, nitrate, ammonia and dissolved phosphorous as well as dissolved oxygen and salinity are measured bi-weekly. As part of this work students not only learn about kelp farming and sustainable forms of aquaculture but they also gain skills using oceanographic equipment, operate small vessels and they get to work closely with industry professionals. This work has led to a project looking at site suitability at hatchery release sites state-wide, and with

funding from the Alaska Blue Economy Center (ABEC) we have shipped Acoustic Doppler Current Profilers and loggers to measure oxygen, salinity, temperature, and light attenuation to determine the suitability for other sites around the state to integrate mariculture species. This project will provide the baseline data necessary to be able to measure benefits for the rearing and released salmon as well as associated environmental benefits. All of this work supports aquaculture workforce development, increases the sustainability of salmon enhancement aquaculture in Alaska, improves food security and provides industry with a proof of concept important for demonstrating the potential economic and environmental benefits for IMTA in Alaska.

Consumer acceptability and shelf-life assessment of three species of frozen seafood over two years' time using sensory properties, consumer acceptability and purchase intent

Ann Colonna, OSU

Ann Colonna, Oregon State University/Food Innovation Center* Christina DeWitt, Oregon State University/COMES Jamie Doyle, Oregon State University/Oregon Sea Grant* Tyson Rasor, Ecotrust

Past research shows that consumers find frozen seafood to be as good as, if not better than fresh (never frozen) products. This project builds on these findings by determining the shelf life (nutrient density, oxidation, texture) and consumer acceptability of three frozen seafood products stored in two different freezers, commercial/industrial (-30C) and home (-18C) over two years.

Five shelf life tests were conducted with over 600 target market consumers from the Portland, Oregon Metro area who were users and likers of seafood. The test dates were conducted at times 0 months, 6 months, 12 months, 18 months and 24 months. At each time point, the seafood was tested by 120 unique consumers who were not aware they were testing frozen seafood or of the storage period. Samples were blind coded and served in a randomized order to prevent order bias in assessments. After 24 months, results show that all attributes tested including the appearance, aroma, texture, flavor, sweetness, firmness, moisture content, aftertaste and overall quality were liked equally or more than at time 0 months. There were no significant differences in the overall liking of the albacore or Coho salmon over 24 months. All mean liking scores of both species were rated above 7.0 (like moderately) on the 9-point hedonic scale; a score considered very favorable by industry standards. Unique to these results, the sablefish overall liking mean scores were also at 7.0 or above at all timepoints, but mean overall liking scores increased significantly over time. The highest mean liking score for the sablefish, stored in a commercial freezer, was 8.06 (like very much) on the 9-point hedonic scale, at timepoint 24 months. This mean liking score at 24 months was significantly higher than the score of 7.13 at timepoint 0 months, demonstrating that not only was the sablefish stored in a commercial freezer for 24 months well liked, it was liked significantly more than the product stored frozen for only one week. This talk will uncover valuable insights about what will

increase consumer confidence and purchase intent of frozen seafood, as well as any deterrents to buying more frozen product. The ability to store samples longer and transport them frozen has a huge sustainability impact for the global seafood industry.

Alaska salmon hatcheries 2.0: leveraging Alaska's salmon hatchery system for broader benefit to the state

Tommy Sheridan, U Alaska Fairbanks

Alaska's salmon hatchery system, implemented in response to depressed salmon runs throughout the state during the 1960s and 1970s, resulted in the development of an innovative program that today involves 30 salmon hatcheries and over 100 release locations in Cook Inlet, along the Kodiak Archipelago, across Prince William Sound, and throughout Southeast Alaska. Alaskan hatchery production has exceeded its founding expectations, and is a cornerstone of Alaska's Blue Economy, bringing significant economic benefits to each region's industry and communities. For example, in 2015, the share of Alaskan hatchery fish harvested in commercial common property fisheries increased to 30% of the statewide harvest value, with the first wholesale value of the commercial hatchery harvest nearing $350 million. However, ageing energy infrastructure at Alaska's salmon hatcheries, uncertainties related to the impacts of climate change on the state's salmon production, and other economic considerations, are leading Alaskan stakeholders to question how the state's hatcheries could be leveraged further for economic development. This presentation will introduce how Alaskan salmon hatcheries are engaging with research and innovation, with a focus on mariculture-related activities, and exploration of renewable energy opportunities in their vicinity. Alaska Blue Economy Center's Tommy Sheridan will lead this presentation, which will be accompanied by a panel discussion with local fisheries experts Angela Bowers and Scott Wagner.

Near Infra- Red (NIR) Spectroscopy Use in Fishmeal and Fish Oil Processing Facilities

Senya Joerss, Trident Seafoods

There is an increasing interest to adopt NIR technologies that will accurately measure quality nutrients for seafood products at the manufacturing level. Third-party testing laboratories are limited for seafood manufacturers in remote areas of Alaska, and logistics are challenging. Once a product is made, there is little to no opportunity to reformulate so inline, real-time testing is advantageous from both a quality and profitability standpoint. Understanding how to implement, utilize, and maintain NIR technologies is critical to continue to produce accurate data which guides manufacturing processes and product quality outcomes.

RFM: The Origin Of Your Seafood Matters

Susan Marks, ASMI, RFM

- Set context by explaining differences between Assessment Programs (e.g. Seafood Watch), and Certification Programs (e.g. RFM, MSC)
- Certification/Sustainability today – pulse point on what the major areas of focus are (e.g. Social, IUU, etc)
- Brief history/timeline of RFM Program
- RFM Updates since 2020 PFT
    - New owners
    - Geographic expansion – reasons & goals of program
    - Strategic partners (e.g. ASMI)
    - Growth of the program
    - Future of the program
- Why RFM – Why origin matters / point of differentiation for the RFM program
    - Discuss RFM consumer research & ASMI consumer research regarding this topic

Investigating differences in value between Alaskan and Icelandic cod fisheries.

Erlingur Gudleifsson, U Alaska Fiarbanks

This research seeks to investigate the longstanding myth suggesting that Alaska catches twice the quantity of cod as Iceland but earns only half the value.
This presentation will articulate an examination of public figures, including ex-vessel, export, wholesale values, and consumer prices, which reveal a nuanced reality. Contrary to expectations, consumer prices between Atlantic and Pacific cod, particularly processed cod filets in the US market, showed limited differences. The myth's second half, addressing the value of fisheries, proved complex due to multiple indicators. While Iceland claimed higher prices at earlier stages of the value chain, consumer and wholesale prices for high-end processed products demonstrated similarities.
Comparing ex-vessel prices between Alaska and Iceland raised questions about the comparability of the data, given differences in eco-systems and landed fish states. Export proportions varied significantly, indicating Iceland's stronger focus on cod exports. Notably, our analysis unveiled that Iceland claims considerably higher international prices for cod than Alaska, supporting the myth's value disparity claim. The investigation urged a comprehensive understanding of the entire value chain in Alaska's cod fisheries for informed decision-making. Despite challenging the myth's quantitative aspect, the qualitative differences in value creation warrant further exploration, emphasizing the need for deeper analysis and collaboration with large fisheries for accurate comparisons. This research contributes to the ongoing discourse on value creation within the Alaska groundfish sector, emphasizing the importance of optimizing processes for sustainable and thriving fisheries in the Arctic.

Antiproliferative Effect from Caulerpa sertularioides Extracts in Human Cancer Cell Lines

Carmen Maria Lopez Saiz

Student Competition Submissions:

Physical and structural properties of hydrogels prepared from chitosan and squid (*Dosidicus gigas*) gelatin

Josafat Marina Ezquerra-Brauer a (*), Santiago P. Aubourg b , Wilfrido Torres-Arreola a , Maribel Plascencia-Jatomea a , Uriel Ramírez-Campas a

This study focused on the obtention of novel chitosan (CH)/squid (Dosidicus gigas) gelatin (SG) hydrogel by employing the casting method. For it, a suspension of commercial CH (85% deacetylated, viscosity > 400 mPa.s, and molecular weight of 570.3 kDa) hydrogel was mixed with SG; glutaraldehyde is used as a crosslinking agent (50% in a 99:1 (v/v) ratio concerning the total solution).SG was obtained from squid arms collagen by extraction with 0.5 M NaOH followed by 0.2 M HCl and thermic treatment. The following systems (M1-M3) were comparatively evaluated: 0.5 mg CH/mL (M1), 0.4 mg CH/mL+0.2 mg SG/mL (M2), and 0.25 mg CH/mL+0.5 mg SG/mL (M3). Hydrogel systems exhibited lower (p<0.05) viscosity and stability in aqueous media at pH 7.2 according to the following system sequence: M1>M2>M3. Hydrogels with SG showed higher (p<0.05) antioxidant activity (DPPH and ORAC assays) according to the following system sequence: M3>M2>M1. The infrared (FTIR) and proton-nuclear magnetic resonance (1H-NMR) spectra corresponding to M1 and M3 systems suggested that hydrogen bonds produce the main interactions between CH and SG. It is concluded that gelatin obtained from squid arms might be a valuable additive in preparing bioactive CH hydrogels.

Chemical characterization of compounds presents in extracts and fractions with antiproliferative potential obtained from white shrimp (*Litopenaeus vannamei)* muscle

: Sandra Carolina De La Reé Rodríguez

Sandra Carolina De La Reé Rodríguez, Carmen María López Saiz, Armando Burgos-Hernández, María Isabel Medina Méndez

Marine organisms constitute an important source of compounds with antiproliferative activity. The lipid fractions obtained from the muscle of Pacific white shrimp (L. vannamei) have shown antiproliferative potential against breast adenocarcinoma (MDA-MB-231), however, the composition of these fractions is still unknown. The aim of this work was to chemically characterize extracts and fractions with antiproliferative potential obtained from L. vannamei. The extraction was carried out with chloroform (1:5 p:v), then using a separatory funnel, hexane and methanol (1:1) phases were obtained. To identify and quantify the lipid of the crude extract and the phases, TLC (neutral lipids) and HPTLC (polar lipids) were performed. Methanolic phase was subjected to open column chromatography to obtain purified fractions. Chloroform extract, methanolic and hexanic phases, and the fractions were analyzed by GC-FID to obtain the fatty acid profile, and HPLC-FLD/DAD to quantify the presence of tocopherol/carotenoids. From the chloroform extract (9.7±0.05 mg), most compounds were soluble in methanol (7.38±0.14 mg), it was also observed that the extracts contain mostly free fatty acids, cholesterol, and polar lipids.
The highest quantity of cholesterol was identified in hexanic phase (69.92%) and polar lipids were concentrated in methanolic phase (68.11%). Regarding the two fractions with the highest antiproliferative activity (C3 and C4), the major fatty acids were PUFA's, specifically EPA and DHA (31.72 and 70.41%, respectively), free and esterified astaxanthin was also identified, with no presence of tocopherol. Therefore, fractions with antiproliferative potential contain free fatty acids and astaxanthin.

Optimization of PCR-based Methods for the Detection of Canned Tuna Species

: Chloe Castanon

Chloe Castanon, Denise Hernandez, Rosalee S. Hellberg

The susceptibility of tuna species mislabeling can be attributed to their high consumer demand, complex global supply chain, and diverse price range. Previous studies have optimized sequencing-based techniques for species identification by targeting a short fragment of DNA known as the mitochondrial control region (CR), commonly referred to as CR mini-barcode. However, the limited retrieval of DNA from canned tuna products reduces the effectiveness of sequencing. This study aimed to optimize canned tuna species identification by evaluating whether the use of species-specific PCR combined with sequencing is more effective than sequencing alone. Two species-specific PCR methods were compared: real-time PCR and multiplex PCR. A sample set of 24 commercial canned tuna products was collected, including cans labeled as albacore tuna, skipjack tuna, yellowfin tuna, and light tuna. DNA was extracted in duplicate from each can, followed by analysis with DNA mini-barcoding, real-time PCR and multiplex PCR. DNA mini-barcoding enabled tuna species identification for 41% of the 24 canned samples. Multiplex PCR allowed for tuna species identification in 35% of samples, while

real-time PCR was able to detect tuna species in 100% of canned samples. Overall, real-time PCR emerged as the most effective method for identifying tuna species in canned products, consistently detecting at least one species in each canned sample run thus far. The combination of real-time PCR and DNA mini-barcoding is recommended to allow for rapid screening of target species along with sequencing-based confirmation.

Metabolic Health Impacts of Seaweeds Pacific Dulse and Nori in Diet-Induced Obese Mice

Hailey Zhou

Leyi Zhou 1* , Elizabeth Ihms 2 , Stephanie Nuss 2 , Woojae Jung 1 , Yongcheol Lee 1 , Brian Dolan 2 , Luke Weinstein 3 , Natalia Shulzhenko 2 , and Jung Yeon Kwon 1, 4

Seaweeds are a highly nutritious and sustainable crop, with components exhibiting various bioactivities and health benefits. Pacific dulse (*Devaleraea mollis*) seaweed holds great cultivating potential in Oregon, yet its bioactive health benefits remain largely unexplored, while nori (Pyropia spp.) has been widely consumed and researched globally. In this study, we aimed to evaluate the metabolic health impact of whole Pacific dulse and nori supplementation in diet-induced obese mice.

A Meta-Analysis of Seafood Species Mislabeling Rates in the United States

Sarah Ahles
Chapman University

Seafood is vulnerable to species mislabeling due to factors such as complex global supply chains, varying prices, and similar appearance of species. Numerous studies have been published reporting a range of mislabeling rates for various forms of seafood. However, these studies oftentimes focus on lesser-consumed species that are vulnerable to species mislabeling. As a result, the overall mislabeling rate of commercially sold seafood in the U.S. remains unknown, especially for the most consumed species.

Anproliferave acvity of compounds isolated from the exoskeleton of white shrimp (Litopenaeus vannamei) in prostate cancer line

Hector Enrique Trujillo Ruiz