VOLUME 8 • ISSUE 1
APRIL 2015

FISHIN

NEWSLETTER OF THE SEAFOOD INDUSTRY
OF TRINIDAD AND TOBAGO



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A PUBLICATION OF THE SEAFOOD INDUSTRY DEVELOPMENT COMPANY LIMITED

Volume 8 • Issue 1

CHAIRMAN'S NOTE

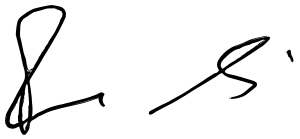
The Seafood Industry Development Company Limited (SIDC), guided by its Board of Directors and operated by its committed staff has engaged itself in the Tilapia Initiative, as mandated by the Ministry of Food Production.

The SIDC has partnered with the Sugar Cane Feeds Centre (SFC) - a Government agency of applied research, demonstration, development and training in tropical livestock production, to make training programmes for persons interested in tilapia farming more accessible. The SIDC also instructs farmers on feed optimization for tilapia and offers programmes dealing with water quality maintenance, post-harvest handling and the recirculating aquaculture system (RAS). Further, the SIDC sells high- quality feed at reasonable and affordable prices.

The SIDC seeks to ensure that Trinidad and Tobago's fisher-folk are able to manage their finances and as such, has implemented a Financial Literacy Programme to this end. This initiative has enabled the SIDC to partner with the Central Bank of Trinidad and Tobago, the Agricultural Development Bank (ADB), the National Insurance Board (NIB), the Ministry of Planning – Economic Development Board (EDB), ttConnect and very soon, other agencies.

As Chairman, I stand committed to ensuring the success of the Tilapia Initiative and shall ensure along with the Board of Directors, Management and staff, that the Tilapia industry flourishes and our fisher-folk are able to sustain themselves financially.

Thank You



Brian Baig

Chairman

SIDC FROZEN SEAFOOD MART

As of March 2014, the SIDC Frozen Seafood Mart was opened at the SIDC Head Office in Charlieville. The SIDC Frozen Seafood Mart allows consumers to purchase high quality frozen products in a sanitary environment. Consumers are privy to a wealth of information about the industry and are provided with recipes using species available at the mart.

The SIDC Seafood Mart is open Monday to Friday from 8:00am to 4:00pm. Available on sale are frozen tilapia fillets, frozen croaker fillets and drawn croaker and tilapia.



A Review of Food Safety and Quality Considerations

for Products of an Aquaculture Origin

Food safety and quality assurance in products of an aquaculture origin is of paramount importance. It requires management at the production level, pre and post harvesting processes as well as the storage and transport of the harvest. This enhances the product value and controls losses while promoting growth for aquaculture operations. The pressure to increase production in order to maximize profits can result in a variety of hazards in the farmed product; these may either be of a physical, biological or chemical nature. Physical hazards are essentially any potentially harmful foreign matter not normally found in food. The extraneous material found in fish products can be grouped into:

1. Non-food safety hazards such as filth
2. Food safety hazards such as glass, metal, wood, bones, stones and plastic *

Biological hazards include parasites, bacteria, viruses and even toxic compounds produced by aquatic organisms. Chemical hazards include agrochemicals, water treatment compounds, pesticides, disinfectants, chemotherapeutants, feed ingredients and organic pollutants. Identifying the hazards and assessing their risks are important with respect to the food safety and quality of products of an aquaculture origin.

Public Health Implications

The Food and Agriculture Organization of the United Nations (FAO), in an article entitled "Integrated livestock-fish farming systems" *(Little and Edwards, 2003)* discussed the recently identified problem of Streptococcus iniae in tilapia in North America. This raised the spectra of food hygiene becoming a major political issue, complicating the promotion of new aquaculture species by new producers. Streptococcus sp. infections of fish are a newly identified threat to humans that is increasingly found in cultured tilapia. Streptococcus iniae and other Streptococci that infect fish can also infect humans. Infections have been contracted during handling and by consumers during preparation. The disease is most prevalent in intensive tilapia production systems, where marginal water quality systems exist, and/or where there is environmental stress or trauma to the fish *(Plumb, 1997)*. There has not been any association with fish from integrated culture systems and this disease. However, risk analysis in which hazards are identified and their relevance and control methods are determined, is a logical approach to assessing the implications of fish production on public health. This assures the consumer receives an aquatic product that is safe, wholesome and of good quality.

Strategies for Food Safety Assurance

Food borne diseases associated with fishery products can be prevented and controlled through appropriate food safety measures. The responsibility for food safety associated with products from aquaculture should be shared between governments, the fish-farming and processing industries and the consumers, with each having an important role to play in the protection of human health. This can be achieved through the development of regulations and the provision of resources for enforcement, education and training in Responsible Aquaculture.

**Espejo-Hermes Jasmin M., Quality Assurance of Aquaculture Products: Milkfish and Tilapia. Philippines: Tawid Publications, 2004.*

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Packaging! Protecting What's Good!



Consumer Corner

There are varieties of fish and fishery products available to the consumer in Trinidad and Tobago which may be due to changes in consumer preferences and consumption patterns over time.

The SIDC conducted a survey in 2013 which highlighted the array of products available; from chilled, frozen and more commonly, value added products including breaded, seasoned, ready-to-cook and ready-to-eat products. It also highlighted the conditions under which fish is retailed in the supermarket trade. A number of deficiencies were observed in the trade, most of which can be attributed to poor product packaging.

Why Package?

Fishery products are highly perishable even in chilled or cold storage and as such, packaging is necessary to protect against the deteriorative effects of cold air.

Packaging also provides a measure of protection against mechanical damage in retailing, and ensuring that the quality of the product is not compromised. The Codex Alimentarius Commission has identified four functions of packaging, namely, containment, protection, convenience and communication.

It was observed during the survey that chilled (seasoned and unseasoned) fishery products were mainly packaged using polystyrene (Styrofoam) trays which were shrink wrapped with a cling-film, while frozen products were packaged in laminate printed bags, vacuum packed or packed in cardboard boxes.

Ready-to-cook products (frozen and chilled) were usually presented in aluminum trays with a hard plastic covering.

Packaging Issues Found in the Trade



Chilled Fishery Products

The use of the Styrofoam tray wrapped with a cling film is not appropriate since it does not offer sufficient protection against the deleterious effect of cold air. Additionally, sharp ended appendages such as claws - in the case of crab and fins of fishes, punctures the packages thus leaving the product susceptible to dehydration and contamination. Furthermore, the cling wrap could be compromised due to poor handling by consumers and merchandizers.



Frozen Fishery Products

Some packages appeared torn and crushed. Packages should have the original shape and wrapping intact since torn packages are not only visually unappealing but they also serve to compromise the quality of seafood by allowing entry to harmful microorganisms, air and other

contaminants. Ice crystals were evident in some packages which indicate that the product has either been stored at incorrect temperatures or thawed and refrozen at some point in time, both of which are deleterious to the quality and safety of the product.

As stated earlier, product packaging cannot be generic. It must be dependent on the type of product and storage conditions in order to determine the degree of protection that is necessary. Species with high lipid/fat content have to be protected against oxidization as well as dehydration therefore thin plastic bags are unacceptable. These species are highly susceptible to oxidation which results in rancidity and the discolouration of the flesh.

Vacuum packaging is a method which exudes air from the package prior to sealing. Maintaining the integrity of the seal and by extension the vacuum, is critical to retaining the quality of the product and preventing deterioration.

The vacuum seal can be lost due to physical damage to the packaging or temperature abuse. It was observed that the vacuum seal in some products was broken, which resulted in product deterioration and decreased product shelf-life.

Ready-to-Cook (Chilled and Frozen)

Most consumers are looking for fast, easy-to-prepare meals which save preparation time and are as good as home-cooked meals. These "convenience foods" were presented in an aluminum tray with a hard plastic covering.

Preparation involves the removal of the plastic covering and reheating in an oven for a specified time at a stated temperature. The main issue here is the effect of the contents of the packaging on the product. Although aluminum offers high mechanical strength, low toxicity, and can withstand extremes of temperatures, the packaging can be affected when seasonings such as lime, salt and pepper are used.

The best approach is to place seasonings in a separate package as the acids found in lime, coupled with the corrosive effect of salt can result in the formation of unfavourable compounds when stored in aluminum over a period of time.



The SIDC in an attempt to demonstrate proper storage and merchandizing practices of frozen seafood and other aquatic products has published a handbook entitled "The SIDC Seafood Handbook: A Consumer's Guide to the Purchase, Storage and Handling of Seafood" which serves as a "go-to-guide" for consumers when shopping for fresh and frozen seafood. This handbook is a pictorial digest which highlights the proper conditions for seafood sale, storage and handling.



Ever wanted a go-to guide when shopping for seafood? The SIDC Seafood Handbook: A Consumer's Guide to the Purchase, Storage & Preparation of Seafood is now available. This handbook is a pictorial digest which highlights the proper conditions for seafood sale, storage and handling. Also included is a "Know your Seafood Section" which provides a quick and easy means of identifying seafood and eating qualities. Purchasing tips of some of the common species found in the marketplace are also given. The handbook is available at the SIDC office and best of all, it's FREE!! Get your copy today!

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Biosecurity
in an Aquaculture Facility

Biosecurity is the concept of **protecting culture animals** from contamination of disease causing organisms and **preventing the spread of diseases** both within a facility and infectious agents leaving a facility. Examining specific points in production where pathogens (disease-causing parasites, bacteria, viruses and fungi) may be introduced or diseases may develop. This will assist pro¬ducers with establishing precautionary measures.

Good biosecu¬rity practices minimizes the animals' exposure and susceptibility to pathogens, **reduces economic losses** from mortalities, and helps prevent mandatory depopulation.

Goals of biosecurity

There are **three main goals** to achieve effective biosecurity:

Animal management

- **Get healthy animals** (eggs, fry, fingerlings and broodstocks) from a reputable supplier.
- **Obtain as much information** on the health of the animal before purchase.
- **Avoid stressing animals** i.e. unnecessary and inappropriate handling.
- Maintaining **good water quality and nutrition** is critical to fish health and the control of pathogens.
- **Observe for abnormal appearance** (e.g. colour change) and behaviour (e.g. poor feeding response).
- Quarantine all new animals coming into a facility, animals moving from one area or system to another within the facility and resident fish that becomes diseased.
- All **quarantine items, equipment and water should be separated** from that of the main farm.
- **Know** the common and important infectious and non-infectious diseases of the animal you cultivate and which life stages may be affected.
- **Treat fish with appropriate** medication. Consult with a fish health professional.

Pathogen management

Understanding pathogen biology is critical in managing its survival and spread. Some diseases and pathogens are considered internationally important and require reporting to relevant authority. Pathogens can survive and thrive in water, system components, equipment, floors, walls, feed, within the cultured animal themselves, other animals (e.g. frogs and rats) and plants. They can enter a facility via aerosol (e.g. fine water droplets) equipment, vehicles and people and may be spread by other animals that live in or near ponds or tanks. However, they differ in their ability to infect and cause diseases. Some simple steps can mitigate this:

- **Remove all uneaten foods and other organic matter** from within the system as they favour pathogen survival and spread.
- Some infectious disease are easily controlled by **good sanitation and disinfection** or with **drugs**.
- Some pathogens cannot be treated effectively or easily, therefore **good preventative practices are the best option**.

People management

Biosecurity will be successful only if farm managers, staff and visitors understand and follow the necessary practices. Access to **sensitive areas must be restricted** to authorized personnel only. Visitors who come to your facility immediately after visiting another facility are serious risks. Fry and fingerlings are more susceptible, therefore handling should go from youngest to the oldest animals.

The use of disinfection stations, especially at entrances and along the system for people and equipment is mandatory. For example:

- Footbaths
- Hand-washing stations with antibacterial soap
- Net disinfection station
- Showers
- Vehicle disinfection station
- 70% alcohol sprays.

Sanitation and disinfection

Sanitation and disinfection can plan a major role in safeguarding the biosecurity of an aquaculture facility. This has grown in importance with the intensification of aquaculture production systems. Many people substitute sanitation and disinfection, assuming they are similar. However, sanitation involves the **removing** of all **foreign material**, while disinfection **eliminates** many or all **pathogenic microorganisms**. Always sanitize before disinfecting!!!

There are a number of disinfection methods that can be used in aquaculture. The most appropriate method depends on the situation, cost and residual toxicity.

There are two categories of disinfection:

1. Physical:
   - Heat— 80-100°C for 10 minutes
   - Sunlight—effectiveness is dependent on exposure time, intensity and temperature
   - Drying equipment
2. Chemical:
   - Chlorine disinfectants— Industrial bleach is a readily available disinfectant. Dilution of 3:1 ratio of water to bleach
   - Quatenary ammonia compounds (QACs) are effective at killing a variety of pathogens but they leave a residue that can be toxic to fish. Follow manufacture's instructions on its use.
   - Alcohols—Isopropyl alcohol or ethanol at 70% concentration kills many common pathogens
   - Iodophors (iodine) - an effective disinfectant and antiseptic. Follow manufacture's instructions
   - Hydrogen peroxide—is an effective surface disinfectant at 3% concentration and is considered environmentally safe as it breaks down into oxygen and water
   - Phenol derivatives—common ingredient in household cleaners such as Lysol®. Effective concentrations of 2-5% is recommended
   - Formaldehyde (formalin: 39—41% formaldehyde) - used to rid fish of pathogens on their skin. The concentration is dependent on the situation. Consult a fish health professional before use.



An example of a foot bath, hand-washing station and restrictive access signage into an aquaculture production facility



Net disinfection station



Examples of biosecurity signage

SIDC's Financial Empowerment Programme for Fishing Communities

SIDC's Financial Empowerment Programme for Fishing Communities was launched for stakeholders in the Couva North constituency at the Waterloo Community Center. The programme began as a focus group session with participants primarily residing in the communities of Waterloo, Brickfield and Orange Valley; most of which represented farmer and fisher folk associations, community groups and youths.

In introducing the programme, SIDC's Industry Development Officer pointed out that fishing communities, which are at the end of the country's travel infrastructure, have been deprived of support from several formal institutions and services over the years. It was further explained that the SIDC recognizes the importance of wealth creation in fishing communities as a means of socio-economic development for residents and so acknowledged the fact that financial literacy is not necessarily linked to a person's level of formal education.

The SIDC supports the formation of sustainable and profitable community-based business enterprises which contribute towards employment opportunities, income generation and poverty reduction for stakeholders. The programme also seeks to strengthen household financial security by inviting the participation of unemployed persons, students, children, and housewives to avail them of the education and support services.



The SIDC came in for high commendation from participants, including the Member of Parliament Ramona Ramdial. MP Ramdial was enthusiastic that SIDC had championed such an initiative and encouraged those present to inform others to participate as it is a proactive programme on the ground. She believed that persons seeking assistance as entrepreneurs through her office should capitalize on this opportunity, more so displaced former Caroni workers who went into the fishing industry, retailing and other forms of self-employment at the closure of Caroni (1975) Limited.

The Financial Empowerment Programme for Fishing Communities was developed by SIDC in partnership with the Central Bank of Trinidad and Tobago – Financial Inclusion Development Agency, Agricultural Development Bank (ADB), National Insurance Board of Trinidad and Tobago (NIBTT), National Agricultural Marketing and Development Corporation (NAMDEVCO) and TT Connect.

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