

Global Market Report
On Aquaculture Standards and Certification

Prepared on behalf of the
Canadian Aquaculture Industry Alliance (CAIA)
by Global Trust Certification



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Executive Summary

As in other fields of production, aquaculture standards can make an enormous and positive contribution to our companies, our industry, our customers, our consumers, our regulators, and our environment. Adherence to standards ensures the positive characteristics of our food products such as quality, safety, and environmental friendliness are sent in to the marketplace on a consistent and cost-effective basis. We tend to take it for granted when Canadian aquaculture products consistently meet market expectations. In effect, the industry is able to achieve this level of success through existing forms of ‘standardization.’ We aim for top quality performance and that means 100% of our operations functioning as close to 100% effectiveness, 100% of the time. If production ‘standards’ were absent, we’d soon notice.

As committed to improvement as the Canadian aquaculture industry has been over the decade across a range of internal and external parameters, in 2009 it finds itself surrounded by new sets of evolving, often unclear, demands to objectively demonstrate the safety and/or sustainability of its practices. This is not a new issue, but what started as food safety-centric demands in the 1990s, has rapidly broadened on a global basis to include new demands for the aquaculture industry to demonstrate their environmental sustainability. These concerns are fundamentally changing the direction of all business - not just aquaculture - toward the provision of safe, sustainable products with measured and minimal environmental impacts.

The last 10 years has seen an increase in the use of independent third party certification programs as a means for industry to objectively demonstrate their commitment and adherence to established standards. Complicating matters, however, is there is no one agreed upon global standard for aquaculture production excellence. In fact, there are numerous standards and certification programs in existence, with many more under development. Given that each standard owner or developer claims their program is better than the next, markets are becoming confused when trying to decide which standard or certification method to trust.

Canadian aquaculture companies are equally challenged, often perplexed, by the range of options and developments related to standards and certification. Some major retailers appear to be doing nothing, others appear to favour certification as a means for more than just regulatory due diligence -- particularly for retailer ‘own labels’ – and are seen as protecting the fundamental integrity of their corporate brands. And, increasingly, many larger retailers and foodservice companies are establishing standards and certification requirements surrounding the sustainability and environmental agenda.

In fact, within the last 10-12 years the advent of eco-labelling, particularly related to sensitive ocean products, has eclipsed all other areas of standards and certification programming, e.g., food safety standards. Currently, there are a number of aquaculture Standards available that include varying degrees of fundamental, usually common (to one extent or another) criteria. These aquaculture standards are at varying degrees of evolution and development. (Evolution of standards and their content is considered a natural and necessary requirement of the ‘continuous improvement’ process.) Depending upon the standard owner and their preferences or biases, programs have evolved from the more ‘traditional’ market needs, e.g., food safety and quality, and extended into areas such as husbandry and welfare. Indeed, some standards do not feature essential food safety or quality issues whatsoever, instead focusing upon their chosen, if limited, area of interest, e.g., sustainability.

As for sustainability (environmental performance) in aquaculture standards, it may best be described in 2009 as a moving target. There are, however, some common criteria that most standards bodies and interested stakeholders, e.g., environmental non-governmental organizations (ENGOs), have focused upon:

- Fish in fish out ratio (wild fish to farmed fish);
- Diseases and parasites (impact on local stocks);
- Site carrying capacity (capability to absorb enrichment from aquaculture activities and sustain natural feeders such as bivalves);
- Escapement that can impact on the local environment (disease, competition for wild resource with native stocks, genetic influences);
- Treatments added to diets and water column that can have a negative impact on the local ecosystem.

As the Canadian industry plans forward, there are some essential facts for consideration. Even though there is a significant amount of competitive ‘noise’ between standards developers, it is very much worth noting that most standards and certification programs contain up to 70-80% of the same or very similar criteria. Differentiation (and often the ‘noise’ factor) between standards is usually played out over a few issues of distinction, i.e., the last 20-30%. Therefore, companies that successfully meet one standard should be able to adopt or migrate to other standards, if or when required, with relative ease. Additionally, it should be recognized that global markets and standards owners have overwhelmingly chosen ISO-65 accreditation as a fundamental requirement for third party certification. The flexibility of your chosen standard(s) and third party providers are key factors.

Looking ahead, although impossible to know who, when, or how, there is likely to be two or three major standards and certification programs covering the global supply of aquaculture products. As well, there are likely to be a number of independent, nationally-focused programs, perhaps administered through private /government partnerships and industry. These may be supported by government legislation and may also be benchmarked to the large global programs. Additionally, there will likely remain a range of more niche-orientated private standards within the organic, ‘superior quality’, ethical, etc., range that producers will continue to access to gain strategic advantage, most noticeably, smaller volume producers or specialized divisions with larger corporations. Finally, there will likely remain a host of internal retailer or processor specific market supply specifications and standards that may or may not be substituted by one external standard offering or another. Based upon this current assessment, a recommended option is to prepare for a long-term environment which features interoperable standards and certification options.

Introduction

This report is an initiative of the Canadian Aquaculture Industry Alliance (CAIA). For the benefit of CAIA members, the report is intended to provide a timely and condensed overview of global developments related to aquaculture standards and certification. These efforts have been channeled through the Canadian Aquaculture Standards Forum (CASF) established by CAIA in 2008, and strongly supported by the Aquaculture Directorate of the Department of Fisheries and Oceans (DFO) as an Industry-Government partnership toward better understanding of emerging issues and options related to standards and certification.

Canada has a very thorough regulatory framework governing aquaculture. In addition to creation of world-class food safety systems, the Canadian industry has undertaken numerous voluntary actions to transparently account for its social, economic and environmental effects. At the national level through CAIA, and regionally through the provincial industry associations, there has been continuous review and adoption of industry best practices, often reflected in species-based or regional Codes of Practice.

In 2009, the question is: Are these practices going to be sufficient in a global market where stricter demands on the supply chain are present or under consideration. Over the last number of years the demands upon food producers has progressed from proving that your food safety systems are in place and effectively monitored, to proving that your practices are environmentally sustainable. How will the Canadian industry ensure it effectively prepares for this new and rapidly evolving environment?

In September 2009, an international team of researchers suggested that aquaculture now accounts for 50 percent of the fish consumed globally.¹ To dramatically illustrate that aquaculture continues to grow more rapidly than any other animal food-producing sector, the FAO's 2008 State of the Fisheries report indicated that aquaculture accounted for 47 percent of the world's fish food supply in 2006. It also reflects relative global ocean capacity given that wild capture fisheries production stopped growing in around mid-1980s. This milestone and associated sustainability questions are likely to characterize discussion and debate related to standards and certification in the foreseeable future.

The difficult-to-define matter of "Sustainability" appears to be rapidly becoming a passport to trade, rather than a direct driver of value growth. If environmental sustainability is part of our value proposition, how can we support this? Will Canadian strategies, or differentiated regional strategies, be underpinned by a commitment to environmental sustainability and integrity? Are our current commitments to sustainable practices being properly noted? Does our commitment have credibility in the market place? Can our efforts be integrated with investments and programs already in place? Where do we turn if one our companies are considering standard and certification options? How do we remain flexible in a cost-conscious environment?

Against these questions, it is also clear that as standards and certification programs and characteristics expand, Canadian producers, customers, and consumers are often perplexed at the inherent value. Companies often wonder whether such programs merely duplicate government laws and regulations, and their associated operating procedures in areas such as food safety, animal health and environmental sustainability. There is some indication that some retailers may impose third-party certifications because they feel that government certification processes are

¹ Online edition of the Proceedings of the National Academy of Sciences.

insufficient. In any case, it may appear legitimate to question whether the activities of private standard and certification bodies adds value or simply adds to compliance costs.

In this context of uncertainty, CAIA established the Canadian Aquaculture Standards Forum (CASF) in 2008. The CASF is an industry-led partnership providing industry and industry stakeholders with clear understanding and options for meeting supply chain quality and sustainable sourcing standards. The first major initiative of the CASF was a standards and certification workshop in Toronto in February 2009. Through 2008 and 2009, with support through CAIA members and DFO, a series of company and sector level projects have proceeded to help prepare the industry for this new standards and certification environment.

This report is a mile-high snapshot of the current global landscape of aquaculture standards and certification related to the Canadian environment. As such, it can only be viewed as contributing to CAIA's vision of the CASF educational continuum. It will provide a synopsis of the significant standards bodies and certification programs in operation, their structure, operation, and market recognition. It will also provide CAIA members with current thinking and opinions related to the growth of sustainability factors and emergence of seafood eco-labels. The ultimate goal of this report is to provide CAIA members with basic, essential, clear and unbiased information which will enable thoughtful and informed decisions supporting the ongoing development of a viable and sustainable Canadian aquaculture industry.

Standards and Certification Overview

Standards and Certification Programs of consumer products is not a new phenomenon, but what is a relatively new phenomenon is the rate of up-take within the seafood industry.

An initial driver of standard development, especially in Europe, was the tightening of the regulatory environment. In response to media-fueled food crises in the late 1980s and through the 1990s, governments responded with stricter legislation placing the liability for food contamination on the industry and retailers. First there were strong 'due diligence' requirements in the United Kingdom and this was followed throughout the EU. In turn, retailers and food manufacturers sought means to ensure their suppliers were operating effectively through the development of standards for good agricultural and manufacturing practices. Some retailers developed their private standards, e.g., Carrefour's "filière qualité" program, while others retailers acted collectively, e.g., the formation of the supermarket retailer group which developed EurepGAP standards in the 1990s (this effort evolved to become the well-known Global GAP standards).

Since the early 1990s, the World Wildlife Federation (WWF) has spearheaded the creation of standards for agriculture, forestry, and wild fisheries. In the wild fisheries, for example, the WWF, along with Unilever, created the Marine Stewardship Council (MSC) in 1997. Since 1999, the MSC has operated as an independent standard owner offering an eco-labelling program aimed at sustainability in the wild capture fisheries sector. To date, the MSC program is perhaps the best-known wild fishery eco-labelling program.

As early as the mid-1990s, quality standards and certification programs for salmon aquaculture were developed in Ireland and Scotland. More recently, the WWF has organized a round table process, known as "dialogues" to develop standards for aquaculture certification. These and other standards typically aim to build consensus about the key impacts of farming activities; identify and support adoption or adaptation of best management practices that significantly reduce or eliminate such impacts; determine acceptable performance levels; and, contribute to continuous improvement strategies which positively direct performance within the aquaculture industry.

Another driver of standards is growing recognition of the complexity of the seafood production chain, particularly for aquaculture. Production chains are geographically long, complex and more often than not consist of many inter-linking chains that are best described as *food webs*. Over the last 20 years, they have developed into international, dynamic and interwoven trading webs where a single consumer item can be formed from multiple ingredients, materials, and substances, and packaging produced, traded and supplied from multiple possible international combinations. These webs serve often complex distribution networks that in the United States, for example, usually sees consumers purchase seafood either in foodservice establishments or retail stores.

Generally, there are growing concerns about the vulnerability of such complex food chains to food and feed contamination issues. Recent food scares such as melamine contaminated milk powder, dioxin contaminated pork, and listeria contaminated syrup have served to highlight the growing risk of contamination of all food chains. Furthermore, there have been specific instances in aquaculture such as melamine in fish feed and popular press stories regarding persistent organic pollutants in aquaculture products which, even if false and misleading, have served to heighten fears.

Food producers, e.g., aquaculture feed producers, typically have multiple options with respect to supply but often have little knowledge of the production events in previous chains for things like feed ingredients, additives, food components, and even packaging materials. Therefore, placing responsibility back up the food chain through the achievement of recognized standards and certification programs is proving to be a favoured option throughout the global marketplace. It helps the retail sector manage and reduce risks to food and product safety. The fact that the retail sector has experienced unprecedented globalization and concentration over the last two decades has added to the strength of this trend. Retailer bargaining power has increased and they are often able to demand higher performance requirements from their suppliers. Many retailers have developed their own private product specifications, but some appear interested in generally accepted standards which are third party audited. Of course, not all retailers demand such qualifications, but the general trend would appear to be in this direction.

Somewhat concurrent with this race to globalization of food chains, and perhaps reactionary to it, have been changing consumer demands. Rising purchasing power, education levels, urbanization, demographics, and evolving lifestyles combined with the decline of food prices relative to other goods has led to changes in consumption patterns. While in the past price and visual aspects were main purchase criteria, the *intrinsic quality* of food has become a much more important parameter. In addition to the physical quality of foods, consumers are increasingly concerned with the processes of food production and trade, and their direct impacts on society and the environment.

These interests cover a range of touchstone issues related to social, environmental or cultural matters such as the treatment of workers, a fair return to producers, environmental impacts and animal welfare. With this complexity, has come an increase in the need for substantiation and verification. This has given rise to new business opportunities or threats such as: provenance (where a product comes from), traceability, purity, safety, ethics, social, welfare, and quality, etc. Objectively demonstrating compliance to any number of such predefined standards by way of third party certification is one method of proof for some specific market preference issues.

These preference developments have been seized as marketing opportunities by some food producers who choose to demonstrate product differentiation through regional traditions, specialties, and provenance. European legislation for protection of products of geographic origin -

Parma ham, Angus beef, Scottish salmon and Lorient oysters - are a few examples. There has also been a growth in standards to support unique food claims such as the premium Label Rouge (France) or healthy organic standards. In those cases, the standards are used to substantiate production and product claims and to allow retailers to segment the market across factors like price premiums, regional preferences and demographics. These examples illustrate the opportunity for niche and specialty marketing which, in particular, can prove important supply chains for less globalised and smaller seafood producers.

Within the last 15 years, however, the landscape for seafood (fisheries and aquaculture) standards and certification has been permanently impacted by the issue of sustainability. Given the sensitive nature of ocean health and the deliberate and highly public targeting of fisheries and aquaculture industries by environmental non-governmental organizations (ENGOS), the nature and imperatives associated with aquaculture standards changed remarkably. As discussed in this report, some of these ENGOS have actively and comprehensively developed voluntary standards that firms may choose to adopt to meet these concerns. Unlike industry, which is expected to adapt and adopt these new demands on tight or shrinking margins, many of these ENGOS are extremely well financed and able to capture market attention.

Some ENGOS have chosen to bypass industry and instead forge partnerships with, or use pressure tactics against, retailers who, as noted above, have significant power to influence supplier networks. In May 2009, for example, following the release of their new report entitled *Out of Stock, Out of Excuses: Ranking retailers on seafood sustainability*, the ENGO Greenpeace continued their efforts to rank Canada's major grocery chains on their sustainability efforts under seven criteria, including the quality of their seafood policies and the number of 'Redlist' species sold. While the report reports that some retailers have made progress on providing sustainable seafood, it purports that others are ignoring the problem. Greenpeace's report gave the following grades (out of 10): Loblaw 2.4; Sobeys 1.1; Walmart 1.0; Overwaitea 0.9; Federated Co-Operatives 0.9; Costco 0.7; Safeway 0.3; and Metro 0.1.

As a result of these numerous and concurrent developments, there is a growing consensus that eco-label standard programs can contribute to sustainability of fisheries and aquaculture. As discussed above, the MSC eco-standard program was initiated as an independent international non-profit organization with a global standard for the certification of wild fisheries with environmentally responsible, sustainable fishing methods. Ten years ago the MSC certified its 1st wild fishery; in October 2009, it certified its 57th. There is strong evidence the MSC will continue to be a highly recognized eco-label.

Eco-labels in seafood are a growing reality and appear to becoming a permanent feature of the modern seafood environment. Eco-labels attempt to effect change in attitudes toward sustainable production through market and stakeholder leverage, often at the global level but also regional or local. As such the mechanism is different from previous product claim labels which rely upon more targeted and focused marketing. For early movers they are seen as an important mechanism to differentiate, segment and, more importantly, gain or secure market share.

As final observations for the benefit of CAIA members, something to remember when assessing the seemingly endless offering of standards and certification programs is that most contain up to 70-80% of the same or very similar criteria. Differentiation between standards is usually played out over a few issues of distinction, i.e., the last 20-30%. This is an important concept to keep in mind as companies struggle with decisions to adopt one program versus another, or whether they should wait for fear of having to reinvent wheels. Therefore, a company can feel very

comfortable investing in many of these credible ISO-65 styled programs, as long as they know their chosen program and certification provider builds in flexibility to easily adopt or migrate to other desired standards in the future.

Sustainability: An Established Trend

Here is a brief overview which confirms important trends toward industry requirements to objectively demonstrate sustainable practices:

- One point for tracking the beginning of the global trend is the collapse of the Northern Cod stock in the early 1990s. The cod fishery closed in Newfoundland in July 1992 and this was a high profile international event.
- In 1995, the Food and Agriculture Organization of the United Nations (FAO) introduced its *Code of Conduct for Responsible Fisheries*. This Code is voluntary. However, certain parts of it are based on relevant rules of international law, including those reflected in the United Nations Convention on the Law of the Sea of December 1982.
- In 1997, the Marine Stewardship Council (MSC) was formed by Unilever and World Wildlife Federation (WWF), partly as a reaction to the loss of the Northern cod fishery.
- The MSC is an international non-profit organization that promotes solutions to the problem of overfishing. The MSC runs the widely recognized environmental certification and eco-labelling program for wild capture fisheries. By 2003, the MSC was not very well known, but global awareness has sky-rocketed over the past few years. The MSC is now having a major influence on seafood markets.
- In 1999, the Monterey Bay Aquarium created *Seafood Watch*. Their well-funded programs - supported by the Packard Foundation - intended to raise consumer awareness and encourage restaurants, distributors and seafood providers to purchase from sustainable sources. Influential seafood pocket guides, website, mobile applications, partnerships and outreach efforts.
- Since 2000, many private and off-the-shelf standard programs have been developed around the world. These cover everything from quality to organic to eco (sustainability) standards.
- In 2001, Global Food Safety Initiative (GFSI) – an association of the world’s largest and leading food retailers – stated that recognized Certification of standard programs must be provided by competent ISO 65 bodies. Often referred to as EN45011 in Europe, ISO 65 is the preferred route for industry to demonstrate that standards remain independent, non-biased and represent the supply chain and multi-stakeholder needs. It is an independent standard developed and owned by the International Standards Organization.
- On a global scale, the production and value of seafood are at record levels. According to the FAO, world seafood production in 2006 exceeded 150 million tonnes, valued at over \$148 billion (first-sale value).
- Of the 150 million tonnes in 2006, over 45 million tonnes came from aquaculture. FAO predicts, as long as the annual rate of increase in aquaculture production outside China remains at around 8 percent, the predicted annual requirement of 53 million tonnes of

aquaculture production by 2010 will be met, even if Chinese production remains at the level reported for 2004.

- Increasingly, aquaculture is subject to scrutiny. This has been especially true of shrimp and salmon production. Salmon aquaculture has received focused negative attention from a variety of sources, particularly ENGOs and single-issue researchers.
- In 2005, the FAO published a set of voluntary guidelines for the eco-labeling of wild fish products. These guidelines outline general principles, including the need for reliable, independent auditing, transparency of standard setting, accountability, and for standards to be based on good science. Minimum requirements and criteria for assessing whether a fishery should be certified and awarded an eco-label are based on the FAO's Code of Conduct for Responsible Fisheries.
- In a 2006 study published in the journal *Science* an international group of ecologists and economists concluded that loss of biodiversity is profoundly reducing the ocean's ability to produce seafood, resist diseases, filter pollutants, and rebound from stresses such as overfishing, and climate change. This study led to headlines around the world hailing "the end of seafood by 2048." The study also strikes a note of hope by recognizing the inherent ability of ocean ecosystems to self-heal and regenerate, under the right circumstances. In other words, it is not too late for the ocean and fisheries.
- Worldwide demand for seafood is on the rise and the FAO predicts that, by 2030, more than 40 million additional tonnes of seafood – almost a 30 percent increase – will be required to meet demand. This will necessarily come from aquaculture.
- On February 5, 2008, Wal-Mart Stores Inc. advised suppliers of its private-label and certain other food categories such as produce, meat and fish, that must comply with Global Food Safety Initiative (GFSI) standards (ISO 65). Wal-Mart said GFSI standards go beyond government regulations. Under the GFSI program, producers of Wal-Mart and Sam's Club private-label and other foods sold in the United States must be audited by independently trained, approved and licensed auditors. Suppliers were required to complete full certification by July 2009.
- In April 2008, Seafood Choices Alliance released results from 2007 survey work which indicates growing awareness among key US seafood buyers - retailers, chain restaurant decision-makers, and wholesalers - of the importance of sustainable seafood and positive environmental practices. Highlights of their report include:
 - Sustainable seafood appears to be a rising trend among chain restaurants, retailers and wholesalers, and each of these sectors sees significant growth in the percentage of their seafood that will be sustainable in five years.
 - All three sectors are increasingly open to dialogue and are interested in obtaining information that can help them make informed and responsible choices for themselves, their customers and the ocean.
 - Majorities in each sector are concerned about the health of the ocean and its impact on their businesses.

- Overfishing is seen as a top threat to seafood sustainability by all sectors, and wholesalers are additionally concerned about the impacts of aquaculture.
- All sectors have taken action to remove selected seafood choices from their product list due to environmental considerations, and in greater numbers than a few years ago.
- Through 2007 and 2008, Greenpeace surveyed U.S. retailers about their seafood sourcing policies. Simplicity is, of course, the genius of the Greenpeace action; it boils down the complexity of sustainable sourcing to a report card on “Good” and “Bad” retailers. Seafood retailers must adopt and implement sustainable seafood procurement policies based on the principles of promoting the best examples of sustainable seafood, removing the worst from the marketplace, and improving the rest, including:
 - A definition of sustainability that covers farmed and wild caught seafood;
 - Criteria for suppliers to meet to be deemed sustainable sources;
 - Criteria to screen out unsustainable stocks;
 - A commitment to work with suppliers to source seafood from the most sustainable sources available, and to not source from suppliers that refuse to change to a sustainable approach;
 - A commitment to work with other stakeholders to improve the management and sustainability of fisheries sourced from;
 - Labeling criteria for all seafood that includes common and scientific names, FAO catch area, stock (wild), farm (cultivated), fishing gear or farming method, and catch date;
 - Training for staff responsible for buying and selling seafood on sustainability issues and the company's policy; and,
 - Consumer outreach and education to promote sustainability in the seafood marketplace.
- In May 2008, the following organizations founded a Mega organization to create an “ambitious but realistic path toward sustainable seafood that businesses can follow to safeguard the future viability of their industry”: Blue Ocean Institute; Canadian Parks and Wilderness Society; David Suzuki Foundation; Ecology Action Centre; Environmental Defense Fund; FishChoice; FishWise; Living Oceans Society; Monterey Bay Aquarium; Natural Resources Defence Council; New England Aquarium; Ocean Conservancy; Sierra Club British Columbia; and, World Wildlife Fund USA. This represents a new and powerful force directed at North American markets and industry. This new organization is called the Conservation Alliance for Seafood Solutions. Their Common Vision identifies six critical areas where industry/companies can take action to ensure a sustainable seafood supply and protect ocean environments:
 - Making a commitment to develop and implement a comprehensive, corporate policy on sustainable seafood;
 - Collecting data to assess and monitor the environmental sustainability of their seafood products;
 - Buying environmentally responsible seafood;
 - Making information regarding their seafood products publicly available;
 - Educating their consumers, suppliers, employees and other key stakeholders about environmentally responsible seafood;

- Engaging in and supporting policy and management changes that lead to positive environmental outcomes in fisheries and aquaculture.
- In July 2008, to better educate its customers about the sustainability of Alaska seafood, the Alaska Seafood Marketing Institute (ASMI) conducted an “invitation only” informational briefing. The targets were top Alaska seafood buyers from the United States and overseas. ASMI firmly promoted the sustainability of their fisheries with their new "Alaska Gold Standard," which they say encompasses the main standards of organizations such as Marine Stewardship Council the FAO.
- In July 2008, Whole Foods Market released its new salmon standard noting, “these additional guidelines will help reduce potential environmental impacts and will require vendor partners to successfully pass an independent, third-party audit that reviews every detail of the standards ...”
- In July 2008, FAO published *Technical Guidelines on Aquaculture Certification*.
- Strong trend indicators are emerging from the US Department of Health and Human Services. In 2007, Secretary Mike Leavitt admitted the department’s relative inability to protect the imported food supply. In 2008, Leavitt is heralding independent third party certification as the centerpiece of their new strategy to encourage, leverage, and build upon voluntary third-party efforts.
- US Secretary Leavitt wrote (in his online Blog) on July 24, 2008:

We observed independent certification being used in many sectors of the import world. Until now, we have not integrated this capacity for improvement into our regulatory responsibility. This needs to be a government-wide strategy; ultimately, it should apply to all product lines.

In the future, products from those firms that have standards and certification processes that we trust will be given expedited entry and access to U.S. consumers. The FDA will be freed to focus its enforcement resources on those suppliers that don’t have certified products. FDA is establishing a pilot with the shrimp industry to help learn how to evaluate third-party certification programs, and implement them in the field.
- In November 2008, Food Marketing Institute (North American grocery retailers) formed international Seafood Sustainability Committee comprised of 22 large retail/wholesale companies; hold first meeting in February 2009 and release draft of extensive discussion document related to defining “sustainability”
- In January 2009, World Wildlife Federation announces creation of the Aquaculture Stewardship Council (ASC): new entity to manage sustainable seafood farming standards under development through the WWF Aquaculture Dialogues
- In May 2009, Greenpeace’s supermarket ranking evaluates Canada’s eight major supermarkets on their progress in providing Canadians with seafood that is sustainably caught and farmed. All score poorly according to Greenpeace.

- In May 2009, Canada's largest retailer - Loblaw - commits to 100% sustainable seafood sales by 2013.
- In July 2009, Wal-Mart announces plans for a *Sustainable Product Index* as an effortless method to demonstrate *ecological transparency* for consumers. An ambitious goal which likely foreshadows sustainability as an ongoing priority for food production industries.
- In October 2009, on the occasion of the 10th anniversary of its well-known 'Seafood Watch' program, the Monterey Bay Aquarium released a new report called "Turning the Tide: The State of Seafood." This report suggests global prospects for securing a sustainable seafood supply and protecting ocean ecosystems are improving, thanks to a growing consensus on how best to manage fisheries and fish-farming operations, and new commitments by consumers, major buyers and the fishing community.
- The October 2009 report "Turning the Tide: The State of Seafood" introduces "Super Green" seafood. These are products that the aquarium says are both heart healthy and produced in an environmentally friendly manner. The Super Green list includes farmed mussels, oysters and Rainbow Trout, with Arctic Char and Bay Scallops also listed a healthy "best choices." The criteria for their Super Green includes low levels of contaminants (below 216 parts per billion [ppb] mercury and 11 ppb PCBs) and daily minimum of omega-3s (at least 250 milligrams per day [mg/d]).

Relevant Aquaculture Standard Bodies and Eco-Label Programs

There are currently at least 40 eco-certification programs applicable to wild caught and/or farmed seafood. Most are applicable to wild caught seafood and eco-label programs with application to farmed seafood being rare. Programs may be run by industry bodies, retailers, or independent third parties that own an eco-label, e.g., MSC.

For Canadian Salmonid and Bivalve producers, the most relevant standard and certification efforts - existing standards or standards in development - include: Global Aquaculture Alliance (GAA); BIM's Certified Quality Programs; SQF; World Wildlife Fund (WWF); and, GlobalGAP. Of these, only GlobalGAP, BIM's Certified Quality Programs; and SQF have existing programs.

Global Aquaculture Alliance (GAA): Best Aquaculture Practice standards

The GAA is an international, non-profit industry trade association dedicated to advancing environmentally and socially responsible aquaculture through the promotion of a Best Aquaculture Practice standards and Certification Program.

The GAA currently has certification standards - known as Best Aquaculture Practices (BAP) - for shrimp hatcheries and farms, tilapia farms, channel catfish farms and processing facilities. The standards encompass food safety, traceability, animal welfare, community and social welfare, and environmental sustainability.

The GAA has indicated that standards will be developed for other species, including farmed Salmon and molluscs. Very little progress has transpired with respect to molluscs. In February 2009, however, GAA appointed John Forster (previous president of Stolt Sea Farm Washington) as the Chair of their Salmon Standards Oversight Committee. This is a twelve-member group that includes equal representation from academia, the environmental community and industry. Notably, from a Canadian perspective, Michael Szemerda, Cooke Aquaculture, and Mary Ellen Walling, British Columbia Salmon Farmers Association, are members of the Oversight Committee. The ENGO community is represented by the Bellona Foundation (Norway); Teresa

Ish, an independent conservationist (United States); the Marine Conservation Society (United Kingdom); and, the New England Aquarium (United States).

The GAA publicly announced an ambitious timeline to have a Salmon BAP standard available for certification. The original intention of the GAA was to have an approved salmon standard by the end of 2009. A draft is being circulated through the Oversight Committee process, but is not currently available for public review and comment. There are suggestions that the original timeline may have been overly ambitious as requests for review and commentary from other interested ENGOs are being considered. GAA is also seeking to have the BAP salmon standard and certification program fully accredited in accordance with ISO 65.

Meanwhile, as it awaits development of the salmon aquaculture standard, GAA has commenced direct marketing of their programs with major retailer and food service chains across North America. The GAA regularly advise that they have a large following of retailer and food service companies that source according to available BAP standards. Some of these are reported to include Darden Restaurants (Red Lobster, Olive Garden) and Wal-Mart.

Certified Quality Aquaculture Programs for Salmon, Trout, Mussels, Oysters

Originating in Ireland, the Certified Quality Programs are now available internationally for Salmon, Trout, Mussels, and Oysters. Unlike most all other existing standards available to aquaculture, these programs were specifically developed for aquaculture. The stakeholder group originally involved with the technical development of the standard included industry members, the Irish Salmon Growers Association, The Irish Sea Fisheries Board (Bord Iascaigh Mara) (Standards owners), the Marine Institute of Ireland (responsible for monitoring of the environmental aspects of salmon aquaculture), the Food Safety Authority of Ireland and Skretting, fish feed manufacturer. The technical committee remains in place for the evolution of the standard with representation from additional sectors such as salmon smoking and fish health. The accreditation status for these programs is quite clear, all being recognized to international standards (EN 45011 / ISO Guide 65:1996).

The Certified Quality Standards focus on best practice, husbandry, welfare, fish health or best bivalve practices, product quality/safety, traceability and specifications for superior quality aquaculture products. There are aspects of waste management and environmental monitoring which are included in all programs. Furthermore, these programs provide enhancement options which allow easy and cost-effective progress toward other standard options including Organic and Eco Standards.

It is believed that the Certified Quality Salmon and Mussel Eco-Standards are the world's first ISO 65 accredited aquaculture Eco Standards. The programs have been tested for supply chain value and wider stakeholder recognition from an environmental performance and sustainability perspective. Generally, the Eco standard components are divided into the following categories: Environmental Management and Commitment; Site Selection and Management; Environmental Aspects; Nature and Biodiversity; Cultural Heritage; Waste Management and Reduction; Resources Management and Conversation; and, Appendices. The program is designed to ensure strict environmental management procedures using the best available techniques and the application of current knowledge for the continuous improvement of environmental performance.

Among other things, the Eco standard requires companies to provide evidence of:

- Management Commitment to Environmental Sustainable Development
- Environmental Review

- Environmental Policy
- Environmental Management System
- Environmental Standards
- Reduced visual impacts
- Use of feed from sustainable sources
- Prevention of nutrient impact/waste reduction
- Energy use and conservation
- Commitment to eliminating non recyclables
- Appropriate waste management and odor reduction
- Protection from taints, chemical, and spills
- Respect for nature, archeology, culture.

The unit of certification is each farm site, hatchery or processing facility. Certification is based on annual or by-annual on-site assessment where criteria are assessed and scored to provide a compliance rating. All non conformances arising must be successfully closed and accepted by the Certification Committee.

SQF

SQF is a division of the Food Marketing Institute. These standards are designed according to current norms for food safety (HACCP) and Quality Systems. The Codes make reference to CODEX Alimentarius Commission Guidelines for the Application of the HACCP system and the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) Hazard Analysis and Critical Control Point Principles and Application Guidelines. As such it is a comprehensive food safety and quality systems approach.

Although not originally designed as an aquaculture standard, SQF has created a Guidance document for salmonid aquaculture. As a layered program, SQF 1000 Code implementation (Levels 1, 2, and 3) are required foundations. Once they are in place, the industry-specific Guidance documents, e.g., for salmonids, apply. Guidance document are further subdivided into various Annexes. Operationally, SQF trained consultant are required for implementation. That includes an in-house SQF trained expert is also required to ensure understanding of SQF implementation.

SQF standard are subject to a three-year revision cycle, or sooner for significant food safety requirement. Notification of reviews/changes are posted on the SQFI web site; suppliers are required to implement amendments within six months. The SQF 1000 Certification Trade Mark can be used by a Producer on product and on documents that are used for public display.

World Wildlife Fund for Nature (WWF)

WWF's interest in aquaculture standards dates back to the 1990s and their involvement with shrimp aquaculture. That evolved into standard development processes known as Aquaculture Dialogues. Their goal is to establish standards which minimize negative environmental and social impacts associated with twelve designated species: shrimp, salmon, abalone, clams, mussels, scallops, oysters, *Pangasius*, tilapia, trout, *Seriola*, and cobia. The WWF predetermined that all other standards in the world are inferior to their eventual eco standards for these species.

Salmon Aquaculture Dialogue

The Salmon Aquaculture Dialogue was initiated in 2004, but is nearing conclusion. The process is managed by a nine-person Steering Committee and Chaired by Jay Ritchlin from the Coastal Alliance for Aquaculture Reform. CAIA is represented on that Committee by Mary Ellen

Walling, and several Canadian researchers are on various technical committees created to help research issues related to salmon aquaculture.

The goal of the Dialogue/Committee is to recommend standards that measurably reduce or eliminate the key impacts of salmon farming across environmental and social performance indicators. In that regard, the process has identified several Principles upon which the standard would be built:

- i. Comply with all applicable international and national laws and local regulations
- ii. Conserve natural habitat, local biodiversity and ecosystem function
- iii. Protect the health and genetic integrity of wild populations
- iv. Use resources in an environmentally efficient and responsible manner
- v. Manage disease and parasites in an environmentally responsible manner
- vi. Develop and operate farms in a socially responsible manner
- vii. Be a good neighbor and conscientious citizen.

Flowing from the Principles, the Standards will be built around directional criteria and chosen indicators which will be used to measure impacts. In effect, the goal is to establish standards with quantitative performance measures for determining whether a given principle is achieved. During 2009, the Steering Committee has been establishing indicators under the various principles. The next Salmon Dialogue meeting will be November 2009, in Bergen, Norway. Participants will discuss draft ecological indicators, hear about progress within the feed and social technical working groups, and learn about the social indicator development process.

Bivalve Aquaculture Dialogue (BAD)

Since 2004, there have been various meetings regarding the Bivalve Aquaculture Dialogue (BAD) which focuses on clams, oysters, scallops and mussels. In reality, however, the development approach did not take off until spring 2009. The first draft of the bivalve aquaculture standards was released in late September 2009, and a 60-day public comment period ends November 30, 2009. The Global Steering Committee (GSC) is composed of: 4 industry members; 4 scientists (university and Government); 3 ENGOs, including WWF; 1 certification body (Global Trust's Dr. Antonio Hervas); and, 1 "other" (a New Zealand statutory organization known as Te Ohu Kai Moana dedicated to future advancement of Māori interests in the marine environment). The only Canadian representative is Canadian Government researcher Peter Cranford (Bedford Institute of Oceanography).

WWF suggest the draft bivalve standard will be finished mid-2010. The following Principles provide the framework for developing the criteria, indicators and standards for responsible bivalve farming:

- i. Obey the law and comply with all international, national, and local regulations and agreements
- ii. Avoid, remedy or mitigate negative effects on habitats and biodiversity
- iii. Maintain the health and genetic diversity of wild populations
- iv. Manage disease and pests in an environmentally responsible manner
- v. Use resources efficiently
- vi. Be a good neighbor and conscientious coastal citizen
- vii. Develop and operate farms in a socially and culturally responsible manner.

In terms of the BAD standard development approach, CAIA producers should know:

- the GSC has agreed to use a science-based development approach;

- to date, general reports suggest unanimity of support for direction within the GSC;
- the draft standard focuses on two primary indicators: benthic and pelagic.
- the intention is to use sulfides as the principal indicator of benthic health;
- the pelagic indicator focuses on the cumulative effect of food supplies in the water column to determine whether a production area is beyond its carrying capacity

To date, Global Trust has conducted a number of benchmark audits for the Canadian industry (mussels and oysters). In a broad sense, these suggested WWF parameters have been considered, but the specifics of carrying capacity, bay phytoplankton productivity, bivalve clearance rates, and sulfide levels could not be practically achieved through a benchmark audit process. Whether producers have ready access to such information is unclear; if they do it is possible to test the proposed WWF model and benchmark the Canadian producers accordingly.

As for the benthic and pelagic models, what is the GSC's level of confidence with the science/data/repeatability behind the applications? It is strongly recommended that the scientific rigour be tested in a variety of global settings for its reliability and predictive value before any real audit application. From the practical viewpoint of experienced auditors, it is unclear how the proposed scientific methods will work from the perspective of a third party audit. For example, do measurements and testing occur as an on-site audit, or is this intended to be a desk-based, scientific evaluation requiring bathymetric, oceanic, or baseline environmental data? It is expected a close examination of these pragmatic issues will necessary before the proposed BAD methods are endorsed.

Aquaculture Stewardship Council (ASC)

In January 2009, WWF announced that a new organization called the *Aquaculture Stewardship Council (ASC)* will be formed and responsible for working with independent, third party entities to certify farms that are in compliance with their various aquaculture standards. Drawing upon their experience in establishing the MSC, they are currently developing a business plan and developing the ASC funding and administrative structures. While the MSC have twice ruled out aquaculture involvement and their possible role with the ASC start-up process remains open but unclear, the ASC is expected to be in operation by 2011. Like the MSC, it is suggested there will be an ASC logo, not a WWF logo, on ASC-certified products.

In June 2009, WWF and GlobalGAP announced a memorandum of understanding which will see GlobalGAP take on the responsibility for certifying farms to Aquaculture Dialogue standards until the official launch of the ASC. Essentially, GlobalGAP's accredited certification bodies will be authorized to audit farms that adopt the Aquaculture Dialogue standards. Apparently, WWF is also considering other entities that may be able to provide these interim business and third party certification services. Once the ASC is established, the ASC and GlobalGAP will assess whether and how their partnership will continue.

GlobalGAP

GlobalGAP is a private sector body that sets voluntary standards for the certification of agricultural and aquaculture products around the globe. While they offer standards for Salmonids, Shrimp, Tilapia, and *Pangasius*, they do not offer a bivalve standard. Their goal is to establish ONE standard for Good Agricultural Practice (G.A.P.). Governance is by a Board whose decisions are based on a structured consultation process. Sector specific interests and multi-stakeholder input are consolidated to ensure global acceptance. Their standards are subject to a three-year revision cycle of continuous improvement to take into account technological and market developments.

Regarding salmonids, there are two main standards: an Aquaculture Base; and the associated Salmonid/Control Points and Compliance Criteria for integrated farm assurance. The Aquaculture Base is detailed and divided into the following categories: site management; chemicals; pest control; OHS; fish welfare; husbandry; aquaculture feed; environment management and husbandry; fresh water; sea water; and sampling and testing techniques. The salmonid standard is detailed and divided into the following categories: Freshwater (applicable to fresh water farms only); stock movements; farm facilities (sea water); farm husbandry; and, harvesting.

Applicants must demonstrate compliance to these standards through audit(s) by an independent certification body accredited to EN 45011 / ISO Guide 65:1996 (general requirements for bodies operating product certification systems). The costs for certification/audit are market driven. It is the responsibility of farmers to arrange and “demonstrate” their compliance through independent verification, so they assume the costs. Essentially it is a comprehensive on-farm food management and best practice standard, plus basic environmental components. Although this standard includes some environmental parameters, they are of a preliminary nature and it is not considered a strong eco-standard; their recent alignment with WWF/ASC may attest to perceived shortcomings in those categories.

Interestingly, in February 2009, GlobalGAP also publicly announced that it had agreed with GAA to work together on developing and harmonizing a worldwide certification system for the aquaculture industry. At the time the agreement was described as an important step toward closer cooperation between the two standards bodies. There were discussion at that time of a “joint checklist approach” toward a single farm audit meeting the requirements of both organizations. Harmonization and integration is a strong positive, though the direction of the relationships are unclear in light of the subsequent GlobalGAP and WWF agreements discussed above.

Retailer Standards and Policies

The majority of international retailers have recognized the importance of responsible sourcing policies for seafood from both fisheries and aquaculture. For example, related to wild fisheries, a number have embraced the MSC certification program as a key requirement and have set targets for the full conversion of all supplies to this standard within the coming years. Unlike fisheries, aquaculture does not have one strong market leader. Instead, there are a number of existing and developing standards and certification options available depending on individual requirements and preferences.

As a point of reference, as indicated above, in early 2009, WWF announced their intention to prepare a business plan for an ‘Aquaculture Certification Council’, largely reported as the ‘MSC equivalent for aquaculture’ although it is likely that the timeline for the availability of a fully operational certification program for all of the species required by Canadian aquaculture producers is in the region of a few years.

Within the trade most retailers and food service organizations have developed internal supplier guides, standards and codes of practice. This section provides a brief overview of the policies presented by some of the more prominent retailers with respect to sustainable seafood procurement.

North America's Top 25 supermarkets

The 25 largest food retailers and wholesalers in the United States and Canada combined to produce \$893 billion US in revenue [food and non-food merchandise] in 2008, up 7.6 percent over 2007. (Source: Supermarket News, January 2009.)

In 2007 and 2008, the 10 largest companies on the list accounted for about 69% percent of the total volume of the top 25. The top 20 companies accounted for approximately 82% of the total volume. The top 25 are:

1. Wal-Mart Stores
2. Kroger Co.
3. Costco Wholesale Corp.
4. Supervalu
5. Safeway
6. Loblaw Cos.
7. Publix Super Markets
8. Ahold USA
9. Delhaize America
10. C&S Wholesale Grocers
11. 7-Eleven
12. H.E. Butt Grocery Co.
13. Sobeys
14. Meijer
15. Metro
16. Wakefern Food Corp.
17. BJ's Wholesale Club
18. A&P
19. Dollar General Corp.
20. Giant Eagle
21. Whole Foods Market
22. Winn-Dixie Stores
23. Trader Joe's Market
24. Associated Wholesale Grocers
25. Aldi

Wal-Mart

Wal-Mart describes their vision to demonstrate environmental leadership by reducing the ecological impact of its operations through company-wide programs focused on waste, energy and products, as well as outreach programs that preserve and enhance local environments. Wal-Mart Stores states that it intends to source only MSC certified seafood from fisheries and has commenced implementing this strategy. For aquaculture, their choices are less specific at this point, although there are good reasons to believe there may be some preference for GAA *Best Aquaculture Practice* (BAP) certified products; for which shrimp and catfish are currently available. Generally, Wal-Mart has advised its good and services suppliers that they must adopt third party audited standard programs.

In July 2009, Wal-Mart announced its Sustainable Product Index. This may be taken as a strong trend indicator that sustainable eco-standards will be a permanent feature of the future marketplace. This program places a very high premium on *ecological transparency* and it will force suppliers to answer key questions such as:

- how are products made?
- where do they come from?
- how much energy is used?
- what are the social impacts?

- what are the environmental impacts?

This system is intended to reveal negatives and puts them into play in what could be described as a “devalue” chain. Data will be boiled down into a single rating that shoppers will see right next to the price tag. It is a system in which “green” becomes a continuous improvement process, i.e., a verb not an adjective.

Furthermore, this is NOT an exclusive Wal-Mart program. They are working with a large cross section of interests and have invited other huge retailers including Target and Costco to adopt the same sustainability index. It will likely be several years before anything concrete emerges from this initiative. As currently envisioned, the Sustainability Product Index will involve asking 15 key questions of Wal-Mart Suppliers:

Energy and Climate: Reducing Energy Costs and Greenhouse Gas Emissions

1. Have you measured your corporate greenhouse gas emissions?
2. Have you opted to report your greenhouse gas emissions to the Carbon Disclosure Project (CDP)?
3. What is your total annual greenhouse gas emissions reported in the most recent year measured?
4. Have you set publicly available greenhouse gas reduction targets? If yes, what are those targets?

Material Efficiency: Reducing Waste and Enhancing Quality

1. If measured, please report the total amount of solid waste generated from the facilities that produce your product(s) for Wal-Mart for the most recent year measured.
2. Have you set publicly available solid waste reduction targets? If yes, what are those targets?
3. If measured, please report total water use from facilities that produce your product(s) for Wal-Mart for the most recent year measured.
4. Have you set publicly available water use reduction targets? If yes, what are those targets?

Natural Resources: Producing High Quality, Responsibly Sourced Raw Materials

1. Have you established publicly available sustainability purchasing guidelines for your direct suppliers that address issues such as environmental compliance, employment practices and product/ingredient safety?
2. Have you obtained 3rd party certifications for any of the products that you sell to Wal-Mart?

People and Community: Ensuring Responsible and Ethical Production

1. Do you know the location of 100% of the facilities that produce your product(s)?
2. Before beginning a business relationship with a manufacturing facility, do you evaluate the quality of, and capacity for, production?
3. Do you have a process for managing social compliance at the manufacturing level?
4. Do you work with your supply base to resolve issues found during social compliance evaluations and also document specific corrections and improvements?
5. Do you invest in community development activities in the markets you source from and/or operate within?

Loblaw Canada

Loblaw is Canada's largest retailer with over 1400 stores across the country. In 2008, Loblaw took the first steps to offer sustainable seafood options to customers by launching Marine Stewardship Council (MSC) certified products and now offers 12 such products.

In May 2009, Loblaw announced its initiative in sustainable seafood policy development with plans to sell only sustainable seafood by 2013. The commitment covers all canned, frozen, fresh, wild and farmed seafood products, in all categories. For 2009-2010, Loblaw has committed to achieve the following:

1. Start assessing all sources of wild and farmed seafood, in partnership with WWF.
2. Continue to work through the Company's supply chain for control brand seafood products to prepare for additional audits to MSC standards.
3. Develop and begin to implement a four-year implementation plan, upon completion of the seafood sourcing assessment.
4. Identify sources with no improvement potential, which should be stopped or phased-out as soon as possible, based on results of the assessment.
5. Identify and recruit experts in fisheries and marine science, to provide Loblaw with sound, independent advice, when needed.
6. Confirm Loblaw's policy decisions and communicate these with suppliers, distributors, colleagues, customers, franchisees, the general public, and other external stakeholders.

Ahold USA

Ahold USA has developed a Sustainable Trade Policy as part of its overall Social and Corporate commitments. Objectives in sustainable trade fall into three areas: product safety; responsible sourcing, including social and environmental requirements; and, 'buying close to home' which Ahold state is good for the environment and helps to support communities and small, local businesses.

Ahold USA has worked with an NGO - the New England Aquarium - in the development of their *Choice Catch* program. The Aquarium's academic resources audit seafood sources for environmental impacts and, accordingly, makes recommendations that help drive purchasing decisions.

Whole Foods USA

Whole Foods Market is the world's largest retailer of natural and organic foods, with stores throughout North America and in the United Kingdom (London). Whole Foods has been a strong advocate of MSC certified seafood since 2000. Farmed fish preferences are based on organic standards and a preference for 'naturally' produced aquaculture products. In mid 2008, Whole Foods introduced two internal standards for suppliers of farmed salmon and shrimp. Based on natural/organic principles these set very demanding specifications for potential aquaculture suppliers to Whole Foods.

A selection of key requirements from their standards includes:

- No antibiotics permitted;
- No in-feed veterinary medicines, including parasitic treatments such as emamectin benzoate;
- Elimination of parasitic treatments by mid 2012;
- Maximum stocking density for open net pens of 20 kg/m³;
- No synthetic pigment sources used post 2010.

There are also established requirements for issues such as: reducing nutrient loading of the local environment; annual reporting on progress toward meeting a Maximum Fish-In Fish-Out ratio of 1:1; the elimination of anti-foulants used on nets; and, fish escape prevention procedures.

Of interest to Canadian producers who are leaders in this area, Whole Foods Market states that it is establishing a purchasing preference for suppliers that develop innovative technologies and practices such as integrated multi-tropic aquaculture, i.e. polyculture with integrated fish-shellfish-seaweed production. They also indicate preferences for closed containment systems that, in their view, substantially reduce environmental impacts.

Of note, the various production standards must be achieved while, at the same time, meeting Whole Foods Market's quality and cost criteria and other internal standards.

Interestingly, the Environmental Law Institute (ELI) provided an external review of Whole Foods Purchasing standards for farmed salmon and shrimp against their own "*Gold Standard for Aquaculture Ecolabel Design*" (published by ELI and The Ocean Foundation). While the report commends Whole Foods for their initiative, it also notes that, the standards will lack transparency, participation, and accountability necessary to assure credibility, without clear procedures. That commentary is largely supported by the FAO Guidelines for Aquaculture Certification governance which call for accountable demonstration through accredited certification according to ISO 65 standards.

However, it may reasonable to expect that retailers, such as Whole Foods, will not desire or see the need to transfer their private sourcing specifications and preferences into internationally recognized standards. Instead the retailers may view their standards as a tool to differentiate, brand and segment their retail space into choice options for consumers within product categories, e.g., organic, premium, natural, select, quality, etc.

Wegman's

Wegman's Food Markets has worked with an NGO - Environmental Defense Fund - to develop standards for sourcing farmed salmon and farmed shrimp in order to provide environmentally preferable products and also promote environmental progress in the aquaculture industry in the Americas. Their efforts in the salmon standard category go back to 2006 when they introduced highly restrictive purchasing standards. These standards have not been able to be achieved by any aquaculture producer and EDF has since withdrawn from aquaculture campaigns due to funding constraints. It is broadly considered that the loss of this funding was a result of their unsuccessful standard development.

Food Market Institute (FMI)

On a North American basis it is noteworthy that the Food Market Institute (FMI) also formed a Sustainable Seafood Working Group in 2008. Their committee includes 22 retail/wholesale companies whose role is to engage individuals and companies with expertise to help their industry (grocery retail) address sustainable seafood issues in a proactive and positive way. Their Committee includes Canadian grocer representatives from Loblaw and Sobeys. This industry group works to produce guidance and resource materials that individual companies would struggle to accomplish alone. CAIA members should track developments associated with this group, but significant product or policy developments are not expected until 2010.

Tesco

In ten years, Tesco has gone from being the UK's third largest supermarket to one of the leading retailers in the world, employing 450,000 people. Tesco has developed an Environmental and Corporate Social Responsibility Policy and Review.

Sustainable seafood policies refer to the use of the United Nations' Food & Agriculture Organization (FAO) *Code of Conduct for Responsible Fisheries* as a sourcing reference. Tesco source from MSC certified fisheries and have also partnered with seafood suppliers in the development of sustainable practices including meeting social and economic requirements in addition to environment. An open perspective has been adopted to the acceptance of external standards and certification, acknowledging those that meet Tesco's internal policy and product standard requirements.

A number of aquaculture 'benchmark' standards have been developed by Tesco for this purpose. For example, farmed salmon standards have been developed for each of the products across the range on offer.

Marks & Spencer (M&S)

M&S operate very specific standards for seafood purchases. Only fish from 'well-managed' sources can be supplied. For a number of years now, M&S has publicly declared that all wild fish supplies should be taken from stocks that are certified sustainable by the Marine Stewardship Council. Where MSC certification is not available, they say the stock should be independently assessed and confirmed acceptable for supply to M&S. M&S has declared that all wild stocks supplied must be independently assessed by 2012.

Production of farmed fish and fish feed must comply with national regulations on environmental impact and the relevant M&S Code of Practice. It is Policy that producers should demonstrate commitment to improving farming methods, animal welfare and their local environment. M&S also state that suppliers should operate Environmental Management Systems and actively improve environmental performance, e.g., minimize the use of packaging and non-renewable resources. Feed for farmed fish must be obtained from sustainable sources and the sources of marine proteins and oils must comply with the policy on wild fish as detailed above.

Sainsbury

Sainsbury's Supermarkets Ltd. is a wholly-owned food retailer operating within the UK. Sainsbury operate both a wild and farmed seafood Sustainable Policy. They are a strong advocate of MSC for wild fish and exhibit preferences for Global GAP certification for farmed fish supplies. Other preferences include organically certified farmed fish.

Waitrose, UK

Waitrose state that they have been working on the sustainable and responsible sourcing for all of its comprehensive range of fish for over 10 years. They have a rigorous policy covering the management of fisheries, the species, methods of capture and full traceability with a clear mission to sell only sustainably caught fish in all of their stores. This policy extends to the feed for their farmed fish where specifications for quality, welfare and environmental impact have been set.

Waitrose states that the key to making any decision (on purchasing) is to balance all available facts and to engage with ENGOs and Conservation Groups. Waitrose has ceased sourcing stocks from deep sea bottom fishing such as orange roughy and flatfish from beam trawling due to the impact of these methods on the environment.

For a fish to be termed "sustainable" in Waitrose it must meet the following criteria

- Be a species that is not regarded as threatened or endangered
- Be caught from a well managed fishery with scientifically based quota's
- Be caught using responsible fishing methods
- Be fully traceable from catch to consumer

Waitrose sells a wide range of farmed fish including Atlantic Salmon, brown trout, rainbow trout, warm water prawns, carp, mussels, oysters, halibut, sea bass and sea bream.

Purchasing is through long-term working partnerships that have been established between Waitrose and the farmers who supply the retailer. Private specifications have been developed under the 'Select Farm' schemes of Waitrose which have focused on high standards of fish quality (lean, firm meat), animal welfare and health whilst minimizing impact on the environment and delicate marine ecosystems.

Carrefour Group

The Carrefour Group operates 15,130 stores across 31 countries and is Europe's largest private employer. In 2005, in France and Belgium, the Group launched a line of "Responsible Fishing" frozen products, guaranteeing optimal traceability and stock management, as well as respect for the ecosystem. In 2008, Hypermarkets France launched an MSC line of frozen products under the Carrefour Agir Éco Planète brand, as well as sourcing a range of MSC fresh products.

For aquaculture, the Group has been developing a range of quality farm-raised fish with limited environmental impact specifications. The Group promotes herbivore farmed fish species, such as tilapia, claria and pangasius, in recognition of sustainability issues with fish meal in farmed fish diets. Meanwhile, they also promote the use of vegetable substitution in the diets of carnivorous species. Carrefour also shows preference for suppliers of shrimps from Global Aquaculture Alliance (GAA) members.

Major Seafood Processors

FoodVest- (Young's Bluecrest)

Food Vest Group includes Europe's largest fish processing business under the Young's Bluecrest name claimed synonymous with seafood for more than 200 years. Young's advocates a set of Fish for Life Principles which define the company's commitment to sustainable sourcing of seafood. Suppliers of farmed products are subjected to a detailed third party audits against a Code of Best Farming Practice, including quality, safety, welfare and environmental criteria. Aspects of farm practices such as the control of permitted medicinal/veterinary treatments, stocking densities, the constituents of feed, pigmentation levels, environmental impact assessment, product traceability, and harvest procedures form part of the assessment. Product samples are also routinely analyzed for microbiological levels as well as a range of chemical, veterinary and environmental contaminant residues.

Birdseye Iglo

Birds Eye Foods is recognized as a frozen food industry leader with supply lines both in agriculture and seafood products. Within the seafood arm of the business (Iglo), approximately half of Iglo Germany's fish carry the MSC logo. Farmed fish supplies must comply with internal sourcing standards and specifications. Birdseye Iglo has not outwardly expressed preferences for external standards and certification but require consistency with the requirements of international norms in addition to meeting accredited standards of governance such as ISO 65 certification. At

a minimum, sources of seafood must meet strict internal responsible sourcing criteria before being considered for purchase.

Eco-Certification

This section introduces eco-labels and how they operate. It also describes the key elements and attributes of eco-certification, and how these determine the effectiveness and credibility of eco-labels.

Eco-certification and Eco-labels

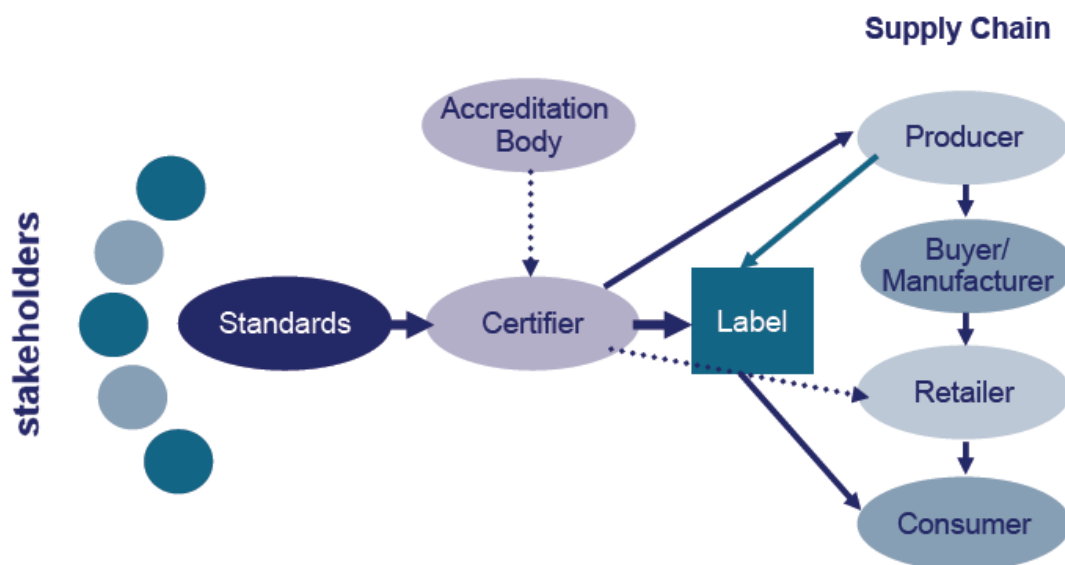
Consumers can easily determine if a product meets their need in terms of size, colour, and price. They can verify claims about taste or ease of preparation, based on their own experience of the product. However, consumers cannot readily verify product credence, i.e., claims that a product was produced in an ethical manner. This is where *eco-certification* and *eco-labels* become relevant. At its most simple level eco-certification is certification provided by a verifier that a product has been produced in a sustainable manner.

Certification systems exist for a range of credence claims, e.g., organic food, free range eggs, fair trade coffee, etc. Different certification schemes appeal to different perceived consumer values. Eco-certification schemes are simply another system of verifying product credence, in this case environmental credence. Eco-labels are used to identify product that has been certified under a particular eco-certification scheme. They are usually registered trademarks and, to an extent, are analogous to 'CSA' or Warranty stickers on manufactured products. They are visual indication that a product conforms to an underpinning set of eco-certification standards.

An eco-label indicates to a consumer that a product has been produced in a sustainable manner, and therefore is a responsible purchasing choice. Consumers are essentially seeking a simple assurance to let them know their purchase is 'OK'.

Key Elements of Eco-certification

Eco-certification schemes have a number of components and there is considerable variation amongst programs. The following diagram illustrates the key components and participants in any eco-labelling program:



Governance

Each eco-labelling scheme requires a governing body that governs the eco-certification program, writes and reviews standards, establishes and reviews auditing. Ideally, governance should

include representation of a range of stakeholders, e.g., producers, retailers and consumers, in order to capture relevant sustainability issues in the eco-certification standards.

Standards

Standards are the ‘rules’ set by the eco-labels governance body, i.e., stakeholders, that producers must comply with to achieve eco-certification and, thereby, entitlement to use an eco-label. The following are essential components of any eco-certification standard:

Scope

- What types of product are eligible to be certified, e.g. wild caught seafood/farmed seafood, etc.?
- What suite of issues is certification attempting to address, e.g., ecology, waste management, and social issues?

Criteria

- Requirements that must be met to achieve certification.

Mode

- Ranges from best practice codes, e.g. PEI Shellfish Aquaculture Environmental Code of Practice, which are largely descriptive and specify criteria in the form of actions that must be taken in order to meet desired goals, through to highly quantitative performance based standards such as those utilized by MSC for certification of fisheries. Standards may be a mix of both. Quantitative data is more rigorous, less subjective but more expensive.

Credibility

Credibility is essentially determined by the content and function of an eco-certification scheme:

Relevance

- Do the standards have sufficient scope and criteria to satisfy concerns of stakeholders and customers?

Rigor

- Does the scheme have adequate processes, independence and traceability of eco-certification to assure stakeholders and customers eco-labelled product does comply with the applicable standards?

Process

Certification involves a number of processes to ensure product that bears an eco-label conforms to the applicable certification standards:

Auditing

- The process of verifying that producers have complied with applicable standards.

Certification

- The process of assessing audit outcomes and deciding whether a producer can be certified and therefore permitted to use the applicable eco-label. Undertaken by certifiers, who are normally independent professional auditors.
- Non-conformance/improvement procedures
- The process for agreeing an improvement plan to correct non-conformance with certification standards.

De-certification (if required)

Where a producer has failed to comply with an improvement plan, or committed some severe environmental misdemeanor, then certification can be withheld, suspended or permanently withdrawn rendering the producer unable to use the eco-label. This is an important process to have as a last resort to protect the credibility of the standards program.

Traceability

Protects against counterfeit product by providing a means for customers to ensure that product bearing the eco-label has undergone certification. The review and tracking of this matter is often referred to as *chain of custody*.

Independence

Eco-certification schemes require a functional separation between governance and delivery processes. This is an accepted requirement for verification against any specified standard. In practical terms this means the organization or person undertaking auditing and certification functions, must be completely independent from the governance body that sets the standard. Auditing and certification functions are often carried out by professional independent auditors.

Customer Acceptance

To be successful in the market place an eco-label must be accepted by customers. Generally this assessment will be made by a retailer based on overall perception of other elements of the eco-certification program with a particular emphasis on governance, credibility and independence. Acceptance will also be influenced by a customer's own procurement policies and general market perceptions.

Emerging Guidance for Administering Eco-Certification Schemes

Eco-certification is still a relatively new field. Consequently, guidance for best practice is limited and varied. There is, however, a range of best practice guidance emerging. These include:

- FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries (equivalent aquaculture guidelines under development);
- ISO 65 Accreditation Standard for product certification programs;
- The ISEAL Alliances Code of Good Practice for Setting Social & Environmental Standards.

Best practice guidance documents of this kind are often called *Normative Standards*. This is because they attempt to recommend and promote consistency in the way different accreditation programs operate. While there is no universally accepted normative standard for certification of aquaculture products, analysis of the various normative standards currently available reveal some consistency amongst them.

The FAO Guidelines

The FAO sees itself as defining minimum standards in terms of the operation and requirements of seafood eco-labels. It also sees itself acting as a harmonizing force.

The FAO's *Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries* sets out 14 clear principles for operation of eco-labelling schemes. The document signals an intention to develop analogous standards for Aquaculture. Development of the FAO guidelines was motivated by:

- Concern that eco-labels could be used as trade barriers
- Variability in scientific basis of standards underpinning eco-labels
- Difficulties for developing countries to participate in programs
- Confusion to customers/consumers caused by proliferation of labels, with varying underpinning standards.

ISO 65 Accredited Certification

Often referred to as EN45011 in Europe, ISO 65 has been noted as a preferred route for companies and sectors to demonstrate that standards remain independent, non-biased and represent the supply chain and multi-stakeholder needs. It is an independent standard developed and owned by the International Standards Organization.

ISEAL Alliance

The ISEAL Alliance (originally International Social, Environmental Accreditation and Labelling Alliance) was founded as a not for profit organization as a collaboration on standards setting within an environmental and social context. ISEAL is an organization whose membership includes a number of existing eco-certification schemes (MSC, Forest Stewardship Council, Rainforest Alliance, and others). ISEAL has developed a *Code of Good Practice for Setting Social & Environmental Standards* which all its members agree to conform with. The code of practice includes guidance on:

Setting Standards

- Is there a requirement?
- Internationally defined – locally adaptable
- Based on law (WTO) and best practice (ISO & ISEAL)
- Stakeholder governance
- Transparent processes

Certification

- Third party verification (of process & delivery)
- Competent verification
- Accessibility for all users (regardless of size or location)
- Consistent delivery
- Systems not just standards (financing, capacity building, training)

Monitoring & Review

- Impacts
- Science & developments
- Reduce overlaps

ISEAL's code of practice provides useful guidance for the various components that make up a credible eco-certification scheme. It must be noted, however, that ISEAL's members are Third Party certifiers and Standards owners. This is important context for their preference that existing schemes be utilized where possible. ISEAL's members have an inherent and obvious vested interest in preventing the emergence of new standard programs which would compete with their own.

Organic Standards

The European Union, the United States, and Japan remain the markets for most organic products, so the rules in those three markets significantly influence how international standards develop. Europe embraced the notion of organic aquaculture some years ago and a number of private standards bodies developed standards for salmon, trout and some marine finfish. The International Federation of Organic Agriculture Movements (IFOAM) has provided general guidance, although in reality focused very much in the agriculture sector. Organic farming development has been under the jurisdiction of EU Regulations (2092/91), although as recently as January 2009, the regulation has been amended to include, among other things, provisions for the regulation of organic aquaculture. With effect from January 1, 2009, (EEC) Regulation 2092/91 has been replaced by Council Regulation (EC) No 834/2007 and Commission Regulation (EC) No 889/2008. This can be seen as a welcome 'leveller' within the consumer market, although many organic advocates have noted that the regulation sets lower (minimum) standards than some of the original private labels. Private standards will still exist, although must respect the minimum EU requirements.

In addition to the above, all previous Regulations dealing with Third Country Imports including (EC) Regulation 94/92, (EC) Regulation 345/2008 and (EC) Regulation 605/2008 have been replaced in their entirety by Commission Regulation (EC) No 1235/2008 which lays down detailed rules for implementation of Council Regulation (EC) 834/2007 in relation to the arrangements for imports of organic products from third countries.

In the United States, the National Organic Standards Board has spent over 10 years grappling with the organic aquaculture question. There has been a number of feasibility studies and task reports and draft standards on the subject, but as of yet there has been no agreement to move forward with the implementation of standards. Imported aquaculture products into the US have been met with a varying degree of political and legal acceptance, although there would appear to be a strong niche market for organic seafoods. In late 2008, NOSB released highly restrictive recommendations for organic finfish (all forms). Progress through this system appears slow for bivalves; in March 2009, the NOSB Livestock Committee, in response to the Aquaculture Working Group (AWG) regarding proposed organic standards for bivalves expressed a series of reservations.

Meanwhile, encouraged by international standards such as IFOAM and European organic aquaculture standardization, the drive for regulatory recognition of organic production standards for farmed finfish and shellfish has been spearheaded over many years by the Pacific Organic Seafood Association (POSA), and actively supported more recently by DFO. To that end, a working group has been formed and when their standard is completed they will send it to the Canadian General Standards Board (CSGB) for ratification. CSGB ratification involves a final ballot process and, when successful, the standard becomes certified and can be regulated. The timing of the first possible ballot is March 2010 and, if it passes, it could be regulated by December 2010. However, from a legal perspective it remains unclear how regulation will occur. For example, if it is a Canadian Agriculture Products (CAP) Act issue then CFIA are the Regulators. That raises questions such as: Would a CFIA audit process apply? Or will they accredit certification bodies? Who owns/holds the standard? If it is CGSB certified then how does the standard get changed as a living document without having to re-enter the CGSB ballot process?

International Fishmeal and Fish Oil Organization (IFFO)

IFFO is a not for profit, non-governmental Organization of global fishmeal and fish oil producers, traders and affiliates. It was formed in 2001, but has a collective history spanning 50 years under the auspices of the Fishmeal Exporters Association, International Association of Fish Meal Manufacturers (IAFMM) and International Fishmeal Oil Manufacturers Association (IFOMA).

Originally, the key role of the Organization has been on the supply, demand and marketing of materials although over the years, IFFO has become a significant conduit for members, in research, science, legislation, policy, the value chain and defending its reputation.

The Organization itself notes that after many years of successful international promotion, and with an increasing demand from aquaculture, a growing media campaign in Europe, started in 1996 to question the sustainability and wisdom of using wild fish as a feed for animals. More recently and due in part to the many examples of overfishing and inadequate government oversight in regard to conventional food fisheries, the so-called industrial fisheries or feed fisheries have sometimes been labelled as being poorly managed as well. There is concern over the sustainability of global fisheries, including fisheries that supply fishmeal and fish oil to aquaculture. In some regions, there are concerns of the origins of 'trash fish' and also of the legality of catches used in the supply of fishmeal and fish oil. The fight against Illegal, Unreported and Unregulated (IUU) fishery material is now a global agenda.

An increasing priority for IFFO has been to defend the reputation of the industry and to counter what is believed to be incorrect statements regarding the sustainability of fishmeal and fish oil.

In 1997, a Committee was formed on Fisheries and the Environment to exchange information between members on the fishery management controls in place in member countries and to keep the public informed on issues of sustainability. Since this time, there has been increasing scrutiny and debate on global fisheries and the state of many of the world's stocks. At the same time, IFFO has been defending many better managed feed fisheries, such as Peruvian Anchovy and Gulf of Mexico Menhaden.

To add to this scrutiny, the feed industry which it supplies has also been subject to numerous food scares and scandals, ranging from environmental contaminants (PCB's dioxins, pesticides) and adulteration of materials with substances such as melamine. Fishmeal and oil are internationally traded commodities forming the basis of many food chains. The need for standards and certification to support the rest of the value chain was apparent.

In response, IFFO, under an internationally represented technical committee, developed a Responsible Supply Standard in order for its members to better demonstrate their commitment to manufacturing safe, responsible sourced materials that are traceable to well managed and regulated fisheries.

IFFO Global Standard for Responsible Supply

In order to better demonstrate to all stakeholders the commitment to responsible practice in areas of feed safety, raw material procurement and delivery, a Global Standard and Certification Program for the Responsible Supply of Fishmeal and Fish Oil has been developed.

The IFFO Global Standard for the Responsible Supply of Fishmeal and Fish Oil (IFFOM RS Standard) (www.iffonet.net) was launched in September 2009. It has been developed under the

auspices of an international technical committee made up of representatives in the supply chain. Representation includes; fishing and fishmeal producer interests, fishmeal traders, fish feed manufacturing, aquaculture production, seafood processors and retailers. Two ENGO's are also represented, the Marine Conservation Society (MCS) and the World Wide Fund for Nature (WWF).

This document defines the requirements for Certification of Responsible Practice and defines the criteria for the sourcing and manufacturing of fishmeal and fish oil.

To confirm the credibility of these undertakings, a third party inspection and certification program has been established to ensure the integrity and transparency of its implementation by members of IFFO. The Certification Program has been designed to allow certification to meet the requirements of the ISO/IEC Guide 65:1996 - General requirements for bodies operating product certification programs. A unique Certification Mark – ***IFFO Assured*** - has been developed which can be used to signify compliance to the IFFO Standard.

Through the Program framework, the requirements for Certification of Responsible Practice are subject to continual review and improvement to ensure that it continues to serve IFFO member and stakeholder needs in the provision of safe, responsibly sourced fishmeal and fish oil for the International market. Many of the members of IFFO have already implemented third party feed safety and GMP assurance programmes such as FEMAS, GMP+ and IFIS.

This new IFFO Certification Program is designed to recognise and build upon each of these positive developments, creating a cost effective and credible program and allow members to visibly demonstrate their commitment to good practice.

Responsible Practices are focused on **3 key pillars**:

- **Responsible Sourcing:** of fishery material (non IUU) from fisheries that comply with the key principles of the FAO Code of Conduct for Responsible Fisheries.
- **Responsible Traceability:** of fishmeal and fish oil back to fisheries that are compliant with this Standard.
- **Responsible Production:** of safe fish meal and fish oil.

This document is focused on the responsible sourcing, production and traceability of material that is legal, safe and fished responsibly. An Applicant Fishmeal producer must be able to demonstrate compliance to the criteria through accurate documentation, record keeping and manufacturing that is traceable to best practice. It sets realistic requirements that IFFO members can transparently meet and demonstrate their commitment and adherence to these responsibilities.

Program Structure

Under the IFFO RS Standard, three main components are included in the assessment.

1. Responsible Fishery

A Responsibly Managed Fishery is described as meeting the requirements of the UN FAO Code of Conduct for Responsible Fishing. A number of normative references are used although the FAO Code forms the fundamental document for the basis of assessment in the IFFO RS Standard. The FAO CCRF is an invaluable, cornerstone document for the definition of responsible fishing practice, however its intention was not as a tool to directly measure and rate a fisheries' ability to meet the requirements within its Articles. The IFFO Standard has translated the FAO CCRF through an assessment methodology allowing

fisheries to be rated according to their compliance.

2. Traceable and avoidance of IUU

An assessment of the origin of manufactured materials to ensure that they can be traced back to legal, regulated and reported landings from the fishery that has been approved as responsibly managed.

3. Responsible Production

IFFO Standard sets key requirements for the safe and responsible manufacture of fishmeal and fish oil. There are a number of internationally accredited (ISO65) administered feed material safety and good manufacturing programs that the industry has already accessed and implemented. These include raw material, in process and storage handling, facilities and premises and requirements for HACCP, hygiene and the control of contaminants. Where these are shown to be equivalent to IFFO Standard requirements, third party certificates are accepted.

As of November 2009, even though the IFFO RS had only recently been launched, it has already attracted international attention and confidence from the value chain with a number of international aquaculture businesses and feed businesses requesting that fishmeal and oil suppliers implement and become certified.

Conclusion

Given the intended nature of this report, suggesting a “conclusion” at this stage would be inappropriate. While clear and obvious answers to the many questions posed by industry is highly desirable, the current global environment suggests that a level of uncertainty can be expected regarding future standards and certification ‘winners,’ or absolute market requirements and directions.

It was in this climate of uncertainty that CAIA established the Canadian Aquaculture Standards Forum (CASF) in 2008 to assist its members navigate forward. This paper is meant to facilitate the dialogue process and, in that regard, is by far the final word with respect to any matter covered. It is hoped this paper will form the basis of further analytical work in this subject area for the general benefit and advancement of CAIA members.

Glossary

A

Accreditation

Formal approval by an external body against a specific standard. The external body may be the owner of the standard or an organization approved by them.

Accredited Auditor

An auditor who has been approved to a specific scheme/program.

Accredited Certification Body

An organization which has been approved to endorse a specific standard.

Algal Bloom

An algal bloom is a proliferation of either phytoplankton or seaweed and is a natural phenomenon. However, nutrient pollution has resulted in a substantial increase in algal blooms along many coastal regions over the past two decades. Phytoplankton blooms can produce toxic effects on humans and other organisms, cause physical impairment of fish and shellfish, or result in severe oxygen depletion of bottom habitats. Blooms involving phytoplankton are sometimes called “red tides” though, in reality, they can be of various colors, or not visible at all. Even miniscule doses of some algal toxins, such as domoic acid or saxitoxin, can cause severe illness or death in humans. Most algal species, however, pose no threat to human health.

Animal Welfare

Animal welfare is the viewpoint that animals, especially those under human care, should not suffer unnecessarily, including where the animals are used for food, work, companionship, or research. This position usually focuses on the morality of human action (or inaction), as opposed to making deeper political or philosophical claims about the status of animals, as is the case for an animal rights viewpoint. For this reason animal welfare organizations may use the word *humane* in their title or position statements.

Antibiotic free

Antibiotic free refers to animals raised without the use of antibiotics. While the U.S. Department of Agriculture does not allow use of the label “antibiotic free” on meat products, the USDA does allow the claims “no antibiotics administered” or “raised without antibiotics.”

Audit

A systematic process used to determine the extent to which requirements are being met, carried out by a competent person(s).

Aquaculture

Aquaculture is the farming of aquatic species, such as fish and shellfish, in salt, brackish, or freshwater. Farming implies private ownership and enhancement of production by stocking, feeding, providing protection from predators and other management measures. According to the Food and Agricultural Organization’s latest figures, about 48% of the seafood consumed worldwide is farm-raised.

Audit - External

An audit carried out by an auditor with no employment relationship with the supply chain. This may be a 2nd or 3rd party audit depending on who is the client.

Audit - Internal

An audit carried out by an auditor who is either an employee or under the management of the direct supplier. This is also known as a 1st party audit.

Audit Report

A written confirmation of the findings at the audit. The format of the report may be specified by the audit standard or the client.

B**Benthos**

The community of marine life inhabiting the sea floor is referred to as the benthos.

Best Management Practice (BMP)

BMPs are processes or procedures that demonstrate a business' dedication to making progress in environmental and corporate social responsibility; sometimes shared with collaborators and competitors to shape standards for an industry.

Bioaccumulation

The accumulation of a substance (typically a persistent chemical or heavy metal) in the tissue of a plant or animal, generally through the uptake of water or food, at a rate faster than the plant or animal can excrete it, resulting in a steady increase in contamination over the organism's lifetime.

Biocatalyst

A substance, such as an enzyme, that initiates or modifies the rate of a biological process and is generally consumed in that process (in contrast with a chemical catalyst, which accelerates a chemical reaction without being consumed).

Biodegradable

Material that, left to itself, will be decomposed by natural processes.

Biodiversity

A contraction of biological diversity, the term 'biodiversity' reflects the number, variety and variability of living organisms, including humankind.

Biomass

This is the total weight of a number of organisms or population of a species. It is possible for a fish population to have a high biomass and be overfished.

Bioplastics

A new generation of compostable and biodegradable plastics which are made from readily renewable resources such as corn, soybeans, and potatoes.

Bivalve shellfish

Aquatic animals that have a hinged two-part shell, such as clams, mussels, oysters and scallops. Also known as molluscs.

Brundtland Report

A 1987 report of the United Nations World Commission on Environment and Development. The report includes both environmental and social goals, recognizing that long-term environmental protection requires appropriate economic development.

C-D**Canadian Shellfish Sanitation Program**

A program that ensures the safety of Canadian shellfish through coordinated efforts of the Canadian Food Inspection Agency, Fisheries and Oceans Canada, and Environment Canada. The program provides early warning of the appearance of domoic acid and other biotoxins in bivalve shellfish (such as oysters, clams, scallops, mussels and cockles). The program also operates a tagging program whereby every bag of oysters,

clams, or mussels taken from Canadian waters is tagged with the location, time and date of harvest so that if there is a disease outbreak linked to shellfish, there is a way to trace back to the specific harvest location.

Carbon Neutral

This term effectively means net zero carbon emissions to the atmosphere. Achieving carbon neutrality means measuring the carbon emissions for an identified product, service or company, then balancing those emissions with carbon reductions or carbon offsets to reach net zero carbon emissions.

Certification body (CB)

Legal or administrative entity tasked with performing certifications. May also be called an ‘inspection body.’

Chain-of-custody

This is the traceability element for many certification programs. It ensures the path taken by raw materials - from ‘ship to store’ - and confirms that certified product only is entering the chain. It means that consumers and seafood buyers can have confidence that the fish they are buying can be traced back to a certified aquaculture farm site.

CITES

Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Copepods

Copepods are a large group (approximately 6,000 species) of tiny shrimplike crustaceans. They are an important food source for many larger animals, including fish, seabirds, and baleen whales.

Common Fisheries Policy (CFP)

The policy under which the EU manages all fisheries within the European EEZ.

Compostable

Organic material that can be biologically decomposed under aerobic conditions.

Conservation Alliance for Seafood Solutions

An alliance of over a dozen conservation organizations from the United States and Canada that pursue a common vision for sustainable seafood and work together using a range of approaches to bring conservation expertise to companies that buy and sell seafood.

Country of Origin Labeling (COOL)

COOL requires large food retailers to label where products come from, including beef, lamb, pork, seafood, fresh and frozen fruits and vegetables and peanuts. Although signed into US law several years ago, only seafood has been compliant since 2005; other proteins listed above became compliant in September. COOL does not require that value-added and processed foods be labeled. COOL is intended to increase food product traceability.

Cradle-to-Grave Assessment

See Life Cycle Analysis

Crustacean

Crustaceans are the aquatic analogs of insects, both being members of the phylum Arthropoda. Found in both fresh and salt water, crustaceans are invertebrates and characteristically have a segmented body and exoskeleton, with limbs that are paired and jointed. Lobsters, crabs, shrimp and barnacles are examples of crustaceans.

E

Eco-Design

Eco-design corresponds to a product design that takes into account the environmental impact of a product throughout its lifecycle, ranging from extraction of raw materials to production, transportation, use, recycling, and final disposal.

Eco-Efficiency

The productivity of something compared to its use of resources and its environmental impact, or the efficiency with which the Earth's resources are used to meet human needs.

Eco-friendly

The term eco-friendly refers to a product, practice or process that is "green" or good for the environment, creating no unnecessary or hazardous waste and minimizing use of non-renewable, natural resources.

Eco-labeling

Eco-labeling is a method of identifying products that cause less damage to the environment than other products. There exists a wide selection of eco-labels with different criteria and varying degrees of legitimacy. While some labels indicate that food was produced according to strict guidelines enforced and verified by third-party food-certifying agencies, other labels are self-awarded by food producers.

Ecological footprint

Similar to a carbon footprint, an ecological footprint is the total amount of land, food, water and other resources used by, or the total ecological impact of, a person's subsistence or an organization's operations; usually measured in acres or hectares of productive land.

Ecosystem

A dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit.

Ecotoxicity

Property of a substance to cause harmful effects on living organisms or their physiology (biochemical effect) and their functional organization (ecosystem).

Effluent

The waste stream flowing from an aquaculture facility. Wastes can include: particulate matter from fecal material and uneaten food; nutrients; and chemicals and drugs such as pesticides, disinfectants, and antibiotics.

Employee Interviews

Private & confidential interviews held between a worker and an auditor. They are a cross-referencing tool for an auditor, typically an integral part of a social audit. Individual worker interviews may be carried out in isolation of a focus group or in addition to them.

END of LIFE (EoL)

The moment when a product ended to fulfill the tasks it was designed for. The end-of-life of a product is not the end of its life cycle, since its environmental impact has not yet come to an end; the disassembly, recycling, incineration, and/or disposal phases still remain.

Energy Efficiency & Energy Conservation

The reduction in energy intensity required to achieve a specific result; the behavioral and economic aspects of providing efficient services requiring less energy through alternative means.

ENGO

An environmentally focused Non-Governmental Organization or charity.

Environmental impact

Environmental impact refers to any change that would affect the environment, good or bad, wholly or partially from industrial/manufacturing activities, products or services.

Environmental Impact Assessment

Process by which the environmental consequences of a proposed project or program are evaluated and alternatives are analyzed. EIA is an integral part of the planning and decision-making processes.

Environmental Management Systems (EMS)

Tools that enable an organization to employ a systematic approach to identify, monitor, and control the impact of its activities, products, or services on the natural environment. The international benchmark for EMS is the ISO 14001 standard.

Ethical sourcing

Ethical sourcing, sometimes called ethical trade, is an approach to food-chain management and generally refers to a company's strategy for taking responsibility for social, environmental and labor practices across its supply chain. Most often, the company setting the standards implements and audits adherence to these standards. In some cases, multiple stakeholders work together as stewards of a company's ethical sourcing standards.

EU - European Union.

Eutrophication

The process by which a body of water accumulates nutrients, particularly nitrates and phosphates. This process can be accelerated by nutrient-rich runoff or seepage from agricultural land or from sewage outfalls, leading to rapid and excessive growth of algae and aquatic plants and undesirable changes in water quality.

Exclusive economic zone (EEZ)

The maritime zone under national jurisdiction (up to 200 nautical miles from the coast), within which a coastal state has the right to explore and exploit, and the responsibility to conserve and manage, the living and non-living natural resources.

F**FAO**

Food and Agriculture Organisation of the United Nations.

Feed Conversion Ratio (FCR)

The ratio of the gain in wet body weight of fish to the amount of dry feed fed to the fish. Currently, farming of carnivorous fish results in a net loss of fish or protein, since these fish require fish oil and fishmeal for feed. Farming herbivorous and omnivorous fish, such as carp, catfish, and tilapia, results in a net gain of fish or protein, since these fish consume a plant-based diet.

Fishmeal

Protein-rich meal derived from processing whole fish (usually small pelagic forage fish, and bycatch) as well as by-products from fish processing plants. Used mainly as feeds for poultry, livestock, and, to a lesser extent, aquaculture species.

Flow-through System (Raceway)

A flow-through system, or raceway, is a type of aquaculture system in which water is diverted from nearby streams or pumped from wells into concrete troughs or tanks where fish are held. The water flows through a series of raceways before being discharged, usually with some form of wastewater treatment.

Focus Group

A group of workers who participate in private and confidential interviews with an auditor.

Follow Up Audit

Audits carried out after the initial appraisal, the main purpose of which is to confirm that agreed corrective actions have been completed.

Food Chain

A food chain is the sequence of organisms through which energy and materials are transferred (in the form of food), or the linear progression of feeding levels in which one organism is the food source for the next.

Food miles

Food miles refers to the distance food travels from farm or harvest to consumer. Food miles translate into carbon dioxide emissions, but the food miles measure does not take into account carbon emissions from food production (grow-out or processing) or the varying amounts of carbon emissions in air and ground transportation. There is currently no certifying or labeling agency for food miles claims.

Food Web

This is the complex, interlocking series of individual food chains in an ecosystem, i.e., all the predator-prey relationships.

Friend of the Sea

Friend of the Sea is a non-profit, non-governmental organization that operates a sustainable seafood certification scheme for products originating from fisheries and aquaculture.

G

Global Reporting Initiative (GRI)

Based in Amsterdam, GRI is a worldwide, multi-stakeholder network of business, civil society, labor, investors, accountants and others who provide sustainability reporting frameworks and guidelines that take into account environmental, social and economic performance. This network collaborates through consensus-seeking approaches to create and continuously improve the Reporting Framework. The framework is intended to facilitate transparency and accountability by organizations around the world.

Global Sullivan Principles

A corporate code of conduct developed by the late civil rights leader Reverend Leon Sullivan, who played a significant role in the international movement that eventually helped end apartheid in South Africa. Sodexo is the first company within the food and facilities management industry to become a Global Sullivan endorser.

Global Warming

The progressive gradual rise of the earth's surface temperature thought to be caused by the greenhouse effect, triggered by increased carbon emissions from burning fuel and other economic activities, and responsible for changes in global climate patterns. The term is most often used to refer to the warming predicted to occur as a result of increased emissions of greenhouse gases. Also referred to as Climate Change.

Green building

A comprehensive process of design and construction that employs techniques to minimize adverse environmental impacts and reduce the energy consumption of a building, while contributing to the health and productivity of its occupants.

Greenhouse Effect

The rise in temperature that the Earth experiences because certain gases in the atmosphere (water vapor, carbon dioxide, nitrous oxide, and methane, for example) trap energy from the sun. Because of their warming effect, these gases are referred to as greenhouse gases. Without them, more heat would escape back into space and the Earth's average temperature would be about 33°C colder. Similarly, their rapid accumulation in the atmosphere can lead to rising temperatures.

Greenhouse Gases

A gas such as carbon dioxide or methane that reflects infrared radiation emitted by the earth, thereby helping to retain heat in the atmosphere.

Green Procurement

Green procurement has been defined as “The use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life-cycle so as not to jeopardize the needs of future generations.” (UN CSD International work program, adopted in 1995).

Greenwashing

The process by which a company publicly and misleadingly exaggerates or embellishes the environmental attributes of itself or its products, while participating in environmentally - or socially-irresponsible practices.

H

HACCP

Hazard Analysis and Critical Control Points is an internationally recognized system for ensuring safe food production. The underlying approach to preventing foodborne illness and promoting quality is to identify the danger spots and aim to avoid them. HACCP works by the following principles:

- Identify the likely health hazards in a given product.
- Identify the critical points in the processing where the hazards may occur.
- Establish safety measures to prevent the hazard from occurring.
- Monitor to make sure the safety measures are working.
- Establish an appropriate remedy if monitoring shows a problem.
- Establish detailed record keeping to document monitoring and remedies taken.
- Verify that the whole system is working.

Hazardous Waste

Hazardous waste is a waste with properties that make it dangerous or potentially harmful to human health or the environment. The universe of hazardous wastes is large and diverse. Hazardous wastes can be liquids, solids, contained gases, or sludges. They can be the by-products of manufacturing processes or simply discarded commercial products, like cleaning fluids or pesticides.

Heavy Metal

A high-atomic-weight metal such as arsenic, cadmium, chromium, cobalt, lead, mercury, uranium or zinc. Heavy metals can be toxic to plants or animals in relatively low concentrations and tend to accumulate in living tissue.

Hypoxia

A state of low dissolved oxygen concentration relative to the level required by oxygen-breathing species. Anoxia is the complete absence of oxygen in the water. Those living creatures that cannot flee oxygen-depleted zones may die if levels drop too low. Every spring, for example, a huge hypoxic region, or “dead zone,” covering about 8,000 square miles appears in the northern Gulf of Mexico due, in large part, to nutrient run-off from the use of agricultural fertilizer.

I-L

ICES

International Council for the Exploration of the Sea. Scientists working through ICES gather information about the marine ecosystem. ICES Advisory Committee develops this information into advice which is used by the 20 member countries to help them manage resources in the North Atlantic Ocean and adjacent seas.

Ichthyology

This is the study of fishes, including their biology, life history, habitat, diversity and classification.

Independent Monitoring System

A system which is not directly controlled or influenced by the supply chain

Industrial fisheries

Fleets of large vessels, using highly mechanized means to catch and process fish and shellfish, particularly for purposes other than human consumption (e.g. fishmeal, fertilizer).

Industrial Ecology

An interdisciplinary field that focuses on the sustainable combination of environment, economy, and technology.

Initiative Clause Sociale (ICS)

French retailers scheme/program.

Integrated Pest Management

The IPM approach relies on non-chemical means to prevent and manage pests, for example, controlling climate, food sources, and building entry points. Chemical treatments are only used in a crisis situation threatening rapid losses or when pests fail to succumb to more conservative methods. IPM uses less pesticides than conventional practices.

Impurity

An unintended constituent present in a substance as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While it is present in the final substance it was not intentionally added.

ISEAL

The ISEAL Alliance is the global association for social and environmental standards systems. Members include: Fairtrade Labelling Organizations (FLO) International; Forest Stewardship Council (FSC); International Federation of Organic Agriculture Movements (IFOAM); International Organic Accreditation Service (IOAS); Marine Aquarium Council (MAC); Marine Stewardship Council (MSC); Rainforest Alliance; Social Accountability Accreditation Service (SAAS); Social Accountability International (SAI); Union for Ethical BioTrade (UEBT).

ISO 65

ISO guide 65 (or EN45011 as it is known in its European version) is the International Standards Organization guideline 'General requirements for bodies operating product certification systems'. It ensures that ISO 65 accredited bodies provide:

- **Independence:** a certification body must be independent of any external pressure being able to influence a certification decision.
- **Transparency:** the evaluation and certification processes must be transparent and explained to all parties before inspection.
- **Quality:** certification decisions can only be consistent and suitable if there are proper internal control mechanisms. The existence of a quality control system, for example, supported by regular internal audits, is essential to identify problems and continuously improve service.

- Equality: all producers must be treated equally.

IUCN

World Conservation Union (formerly the International Union for Conservation of Nature and Natural Resources).

IUCN Redlist

The world's most comprehensive inventory of the global conservation status of plant and animal species. It is widely considered to be the most objective and authoritative system for classifying species in terms of the risk of extinction. Classification groups are: Data Deficient, Near Threatened, Vulnerable, Endangered, Critically Endangered, Extinct in the Wild, or Extinct.

IUU fishing

Illegal, unreported and unregulated fishing. Also known as pirate fishing.

Life Cycle Analysis

A comprehensive examination of the environmental and economic effects of a product at every stage of its existence, from extraction of raw materials to its eventual disposal and assimilation into the environment. Also known as cradle-to-grave assessment.

Listeriosis

A type of food poisoning caused by the bacterium *Listeria monocytogenes*. Unlike most other harmful bacteria, *Listeria monocytogenes* will grow (slowly) on foods stored in a refrigerator. Safe food handling procedures will prevent most cases of illness from this bacterium. Specifically with respect to seafood, to prevent listeriosis pregnant women, young children, older adults or those with weakened immune systems should avoid refrigerated smoked fish products unless the products have been cooked, for example, in a casserole.

M

Main Constituent

A constituent, not being an additive or impurity, in a substance that makes a significant part of that substance and is therefore used in substance naming and detailed substance identification.

Management System

Activities carried out by senior management to ensure that compliance to a standard is both achieved and thereafter maintained.

Mandatory Requirement

A “must” do, or “must” have.

Marine biotoxins

Marine biotoxins are a group of natural toxins that sometimes accumulate in fish and shellfish. Many biotoxins are produced by microscopic marine algae (phytoplankton, including diatoms and dinoflagellates) and can accumulate in fish or shellfish if they ingest these algae.

Marine Stewardship Council

A global, non-profit organization founded in 1997 to promote responsible fishing practices worldwide. The MSC label assures that the product comes from a well managed fishery and has not contributed to the environmental problem of over fishing.

Maximum Sustainable Yield

The maximum amount of a renewable resource that can be harvested over an indefinite period without causing its stock to be depleted.

Molluscs

Aquatic animals that have a hinged two-part shell (bivalve shellfish), such as clams, mussels, oysters and scallops, as well as various types of octopus, snails and squid.

Monitor

To continuously check a factory site for compliance, either by an internal or external system.

Monterey Bay Aquarium

Finalized a list of seafood (as part of a 1997-1999 “Fishing for Solutions” exhibit) about making better seafood choices. The list evolved into the *Seafood Watch* pocket guide for consumers.

Multiple Audits

These occur when a contractor is audited several times for different customers. A common complaint is that these are both disruptive, non-productive, and costly.

N**National Fisheries Institute**

Organization committed to sustainable management of the oceans and being stewards of the environment by endorsing the United Nations’ Principles for Responsible Fisheries, recognizing the value of ensuring the industry does not adversely affect surrounding ecosystems or damage native species. NFI supports and promotes sound public policy based on hard science.

New England Aquarium

One of the first aquariums in the world to create a conservation department. Their mission is to address aquatic conservation problems, locally and globally, by creating and linking community efforts with research, policy and public awareness.

Non Compliance

Any area where investigation highlights a variation from the required standard.

Non Renewable Resource

A resource with a more or less finite initial endowment that can be depleted over time.

Not Chemically Modified Substance

A substance whose chemical structure remains unchanged, even if it has undergone a chemical process or treatment, or a physical mineralogical transformation, e.g., to remove impurities

O**Observation**

In the view of the auditor an issue which is not a non-compliance but an opportunity for improvement.

Ocean Wise

Ocean Wise is a Vancouver Aquarium conservation program created to educate and empower consumers about the issues surrounding sustainable seafood. Ocean Wise works directly with restaurants and markets, helping them make more ocean-friendly buying decisions, which are highlighted on their menus and display cases with the Ocean Wise symbol.

OECD

Organization for Economic Cooperation and Development.

Organic

A term signifying the absence of pesticides, hormones, synthetic fertilizers and other potentially toxic

materials in the cultivation of agricultural products; 'organic' is also a food labeling term that denotes the product was produced under specific Governmental Regulatory approval.

Overfishing

In fisheries science, overfishing is occurring when the fishing mortality has reached an explicit limit set by management, above which the stock is expected to decline towards an overfished state. (Exact definitions vary between management systems).

Ozone

A chemically unstable and highly reactive gas (each molecule of which consists of three atoms of oxygen in contrast with the usual two) found mainly at ground level in cities and in the stratosphere. At ground level, ozone can be a lung irritant. In the stratospheric ozone layer, the gas plays an important role in protecting the Earth's surface from high levels of biologically damaging ultraviolet (UV) radiation, which is known to be a significant risk factor for skin cancers, eye cataracts, and the suppression of mammalian immune systems.

Ozone Layer

The region of the stratosphere (lying approximately 15-40 km above the Earth's surface) that contains the bulk of the world's atmospheric ozone.

P-R

Persistent organic pollutants (POPs)

Organic chemicals that remain intact in the environment for long periods, become widely distributed geographically, and biomagnify up the food chain by accumulating in fatty tissues of animals.

Polyculture and Integrated Aquaculture

The farming of two or more species in the same aquaculture system; it may involve animals, plants, or plants and animals together. These methods can improve the environmental performance of aquaculture because waste products are used instead of discharged into the environment.

Precautionary Principle

A proactive method of dealing with the environment that places the burden of proof on those whose activities could harm the environment rather than on the public. It is the opposite of the wait-and-see principle; acting before scientific proof of deleterious effects is applying a precautionary approach.

Quality Management Program (QMP)

A regulatory-based system that requires all federally registered fish processing plants in Canada to develop and implement an in-plant quality control program.

Recycled Materials

Raw materials derived from recycling of waste and that can be used in manufacturing of a new product.

Recycling

Plastic waste materials processing for the original purpose or for others, excluding energy recovery.

Renewable Energy

Energy produced from natural elements (sun, wind, water, earth): solar and wind energy, hydroelectricity, geothermal, biomass, tidal, biogas from landfills, etc.

Renewable Resource

A resource that is capable of being replenished through natural processes (e.g., the hydrological cycle) or its own reproduction, generally within a time-span that does not exceed a few decades. Technically, metal-bearing ores are not renewable, but metals themselves can be recycled indefinitely.

Repurposing

Cleaning or refurbishing that allows a product to be reused again in its current form, thereby extending its useful life.

Risk Assessment

A structured analysis of the potential damage to a business that could be caused by an organizations failure to meet the requirements of a standard.

S**SeaChoice**

SeaChoice is a seafood markets program with the primary goal of fostering sustainable fisheries in Canada and abroad. With the SeaChoice program as a common voice, five environmental organizations (Canadian Parks and Wilderness Society [CPAWS], David Suzuki Foundation, Ecology Action Centre, Living Oceans, Sierra Club Canada [BC Chapter]) work together through a coalition entitled *Sustainable Seafood Canada* to raise public awareness regarding oceans and sustainable fisheries.

Shellfish

Aquatic animals that have a hinged two-part shell (bivalve shellfish), such as clams, mussels, oysters and scallops. Also known as bivalve molluscs.

Shellfish poisoning

Serious and potentially fatal illness resulting from eating shellfish with high levels of naturally occurring marine biotoxins (Paralytic Shellfish Poisoning [PSP], Amnesic Shellfish Poisoning [ASP] and Diarrhetic Shellfish Poisoning [DSP]). Bivalve shellfish feed on microscopic algae that can sometimes produce naturally occurring marine biotoxins, which in turn can build up in their tissues.

Social Accountability International (SAI)

SAI is an international not-for-profit human rights organization dedicated to the ethical treatment of workers around the world. Developer of SA8000 which is a standard and verification system for managing ethical workplace conditions throughout global supply chains. SAI works with companies, consumer groups, ENGOs, workers and trade unions, local governments, as well as a network of agencies accredited for SA8000 auditing, to help ensure that workers of the world are treated according to basic human rights principles by providing solutions for ethical supply chain management.

Socially Responsible Investment (SRI)

Socially responsible investment made on the basis of social, environmental and ethical criteria, along with financial performance.

Solid Waste

Non-liquid, non-soluble materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities which contain complex and sometimes hazardous substances, including garbage, ashes, industrial wastes, construction debris, commercial refuse, sewage sludge, and discards such as appliances, furniture, and equipment.

Stakeholders

Internal and external parties concerned by operation of the enterprise: employees, clients, suppliers, shareholders, associations, civil partnership, public authorities, etc.

Substance

A chemical element and its compounds, in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent, which may be separated without affecting the stability of the substance or changing its composition. For instance: Cadmium, Formaldehyde, etc.

Sustainable Development

“A development that meets the needs of the present without compromising the ability of future generations to meet their own needs,” according to the Report of the World Commission on Environment and Development 1987 [Brundtland Commission].

Sustainable Seafood

Sustainable seafood refers to fish or shellfish caught or farmed in a manner that does not risk the species' future or harm the environment. Factors that influence seafood sustainability include overfishing, bycatch and the environmentally destructive impacts of trawl nets, and escapements.

T-W**Toxic Waste**

A waste that poses a substantial present or potential hazard to human health or the environment. It includes wastes that are poisonous, carcinogenic, mutagenic, teratogenic, phytotoxic or toxic to aquatic species.

Traceability

The ability to trace the history, application or location of an entity by means of recorded identifications. External traceability, refers to systems aimed to allow the traceability of a product and/or attribute(s) of that product through the successive stages of the distribution chain (farm to table). Internal traceability refers to the traceability of raw materials, intermediate and final products within a productive or commercial unit, e.g., within the farming operation. Internal traceability systems are also aimed at productivity improvement and cost reduction.

Triple Bottom Line

A business venture's simultaneous pursuit of beneficial outcomes along three dimensions: economic, social, and environmental. The often-cited phrase, “people, planet, profit” is an alternate and self-explanatory reference to the concept of triple bottom line.

Trophic level

The position that an organism occupies in a food chain, i.e. what it eats, and what eats it.

United States Department of Agriculture (USDA)

The USDA regulates the definitions of organic and natural products and has jurisdiction for the inspection of production facilities.

USDA Organic Label

Products carrying this label are certified according to USDA standards.

Verification

A process of checking that corrective actions have in fact been implemented.

Vibrio parahaemolyticus

A naturally occurring bacterium found in Canada's coastal waters, and which during the summer months can increase to levels that may cause illness, particularly in oysters. Infection results in gastroenteritis, typically including diarrhea and abdominal ("stomach") cramps which may last several days. Cooking shellfish thoroughly is the most effective way to prevent illnesses from bacteria or viruses. This is especially recommended during the summer months when levels of *Vibrio parahaemolyticus* bacteria are at their highest.

Waste Water

Water used in domestic, agricultural, commercial or industrial process and, as a result, contains pollution that has potentially harmful substances.