Best Aquaculture Practices Standards for the Tilapia Industry:
Certification for Greater Sustainability

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The New Market Perspective

Consumers want more assurance about quality and safety of their seafood.

Certification addresses:
- Environmental and social responsibility
- Seafood safety
- Provides traceability
What is Certification?

Procedure by which a third party provides written or equivalent assurance that a product, process or service conforms to specified requirements.

Certification may be based on a range of inspection activities, including continuous inspection in the production chain.
What Drives Certification?

- **The Market!**
  - Consolidation has led to more powerful buyers who wish to protect their brands.

- Certification is a mechanism for major buyers to influence production practices throughout the supply chain.
Certification as a Solution

In 2003, the Economist Magazine stated in their special report on The Blue Revolution:

“An internationally recognized certification scheme is urgently needed to alert consumers to the sustainability (or otherwise) of the farmed fish they are eating...only then will it be clear how green is the blue revolution”
Market-Driven Certification Programs Are Growing in Many Industries

- Cocoa
- Coffee
- Ferns and cut flowers
- Fruits
- Tea
- Lumber
- Palm oil
- Seafood
Seafood Programs

Organizations providing ‘recommendation lists’ to consumers:
- Australian Marine Conservation Society (AMCS)
- Greenpeace
- Marine Conservation Society UK (MCS)
- Monterey Bay Aquarium (MBA)
- NOAA Fisheries Fish Watch
- The North Sea Foundation: Goede Vis
- Sustainable Fisheries Partnership (SFP)
- World Wide Fund for Nature (WWF) International, and WWF Hong Kong, etc.

Standard-setting, certification and eco-labelling schemes:
- Friend of the Sea (FOS)
- Marine Ecolabel Japan (MEL-Japan)
- Marine Stewardship Council (MSC)
- Global Aquaculture Alliance (GAA)
- Global GAP
- Naturland
- Soil Association; RSPCA UK, etc., etc.

National Programs:
- Iceland
- Thailand
- Bangladesh
Attributes of Certification Standards Development

- Multi-stakeholder
- Consensus-based
- Transparent and inclusive
- Achievable
- Science-based
- Continuously improved
- International guidelines: FAO, ISO, GFSI...
Global Aquaculture Alliance (GAA)

• An international, non-profit trade association dedicated to advancing environmentally and socially responsible aquaculture.

• GAA recognizes that aquaculture is the only sustainable means of increasing seafood supply to meet the food needs of the world's growing population.

• Through the development of its Best Aquaculture Practices (BAP) certification standards, GAA is a leader standards-setting organization for aquaculture seafood.
GAA Programs

- Fact-based Communications
  - Advocate magazine
  - Website (www.gaalliance.org)
  - Electronic newsletter
- Advocacy
- Networking
- Certification Standards (BAP)
- Data Collection
- Meetings
  - Global Outlook for Aquaculture
  - Leadership (GOAL)
GAA’s Best Aquaculture Practices

• Standards for Hatchery, Farm, Feed Mill, and Processing Plant

• Standards in place for:
  – Shrimp
  – Channel catfish
  – Tilapia
  – Pangasius
  – Salmon, mussels, others in process

• ISO certified inspection bodies

• GFSI benchmarked

• Consumer-facing Ecolabel
Current BAP Standards

- hatchery
- feed mill
- processing plant
- farm

www.gaalliance.org/bap/standards.php
BAP Standards
Under Development

salmon

mussels

marine fish
Process of Development of BAP Standards

• Standards Oversight Committee
  – 4 NGOs, 4 Industry, 4 Academic/Policy

• Technical committees

• Public comment period

• Continual revisions

• Committed to compliance with:
  – FAO Guidelines for Aquaculture Certification
  – Global Food Safety Initiative
Standards Development Process

1st draft

Technical Committee

Public Review

2nd draft

4-Industry
4-Environmental NGOs
4-Academic/regulatory

Standards Oversight Committee

Annual Review

FINAL VERSION
<table>
<thead>
<tr>
<th><strong>Community</strong></th>
<th>Property Rights and Regulatory Compliance</th>
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<td>Community Relations</td>
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<td>Worker Safety and Employee Relations</td>
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<td><strong>Environment</strong></td>
<td>Sediment and Water Quality</td>
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<td>Fishmeal and Fish Oil Conservation</td>
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<td>Control of Escapes and Use of GMOs</td>
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<td>Predator and Wildlife Interactions</td>
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<td>Storage and Disposal of Farm Supplies</td>
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<td><strong>Animal Welfare</strong></td>
<td>Health and Welfare</td>
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<tr>
<td></td>
<td>Biosecurity and Disease Management</td>
</tr>
<tr>
<td><strong>Food Safety</strong></td>
<td>Control of Residues and Contaminants</td>
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<td></td>
<td>Harvest and Transport</td>
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<tr>
<td><strong>Traceability</strong></td>
<td>Record-Keeping Requirement</td>
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## BAP Standards Address the Entire Production Chain

<table>
<thead>
<tr>
<th></th>
<th>Hatchery</th>
<th>Farm</th>
<th>Feed</th>
<th>Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Social</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Food Safety</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Traceability</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
BAP Standards: Certification Mechanism

• Independent inspectors/auditors and certification body
  – No conflict of interest
  – 3rd party

• Allow for farm cluster certification

• Chain of custody/traceability
BAP Certification Process

• Training
  – Auditors of processing plants, farms, feed mills, and hatcheries
  – Facility operators

• Audits
  – Conducted by ISO 65 inspection bodies

• Food Safety
  – BAP Standards are compliant with GFSI benchmarking
  – Food safety testing by ISO certified labs

• Online and internal traceability
BAP Traceability Database
Certified Facilities Can Use BAP Mark on Retail Packaging
Tilapia Farm Certification

Tilapia Farm Facilities wanting to become BAP certified shall complete the following steps:

1. Review Certification Application Form and BAP Standard for Tilapia Farms.
2. Return completed application form to the BAP office.
3. Registration of Applicant, Signing of Facility Agreement, and Payment of Inspection Fees.
5. Client pays BAP program fees.
6. Check ACC website for company listings.
7. Use of the BAP logo.
8. Maintain records and input online verification data.
9. Recertify each year.

www.aquaculturecertification.org
Best Aquaculture Practices for Tilapia

- Promotion of responsible practices in the tilapia industry.
- Global standards that comply with the requirements for environmentally friendly and socially equitable practices.
- Promote sustainability and comply with government regulations and consumer demands.
GAA Develops Standards for Best Aquaculture Practices

- **Community**
  - Community rights
  - Child labor and worker safety

- **Environment**
  - Habitat
  - Effluents
  - Salinization

- **Animal Welfare**
  - Tilapia Husbandry

- **Food Safety**
  - Drug and Chemical Management
  - Microbial Sanitation
  - Traceability
Standard 1

Property Rights and Regulatory compliance

Shall comply with local and national laws and environmental regulations.

Provide current documentation that demonstrates legal rights for land and water use, construction, operation and waste disposal.
Standard 2

Community Relations

Shall not block access to public areas, common land, fishing grounds or other traditional natural resources used by local communities.
Standard 3
Worker Safety and Employee Relations

Tilapia farms shall comply with local and national labor laws to assure adequate worker safety, compensation and, where applicable, reasonable on-site living conditions.

- Provide legal wages
- Safe working environment
- Adequate living conditions
**Standard 4**

**Wetland Conservation and Biodiversity Protection**

- Tilapia culture ponds shall not be located in mangrove or other wetland areas where they displace important natural habitats.

- Farm operation shall not lessen biodiversity or cause other ecological damage in surrounding ecosystems.
Standard 5

Effluent Management

Tilapia farmers shall monitor their discharges to confirm compliance with BAP effluent water quality criteria.

- Avoid water quality deterioration in mixing zones.
- Minimize loads of pollutants discharged into receiving water bodies.
## Standard 5
**Effluent Management**

Water quality criteria for land-based farms

<table>
<thead>
<tr>
<th>Unit</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH (standards units)</td>
<td>6.0-9.5</td>
</tr>
<tr>
<td>Total suspended solids (mg/L)</td>
<td>100 or less</td>
</tr>
<tr>
<td>Soluble phosphorus (mg/L)</td>
<td>0.5 or less</td>
</tr>
<tr>
<td>Total ammonia nitrogen (mg/L)</td>
<td>5 or less</td>
</tr>
<tr>
<td>5-day biochemical oxygen demand (mg/L)</td>
<td>50 or less</td>
</tr>
<tr>
<td>Dissolved oxygen (mg/L)</td>
<td>4 or more</td>
</tr>
<tr>
<td>Chloride discharge into freshwater (mg/L)</td>
<td>800</td>
</tr>
</tbody>
</table>
## Water quality monitoring in lakes and reservoirs with tilapia cage or net pen culture

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sample depth</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Vertical profile, 1m int.</td>
<td>Monthly</td>
</tr>
<tr>
<td>Dissolved oxygen</td>
<td>Vertical profile, 1m int.</td>
<td>Monthly</td>
</tr>
<tr>
<td>pH</td>
<td>Equal to cage mid-depth</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Chlorophyll a</td>
<td>Equal to cage mid-depth</td>
<td>Quarterly</td>
</tr>
<tr>
<td>5-day biochemical oxygen demand</td>
<td>Equal to cage mid-depth</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Secchi disk visibility</td>
<td>NA</td>
<td>Weekly</td>
</tr>
<tr>
<td>Soluble phosphorus</td>
<td>Equal to cage mid-depth</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Total ammonia nitrogen</td>
<td>Equal to cage mid-depth</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Phytoplankton abundance and species</td>
<td>Equal to cage mid-depth</td>
<td>Annually</td>
</tr>
</tbody>
</table>
**Standard 6**

**Conservation of global resources: fishmeal and fish oil**

Tilapia farms shall accurately monitor feed inputs and minimize the use of fishmeal and fish oil derived from wild fisheries.

Fish in:Fish out ratio = \( \frac{(\text{FMI} + \text{FOI})}{(\text{YFM} + \text{YFO})} \times \text{FCR} \)

Typically fish in: fish out ratio for tilapia: >1
Standard 7

Soil and Water Conservation

Construction and operation of tilapia farms shall neither cause depletion of ground-water in surrounding areas nor salinization of soil or water.

- Avoid ponds construction in highly permeable, sandy soil.
- Do not discharge effluents into freshwater areas.
- Avoid excessive pumping of freshwater aquifers and monitor to determine if aquaculture use is contributing to a decline in the water level.
- Monitor chlorine concentration in freshwater wells near the farm.
- Control erosion.
- Dispose of sediments in a responsible manner.
Standard 8
Escapes, non-native stocks and genetically modified organisms

Minimize escapes of farm stock and comply with government regulations regarding the implementation of native and non-native stocks and the use of GMOs.
Standard 9

Storage and Disposal of Farm Supplies

- Proper containment, storage and disposal of lubricants and chemicals in responsible manner.
- Proper sanitation procedures for paper and refuse and waste management.
- Proper labeling and use of chemicals to eliminate potential hazards to water and environment.
- Suppliers should provide reliable information on the products they use.
Tilapia producers shall demonstrate that all operations on farms that involve fish are designed and operated with animal welfare in mind, and that the employees are trained to provide appropriate levels of husbandry.

- Design facilities for humane holding, transport and rearing of fish.
- Eliminate unnecessary animal stress and suffering.
- Establish effective farm level monitoring for water quality, feed, production parameters, stock health, chemical use; and adopt strategies for maximizing efficiency of their use.
- Appropriate temperatures at harvest and during transport.
- Rapid diagnosis and treatment of disease for fish mortality management.
- Humane slaughter and removal of infected and dead fish.
Standard 11
Drug and Chemical Management

- Banned antibiotics, drugs, hormones or other chemical compounds shall NOT be used.

- Other therapeutic agents shall be used as directed on product labels for control of diagnosed diseases, not prophylactic purposes.
Standard 12
Microbial Sanitation

- Human waste and untreated animal manure shall be prevented from contaminating pond waters.
- Domestic sewage shall be treated and not contaminate surrounding areas.
Standard 13

Harvest and Transport

Tilapia shall be harvested and transported to the processing plant or other market in a manner that minimizes:

- Stress
- Physical damage
- Contamination
- Maintains temperature control
Product traceability is a very crucial component of the BAP program. It ultimately assures that all steps in the production process are complying with environmental, social and food safety standards.

**Data required for each culture unit for each production cycle:**

- Identification number of culture unit
- Volume or surface area
- Stocking rate
- Source of fingerlings
- Antibiotic and drug use
- Herbicide, algicide or other pesticide used
- Harvest date
- Harvest quantity
- Processing plant or purchaser
Current BAP-Certified Facilities & Finished Product Quantities

- Hatcheries: 28
- Farms: 251
- Processing plants: 138
- In 2010: 24 new plants and 92 new farms

- Shrimp: 464,409 MT
- Catfish: 55,449 MT
- Tilapia: 140,474 MT

Since 2007, we have certified over 660,000 MT of finished products.
# EXAMPLES OF BAP-CERTIFIED TILAPIA FACILITIES IN CHINA

<table>
<thead>
<tr>
<th>ACC No.</th>
<th>FACILITY</th>
</tr>
</thead>
</table>
| F1077   | HQ Sustainable IOM Farm Group 1  
Wenchang City, Hainan Province, P.R. China                  
Zheng Qingzhen Tanniu; Fuyongyi Tanniu; Fuguohong Tanniu |
| F10206  | Zhuhai Yihai Aquatic Co., Ltd.  
Doumen, Zhuhai, Guangdong, China |
| F10118  | Liang Jianqiang Tilapia Farm of Gaoyao City Evergreen Aquatic Product  
Science and Technology Co., Ltd. Gaoyao, Guangdong, China |
| F10111  | Wchuan Tilapia Farm Base-Zhanjiang Guolian Aquatic Products Co., Ltd.  
Zhanjing, Guangdong, China |
| F10110  | Shanwei Cathay Food Freezing and Processing Co., Ltd. - IOM Farm Group 2  
Hongyang - Guangdong; Pin An Dong - Guangdong |
| F10105  | Zhuhai Jiayi Aquatic Limit Company, Ltd. - Qianwu Farm  
Zhuhai, Guangdong, China |
| F10104  | Yang Sei Taishan Mingsheng Aquafarm Co., Ltd  
Shunde Town, Foshan City, Guangdong, China |
Hainan Sky-Blue Ocean Foods Co., Ltd

Hainan Tilapia
- Superior Quality
- Food Safety
- Traceability

Feed Farm Process Product

www.sbofoods.com
BAP Market Endorsement

• Approximately 70% of major retailers in the U.S. support BAP certification:
  – Walmart, Sam’s Club
  – Target
  – Darden Restaurants

• Program growing in Canada and U.K.:
  – Sobey’s
  – ASDA
  – Lyons Seafood
  – The Cooperative
BAP Certification Drivers: Corporate Partners
NEW GAA WEBSITE:
www.gaalliance.org
Digital version of the GAA magazine is available free for download

www.gaalliance.org
Best Aquaculture Practices Certification

Wholesome Seafood. Responsibly Produced.

and coming soon....

Best Aquaculture Practices Certification

虾・罗非鱼
叉尾鲍最规范水产养殖标准已推出

and coming soon....

鲑鱼・贝类养殖标准即将推出

全球水产养殖
通过责任水产养殖，
供给世界。
几乎全球消费的每两条鱼中，
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