5 Star Tilapia Grading System

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5 Star Tilapia Grading System

Purpose:
• To address the #1 concern – “Off-Flavor”

Intended For:
• Producers
• Importers
• Retailers
• Food Services – Restaurants
• Researchers.
• Consumers
Tilapia Market in US Today
Well received - Many Tilapia Recipes
Famous Restaurant

• Parmesan-Crusted Tilapia
• Filet of tilapia lightly coated
• with Parmesan and sautéed
• with capers, tomatoes, sage
• and lemon butter.
• Served with crispy red potatoes.
Tilapia’s Famous Fan

- Tilapia’s #1 kitchen in the US – the White House.

“ I am looking for a new chef for the White House – must be able to prepare Tilapia and tortilla taco. “

- Michelle Obama.
Why Chefs Favor Tilapia

• On the other hand, tilapia is so mild that anyone can like it, and it can be more interesting than chicken (or at least much more moist, and theoretically healthier). It's easy to pick flavors that go well with it, too--it's as simple as trying to match a flavor to French bread. For all of these reasons, tilapia is a logical choice for any menu, from a restaurant's perspective.

• Foodie Universe’s Restaurant Review
Tilapia for Sushi
# 1 Premium fish fillet

In surveys, 80% of “Red Snapper” sushi sold in the US is actually Tilapia.

Reasons:
• **Price Ratio** - $8 vs $1 /lb (seasonal)
• Taste between the two are similar
• Tilapia is as good as any other fillet
What is the Chefs’ #1 Concern

Access to consistent, high quality ingredients is paramount.

Tilapia sporadically contains an Off-Flavor taste despite freshness.
Market Impacts of Off-Favors

• For importers, a bad lot may be unsellable and hurt established business relationships.
Market Impacts of Off-Favors

• For retailers and food services, a single bad experience will drastically reduce repeat business
Market Impacts of Off-Favors

• For the Tilapia industry, bad experiences lead to negative perceptions of the fish and can lead to reduced overall demand and *Lower Price*. 
5 Star Tilapia off-Favor Grading System

Commonly non-scientific solution by major producers.

• Human Tasters to test each lot – a subjective approach

5 Star Tilapia off-Favor Grading System.

• A scientific and quantitative method for a common problem.
Key off-Flavor Compounds – [1]

- Geosmin
  - Contributes earthy flavor
  - Cyanobacterial byproduct
  - Detectable in air and water by humans at ... 5-10 ppt
  - Detectable in fish flesh by humans at ... 250 ppt
  - Concentrated in skin and dark muscle
Key Off-Flavor Compounds – [2]

- 2-Methylisoborneol (MIB)
  - Contributes musty flavor
  - Cyanobacterial byproduct
  - Detectable by in air and water by humans at ... 15-20 ppt
  - Detectable in fish flesh by humans at ... 100 ppt
Detection of Geosmin and MIB

- Gas Chromatography-Mass spectrometry
  - Headspace-Solid-Phase Micro-Extraction
    - LOD ~ 2 ppt
  - Solid-Phase Micro-Extraction
    - LOD ~ 2 ppt
  - Selective Ion Monitoring
    - LOD ~ 5 ppt
- Any approach that can achieve at least 10 ppt LOD is permissible
Sampling Methodology

- Single source lot processing
  - 100 grams each from 10 fillets/lot
  - Tissue homogenized and tested as a single sample

- Multi source lot processing
  - Each source sampled and tested independently
  - Lot graded based upon highest detected level of Geosmin and MIB
5 Stars ★★★★★ Grading System

- ★★★★★ 5 Stars Level

Off-flavors below detectable levels for humans

- Geosmin < 250 ppt
- And MIB < 100 ppt
5 Stars Grading System

• ★★★★★ 3 Star Level

Off-flavors at levels at which some humans may detect

- Geosmin < 500 ppt
- And MIB < 200 ppt
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• ★★★★★ 1 Star Grade

Off-flavors detectable by most people

– Geosmin > 500 ppt
– or MIB > 200 ppt
★★★★★★ Sushi Grade

• Fillets must be kept at 
  
  $-20^\circ\text{C}$ for $>168$ hours, or $-35^\circ\text{C}$ for $>15$ hours

prior to sale (US FDA protocol)

• Fillets must maintained $< -10^\circ\text{C}$
  at at times during transport

In surveys, 80% of “red snapper” sushi sold in the US is actually Tilapia
5 Stars Grading System Testing Program Requirements [1]

- Annual Audits by ISO 65 accredited independent 3rd party CB, including sampling and lab testing

- Lab testing must be performed by an ISO 17025 accredited 3rd party Lab.

- Quarterly and Semi-annual monitoring audit.
5 Stars Grading System
Testing Program Requirements [2]

- Records must be maintained for 5 years
- Records must be retrievable for verification within 24 hours of a request
- Not a substitute of Safety Certification.
- Works in conjunction of Food Safety regulations and certification to create better Quality recognition.
5 Star Tilapia Grading System
★★★★★

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• To differentiate the best Tilapia for #1 concern – “Off-Flavor”

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5 Star Grading System – Release Time Tables

Certification Implementation Time Tables

• Announcement – April, 2011
• Expert and Public Comments (Welcomed) – May, 2011
• Pilot Certifications – June-September, 2011
• Public Certifications – October, 2011
Talipia International Cooking Contest

- 1<sup>st</sup> 5 Star certified Tilapia International cooking contest
- Scheduled at Nov, 2011. Sponsored by: CAPPMA.
- Location – Hainan (pending)
- Further Information to be released.
Thank you!

Question?
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