# HACCP

# AND FISH PROCESSING

BIG FISH FARMS

# WHY IT'S A GOOD IDEA FOR A FARM

- OFFERS MORE SALES OPPORTUNITIES
- ORGANIZE YOUR PROCESS
- DOCUMENTS YOUR FARMS SAFE PRACTICES

# HACCP

HAZARD ANALYSIS AND CRITICAL CONTROL POINT
IT IS BUILT ON A FOUNDATION OF GOOD MANUFACTURING PRACTICES


HACCP IS PREVENTATIVE  NOT REACTIVE

HACCP IS NOT A ZERO RISK SYSTEM.  IT IS DESIGNED TO MINIMIZE THE RISK OF FOOD SAFTY HAZARDS

# SANITATION

- WATER- SAFE SOURCE, ICE
- CROSS CONTAMINATION
- HAND WASHING
- PROPER CLEANING /SANITIZING OF EQUIPMENT AND SURFACES
- LABELING AND STORAGE
- EMPLOYEE HEALTH
- EXCLUSION OF PESTS

# GOOD MANUFACTURING PRACTICES

- THESE ARE THE BASIS FOR DETERMINING IF PROCESSING METHODS ARE SAFE AND FOOD IS BEING PROCESSED UNDER SANITARY CONDITIONS

# WRITING YOU PLAN

- ASSEMBLE A TEAM OF EXPERTS
- DESCRIBE THE PRODUCT, INTENDED USE AND CONSUMER
- DEVELOP A PROCESS FLOW CHART AND PROCESS DESCRIPTION

## Flowchart for Paddlefish Processing

Receive live paddlefish

Sex is determined

Male Fish

Female Fish

Fish Bellies are cleaned with alcohol

Ovaries are removed

Meat is processed as with male fish

Cleaned

Ovaries are rinsed

Fillet or bulleted

Screened

Stored on ice in refrigerator or frozen

Salted

Drained

Delivered on ice to customers

Packaged

Stored in refrigeration

Delivered on ice or Shipped with gel-packs

**Standard Operating Procedures for Processing Live, Whole Paddlefish for Meat and Quality Control Checkpoints**

**Beginning of processing day.**
SSOP checklist checked and dated. Processing room is clean and ambient temperature is sufficiently cool for safe processing.

**Receiving**
Live or very recently dead cold fish arrive for processing. All fish are from lakes we either have under contract and therefore have been involved with the growers for several years or from a trusted source. Each lot contains a Grower Certificate.

**Cleaning Fish**
Fish knives and cutting boards inspected at beginning of processing day. Boards and knives are cleaned often throughout the day. Cleaning time is sufficiently short but temperatures of fish are checked periodically to ensure they don't exceed 40 degrees. All offal is properly removed during processing and at the end of the processing day.

**Fish Storage**
Immediately after the fish has been bulleted or filleted it goes onto ice and is stored in a walk-in, in a cooler or place directly in the freezer.

**End of Processing Day**
SSOP checklist is checked and dated

**Finished Product Labeling and Delivery**
All fish sold has an accompanying invoice saying "paddlefish" or a sticker stating "paddlefish" or both. Local deliveries are made with meat in coolers and surrounded by ice. If the fish is shipped to another city/ state, it is packed in a waxed seafood box and ice then transported in a refrigerated truck.

| Market Names | Latin Names | Hazards | | | | |
|---|---|---|---|---|---|---|
| | | *Biological* | *Chemical* | | | |
| | | Parasites CHP 5 | Natural Toxins CHP 6 | Histamine CHP 7 | Chemical CHP 9 | Drugs CHP 11 |
| **BARRAMUNDI** | *Lates calcarifer* | | | | ✓ | |
| **BASS** | *Ambloplites spp.* | | | | ✓ | |
| | *Micropterus spp.* | | | | ✓ | |
| | *Morone spp.* | | | | ✓ | |
| | *Stereolepis gigas* | | | | ✓ | |
| | *Synagrops bellus* | | | | ✓ | |
| **BASS AQUACULTURED** | *Morone spp.* | | | | ✓ | ✓ |
| | *Centropristis spp.* | | | | ✓ | ✓ |
| **BASS, SEA** | *Acanthistius brasilianus* | ✓ [4] | | | | |
| | *Centropristis spp.* | ✓ [4] | | | | |
| | *Dicentrarchus labrax* | ✓ [4] | | | | |
| | *Lateolabrax japonicus* | ✓ [4] | | | | |
| | *Paralabrax spp.* | ✓ [4] | | | | |
| | *Paranthias furcifer* | ✓ [4] | | | | |
| | *Polyprion americanus* | ✓ [4] | | | | |
| | *Polyprion oxygeneios* | ✓ [4] | | | | |
| | *Polyprion yanezi* | ✓ [4] | | | | |
| **BIGEYE** | *Priacanthus arenatus* | | | | | |
| | *Pristigenys alta* | | | | | |
| **BLUEFISH** | *Pomatomus saltatrix* | | | ✓ | ✓ | |
| **BLUEGILL** | *Lepomis macrochirus* | | | | ✓ | |
| **BLUENOSE** | *Hyperoglyphe antarctica* | | | | | |
| **BOMBAY DUCK** | *Harpadon nehereus* | | | | ✓ | |
| **BONITO** | *Cybiosarda elegans* | | | ✓ | | |
| | *Gymnosarda unicolor* | | | ✓ | | |
| | *Orcynopsis unicolor* | | | ✓ | | |
| | *Sarda spp.* | | | ✓ | | |
| **BOWFIN and roe** | *Amia calva* | | | | ✓ | |
| **BREAM** | *Abramis brama* | | | | | |
| | *Argyrops spp.* | | | | | |
| | *Sparus auratus* | | | | | |
| **BREAM or BOGUE** | *Boops boops* | | | | | |

## Hazard Analysis Worksheet

**STEP #10:** ***UNDERSTAND THE POTENTIAL HAZARD.***

Environmental chemical contaminants and pesticides in fish pose a potential human health hazard. Fish are harvested from waters that are exposed to varying amounts of industrial chemicals, pesticides, and toxic elements. These contaminants may accumulate in fish at levels that can cause illness. The hazard is most commonly associated with long-term exposure to these contaminants; illnesses associated with a single exposure (one meal) are very rare. Concern for these contaminants primarily focuses on fish harvested from fresh water, estuaries, and near-shore coastal waters (e.g. areas subject to shoreside contaminant discharges), rather than from the open ocean. Pesticides used near aquaculture operations may also contaminate fish.

The hazard of methyl mercury is covered in Chapter 10.

• Control of chemical contaminants

Federal tolerances, action levels, and guidance levels are established for some of the most toxic and persistent contaminants that are found in fish. These levels are listed in Table #9-1. States often use the Federal tolerances, action levels, and guidance levels for deciding whether to issue consumption advisories or to close waters for commercial harvesting of all or certain species of fish.

In the case of molluscan shellfish, State and foreign government agencies, called Shellfish Control Authorities, consider the degree of chemical contamination as part of their classification of harvesting waters. As a result of these classifications, molluscan shellfish harvesting is allowed from some waters, not from others, and only at certain times or under certain conditions from others. Shellfish Control Authorities then exercise control over the molluscan shellfish harvesters to ensure that harvesting takes place only when and where it has been permitted.

Significant elements of Shellfish Control Authorities' efforts to control the harvesting of molluscan shellfish include: 1) a requirement that containers of in-shell molluscan shellfish (shellstock) bear a tag that identifies the type and quantity of shellfish, harvester, harvest location, and date of harvest; 2) a requirement that molluscan shellfish harvesters be licensed; 3) a requirement that processors that shuck molluscan shellfish or ship, reship, or repack the shucked product be certified; and, 4) a requirement that containers of shucked molluscan shellfish bear a label with the processor's name, address, and certification number.

**STEP #11:** ***DETERMINE IF THIS POTENTIAL HAZARD IS SIGNIFICANT.***

At each processing step, determine whether "environmental chemical contaminants and pesticides" is a significant hazard. The criteria are:

1. Is it reasonably likely that unsafe levels of environmental chemical contaminants or pesticides will be introduced at the receiving step (e.g. does the raw material come in with an unsafe level of an environmental chemical contaminant or pesticide)?

Tables #3-1 and 3-2 (Chapter 3) identify the species of fish for which "environmental chemical contaminants and pesticides" is a potential hazard. Under ordinary circumstances, it would be reasonably likely to expect that, without proper controls, unsafe levels of environmental chemical contaminants and pesticides could enter the process at the receiving step from those species. There may be circumstances in your geographic area that would allow you to conclude that it is not reasonably likely for unsafe levels of environmental chemical contaminants and pesticides to occur in fish from your area. You should be guided by the historical occurrence of environmental chemical contaminants and pesticides, at levels above the established tolerances, action levels, or guidance levels, in fish from your geographic area.

*Continued*

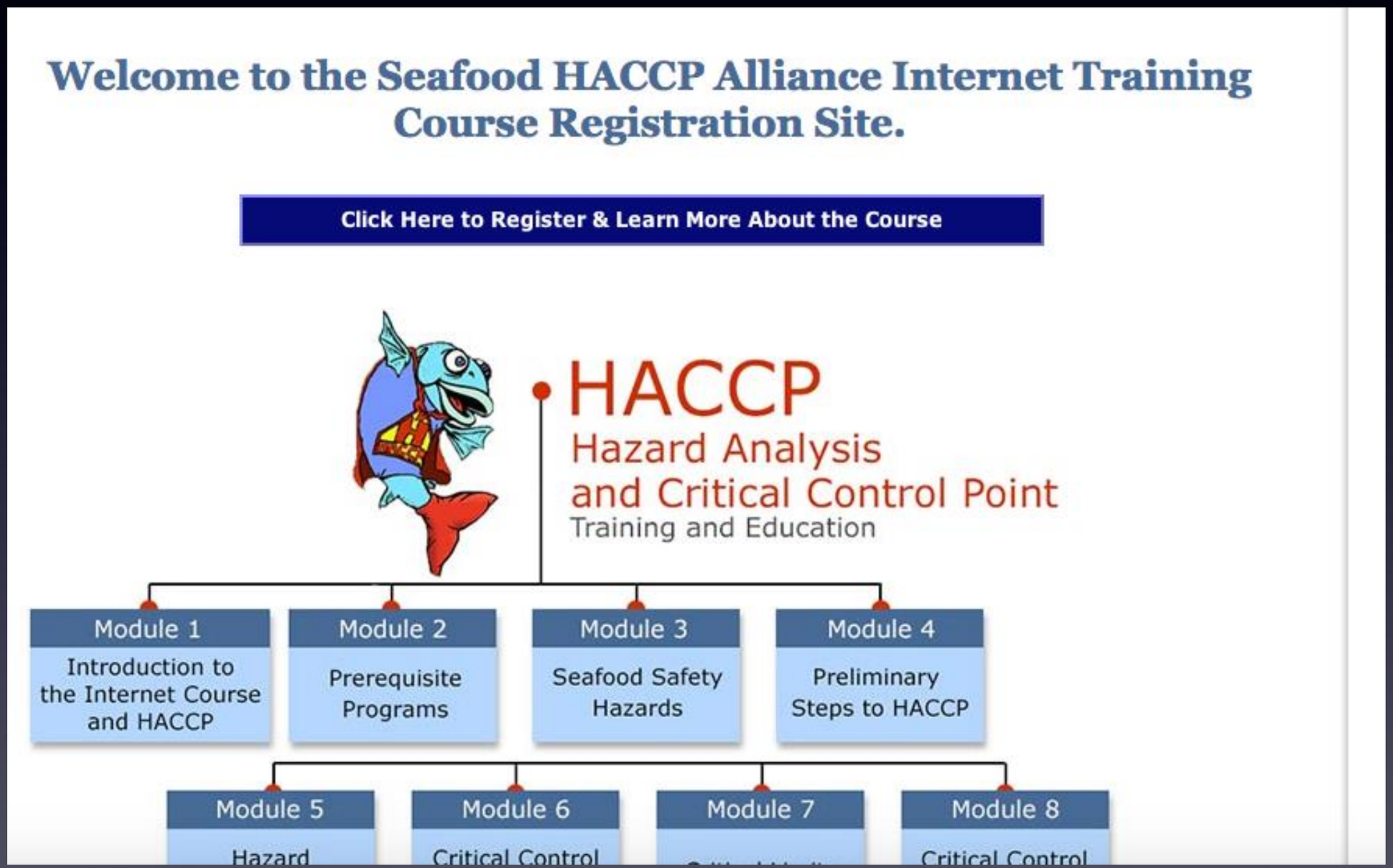
| Finished Product Food | Package Type | Method of Distribution and Storage | Hazards | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Biological* | | | | | | | *Chemical* | *Physical* | |
| | | | Pathogen growth-temperature abuse CHP 12 | C botulinum growth CHP 13 | Toxin formation-inadequate drying CHP14 | S. aureus toxin batter CHP 15 | Pathogen survival through cooking CHP 16 | Pathogen survival through pasteurization CHP17 | Pathogen contamination after pasteurization CHP 18 | Allergens/ Additives CHP 19 | Metal inclusion CHP20 | Glass inclusion CHP 21 |
| Raw fish other than oysters, clams and mussels (includes non-finfish species) | Vacuum packaged (e.g. mechanical vacuum, steam sweep, hot fill), MAP, CAP, hermetically sealed or packed in oil | Other than frozen | ✓ | ✓ | | | | | | ✓ | ✓ | |
| Raw fish other than oysters, clams and mussels (includes non-finfish species) | Other than vacuum packaged, MAP, CAP, hermetically sealed or packed in oil | All | | | | | | | | ✓ | ✓ | |
| Partially cooked or uncooked prepared foods | Vacuum packaged (e.g. mechanical vacuum, steam sweep, hot fill), MAP, CAP, hermetically sealed or packed in oil | Frozen | ✓ | | | | | | | ✓ | ✓ | ✓ |
| Partially cooked or uncooked prepared foods | Vacuum packaged (e.g. mechanical vacuum, steam sweep, hot fill), MAP, CAP, hermetically sealed or packed in oil | Other than frozen | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ |
| Partially cooked or uncooked prepared foods | Other than vacuum packaged, MAP, CAP, hermetically sealed or packed in oil | All | ✓ | | | | | | | ✓ | ✓ | ✓ |

Note: MAP = modified atmosphere packaging; CAP = controlled atmosphere packaging

| | | | | | |
|---|---|---|---|---|---|
| **Firm Name** Big Fish Farms LLC | | | | | |
| **Address** 303 Prospect St, Bellevue KY 41073 | | | | | |
| **Processing Facility** KSU Aquaculture Research Facility | | | | | |
| **Address** 103 Athletic Rd, Frankfort, KY 40601 | | | | | |
| **Product Description** :Farm Raised Paddlefish caviar in large plastic tubs/ or vacuum packed in tins | | | | | |
| **Method of Storage and Distribution** Stored under refrigeration or frozen and delivered on ice | | | | | |
| **Intended Use and Consumer** Caviar Wholesaler, Restaurants, Fish Stores, Directly to Consumers | | | | | |
| **(1) Ingredient/ Processing Step** | **(2) Identify Potential Hazards introduce, controlled or enhanced at this step** | **(3) Are any food safety hazards significant** | **(4) Justify your decision for column 3** | **(5) What Control measures can be applied to prevent significant hazards?** | **(6) It this a critical control point (yes or no)** |
| Receive paddlefish | Biological<br>Chemical<br>Physical | No<br>yes No | Environmental contaminants and pesticides | Grower Certification | yes |
| Ovaries removed | Biological<br>Chemical<br>Physical | yes no<br>no | Pathogens and C.botulinum could be present on fish but will be addressed at the salting stage /and in vacuum packaging | Temperature Controls ovaries are refrigerated or iced while waiting to be screened Sanitary conditions | No |

| | | | | Monitoring | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **(1) Critical Control Point (CCP)** | **(2) Significant Hazard(s)** | **(3) Critical Limits for each Preventive Measure** | **(4) What** | **(5) How** | **(6) Frequency** | **(7) Who** | **(8) Corrective Actions** | **(9) Records** | **(10) Verifications** |
| Finished Product Transportation | C.botulinum formation during finished product transportation | Maximum cooler temperature or 40 degrees | Cooler temp. and addition of ice | visually noting the presence of ice | Before and when product arrives at storage destination | BFF employee | If ice is not noted when product arrives for storage then digital temp of product is taken and it is then evaluated based on time/ temp exposure | Each shipment in transportation log. | Review trans logs. |
| Finished Product Storage | C.botulinum formation during finished product storage | Maximum cooler temperature or 40 degrees | Cooler Temperature or by adding ice to storage container within the cooler | Digital temperature reading and or visually noting presence of ice | Continuous with visual once a day | BFF employee | Adjust and or repair cooler also hold product and evaluate based on time/ temperature exposure | Note temp. daily in log | Review temp log. |

http://seafoodhaccp.cornell.edu/Intro/index.html



# HACCP working with other industry segments

- Even if you are only partially involved in the process, you need to document your part.