

HACCP

AND FISH PROCESSING

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 SAFETY 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

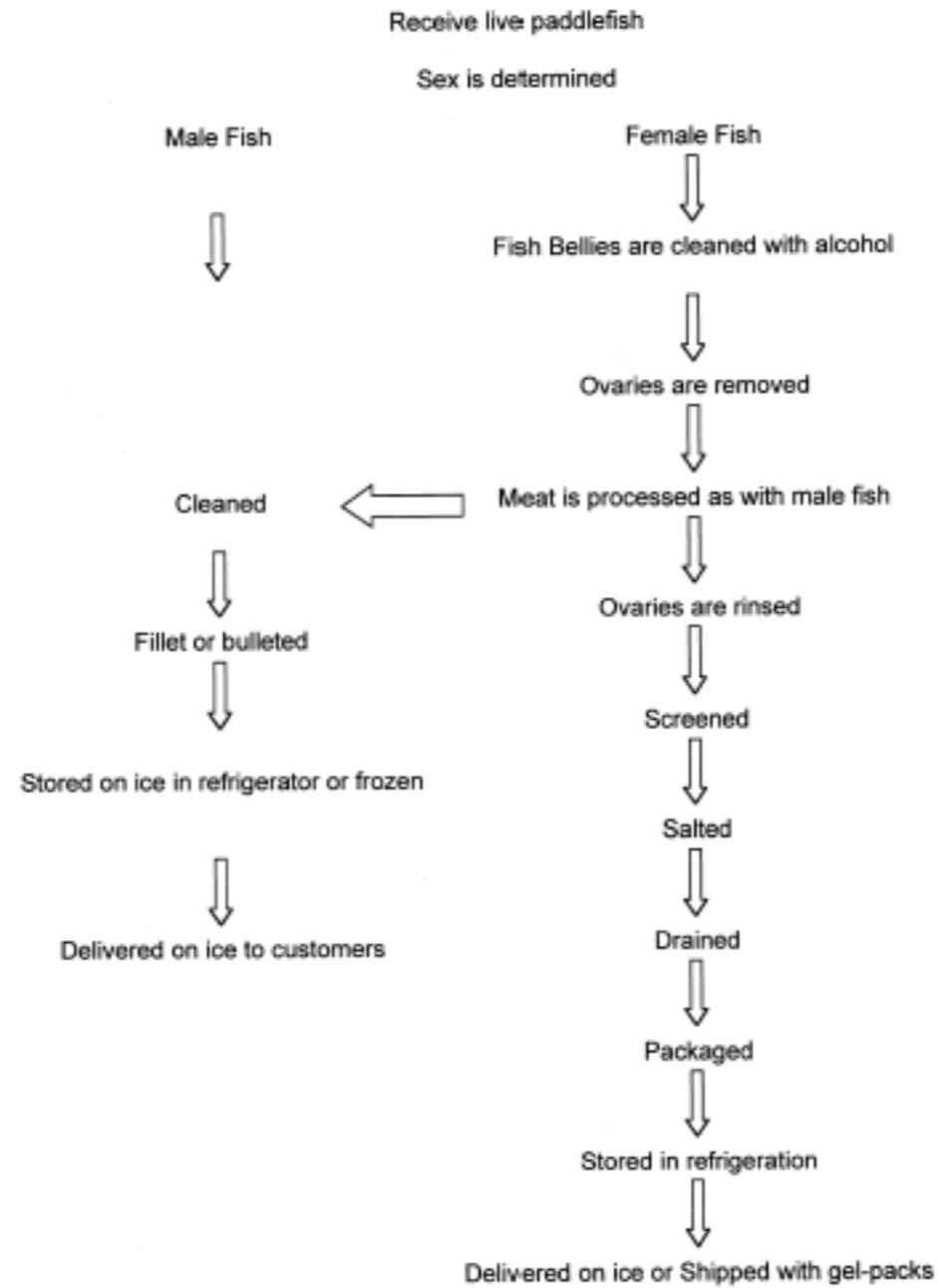
GOOD MANUFACTURING PRACTICES

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

WRITING YOUR 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



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 bulletted 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	<i>Lates calcarifer</i>				✓	
BASS	<i>Ambloplites spp.</i> <i>Micropterus spp.</i> <i>Morone spp.</i> <i>Stereolepis gigas</i> <i>Synagrops bellus</i>				✓ ✓ ✓ ✓ ✓	
BASS AQUACULTURED	<i>Morone spp.</i> <i>Centropristis spp.</i>				✓ ✓	✓ ✓
BASS, SEA	<i>Acanthistius brasilianus</i> <i>Centropristis spp.</i> <i>Dicentrarchus labrax</i> <i>Lateolabrax japonicus</i> <i>Paralabrax spp.</i> <i>Paranthias furcifer</i> <i>Polypriion americanus</i> <i>Polypriion oxygeneios</i> <i>Polypriion yanezi</i>	✓ ⁴ ✓ ⁴ ✓ ⁴ ✓ ⁴ ✓ ⁴ ✓ ⁴ ✓ ⁴ ✓ ⁴ ✓ ⁴				
BIGEYE	<i>Priacanthus arenatus</i> <i>Pristigenys alta</i>					
BLUEFISH	<i>Pomatomus saltatrix</i>			✓	✓	
BLUEGILL	<i>Lepomis macrochirus</i>				✓	
BLUENOSE	<i>Hyperoglyphe antarctica</i>					
BOMBAY DUCK	<i>Harpadon nehereus</i>				✓	
BONITO	<i>Cybiosarda elegans</i> <i>Gymnosarda unicolor</i> <i>Orcynopsis unicolor</i> <i>Sarda spp.</i>			✓ ✓ ✓ ✓		
BOWFIN and roe	<i>Amia calva</i>				✓	
BREAM	<i>Abramis brama</i> <i>Argyrops spp.</i> <i>Sparus auratus</i>					
BREAM or BOGUE	<i>Boops boops</i>					

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	Clostridium growth CHP 13	Toxin formation-inadequate drying CHP14	S. aureus toxin hazard 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-finish 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-finish 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 Chemical Physical	No yes No	Environmental contaminants and pesticides	Grower Certification	yes
Ovaries removed	Biological Chemical Physical	yes no 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

(1) Critical Control Point (CCP)	(2) Significant Hazard(s)	(3) Critical Limits for each Preventive Measure	Monitoring				(8) Corrective Actions	(9) Records	(10) Verifications
			(4) What	(5) How	(6) Frequency	(7) Who			
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>

Welcome to the Seafood HACCP Alliance Internet Training Course Registration Site.

[Click Here to Register & Learn More About the Course](#)



HACCP

Hazard Analysis
and Critical Control Point
Training and Education



HACCP

working with other industry segments

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