PARTIAL QUALITY CONTROL: SURIMI/MEAT PRODUCTS

August 1, 1988

Prepared for:

Alaska Fisheries Development Foundation
508 West 2nd Avenue, Suite 212
Anchorage, AK 99501
(907) 276-7315

by:

Manning, Batson, & Associates, Inc.
1931 Second Avenue, Suite 215
Seattle, WA 98101
(206) 442-9467

This information was produced with funds provided through the Saltonstall-Kennedy program administered by the National Marine Fisheries Service under Cooperative Agreement #85-ABH-00044.

TABLE OF CONTENTS

PARTIAL QUALITY CONTROL

SURIMI/MEAT PRODUCTS

Overview

Any USDA plant wishing to use surimi in the preparation of processed meat products will need to develop a partial quality control system to ensure safety and wholesomeness of the end product from the receipt of raw materials through product manufacture, storage, and shipment. The system must be submitted to the Administrator of FSIS for approval.

The system should provide detailed information on control of raw material, Critical Control Points (CCP) and how they will be used, the type of testing to be done and sampling protocol, samples of charts and records which will be used for documentation and monitoring, the length of time such documents will be maintained by the plant, standards to be used in testing product integrity, and corrective action to be used in cases of unsuitable product or production practice.

Clostridium botulinum type E and Vibrio parahaemolyticus are two organisms associated with surimi-meat admixtures for which USDA has expressed particular concern. Provisions for the control of these organisms should be demonstrated in the PQC. The incidence level studies on type E bot executed by Dr. Mel Eklund (National Marine Fisheries Service, Seattle) will be helpful in this effort and should be employed accordingly in the design of a relevant PQC.

An outline of steps taken to ensure that surimi does not come into contact with other raw materials, and that cross contamination between production lines is effectively prevented should also be fully described in the PQC document.

A letter of application for USDA approval must be drawn up to accompany the proposed PQC. The letter must state the objective of the PQC, and state that all data and information generated by the program will be maintained by the plant and made available to USDA.

The following are general PQC guidelines and sample letter of application for the Spicy Bites which AFDF/MBA gained USDA sketch label approval for in June 1988. It identifies the different areas which need to be considered in creating a PQC for this type of product, but needs more concrete detail that can only be provided by a USDA plant. It should, however, provide and overview of the type of work involved with a PQC.

Once interested plants begin serious consideration of a surimi/meat program, any missing information in the guidelines can be filled in, and the program expanded where necessary. It is probable that much of this information will already be in place at plants proposing to manufacture surimi/meat products. It could be as simple as inserting "surimi" in strategic places in already existing PQC documents. Plants producing batter and breaded products which are interested in the manufacture of surimi/meat products should have appropriate batter and breading controls and comprehensive plant sanitation programs (and trichinae controls if using pork) already in place. These programs, therefore, are not covered in the following general guidelines.

LETTER OF APPLICATION (SAMPLE)

Administrator
United States Department of Agriculture
Food Safety and Inspection Service
Washington, D.C. 20250

Dear Sir,

We are requesting approval of our partial quality control program which has been developed to ensure the safe production of Spicy Bites which contain 15% surimi as a portion of the meat block. The program was developed to control quality from the handling of raw materials through end product preparation and packaging. The system is designed for use in Establishment #____, (COMPANY NAME AND LOCATION).

All records generated by this program will be maintained by the Quality Control department for a period of 2 years and will be readily available to USDA personnel. The Quality Control Manager and his/her supporting department of ____ technicians will be responsible for the implementation and monitoring of the program. The Quality Control department will have the authority to halt operations and retain product if necessary.

(COMPANY NAME) employs about _____ production workers and produces the following products:

(PRODUCT LIST HERE AND APPROXIMATE WEEKLY PRODUCTION VOLUME)

Sincerely,

XXXXX
President

GENERAL GUIDELINES

I. Raw Materials

In consideration of the raw material section of the PQC, emphasis will be placed on surimi being introduced into a USDA inspected plant. Other raw materials used in the production of the products like Spicy Bites are ingredients typically used in meat nuggets, and are therefore, already handled in the overall Quality Control system of USDA plants which produce batter and breaded, deep fat fried meat products.

A. Receipt of Raw Materials - In receiving raw material (including surimi), a system which addresses the following areas will be required:

1. Lot identification numbers - This system should involve the following:

   a. documentation of receiving dates to include supplier and supplier lot ID numbers
   b. Assignment of plant lot identification number
   c. Incorporation of supplier ID into plant lot identification number which accompanies product from mixing stage through the preparation phases to final product ID. This is a Critical Control Point (CCP) (plant should already have a lot ID system)

2. Specifications - Establishment of specification requirements for raw material surimi and development of a check system upon receipt of materials to ensure compliance with set plant standards (CCP)

3. Verification of Wholesomeness - Set up sample pulling and testing protocol. Sampling protocol may be related to the variability of surimi as a product or supplier record. Example: processor may periodically visit and review surimi supplier's operation to establish a rating system. If surimi supplier's Quality Control procedure (HACCP) is determined adequate, and supplier history in product wholesomeness is good, the frequency of incoming sampling and testing may be reduced. (CCP)

B. Temperature Control - Design of a temperature monitoring/documentation procedure which ensures the maintenance of surimi temperature at or below -20 C; methods for taking temperature should be specified. (CCP)

C. Storage - A stock rotation program should be in place and a storage area which is specifically designated for surimi inventory should be available. A time frame for storing new raw material inventory should be identified.

D. Equipment and Instruments - Equipment for receiving and storing raw material should be described along with all instruments and/or equipment employed in monitoring receipt of raw materials. Methods for handling equipment (calibrating thermometers, etc.) should be specified. (CCP)

E. Establish procedures for handling surimi which does not meet plant specifications or is subjected to temperature abuse during shipment or storage, etc.

F. Additional Possible Critical Control Points (CCP):

1. Records for Incoming Surimi - These identify the origin of supplies, results of incoming inspection for wholesomeness, condition of packages, etc. (Receiving Log, wholesomeness verification records from random sampling/lab analyses or supplier rating system)

2. Identity of person entrusted with receipt of raw materials

II. Product Formulation and Mixing

A. Handling of surimi from storage to production sight:

1. Temperature control - procedures and documentation; procedures for handling product which exceeds acceptable temperature levels

2. Time frame for handling surimi between storage and product formulation/preparation

3. Description of intermediate holding areas; should include separation from other raw materials from storage area through intermediate holding areas to production line (for prevention of cross contamination)

B. Product Formulation Procedures

1. Formulation manual or computerized? Formulas/recipes should be posted at formulation site (CCP). Ingredients pre-weighed for each batch?

2. Production batch sized should be specified

3. Surimi inclusion levels - range restrictions (CCP)

4. (Use of Nitrites - inclusion levels)

5. Measuring ingredients - procedures and documentation; eg. Once per hour, QC will check ingredient measurements. If any of those checked exceed formulation requirements by ± .5%, the appropriate corrective action will be taken and cause of error determined (equipment or human error); the incident will then be documented. (CCP)

6. Equipment/instrument use - methods should be specified, calibration of instruments described (CCP)

C. Product Mixing

1. Identification of equipment (3/16" plate for grinding, paddle blender, etc.)

2. Total mixing time - should be specified and documented (CCP)

3. Chronology of product mixing phase; i.e. surimi to be ground in with meat (rather than added to meat block in paddle blender), mixture to blast freezer before forming phase to bring temperature to 27 F, etc. Should be posted at mixing site. (CCP)
4. Temperature control methods; procedures for handling product which exceeds temperature requirements. (CCP)

5. This section should also include prevention of cross contamination with other products being formulated and mixed in the same general vicinity (CCP)

6. Appropriate corrective action for mixing errors should be identified (CCP)

D. Product Forming and Cooking

1. List equipment line used for forming, pre-dust, batter, breading, deep fat frying

2. Transport of product from blender to hopper for forming

3. Forming stage - piece size (CCP)

4. Pre-dust, batter, breading weight pick up monitored once per hour of production (CCP)

5. Deep fat frying - cooking temperature and time, product internal temperature; procedures (eg. Finished product internal temperature is taken hourly by inserting a dial thermometer into the center of the product directly after the fryer. Dial thermometers are calibrated daily by the QC department by checking with a certified thermometer in cold water and hot water baths). Need to establish procedures for handling product with internal temperatures found to be lower than acceptable level. (CCP)

6. End product to blast freezer until an internal temperature of _____ has been reached - about _____ minutes (CCP)

7. Establish QC monitoring of cooking and blast freezing of product;

   Critical Control Points

   Example: The QC department will review all cooking and blast freezer control charts on a daily basis. All such charts will be kept on file in the QC office for 3 months. If cooking errors are found, QC will retain all batches associated with cooking or freezing errors (whether due to faulty equipment or human error) for laboratory analyses. Appropriate action will be taken pending receipt of lab results and recommendations.

8. End product testing - establish standards, sample pulling protocol and specific testing methods, documentation and procedures to handle product which fails to meet identified standards. (CCP)

III. Packaging of End Product

A. Retail

1. Quantity of product packaged per week

2. Packing method: eg. Product is vacuum packaged 24 pieces per box with pre-printed front and back panels.

3. Labelling (specs below to conform with USDA requirements)

Example: Nutritional information appears in a _____ sized box on the right hand side of back panel; consumer preparation instructions in _____ print size appears in a _____ sized box on the left side of the back panel. "DO NOT THAW PRODUCT BEFORE HEATING" appears on the upper left corner of the front panel in _____ print size, bold letters. Expiration dates designated according to production date.

4. Lot ID Numbers Appear on package.

Example: Lot identification number appears on the right side panel of package with identification number of line inspector responsible for batch directly below lot ID (CCP)

B. Institutional

1. Quantity of product packaged per week

2. Packing method (CCP): eg. Product is vacuum packaged 10 lbs per polyurethane bag and packed in cardboard wax sealed boxes. Boxes are labelled with pre-printed pressure sensitive labels.

3. Product Information/Labelling

Example: Detailed cooking instructions will appear on label. Information should be provided to food service establishments which outlines how product can and can not be advertised. Menus should indicate that product contains surimi; food servers should be instructed on how to handle product, etc. (CCP)

4. Lot Identification Numbers on Package - Batch inspector number included (CCP)

C. Additional Packaging Critical Control Points (from USDA Guidebook):

1. Integrity of packaging materials

a. Material Identity
b. Condition upon receipt and use
c. Packaging Supplier Verification

IV. Storage and Shipping

As with all products, the plant management is responsible for assuring storage in sanitary, vermin-free facilities with adequately controlled environment. These requirements should already be addressed in the traditional USDA plant inspection.

A. Storage area should be described with temperature control and documentation procedures/review delineated. Product batches from any documentation which reveals temperature abuse will be retained by QC department for laboratory analyses. Appropriate action will be taken upon review of lab results and recommendations. (CCP)

B. Quality control's use of a hold tag system will assure positive identification of product which should not be shipped (due to production errors, unacceptable raw material which was undetected in incoming raw material checks, etc..). System should be documented with appropriate accompanying forms (CCP)

C. Handling Returned Goods - The PQC will need to discuss policies and procedures for handling returned goods. Identification and control of returned goods is imperative. Limitations on the use of returned product in combination with newly processed product needs to be explored and procedures developed.

D. Additional Critical Control Points - may include (from USDA Guidebook):

1. Sanitation of Vehicles, trucks, RR cars, etc.

2. Returned Goods:
   a. Policy
   b. Responsibility
   c. Identification
   d. Designated Storage Area
   e. Disposition
   f. Notification to USDA
   g. Corrective Action
   h. Follow up

3. Shipping Policy

   a. Need to specify inventory system (FIFO - first in, first out).
   b. Damage during loading

4. Temperature control during shipping

5. Records kept and systematically reviewed

In addition to addressing each of the areas listed in this outline, it will be necessary to present sample documentation forms/charts for monitor and control in all areas covered above, a production flow chart for the proposed surimi/meat product should also be provided.

This outline is meant to be used as a working document and check list for developing a surimi/meat PQC which is relevant to the producing USDA plant.