CHAPTER 3

Inspection/Verification of a Tuna Cannery

This section contains information for use by inspection agencies and manufacturers to assess their operation in relation to their Quality Control Program.

In carrying out the inspection and verification, the inspector or auditor (designated experience personnel to carry out plant inspection audit) should first:

1) familiarize themselves with the process,

2) be aware of companies QC programme,

3) have equipment needed for inspection checked and calibrated,

4) have a checklist of items to be inspected.

Equipment needed for inspection included a flashlight, steam vent sizer, chlorine test kit, lightmeter, tape measure, divider (for checking temperature records), stopwatch and a thermometer.

The main activities of a plant inspection and audit is to assure that the requirements of the official agency having jurisdiction and a specified QC program is being followed. This can be accomplished by:

1) observation of operation and hygienic practices used in the plant.

2) review of records kept, for plants operating under a HACCP program a record of CCP's is essential,

3) review of the QC program.

Essential components of cannery inspection are construction, equipment, personnel hygiene, hygienic requirements, processing practices and process controls as given in Appendix - Codex Alimentarius, Recommended International Code of Hygienic Practice for Low and Acidified Low Acid Canned Foods.

The equipment that should be inspected includes, canning equipment, empty can handling, retort, retort controls and instrumentation, steam supply, and warehouse and handling equipment. A checklist includes:

Equipment Checklist

ITEM 1 : **Canning Equipment**

a. General
b. Butchering, Gutting, Cleaning Equipment
c. Filling Machines
d. Pre-Cookers

e. Dispensing Machines
f. Weighing Machines
g. Patching Tables
h. Sealing Equipment
I Can Washers
j. Conveyors

ITEM 2 : **Empty Can Handling Equipment**

ITEM 3 : **Retort Controls and Instrumentation**

a. Temperature Measuring Devices
b. Temperature Recorders and Controllers
c. Pressure Gauges
d. Timers, Clocks

ITEM 4 : **Retort Equipment**

a. General
b. Dividers, Separators
c. Steam Spreaders
d. Bleeders
e. Vent Piping
f. Water Piping
g. Air Lines
h. Drains
I. Safety and Pressure Relief Valves

ITEM 5 : **Steam Supply (Including Boilers)**

ITEM 6 : **Warehousing, Post Process Handling Area and Equipment**

a. General
b. Restricted Post Process Area
c. Air Cooling and Interim Storage
d. Handling Systems

Some specific processing practices and process controls that should be checked are:

Processing Practices and Process controls Checklist

1.0 **Manufacturing Controls**

1.1 Safety of Product Formulation

1.1.1 Food Additives
1.1.2 Nutritional Requirements
1.1.3 Label Accurately Reflects Products Formulation (Allergen Control)

1.2 Empty Containers

1.2.1 Empty Container Defects Inspection
1.2.2 Visual Inspection at Depalletizer
1.2.3 Empty Container Handling
1.2.4 Container Cleaning Prior to Filling
1.2.5 Protection of Cleaned Containers

1.3 Container Closure

1.3.1 Visual Examination
1.3.2 Destructive Examination

1.4 Thermal Process

1.4.1 Validated Process
1.4.2 Product Formulation (critical factors monitored and controlled)

1.5 Filling

1.5.1 Filling of Container
1.5.2 Flange and Sealing Area (monitoring and control)

1.6 Retort Operation

1.6.1 Lag Time
1.6.2 Initial Temperature
1.6.3 Basket or Retort Loading
1.6.4 Posting of Vent Schedule, Scheduled Processes and Retort Operating Procedures
1.6.5 Adherence to Posted Vent Schedule
1.6.6 Adherence to Scheduled Process
1.6.7 Adherence to Retort Operation Procedures
1.6.8 Thermal Status (heat sensitive indicators)
1.6.9 Time/Temperature Recording Device
1.6.10 Written Process Deviation Procedure

1.7 Post Process

1.7.1 Cooling Water
1.7.2 Bactericide Check
1.7.3 Chlorine/Water Contact Time

1.7.4 Container Cooling
1.7.5 Container Handling
1.7.6 Container Drying

1.8 Verification of Manufacturing Controls

1.8.1 Means of Verification Established

2.0 **Premises**

2.1 Outside Property

2.1.1 Roadways
2.1.2 Drainage
2.1.3 Grounds

2.2 Building

2.2.1 Building Exterior
2.2.2 Interior Design and Construction
2.2.3 Lighting
2.2.4 Ventilation
2.2.5 Drainage and Sewage Systems
2.2.6 Process Flow - Cross Contamination

2.3 Sanitary Facilities

2.3.1 Washrooms, Lunchrooms and Change rooms
2.3.2 Hand washing and Sanitizing Facilities
2.3.3 Process Area Hand/Feet Disinfection
2.3.4 Equipment Cleaning and Sanitizing Facilities

2.4 Water Quality

2.4.1 Water Supply - Potable
2.4.2 Testing/Monitoring
2.4.3 Cross-connection
2.4.4 Water Treatment Chemicals
2.4.5 Recirculated Water
2.4.6 Ice Supply
2.4.7 Steam

3.0 **Storage/transport**

3.1 Receiving of Raw Materials

3.1.1 Specifications
3.1.2 Handling

3.2 Storage

3.2.1 Temperature and Humidity Control
3.2.2 Finished Product
3.2.3 Returned Foods
3.2.4 Non-Food Chemicals

4.0 **Equipment**

4.1 General Equipment Design and Installation

4.1.1 Food Contact Surfaces
4.1.2 Chemicals and Lubricants
4.1.3 Preventative Maintenance Program
4.1.4 Waste Containers

4.2 Retort Equipment

4.2.1 Temperature Measuring Devices
4.2.2 Timing Devices
4.2.3 Recorder Controller
4.2.4 Retort Installation
4.2.5 Heat Distribution
4.2.6 Retort Steam Supply

4.3 Container Closure Equipment

4.3.1 Installation, Operation and Maintenance

5.0 **Personnel**

5.1 Training

5.1.1 General Food Hygiene
5.1.2 Technical Training

5.2 Hygienic Practices

5.2.1 Communicable Disease

5.2.2 Washing of Hands
5.2.3 Personal Cleanliness and Conduct
5.2.4 Controlled Access

6.0 **Sanitation/Pest Control Program**

6.1 Adequacy of Sanitation Program

6.1.1 Written Program for all Areas and Equipment

6.2 Adherence to Written Program

6.2.1 Firm Monitors Adherence to Written Program
6.2.2 Firm Verifies Effectiveness of Program

6.3 Adequacy of Pest Control Program

6.3.1 Written Program

6.4 Adherence to Pest Control Program

6.4.1 Firm Monitors Adherence to Written Pest Control Program
6.4.2 Firm Verifies Effectiveness of Program

7.0 **Records**

7.1 Safety of Product Formulation

7.1.1 Safety of Product Formulation Records

7.2 Empty Container Records

7.2.1 Empty Container Defect Inspection Records

7.3 Container Closure Records

7.3.1 Visual Examination Records
7.3.2 Destructive Examination Records
7.3.3 Records Reviewed and Signed

7.4 Thermal Process Records

7.4.1 Validated Scheduled Process
7.4.2 Critical Product Formulation Factor Records

7.5 Fill Records

7.5.1 Critical Fill Factor Records

7.6 Retort Operation Records

7.6.1 Retort Operator Records
7.6.2 Process Deviation Records
7.6.3 Thermal Status Records

7.7 Post-Process Records

7.7.1 Bactericide Check Records
7.7.2 Verification Records

7.8 Process Record Retention

7.8.1 Retention of Processing Records

7.9 Finished Product Distribution

7.9.1 Finished Product Distribution Records

7.10 Health and Safety Complaints

7.10.1 Health and Safety Complaint Records

7.11 Sanitation

7.11.1 Cleaning and Disinfection Records
7.11.2 Pest Control Records

7.12 Equipment

7.12.1 Equipment Calibration Records
7.12.2 Heat Distribution Test Records
7.12.3 Closing Machine Maintenance Records

8.0 **Recall (Health & Safety)**

8.1 Written Recall System
8.2 Code Identification
8.3 Procedures for Recall Notification

Information on the heat process, retorts and retort control instrumentation, venting and process establishment and heat distribution tests should be kept and reviewed by a competent authority. An example of a survey form for some of the information required is attached.

In assessing compliance with the GMP's, a checklist used by the DOF Thailand is attached.

After completion of inspection/audit a report should be generated, the manufacture should be informed of the results and recommendations and corrective actions if required.

CANNERY RETORT SURVEY FORM

PLANT : _____ LOCATION : _____

DATE : _____ INSPECTOR: _____

1. EQUIPMENT

Retort Shell

Diameter _____ Length _____

Single door? _____ Double door? _____

Steam Supply:

1. Steam header pipe size _____ (in.)
2. Pipe size to retort _____ (in.)
3. Number branch lines off main header _____
4. Size of regulating valve _____ (in.)
5. Steam line pressure _____ (p.s.i.) (regulated pressure)
6. Steam spreader size _____ (in.)

number of holes _____

size of holes _____ (in.)

Instruments and Controls:

1. Type of controller unit _____
2. Controller probe wells bled? Yes _____ No _____
3. Thermometer - range _____

- degrees per scale division _____
- easily read _____

4. Thermometer wells bled? _____
5. Pressure gauges wells - range _____

- pounds per scale division _____
- easily read? _____

Retort Loading Equipment

Retort buggies? _____ baskets? _____

Tumble pack? _____ or divider plates? _____ metal? _____ plastic? _____

divider plate holes - size _____ spacing _____

chemnies used? _____

CANNERY RETORT OPERATION

2. Operation

Written instructions provided to retort operator for:

Venting procedure? _____

Cooking time - temperature? _____

Venting Schedule used:

Time _____ (min), and

Temperature _____ (°F,°C) (minimum)

Venting test conducted by _____

Cooking Processes Used:

Product	Can Size	Init. Temp. (°F,°C)	Process Time (min.)	Process Temp. (°F,°C)

Process Authority: _____

Can Cooling:

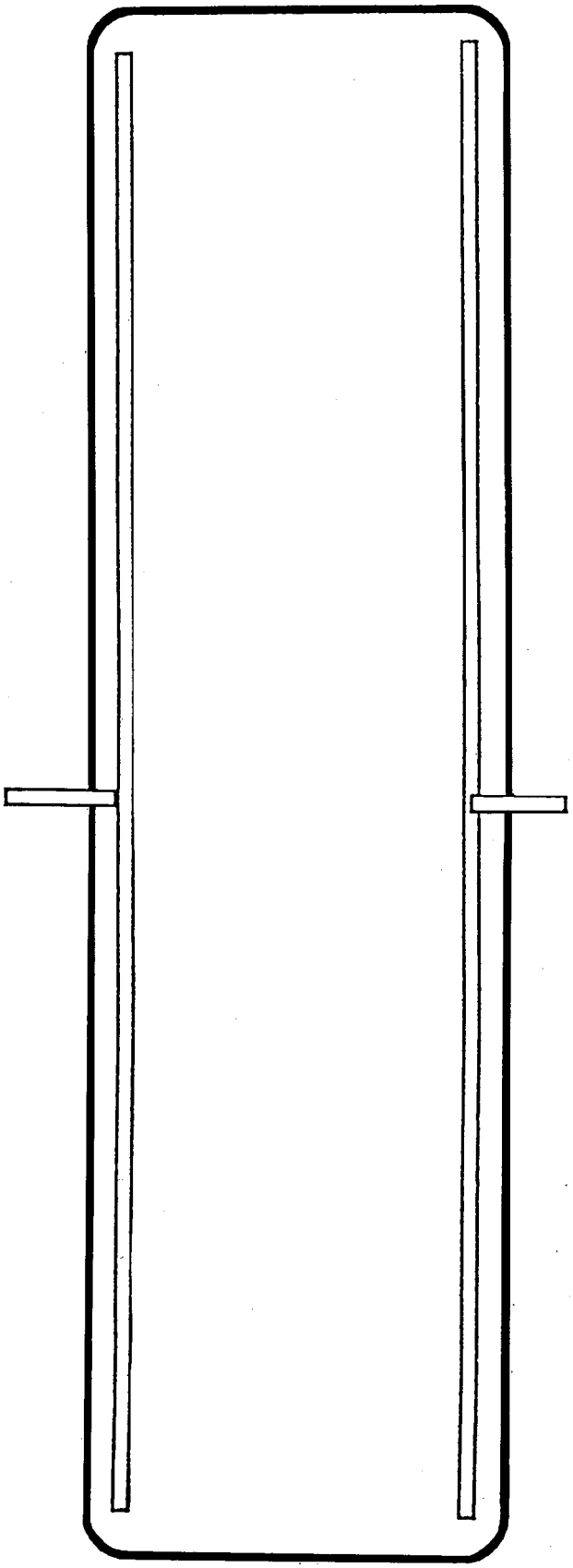
In retort? _____ Out of retort? _____

Water spray? _____ In air? _____

Water flood? _____ Water channel? _____

Air overpressure? _____

Cooling Time _____ (min)



Canned Tuna GMP Compliance

Plant:_____ Inspector:_____ Date:_____

RECEIPT, EXAMINATION, HANDLING & STORAGE OF RAW FISH

Item	GMP	GMP Description	Compliance Category 1	2	3	Comments/Action
1	1.1/1.2	Delivered fish inspected & graded				
2	1.1/1.2	Unacceptable fish rejected (lot/individual)				
3	1.1/1.2	Unacceptable fish segregated				
4	1.1/1.2	Records made & maintained				
5	1.3	Chemical analysis conducted				
6	1.3	Unacceptable lots segregated/culled				
7	1.3	Products analysed do not exceed standards				
8	1.3	Chemical analysis records made & maintained				
9	1.3	Laboratory performance satisfactory				
10	1.4	Fish unloaded/in transit - properly protected				
11	1.4	Fish unloaded/in transit - minimum thawing				
12	1.5	Fish stored in sanitary containers				
13	1.5	Timely rotation of stocks & records kept				
14	1.6	Storage temperature no warmer than -18°C (0°F)				
15	1.6	At -18°C (0°F) fish stored no more than 3 months				
16	1.6	Cold storage equipped with temperature measuring device				
17	1.6	Temperature recorded daily				
		RECEIPT, EXAMINATION, HANDLING & STORAGE OF RAW FISH SUBTOTAL				

Canned Tuna GMP Compliance

Plant:_____ Inspector:_____ Date:_____

THAWING, BUTCHERING, STAGING

Item	GMP	GMP Description	Compliance Category			Comments/Action
			1	2	3	
18	2.1	Thawing uniform, matches production capacity				
20	2.1	Recycling not used for more than 1 load in tank				
21	2.1	Thawing water temperature below 20°C (68°F)				
22	2.1	Water tempered before entering thaw tank				
25	2.3	Properly thawed, internal temperature below 5°C (41°F)				
26	2.3	Fish warmer than 5°C (41°F) pre-cooked within 1 hr				
27	3.1	Butchering time limits met				
28	3.2	Fish rinsed prior to butchering				
30	3.3	Fish properly butchered				
31	3.3	Fish washed thoroughly after butchering				
33	3.3	Butchered fish inspected				
34	3.3	Rejected fish segregated				
35	3.3	Rejected fish properly disposed of				
36	3.3	Records made and maintained				
37	3.4	Fish placed cut side down on racks				
39	3.4	Cooking racks clean and sanitary				
40	3.4	No reject quality/improperly eviscerated fish				
41	3.4	Unacceptable fish culled and removed				
42	3.4	Lot reinspected				
43	3.5	Staging time limits met				
44	3.5	Records made and kept				
	THAWING, BUTCHERING, STAGING SUBTOTAL					

Canned Tuna GMP Compliance

Plant:_____ Inspector:_____ Date:_____

PRE-COOKING, COOLING, CLEANING

Item	GMP	GMP Description	Compliance Category			Comments/Action
			1	2	3	
46	4.1	Pre-cook equipment/utensils clean and sanitary				
48	4.1	Pre-cook process adhered to				
49	4.1	Pre-cook records made and maintained				
50	5.1	Cooling to cleaning time limits met (6 hr)				
53	6.2	Outer work clothing functional and cleanable				
54	6.2	Outer work clothing worn when processing				
55	6.2	Aprons and gloves not worn in washrooms or outside				
56	6.2	Waterproof aprons properly cleaned				
57	6.2	Hair restraints used				
58	6.2	Fingernail polish / jewellery not worn				
60	6.3	Open wounds / sores				
61	6.4	Culling / Inspection at end of cleaning line				
62	6.4	Stations staffed with qualified personnel				
63	6.4	Loins properly inspected				
64	6.4	Reject quality flesh / loins removed and disposed of				
65	6.4	Records made and maintained				
66	6.5	Cleaned flesh not contaminated with offal				
67	6.6	Flesh containers washed after each use				
68	6.6	Cleaning tables rinsed once every 4 hrs				
69	6.6	Cleaning surfaces cleaned and sanitized at shift end				
70	6.6	Cleaning and sanitizing records kept				
71	6.6	Cleaned flesh holding time limit met (1 hr maximum)				
72	6.6	Records of cleaned product storage kept				
	PRE-COOKING, COOLING, CLEANING SUBTOTAL					

Canned Tuna GMP Compliance

Plant:_____ Inspector:_____ Date:_____

PACKING, RETORTING, CAN COOLING, LABELLING,
CASING, PRODUCT STORAGE, QUALITY CONTROL PROGRAM

Item	GMP	GMP Description	Compliance Category			Comments/Action
			1	2	3	
73	7.1.1	Ingredients inspected				
74	7.1.1	Non-complying ingredients removed and disposed of				
75	7.1.1	Records made and maintained				
77	7.2.1	Empty cans and lids inspected				
78	7.2.1	Empty cans properly cleaned				
79	7.2.1	Records made and maintained				
80	7.3.1	Loins and flesh inspected at can filling				
81	7.3.1	Defective material removed and reworked				
82	7.3.1	Records made and maintained				
83	7.3.2	Loins cut neatly and uniformly / no product on flange				
84	7.3.2	Filling machine knives checked for nicks				
85	7.3.2	Weighing devices available				
86	7.3.2	Fish fill and net content inspections made				
87	7.3.2	Non-compliant cans removed and corrected or rejected				
88	7.3.2	Records made and maintained				
90	7.3.3	Recipe and fill specifications adhered to				
91	7.3.3	Recipe and fill specifications monitored by QC staff				
92	7.3.3	Non-compliant fill specs, removed and corrected or rejected				
93	7.3.3	Records made and maintained				
94	7.4.1	Cans properly washed after seaming				
95	7.4.2	Can integrity, code legibility and accuracy inspected				
96	7.4.2	Seamer stopped if defects found or specifications not met				
97	7.4.2	Seamer repaired and retested and passes before restart				
98	7.4.2	Responsible agency notified of defects, products isolated				
99	7.4.2	Records made and maintained				
100	7.4.3	Can seam tear-down / measurement every 4 hrs				
101	7.4.3	Seamer stopped if defects found or specifications not met				
102	7.4.3	Seamer repaired and retested and passes before restart				

103	7.4.3	Vacuums measured			
104	7.4.3	Vacuums meet specifications			
105	7.4.3	Integrity or vacuum defects found, responsible agency notified			
106	7.4.3	Integrity or vacuum defects found, products isolated			
107	7.4.3	Integrity of vacuum defects found, products inspected & culled			
108	7.4.3	Integrity of vacuum defects found, serious can destroyed			
109	7.4.3	Integrity or vacuum defects found, cull report to resp. agency			
110	7.4.3	Procedure to clear jam-ups followed			
111	7.4.3	Records made and maintained			
113	7.5.1	Cans coded properly			
116	8.1	Retort operators have approved training			
117	8.1	Retorting procedures adhered to			
118	8.1	Retorting procedures monitored by QC staff			
119	8.1	Records made and maintained			
120	8.2	Cans begin to be heat processed within 2 hrs			
122	9.1	Cans water cooled to 45-50°C (113-122°F)			
123	9.2	Cans dried in clean area of plant			
124	9.2	Cans not touched by hands until cool and dry			
125	9.2	Cans not washed after cooling			
127	9.3	Chlorine added at least 20 min prior to use, ≥2 ppm			
128	9.3	2 ppm residual chlorine maintained at discharge			
129	9.3	Chlorine level measured twice per packing shift			
130	9.3	Records made and maintained			
131	9.4	Unretorted cans not mixed with retorted cans			
132	9.4	Indicators used to check satisfactory retorting			
133	9.4	Records made and maintained			
136	10.1	Product inspection stations before and at labelling			
137	10.1	Cans inspected before and after labelling			
138	10.1	Cans inspected before casing and warehousing			
139	10.1	Defects/swells/rusty/dirty/damaged cans removed			
140	10.1	Defective/swollen cans, lots isolated/identified			
141	10.1	Swollen/serious defects - isolated/destroyed			
142	10.1	Records made and maintained			
143	11.1	Cartons/cases legibly marked with code			
144	11.1	Codes and cartons/cases are same as cans in cases			

145	11.1	Clean, sound material used for cartons and cases			
147	12.1	Can warehouse has proper storage conditions			
151	12.1	Temperature monitored, no excess heat or freezing			
152	12.1	Product storage records made and maintained			
156	13.1	QC control points identified and monitored			
157	13.1	GMP control point deviations identified and corrected			
158	13.1	GMP and QC program records made and maintained			
	PACKING, RETORTING, CAN COOLING, LABELLING, CASING, PRODUCT STORAGE, QUALITY CONTROL PROGRAM	SUBTOTAL			

Canned Tuna GMP Compliance

Plant:_____ Inspector:_____ Date:_____

GENERAL GMP ASSESSMENT ITEMS

Item	GMP	GMP Description	Compliance Category			Comments/ Action
			1	2	3	
19	2.1	Thaw water from a safe and sanitary supply				
23	2.2	Thawing tanks are of a sanitary design				
24	2.2	Thawing tanks constructed of approved materials				
29	3.2	Wash water from a safe and sanitary supply				
32	3.3	Rinse water from a safe and sanitary supply				
38	3.4	Cooking racks of an approved sanitary design				
45	4.1	Cooking equipment and utensils ofan approved sanitary design				
47	4.2	Precook time / temperature submitted to the responsible agency				
51	6.1	Cleaning equipment and utensils of an approved sanitary design				
52	6.1	Claning area properly designed and constructed				
59	6.3	Communicable diseases / carriers				
76	7.1.2	Spring water meets standards				
89	7.3.3	Recipe / fill specifications provided to responsible agency				
112	7.5.1	Can code key submitted to and approved by responsible agency				
114	8.1	Canning facilities and equipment approved by responsible agency				
115	8.1	Canning process submitted A& approved by responsible agency				
126	9.3	Can cooling water from a safe and sanitary supply				
135	9.4	Traffic control systems utilized				
146	12.1	Warehouse registered and in good repair				
148	12.1	Warehouse sanitation program implemented				
149	12.1	Warehouse insect and rodent control program				
150	12.1	Approved pesticides used				
153	13.1	QC program approved by responsible agency				
154	13.1	QC personnel received approved training				
155	13.1	Training records made and maintained				
	GENERAL GMP ASSESSMENT ITEMS SUBTOTAL					

Sub-total - Receipt, Examination, Handling & Storage of Raw Fish			
Sub-total - thawing, Butchering, Staging			
Sub-total - Precooking, Cooling, Cleaning			
Sub-total - Packing, Retorting, Can Cooling, Labelling, Warehouse			
Sub-total - General GMP Assessment AItems			
Sub-total - GMP Compliance Assessment			
Total			

Acknowledged by:

Inspector

Acknowledged by:

Company Representative