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
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:

<table>
<thead>
<tr>
<th>Product</th>
<th>Can Size</th>
<th>Init. Temp. (°F, °C)</th>
<th>Process Time (min.)</th>
<th>Temp. (°F, °C)</th>
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<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

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

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

RECEIPT, EXAMINATION, HANDLING & STORAGE OF RAW FISH

SUBTOTAL
## Canned Tuna GMP Compliance

**Plant:** ___________________  **Inspector:** ___________________  **Date:** ___________________

### THAWING, BUTCHERING, STAGING

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

**THAWING, BUTCHERING, STAGING SUBTOTAL**
# Canned Tuna GMP Compliance

Plant: ___________________  Inspector: _____________________  Date: ______________________

## PRE-COOKING, COOLING, CLEANING

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

Total: 87
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<td>1</td>
<td>2</td>
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<tr>
<td>73</td>
<td>7.1.1</td>
<td>Ingredients inspected</td>
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<td>74</td>
<td>7.1.1</td>
<td>Non-complying ingredients removed and disposed of</td>
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<td>75</td>
<td>7.1.1</td>
<td>Records made and maintained</td>
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<td>77</td>
<td>7.2.1</td>
<td>Empty cans and lids inspected</td>
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<tr>
<td>78</td>
<td>7.2.1</td>
<td>Empty cans properly cleaned</td>
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<td>79</td>
<td>7.2.1</td>
<td>Records made and maintained</td>
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<td>80</td>
<td>7.3.1</td>
<td>Loins and flesh inspected at can filling</td>
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<tr>
<td>81</td>
<td>7.3.1</td>
<td>Defective material removed and reworked</td>
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<td>82</td>
<td>7.3.1</td>
<td>Records made and maintained</td>
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<tr>
<td>83</td>
<td>7.3.2</td>
<td>Loins cut neatly and uniformly / no product on flange</td>
<td></td>
<td></td>
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<tr>
<td>84</td>
<td>7.3.2</td>
<td>Filling machine knives checked for nicks</td>
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<td>Cans properly washed after seaming</td>
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<td>Can integrity, code legibility and accuracy inspected</td>
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<td>Seamer stopped if defects found or specifications not met</td>
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<td>Seamer repaired and retested and passes before restart</td>
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<td>Responsible agency notified of defects, products isolated</td>
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<td>Vacuums meet specifications</td>
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<td>Integrity or vacuum defects found, products isolated</td>
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<td>Integrity or vacuum defects found, cull report to resp. agency</td>
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<td>Cans coded properly</td>
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<td>Retort operators have approved training</td>
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<td>Cans begin to be heat processed within 2 hrs</td>
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<td>Cans water cooled to 45-50°C (113-122°F)</td>
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<td>Cans dried in clean area of plant</td>
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<td>120</td>
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<td>Cans not touched by hands until cool and dry</td>
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<td>121</td>
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<td>Cans not washed after cooling</td>
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<td>122</td>
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<td>Chlorine added at least 20 min prior to use, ≥2 ppm</td>
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<td>123</td>
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<td>2 ppm residual chlorine maintained at discharge</td>
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<td>Chlorine level measured twice per packing shift</td>
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<td>Unretorted cans not mixed with retorted cans</td>
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<td>Indicators used to check satisfactory retorting</td>
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<td>Product inspection stations before and at labelling</td>
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<td>Cans inspected before and after labelling</td>
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<td>Cans inspected before casing and warehousing</td>
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<td>Defects/swells/rusty/dirty/damaged cans removed</td>
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<td>Defective/swollen cans, lots isolated/identified</td>
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<td>Swollen/serious defects - isolated/destroyed</td>
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<td>Cartons/cases legibly marked with code</td>
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<td>Codes and cartons/cases are same as cans in cases</td>
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<td>Clean, sound material used for cartons and cases</td>
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<td>145</td>
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<td>Can warehouse has proper storage conditions</td>
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<td>Temperature monitored, no excess heat or freezing</td>
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<td>Product storage records made and maintained</td>
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<td>QC control points identified and monitored</td>
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<td>GMP control point deviations identified and corrected</td>
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<td>157</td>
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<td>GMP and QC program records made and maintained</td>
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PACKING, RETORTING, CAN COOLING, LABELLING, CASING, PRODUCT STORAGE, QUALITY CONTROL PROGRAM

SUBTOTAL
### Canned Tuna GMP Compliance

<table>
<thead>
<tr>
<th>Plant: ___________________</th>
<th>Inspector: ___________________</th>
<th>Date: __________________________</th>
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**GENERAL GMP ASSESSMENT ITEMS**

<table>
<thead>
<tr>
<th>Item</th>
<th>GMP</th>
<th>GMP Description</th>
<th>Compliance Category</th>
<th>Comments/Action</th>
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<tr>
<td>19</td>
<td>2.1</td>
<td>Thaw water from a safe and sanitary supply</td>
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<td>23</td>
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<td>Thawing tanks are of a sanitary design</td>
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<td>Thawing tanks constructed of approved materials</td>
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<td>Wash water from a safe and sanitary supply</td>
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<td>Claring area properly designed and constructed</td>
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<td>Communicable diseases/carriers</td>
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<td>Spring water meets standards</td>
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<td>Canning facilities and equipment approved by responsible agency</td>
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**GENERAL GMP ASSESSMENT ITEMS SUBTOTAL**
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