GUIDELINES PROCEDURES FOR THE VISUAL INSPECTION OF LOTS OF CANNED FOODS FOR UNACCEPTABLE[1] DEFECTS

CAC/GL 17-1993 [2]

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[1] Unacceptable defects are those which show visual evidencethat a metal container is without hermetic seal or that microbial growth has occurred in the container's contents (see Appendix 2).

[2] The Guideline Procedures for the Visual Inspection of Lots of Canned Foods were adopted by the Codex Alimentarius Commission, 1993. The Guidelines have been sent to all Member Nations and Associate Members of FAO and WHO as an advisory text, and it is for individual governments to decide what use they wish to make of the Guidelines.

EXPLANATORY PREFACE

The safety of canned foods is assured primarily by the application of Good Manufacturing Practices (GMP's) in the manufacture of the containers, processing and handling the container in the processing establishment, and storage and distribution of the finished product. When the safety or acceptability of a lot of canned food is in question the first action should be the verification that GMP's were followed. However, there are instances e.g., international trade, when safety or acceptability of a lot may be in question and no evidence is available which would give assurance that GMP's had been followed. In such situations it would be appropriate for a canning expert to assess the acceptability or safety by both inspection and reference to any pertinent documentation relating to processing, shipping, etc. of the lot which may be available. The type of examination carried out under such circumstances will vary and be dictated by the particular problem or situation. The examination may be expected to reflect the experiences of the particular expert engaged.

Some container defects can increase the potential for microbiological contamination of canned foods resulting in spoilage and in some instances in foodborne illness. While some of these defects are hidden, many are visible on the container surfaces permitting their detection without destructive analysis. Control of such defects, that is preventing their occurrence, is exercised in a number of critical control points in the GMP's to assure that the risk of post-process microbial contamination which may result in spoilage and food poisoning is minimized. It is in this sense that inspection of lots of canned foods for visual defects can be a viable means to determine their acceptability. Since such inspection is non-destructive it permits the inspection of larger numbers of containers at minimal cost. However, when such inspections are carried out, only statistical based sampling plans should be used and the choice of sampling plan depends on the nature of the inspection being undertaken.

It is important to recognize that sampling inspection for defects alone cannot give the same level of assurance to GMP's because:

1. not all defects are apparent by visual inspection; and
2. there are limitations on resources available for the application of statistically based sampling plans.

Control of visual defects is just one of the GMP's relevant to assuring that the risk of contamination with microorganisms which may result in spoilage and food poisoning are minimized. From this, it is clear that sampling plans need to be considered in relation to their intended purpose and to the acceptable and unacceptable defects.

End-product examination for visual defects should not be over emphasized as it may divert attention away from those GMP's which cannot be monitored by end-product examination (see Codex Alimentarius Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods, CAC/RCP 23-1979 (Rev.1, 1989, Rev. 2, 1993)).

Sorting may be appropriate to remove defective cans but this should be decided at the "retention" stage by a person with experience in the evaluation of defective cans.

IT IS MOST IMPORTANT THAT SAMPLING INSPECTION OF LOTS OF CANNED FOOD FOR THE PRESENCE OF VISUAL DEFECTS IS NOT THE ONLY BASIS FOR JUDGING PRODUCT TO BE FIT FOR HUMAN CONSUMPTION

1. INTRODUCTION

The container defects named and illustrated in the manual and listed in Appendix 2, should be obvious and render the container or its contents defective, that is not suitable for distribution and sale. Anyone with a minimum of training should be able to recognize and intercept containers with these defects and to remove them from the food distribution chain. Expert advice should then be sought on the acceptability of the remainder of the lot (see also the Codex Guidelines for the Salvage of Canned Foods Exposed to Adverse Conditions).

The external defects listed in Appendix 2 and illustrated in the manual as unacceptable defects, are those which show visual evidence that a metal container is without a hermetic seal or that microbial growth has occured in the containers contents. These represent only one extreme of a whole range of visual defects which may be found in metallic containers. Provisions should be made to ensure that an inspector can differentiate between those shown in the manual as unacceptable defects and other defects that may be found in the course of an inspection.

The safety of canned foods is most properly assured through strict adherence to Good Manufacturing Practices as detailed in the Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods, CAC/RCP 23-1979 (Rev.1, 1989, Rev. 2, 1993), at the time of can manufacture, canning, storage and shipping. The inspection of a sample from a lot of finished product can provide only limited assurance of safety, since its main goal is to obtain a measure of the lot quality with respect to defectives and is mot suited to the examination of shipments of unknown history. What action, if any, that should be taken would depend upon the quantity and type of defectives found and/or upon prevailing requirements of the regulatory agency having jurisdiction.

2. OBJECTIVE

This guide is intended for use by those charged with the responsibility for the visual inspection of lots of canned foods for unacceptable defects which are depicted in the pictorial manual and listed in Appendix 2. This guide is not intended to be used to determine the disposition of a lot of canned food.

3. INSPECTOR

The term inspector applies to anyone who is charged with the responsibility to inspect a lot of canned foods for container defects and is not confined to those from regulatory agencies.

3.1 Training

Inspectors should be trained in the techniques required for the inspection of canned foods for container defects, with particular reference to the detection and identification of unacceptable defects as depicted in the manual and listed in Appendix 2.

3.2 Powers

Inspectors should have the authority to exercise control over a lot until inspection, including evaluation of the results, is complete. Inspectors should also have the authority to control the disposal of defective cans and the entire lot if it is deemed unacceptable for sale.

4. INSPECTION

4.1 Preparation for Inspection

The inspector should be given all pertinent information on the lot(s) designated for and prior to the sampling for inspection, for example:

- Location of the lot(s);
- lot size (number of cartons and number of containers/carton);
- food type (peas, beans, luncheon meat, etc.);
- type and size of can;
- list of codes in the lot(s) and number of cartons in each;
- processor, country of origin, legal agent, etc.;
- sampling plan.

In order to properly sample an inspection lot and examine cans, all cans in the lot should be accessible. Adequate space and illumination should be available at the site of the inspection. As some defects are difficult to observe with the naked eye a magnifying glass (3x to 5x) and a high intensity light source are useful for the examination of the container surface and the label. The reference defect manual should be available for consultation to ensure that defects are correctly identified. Adequate assistance should be available to the inspector so that he may have access to the entire lot for sampling.

The inspector should be informed as to the information, observations and sampling plan that are required for the inspection. A specific form or check list which details the information required and with sufficient space to record observations is an excellent means to ensure that the necessary information and observations are acquired and recorded. An example of a check list is given in Appendix 1.

4.2 Overview Inspection

The lot(s) should be examined visually for the presence of damaged, wetted or stained cartons. To properly conduct this overview inspection, as many of the cartons as possible should be exposed to view. It is not possible to conduct a proper overview when the lot(s) are contained in a truck, boxcar or shipping container as only those cartons facing the doors are exposed for examination.

Any damaged, wetted or stained cartons should be separated from the lot for a more detailed inspection. It should be kept in mind that the wetting or staining of cartons can often be the result of leakage of cartons immediately above which may not show any visible signs of leakage.

The number of damaged, wetted or stained cartons which are separated from the lot should be recorded as well as the location to which they have been removed. Precautions should be taken to prevent their inadvertent removal until they have been satisfactorily inspected and their fate determined. When there is obvious forklift or transportation damage, the inspector may permit removal of the damaged containers without prejudicing the evaluation of the remainder of the lot, provided the damage is not a prevailing condition throughout the lot. This would also apply to lots not selected for examination where similar conditions prevail. If can damage is not due to handling, refer to actions in Section 6.

Any damaged, wetted or stained cartons previously separated from the lot during the overview inspection may be sorted separately and given a 100% inspection to identify the unacceptable defects present.

5. SAMPLING INSPECTION

The lot(s) should be sampled in accordance with a designated sampling plan. The sampling plan(s) used should be recorded.

Statistically based sampling plans call for a random selection of the sample units in the sample. For inspections, all items in the lot should be accessible and every effort should be made to ensure that the sample obtained is representative of the lot. It is important that the method used to obtain the sample is recorded as it may have an impact on the evaluation of the results. Where the lot has very limited access, the inspector would well be advised to seek guidance.

Frequently lots of canned foods can contain more than one code lot. In such cases and prior to sampling it should be determined whether each code lot will be sampled separately and what sampling plan will be used for each.

Each sample unit should be identified so that any defects found can be related to a particular unit. The number of sample units taken should be recorded.

5.1 Examination of Sample

When the required number of cans has been selected they should be carefully examined for defects. The first step is to carefully observe the overall external appearance of the cans, paying particular attention for any signs of swelling or leakage. The latter may be evidenced by the presence of product on the can or staining of the label. The label should be removed from a suspect can after its position has been marked. This allows for easier location of a defect on the can. All parts of the can should be carefully examined with particular attention being paid to seams, areas of embossing and tear away strips, if present.

Each sample unit found to have any of the unacceptable defects as shown in the manual should be recorded. All defects observed for each sample unit should be recorded. In the event that an inspector is uncertain of a defect, he should seek a second opinion from an expert.

6. ACTION WHEN DEFECTS ARE FOUND

When an inspector finds any defect shown in the manual he should either notify his superior or follow established procedures which set out criteria regarding the action to be taken. It may be appropriate to retain the lot and send defective cans to a laboratory for further investigation. It is important to remember that the individual cans which have unacceptable defects may represent a health hazard and proper care should be exercised in handling, shipping or disposing of such cans. All defective cans should remain under control until destroyed.

APPENDIX I

LOT INSPECTION RECORD

INFORMATION ON LOT

1. Owner or consignee (name and address)
2. Location of lot
3. Manufactured by/for (name, address and establishment No., if appropriate)
4. Transportation (type and duration)
5. Date of arrival
6. Number of cartons
7. Number of containers per carton
8. Product: brand name; and common name (include style if appropriate)
9. Secondary packaging
10. Type and size of container
11. Code lots present (include cartons per code if available)
12. Code interpretation (if available)
13. Details of any accompanying documentation
14. Has lot been salvaged?
15. Is lot part of a larger lot or consignment?
16. If yes, where is remainder of lot or consignment located?

INFORMATION ON INSPECTION

1. Date of inspection
2. Inspector's name, address and agency or affiliation
3. Sampling plan used
4. Method by which sample was taken
5. Was it possible to sample freely?
6. Number of containers (sample units) in the sample taken
7. How were sample units identified?
8. List all defects found for each container and note which are unacceptable defects
9. List containers sent to laboratory for further examination
10. Results of laboratory analysis
11. Other comments or observations related to the inspection

INFORMATION ON DISPOSITION

1. Lot accepted or detained
2. How were defective (unacceptable) containers disposed of?
3. If lot retained, what further action is recommended or has been taken?

APPENDIX II

UNACCEPTABLE DEFECTS

The following defects are considered to comply with the definition given for unacceptable defects:

1.Perforated external corrosion

2. Severe body denting (plate fracture with leakage evident)

3. Severe double seam denting (fracture evident)

4. Defective side seam weld (wild burn through)

5. Defective side seam weld (wild blow out)

6. Incomplete side seam weld

7. Incomplete open side seam weld (leakage evident)

8. Mislocked side seam

9. Body puncture

10. Body perforated

11. Hard swell or buckle swell or blown

12. Cable-cut (end plate cutthrough, leakage evident)

13. Sharp embossed code (endplate fractured)

14. Deadhead or skidder

15. Incomplete double seam (2nd operation incomplete)

16. Cut-over or cut-through (plate fractured)

17. Torn flange (visible hole)

18. Knocked down curl

19. Knocked down flange

20. Torn back curl

21. Score line fracture