CONTAINER HANDLING:

Container integrity is easily taken for granted. Container integrity is the ability of a packaged, sealed food container to withstand processing and distribution and to prevent entry of microorganisms.

Before processing containers, lids, and flexible roll stock must be handled in a manner that prevents defects and damage that could affect the hermetic condition of the sealed container. After processing, it is important to prevent entry into a food container of both spoilage organisms and organisms of public health significance, such as *Clostridium botulium*.

The integrity of a food container is influenced by its design, quality of seal formation and care in handling.

Containers must maintain hermetic seal under commercial operating conditions. According to 9 CFR 431.2(a), empty containers, closures, and flexible pouch roll stock must be evaluated by the establishment to ensure that they are free of structural defects and damage that may affect product or container integrity. This requirement applies to all commercial containers. The hermetic seal must prevent entry of microorganisms during and after thermal processing. Gentle handling is especially important with plastic pouches, paperboard boxes, and semi-rigid bowls and trays because these containers are not as strong as the rigid containers.

There are three requirements to keep canned product commercially sterile: 1) the hermetically sealed container which prevents microorganism re-entry, 2) the heat process to ensure product commercial sterility, and 3) post process handling that protects container integrity.

Rough handling can cause metal cans with good double seams to loose their double seam integrity and possibly leak post process. Glass jar closures can fail even if made well. Untrained employees may be inclined to use whatever containers are available for use including damaged boxes of pouches, lids, etc. IPP should examine product in empty container storage areas. Pre-production container handling includes examining empty containers, determining methods for cleaning, minimizing rough handling and looking for handling procedures that may damage containers prior to filling.

Rigid containers must be cleaned before filling to prevent incorporation of foreign matter into the finished product. Closures, semi-rigid containers, preformed flexible pouches, and flexible pouch roll stock contained in original wrappings do not need to be cleaned before use. All empty containers, closures, and flexible pouch roll stock must be stored, handled, and conveyed in such a manner that will prevent soiling and damage that could affect the hermetic condition of the sealed container.

There are steps in the processing canned product that may be of particular concern as it relates to container integrity. The manner in which establishments blanch product and fill containers are important considerations. Blanching is when raw vegetables are cooked in hot water or exposed to steam, usually prior to thermal processing. Blanching may affect container integrity, the thermal process and product quality. Blanching shrinks product to assist in the proper filling of container, but can expels cellular gases that can cause strain on the container during thermal processing. Blanching food drives the air out of the food. Air reduces the vacuum in the container which can lead to container damage. Residual air in pouches can create small cold spots that affect heat penetration. Residual air in metal cans expand during heating and may create internal pressure leading to buckling. Containers can be filled by hand or mechanically filled depending

upon the container and product. The filling of the container must be controlled to ensure that any filling requirements are met. Even if headspace is not a critical factor in the process schedule (agitating process), headspace is important for the formation of a vacuum. Establishments must prevent overfilling.

The steps closer to the retort are the more critical. The seams are mostly formed by the time they arrive at the warehouse. The establishment needs to handle the containers carefully through labelling, palletizing, casing and warehousing.

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