1. **Receipt and Sampling of Raw Material**

Ackees are purchased from approval suppliers who have been trained by Tijule in the proper selection and racking of mature ackees. Farms are visited prior to the beginning of the season. The premises are inspected and examined to ensure the racks are in good condition and are located in areas away from animal houses, out houses (pit latrines) and garbage storage areas. Suppliers, whose premises are found acceptable, are given orders to supply the fruit on specific days and are asked to transport the fruits under clean conditions, with the tray of the vehicle washed and sanitized and/or lined with clean plastic. Suppliers using public transport are required to package the fruit in clean bags. Most of the ackees are sourced from Clarendon. Ackees are brought in loose bulk form. Ackees that are tree-ripened (not on racks) are also bought from approved suppliers.

Only mature, wholesome, open (‘fit’) ackees are accepted at the factory. Immature ackees have been shown to contain a higher level of hypoglycin than ackees that are mature. On arrival at the factory, each delivery must be inspected by the Ackee Receival Inspector or QC or Production supervisor. For the receival, ackees are examined for maturity, firmness, wholesomeness and any signs of rotting. Samples of 4 - 12 units are taken from each lot and examined. Indices of maturity are opening of the pod at the seams, hardened seeds, segments that are easily removed and full and bright in colour with loose inner membranes i.e. raphe. Immature ackees are difficult to force open and if they do open, it is not along the seams (particular attention must be paid to this as there might be individuals who will try to get the fruit to open before they are fully mature). Only ackees that are between Stages 7-9 maturity should be shelled. The seeds of immature ackees are soft (sometimes brown in colour) and the segments small and difficult to dislodge. Only fruits which are firm, mature, clean, and wholesome are accepted. All young, unopened, immature, bruised, and rotting ackees are rejected.

1. **Shelling**

Shelling (or husking) involves removal of the ackee segment with seeds attached (arils) from the pod. Shells are discarded and the arils with the seeds are placed in clean, sanitized tubs and transferred to the sorting area.

1. **Sorting**

Mature pods are put into clean, sanitized tubs and are taken for sorting and weighing. This 100% inspection further eliminates any immature, damaged, soft or rotten pods that might have escaped the initial inspection and the inspection during shelling thus removing the threat of high hypoglycin from immature ackees. Tubs are then weighed to determine payment.

1. **Cutting & Inspection**

Seeds along with raphe or red inner membrane are removed from the segments with the aid of a small knife. Extreme care is taken when carrying out this operation to ensure proper removal of the raphe since this can contribute to high levels of hypoglcin in the finished product. Care is also taken to ensure that minimum damage is done to the segments and that all of the seed has been removed. Trimmed segments should be free of seeds and any red tissue. Red tissue is removed with the aid of commercially purchased hand towels. Ackee segments with reddish colouration and pieces of pink/red tissue remaining in them, will show discoloured areas after processing. Any segment which cannot be cleaned properly ‘red ackees’ are dumped.

Cleaned ackee segments are placed in sanitized tubs and collected from the cutting area.

Further inspection is carried out on each tub of cleaned ackees to verify the removal of blemished segments as well as any segments that might have raphe remaining in them. To do this the cut arils are spread out on clean, sanitized stainless steel tables and inspected to remove any pieces of extraneous matter which in this case might be pieces of discarded raphe or any segments with raphe. This will further eliminate any chance of the wash water being contaminated with pieces of loose raphe or segments with raphe being placed in the cans.

1. **Washing**

Cleaned ackee segments are washed in two stages, to remove extraneous matter and to decrease any residual hypoglycin. The first wash consists of a 30-second manual agitation in a 0.5% acidified solution. The second wash is also done in a 0.5% acidified solution for 20 seconds. Washing solution is prepared by mixing glacial acetic acid in potable water. Acetic acid is purchased from reputable manufacturers and under guarantee so there are no associated hazards. The water that is used to mix the solution is potable water from the public water supply. Two to three tubs of ackees are washed in one wash station of acidified solution. Waste solution is discarded via the floor drains. Fresh washing solution is used for the next tub. This is strictly adhered to in order to prevent cross contamination of the batches.

1. **Dry fill & Weighing**

**Canned Ackees**

Washed ackee segments are manually filled into cans, which were rinsed in sanitized water and then drained. Segments are packed into the cans as solidly as possibly without crushing them. Cans are weighed to achieve the required drained weight of 12.5 oz for A2 cans and 64 oz for A10 cans.

**Frozen ackees**

Washed ackee segments are manually put into plastic bags and the bags are weighed and placed into cold room.

1. **Wet Fill - (addition of brine)**

The brine solution used for canning operations is a 2% solution and is prepared in a kettle positioned near the exhaust box. Brine is mixed using tap water, salt, and citric acid (citric acid is added to improve the quality of the product) and other ingredients. The brine is allowed to reach boiling point. The brine is filtered prior to use. Brine is filtered with the use of a filter on the outlet end of the kettle. Filtration serves to prevent the entry of any potential form of extraneous matter into the cans. Brine is added to individual cans as they enter the exhaust line.

1. **Exhausting**

The residence time in the exhaust box is approx. 1½minutes. Steam supply is adjusted so that the internal temperature of the can is above the required 150 oF (minimum) internal temperature when the can is tested after closing. As the cans exit the exhaust box, the can is topped up with brine where necessary as the cans move to the seaming head of the seamer.

1. **Sealing and coding**

**Canned ackees**

Lids are automatically applied and the cans are sealed. The first can is set aside for verification of the centre/internal temperature and the remaining cans are inverted and stacked in the retort basket. The centre/internal temperature of the first can removed is measured and should be no less than 150oF. After the cans exit the seamer they are coded with product code, manufacture date and best before date. A10 cans are manually coded.

**Frozen ackees**

The packets of weighed, frozen ackees are sealed in the sealer. The sealed bags are then packed into washed sanitized crates for storage in the Freezer Store.

1. **Retorting**

The retort baskets are transferred via overhead winch to a still retort in which they are processed according to the scheduled process, for Acidified Ackee (citric acid) a minimum of 6 minutes at 245oF and Non-acidified (salt only) a minimum of 10 minutes at the same temperature for A2 and 15 minutes for A10 at 242oF. All information on the thermal process is recorded on log sheets and thermal charts. Additional information is included in the scheduled process.

1. **Cooling**

The cans are conveyed into chlorinated water and allowed to remain in the cooling tank until the average temperature of each can is approximately 98ºF. This will take between 10-15 minutes, (cooling curve). This timing is dependent upon the time of the cook, i.e. the first cook for the day will take a shorter time to cool as the water will be at room temperature, however after the first cook, the water would have absorbed a percentage of the heat of the cans and therefore take a longer time to cool for the subsequent cooks. Temperatures in excess of 105oF may result in quality deterioration of the product, and temperatures below 95oF will not permit proper drying of the cans which may lead to exterior rusting. Upon removal of the cans, the cooling water is checked for residual chlorine. Cans are observed while in the cooling tank to see if there are any signs of bubbles coming from them. Bubbling would indicate that there are holes or cracks within the cans through which microorganisms could enter.

1. **Oiling and Packaging.**

The cans are individually cleaned with a cloth coated with edible oil, with care taken to coat the ends and double seams. This aids in preventing rusting of the cans after they are stacked in cartons in the warehouse.

1. **Labeling, Carton filling & Sealing.**

Canned ackees in brine have to be cleared for sale by the signing off on the Food Safety Team Leader Review form following a review of all the CCPs and where necessary is released for sale against the test results and other verification checks. Cans are labelled with the required label and re packed in cartons which are then sealed and labelled. During the labeling process cans are also examined for signs of corrosion, external moisture, bubbling/frothing since this would indicate that there are leaks within the cans. If these indicators are seen the cans are removed and dumped.

1. **Finished Product Storage.**

Canned products are carefully handled to avoid damage and stored in a cool area for retention of quality.

Frozen products are stored in the freezer store at -5°C.

1. **Shipping**

Shipping is done as required by Sales and Marketing.

1. **Returned Goods.**

This is handled as per company’s Control of Non- conforming Product Procedure.