Procedure for Recording Temperature Profiles in a Commercial Fryer – Yeast Raised Doughnut

Step 1: Format the Data Logging Device

- Prepare the data logging device for use by setting to record temperatures at a frequency of every 1 second.
- Select either °F or °C for recording temperatures; the final calculator is equipped to convert between these values.
- Refer to your device's quick start manual for detailed instructions on preparing your specific logging device.

Step 2: Use of Data Logger for temperature collection

- Follow your data logger device's specific procedures to start recording.
- Collect doughnuts directly out of the fryer from one side of the fryer (i.e. row 1, right-side, front-side) and place on a collection pan adjacent to the Data Logger device. Collect the number of doughnuts that correspond to the number of channels/thermocouple leads on the Data Logger device.
- As quickly as possible from the doughnut exiting the frying, place a thermocouple into the geometric center of the product. For example, with a doughnut ring place into the center of the outer ring or with a doughnut shell place into the true center of the piece. Repeat with each doughnut, one doughnut per channel/thermocouple.
- Place tray into an area or onto a line (if possible) that mimics the cooling conditions of the doughnut.
- Record data for a time equal to two times the total frying time. For example, if fry time is one minute per side, or two minutes total, record cooling temperatures for four minutes.
- Follow the device instructions for removing probes and ending recording.
- Download the recorded data to a computer and prepare the data logger for another run.
- Export the data from each run into Excel format and save for later use. For quick reference, save each run under a new tab in the same Excel worksheet.
- Repeat this process until data from a total of three product runs has been recorded. Then repeat the process for doughnuts collected from the opposite side of the fryer (i.e. row 8, left-side, back-side).

Step 3: Data Compilation and Oven Validation

- Using the Excel files from the three completed runs, determine which probes took the least amount of time to reach 170°F (77°C) for each run.
- Converting the Excel data into graphical format allows for easier selection of the coolest probes. In Excel, highlight the entire data series for all probes, select the **Insert** tab and click on **Insert Line Chart** icon. A graph will display next to the data columns on the worksheet. The lowest line represents the coolest sensor (time along x-axis, temperature along y-axis).
- Copy and paste the column of data for the coolest sensor across all five runs into the appropriate Baking Process Kill Step Calculator tab.

*Note: Temperature data from the selected probes must all fall within a range of +/- 10% of the time to reach 170°F. (i.e. if the average time to 170°F is 9 minutes then the range that all temperatures must be in is +/- 0.9 min. or 8.1-9.9 minutes). If temperatures do not fall within this range corrective action should be taken to modify the baking profile until data falls within this range.