Specifications

Project: Colorimeter (Spectrophotometer)

GENERAL INFORMATION

1.0 <u>Scope of Work</u>:

Provide a Colorimeter (Spectrophotometer) to the USDA-ARS Characterization and Interventions for Foodborne Pathogens.

2.0 <u>Background</u>:

The research unit "Characterization and Interventions for Foodborne Pathogens" at the Eastern Regional Research Center in Wyndmoor, PA investigates innovative technologies to control and inactivate pathogens in different food commodities. Some of these interventions are radio frequency, cold plasma, pulsed light and ultrasound. The mission of our research is to ensure the microbial food safety of the product after using the different interventions; however, quality needs to be like the fresh product. Color is one of the main quality attributes that consumers look at when deciding to purchase a food product. Then, as part of our research, the evaluation of color is a basic need during our research. This purchase request is for a colorimeter (spectrophotometer) that can be used to measure the color of eggs, fruits and vegetables, nuts, seeds and liquid foods such as juices.

CONTRACTOR REQUIREMENTS

3.0 <u>Technical Requirements/Tasks:</u>

The colorimeter (spectrophotometer) must have the following characteristics:

- The instrument must have dual aperture capability with one aperture of at least illuminated 11 mm (diameter) measuring at least 6 mm (medium objects) and the second small aperture must be illuminated 6 mm (diameter) measuring at least 3 mm (small objects).
- It can read colors in curved surfaces and small samples (seeds, nuts)
- It has a minimum 2.5 in or larger screen color display with readings
- It has a fast-measuring speed to evaluate several samples
- It must be vertical orientation and have a small footprint required to meet current available lab space (3.5 in x 9 in x 5 in) and maximum weight 2 lbs
- The instrument must be a dual beam spectrophotometer with a measurement geometry D/8º integrating sphere measuring from 400 to 700 nm with 10 nm resolution and an accuracy specification of repeatability 0.02 DE*ab and inter instrument agreement within 0.12 DE*ab average across 12 BCRA tiles.
- It can be used to measure color of solid foods such as eggs, fruits and vegetables, nuts and seeds, but also liquid foods such as fruit juices, egg albumen and yolk.
- It has a camera viewfinder to improve sample accuracy during reading
- It has software that analyzes color differences between samples (i.e. color net change, DE)
- It has a hand-held design, so it can be used in different labs and the pilot plant
- It is compatible with a tripod

The colorimeter (spectrophotometer) should have the following accessories:

1. Hard case for storage and transportation
2. A vertical leveling jig
3. A wrist strap
4. A cradle for charging and a charging terminal spot
5. A white calibration cap

4.0 <u>Deliverables / Schedule:</u>

The colorimeter (spectrophotometer) shall be delivered to 600 East Mermaid Lane, Wyndmoor, PA 19038 within 60 days of award.