Specifications Document
Product Description: Near-infrared Spectrophotometer with calibrations for oat quality analysis

1) Can quantitatively measure the following oat quality traits using vendor supplied calibration models:
    a. Protein
    b. Moisture
    c. Oil or fat
    d. Starch
    e. Beta-glucan
    f. Total digestible fiber
2) Can quantitatively measure the above sample traits using vendor supplied calibration models in at least 1 of the following sample types:
    a. Whole oats
    b. Oat groats (hulled oats)
    c. Oat flour
    d. Oat flakes
3) Wavelength range approximately 900 – 1700 nm
4) Measurement mode: reflectance
5) Benchtop footprint, approximately 20 inches (width) x 24 inches (depth)
6) Analysis time per sample 30 seconds or less. Shorter analysis times strongly preferred
7) Samples presented in magnetically positioned and 360 degree rotating sample dish
8) Very low measurement variation due to operator differences
9) Can be operated effectively by person without scientific training
10) Multiple sample presentation dish/cup formats available for sample quantities ranging from approximately 1.5 g – 180 g. Sample dishes/cups must be reusable
11) Non-destructive analysis of samples
12) Instrument expected to last at least 10 years when used in a lab environment and when regular maintenance is performed
13) Collected spectra data files can be exported in non-vendor specific file formats and can be analyzed outside of vendor software if desired
14) Calibrations developed in-lab (not those provided by vendor) may be shared without vendor restrictions with other researchers
15) Automatic outlier detection implemented for each measurement
16) Automated wavelength standardization
17) Automatic monitoring of lamp and spectrophotometer stability
18) Lamp is changeable/replaceable by user
19) Vibration resistant spectrophotometer
20) At least 3 USB connections for computer accessories (mouse and keyboard) and data transfer off instrument
21) Vendor software available to allow in-lab calibration development. Software may not be subscription based but rather must be a one-time cost to purchase software. Software will not be purchase now, but compatible and capable software must be available from vendor for possible future purchase

22) Sample data file tagging by barcode reader possible. Not for purchase now, but this must be possible for potential future purchase/set up
23) Instrument installation and training by Vendor technicians and product specialists
24) 1-2 years of unlimited support for using instrument, refining calibrations purchased from vendor, and technical assistance in developing new calibrations with user supplied spectra and reference parameter measurements
25) Vendor focused on instruments and technical support for agricultural sector including researchers, producers, and buyers

Preferred Technical Features:

1) Reflectance-based diode array detector without moving parts for greater stability of detector and stability of measurements across lab environment (temperature and humidity) and time (months, years)
2) Sample dishes that do not require cleaning
3) Internal, self-adjusting/calibration of detector to NIST standard
4) Continuous data acquisition at all wavelengths