# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title:** **Supply of laboratory equipment for ensuring implementation of new laboratory analysis methods p 1/43**

**Publication reference:** EC-ENEST/TGD/2025/EA-OP/0051

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments on its proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offeredspecifications.

***Unless otherwise specified, the requirements in these Technical Specifications are presented as a minimum standard that the offered goods (including ancillary services and works, if required) must meet.*** ***Any features superior to the minimum specifications or additional features offered should be clearly identified in the tenderer’s offer.***

**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| APCI | Atmospheric pressure chemical ionization |
| B/W | Black and white |
| CETI | Centre for Ecotoxicological Research |
| CFR | Change failure rate |
| CMOS | Complementary metal oxide semiconductor |
| CO2 | Carbon dioxide |
| Cy5 | Cyanine 5 |
| ESI | Electrospray ionization |
| FAM | 6-carboxyfluorescein |
| HEX | Hexaclhloro-6-carboxy fluorescein |
| IPH | Institute for Public Health |
| IQ | Installation Qualification |
| JOE | 6-carboxy-4',5'-dichloro-2',7'-dimethoxyfluoresceine |
| LC-MS | Liquid Chromatograph - Mass Spectrometer |
| LED | Light-emitting diode |
| LIMS | Laboratory information management system |
| MRM | Multiple reaction monitoring |
| NDIR | Nondispersive infrared |
| OD | Outside density |
| OQ | Operational Qualification |
| PCR | Polymerase chain reaction |
| PQ | Performance Qualification |
| RCF | Relative Centrifugal Force |
| RPM | Revolutions Per Minute |
| RS | Recommended Standard |
| SIM | Selected ion monitoring |
| SIR | Selected ion recording |
| SRM | Selected reaction monitoring |
| SYBER | Cyanine dye |
| TAMRA | Tetramethyl rhodamine |
| UV | Ultra violet |
| VIC | 2'-chloro-7'phenyl-1,4-dichloro-6-carboxy-fluorescein |

**Lot 1 - Laboratory equipment for analysis in the area of animal disease, food and feed**

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **1.1** | **Thermo Shaker for microplates**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.1.1** | Temperature Setting Range: From ambient temperature +5°C to +60°C. |  |  |  |
| **1.1.2** | Temperature Stability: High stability suitable for laboratory applications, within ±0.5°C. |  |  |  |
| **1.1.3** | Temperature Uniformity: Consistent performance across the platform, with a variation not exceeding ±0.5°C at common operating temperatures. |  |  |  |
| **1.1.4** | Shaking Motion: Orbital shaking with a 2 mm orbit, or microplate applications. |  |  |  |
| **1.1.5** | Speed Control Range: Adjustable within a range of 250 to 1200 rpm. |  |  |  |
| **1.1.6** | Microplate Compatibility: Compatible with standard microplates, accommodating a height of maximum 18 mm and holding maximum 4 plates. |  |  |  |
| **1.1.7** | Display: Digital display showing temperature, speed, and time settings. |  |  |  |
| **1.1.8** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.2** | **ELISA washer**  **Quantity: 2** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.2.1** | Dispensing Channels: Supports 1-4 channels for flexible operation. |  |  |  |
| **1.2.2** | Manifold Type: Compatible with both 8- and 16-way manifolds for parallel processing of 8- or 16-wells. |  |  |  |
| **1.2.3** | Dispensed Volume Range: Adjustable from 50 µl to 3,000 µl for washing and from 50 µl to 400 µl for dispensing. |  |  |  |
| **1.2.4** | Dispensing Accuracy: ≤1.5%. |  |  |  |
| **1.2.5** | Dispensing Uniformity: Uniform performance across wells, with coefficient of variation (CV)≤3%. |  |  |  |
| **1.2.6** | Residual Volume: Minimal residual liquid left in wells ≤2 µl per well. |  |  |  |
| **1.2.7** | Vacuum Filtration: Adjustable vacuum range with high-efficiency aspiration and filtration. |  |  |  |
| **1.2.8** | Wash Buffers, maximum number of wash buffers controlled: 4 |  |  |  |
| **1.2.9** | Power supply requirement: 220/230V, 50/60Hz |  |  |  |
| **1.2.10** | Application: Suitable for sensitive applications such as detection of prion proteins. |  |  |  |
| **1.3** | **Tissue Homogenizer**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.3.1** | Maximum capacity: 24 tubes, designed to accommodate a range of tube sizes. |  |  |  |
| **1.3.2** | Speed Range: Adjustable speed range 4,000 - 6,800 rpm. |  |  |  |
| **1.3.3** | Locking System: Features an automated tube locking mechanism. |  |  |  |
| **1.3.4** | Programmability: Supports multiple user-defined programs, with automatic saving of parameters. |  |  |  |
| **1.3.5** | Cycle Options: Configurable for multiple cycles. |  |  |  |
| **1.3.6** | Cycle Duration: Adjustable cycle times, allowing for short to extended operations. |  |  |  |
| **1.3.7** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.4** | **Tissue Processor**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.4.1** | Reagent Containers: Accommodates minimum 20 reagent and condensate bottle. |  |  |  |
| **1.4.2** | Bottle Volume: Supports large-volume containers with a maximum capacity of 4 L. |  |  |  |
| **1.4.3** | Paraffin Baths: Equipped with minimum 2 paraffin baths, each with a capacity of 4 L. |  |  |  |
| **1.4.4** | Melting Time: Designed to melt paraffin within 7 hours. |  |  |  |
| **1.4.5** | Temperature Settings: Adjustable from 50°C to 65°C. |  |  |  |
| **1.4.6** | Standby Mode: Elevated above the melting point, maximum 71°C. |  |  |  |
| **1.4.7** | Processing Reagents: Configurable from ambient temperature to 65°C. |  |  |  |
| **1.4.8** | Cleaning Reagents: Adjustable from 35°C to 85°C. |  |  |  |
| **1.4.9** | Maximum Processing Capacity: 200 cassettes per cycle. |  |  |  |
| **1.4.10** | Vacuum and Pressure Settings: Filling Vacuum - with a vacuum level of 50kPa to 80 kPa. |  |  |  |
| **1.4.11** | Draining Pressure: Supports pressure-assisted reagent drainage at levels 30kPa to 60 kPa. |  |  |  |
| **1.5** | **Microtome**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.5.1** | Specimen Feed: 24 mm, with up to 2mm tolerance range for precision. |  |  |  |
| **1.5.2** | Vertical Stroke: Provides a stroke length from 1 mm to 70 mm. |  |  |  |
| **1.5.3** | Clamping Options: Standard Clamp, accommodates specimens with dimensions to fit in the space of maximum 70 x 50 x 30 mm. |  |  |  |
| **1.5.4** | Super Cassette Clamp: Designed for larger specimens, supporting dimensions to fit in the space of maximum 100 x 70 x 50 mm. |  |  |  |
| **1.5.5** | Specimen Retraction: Adjustable retraction in manual sectioning mode, 10 µm to 100 µm. |  |  |  |
| **1.5.6** | Specimen Orientation: Offers flexibility with horizontal and vertical adjustments, from -8° to +8°. |  |  |  |
| **1.5.7** | Section Thickness Settings: Range: Configurable between 1 µm and 60 µm for a variety of sectioning needs. |  |  |  |
| **1.5.8** | Increment Options: Fine adjustments in increments (e.g., 1 µm for thin sections, 5 µm for thicker sections). |  |  |  |
| **1.5.9** | Trimming Section Thickness: Selectable trimming thickness values, commonly 10 µm and 30 µm, for preparation stages. |  |  |  |
| **1.6** | **Slide stainer**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.6.1** | Maximum Loading Capacity: 11 slide racks. |  |  |  |
| **1.6.2** | Slide Rack Capacity: Each slide rack has the capacity to hold maximum 30 specimen slides. |  |  |  |
| **1.6.3** | Total Number of Stations: Equipped with minimum 26 stations. |  |  |  |
| **1.6.4** | Number of Reagent Stations: minimum 18 reagent stations for efficient processing. |  |  |  |
| **1.6.5** | Reagent Container Volume: Each reagent container holds maximum 450 mL, suitable for extended use during staining protocols. |  |  |  |
| **1.7** | **Cold plate**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.7.1** | Operating Temperature: Minimum -6°C. |  |  |  |
| **1.7.2** | Workload Capacity: solidifying a minimum of 65 blocks within 30 minutes. |  |  |  |
| **1.7.3** | Power supply requirement: 220/230V, 50/60Hz |  |  |  |
| **1.8** | **Water bath**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.8.1** | Heating temperature: 5°C - 75°C |  |  |  |
| **1.8.2** | Offered water bath fits the available space at the delivery location: maximum external dimensions of water bath = 360mm x 350mm x 120 mm. |  |  |  |
| **1.8.3** | Power supply requirement: 220/230V, 50/60Hz |  |  |  |
| **1.9** | **Microplate reader**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.9.1** | Measurement Channels: 12 measurement channels with 1 reference channel. |  |  |  |
| **1.9.2** | Filters: Supports maximum 6 filters per slide for flexible analysis. |  |  |  |
| **1.9.3** | Wavelength Range: 340 nm to 750 nm. |  |  |  |
| **1.9.4** | Bandwidth: 50% transmission bandwidth of 10 ± 2 nm. |  |  |  |
| **1.9.5** | Resolution: 0.001 OD. |  |  |  |
| **1.9.6** | Interface: RS 232 C (remote control) and parallel interface. |  |  |  |
| **1.9.7** | Shaking Function: Linear shaking with four selectable modes. |  |  |  |
| **1.9.8** | Accuracy: 0.0 to 2.0 OD: ≤ (1.0% + 0.010 OD). 2.0 to 3.0 OD (at 492 nm): ≤ (1.0% + 0.010 OD). |  |  |  |
| **1.9.9** | Measurement Range: 340 nm to 399 nm: 0 to 3.0 OD. 400 to 750 nm: 0 to 4.0 OD. |  |  |  |
| **1.9.10** | Must have the option for Temperature Control |  |  |  |
| **1.9.11** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.10** | **Automated Inoculation Delivery System**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.10.1** | Dosing Capability: 96-well microtiter plates eliminating issues with skipped wells and repeat testing. |  |  |  |
| **1.10.2** | Dosing Control: Adjustable dosing volume and customizable pattern selection. |  |  |  |
| **1.10.3** | Test Type: Minimum Inhibitory Concentration (MIC) testing, suitable for antimicrobial susceptibility testing. |  |  |  |
| **1.10.4** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.11** | **Small refrigerator for biomedical storage**  **Quantity: 3** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.11.1** | Type: Upright configuration. |  |  |  |
| **1.11.2** | Capacity: minimum 330 L, not exceeding 400 L due to laboratory spacing constrains. |  |  |  |
| **1.11.3** | Temperature Range: +0°C to +10°C. |  |  |  |
| **1.11.4** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.12** | **Large refrigerator for biomedical storage**  **Quantity: 4** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.12.1** | Temperature Range: +0°C to +10°C. |  |  |  |
| **1.12.2** | Capacity: minimum 500L, not exceeding 600L due to laboratory spacing constrains |  |  |  |
| **1.12.3** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.13** | **Natural Convection Incubator**  **Quantity: 2** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.13.1** | Temperature Settings: Adjustable temperature settings from +20°C to +80°C with a setting accuracy of ±0.1°C. |  |  |  |
| **1.13.2** | Controller and Display: Equipped with a touchscreen display |  |  |  |
| **1.13.3** | Interfaces: Ethernet interface for connectivity and monitoring. |  |  |  |
| **1.13.4** | Housing: Features a fully insulated stainless steel door and inner glass door for optimal insulation and visibility. |  |  |  |
| **1.13.5** | Maximum loading per grid/shelf: 20 kg. |  |  |  |
| **1.13.6** | Total maximum chamber load: 200 kg. |  |  |  |
| **1.13.7** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.14** | **CO2 Incubator**  **Quantity: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **1.14.1** | Temperature Setting Range: Dry Heat Sterilization of minimum 140 ºC for maximum 14 hours. |  |  |  |
| **1.14.2** | Temperature Fluctuations: ±0.4°C at +37°C. |  |  |  |
| **1.14.3** | CO2 Control: Adjustment Range: 0 to 20% CO2, with digital electronic CO2 control and NDIR system. |  |  |  |
| **1.14.4** | O2 Control: Adjustment Range: 1% to 20% O2. |  |  |  |
| **1.14.5** | Works Calibration Certificate: Includes certificate for temperature and CO2 at +37°C, 5% CO2, and 90% relative humidity. |  |  |  |
| **1.14.6** | Internal Equipment: Shelves: 2 perforated stainless-steel shelves for efficient air circulation. |  |  |  |
| **1.14.7** | Max. Chamber Load: 90 kg. |  |  |  |
| **1.14.8** | Max. Load per Internal: 15 kg. |  |  |  |
| **1.14.9** | Power supply requirement: 220/230V, 50/60Hz. |  |  |  |
| **1.15** | **General requirements** |  |  |  |
| **1.15.1** | **Technical requirements**   * All equipment is furnished with the necessary accessories and/or parts to ensure that it is operating to the required technical specifications * Offered goods are manufactured and marketed under registered brand name * Following unloading and prior to acceptance, all equipment undergoes basic check, installation, setup, calibration according to manufacturer’s specifications, functional testing and verification. |  |  |  |
| **1.15.2** | **User’s operation and maintenance manuals in English or Montenegrin language**  Manuals are detailed, as to enable the users to operate, maintain and adjust all parts of the supplies. |  |  |  |
| **1.15.3** | **Training**  The Contractor shall provide training materials in electronic form. The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor.Training will be carried out at the delivery places of the equipment and it will cover training in instrument operation, including operation tasks.  **Training topics**   * **Items N° 1.4 and N° 1.6:** For the devices under items N° 1.4 and 1.6 (Tissue Processor and Slide stainer) training for two people is required for 5 days. Training is required to master the techniques and diagnostic methods for transmissible spongiform encephalopathies according to Regulation (EC) No 999/2001. * **Item N° 1.10:** For the device under N° 1.10 (Automated Inoculation Delivery System), training for two people is required for 7 days. Training is required to master the techniques of the microdilution method in accordance with the Implementation Decision (EC) No 1729/2020. |  |  |  |
| **1.15.4** | ***Warranty***  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |
| **1.15.5** | ***Commercial Warranty***  Manufacturer’s warranty in duration of two years.  Tenderer must provide a detailed description of the organisation of the related service (e.g. name and contact information of the authorised service provider) in accordance with the applicable conditions laid down in Article 32 of General Conditions and Article 32 of the Special Conditions. |  |  |  |

**Lot 2 - Laboratory equipment for analysis in the area of food safety, pesticide residue and other contaminants**

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **2.1** | **Ultra-High-Performance Liquid Chromatograph (UHPLC) with Triple Quadrupole (MS/MS) Mass Spectrometer**  **Quantity: 2 sets** |  |  |  |
| **2.1.1** | **Quaternary pump**  **Quantity per set: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **2.1.1.1** | Gradient formation: Low-pressure mixing, quaternary gradient |  |  |  |
| **2.1.1.2** | Number of solvents (eluent lines): 4 |  |  |  |
| **2.1.1.3** | Minimum settable flow range: 0.01–2.0 mL/min |  |  |  |
| **2.1.1.4** | Maximum operating pressure: 1000 bar |  |  |  |
| **2.1.1.5** | Purging must be controlled by software |  |  |  |
| **2.1.2** | **Autosampler**  **Quantity per set: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **2.1.2.1** | Maximum operating pressure: Equivalent to pump pressures |  |  |  |
| **2.1.2.2** | Sample Capacity: Minimum 90 position for 1.5 mL or 2.0-mL vials |  |  |  |
| **2.1.2.3** | Minimum injection volume range: 0.1 μL – 10 μL |  |  |  |
| **2.1.2.4** | Minimum sample thermo-statting range: 4°C – 40°C |  |  |  |
| **2.1.3** | **Termostated Column Compartment**  **Quantity per set: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **2.1.3.1** | Minimum temperature range: 20 - 90°C |  |  |  |
| **2.1.3.2** | Temperature accuracy: maximum ±0.5 °C |  |  |  |
| **2.1.3.3** | Minimum column capacity: 2 columns |  |  |  |
| **2.1.3.4** | Column Compartment: Equipped with switching valve for column changing |  |  |  |
| **2.1.3.5** | Column Compartment: Valve switching for column changing controlled by software |  |  |  |
| **2.1.4** | **Triple Quadrupole mass spectrometer**  **(tandem mass spectrometer)**  **Quantity per set: 1** |  |  |  |
| Manufacturer’s name: |  |  |  |
| Product type, model: |  |  |  |
| **2.1.4.1** | Ion source: ESI and APCI |  |  |  |
| **2.1.4.2** | Source maintenance: Instrument allows the source elements to be removed for cleaning without venting the instrument |  |  |  |
| **2.1.4.3** | Minimum mass range: 5-2000 m/z |  |  |  |
| **2.1.4.4** | Mass stability: ≤ 0.1 Da in 24 hours |  |  |  |
| **2.1.4.5** | Polarity Switching: 25 msec |  |  |  |
| **2.1.4.6** | MRM or SRM 1pg of Reserpine ESI positive sensitivity: Minimum signal-to-noise ratio: 1500000:1 |  |  |  |
| **2.1.4.7** | MRM or SRM 1pg of Chloramphenicol ESI negative sensitivity: Minimum signal-to-noise ratio: 1500000:1 |  |  |  |
| **2.1.4.8** | Number of MRM or SRM per method: 30 000 MRM or SRM /method |  |  |  |
| **2.1.4.9** | Scan rate: 15000 Da/sec |  |  |  |
| **2.1.4.10** | Number of MRM or SRM per second: 500 MRM or SRM/sec |  |  |  |
| **2.1.4.11** | Acquisition modes: Full-scan MS, Product ion scan, Precursor ion scan, Neutral-loss scan, SIM or SIR, MRM or SRM |  |  |  |
| **2.1.4.12** | Calibration and tuning: The system includes an automated tuning and calibration facility for hardware set-up using calibration solution |  |  |  |
| **2.1.4.13** | Vacuum system: Turbomolecular pump and external single oil rotary pump |  |  |  |
| **2.1.4.14** | Nitrogen generator: Nitrogen generator with built-in compressor according to manufacturer recommendation |  |  |  |
| **2.1.5** | **PC and Software**  **Quantity per set: 1** |  |  |  |
| **2.1.5.1** | PC: configuration in line with requirements prescribed by software manufacturer |  |  |  |
| **2.1.5.2** | PC peripherals: Monitor with diagonal minimum 25", mouse and keyboard, B/W laser printer with double-side printing, minimum print speed 30 page/min |  |  |  |
| **2.1.5.3** | Operating system (e.g. MS office or equivalent): as specified by manufacturer |  |  |  |
| **2.1.5.7** | Installed operating system and associated software for the instrument are licensed |  |  |  |
| **2.1.5.8** | Software acquisition: LC-MS/MS Control Software, compatible with the specific LC-MS/MS system |  |  |  |
| **2.1.5.9** | Software enables both instrument control and data acquisition |  |  |  |
| **2.1.5.10** | Data Processing and Analysis Software: Enabled quantitative and qualitative analysis, including peak detection, integration and quantification |  |  |  |
| **2.1.5.11** | Calibration curve generation and validation |  |  |  |
| **2.1.5.12** | Multi-component analysis and matrix effects correction |  |  |  |
| **2.1.5.13** | Report generation in PDF and Excel |  |  |  |
| **2.1.5.14** | Full-featured MS/MS spectral analysis |  |  |  |
| **2.1.5.15** | Capacity to handle large datasets with advanced filtering and visualization tools |  |  |  |
| **2.1.5.16** | Support for automated data processing workflows |  |  |  |
| **2.1.5.17** | Data Storage and Backup: Software enabling secure, organized storage of data, including raw data files, processed results, and reports |  |  |  |
| **2.1.5.18** | Backup options ensuring data integrity and avoiding loss of important results |  |  |  |
| **2.1.5.19** | Support for External Data Interfacing: enabled import/export data in standard formats (e.g. csv, mzXML, raw) for further analysis or reporting in other software platforms |  |  |  |
| **2.1.5.20** | Support for integration with laboratory information management systems (LIMS) or other laboratory data management tools |  |  |  |
| **2.1.6** | **General Requirement**  All components of the UHPLC/MS/MS system must be manufactured by the same manufacturer, except Nitrogen generator, Computer, Monitor and B/W Laser printer. |  |  |  |
| **2.1.7** | **Testing**  All three steps of equipment validation protocols performed:   * **Installation Qualification (IQ)**: This step ensures that the equipment or system is installed correctly according to the specifications. It involves checking that all components are present, properly installed, and configured * **Operational Qualification (OQ):** This phase verifies that the equipment or system operates as intended under specified conditions. It includes testing to determine process control limits, potential failure modes, and action levels PQ verification protocols performed after installation. * **Performance Qualification (PQ)**: The final step, PQ, confirms that the equipment or system consistently performs according to the required specifications during normal operation. It ensures that the process produces acceptable results consistently |  |  |  |
| **2.1.8** | **Training**   * Two separate trainings conducted per each final beneficiary institution/delivered instrument, i.e. one for the instrument delivered to IPH, the other for the instrument delivered to CETI * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor. * Training will be carried out at the delivery places of the equipment   **Training topics**   * **Item N° 2.1 at CETI premises**   Minimum Training Requirements   * Number of Participants: 5 persons * Duration: Two training periods, each lasting 5 days   **First Training Period (Immediately After Installation):**  The training will cover:   * Software Utilization:   + Familiarization with new features and settings   + Program initiation and operation   + Sequence formation   + Data analysis, interpretation and management   + Statistical analysis   + Instrument calibration and performance checks   + Troubleshooting common issues * Preventive System Maintenance (routine maintenance: cleaning and replacing components (e.g., ion source, pump, columns), as well as monitoring system performance. * Instrument Method Development   + Analysis of aminoglycosides using LC-MS/MS   **Second Training Period:**  Focus on:   * Instrument Method Development:   + Determination of pesticides in food (fruits and vegetables) using LC-MS/MS * **Item N° 2.1 at IPH premises**   5 persons, 2 training periods, 5 days each, the training should cover:   * + Familiarization with the LCMS software (setting the method, i.e., starting the sample analysis; data processing—quantification (forming the calibration curve, forming the sequence, single analysis; UV spectra—training for determining spectrum purity; generating reports, etc.)   + Training for optimization of MS parameter settings (optimizing acquisition conditions; optimizing ion source conditions if applicable)   + Maintenance of LC and MS components—; TUNE-check/autotune, and generating analysis reports;   + Method setup for determining mycotoxins in food and feed (first training period) and pesticides in food (second training period) - LC and MS conditions, forming the calibration curve and analysing a real sample (e.g. reference material). |  |  |  |
| **2.1.9** | **Standard Warranty**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions |  |  |  |
| **2.1.10** | **Commercial Warranty**  Manufacturer’s warranty in duration of two years.  Tenderer must provide a detailed description of the organisation of the related service (e.g. name and contact information of the authorised service provider) in accordance with the applicable conditions laid down in Article 32 of General Conditions and Article 32 of the Special Conditions. |  |  |  |
| **2.1.11** | **After Sales Service:**  **Response time**   * On-site response time within 48 hours during one year after provisional acceptance.   Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider) |  |  |  |
| **2.2** | **Automatic solvent evaporation system**  **Quantity: 1 set** |  |  |  |
| **2.2.1** | Gas Supply: The system operates using inert gas (nitrogen) |  |  |  |
| **2.2.2** | Minimum Pressure: 4 bar |  |  |  |
| **2.2.3** | Required Supply Flow: full flow capability for each manifold |  |  |  |
| **2.2.4** | Water Temperature Range: Ambient to 80°C or more |  |  |  |
| **2.2.5** | The temperature must be precise and uniform, with temperature control in place (± <0.5 °C). |  |  |  |
| **2.2.6** | Vial Capacity: The system is equipped with 24 positions for evaporation or more, providing high throughput and built-in capacity to process multiple samples simultaneously. |  |  |  |
| **2.2.7** | Tube and Rack: Suitable type of tube and racks for this instrument supplied with the product. |  |  |  |
| **2.2.8** | The instrument supports glass/plastic vials of 7 mL and 15 mL capacity, ensuring compatibility with common sample volumes. |  |  |  |
| **2.2.9** | Compatible Racks and Tube Sizes: Includes compatible racks designed to hold and secure these vials during the evaporation process. |  |  |  |
| **2.2.10** | The racks are adjustable to accommodate both 7 mL and 15 mL vials. |  |  |  |
| **2.2.11** | Solvent Compatibility: Acetone, Acetonitrile, Chloroform,  Dichloromethane, Diethyl ether, Dimethylformamide, Dimethylsulfoxide, Ethanol, Ethyl acetate, Heptane, Hexane, Isooctane, Isopropanol, Methanol, Methyl tert-butyl ether, Pentane, Tetrahydrofuran, Toluene, Water |  |  |  |
| **2.2.12** | Chemical Resistance: Formic acid 5%, Acetic acid 10%, Butyric acid 5%, Phosphoric acid 5%, Propionic acid 5%,  Ammonium Hydroxide 5%, Triethylamine (TEA) 5% |  |  |  |
| **2.2.13** | Interface: Touch Screen |  |  |  |
| **2.2.14** | Fume Hood/Ventilation: The system must be either connected to a ventilation system using the exhaust outlet at the rear of the system or placed in a well-ventilated fume hood or an equivalent enclosure to reduce the risk of exposure to harmful solvent vapours. |  |  |  |
| **2.2.15** | Operating Temperature: 18 °C to 32 °C |  |  |  |
| **2.2.16** | Power supply requirement: 220/230V, 50/60Hz |  |  |  |
| **2.2.17** | **Training**   * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation to the language of the training will be provided and paid by the Contractor * Training will be carried out at the delivery locations of the equipment.   **Training topic: Item N° 2.2** - 5 persons, 1 day, concerning use of the equipment and maintenance. |  |  |  |
| **2.2.18** | **Warranty:**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |
| **2.2.19** | **Commercial Warranty**  Manufacturer’s warranty in duration of two years.  Tenderer must provide a detailed description of the organisation of the related service (e.g. name and contact information of the authorised service provider) in accordance with the applicable conditions laid down in Article 32 of General Conditions and Article 32 of the Special Conditions. |  |  |  |

**Lot 3 - Laboratory equipment for PCR analysis and sample preparation in the area of pests (harmful organisms)**

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **3.1** | **Real-time PCR system with laptop**  **Quantity: 2** |  |  |  |
| **3.1.1** | Research area: Plant Science, Pathogen Detection |  |  |  |
| **3.1.2** | Accuracy: ±0.2 °C |  |  |  |
| **3.1.3** | Controller Touchscreen: Yes |  |  |  |
| **3.1.4** | Run Time: <30 min |  |  |  |
| **3.1.5** | Detection Sources: 8 filtered photodiodes |  |  |  |
| **3.1.6** | Detection method: CMOS technology |  |  |  |
| **3.1.7** | Dynamic Range: 9 |  |  |  |
| **3.1.8** | Excitation Source: Bright white LED |  |  |  |
| **3.1.9** | Maximum Optical Modules: 6 |  |  |  |
| **3.1.10** | Maximum Block Ramp Rate: 9°C/Sec |  |  |  |
| **3.1.11** | Number of Wells: 96-well block and 384-well block - interchangeable block format |  |  |  |
| **3.1.12** | Number of wells for multiplexing: minimum 5 targets per well |  |  |  |
| **3.1.13** | PCR uniformity: ±0.4 °C |  |  |  |
| **3.1.14** | Reaction Volume: 1-30µL for 96-well block and 5-20µL for 384-well block |  |  |  |
| **3.1.15** | PCR uniformity: ±0.4 °C |  |  |  |
| **3.1.16** | Self-Installable Optical Cartridges: Yes |  |  |  |
| **3.1.17** | Software Included: Free software including LIMS connectivity feature 21 CFR part 11 enabled software |  |  |  |
| **3.1.18** | Optical cartridge types: FAM or SYBER Green, VIC or JOE or HEX, TAMRA, Texas Red, Cy5 |  |  |  |
| **3.1.19** | Thermal System Temperature Range: 10-99.9 °C |  |  |  |
| **3.1.20** | Laptop for Real-time PCR system   * Operating System: Windows 11 or equivalent * Processor: Intel Core i7 or equivalent * HDD SSD, minimum capacity 512 GB * RAM Memory: minimum 16 GB |  |  |  |
| **3.1.21** | **Testing and Calibration**  Following unloading and prior to acceptance, all equipment  undergoes basic check, installation, setup, calibration  according to manufacturer’s specifications, functional  testing and verification. |  |  |  |
| **3.1.22** | **Training**  Training for 4 persons in duration of 4 days covering installation followed by testing the new methods enabled by the new instrument and instrument maintenance.   * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor. * Training will be carried out at the delivery places of the equipment * A four-day training course for up to four participants, covering the installation, available instrument options, basic operation, assay design, troubleshooting, and data interpretation. The training will also include hands-on practice with testing new methods. The contractor shall provide the necessary reagents for testing the new methods and, if applicable, a calibration kit for device calibration. |  |  |  |
| **3.1.22** | **Warranty**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |
| **3.2** | **RNA/DNA extraction device**  **Quantity: 2** |  |  |  |
| **3.2.1** | Fully automated system for extraction of nucleic acids,  performing all steps: lysis, binding, washing and eluting |  |  |  |
| **3.2.2** | Starting material: plant material |  |  |  |
| **3.2.3** | Centrifuge, shaker and pipetting system included |  |  |  |
| **3.2.4** | Decontamination of workspace with UV light |  |  |  |
| **3.2.5** | Processes up to 12 samples in a single run |  |  |  |
| **3.2.6** | Monitor runs remotely |  |  |  |
| **3.2.7** | Place for operation: for indoor use |  |  |  |
| **3.2.8** | Operating temperature: 18 – 28 °C |  |  |  |
| **3.2.9** | Storage conditions: 15 – 30 °C |  |  |  |
| **3.2.10** | Centrifuge: 12 rotor positions |  |  |  |
| **3.2.11** | Shaker: speed 100-2000 rpm, heating range of ambient temperature to 70 °C |  |  |  |
| **3.2.12** | Pippeting system: pippeting range 5-900 μl |  |  |  |
| **3.2.12** | Interface: Touchscreen |  |  |  |
| **3.2.13** | Data output: via built-in USB port |  |  |  |
| **3.2.14** | Compatibility: Operating system Windows 8 or later |  |  |  |
| **3.2.15** | UV lamp: wavelength 278 nm |  |  |  |
| **3.2.16** | **Testing and Calibration**  Following unloading and prior to acceptance, all equipment undergoes basic check, installation, setup, calibration according to manufacturer’s specifications, functional testing and verification. |  |  |  |
| **3.2.17** | **Training**   * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor. * Training will be carried out at the delivery places of the equipment   Training for 4 persons in duration of 2 days covering installation followed by testing the new methods enabled by the new instrument and instrument maintenance. |  |  |  |
| **3.12.18** | **Warranty**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |
| **3.3** | **Homogenizer for plant tissue (including seeds)**  **Quantity: 2** |  |  |  |
| **3.3.1** | Sample volume 0.1 – 1 g |  |  |  |
| **3.3.2** | Buffer volume 2 – 5 ml |  |  |  |
| **3.3.3** | Extraction bags Universal or Universal-U-form 120 mm x 150 mm |  |  |  |
| **3.3.4** | Homogenization time range 5 – 60 seconds |  |  |  |
| **3.3.5** | Speed 500 – 1000 rpm |  |  |  |
| **3.3.6** | **Testing and Calibration**  Following unloading and prior to acceptance, all equipment undergoes basic check, installation, setup, calibration according to manufacturer’s specifications, functional testing and verification. |  |  |  |
| **3.3.7** | **Training**   * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor * Training will be carried out at the delivery places of the equipment.   **Training topic:** Training for 3 persons, 1 day about installation requirement followed by testing the equipment and maintenance. |  |  |  |
| **3.3.8** | **Warranty**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |
| **3.4** | **Laboratory centrifuge**    **Quantity: 1** |  |  |  |
| **3.4.1** | Maximum capacity: 1000ml |  |  |  |
| **3.4.2** | Maximum RPM: 20 000 |  |  |  |
| **3.4.3** | Maximum RCF: 35 000 x g |  |  |  |
| **3.4.4** | Maximum capacity of conical tube per rotor: 16×15 mL/6×50 ml |  |  |  |
| **3.4.5** | **Testing and Calibration**  Following unloading and prior to acceptance, all equipment undergoes basic check, installation, setup, calibration according to manufacturer’s specifications, functional testing and verification. |  |  |  |
| **3.4.6** | **Training**   * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor * Training will be carried out at the delivery places of the equipment.   **Training topic:** Training for2 persons, 1 day covering installation followed by testing the equipment and maintenance. |  |  |  |
| **3.4.7** | **Warranty**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |
| **3.5** | **Ultra-Low Temperature Freezer**  **Quantity: 1** |  |  |  |
| **3.5.1** | Capacity (Metric):  ≥ 400 l, but due to space constraints, not exceeding 600 l |  |  |  |
| **3.5.2** | Classic interface |  |  |  |
| **3.5.3** | "Green" hydrocarbon-based cooling liquids (R290/ R170) |  |  |  |
| **3.5.4** | Maximum 6 shelves |  |  |  |
| **3.5.5** | Air-cooling -90 to -80 °C |  |  |  |
| **3.5.6** | Power supply requirement: 220/ 230V, 50/60Hz |  |  |  |
| **3.5.7** | **Testing and Calibration**  Following unloading and prior to acceptance, all equipment undergoes basic check, installation, setup, calibration according to manufacturer’s specifications, functional testing and verification. |  |  |  |
| **3.5.8** | **Training**   * The Contractor shall provide training materials in electronic form. * The language of the training and the training documents will be in Montenegrin; if not, interpretation/translation will be provided and paid by the Contractor * Training will be carried out at the Biotechnical Faculty, Plant Virology Laboratory, Mihajla Lalica 15, Podgorica   **Training topic:**  Training for2 persons, 1 day covering installation andmaintenance. |  |  |  |
| **3.5.9** | **Warranty**  One year after provisional acceptance in accordance with the conditions laid down in Article 32 of the General Conditions. |  |  |  |

**Appendix 1: Distribution list**

**Lot N° 1: Laboratory equipment for analysis in the area of animal disease, food and feed**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item number and title** | **Quantity** | **Name and contact details of person responsible for provisional and final acceptance** | **Place of acceptance** |
| **Item N° 1.1:** Thermo Shaker for microplates | 1 |  | Biotechnical Faculty of the University of Montenegro  Diagnostics Veterinary Laboratory  Bulevar Džordža Vašingtona, bb, p.fah 69  81000 Podgorica, Montenegro |
| **Item N° 1.2:** ELISA washer | 2 |
| **Item N° 1.3:** Tissue Homogenizer | 1 |
| **Item N° 1.4:** Tissue Processor | 1 |
| **Item N° 1.5:** Microtome | 1 |
| **Item N° 1.6:** Slide stainer | 1 |
| **Item N° 1.7:** Cold plate | 1 |
| **Item N° 1.8:** Water bath | 1 |
| **Item N° 1.9:** Microplate reader | 1 |
| **Item N° 1.10:** Automated Inoculation Delivery System | 1 |
| **Item N° 1.11:** Biomedical REFRIGERATOR | 3 |
| **Item N° 1.12:** Biomedical REFRIGERATOR | 4 |
| **Item N° 1.13:** Natural Convection Incubator | 2 |
| **Item N° 1.14:** CO2 Incubator | 1 |

**Lot 2: Laboratory equipment for analysis in the area of food safety, pesticide residue and other contaminants**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item number and title** | **Quantity** | **Name and contact details of person responsible for provisional and final acceptance** | **Place of acceptance** |
| **Item N° 2.1:** Ultra-High-Performance Liquid Chromatograph (UHPLC) with Triple Quadrupole (MS/MS) Mass Spectrometer | 1 |  | Center for Ecotoxicological Research  Bulevar Šarla De Gola 2,  81000 Podgorica, Montenegro |
| **Item N° 2.2:** Automatic solvent evaporation system | 1 |
| **Item N° 2.1:** Ultra-High-Performance Liquid Chromatograph (UHPLC) with Triple Quadrupole (MS/MS) Mass Spectrometer | 1 |  | Institute for Public Health  Džona Džeksona bb,  81000 Podgorica, Montenegro |

**Lot 3: Laboratory equipment for PCR analysis and sample preparation in the area of pests (harmful organisms)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item number and title** | **Quantity** | **Name and contact details of person responsible for provisional and final acceptance** | **Place of acceptance** |
| **Item N° 3.1:** Real-time PCR system with laptop | 1 |  | Biotechnical Faculty of the University of Montenegro  Plant Virology Laboratory Podgorica  Bulevar Džordža Vašingtona, bb, p.fah 69  81000 Podgorica, Montenegro |
| **Item N° 3.2:** RNA/DNA extraction device | 1 |
| **Item N° 3.3:** Homogenizer for plant tissue (including seeds) | 1 |
| **Item N° 3.5** Ultra-low temperature freezer | 1 |
| **Item N° 3.4:**  Laboratory centrifuge | 1 |  | Biotechnical Faculty of the University of Montenegro  Plant Bacteriology Laboratory Podgorica  Bulevar Džordža Vašingtona, bb, p.fah 69  81000 Podgorica, Montenegro |
| **Item N° 3.1:** Real-time PCR system with laptop | 1 |  | Center for Subtropical Cultures  Plant Bacteriology Laboratory Bar  Rista Lekića bb,  85000 Bar, Montenegro |
| **Item N° 3.2:** RNA/DNA extraction device | 1 |
| **Item N° 3.3:**  Homogenizer for plant tissue (including seeds) | 1 |