AFRICA CENTRE OF EXCELLENCE FOR MYCOTOXIN AND FOOD SAFETY (ACEMFS)

LABORATORY FACILITY SUSTAINABILITY PLAN COVERING GOVERNANCE, OPERATIONAL PROCEDURES, MARKETING AND FINANCIAL PROJECTIONS

Compiled by

Entrepreneurship Centre, Federal University of Technology, Minna, Niger State

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Executive Summary

The Africa Centre of Excellence for Mycotoxin and Food Safety aims to address critical challenges in food safety, agricultural productivity, and public health in Africa through innovative research, training, and community engagement. This proposal is subdivided into three main sections: governance, operational procedures, and marketing/financial projections. This would empower the Centre of Excellence to adopt a transformative approach towards tackling Mycotoxin challenges, integrating rigorous scientific research with practical, community-oriented interventions.

The centre would be managed by a governing board headed by a Food Safety expert as chairperson and other members drawn from various sectors. This board would meet quarterly to plan the Centre's future, and the executive laboratory manager would manage the day-to-day Operations.

The Centre has immense potential to build capacities in the field of Mycotoxin studies and also strong chances of sustainability from conducting laboratory tests and training programmes both for the university communities and the Food Value Chain Actors (Farmers, Manufacturers, Regulators, Government, Food Industries etc.). The Centre has a projected income of about ₦17,200,000:00 from the Federal University Technology Minna community in the first year of full operation, ₦405,000 from Ibrahim Babangida University and about ₦13,000,000:00 from the Government Department and Agencies on conducting short courses on food handling and hygiene and technical training for their staff. These incomes have a potential increase rate of about 15% following the year of its operation.

1. Governance

1.1 Laboratory Management Team (Governing Board)

The management team will comprise ten (10) members with diverse expertise:

1. Chairperson: Food safety expert with national recognition
2. Vice-Chairperson: Academic leader in food science or agricultural research
3. Scientific Director: Lead researcher in Mycotoxin studies
4. Government Representative: From Federal Ministry of Agriculture or NAFDAC & SON
5. Industry Representative: From the agricultural or food processing sector
6. Agricultural Innovation Specialist
7. Financial/Resource Management Expert
8. International Collaborations Coordinator
9. Community Stakeholder Representative

1.2 Functions of the Laboratory Management Team

Strategic Planning and Vision Setting

Develop long-term strategic goals for the laboratory, defining its scientific direction, research focus, and organisational trajectory. Create a comprehensive roadmap that aligns with emerging scientific trends, technological advancements, and institutional mission.

Financial Oversight and Resource Allocation

Manage the laboratory's budget and allocate financial resources across research projects, departments, and operational needs. Ensure fiscal responsibility, optimise funding distribution, and make strategic financial decisions to support scientific innovation and infrastructure development.

Research Priority Determination

Identify and prioritise research areas with the highest potential impact, scientific significance, and alignment with organisational goals. Evaluate emerging scientific domains,

assess research proposals, and make informed decisions about resource allocation and project selection.

Institutional Partnerships Development

Forge strategic partnerships with academic institutions, research centres, industry leaders, and other laboratories. Negotiate collaborative agreements, develop joint research programs, and create networks that enhance scientific capabilities and knowledge exchange.

Policy Recommendation to State and Federal Governments

Provide expert scientific insights to policymakers, draft policy recommendations, participate in governmental advisory committees, and contribute to developing science-related legislation and funding strategies.

Ethical Oversight of Research Activities

Establish and enforce ethical guidelines for research, review research protocols, ensure compliance with ethical standards, manage institutional review boards, and maintain the highest levels of scientific integrity and responsible conduct of research.

Fundraising and Resource Mobilization

Develop and implement comprehensive fundraising strategies, write grant proposals, engage with potential donors, and seek funding from government agencies, private foundations and corporate sponsors to support research initiatives.

International Collaboration Management

Develop and maintain international research collaborations, facilitate cross-border scientific exchanges, manage international research projects and represent the laboratory in global scientific forums and networks.

Annual Performance Evaluation

Conduct comprehensive performance assessments of research teams, individual scientists, and overall laboratory performance. Evaluate scientific output, impact, productivity, and alignment with strategic goals to drive continuous improvement and excellence.

1.3 Laboratory Management and Functions

Executive Laboratory Manager

Provides overall strategic leadership, sets organisational vision, makes high-level decisions, represents the laboratory at senior management levels, ensures alignment with institutional goals, and drives long-term organisational strategy and performance.

Chief Laboratory Officer

Oversees technical capabilities, guides scientific methodologies, ensures technological advancement, manages technical infrastructure, evaluates emerging scientific technologies, maintains research standards, and coordinates complex technical projects and innovations.

Operations Manager

Manages daily laboratory operations, coordinates workflow processes, optimises operational efficiency, ensures smooth interdepartmental communication, implements operational strategies, monitors resource utilisation, and maintains operational excellence and productivity.

Quality Assurance Manager

Develops and implements quality management systems, conducts internal and external audits, ensures compliance with regulatory standards, maintains documentation integrity, manages quality control processes, and drives continuous improvement in laboratory performance.

Research & Development Lead

Designs research strategy, identifies innovative research opportunities, manages research portfolios, secures research funding, leads research teams, monitors scientific developments, evaluates research outcomes, and drives scientific innovation and discovery.

Training Coordinator

Develops comprehensive training programs, designs skill development curricula, conducts professional development workshops, manages staff training requirements, ensures competency standards, tracks individual learning progress, and supports continuous professional education.

Admin/Finance Manager

Manages financial operations, develops budgets, controls expenditures, handles procurement, manages administrative processes, ensures financial compliance, prepares financial reports and provides critical financial and administrative support to the organisation.

1.4 Reporting Structure

Quarterly Board Meetings

Comprehensive strategic review sessions where the Executive Director presents organisational performance, financial status, research achievements and future strategic directions. These meetings involve in-depth discussions on key performance indicators,

long-term goals, significant research breakthroughs, challenges and strategic pivots. Board members provide critical oversight, approve major decisions, and offer high-level guidance.

Monthly Executive Management Meetings

Detailed internal coordination sessions where senior leadership team members comprehensively review operational performance, discuss ongoing research projects, analyse financial metrics, address organisational challenges, align departmental objectives, and synchronise strategic initiatives. These meetings ensure cross-departmental communication, rapid problem-solving, and maintenance of organisational momentum.

Annual Stakeholder Meetings

Comprehensive annual gatherings that provide a holistic overview of the organisation's achievements, financial health, research impacts, future strategic directions, and collaborative opportunities. These meetings involve presenting detailed annual reports, highlighting significant scientific contributions, demonstrating research value, and engaging with key investors, partners, and funding agencies to maintain transparency and build sustained support.

Regular Compliance Reporting to Regulatory Bodies

Systematic, meticulously prepared documentation submitted to relevant regulatory agencies detailing the organisation's adherence to scientific, ethical, and operational standards. These reports include comprehensive data on research protocols, safety measures, quality assurance processes, ethical compliance, and alignment with national and international regulatory requirements, ensuring institutional accountability and maintaining regulatory certification.

2. Operational Procedures

2.1 Services Available in the Laboratory for Commercial Use

2.1.1 Laboratory Services

Sample Reception and Logging

Implement standardised intake procedures for receiving samples, including comprehensive documentation, unique identifier assignment, initial quality assessment, and systematic tracking. Develop a robust chain of custody protocols to ensure sample integrity, traceability, and confidentiality throughout the analytical process.

Testing Procedures and Protocols

Establish rigorous, scientifically validated methodologies for sample analysis, utilising advanced instrumental techniques, standardised operating procedures, and comprehensive step-by-step analytical workflows. Ensure reproducibility, accuracy, and methodological consistency across all testing processes.

Quality Control Measures

Design comprehensive quality assurance systems, including internal validation processes, calibration of analytical instruments, periodic proficiency testing, method verification, inter-laboratory comparisons, and continuous performance monitoring to maintain the highest scientific standards and reliability.

Result Reporting and Interpretation

Develop detailed, scientifically precise reporting mechanisms that provide clear, comprehensive analytical findings, statistical significance, contextual interpretations, potential implications, and recommended follow-up actions. Ensure clarity, accuracy, and actionable insights in all research communications.

Certificate Issuance

Create standardised certificate generation processes that include verified analytical results, methodological details, accreditation information, laboratory credentials, official authentication, and comprehensive documentation to support legal and scientific credibility.

Storage and Disposal Protocols

Implement secure, systematised sample storage strategies with controlled environmental conditions, comprehensive tracking systems, organised archival methods, and environmentally compliant disposal procedures that adhere to scientific and regulatory guidelines.

Research Divisions

A. **Mycotoxin Detection and Analysis:** Develop advanced detection methodologies, characterise mycotoxin profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for mycotoxin identification and quantification across various matrices.

B.Toxic metals Test: Develop advanced detection methodologies, characterise toxic metals profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for toxic metals identification and quantification across various matrices.

C. Pesticide Residues: Develop advanced detection methodologies, characterise pesticide residue profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for pesticide identification and quantification across various matrices.

D. Veterinary Drug Residue: Develop advanced detection methodologies, characterise veterinary drug residue profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for identification and quantification across various matrices.

E. Microbial Pathogens: Develop advanced detection methodologies, characterise microbial pathogens profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for microbial pathogens identification and quantification across various matrices.

Agricultural Interventions

Design innovative strategies for mycotoxin prevention in agricultural systems, develop crop management protocols, investigate resistant cultivars, create pre-harvest and post-harvest intervention strategies, and support sustainable farming practices.

Public Health Impact Studies

Conduct comprehensive epidemiological research, assess health risks associated with mycotoxin exposure, develop population-level intervention strategies, analyse long-term health implications and provide evidence-based recommendations for public health policy.

Technology Transfer and Innovation

Bridge scientific discoveries with practical applications, develop commercialisation strategies, support technology licensing, facilitate industry partnerships, create innovative diagnostic and mitigation technologies, and support knowledge translation processes.

2.1.2 Research Activities

Research Project Selection Criteria

Develop a comprehensive evaluation framework for research project selection, incorporating scientific merit, innovative potential, alignment with organisational strategic goals, potential impact, feasibility, resource requirements, funding potential, and global scientific priorities.

Collaboration Frameworks

Establish structured mechanisms for scientific collaborations, including comprehensive memoranda of understanding, clear intellectual contribution guidelines, shared resource protocols, transparent communication channels, performance evaluation metrics, and mutually beneficial partnership development strategies.

Data Management Protocols

Implement robust data governance systems ensuring comprehensive data collection, secure storage, rigorous documentation, standardised metadata management, ethical data handling, compliance with international research data standards, version control, and systematic archival procedures.

Publication Procedures

Create systematic guidelines for scientific publication, including internal review processes, ethical clearance procedures, authorship attribution protocols, manuscript preparation standards, journal selection strategies, peer review coordination, and comprehensive documentation of research dissemination efforts.

Intellectual Property Guidelines

Develop comprehensive intellectual property management strategies, including invention disclosure processes, patent evaluation mechanisms, technology transfer protocols, collaboration IP sharing frameworks, commercialisation pathways and clear guidelines for protecting and leveraging scientific innovations.

2.1.3 Training Programs

Curriculum Development

Design comprehensive, scientifically rigorous training curricula integrating theoretical knowledge, practical skills, and emerging research trends. Develop modular, adaptive learning frameworks that address mycotoxin research, analytical techniques, safety protocols, and contemporary scientific methodologies.

Training Delivery Methods

Implement multimodal training approaches, including interactive workshops, hands-on laboratory sessions, online learning platforms, virtual simulations, expert-led seminars, mentorship programs, and blended learning strategies, to accommodate diverse learning styles and professional development needs.

Assessment Procedures

To ensure high-quality learning outcomes, create robust evaluation mechanisms incorporating theoretical examinations, practical skill assessments, performance-based evaluations, competency tracking, comprehensive feedback systems, and continuous professional development monitoring.

Certification Process

Establish standardised certification protocols that validate participants' scientific competencies, include comprehensive skill assessments, maintain rigorous credentialing standards, provide detailed performance documentation, and align with international professional development benchmarks.

Follow-up Support

Develop structured post-training support mechanisms, including mentorship programs, continuous learning resources, professional networking platforms, periodic skill refresher courses, career development guidance, and ongoing professional performance tracking.

2.1.4 Quality Management System

International Standard Organization (ISO 17025) Accreditation Maintenance

Acquire and manage compliance with ISO 17025 standards, ensuring continuous technical competence, validity of test results, implementation of quality management principles, periodic reassessment, and maintaining rigorous laboratory performance and credibility.

Standard Operating Procedures (SOP)

Develop comprehensive, detailed procedural documentation that provides step-by-step guidance for all laboratory processes, ensuring consistency, scientific precision, regulatory compliance and standardised operational excellence across all research and analytical activities.

Equipment Calibration and Maintenance

Implement systematic equipment management protocols, including precise calibration schedules, regular performance verification, maintenance tracking, instrument performance documentation, traceability of measurement standards, and comprehensive documentation of all technical interventions.

Staff Competency Assessment

Design holistic evaluation frameworks to assess scientific staff's technical skills, professional competencies, continuous learning progress, performance metrics, skill gaps identification, targeted professional development strategies, and maintenance of a high-performance scientific workforce.

Documentation Control

Establish robust document management systems ensuring version control, secure record-keeping, systematic archival processes, access management, comprehensive tracking mechanisms, regulatory compliance, and maintaining the integrity of scientific and administrative documentation.

Internal Audit Procedures

Develop comprehensive internal audit strategies, including systematic review processes, performance evaluation mechanisms, compliance verification, quality assurance assessments, continuous improvement identification, and structured feedback and corrective action frameworks.

2.1.5 Safety Protocols

Laboratory Safety Guidelines

Develop comprehensive safety frameworks addressing potential biological, chemical, and physical hazards. Establish clear risk assessment protocols, implement systematic safety training, create detailed safety communication strategies, and continuously monitor laboratory safety environments.

Waste Management Procedures

Design rigorous waste segregation, handling, storage, and disposal protocols that comply with environmental regulations. Implement systematic categorisation of hazardous and non-hazardous waste, develop sustainable disposal mechanisms and ensure minimal environmental impact.

Emergency Response Procedures

Create detailed, structured emergency response plans for scenarios such as chemical spills, biological contaminations, fire incidents, medical emergencies, and potential laboratory accidents. Develop comprehensive communication protocols, evacuation strategies, and rapid intervention mechanisms.

Personal Protective Equipment Requirements

Establish comprehensive guidelines for selecting, using, maintaining, and replacing personal protective equipment. Develop detailed specifications for protective gear, conduct regular equipment assessments, and ensure strict compliance with safety standards across all laboratory operations.

Chemical Handling Procedures

Implement systematic protocols for chemical storage, transportation, usage, and disposal. Develop detailed safety data sheets, create comprehensive risk management strategies, establish strict handling guidelines, and ensure proper chemical management training.

2.1.6 Data Management

Sample Tracking System

Develop comprehensive digital tracking mechanisms with unique identifiers, real-time monitoring, end-to-end traceability, automated logging, geo-location capabilities, chain of custody documentation, and integrated quality control checkpoints for precise sample management and accountability.

Results Database

Create robust, secure, and scalable database infrastructure for scientific results storage, featuring advanced data validation protocols, comprehensive metadata management, version control, statistical analysis capabilities, secure access controls and seamless integration with research management systems.

Client Information Management

Implement secure, confidential client information management systems ensuring data privacy, regulatory compliance, encrypted storage, controlled access protocols, comprehensive consent management, and systematic information life-cycle management with maximum protection and transparency.

Research Data Repository

Establish a centralised digital research data infrastructure supporting comprehensive data archival, long-term preservation, metadata standardisation, interoperability with scientific platforms, version tracking, access management, and compliance with international research data management standards.

Document Control System

Design a systematic document management framework ensuring version control, secure storage, access tracking, comprehensive audit trails, regulatory compliance documentation, systematic archival processes, and integrated workflow management for all scientific and administrative documentation.

2.1.7 Client Services

Sample Submission Procedures

Develop comprehensive, user-friendly sample submission protocols, including detailed guidelines, multiple submission channels (online, in-person, courier), standardised submission forms, clear packaging instructions, comprehensive sample identification systems, and transparent communication about submission requirements and expectations.

Result Reporting Formats

Create scientifically precise, client-friendly reporting mechanisms that provide clear, comprehensible analytical results, including detailed methodology explanations, statistical interpretations, graphical representations, contextual insights, actionable recommendations, and adherence to regulatory reporting standards.

Technical Consultation Services

Establish dedicated expert consultation frameworks to address clients' technical and scientific inquiries. These frameworks should offer in-depth scientific guidance, interpretation of complex analytical results, personalized technical support, comprehensive problem-solving strategies, and proactive communication channels.

Client Feedback Mechanism

Design systematic feedback collection and analysis processes, including multiple feedback channels, structured survey instruments, continuous improvement tracking, performance evaluation metrics, responsive communication protocols, and strategic implementation of client suggestions and recommendations.

Complaint Handling Procedures

Implement robust complaint resolution frameworks with clear escalation protocols, timely response mechanisms, comprehensive documentation, root cause analysis procedures, systematic corrective action strategies, and transparent communication to ensure client satisfaction and continuous service improvement.

2.1.8 Support Units

a. **Laboratory Management**
   The support unit oversees the efficient operation of laboratory activities, ensuring proper equipment maintenance, adherence to safety protocols, inventory management, and compliance with regulations. They facilitate smooth workflow and coordinate between various teams to ensure timely task completion.

b. **Training and Capacity Building**
   The support unit organises training programs for laboratory staff to enhance technical skills, promote best practices, and ensure proficiency in new methodologies. It also develops and implements educational resources to improve staff competency and support professional development.

c. **Resource Mobilization**
   The support unit identifies and secures financial, technical, and material resources needed for laboratory operations. This includes sourcing funding, establishing partnerships, and ensuring the availability of necessary tools, reagents, and infrastructure to maintain laboratory functionality.

d. **Community Engagement**
   The support unit fosters relationships with the local community and stakeholders by raising awareness about the laboratory's services and outcomes. They engage in outreach initiatives, facilitate communication, and address community needs, ensuring the laboratory's relevance and impact.

e. **Monitoring and Evaluation**
   The support unit develops and implements monitoring and evaluation (M&E) systems to assess laboratory performance, quality of services, and adherence to standards. They track progress, gather data, and provide insights for continuous improvement and reporting to stakeholders.

2.2 Research Protocols

a. **Standardized Research Methodology**
Research protocols establish consistent methodologies for experiments, ensuring reproducibility and reliability of results. They define procedures, data collection methods, and analysis techniques to maintain scientific rigour and quality across research projects.

b. **Ethical Clearance Processes**
Research protocols include procedures for obtaining ethical clearance to ensure that studies comply with ethical guidelines. This involves reviewing potential risks, ensuring informed consent, and protecting participant confidentiality in all research activities.

c. **Peer Review Mechanisms**
Protocols incorporate peer review as a quality control process, ensuring research integrity. External experts evaluate research design, methodology, and results, offering constructive feedback to enhance credibility, accuracy, and scientific value.

d. **Open-access Publication Policy**
Research protocols promote open-access publication to ensure research findings are freely accessible to the global scientific community. This policy enhances knowledge sharing, encourages transparency, and supports the dissemination of research without financial barriers.

e. **Collaborative Research Frameworks**
Protocols define collaborative research guidelines, fostering partnerships between institutions, researchers, and stakeholders. They outline roles, responsibilities, and intellectual property agreements to facilitate effective teamwork, resource sharing, and cross-disciplinary research efforts.

2.3 Financial Management

a. **Budgeting Procedures**

Budgeting procedures in a laboratory involve forecasting equipment, supplies, salaries, and maintenance expenses. The financial management team collaborates with laboratory staff to create a detailed budget, ensuring resources are allocated efficiently to support ongoing operations and research initiatives.

b. **Cost Recovery Mechanisms**

Cost recovery mechanisms in a laboratory help cover operational expenses through service fees, grants, or funding. This includes billing for external services, charging for research outputs, and securing financial contributions from stakeholders to maintain sustainable operations.

c. **Financial Reporting**

Financial reporting involves documenting and summarising the laboratory's financial activities. Reports include income, expenses, and budget variances, providing transparency and helping stakeholders assess financial health. These reports guide decision-making and ensure compliance with funding requirements and regulations.

d. **Asset Management**

Asset management ensures proper tracking, maintenance, and utilisation of laboratory equipment, tools, and facilities. Financial managers monitor asset acquisition, depreciation, and disposal, ensuring that valuable resources are protected and used efficiently to maximise the laboratory's capabilities.

e. **Procurement Procedures**

Procurement procedures in laboratories involve sourcing and purchasing materials, equipment, and services. These procedures ensure compliance with budgetary constraints, quality standards, and regulatory requirements. Transparent vendor selection, contract negotiation, and timely delivery are key aspects of effective procurement.

3. Marketing and Engagement Potential

3.1 Marketing Strategy (Business Model Canvas Approach)

A. Value Proposition

State-of-the-Art Testing Facilities

- **Modern Analytical Equipment:** Equipped with advanced tools for precise testing.
- **Rapid Testing Capabilities:** Ensure timely results to meet client demands.
- **Accurate and Reliable Results:** Deliver trustworthy data for critical decisions.
- **Comprehensive Testing Scope:** Cover diverse industries and needs.

Internationally Accredited Methodologies

- **ISO Certified Procedures:** Adherence to globally recognised standards.
- **Globally Recognized Standards:** Ensure credibility and acceptance.
- **Reliable Quality Assurance:** Maintain consistency and precision.
- **Traceable Results:** Guarantee transparency and accountability.

Research and Development Capabilities

- **New Method Development:** Pioneer innovative testing techniques.
- **Collaborative Research Opportunities:** Foster partnerships for advanced studies.
- **Innovation in Testing Approaches:** Adapt cutting-edge strategies.
- **Problem-Solving Capacity:** Address unique client challenges effectively.

Training and Capacity Building

- **Hands-on Technical Training:** Practical sessions for real-world application.
- **Professional Development Programs:** Enhance expertise and career growth.
- **Knowledge Transfer Sessions:** Share industry-relevant insights.
- **Skill Enhancement Workshops:** Build proficiency in specialised areas.

Regulatory Compliance Support

- **Advisory Services:** Offer expert guidance on regulations.
- **Documentation Assistance:** Streamline compliance paperwork.
- **Standards Interpretation:** Simplify understanding of complex norms.
- **Compliance Monitoring:** Ensure ongoing adherence to standards.

Quality Certification Services

- **Product Certification:** Validate product conformity.
- **Process Validation:** Ensure effective and consistent processes.
- **System Audits:** Evaluate operational efficiency.
- **Compliance Verification:** Confirm adherence to regulations.

B. Target Audiences

Government Agencies

- **Regulatory Bodies:** Require mycotoxin testing and monitoring for policy enforcement.
- **Agricultural Ministries:** Implement food safety and crop protection policies.
- **Public Health Departments:** Oversee compliance with food safety standards.

Food Processing Companies

- **Manufacturers:** Require quality certification for market competitiveness.
- **Product Testers:** Need regular testing to maintain product standards.
- **Food Safety Compliance Seekers:** Ensure adherence to regulatory guidelines.

Farmers Cooperatives

- **Primary Producers:** Require crop testing for safety and quality.
- **Training Seekers:** Look for best practice knowledge to improve yields.
- **Bulk Testing Clients:** Need cost-effective solutions for large-scale testing.

Research Institutions

- **Universities:** Conduct food safety and agricultural research.
- **Agricultural Research Centers:** Focus on advancing farming practices.
- **International Partners:** Collaborate on global food safety initiatives.

Agricultural Extension Workers

- **Field Officers:** Seek technical training to support farmers effectively.
- **Community Educators:** Require updated information to teach best practices.
- **Testing Support Seekers:** Need access to laboratory services for validation.

Food Exporters

- **Export Certificate Seekers:** Need compliance documentation for trade.
- **International Traders:** Require adherence to global standards.
- **Quality Assurance Clients:** Ensure export readiness through rigorous testing.

Quality Control Laboratories

- **Reference Testing Clients:** Need benchmark analysis for comparison.
- **Methodology Training Seekers:** Enhance testing accuracy and consistency.
- **Proficiency Testing Participants:** Validate and improve laboratory performance.

C. Marketing Channels

Professional Conferences and Seminars

- **Present Research Findings:** Highlight achievements and innovations.
- **Network with Stakeholders:** Build connections with key industry players.
- **Showcase Capabilities:** Demonstrate expertise and service range.
- **Share Expertise:** Offer insights to establish thought leadership.

Agricultural Trade Shows

- **Demonstrate Services:** Showcase offerings to a targeted audience.
- **Meet Potential Clients:** Identify and engage prospective customers.
- **Display Equipment:** Highlight cutting-edge tools and technologies.
- **Build Industry Relationships:** Strengthen partnerships and collaborations.

Industry Publications

- **Technical Articles:** Share in-depth analyses and solutions.
- **Research Papers:** Publish findings to influence industry practices.
- **Service Announcements:** Communicate updates and new offerings.
- **Expert Opinions:** Provide thought leadership on critical topics.

Social Media Platforms

- **Regular Updates:** Keep audiences informed and engaged.
- **Educational Content:** Share knowledge to build credibility.
- **Success Stories:** Highlight achievements to inspire trust.
- **Service Information:** Promote offerings directly to followers.

Direct Marketing to Stakeholders

- **Targeted Emails:** Deliver personalised messages to key contacts.
- **Customized Presentations:** Tailor information to stakeholder needs.

- **Personal Visits:** Build rapport through face-to-face interaction.
- **Information Packages:** Provide detailed materials for decision-making.

Partnership with Agricultural Extension Services

- **Joint Programs:** Collaborate on initiatives to amplify impact.
- **Shared Resources:** Optimize costs and expand outreach.
- **Combined Outreach:** Reach wider audiences through joint efforts.
- **Collaborative Training:** Enhance learning opportunities for stakeholders.

Website and Digital Presence

- **Online Service Catalog:** Showcase offerings for easy access.
- **Resource Center:** Provide educational materials and tools.
- **News Updates:** Share the latest developments and achievements.
- **Client Portal:** Offer a convenient platform for customer engagement.

C ii. Research Commercialization

- **Patent Development:** Secure intellectual property rights for innovations.
- **Technology Licensing:** Transfer technologies for commercial use.
- **Consultancy Services:** Provide expert advice to address industry challenges.
- **Specialized Training Programs:** Offer tailored capacity-building solutions.

C iii. Stakeholder Engagement

- **Agricultural Cooperative Partnerships:** Collaborate on projects to support farmers.
- **Government Policy Advisory:** Provide expertise to shape effective policies.
- **International Research Collaborations:** Partner with global institutions for innovation.
- **Private Sector Innovation Partnerships:** Develop solutions with industry leaders.

D. Revenue Streams

- **Government Grants:** Secure funding for public-interest research.
- **International Research Funding:** Access global resources for large-scale projects.
- **Private Sector Sponsorships:** Partner with businesses to finance innovations.
- **Development Agency Partnerships:** Collaborate on initiatives addressing societal needs.
- **Innovative Research Commercialization:** Monetize discoveries for financial sustainability.
- **Client Subscriptions and Fees:** Generate revenue through service offerings.

E. Key Activities

A. Mycotoxin Detection and Analysis: Develop advanced detection methodologies, characterise mycotoxin profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for mycotoxin identification and quantification across various matrices.

B. Toxic metals Test: Develop advanced detection methodologies, characterise toxic metals profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for toxic metals identification and quantification across various matrices.

C. Pesticide Residues: Develop advanced detection methodologies, characterise pesticide residue profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for pesticide identification and quantification across various matrices.

D. Veterinary Drug Residue: Develop advanced detection methodologies, characterise veterinary drug residue profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for identification and quantification across various matrices.

E. **Microbial Pathogens:** Develop advanced detection methodologies, characterise microbial pathogens profiles, investigate contamination mechanisms, design sensitive analytical techniques, and create comprehensive databases for microbial pathogens identification and quantification across various matrices.

Online Booking for Services: Clients can book laboratory tests through this link: https://udkfdheravu.typeform.com/to/FCr3MFDs

F. Key Performance Indicators (KPIs)

- **Number of grants won:** Track scientific contributions to the field.
- **Number of Patents Filed:** Measure innovation and intellectual property output.
- **Training Programs Conducted and Participants:** Assess capacity-building efforts.
- **Policy Recommendations Implemented:** Evaluate influence on regulatory frameworks.
- **Impact Assessments:** Quantify contributions to local, national and international economies and policies
- **Health Risk Reduction Metrics:** Measure advancements in mitigating public health threats.
- Number of laboratory services delivered
- Result accuracy and acceptability

3.2 Key Partners

1. **Standards Organization of Nigeria:** Ensure alignment with regulatory standards.
2. **National Agency for Food and Drug Administration and Control** (NAFDAC): Ensure alignment with regulatory standards.
3. **Republique de Cote d'Ivoire:** Support regional research and development initiatives.
4. **Standards Association of Zimbabwe:** Collaborate on compliance and food safety standards.
5. **All Farmers Association of Nigeria:** Partner for grassroots agricultural impact.
6. **Nigerian Agricultural Quarantine Service:** Enhance crop protection measures.
7. **NAIS:** Strengthen agricultural innovation systems.
8. **Mytox South:** Advance mycotoxin-related research and solutions.
9. **Sierra Leone Standards Bureau:** Promote quality assurance in food production and 40 others.

3.3 Cost Structure (Initial Implementation Budget)

Estimated Annual Budget: ₦250-350 Million

- **Research Infrastructure (40%):** Build and maintain state-of-the-art facilities.
- **Personnel (30%):** Recruit and retain skilled professionals.
- **Operations (15%):** Cover day-to-day functioning costs.
- **Marketing and Engagement (10%):** Drive outreach and stakeholder involvement.
- **Contingency (5%):** Prepare for unexpected expenses.

3.4 Risk Management

- **Comprehensive Risk Assessment Framework:** Identify potential challenges proactively.
- **Continuous Monitoring Mechanisms:** Maintain oversight to detect and address issues promptly.
- **Adaptive Strategy Development:** Ensure flexibility to respond to changing circumstances.
- **Stakeholder Communication Protocols:** Foster transparency and collaboration.

3.5 Sustainability Measures

Revenue Generation Strategies

Develop diversified income streams through innovation, partnerships, and market expansion to ensure financial sustainability and resilience.

Cost Optimization Procedures
Implement lean operations, adopt technology, and streamline processes to reduce costs while maintaining product or service quality.

Resource Efficiency Measures
Maximise resource utilisation by minimising waste, adopting circular practices, and optimising energy consumption.

Environmental Management
Adopt eco-friendly practices, reduce emissions, and comply with regulations to protect ecosystems and enhance sustainability.

Social Responsibility Initiatives
Engage in community-focused programs, promote equitable practices, and foster sustainable development to create lasting societal impacts.

3.6 Success Metrics

1. Operational

- **Number of Samples Analyzed:** Track the volume of analyses conducted to measure laboratory efficiency.
- **Research Projects Completed:** Quantify completed projects to evaluate output and innovation.
- **Training Programs Conducted:** Assess the frequency and impact of capacity-building initiatives.
- **Accreditation Status Maintained:** Ensure adherence to standards for credibility and quality assurance.

2. Financial

- **Revenue Targets:** Monitor income against goals to ensure financial sustainability.
- **Cost Recovery Ratios:** Measure the ability to recover operational costs for long-term viability.
- **Grant Funding Secured:** Track funding obtained to support research and development.
- **Operating Efficiency:** Evaluate resource utilisation against financial performance.

3. Impact

- **Farmer Adoption of Best Practices:** Measure uptake of sustainable agricultural methods.
- **Reduction in Mycotoxin Contamination:** Assess improvements in food safety standards.
- **Industry Compliance Improvement:** Monitor adherence to regulations within the sector.
- **Knowledge Dissemination:** Quantify outreach and the sharing of research findings.

3.7 Financial Projection for the First Year

In its first year of operation, the ACEMFS laboratory facility is projected to earn approximately N17,200,000 from conducting SAAT, SEET, SIPET, SLS, and SPS tests.

Table 1.0: FUT, Minna Community

FUT Community	No. of Students	50% Target	Type of Test	Price ₦	Amount ₦
SAAT	210	105	Pesticide Residue	30,000	3,150,000
SEET	449	225	Heavy/Toxic Metal	20,000	4,490,000
SIPET	641	321	Heavy/Toxic Metal	20,000	6,410,000
SLS	110	55	Food Hone Pathogens	30,000	1,650,000
SPS	150	75	Heavy/Toxic Metal	20,000	1,500,000
Total					**17,200,000**

Table 2.0 indicates that the ACEMFS laboratory facility is projected to earn approximately ₦4,050,000 from conducting tests for Ibrahim Babangida University, Lapai.

Table 2.0 Ibrahim Babangida University, Lapai

IBBUL Dept	No. of Students	50% Target	Type of Test	Price ₦	Amount ₦
FST	75	38	Heavy/Toxic Metal	20,000	750,000
MCB	140	70	Food Hone Pathogens	30,000	2,100,000
BCH	120	60	Heavy/Toxic Metal	20,000	1,200,000
Total					**4,050,000**

Table 3.0 illustrates that the ACEMFS laboratory facility is projected to generate an estimated income of ₦7,500,000 from conducting technical training programs for NAFDAC, SON, and the Federal Ministry of Agriculture staff. Each training stream is expected to generate ₦2,500,000, with the likelihood of running such training sessions quarterly throughout the year. This would amount to a total of ₦30,000,000 in the first year of entire operations.

Additionally, the Centre could offer short courses on Food Handling and Hygiene for staff of the same Federal Government Ministries, Departments, and Agencies. Each stream of this short course is anticipated to generate ₦4,500,000, with plans to conduct these courses quarterly. This implies that the Centre would make another ₦18,000,000 from this program annually. The projected income tends to increase by about 15% due to increased awareness of the eloquent service rendered by the Centre.

Table 3.0: Federal Ministries/Departments of Nigeria

Technical Training	No. of Staff	Type of Test	Price ₦	Amount ₦
MDAs				
NAFDAC	10	Technical Training	250,000	2,500,000
SON	10	Technical Training	250,000	2,500,000
Fed. Min. of AGRIC	10	Technical Training	250,000	2,500,000
Total				**7,500,000**
Short Courses				
NAFDAC	10	Food handling and Hygiene	150,000	1,500,000
SON	10	Food handling and Hygiene	150,000	1,500,000
Fed.Min. of AGRIC	10	Food handling and Hygiene	150,000	1,500,000
Total				**4,500,000**
Grand Total				**13,000,000**

4. Key Staff of the Centre

Prof. H. A. Makun
Centre Leader

Prof. H. L. Muhammed
Deputy Centre Leader

Prof. A. S. Abdulkareem
Sectoral Liaison Officer

Prof. Chinma Chiemela
Researcher

Prof. Alexander I. Ajai
Examination Officer

Prof. E. O. Ogbadoyi
Research Coordinator

Prof. J. O. Tijani
IPPTO Officer

Prof. John Adama
Research Theme Leader

Dr. H. S. Auta
M & E Officer

Dr. Eucharia Diugu
Guidance & Counseling Officer

Mrs. Funmilayo Okoineme
Accountant

Mr. Habu Jimoh
IT Officer (Reg. Port.)

Haruna Abubakar
Pro. & Prop. Mgt. Officer

Shafiu Sule
Internal Auditor

Silas Bijim
Env. & S. S. Officer

Abraham S. Twaki
IT Officer (Web)

Yandalu Yusus
Fin. Officer

Amarachi E. Nwankpa
Centre Secretary

4.1 Relevant Human Resources

S/N	Name	Rank	Area of Specialisation	Qualification
1	Hussaini Anthony Makun	Professor	Mycotoxicology	PhD
2	Hadiza Mohammed Kudu	Lecturer II	Mycotoxicology	PhD
3	Susan Salubuyi	Lecturer II	Mycotoxicology	MSc
4	Hadiza Lami Mohammed	Professor	Toxic Metals	PhD
5	Alexandre Ajai	Professor	Pesticide Residues/ Toxic metal	PhD
8	John Adama	Professor	Veterinary Drug Residues	PhD
7	Usman Abdulkadir	Associate Professor	Veterinary Drug Residues	PhD
8	Eunice Akande	Associate Professor	Veterinary Drug Residues	PhD
9	Isreal Olayemi	Professor	Pesticide residues	PhD
10	Maimuna Umar	Senior Lecturer	Food Borne pathogens	PhD
11	Chinma Chiemela Enyinnaya	Professor	Food Technology	PhD
12	Rabiat Hamzat	Senior Lecturer	Toxicological Risk analysis of Food toxicants	PhD
13	Abdullahi Abdulkadir	Senior Lecturer	Toxicological Risk analysis of Food toxicants	PhD
14	Mohammed T Salaudeen	Professor	Plant Pathology	PhD
15	Andrew Gana	Professor	Plant Pathology	PhD
16	Emmanuel Ogbadoyi	Professor	Molecular Biology of Food Borne Pathogens	PhD
17	Zainabe Adamu	Lecturer I	Molecular Biology of Food Borne Pathogens	MSc
17	Evans Chidi Egwin	Professor	Industrial Food Packaging materials	PhD
18	Ifeanyi Famous Ossamulu	Lecturer I	Industrial Food Packaging materials	PhD
19	Ambali Abdulkareem Saka	Professor	Nanotechnology application in food safety	PhD

20	Jimoh Oladejo Tijani	Associate Professor	Nanotechnology application in food safety	PhD
21	Helen Shnada Auta	Associate Professor	Micro and nanoplastics in food value chain	PhD
22	Eustace Manayi Dogo	Senior Lecturer	Data Analytics in Food Safety	PhD
23	Matthew Kolo	Senior Lecturer	Nuclear Physics	PhD
24	Moses Agida	Senior Lecturer	Nuclear Physics	
25	Olarinoye Ismail Oyeleke	Associate Professor	Nuclear Physics	PhD
26	Isaac Ikem Okorie	Chief Technologist	RT PCR	HND
27	Bulus Musa Baba	Chief Technologist	ICP OES	Postgraduate Diploma
28	Peter Ayodele Obasa	Principal Technology	UHPLC	
29	Abdulrahman Abdulkareem	Chief Technologist	GM/MS	Postgraduate Diploma
29	Amarachi Eunice Nwankpa	Secretary	Political Science	BSc
30	Funmilayo Imoleayo Okoinemen	Project Accountant	Accounting	BSc/ICAN
31	Yusuf Yandalu	Finance Officer	Accounting	BSc
32	Ado Malik	Assistant Project Accountant	Accounting	BSc/ICAN
33	Shafiu Sule	Internal Auditor	Accounting	BSc
34	Lydia Legbo	Deputy Director, Information Unit	Journalism	BA
35	Habila Silas Bijim	Environmental Safeguard Officer	Public Health	BSc

4.2 Laboratory Equipment

Metal Digester

Microscope

Autoclave

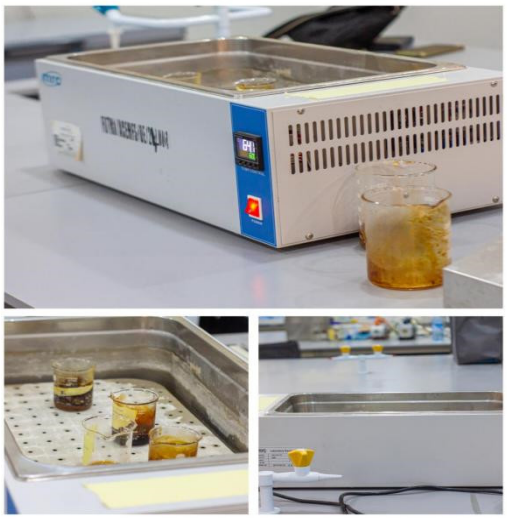
Cyclo Mixer

UHPLC (Ultra-High-Performance Liquid Chromatography)

Incubator

Vacuum Controller

Homogenizer



Water Bath

Soxchlet apparatus set up

Ultra-Pure Water

Ultrasonic water bath

Weighing balance

UV detector (for UHPLC)

ICP-OES

Heating mantle

4.3 Summary of the Capabilities and Uses of the Equipment at the Centre

1. Thermo Scientifi iCAP PRO X ICP-OES systems. These systems offer easy-to-use software with pre-optimized method conditions, providing multi-element detection technology far superior to single-element AAS.
2. The Thermo Scientific Dionex UltiMate LPG-3400RS Rapid Separation Quaternary Pump supports ternary and quaternary gradients over an industry-leading flow-pressure footprint. It supports using up to four solvents at up to 15,000 psi (100 MPa) and a recommended flow rate range from 200µL to 8.0mL/min, with excellent flow stability. Rapid Separation (RS) systems provide ultra-fast separations with ultra-high resolution in an exceptionally versatile HPLC/UHPLC system for the rigorous demands of large and small molecule analysis. These systems operate at pressures up to 1000 bar.
3. The TRACE 1610 GC-MS is designed to enhance the workflow experience for new and expert users through its advanced multi-functional touch screen with instrument health monitoring and how-to videos. The TRACE 1600 GC-MS is designed for minimum interaction with the instrument, limiting the local operations to the essentials and enabling full instrument control through the chromatography data system. To stay ahead, analytical testing laboratories need the ultimate confidence of a GC-MS system that easily and reliably produces trusted results day after day. You can count on the Thermo Scientific ISQ 7610 Single Quadrupole GC-MS System for this.
4. The SimpliAmp Thermal Cycler is a small, easy-to-use, and accurate thermal cycler that suits any lab's needs for everyday PCR. The Applied Biosystems QuantStudio 5 Real-Time PCR System is designed for users who need superior performance, maximum dye versatility, and security options in a real-time PCR system that is affordable and easy to use. Simplified instrument software with interactive touchscreen for greater ease of use 96-well 0.2 mL format or 96-well 0.1 mL format. Simple and optimised protocols, reliable assays and reagents, and intuitive software are available for various applications, including gene expression, genetic variation, and regulation.

5. Letters of Technical Support

2nd November 2024

TO WHOM IT MAY CONCERN: LETTER OF SUPPORT FOR AFRICA CENTER OF EXCELLENCE FOR MYCOTOXIN AND FOOD SAFETY (ACEMFS), FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, FOR EQUIPMENT SUPPLIES, INSTALLATION, END-USER TRAINING, MAINTENANCE, AND TECHNICAL SUPPORT

We are pleased to confirm our ongoing partnership with ACEMFS and offer our full technical support for the ACEMFS equipment supplied, installation, maintenance, and technical support services. As part of this collaboration, KATCHEY provides ACEMFS with the necessary resources to ensure that the ACEMFS laboratory operations are equipped with the highest-quality equipment and services.

We support ACEMFS in the following key areas:

Equipment Procurement, Installation, End User Training and Maintenance: We supply ACEMFS with top-tier premium equipment and ensure it is installed along with end-user training and continuous maintenance services to guarantee operational efficiency and longevity.

Technical Support: Our team provides comprehensive technical support to ACEMFS, assisting with troubleshooting, user training, and any other technical inquiries that may arise while using the equipment supplied.

ANAB ISO Extension: As part of our commitment to quality, we extend our ANAB ISO certification to the ACEMFS's laboratory upon confirmation of the complete optimisation, ensuring their systems and processes meet internationally recognised standards and adhere to best practices in the industry. Through our partnership, ACEMFS benefits from our expertise and high standards, which we believe enhances their ability to deliver reliable and efficient customer services. We are confident that ACEMFS's customers can trust in their continued commitment to quality and excellence, backed by our robust support infrastructure.

Please contact us for further details about our collaboration with ACEMFS.

Yours Sincerely,

For KATCHEY COMPANY LIMITED
Simon Idoko
AGM, BD

STANDARDS ORGANISATION OF NIGERIA

State Office: Bala Shamaki Road Opposite Legbo Kutigi International Conference Centre Minna, Niger State.

Corporate Office: 52, Lome Crescent, Wuse Zone 7, Abuja. info@son.gov.ng www.son.gov.ng

Lagos Ops. Office 13/14, Victoria Arobieke Street, Off Admiralty Way, Lekki Peninsula Scheme Lekki, Lagos State. PMB. 2102, Taba.

5th December, 2024

To whom it may concern

LETTER OF SUPPORT FOR AFRICA CENTRE OF EXCELLENCE FOR MYCOTOXIN AND FOOD SAFETY, FUT MINNA-STANDADIZATION, STUDENT INTERNSHIP & ISO CERTIFICATION

We are pleased to confirm our ongoing partnership with ACEMFS and to offer full support in ensuring that her laboratory remains of high standard through investigating into the quality of her facilities, materials and products.
As part of this collaboration, SON provides ACEMFS with necessary human resources to ensure that her laboratory operates at the highest standard.

We support ACEMFS in these key areas:

- STANDARDIZATION: As SON, we are the custodian of standards, we create, approve and declare products, materials and services and ensure the implementation of the standards.
- STUDENT INTERNSHIP: As part of our support, we train ACEMFS students during internship where they acquire knowledge by exposing them to standardization and factory quality inspection as related to mycotoxins.
- CERTIFICATION OF EQUIPMENT: As part of our commitment to quality, we ensure reference standard for calibration and verification of her equipment.
- ISO CERTIFICATION: As a standard body, we extend our ISO Certification to ACEMFS Laboratory, ensuring the system and process meets international recognized standard and adhere to best practices in the industry.

Through our partnership, ACEMFS benefits from our expertise and high standard, which enhances the Centre's ability to deliver reliable and efficient services to customers. We are confident that ACEMFS customers can trust in their continued commitment to quality and excellence backed by our robust support infrastructure.

Yours Sincerely,

For SON
Hauwa Nuhu Yusuf
State Coordinator, Niger State Office 1.

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