Aquatic Animal Health Package of Practices:
Fish sampling for disease diagnostics

WorldFish

Fish sampling for disease diagnostics

Quality biological sampling is a fundamental requirement for all kinds of work on diagnosing diseases and screening for pathogens. Fish sampling requires specific techniques and skills to collect good biological samples for accurate disease diagnosis. WorldFish and partners are developing a package of practices on fish sampling protocols for routine disease diagnostics and outbreak investigations in tilapia, carp and catfish production systems.

These sampling protocols provide guidance and training to project team members, researchers, resident veterinarians, extension officers and farmers tasked with collecting quality biological samples for laboratory diagnosis whenever disease outbreaks occur on farms or hatcheries.

This package of practices includes the following key resources:

- Quick fish sampling guides for disease diagnostics

    - Sampling materials for fish disease diagnostics https://hdl.handle.net/20.500.12348/4836
    - Wet mount sampling guide (for ectoparasites & fungi) https://hdl.handle.net/20.500.12348/4837
    - Microbiome sampling guide https://hdl.handle.net/20.500.12348/4838
    - Blood sampling guide https://hdl.handle.net/20.500.12348/4839
    - Bacteriology sampling guide https://hdl.handle.net/20.500.12348/4840
    - Molecular diagnostics sampling guide https://hdl.handle.net/20.500.12348/4841
    - Histology sampling guide https://hdl.handle.net/20.500.12348/4842

- Fish sampling for disease diagnostics microcourses developed on the Learn.ink online platform for digitized learning and training:

    - Intro to fish sampling for disease diagnostics https://bit.ly/39RfhO0
    - Foundations in fish disease sampling https://bit.ly/3kVQm1W
    - Wet-mount sampling https://bit.ly/3ojMTfT
    - Microbiome sampling https://bit.ly/2XZ5931

- Blood sampling https://bit.ly/3F82nd4
- Bacteriology sampling https://bit.ly/3oljnX2
- Molecular and virology sampling https://bit.ly/39VaGdu
- Histology sampling https://bit.ly/3zUCKs4

Quick protocol for antimicrobial susceptibility testing (AST) in aquatic animal species from aquaculture and fisheries https://hdl.handle.net/20.500.12348/4862

These quick fish sampling guides/microcourses and protocol provide visual step-by-step instructions on sample collection and processing for key disease diagnostic methods and AST in aquatic animal species from aquaculture and fisheries. They can be printed and laminated on cards for use in the field.

Our fish sampling microcourses on Learn.ink are used for long-distance virtual training of students, project staff, farmers and extension workers. The microcourses provide them with the knowledge and skills they need to collect high-quality fish samples for disease diagnostics. Training and preparation in basic sampling techniques also build the capacity of local workers to participate in developing a sample delivery network that farmers can depend on in the event of abnormal fish mortality incidents or suspicion of a disease outbreak.

Biological samples collected from affected farms, hatcheries or the wild, along with the pathogens isolated from those samples, constitute locally owned biobanks and national databases. Made accessible for use by public and private entities, these biobanks represent valuable resources for further pathogen characterization, such as whole genome sequencing and antimicrobial susceptibility testing. Pathogen genomics data provides valuable insights into the origins and tracking of diseases. This allows the public and private sectors to formulate biosecurity management plans and targeted control measures, such as developing autogenous vaccines.

For scaling purposes, WorldFish will continue to promote uptake and use of these fish sampling protocols among national partners in our focal and scaling countries, in addition to bilateral projects presently being implemented by WorldFish and partners (e.g. the United States Agency for International Development Feed the Future Innovation Lab for Fish (USAID FIL) project in Nigeria, Agence Française de Développement (AfD) projects in Malawi and Zambia, Centre for Environment Fisheries and Aquaculture Science (Cefas) antimicrobial resistance and CGIAR COVID-19 country projects in Bangladesh and the Norwegian Agency for Development Cooperation (Norad) project in Egypt, Ghana and Kenya). This approach will ensure wider use of these fish sampling protocols for collection of large number of biological samples for disease diagnostics from different farming systems and geographies. Analysis of this data would lead to better understanding of emerging and endemic pathogens in aquatic food systems.

This package of practices is the first version and is a work in progress. WorldFish will continue to refine and revise the working versions based on feedback from value chain actors and lessons learned from the field in order to make it relevant to the national competent authorities in the countries where we work.

For more information, please visit www.worldfishcenter.org

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