

**IMPLEMENTATION OF THE  
OIE STANDARDS; PRACTICAL  
EXPERIENCES  
NIGERIA.**

(a). **Veterinary Service/Competent Authority** Responsible for control programmes for OIE-listed Aquatic Animal Diseases

(i). **Organizational Structures**

The Federal Department of Fisheries is the Competent Authority but the Federal Department of Livestock is the Veterinary Service provider

There is a Resident Veterinarian in the Federal Department of Fisheries;

Fish Disease Branch came into inception in 2008 (Quality Control & Fish Disease management Division), this Branch is responsible for control programmes for OIE-listed aquatic animal diseases

(ii). **Legislation and Regulation:**

The Sea Fisheries Act No. 71 of 1992 and its Regulations - promulgated for the purpose of ensuring adequate management of the Nation's marine fisheries.

Inland fisheries Act No. 108 of 1992 - promulgated for the purpose of enabling adequate coordination in the management of Nigeria's inland Fisheries Resources.

Sea Fisheries Act of 2004

None of these laws have relevant sessions and do not meet the demand of Aquaculture and Fishing Industry on Fish Diseases or its control.

On the 5<sup>th</sup> of May, 2011 through EU programme ACP fish 11, relevant sessions on Aquatic Animal Health have been included during the review of Sea Fisheries Act in Lagos.



**REVIEW OF SEA FISHERIES ACT OF 2004 ON THE  
5TH OF MAY 2011 AT NIOMR, LAGOS**



**FISH DISEASE WORKSHOP FOR STAKEHOLDERS AT CO-OPERATIVE  
CENTRE, UNIVERSITY OF IBADAN, IBADAN, NIGERIA**

(iii). **Private Sector:**

Fish Disease Branch trained stakeholders on most common fish diseases at 2 strategic places – Abuja (for Northern Nigeria) and Ibadan (for South West and Environs).

OIE-listed diseases and the Role of Diagnostics in Aquatic animal diseases through a tabular form (Quarterly Aquatic annual disease report questionnaire, re-designed from an old OIE format for Disease reporting) were introduced.

Cat Fish Farmers Association (CAFFAN) in 2009 and 2010.

Now, for the Health services provider in this sector, largely the veterinarians, by the first 2 weeks in June 2012, FISON (Fisheries Society of Nigeria) will be training about 20-40 veterinarians (per location) on fish medicine at Lagos and Kaduna, this will facilitate introduction of Fish Disease Data format and OIE-listed Aquatic Animal Diseases.

- At the inception of Fish Disease Branch, the private Fish Disease Diagnostic Laboratory in Nigeria (Animal Care Konsult, Ogere Remo, Ogun State) was visited and we introduced the OIE-listed Aquatic Animal Diseases to them.  
Most veterinarians and farmers take their fish samples to them for diagnosis.

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## QUARTERLY AQUATIC ANIMAL DISEASE REPORT

## LEVEL OF DIAGNOSIS

	ITEM OIE LISTED DISEASES OF FISH	DISEASE STATUS MONTHS			Level of Diagnosis	Epi- Miological Comment
1	Epizootic haematopoetic necrosis					
2	Infectious haematopoetic necrosis					
3	Oncorhynchus masou virus disease					
4	Spring viraemia of carp					
5	Channel catfish virus disease					
6	Infectious pancreatic necrosis					
7	Infectious salmon anaemia					
8	Epizootic ulcerative syndrome					
9	Bacteria Kidney disease <i>Renibacterium salmoninarium</i>					
1	Enteric septicaemia of catfish					
0	<i>Edwardsiella ictaluri</i>					
1	Piscirickettsiosis <i>Piscirickettsia</i>					
1	<i>salmonis</i>					
1	Gyrodactylosis <i>Gyrodactylus salaris</i>					
2						
1	Red Sea bream iridoviral disease					
3						
1	White sturgeon iridoviral disease					
4						
	<b>NON-OIE LISTED DISEASES OF FISH</b>					
1	Tapeworms					
2	Ichthyophthiriasis (ich or white spot disease)					
3	Fish lice (Genus <i>Angulus</i> )					
4	Fish Grubs(larval flukes)					
5	Velvet Diseases					
6	Monogenetic flukes					
7	Anchor parasites					
8	Costiasis Disease (occur primarily in cold water)					
	<b>MYCOTIC DISEASES</b>					
1	Fungi (Genera <i>Saprolegnia</i> and <i>Achlya</i> )					
2	Branchiomycosis (Gill rot)					
3	Ichthyosporodiosis					

LEVEL	SITE	ACTIVITY
I	Field	Observation of animal and environment Clinical Examination
II	Laboratory	Parasitology Bacteriology Mycology Histopathology
III	Laboratory	Virology Electron Microscopy Molecular Biology Immunology

### SUBJECTS TO BE COVERED IN THE EPIDEMIOLOGICAL COMMENTS

1. Origin of the disease or pathogen (history of the disease)
2. Species affected
3. Mortality rate (high/low or decreasing/increasing)
4. Size of infected areas or names of infected areas
5. Death toll (economic loss, etc)
6. Preventive/ control measures taken
7. Disease characteristics (unusual clinical signs or lesions)
8. Pathogen (Isolated/sero-typed)
9. Unknown diseases (describe details as much as possible)
10. Samples sent to National or International Laboratories for confirmation (indicate the names of the laboratories)
11. Published paper (articles in journal/web site etc)
12. Unknown diseases, describe details as much as possible.

## (b). Incidence of pathogens/Diseases in Nigeria

BACTERIA DISEASES	BACTERIA ISOLATION AND SENSITIVITY TEST
<i>Aeromonas hydrophilis</i>	<ul style="list-style-type: none"> <li>• Suratadone (Nitrofurans)</li> <li>• Enrosloxacin (fluoroquinolone)</li> </ul>
<i>Enterobacter</i>	<ul style="list-style-type: none"> <li>• Suratadone</li> <li>• Amoxicillin</li> </ul>
<i>Pseudomonas</i>	<ul style="list-style-type: none"> <li>• Enrosloxacin</li> </ul>
<i>Vibriosis</i>	<ul style="list-style-type: none"> <li>• Tetracycline</li> </ul>
<i>Flexibacter</i> (surface bacteria, secondary invasion)	<ul style="list-style-type: none"> <li>• Tetracycline</li> </ul>
<i>Streptococcus</i> infection ( <i>spp-iniae</i> )	<ul style="list-style-type: none"> <li>• Streptomycin</li> <li>• Penicillin</li> <li>• Combination of the two</li> </ul>
<b>Parasitic Diseases</b>	
Coccidiosis (Earthen pond)	<ul style="list-style-type: none"> <li>• Anticoccidial e.g. Maduramycin</li> </ul>
<i>Hexamita</i>	<ul style="list-style-type: none"> <li>• flagyl (metronidazole)</li> </ul>
Worm infestation	<ul style="list-style-type: none"> <li>• Albendazole</li> </ul>
<u>Monogenea</u> <i>Gyrodactylus Sp</i> <i>Dactylogyrus</i> <u>Digenea</u> Opisthorchids (Clonorchis, Opistorchis)	<ul style="list-style-type: none"> <li>• Salt Treatment (the right concentration must be calculated)</li> <li>• Use of Formalin (35-37%)</li> </ul>
<b>Fungi Infection</b>	
Saprolegniasis (surface infection)	Formalin
Aspergilomycosis	Use of antimycotic/antifungi
Aflatoxicosis (Aflatoxin from feed)	Check source of feed Use of toxin-binder e.g. toxnil, mycofix.



In the south western Nigeria, Ibadan Oyo State, the following fish diseases are the most common (Adedeji O., Department of Veterinary Public Health, University of Ibadan, Ibadan).

1. **Tapeworm Infestation:** (Catfish Tapeworm)  
*Corallobothrium fimbriatum* & *Ligula Intestinalis*
2. **Fish Grubs:**
  - (a). *Clinostomum* (Yellow grub)
  - (b). *Posthodiplostomum* (White grub)
3. **Fish Lice** – Genus *Angulus*
4. ***Saprolegnia*** infection: (Mycotic Disease)  
*Saprolegnia* sp.
5. **Haemorrhagic Septicaemia** of Cat fish (Bacteremia)  
***Aeromonas hydrophilis***
6. ***Pseudomonas*** infection
7. **Tumour** – unknown aetiology
8. **Scoliosis** – vit C deficiency & genetic
9. **Furunculosis** – *Aeromonas salmonicida*

In another fish Disease survey for more than 6 months in different culture systems (Oladosu G. presented as Research work at Fisheries Society of Nigeria in November 2011: Department of Veterinary Medicine, University of Ibadan, Ibadan) the pathogens are as follows:

(A). **Incidence of parasites on the skin of fingerlings and adult of *Clarias gariepinus* under the different culture system**

Culture System	Earthen Pond		Recirculating System		Flow Through System	
	Fingerlings	Adult	Fingerlings	Adult	Fingerlings	Adult
Parasite observed & Incidence	<i>Trichodina</i> sp 100	<i>Trichodina</i> sp 55	<i>Trichodina</i> sp 55	<i>Trichodina</i> sp 25	<i>Trichodina</i> Sp 45	<i>Trichodina</i> Sp 30
	<i>Costia</i> Sp 50	<i>Gyrodactylus</i> Sp 60	<i>Costia</i> Sp 50	<i>Gyrodactylus</i> sp 50	Monogenea trematode Sp 70	Monogenea trematode Sp 45
	<i>Gyrodactylus</i> Sp 60	<i>Piscicola</i> Sp 35		<i>Costia</i> Sp 10	<i>Costia</i> Sp 10	

(B). **Incidence of parasites on the gills of fingerlings and adults of *Clarias gariepinus* under different culture systems**

Culture System	Earthen Pond		Recirculating System		Flow through System	
	Fingerling	Adult	Fingerling	Adult	Fingerling	Adult
Fish type	Fingerling	Adult	Fingerling	Adult	Fingerling	Adult
Parasites observed & Incidence	<i>Trichodina</i> Sp 100	<i>Trichodina</i> Sp 20	<i>Trichodina</i> Sp 50	<i>Trichodina</i> Sp 20	<i>Trichodina</i> Sp 25	<i>Trichodina</i> Sp 15
	<i>Cleidodiscus</i> Sp 45	<i>Dactylogyrus</i> sp 60	<i>Epistilis</i> Sp 5	<i>Dactylogyrus</i> Sp 20	Monogenea Sp 50	Monogenea Sp 25

(c). **Incidence of columnaris disease (*Flexibacter columnaris*) in clariid catfish species reared under different culture system.**

Culture Systems	Flow-through system		Recirculating system		Static pond	
	Fingerlings	Adult	Fingerlings	Adult	Fingerlings	Adult
Fish Size	30	30	30	30	40	30
% Fish Diagnosed	20	40	-	-	-	-
Mean	25	35	30	30	40	30

The most current cases from Fish Disease Diagnostic laboratory, Animal Care Service Konsult (Nig.) Ltd Ogere, Ogun State (Oladele et al., 2011) showed very high and usual mortalities in the following diseases.

- (i). Arborescent organ necrosis syndrome in Catfish – *Clarias gariepinus* (Burchell) –  
Aetiology: *Aeromonas sobria* and *Enterobacter cloacae*  
(arborescent organ of catfish allows it to breath air directly)

Clinical signs: Anorexia, high morbidity, (weak fish showed lateral recumbence at the base of the tanks). Farm records showed that mortality was high over a period of 24 days before laboratory intervention. 72.8% mortality over the period.

Pathology: Depigmentation of the skin, inflammation of the dorsal muscles just caudal to the skull, opacity of the lens, pale gills with some being ash coloured and necrotic arborescent organs covered with mucoid exudates were observed. A grey and putrefying fascia-like mass was also observed on the necrotic arborescent organs

Treatment: Streptomycin

Formalin (38% was used at 50mg/l of water to disinfect tanks, which were later rinsed and used for treatment

Epidemiology

Very serious out break from mid 2008- Date

The most severe cases were observed from mid 2008 - 2010 (40 cases).

Outbreaks occur between 3-4 months of age, peak at 4 months.

Treatment: Enrosloxacin (hardness of water affects treatment)



Necrosis of the arborescent Organ of *Clarias gariepinus* with the presence of mucoid exudates



Presence of a grey Fascia-like mass on the arborescent organ of *Clarias gariepinus*

ii). **High mortality in *Clarias gariepinus* fry associated with *Klebsiella pneumoniae***

Aetiology : *Klebsiella pneumoniae* sub sp *pneumoniae*

Clinical signs : mortality above 60% in a batch of 20,000 in the catfish hatchery. And the mortality pattern had been on for several batches of catfish fry.

The major complaint from fish farmers patronizing the laboratory range from poor hatchability to sudden high mortality at the larval, fry or fingerling stages. At day 7 post infection - lesions observed were gastroenteritis, Liquefaction of kidneys and ascitic fluid in peritoneal cavity.

Within 12 days Post- infection- 100% mortality

At the time of submission of samples, mortality at the hatchery amongst the two-week old catfish was already above 60% in a batch of approximately 20,000. Mortality stopped after second day of treatment with only about 1,800 fry surviving. 14

(iii). **An outbreak of *Acinetobacter baumani* infection in *Clarias gariepinus*: A case Report (farm at Lekki, near Ajah in Ibeju-Lekki Local Government Area of Lagos State).**

**Culture system:** Recirculatory system with 3 lines of 36 concrete tanks

Stocking density – 310 fishes per m<sup>2</sup> (3100 adult fishes per tank) except for tanks in line 1 of phase 1 with a higher stocking density of 375 fishes per/m<sup>2</sup>  
Source of water – Boreholes.



Infection occurred in 52 tanks across two lines (36 tanks each)

**History:** The farmer observed a high mortality despite previous medication with oxytetracycline, a furaltadone and NaCl (common salt) at different times. Clinical signs and gross lesions – high morbidity and mortality, lethargy, dermal necrosis and ulcerations on the head, fins and peduncle with depigmentation of the skin. The liver and spleen were congested and midly pale. The cumulative mortality of catfishes in the 3 phases was 4,444 before commencement of laboratory recommendation. Within a period of two weeks a total of 7288 catfishes died of the infection as shown in Tables 1 and 2

#### TABLES 1 & 2

*Acinetobacter baumani* appears to have tropism for most body tissues of cat fish considering the fact that it was isolated from most of the organs sampled. Isolation of this organisms from the milk (semen of male fish), causing high level of spermatozoa damage in male cat fish, thus low fertility and early fry mortality since the milk is used in artificial propagation of ***Clarias gariepinus*** at the hatchery.



Dermal necrosis and ulcerations in the catfishes



**Table 1: Mortality pattern before administration of enrofloxacin**

Line 3 phase 1 Age: 5 to 8 weeks post-stocking (16 tanks) Population = 48,000 as at 3/3/09		Line 1 phase 2 Age: 18 to 20 weeks post-stocking (20 tanks) Population = 60,000 as at 3/3/09		Line 1 phase 1 Age: 15 to 18 weeks post-stocking (16 tanks) Population = 60,000 as at 3/3/09	
Date	Mortality	Mortality	Mortality	Mortality	Mortality
4/3/09	149	150		3	
5/3/09	153	140		10	
6/3/09	155	135		50	
7/3/09	165	155		123	
8/3/09	185	100		528	
9/3/09	190	250		659	
10/3/09	130	300		714	
Total	1127	1230		2087	

**Table 2: Mortality pattern during and after administration of enrofloxacin**

Line 3 phase 1 Age: 5 to 8 weeks post-stocking (16 tanks) Population = 48,000 as at 3/3/09		Line 1 phase 2 Age: 18 to 20 weeks post-stocking (20 tanks) Population = 60,000 as at 3/3/09		Line 1 phase 1 Age: 15 to 18 weeks post-stocking (16 tanks) Population = 60,000 as at 3/3/09	
Date	Mortality	Mortality	Mortality	Mortality	Mortality
11/3/09	125	50		850	
12/3/09	85	32		787	
13/3/09	30	17		520	
14/3/09	25	5		203	
15/3/09	70	1		52	
16/3/09	10	0		21	
17/3/09	5	0		5	
18/3/09	2	0		2	
total	302	105		2440	
Percentage mortality 2.97 % (in 15 days)		2.22 %		7.5 %	

## Plate 1: Dermal Necrosis and ulcerations in the cat fishes

### (iv). Jaundice cat fish syndrome

aetiology – *Staphylococcus aureus*

Clinical signs: Devastating yellowish colour of fish. An haemolytic syndrome (yellowish colour of abdominal muscle, fat e.t.c). There has been a re-occurrence in the last 4 years, from year 2008 – date – 14-15 cases have been recorded. In year 2011 – 4 cases.

### (v). *Gyrodactylus* Sp.

Frustrating.

(In order to treat a bacteria disease successfully usually we have to first de-parasitise *Gyrodactylus* sp because of their number.

### (vi). *Tetrahymela* (protozoan infection, Hatchery infection)

### (vii). *Trichodina* (Hatchery cases)

### (viii). *Hexamita* – All year round. Adult fish affected.

Infection observed usually with farms using water from springs and rivers, and not boreholes.

Non – Infections cases (Function of management)

### (ix). 100 - 300 mg/l total ammonia Nitrogen

### (x). Nitrite 0.35mg/l (Limit 0.2mg/l)

## MONITORING & CONTROL

- Farmers with unusual morbidity or mortality usually consult other fish farmers before reporting to fisheries officer or private consultants, and finally to the veterinarians with relevant knowledge and later to the private fish disease diagnostic laboratory or some form of laboratories at the institution of learning or research institute.

- (C). Are OIE- Listed disease for Aquatic animals notifiable and reported to the OIE?  
In ***Gyrodactylosis***, the specificity of the incriminating parasite has not been determined, usually we mention *Gyrodactylus* sp.  
We have not had any survey or screened for OIE-Listed Diseases.

**(D) Challenges**

- We do not have an existing Fish Disease surveillance system in place
- Lack of National Aquatic Animal Disease Diagnostic Centre or simply Fish Disease Diagnostic Laboratory by the Federal Dept of Fisheries

**(i) Information Sharing(Consumers and Producers)**

- CAFFAN (Cat Fish Farmers Association of Nigeria)
- FISON (Fisheries Society of Nigeria)
- AFFAN (All Fish Farmers Association of Nigeria)
- A summarised manual from the OIE Aquatic Animal Disease Diagnostic manual was developed and introduced to CAFFAN members in Lagos state
- Value Chain (currently by the Federal Ministry of Agriculture)
- Disease reporting Questionnaire

**(ii) Administrative Constraints (Regulatory Constraints)**

- Fish Disease Branch is the newest of all the branches
- Sea Fisheries Act No. 71 of 1992 and Sea Fisheries Act of 2004 had no relevant sessions in Aquatic Animal Health
- Awareness on the importance of Fish Diseases
- Availability of Key knowledgeable officers in National funds allocating groups
- Availability of funds to build Fish Disease Diagnostic Laboratories

**(iii). Technical Constraints**

- Lack of National Aquatic Animal Disease Diagnostic Laboratories

(iv).

**Capacity Constraints**

- Training & Re-Training of professional (Veterinarians, and Fisheries officers, Aquaculturists on identification of fish and shrimps diseases is grossly inadequate (Nigerian Institute of Oceanography and Marine Research trained 15 veterinarians from ADP'S in 2010, Federal Department of Fisheries trained 60 stakeholders at Ibadan and Abuja in December, 2009).
- There is the need to produce Fish disease manual for Nigeria.

(v).

**Future Work**

- Organisation of all fish medicine practitioner into a group which will facilitate networking and collation of fish disease data
- Creating Awareness on Aquatic Animal Disease
- Setting up of Fish Disease Diagnostic Laboratories
- Creating awareness on notifiable OIE - Listed Aquatic Diseases.
- Screening for OIE-listed Diseases
- Implementation of OIE standards
- Fish Disease Surveillance System
- Organisation of workshops on importance of fish disease data and creation of fish disease data bank
- Capacity building of veterinarians, fisheries officers, laboratory staff, aquaculturist, farm attendants and other stakeholders in the sector

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**THANK YOU**