World Organisation for Animal Health

Training of National Focal Points for Aquatic Animal Health (Cycle IV)

2 - 4 October 2023 Kigali, Rwanda

The Fleming Fund

Training of National Focus Points for Aquatic Animal Health Cycle IV WOAH

Aquatic Health in Sub Saharan African Aquaculture

Survey based perceptions & recommendations for evidence based sector strengthening with emphasis on private sector

Giving a voice .....

Kigali October 2023

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Casammak Aquaculture

Rationale & Action….. 10 X AAH country briefs

Phase 1

- June 22 FAO Commissioned Casammak Aquaculture/ThinkAqua to carry out aquatic animal health information/ status, key contacts, & data collection across 10 SS African countries……..

- Carried out by key informant interviews with AAH specialists in each country then independently verified

- 1st Output: 10 X User friendly country briefs produced -> open access online disseminated through major African aquaculture networks

- Target beneficiaries? All involved in working in or related to AAH across each country – private, govt, research/academia, NGO plus other international …

- 2-3 page brief with key information / contacts all in one place

October 2022

Aquatic Health Information Sheet: Ghana

Summary information

Customs and borders

International airports (1):
Kotoka International Airport

Official Land border crossing points (48)

Bordering countries (3):
Togo, Burkina Faso and Cote D'Ivoire

Coastal customs ports (2):
Tema and Takoradi

Veterinary services

Key contacts supporting national aquatic health management

Fisheries Commission	1. Mary Nkansa, Head: Fish Health Unit: [redacted] Tel: +233246634120 2. Dr Ewurabena N. Bediako Seconded Vet Officer in-charge, Greater Accra: [redacted] Tel: +233 272260321	Universities	1. Prof. Benjamin Emikpe, School of Veterinary Medicine, KNUST: [redacted] Tel: +233 549410843 2. Dr Sam Addo, Department of Marine and Fisheries Science, University of Ghana, Legon: [redacted] 3. Dr Sam Dadzi, University of Ghana, Legon: [redacted]
Veterinary Services	1. Dr. Dzadu Kwaku Appiah, Vet officer: Akatamba zone: [redacted] Tel: 0503366871 / 024/730139 2. Dr Stanley Hughes-Obiesi, Vet officer Kumasi office: Tel: +233 242606479	Private sector and other support	1. Sandy Chatham, Virbac: [redacted] Tel: 0243042972 2. John Damazoro, ASA/WISHH: [redacted] Tel: 0541056780

Main fish pathogens and health conditions detected in Ghana

1. *Streptococcus agalactiae* Ib, Ia, III - Ib – in 2015/2016, leading to collapse of number of small- and mid-scale farming businesses. *Streptococcus iniae* also detected. *Streptococcus* spp. associated with high mortalities in cages and hatcheries around Lake Volta.
2. *Flavobacterium columnaris* - minor outbreaks in farms during season transition in March/April and October/November.
3. *Aeromonas* spp, *Edwardsiella* spp – minor outbreaks seen in catfish farms.
4. Range of common ectoparasites including Trichodinids/Gill flukes/Myxozoan parasites.
5. Intestinal Parasites *Ascaris, Argulus*: Fungal: *Saprolegnia*.
6. Infectious Spleen and Kidney Necrosis Virus (ISKNV) - outbreak on Lake Volta between Oct 2018 and Feb 2019. Led to 70% kill of standing crop of many cage farms on the Volta Lake and river below.

Private sector background

Before 2015 there was relatively limited use of chemicals or treatments for fish disease, except by larger companies. However, post 2015 there is far more widespread use of chemical and pharmaceutical treatments – often unregulated – around the Volta Lake and nearby hatcheries, cages and ponds. These include antibiotics, probiotics and, since 2018, licenced vaccines. Formalin, methylene blue, salt, potassium permanganate, copper sulphate etc. are also used – mainly in hatcheries. There is some use of natural treatments e.g., neem, garlic etc. on farms and heat shock treatments by several hatchery operators. In 2016 French pharmaceutical company Virbac introduced *Streptococcus agalactiae* vaccine starting with strain Ib then later including Ia, and have been vaccinating fish commercially in Ghana since allied to feed supplier Cycle Farms. Raanan Feeds also provide fish health training and advice as part of their customer service. UK Ridgeway Biologicals and Dr Gustavo Ramirez have delivered diagnostics and autogenous vaccine development on farms. Some Ghanaian consultants advise on husbandry and fish health related problems. This can range from reducing stress through better management practices, to farm biosecurity, and different treatments including prophylaxis.

Rationale & actions : Online Survey

Phase 2

- Next stage - SS African AAH survey to bring out key points and areas but with private sector context.....

- Following information briefs - identify key areas - missing knowledge , key outcomes - in essence where organisations like FAO, WOAH, national govts, private sector others can?/should ? put resources into in future .....

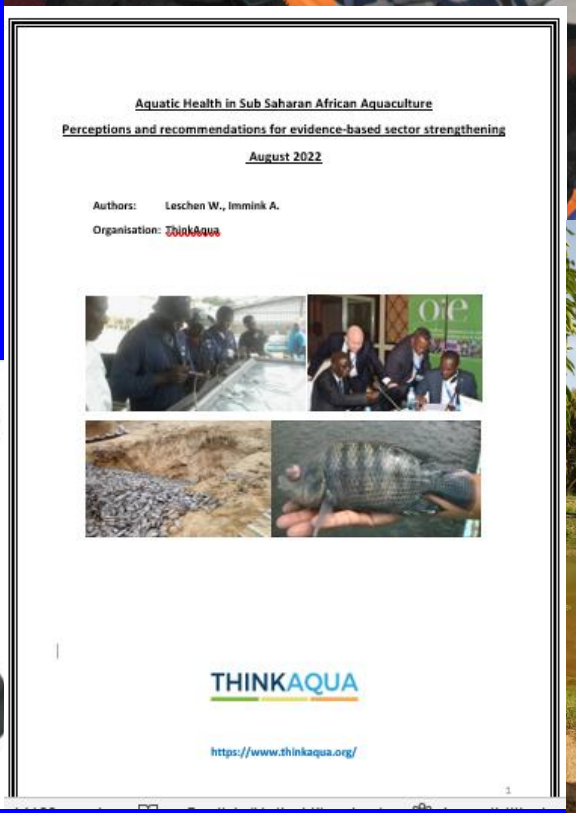
- Context: increasing commercialisation/intensification aquaculture across Africa - bringing challenges & costs related to AAH

- Lessons learning across & between different countries
-
- So an Information and evidence base

- To firstly prioritise ..... Then act .....

Online survey: Methodology

- -Questionnaire formulated into Oxford online survey format
- Piloted with 3 specialists modified and then up online
- Divided into 4 stakeholder groups: a. Private b Govt c. c. Educ/Research d. NGO
- Questions qualitative/ quantative - some specific to stakeholder group but many common to all 4 - allowing comparative analysis
- Publicised across all major African aquaculture networks SARNISSA, AAM, WAS AC, plus through key informants
- Incl prize draw for 2 monocular microscopes
- Survey ran for 8 weeks then collation of results & analyses


Aquatic Health in Sub Saharan African Aquaculture

Perceptions and recommendations for evidence-based sector strengthening

August 2022

Authors: Leschen W., Immink A.

Organisation: ThinkAqua

THINKAQUA

https://www.thinkaqua.org/

Final report

Anonymised survey!!!!!!!

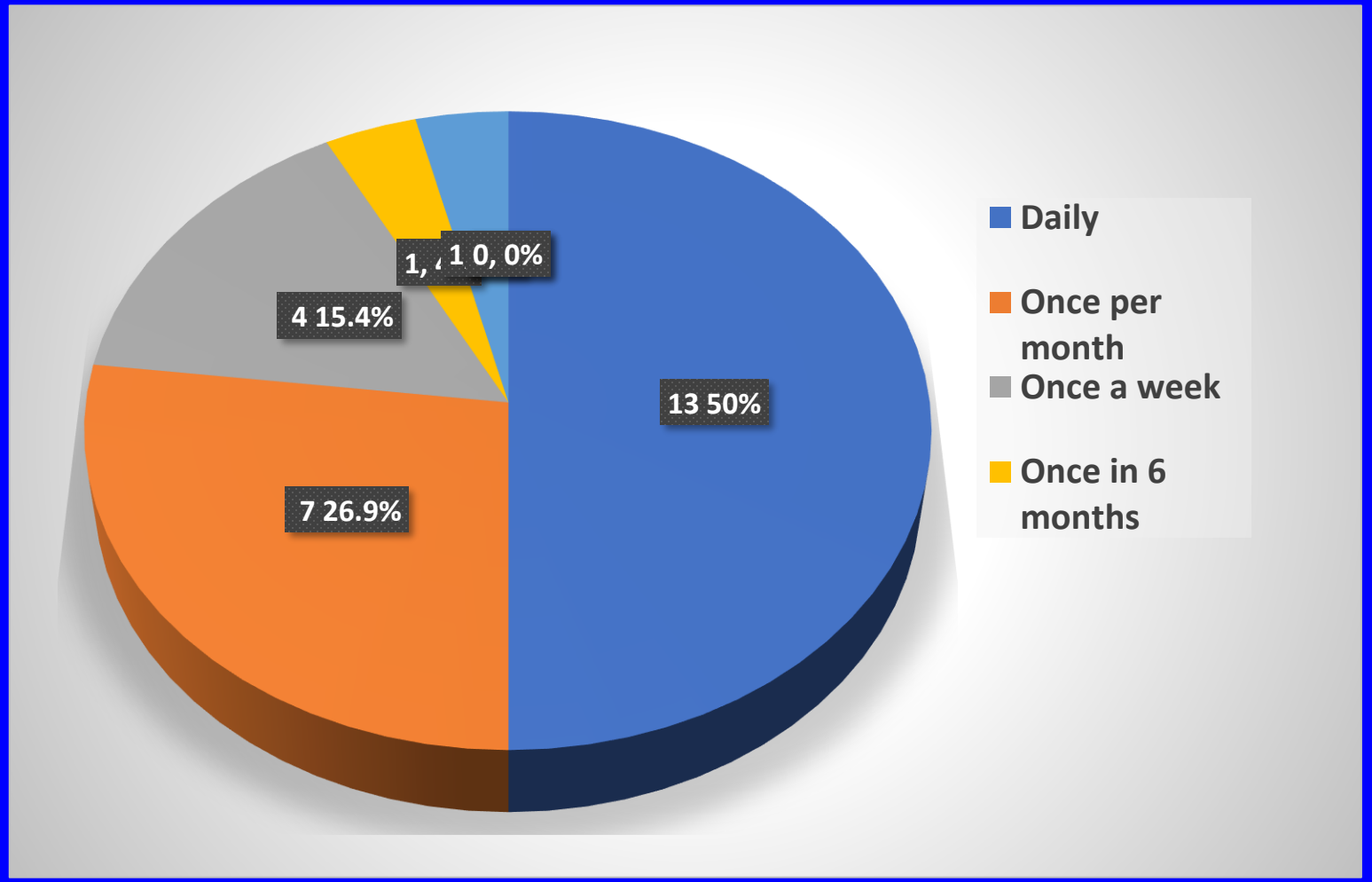
Key points on respondents

- Total: 69 respondents
- Private sector most respondents (36.9%),
- Of which 65% from Ghana..
- Education/research sector next 34.7% respondents.
- 84% of all respondents were male,
- Govt (28.6%) and Education/Research (25%) sectors had highest female representation
- Private sector only 1 female respondent (3.2%).
- Countries : Ghana highest represented (33.3%) then Kenya (15.9%) and Nigeria (8.7%)
- Education/research sector had highest education levels: 54.2% PhDs
- Only 2 Veterinary Doctors - one from govt ,one private……
- Majority private sector were univ educated BSc, MSc up to 1 PhD
- 4 respondents (15.4%) with vocational certificate/diploma
- Fish farm producers made up 73.1% of private sector

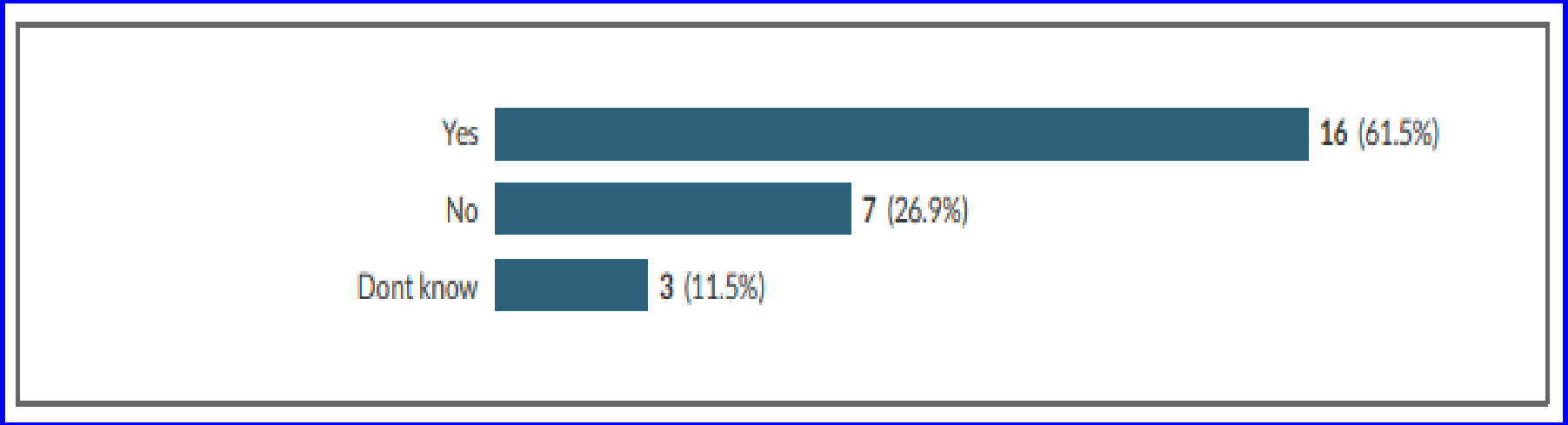
Findings from our survey.....

1. Private Sector

How often in last 5 years are you working related to fish diseases?



Is there 1 (or more?) operational working fish/shrimp diseases diagnostic laboratory in your country where you can take samples to - to be analysed for fish/ shrimp diseases which is both affordable and accessible?

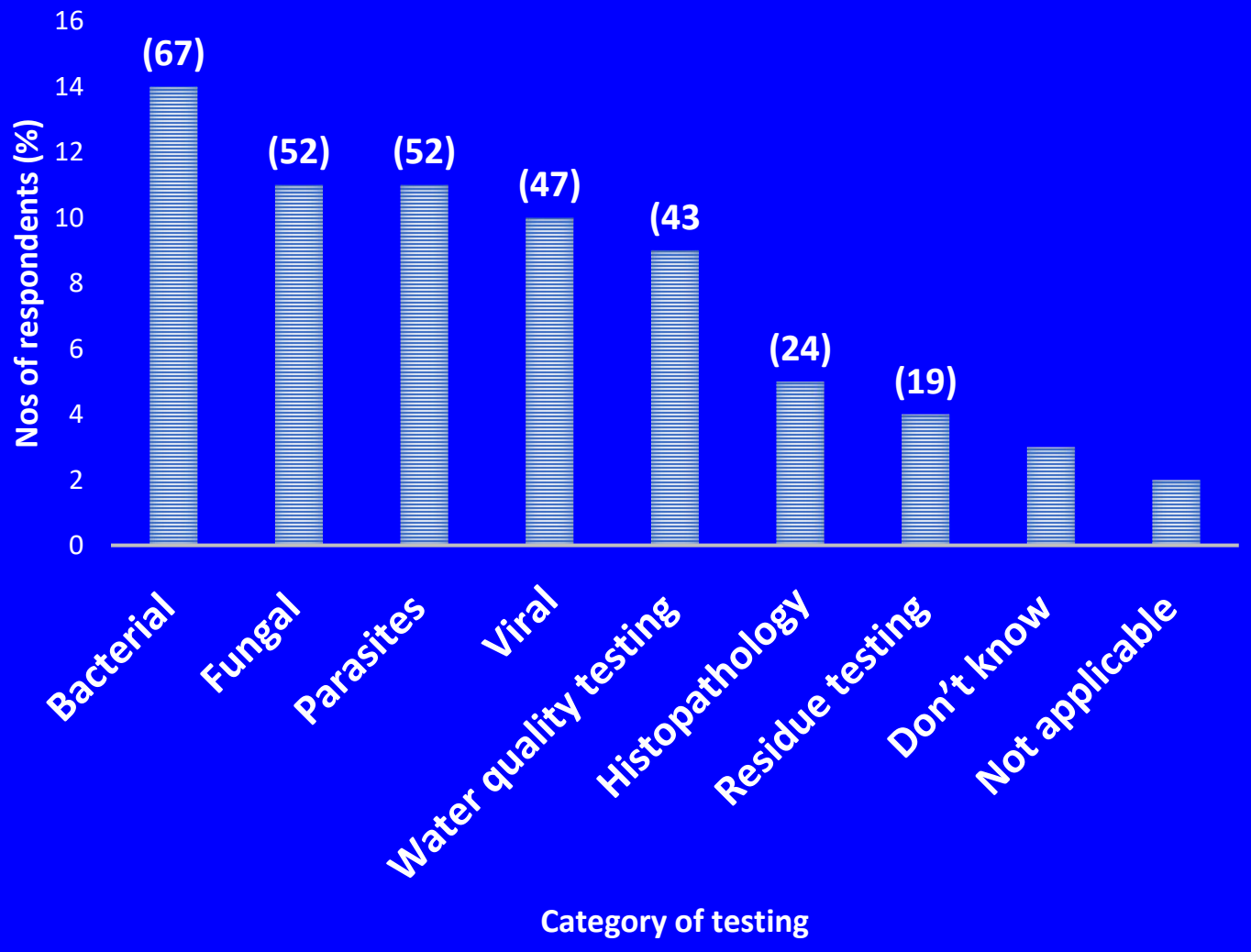


If yes please can you give details – eg its location and whether run by govt? private? or univ sector(s)?

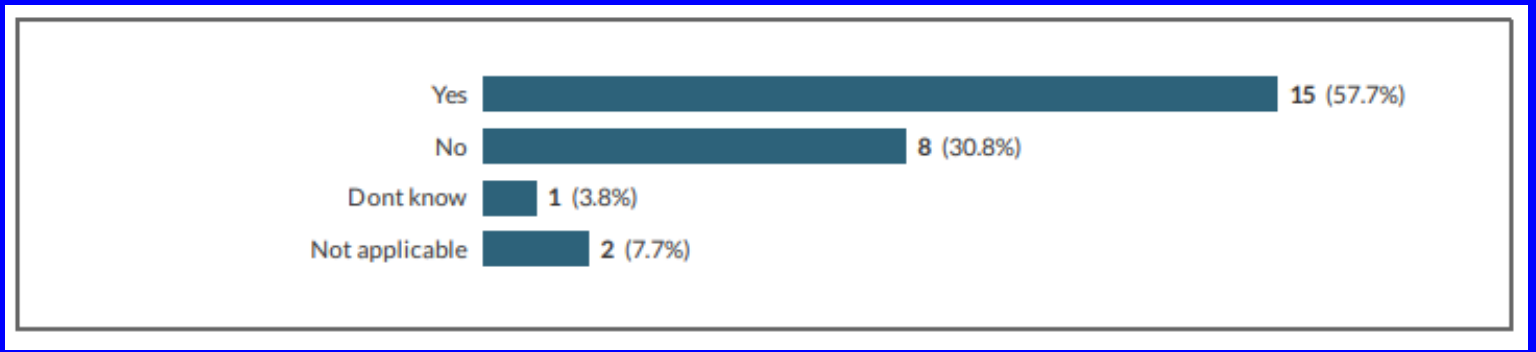
- No such lab (X3 replies)
- University of Ghana Legon (X3 replies)
- Veterinary services
  Marine & Aquaculture. CSIR
- Fisheries Commission veterinary lab, Accra.
- Aquaculture Development Center Akosombo Govt institution
- Kumasi KNUST - Central Lab, run by univ
- Research team & govt of Ghana, Fish. Commission.
- Tema FDA, Govt
- Central Veterinary Laboratories in Lilongwe, Blantyre city (Malawi Government)
- Noguchi & Biological laboratory (X 2 replies)
- Govt Veterinary Laboratory, in Kabete, outskirts Nairobi
- Kenya Eldoret - Univ Kisumu - Govt
- Kenya Marine Research Institute, KMFRI government run Institution

- Multiple laboratories in Ghana, but none equipped for diagnostics of all major tilapia diseases including viruses. Neither accessible / affordable …

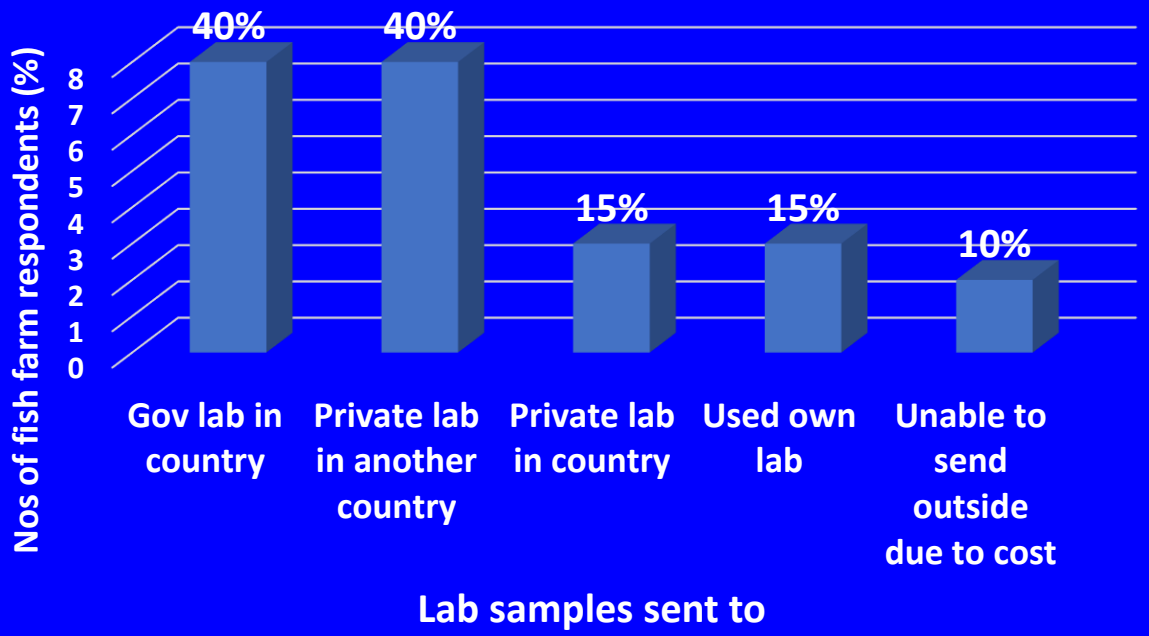
If yes please do you know which categories or types of pathogens and or testing this lab is able routinely & regularly able to detect? Including other services they offer?



If you run or work on a fish/shrimp farm or hatchery – in the last 5 years, have you/ the farm sent out samples to a laboratory or elsewhere to be analysed for disease(s)?

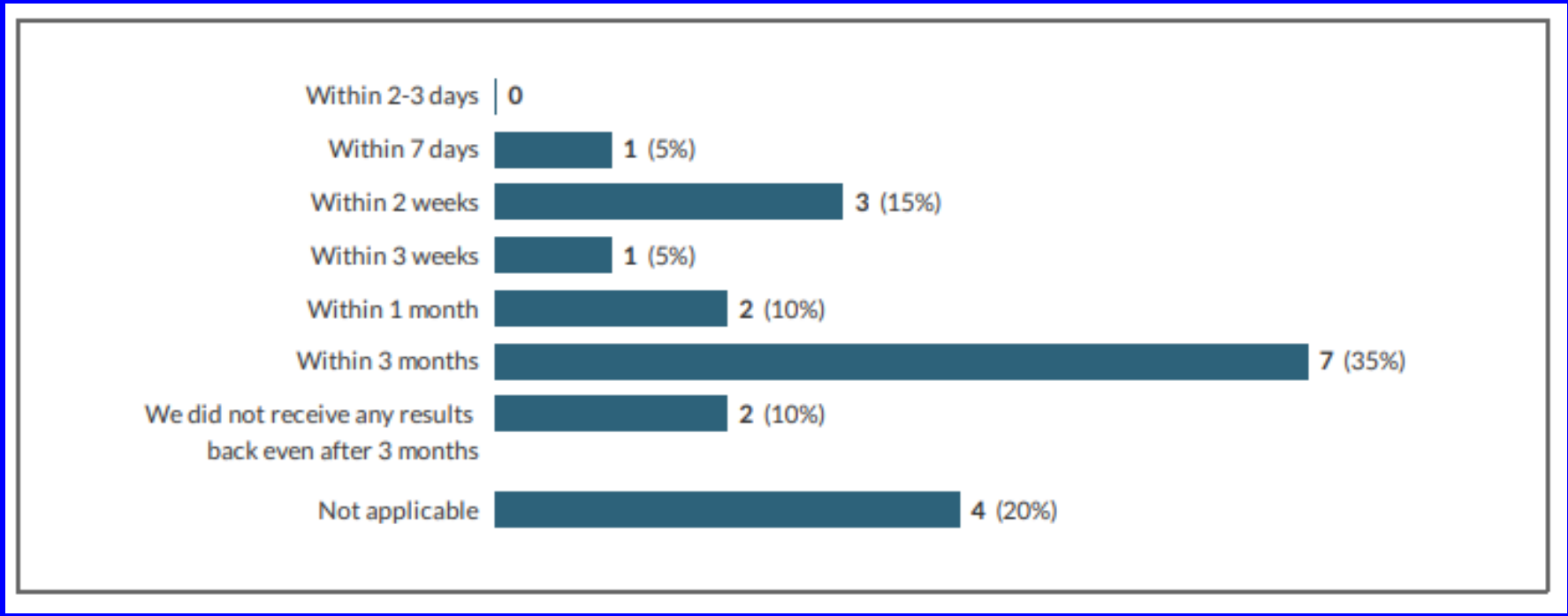


If yes can you state which laboratory you sent to? (Multiple answers accepted)



Note: Of the fish farmers who sent fish disease samples to a lab in last 5 years (14 out of 24) 55% used either in country or outside private sector labs as compared to 40% using govt in country labs (8 out of 24).

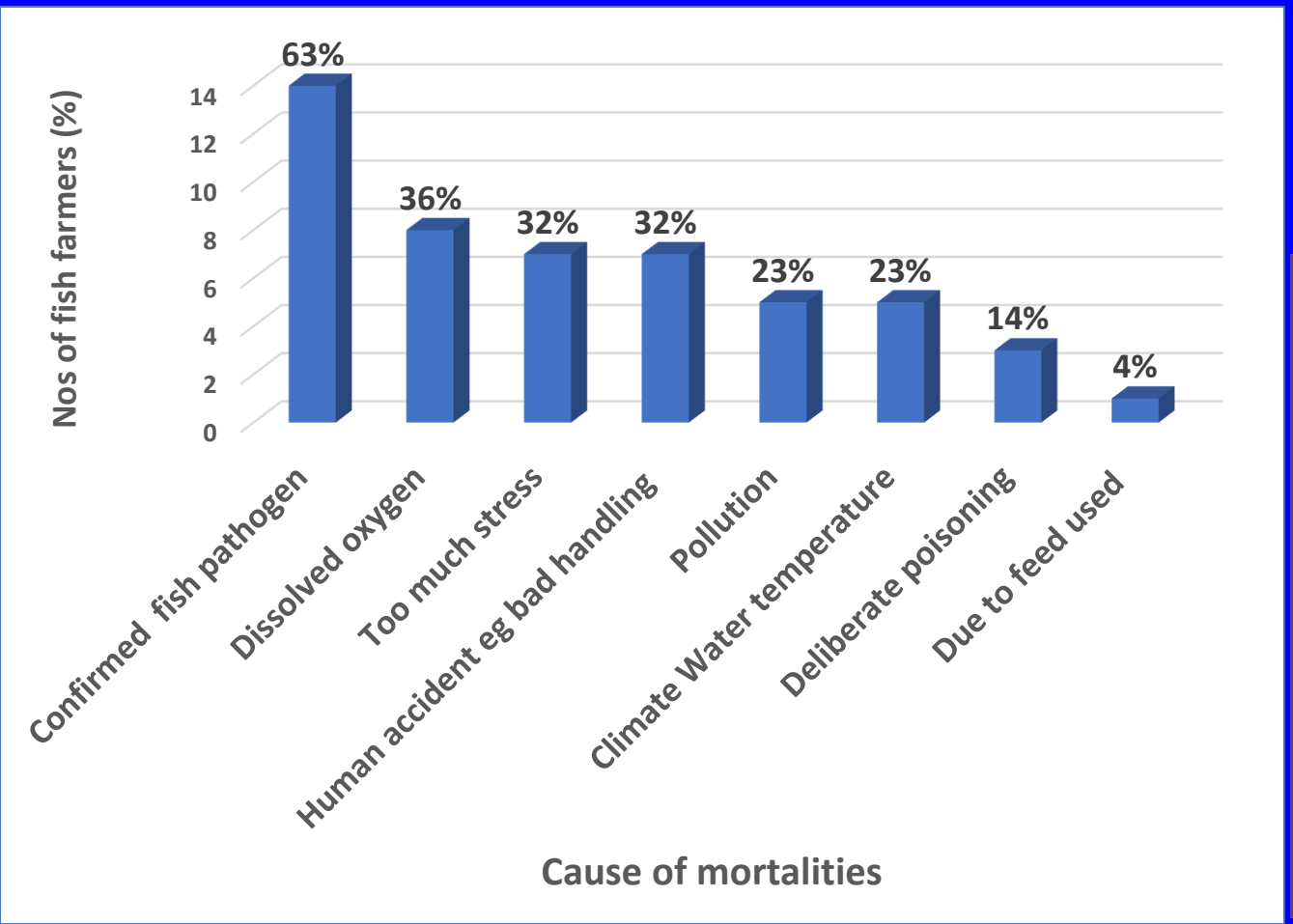
Can you state how long it took to obtain the results back from this lab?

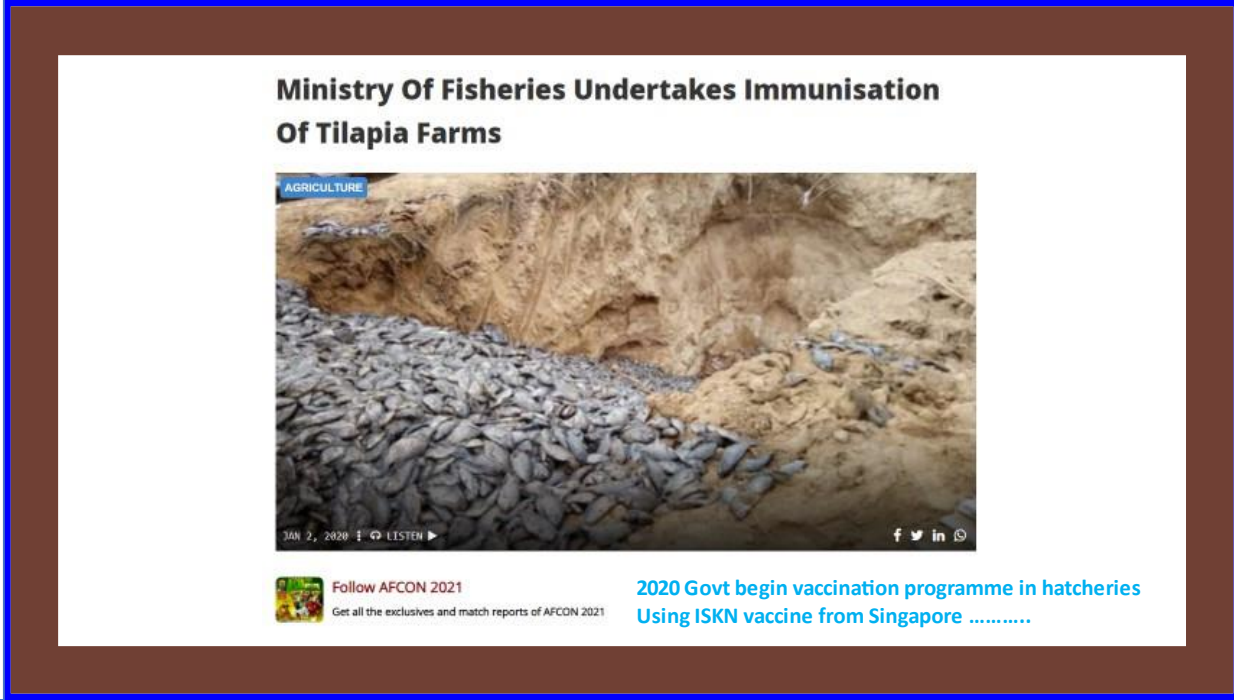


- For 35% of fish farmers it took between 1-3 months to receive results back,
- 10% did not receive any results back even after 3 months.
- Only 5% received results back within 7 days……

Fish Mortalities /Pathogens

- (73%) of fish farmers said they experienced significant mortalities on their farm(s)/hatcheries in last 5 years,
- 71% of these stating they knew the reasons why fish were dying.
- When then asked what was cause of their mortalities :





For those who stated mortalities were caused by a known fish pathogen…….. when asked to name 1 or more pathogen that had killed their fish, they gave the following responses:

- *Streptococcus agalactiae 1b, 1a, Strep sp X 10*
- *Infectious Spleen &Kidney Necrosis Virus, ISKNV X 5*
- *Saprolegnia Fungus x 4*
- *Bacterial columnaris x 3*
- *Trichodina sp x2*
- *Epizootic Ulcerative Syndrome EUS??*
- *Bacterial infection ……*
- *White shrimp virus*
- *Tilapia Lake Virus*
- *Dropsy*
- *Gyrodactylus*
- *Anchor worm*
- *Parasitic infections……*

- **71% of respondents thought fish diseases were now a big problem for their farm/also within their country,**
- **With a further 9% saying …… a slight problem now**
- **Only 1 respondent (3.8%) saying fish diseases not a problem in his country now and he thought they would not be a problem in next 5 years.**

Private Sector support for fish disease: Some examples they gave …….

- *Ghana Chamber of Aquaculture provide trainings online also now pilot fish farmers insurance scheme…… .*
- *Vaccine company collect samples, send to overseas labs for testing. Also sell vaccines /vaccinate fish to mitigate mortality*
- *WISHH helping with Water Quality management fish husbandry*
- *Organise short seminar, workshops & training on water quality management concepts, stress and fish health and disease management.*
- *1. By training a group of farmers about biosecurity. 2.By training farmers how to manage good farming practices*
- *Host fish research interns*
- *Collaborate with govt when outbreaks and huge mortalities recorded.*
- *Provision of predator nets, training on management and market access*
- *We offer free disease screening to as many farmers as we are able to reach in Ghana and beyond. Provide on job training of fish vaccination and technical support for products & trials with our customers.*

International Aquatic Veterinary Biosecurity Consortium
www.iavbc.org

COA | Chamber Of Aquaculture Ghana

Part 2

zoom

Biosecurity Principles in Aquaculture:

Practical Disease Prevention, Control and Eradication at the farm

Speaker A. David Scarfe
(Aquatic Veterinary Associates International, LLC)

Speaker Prof Dusan Palic
(Maximilians-Universitity Munchen)

Host Dr. Collins Prah Doudu
(Lecturer, University of Ghana)

8th November, 2021
13:00 -15:00 GMT

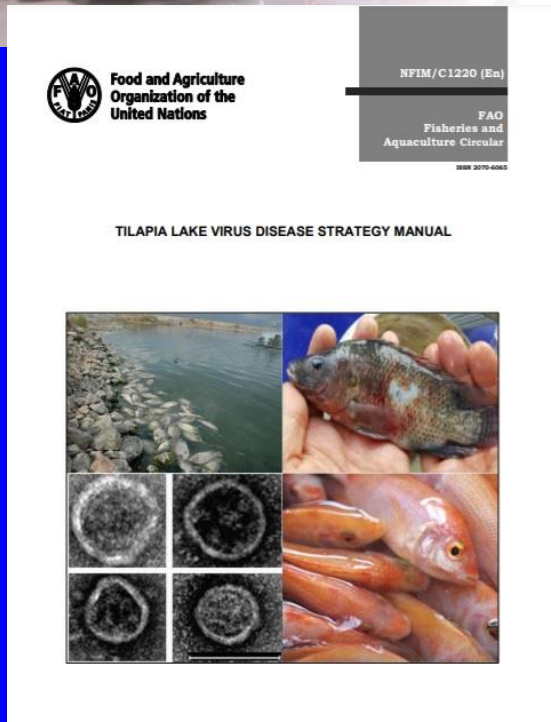
Information and Knowledge – How to find ? And gaps ?

Where do you look to find information about aquatic health / fish diseases in order to learn more and increase your knowledge? The top 5 ranked responses from private sector respondents were:

1. Internet – by far most popular choice
2. Books
3. From colleagues, fellow fish farmers, friends
4. Extension officers……
5. Fish health specialists & veterinary companies mainly from outside country

Which information or knowledge about fish or shrimp diseases would you like to know more about but currently cannot find out?

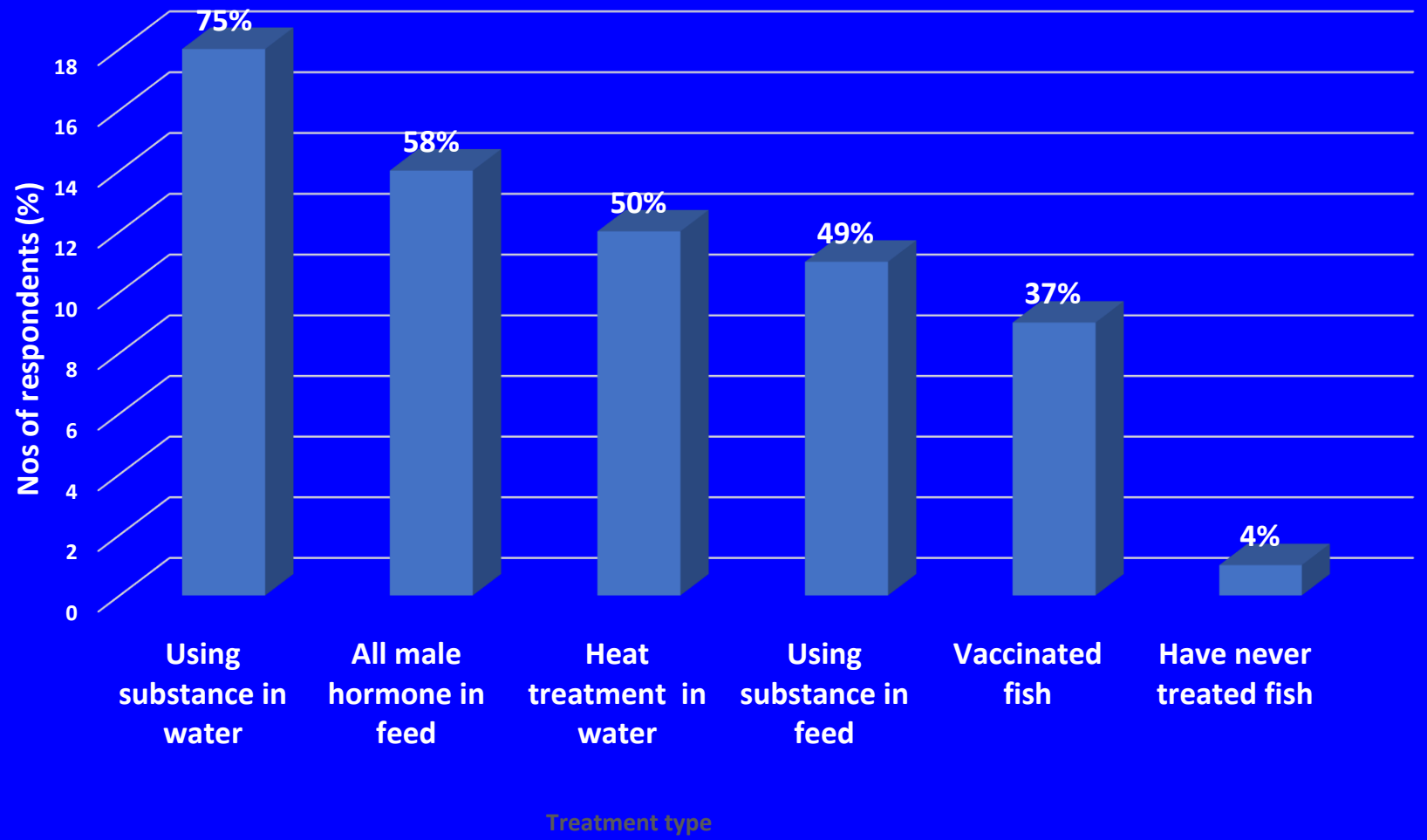
1. Diagnosis, identification, treatment of viral disease of tilapia.
2. Understanding of on-farm causes, diagnoses, and fish health management procedures; including measures for preventing/mitigating fish mortalities.
3. Pathogen detection, identification and treatments and vaccination.
4. Where to access effective diagnostic laboratories?



When asked if they were aware of any specific fish diseases or aquatic animal health issues in other African countries 58% of respondents said they were not.

Treatments

Have you personally done or been involved in any of the following treatments in the last 5 years?



Reasons for treating fish (multiple answers) …… ?

- 67% did so because of a particular pathogen they knew was present.
- 37% treated due to seeing clinical signs/marks on the fish
- 29% because they observed behavioural changes in the fish.
- Whilst 42% routinely treated fish (prophylactically) to prevent disease occurring.

List of specific treatments they had been using in last 5 years:

- *Salt /Salt bath, x10*
- *Potassium permanganate x 8*
- *Antibiotics Ammoxycillin Floxinor Humivet Neoxyvit Tetracycline x 3*
- *Vitamin C. x3*
- *Hydrogen Peroxide x3*
- *Strep agalactiae 1b vaccine, Icytovac MSD vaccine*
- *Vaccines, Aquaflor X2 Aquavaccin Iridovaccin Strep injection vaccine.*
- *Tilavac Volta, tilavac s3, tilavac s1a,*
- *Copper sulphate x2 Formalin x 2*
- *17alpha methyl testosterone SR hormone x 2*
- *Heat treatment*
- *Methylene Blue, Chloramine T, Benzalkonium Chloride,*
- *Anaesthetics*
- *Epsom salts, sodium bicarbonate*
- *Iodine*
- *Herbs (neem) Malachite green, builders lime*

Where to buy fish health chemicals/ treatments ?

- 31% respondents not aware of specific outlets to buy chemicals/pharmaceuticals/ vaccines.
- 69% who said they were, listed below locations:

- *Raanan Prampram (Accra), fish feed company (x4 replies)*
- *Agrovets in Nairobi, countrywide (x3 replies)*
- *Local markets & aquatic shops*
- *Tema timber market*
- *Poultry vet shops*
- *Koudijs feed*
- *Ministry of Fisheries*
- *Any big pharmacy shops.*
- *Mallam, Accra - Wella Chemicals Ltd*
- *Pharmacy/chemical shops in Akosombo Atimpoku*
- *La veterinary service Labadi, greater Accra.*
- *Ziweto Enterprise & Agric Trading Centre - Lilongwe Malawi*
- *In Rwanda: normally buy abroad no precise place*
- *Oak farms Frankatson Reiss and Co BVD limited*
- *Aquarech company*
- *Aquavet solutions, Achimota, Accra*

Biosecurity :

What do you personally understand the term “Biosecurity “related to your own farm and or aquaculture in your country or elsewhere to mean?

- *Securing all/most channels to which external pathogens can be introduced to my farm & vice versa*
- *Simply put, self and staff protection of doing things right by controlling what is within.*
- *Biosecurity: putting in place a disinfection point at the entrance of your farm or hatchery*
- *Measures put in place to prevent disease outbreaks in farms.*
- *Preventing spread of infectious diseases from one place (farm) to another.*
- *Measures put in to place to safe guard the fish from infections, transmission and mortalities*
- *Biosecurity does not exist in ……., and most attempts are poorly informed and half hearted.*

Import Export of live aquatic organisms

- Only 27% respondents said they had experience/knowledge about procedures bringing in or sending out shipments of live fish/aquatic animals/plants at airports land borders seaports.
- Remaining 73% had not.
- Of those who had - they listed below their experience & knowledge:

- *Need to obtain certificate/permit from fisheries commission and Vet. Dept.*
- *Need permit at fisheries regulatory authority prior to sending/bringing in fish into/out of country airports land borders ……*
- *Permit approval by department in charge is a must……*
- *Ornamental Fish Exporting company in Salima, Malawi. All fish treated first - external parasites prior to packaging in aerated bags then out through Kamuzu International Airport*
- *Licence and certificate of origin with documents scrutinised by authorities before out of the country*
- *Health Certificate, Country of Origin - Nairobi*
- *There are often illegal introductions - currently no quarantine facilities for fish in the country, also it's foolish and immoral and happens regularly……*

Where to go to find out about…….

- 76% of respondents did not know any internet site or a place to find out information and regulations for importing / exporting (live) fish/shrimp/aquatic plants into and from their own country.

The ones who did know gave the following specific sources they were aware of:

- *I stated No but in our global world today, YouTube have everything out there*
- *FAO*
- *Animal Health Livestock Development Dept Ministry of Agric, Malawi govt offices in Lilongwe or website & Fisheries Dept Lilongwe, Capital hills*
- *www.mofad.gov.gh www.fishcom.gov.gh*
- *OIE manual*
- *Farm Africa*
- *Ministry of Fisheries and Agriculture*

Of the 7 who responded above only one could provide specific govt website and 2 others Govt ministry locations..
Interesting to see the others quote international organisations like FAO OIE and Farm Africa.

Summarised recommendations from private sector for future (ranked)

1. Strengthen/ prioritise in-country budgets for AAH / - in terms of resources, infrastructure, monitoring & regulations.

2. Produce far more information in easily accessible & understandable formats on aquatic health/fish diseases & associated biosecurity – viral pathogens of tilapias - particularly mentioned.

3. Better practical hands-on training in aquatic health & biosecurity at all levels – tailored & relevant for each country, prod systems, species - not based on European/ US examples……

4. At least 1 functional accessible, affordable aquatic health diagnostic laboratory in country with necessary experienced & trained staff, faster sample turnover in order to be viable for commercial producers.

5. Available, accessible suppliers of chemicals, pharmaceuticals including vaccines for treating fish alongside clear, user-friendly, country specific information & guidelines.


The Fish Site

Find species, diseases, articles... Breeding & genetics Farm management Health & welfare Nutrition Environment Post-harvest

Virus linked to mass tilapia mortalities on Lake Volta

DISEASE HEALTH

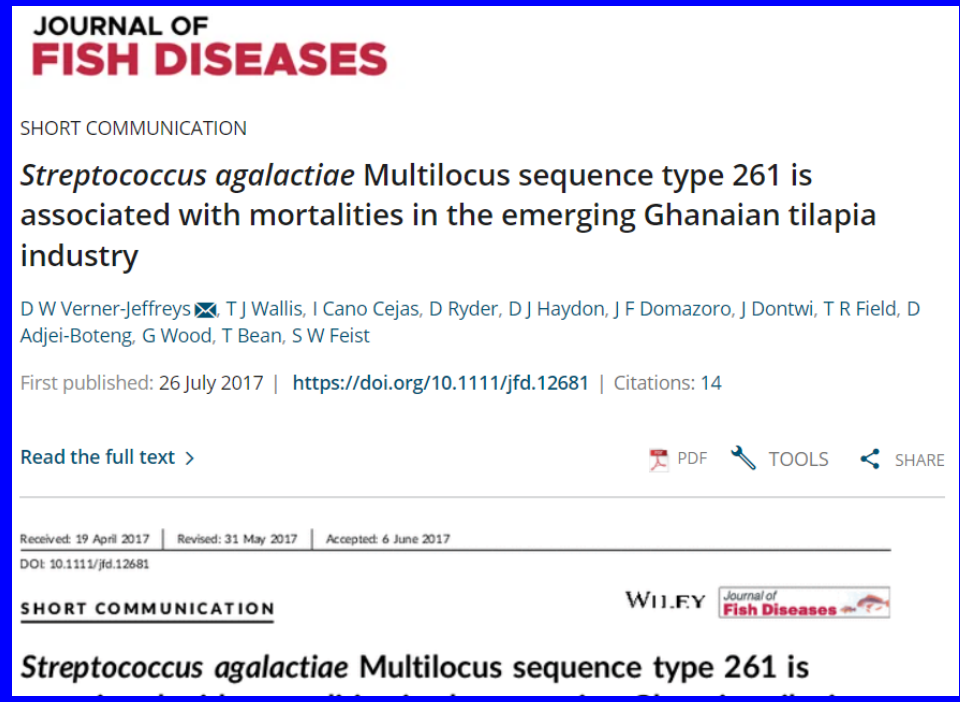
by Efua Konyim Okai and Rob Fletcher
30 July 2019, at 6:00am

A new suspect has emerged in the search for the causes of the massive disease outbreak that has been affecting tilapia on Lake Volta in Ghana.

New research, led by a team of UK-based scientists working for Ridgeway Biologicals, concludes that one of the causes of the mass mortalities on the lake is infectious spleen and kidney necrosis virus (ISKNV) – the first confirmed case of the virus in Africa. The report also warns international authorities and producers about the risk of spreading

Some final reflections from private sector ps .....

- Male female ratio of respondents – missed opportunity
- Country with most respondents ..... Ghana..... ..... Why ?
- Private sector ps showed through survey – are involved regularly in AAH
- Major concerns from 3 Lake Victoria coastline ps in terms of aquatic health/biosecurity as each commercial aquaculture sectors begin to grow & intensify.
- In certain countries private sector begin to set up own mechanisms & activities towards increasing awareness and self-regulation but looking for incentives.....?
- Issue of (no) laboratories in each country ....Multifaceted... Set up? Sample turnaround times ? Affordability Who pays? Govt ? Private sector? Income generation? Business model ?
- Treatments – survey show PS in some countries have significant knowledge / experience but they still want more information



JOURNAL OF
FISH DISEASES

SHORT COMMUNICATION

Streptococcus agalactiae Multilocus sequence type 261 is associated with mortalities in the emerging Ghanaian tilapia industry

D W Verner-Jeffreys, T J Wallis, I Cano Cejas, D Ryder, D J Haydon, J F Domazoro, J Dontwi, T R Field, D Adjei-Boteng, G Wood, T Bean, S W Feist

First published: 26 July 2017 | https://doi.org/10.1111/jfd.12681 | Citations: 14

Read the full text › PDF TOOLS SHARE

Received: 19 April 2017 | Revised: 31 May 2017 | Accepted: 6 June 2017
DOI: 10.1111/jfd.12681

SHORT COMMUNICATION

WILEY Journal of Fish Diseases

Streptococcus agalactiae Multilocus sequence type 261 is

What's your biggest worry at work?

Like every farmer on the lake, the last few years have been more than challenging. First there was the ISKN virus outbreak, which caused mortalities of about 80 percent on most farms. I was able to limit my mortalities to under 60 percent through the use of a neem extract treatment which I developed myself. And when we started to recover from ISKN, Covid-19 broke out. We are now coming out of those challenges. But as a regular farmer on the lake I get anxious when there are very heavy rains, which affect the water levels on the cages and expose the fish to health challenges.

ISKN and Covid-19 have made business tough for

Reflections……

- For each country clear information available (online and at least one location) step-by-step procedures/ forms , criteria to meet for import / export of live aquatic organisms.

- Need to improve working relationship/coordination between Fisheries & Veterinary Depts in terms of aquatic health also customs and borders

- Better, more specialised in-country training/information on aquatic animal health & biosecurity including an emphasis on their priorities: viral pathogens and Streps…….

- For Employers - Students at all levels need far more hands on in-lab and on farm training/ awareness in disease diagnosis, treatment & biosecurity procedures.

Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

We wish to thank all those working in African aquaculture who took the time to complete the online survey. And also acknowledge: ThinkAqua, Dr Gillian Taylor, John Domozoro & Venny Mwainge, for their help in raising awareness of this survey to those working with & /or affected by fish/ shrimp diseases across southern, east, & west Africa respectively. Also to acknowledge & thank FAO for funding this work

- William Leschen
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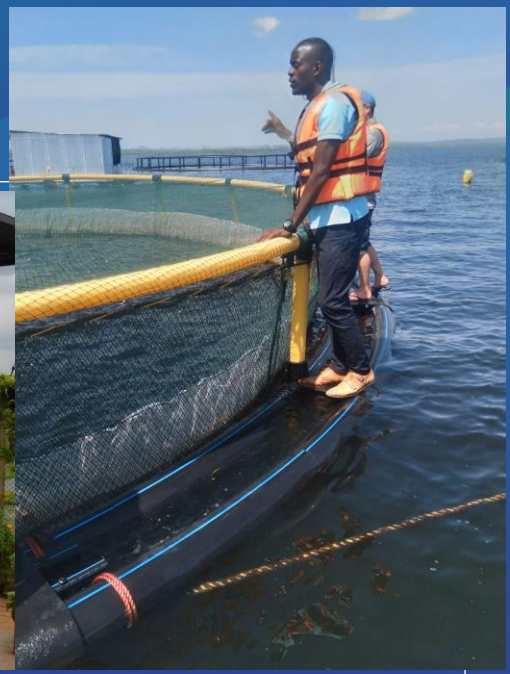

Casammak Aquaculture

	Stakeholder Sector Group participants				
	Private n=26	**Government n=14**	**Education Research n=24**	**NGO n=5**	**Total n=69**
Gender	25 male (96.8%) 1 female (3.2%)	10 male (71.4%) 4 female (28.6)	18 male (75%) 6 Female (25%)	5 male (100%)	58 male (84%) 11 female (16%)
From….. Countries	Ghana 17 (65%) Kenya 4 (15%) RSA 1 (3.8%) Togo 1 (3.8%) Malawi 1 (3.8%) Rwanda 1 (3.8%) Cape Verde 1 (3.8%) n= 7	Zambia 2 (16.6%) Uganda 2 (16.6%) Malawi 1 Kenya 1 Ghana1 Angola 1 Algeria 1 Ethiopia 1 RSA 1 Nigeria 1 Eswatini 1 Guinee Bissau 1 (all 8.3%) n=12	Kenya 6 (25%) Nigeria 5 (21%) Ghana 3 (12.5%) Malawi 3 (12.5%) Tanzania 2 (8.3%) DRC 2 (8.3%) Namibia 1 Botswana 1 Ethiopia 1 (all 4.15%) n=9	Ghana 2 (40%) Zambia 1 Tanzania 1 Uganda 1 (all 20%) n=4	20 countries Most participants: Ghana 23 (33%) Kenya 11 (16%) Nigeria 6 (9%) Malawi 5 (7%) Zambia 3 Uganda 3 Tanzania 3 (all 4%) n=20
Education level	Postgrad 12 (46%) Undergrad 10 (38.5%) Vocational Dip / Cert 4 (15.4%) PhD 1 Dr Vet Medicine 1 Secondary Sch leaver 1 (all 3.8%)	Postgrad 7 (50%) Undergrad 4 (28.6%) PhD 2 (14.3%) Dr Veterinary M Medicine 1 (7.1%)	PhD 13 (54.2%) Postgrad 9 (37.5%) Undergrad 2 (8.3%)	Postgrad 2 (40%) Undergrad 2 (40%) PhD 1 (20%)	PhD 17 (24.6%) Postgrad 30 (43%) Undergrad 18 (26%) Vet Dr 2 (2.8%) Vocational dip/ Cert 4 (5.8%) Sec Sch leaver 1 (1.4%)
Work sub sectors – (some multiple answers/ roles)	Fish farm producer 19 (73.1%) Hatchery producer 10 (38.5%) Consultant 10 (38.5%) Market wholesale / retail 5 (19.2%) Extension/Training 4 (15.4%) Veterinary and diagnostics 3 (11.5%) Feed Company 2 (7.6%) Agric/ Pharmaceuticals input dealers 2 (7.6%)	Veterinary 4 (28.6%) Aquaculture 4 (28.6%) Aquaculture & Fisheries 2 (14.3%) Specific fish diseases 2 (14.3%) Fisheries 1 (7.15%) Regulatory legal enforcement 1 (7.15%)	Univ student 6 (25%) “Non Univ” research 5 (20.8%) Univ staff 5 (20.8%) Univ research 4 (16.7%) Voc College staff 1 Univ Technical staff 1 (both 4.2%)	Africa country NGO 3 (60%) International NGO 2 (40%)	