Fish Farm Solutions Ltd.

New fish health sensor for aquaculture







Unia Europejska Europejski Fundusz Morski i Rybacki





Target markets Fish farms as the primary target

Aquaculture – rising market with unresolved issues

Global capture fish & aquaculture production forecast (milion t, LWE)*



Capture production 🛛 🗧 Aquaculture production

\$ 138.5 m Farmed food fish production in 2016

But!

Aquaculture is one of the fastest growing animal-food sectors

In 2020 it is expected that, for the first time, share of farmed species in global fishery production will exceed that of wild species

Fish infections cost industry billions of dollars in worldwide losses each year





Norway – increasing losses due to salmon diseases

Norway

contributes more than 50% of the global salmon production Average mortality of Atlantic salmon in fish farms in 2000-2017.* Mortality ranges for specified county for a given year from <10% to even 50%, yet average remains stable.

13.6%



Losses from dead Atlantic salmon in Norway are increasing due to rising scale of production. In 2017 losses reached

\$72.7 m

*losses due to mortality vs input of fish in a given year



Norway – PD as a major viral disease



36% Of salmon farms in Norway which submitted diagnostics to Norwegian Veterinary Institute suffered from Pancreas disease (PD).

40% Mortality on PD-affected farms may reach up to 40% of stock over 3- or 4- month period.

£1.43 m Estimated single fish farm loss, due to Pancreas disease according to Aunsmo et al (2012).

Current fish farms diagnostics path





It is a time-consuming method.

Fish farmers don't have a handy and ready to use test to monitor their aquaculture in a timely manner.



SensDx Technology

SensDx products



ACCURATE, QUICK, EASY-TO-USE AND LOW-COST diagnostics of a spectrum of infections RAZOR-RAZORBLADE MODEL: single use electrodes are the main source of revenue



The secret sauce



KEY TECHNOLOGY | Ultrasensitive tests modified with biological molecules

- The platform's design is a **combination** of biotechnology, electronics and electrochemistry
- The surface of the **electrodes** (single-used tests) is modified by **molecules** selected towards chosen biomarkers (either diseases or pathogens)
- The **reaction** on the surface of the electrode is measured by highly sensitive electrochemical method, based on <u>Electrochemical Impedance Spectroscopy</u> (EIS)
- The electronic reader measures and analyses the **signal** created by the <u>specific reaction</u> <u>between the biomarker and selected molecules</u>



Outcome: the interpretation of the signal gives an unequivocal, binary **answer** (yes or no) whether the molecules are associated with a specific disease (e.g. FluSensDx), or



Outcome: the interpretation of the signal indicates which disease (if any) the tested molecules correspond with (MultiSensDx)



Why is it innovative?

#1



HIGH SENSITIVITY ≥ 96% sensitivity¹ ≥ 99% specificity²

Fit to detect all influenza virus serotypes at every stage of the infection as opposed to competitors



Diagnostic test result in less than 5 minutes and a simple procedure means the test can be done by the patients themselves

#3 LOW MANUFACTURING COST

The unit price (in large-scale production) will be below the cheapest product in the market, while offering much better quality



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Our solution FishSensor for quick disease detection

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FishSensor



Highly sensitive

Sensitivity to Pancreas Disease as high as 99% in comparison to PCR method (gold standard).

Easy to use and quick Diagnostic test result in 5 to 10 minutes.

Low manufacturing cost

The unit price will not exceed the competitive method price, while offering much better utility



Team – complementary experience & knowledge

Polish R&D and commerialisation experience

Our team consists of scientists – masters in their scietific field and business-oriented people with experience in developing diagnostic devices achieved in SensDx Company – diagnostic devices provider for patients and physicians.









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Dawid Nidzworski Krzysztof Urbański

Tomasz Gondek

FishFarm Solutions Ltd.

Norwegian market expertise

Our partners and investors operates in Norwegian aquaculture (owners of fish farms, aquaculture suppliers). They give the Company close market outlook and represents real user's needs.



Per Kristian Nordøy

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Team – complementary experience & knowledge

Polish R&D and commercialisation experience



SensDx provides diagnostic tests for human. Its first product – test for flu – already received CE mark and is currently tested in clinics. FishFarm Solutions Ltd.

13 employees Norwegian market expertise

CEO and/or owners of:

- LetSea AS aquaculture R&D center formed in 1996,
- EcoMarin AS owns many aquacultures in Norway whose revenues achieved EUR 35 m in 2017
- Solutio Diagnostics AS

From technology to market

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We have all it takes to change fish farms diagnostics market



Product pipeline





I 2020 Other tests: ISAV, HPR0 III 2020 Other tests: IPNV, Yersinia VIII 2020 Multisensor Listeria HSMB CMS, SAV2 and SAV3

FishSensor features



Ultra sensitivity

Detection of small amount of pathogens in samples. Sensitivity comparable only to the molecular RT-PCR method that is carried out in the lab.



Measurement speed

FishSensor will show the result in 5 to 10 min.



No professional lab needed

Test is carried out on the sensor, which reduces the time and costs for obtaining the results.



Multisensor

FishSensor will allow for detection of up to seven different pathogens with a single electrode, basing on one sample.

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Selling strategy



Disposable test

- 1) Test for one sample,
- 2) Can detect from one to multiple diseases,
- 3) For one-time use only.

Pricing:

to be decided based on clients price sensitivity. Our product has no equivalent on the market and there is a space for significant margins due to the low costs of production



Water sensor – integrated system with IT platform Monthly fixed fee and sucess-fee



Reusable reader

- 1) Read one test a time,
- 2) Display results of test,
- 3) For multiple use

Pricing: ~250 EUR





Future development

Shrimp diagnostics

- White Spot Virus
- Acute Hepatopancreatic Necrosis Disease
- Enterocytozoan hepatopenaei

Tilapia diagnostics

- Francisella noatunensis subsp. orientalis

Karp, trout etc. diagnostics

- We are looking for a partner for cooperation





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