Food and Agriculture Organization of the United Nations

Introduction to Cefas, the FAO Reference Centre for Bivalve Mollusc Sanitation

UK Government

About Us - Cefas (Centre for Environment, Fisheries and Aquaculture Science)

WHAT IS CEFAS?

Cefas is an Executive Agency of UK government Ministerial Department of Environment, Food and Rural Affairs (Defra)

Provider of Marine and Freshwater Science – the main evidence, advice and services for the aquatic environment for UK Government.

600 staff: (500 scientists and technicians 80+ PhD students, visiting scientists)

Top 5% of 2,500 International scientific institutes

Strong Partnerships with other UK GOV bodies, national and international university alliances

Our Science - Cefas (Centre for Environment, Fisheries and Aquaculture Science)

WHERE IS CEFAS?

https://www.cefas.co.uk/icoe/aquatic-animal-health/designations/

https://www.cefas.co.uk/icoe/seafood-safety/designations/

FAO REFERENCE CENTRE FOR BIVALVE MOLLUSC SANITATION AT CEFAS

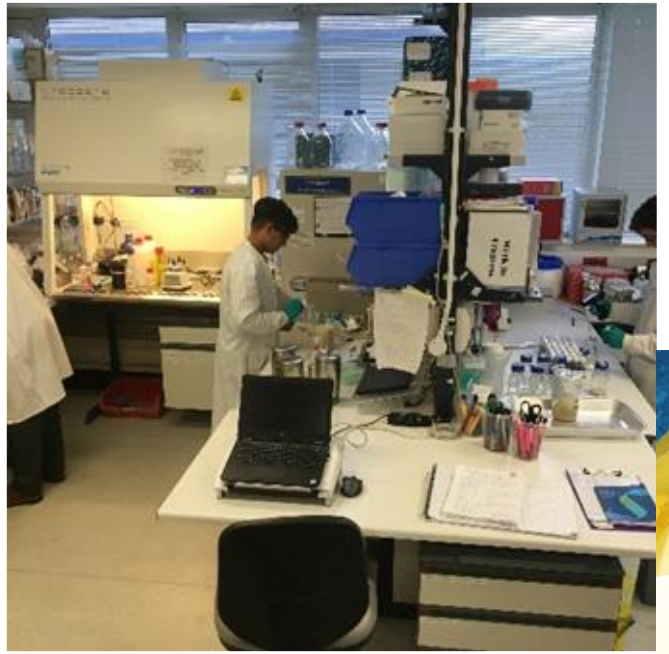
One of **FAO's global missions** is to provide **field and technical support to member countries**

Reference Centres designated by FAO are regarded as **Centres of Excellence** in providing,

- **Scientific and technical expertise,**
- **Diagnostic and reference services,**
- **Laboratory and field training,**
- **Coordinating research and developmental studies**

All contributing to FAO/WHO projects

Annual programmes of work funded by UK GOV



Bivalve Mollusc Sanitation: Growing Area Risk Profile

Bivalve Mollusc Sanitation: Growing Area Assessment & Review

OPERATING IN PARTNERSHIP WITH FAO AND WHOA AS REFERENCE AND COLLABORATING CENTRES

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WORLD ORGANISATION FOR ANIMAL HEALTH

Collaborating Centre for Emerging Aquatic Animal Diseases

Food and Agriculture Organization of the United Nations

Reference Centre for Antimicrobial Resistance (AMR)

Veterinary Medicines Directorate

Animal & Plant Health Agency

Food and Agriculture Organization of the United Nations

Reference Centre for Bivalve Shellfish Sanitation

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FAO REFERENCE CENTRE FOR BIVAVLE MOLLUSC SANITATION SINCE 2019

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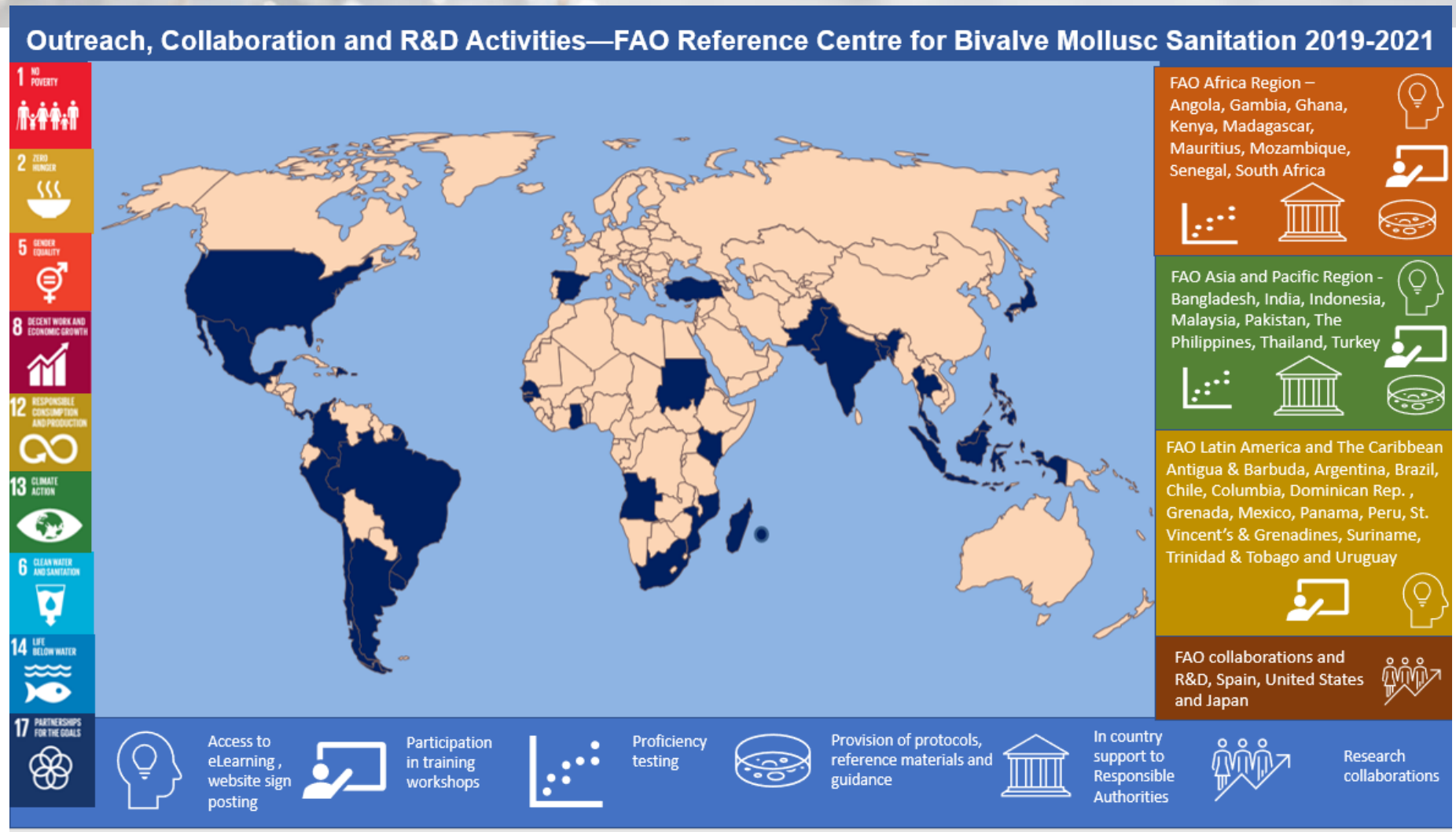
Active in **30 countries**

Technical guidance and eLearning covering risk based development of safe bivalve aquaculture

FAO global regional training workshops for responsible authorities

Technology transfer through sharing protocols and proficiency testing to develop relevant approaches



FAO Reference Centre for Bivalve Mollusc Sanitation - Cefas (Centre for Environment, Fisheries and Aquaculture Science)

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World Health Organization

BIVALVE MOLLUSCS AS A SUSTAINABLE FOODSTUFF

Extractive, **unfed**

Low industry costs

Gender opportunities in **rural communities**

No **antimicrobial** or **chemical** usage

RAISED WITHOUT ANTIBIOTICS

BIVALVE MOLLUSCS AS A SUSTAINABLE FOODSTUFF

Relatively **low carbon footprint** compared to other forms of protein production – 340 tonnes CO_2 per tonne beef vs 11 tonnes bivalve protein

Globally an estimated **1.5 million sq km** of coastline suitable for growing **bivalve shellfish**

1% of this area could produce enough **protein for one billion people**

Higher **protein** content than many meats and plants

High levels of **omega 3 fatty acids** and **micronutrients** (iron, zinc and magnesium)

Over two billion people worldwide are micronutrient deficient

RELATIVE GLOBAL IMPORTANCE OF BIVALVE MOLLUSCS – SOME FACTS

Increase in **production** over 50 years -1m tonne in 1950, to over **17m tonnes** in 2020 **(>80% aquaculture)**

Total value of USD 30 billion*

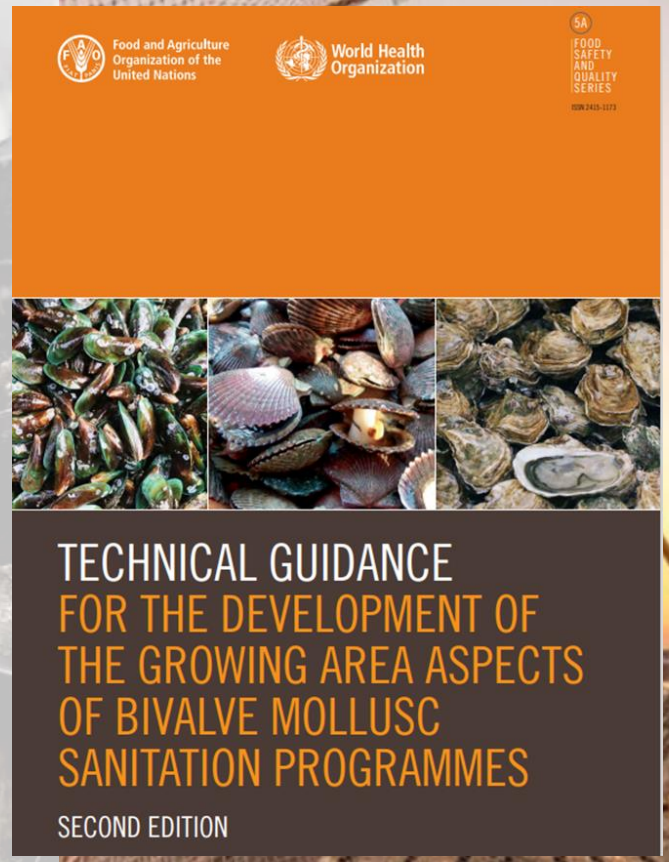
Total Export value circa **USD 4.2 billion**

Value of trade in live, fresh or chilled **USD 1.4 billion**

Still only around **3% of bivalve molluscs** are **traded outside** of the **country** of **production**

Official Controls are required in both **primary production (monitoring and classification)** and **end-product** for US, EU and other markets*

Complex risks and differing risk management approaches = complex regulatory requirements which can be a disincentive to countries



* Mainly as foodstuff but also sources of Calcium carbonate, oxide, as animal feed supplements and cosmetics

FOOD SAFETY CONSIDERATIONS

Bivalve molluscs are a **unique foodstuff**, presenting a unique public health risk

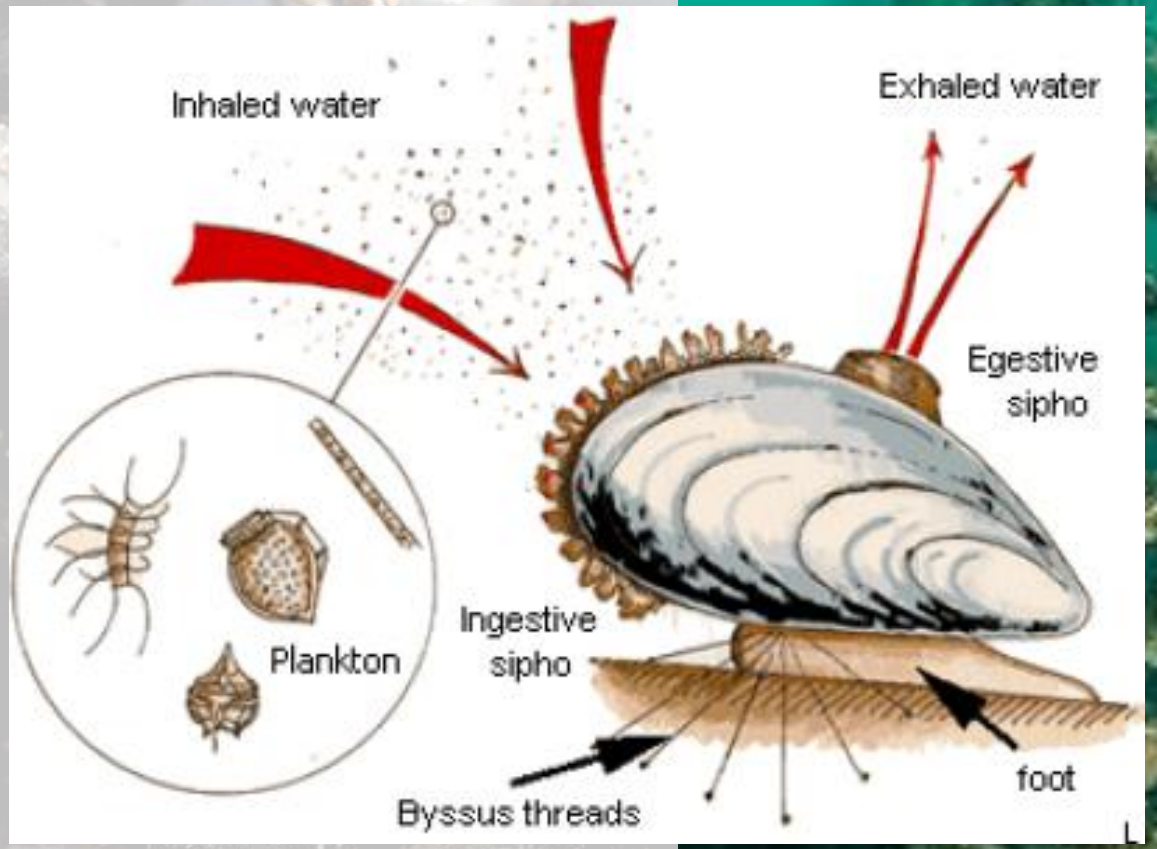
As **filter feeders** – taking on the **characteristics of their environment**

Hazard in the environment = hazard in the bivalve, cleaner the water, the cleaner the product

Frequently **consumed raw or lightly cooked**, without extensive processing

Contamination can occur during **primary production** (accumulating as they grow)

Most **food safety systems** are applied in **primary production** (and at the **end product** stage)



HAZARD IDENTIFICATION AND RISK ANALYSIS– IN PRIMARY PRODUCTION OF BIVALVE MOLLUSCS

HAZARDS

ANTHROPOGENICALLY DERIVED PATHOGENS

E.g., noroviruses, hepatitis A virus, *Salmonella* sp from human or animal faecal waste

ENVIRONMENTAL PATHOGENS

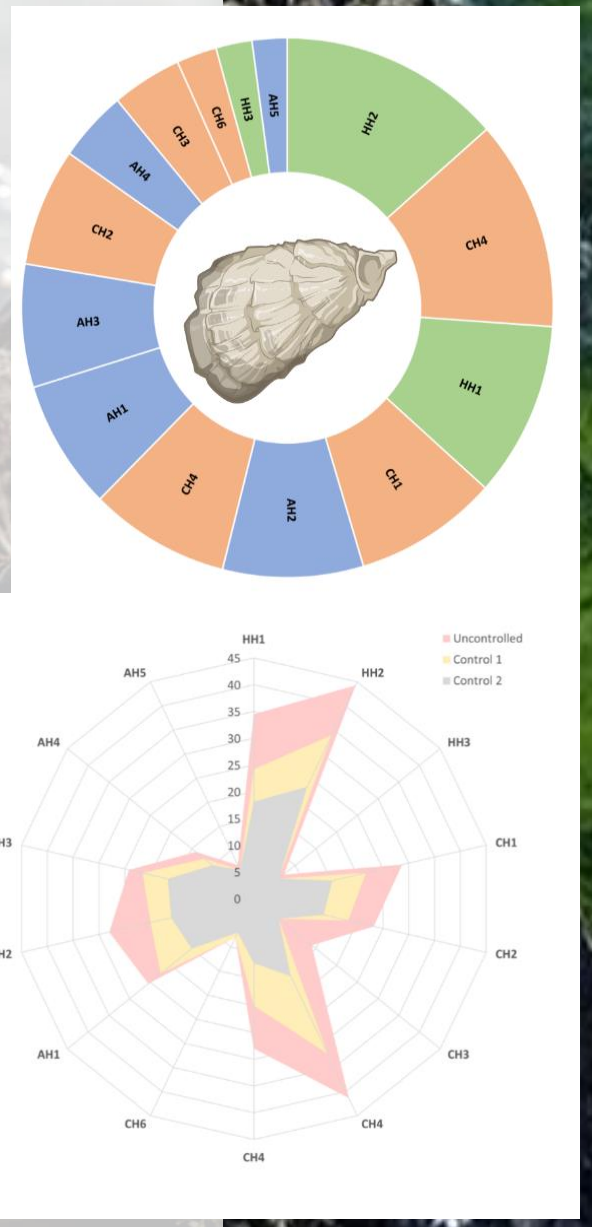
E.g., *Vibrio parahaemolyticus* and *Vibrio vulnificus* common in low salinity, warm waters

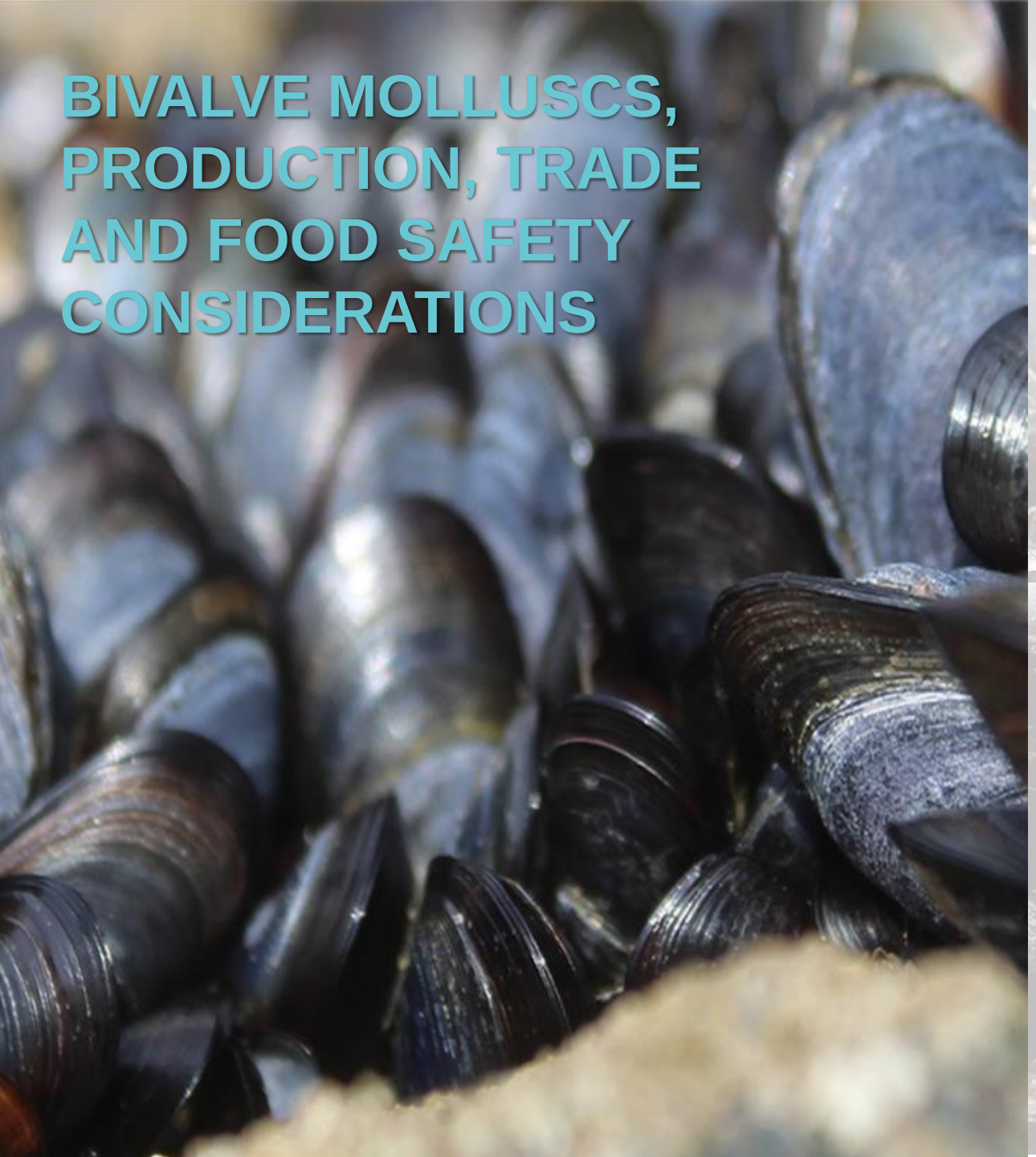
CHEMICALS & HEAVY METALS

E.g., natural algal biotoxins, heavy metals, persistent organic compound), veterinary pharmaceuticals

ANIMAL PATHOGENS

E.g., WOAH listed viruses (*Bonamia exitiosa, B. ostreae, Marteilla refringens, Perkinsus marinus, P. olseni.*





BIVALVE MOLLUSCS, PRODUCTION, TRADE AND FOOD SAFETY CONSIDERATIONS

SUMMARY

- Bivalve molluscs have food security and nutritional benefits
- Significant potential for bivalve production exists globally
- As filter feeders they concentrate hazards (pathogens, contaminants etc) in growing areas, which may not be eliminated during processing (raw product)
- Hazards can be derived from natural and manmade sources
- Typically controls are applied in primary production and to end products
- **Economic and societal benefits**, but **clean environments** are preferred for cultivation and extensive **official control programmes** are required

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