Aquatic animal vaccines

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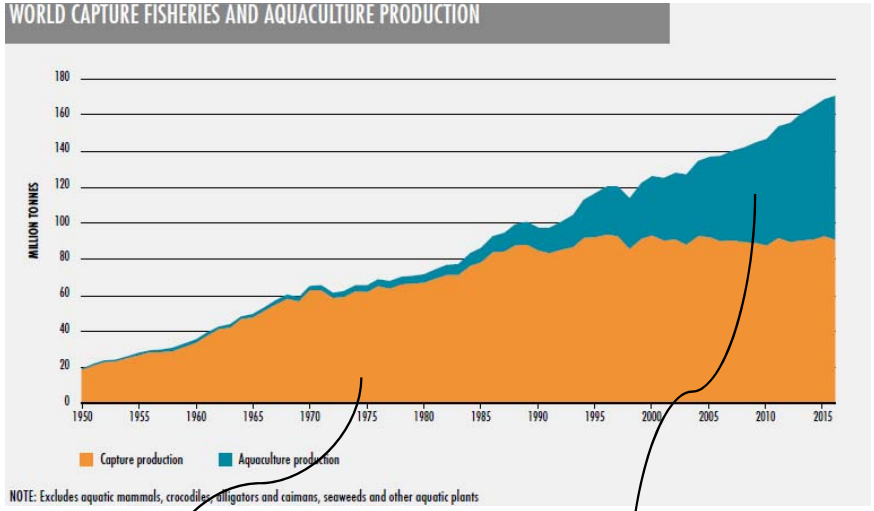
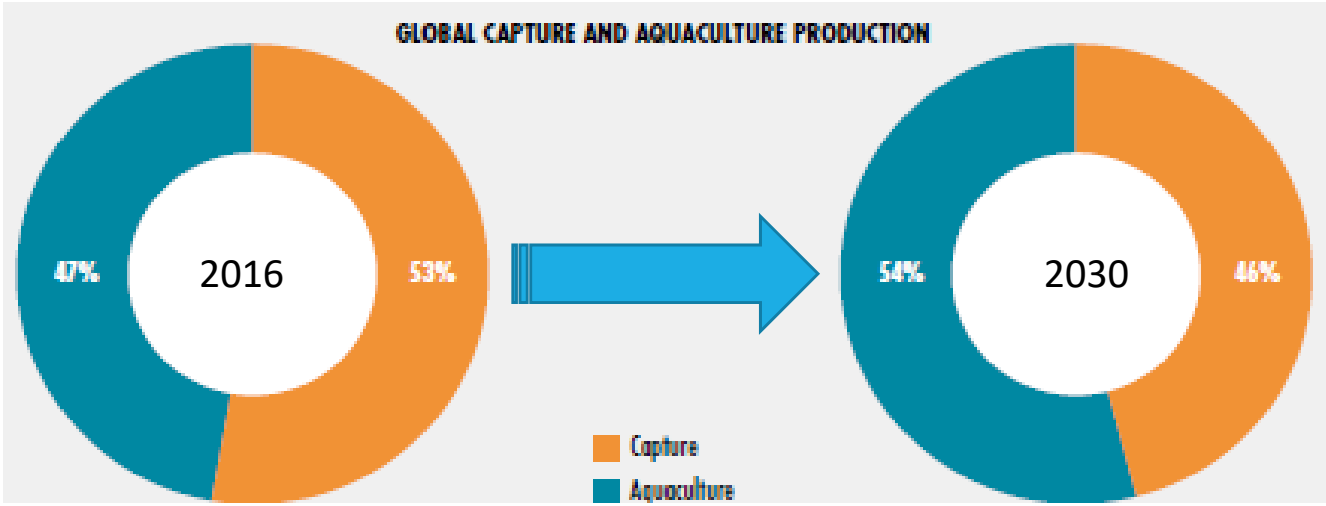
Increasing role of aquaculture



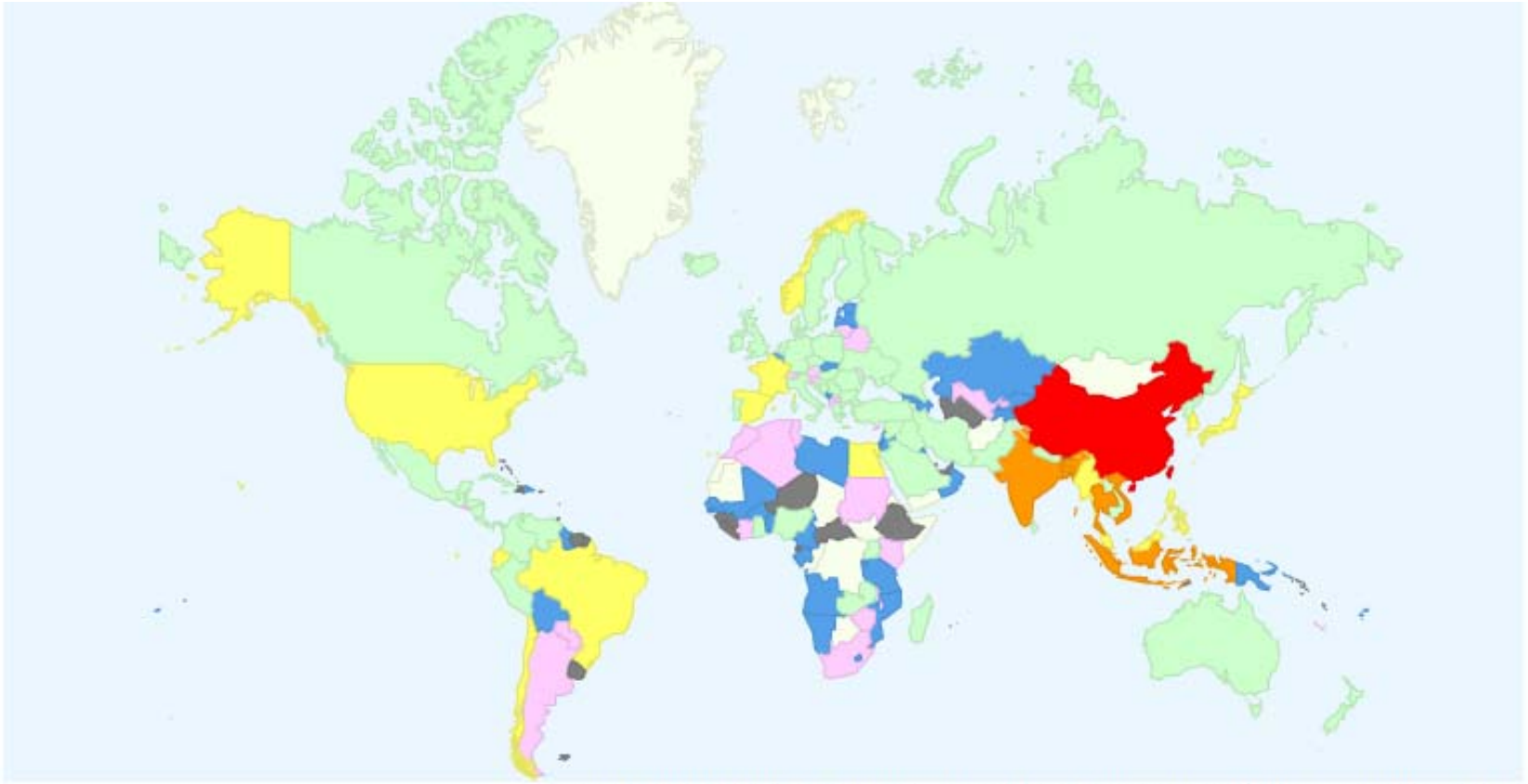


Capture

Aquaculture

FAO The state of world fisheries and aquaculture 2018

Aquaculture production of aquatic animals for human consumption(tones) in2009



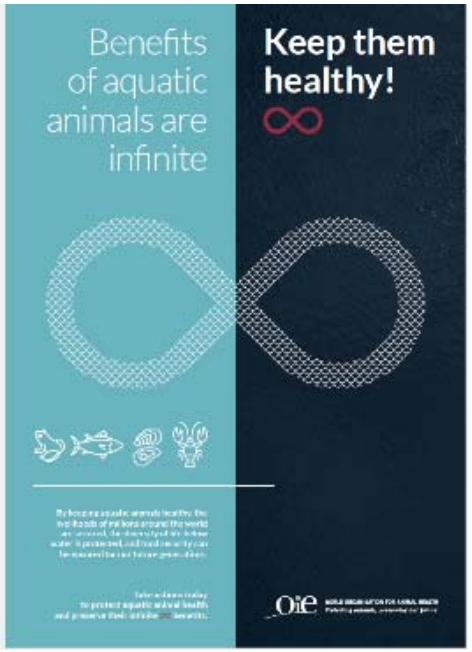
Download Map High Resolution Download Map Low Resolution Download Data

Data on aquaculture production of aquatic plants worldwide are not included in this map.

Tonnes:	No Data	0-100	101-1,000	1,001-5,000	5,001-200,000	200,001-1,000,000	1,000,001-5,000,000	>30,000,000
Level:	0	1	2	3	4	5	6	7

http://www.fao.org/fishery/naso-maps/naso-maps/en/

Importance of Aquatic Animal Health



Aquatic vaccines

- ✓History
- ✓Impact for fish production
- ✓Vaccination method
- ✓Considerations
- ✓Regulations
- ✓Challenges

History of Aquatic Vaccines

- 1986-1990

Immersion vaccines for *Vibrio salmonicida* (Norway, 1986)

Immersion vaccines for *Vibrio anguillarum* (Japan, 1988)

Immersion/Injection vaccines for *Aeromonas salmonicida* (Norway, 1989)

- 1990's

Development of many types of injection vaccines

-Combined vaccines, Adjuvant vaccines

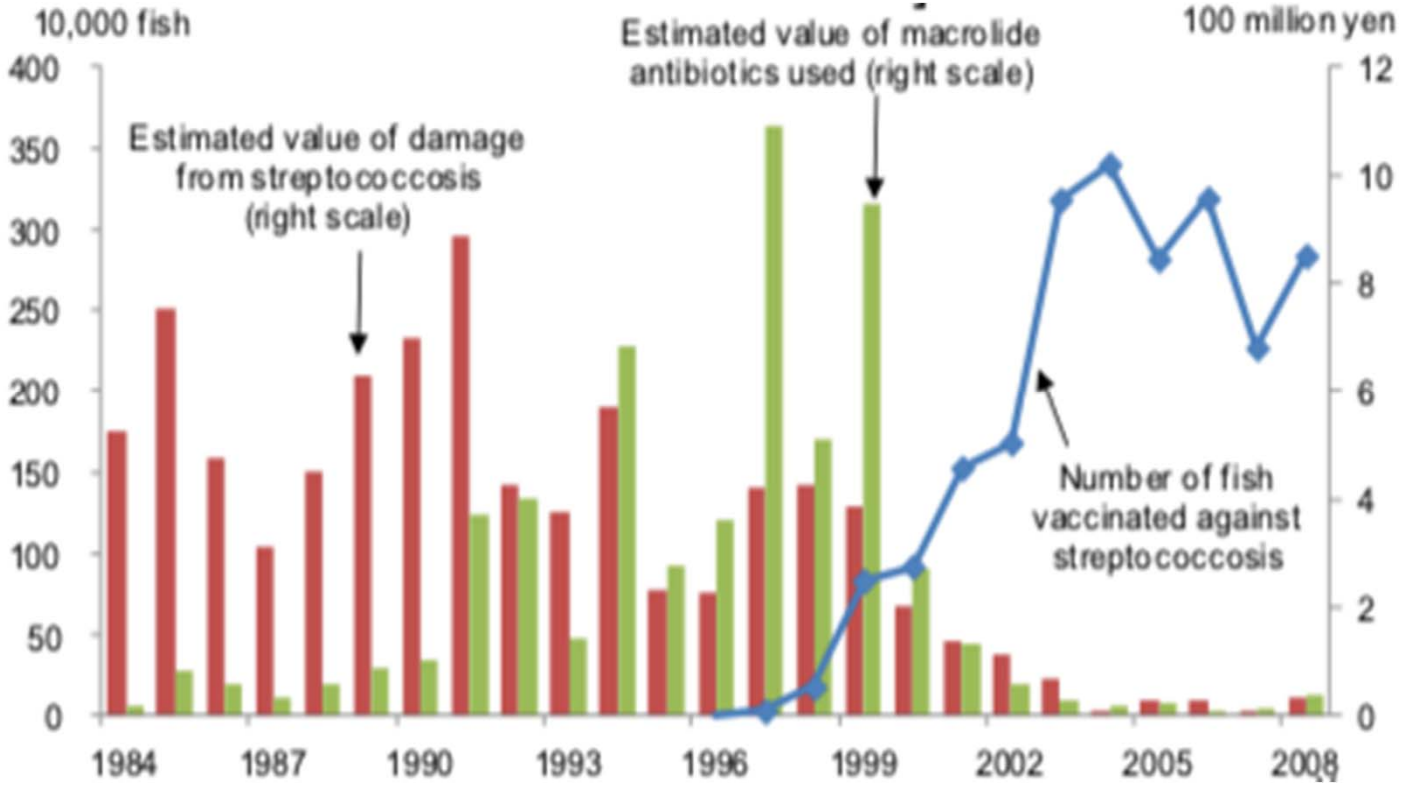
- 2000's ~

DNA vaccines for Infectious Hematopoietic Necrosis Virus (Canada, 2005)

DNA vaccines for Infectious Pancreatic Necrosis Virus (Norway, 2018)

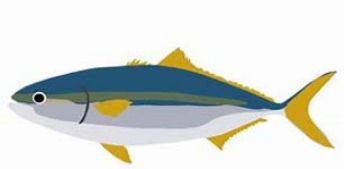
Impact to the fish production

Shift to Prevention from Treatment



- Improving productivity
- Cost down
- Decreasing antibiotic usage

(Eco-friendly, Food safety ,Public Health)

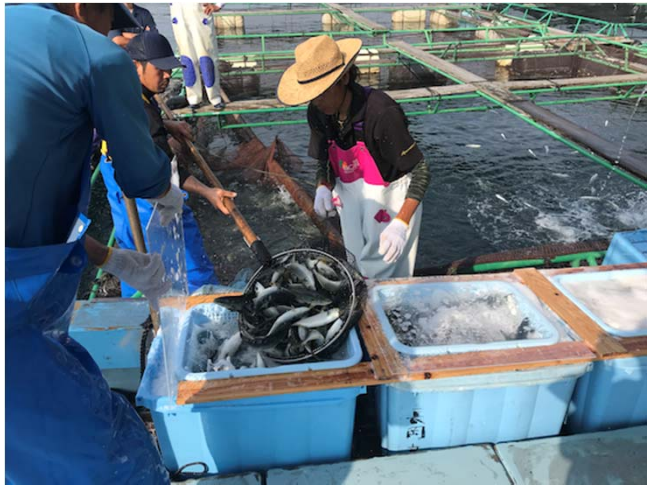


Vaccination methods

1. Injection（i.p. , i.m.)
2. Immersion
3. Oral

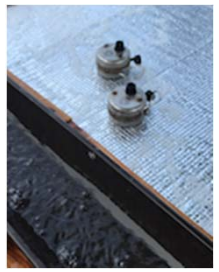
* Inactivated antigen are most common

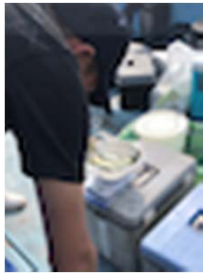
Process of Injection vaccine



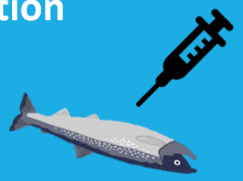
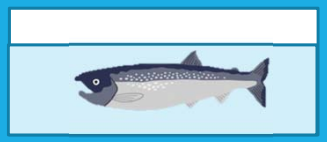
Automatic injection devices

Number and body weight of vaccinated fish are monitored





Features of vaccination methods

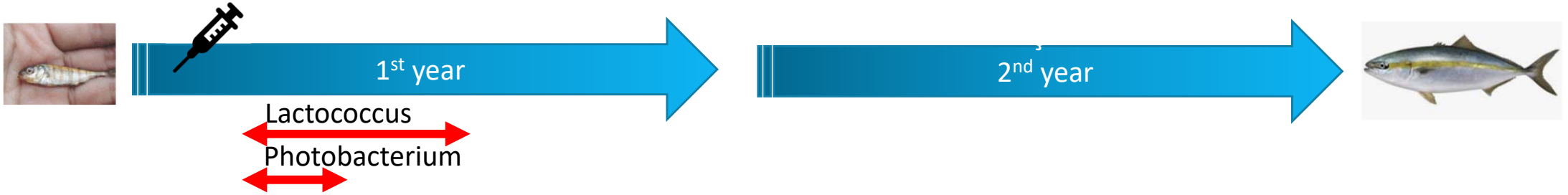
	Injection 	Immersion 	Oral 
Efficacy	+++	+	+
Application	+	++	+++
User safety	+	+++	+++
Stress for fish	+++	+	-
Labor costs	+++	+	+
Amount of Vaccine	+	+++	+++
Accuracy of administration	+++	+	-
Handling skill	+++	+	-
Comments	Most common methods		Easiest methods

Considerations

1. To know the disease

-What kind of diseases do you want to control?

-When is the season of each disease?



2. Vaccination should be carried out for healthy fish

- Good nutrition

- Good health condition

Considerations

3. Based on Label

-Target fish*, Condition of water temperature, Fish size, Dose, Administration route

EX. Yellowtail , 18 to 22 degree, 20 to 1000g , 0.1ml , i.p.

Target fish *:Salmon, Tilapia, Pangasius, Bass, Sea-Bream, Flat fish, Grouper, Yellowtail etc.

4. Based on Instruction

-Food should be withheld for 1 day prior to vaccination.

-Do not move fish for 5-6days before and after vaccination

-Withdraw period etc.

Distribution and use of Aquatic vaccine

1: Application for Vaccine use

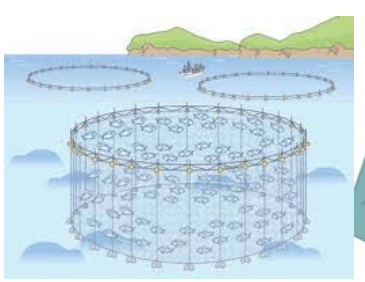
2: Issue of prescription

Consultation by the specialist

3: Order

5: Feedback the usage data

4: Shipment to Fish-farm



Quality control

- GMP based manufacture
- Inspection for final products by the national authority

  -National assay (Efficacy / Safety tests)

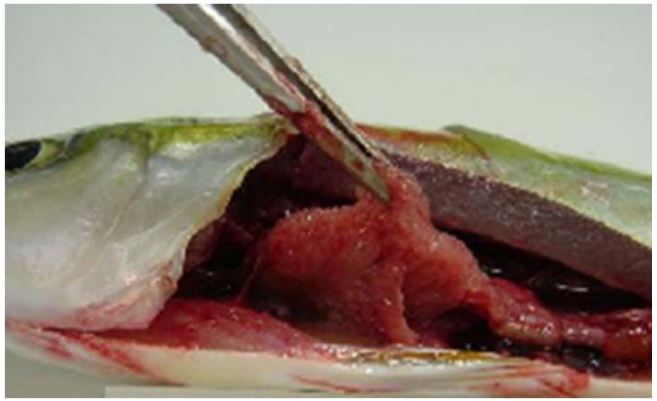
  -Reviewing of dossier (Summary lot protocol)

Safety tests / Efficacy tests

Vaccination

Quarantine period → Safety test → Efficacy test

- Adverse effect
- Local reaction

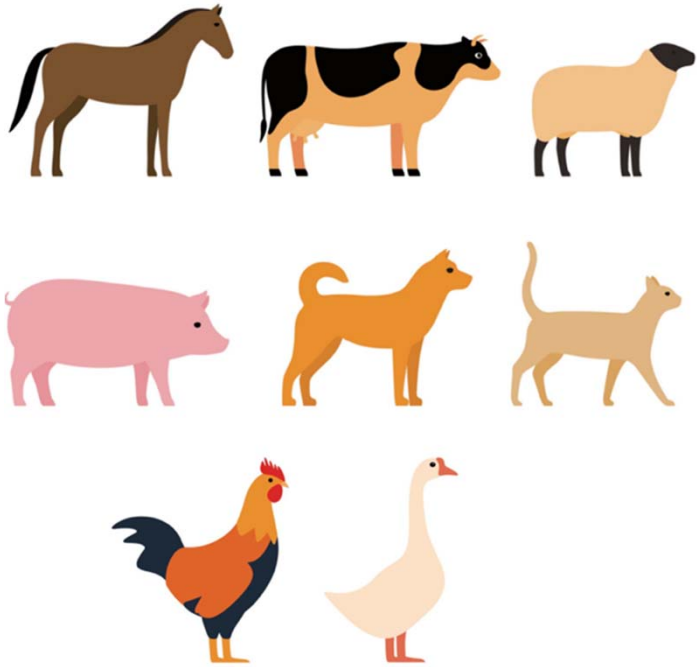


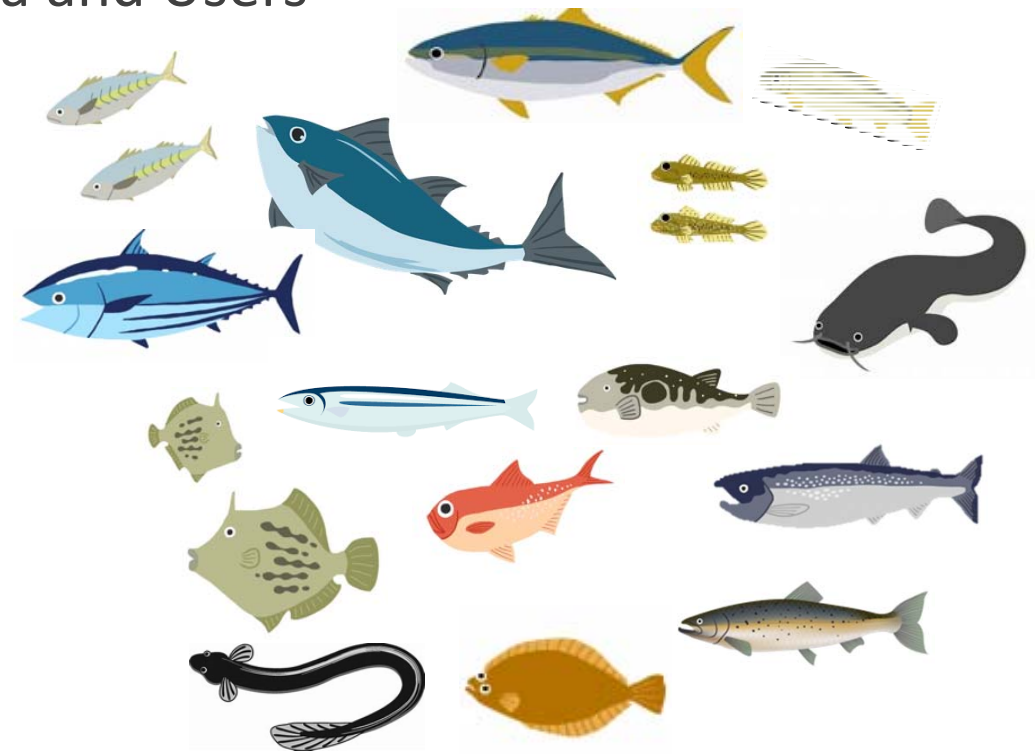
Grading score for local reactions

- Artificial challenge test
- Immunological test

Challenges for regulators

- Involvement of specialist, Vets or other
- Development of effective vaccines for local fish in your country
- Communication with Industry , Academia and Users





Thank you for your attention

Special thanks for

- Kagoshima Fisheries Technology and Development Center
- Azuma-cho Fishery Cooperative in Kagoshima