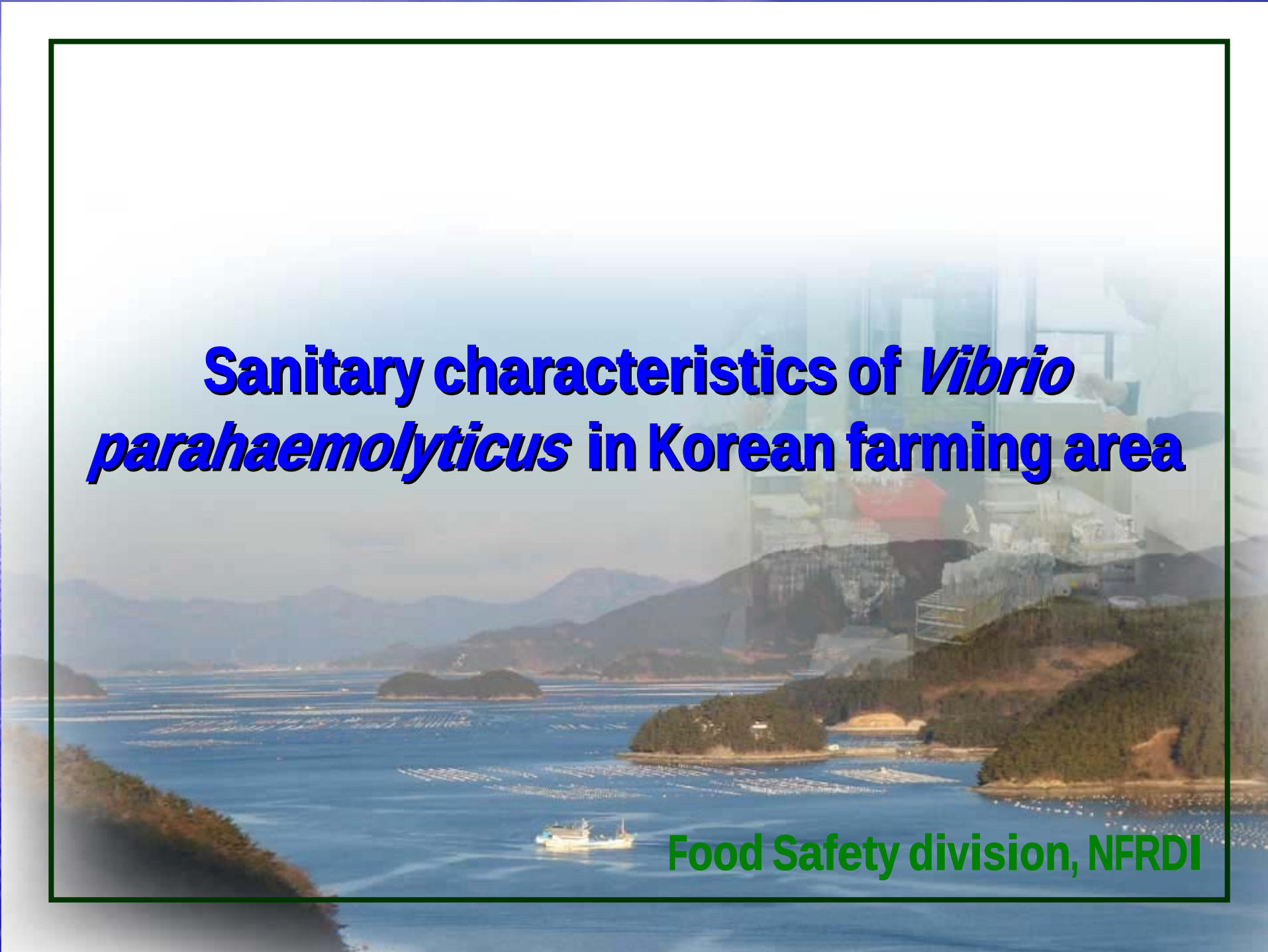
Sanitary characteristics of *Vibrio parahaemolyticus* in Korean farming area



Food Safety division, NFRDI

INTRO

- Food Safety Research Division, NFRDI

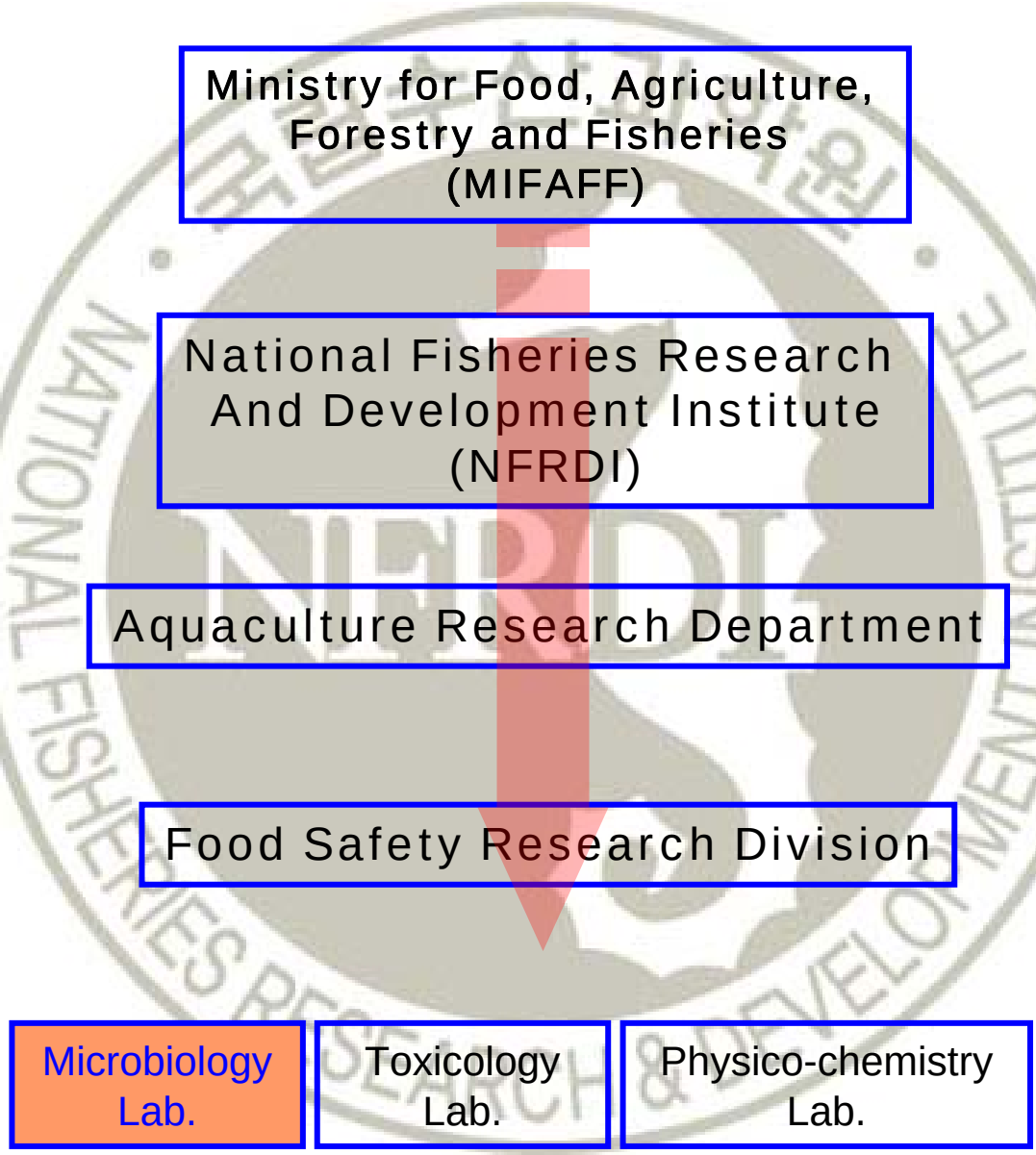
KSSP

- History
- Farming area & Lab
- Production
- Operation
- Evaluation

Vibrio

- Vibriosis
- Detection status in Korea
- Amendment proposal

(FOOD SATETY RESEARCH DIVISION, NFRDI)


Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF)
National Fisheries Research And Development Institute (NFRDI)
Aquaculture Research Department
Food Safety Research Division
Microbiology Lab.
Toxicology Lab.
Physico-chemistry Lab.

Functions and Operations

➢Study on Sanitation and safety management, such as HACCP of marine products and marine processed products

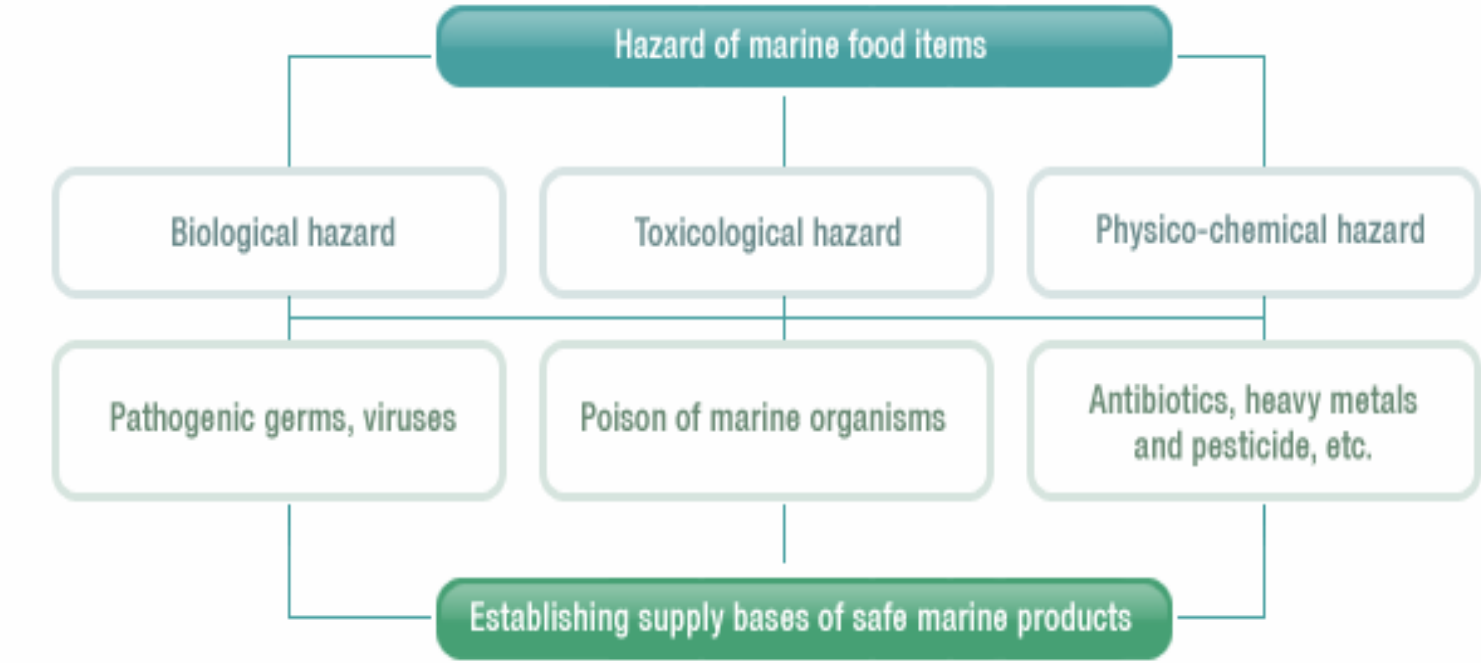
- Sanitation standards setting and management for marine products
- toxicity of marine products and microbial test
- physico-chemical characteristics of marine products

Major Fields of Research

➢Sanitation management of marine products

- toxicological hazards of marine food items
- pathogenic germs and viruses originated from marine products
- physico-chemical hazard control of marine food items
- establishment and operation of HACCP
- Operation of international Sanitation-related agreements for export of marine products
- Analysis on food Sanitation and safety-related hazards upon request (pathogenic germs, shellfish poison and blowfish poison, etc.)

Direction of Research and Promoted Tasks

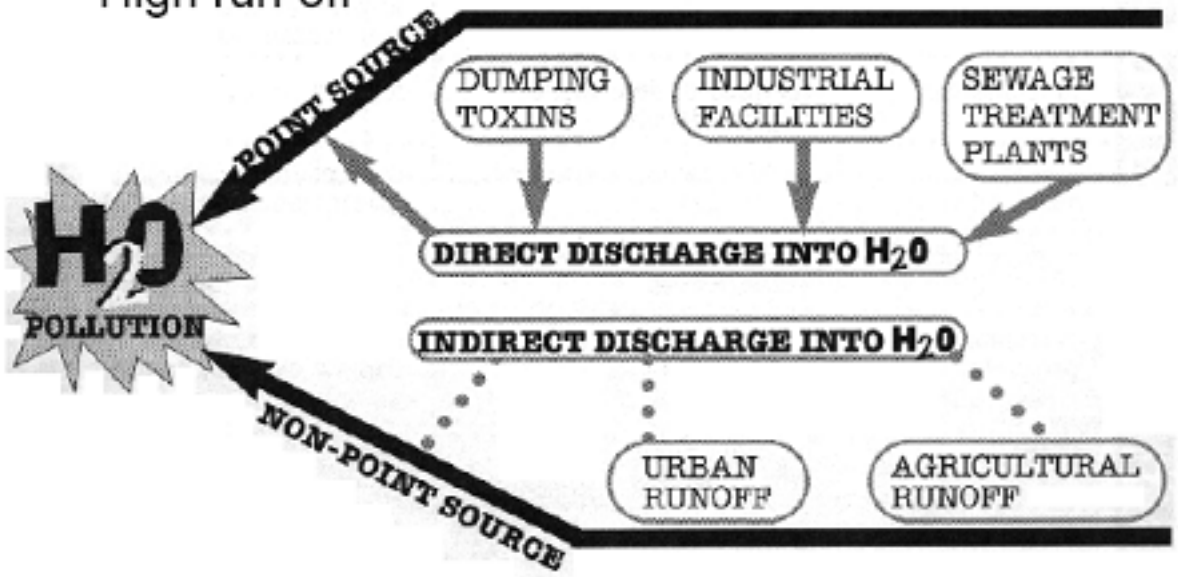


KSSP

(KOREAN SHELLFISH SANITATION PROGRAM)

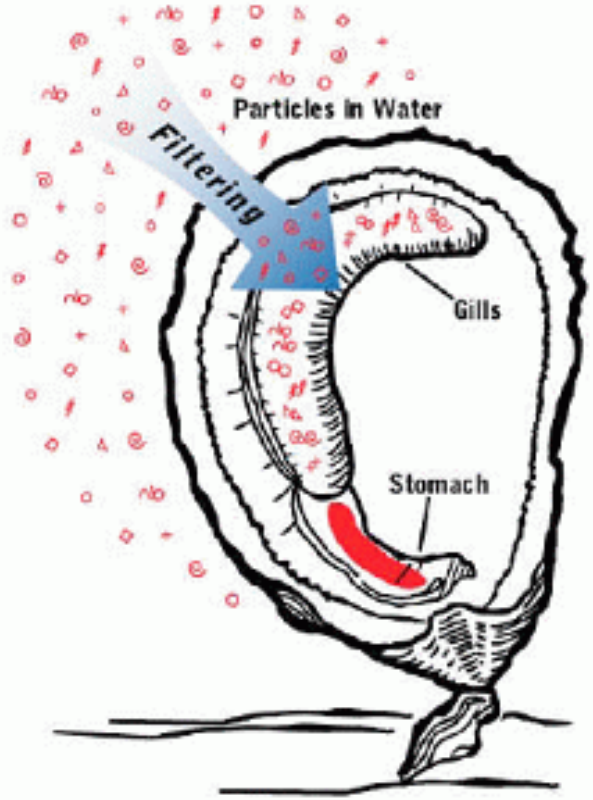
Why Shellfish?

- Habitat
  - Coastal estuarine systems
    - Populated areas
    - High run-off



Why Shellfish?

- Anatomy and Physiology
  - Filter feeders
    - Non-selective approach
    - Concentrate pathogens or Toxins
    - Micro-environments
      - Surface
      - Internal



History of KSSP

'60 **Microbiological laboratory** at Processing and Chemical Division in the Central Fisheries Research Center (Current NFRDI)

'72 **Shellfish Sanitation Agreement** between Korean CA and USFDA

'76 Food Sanitation Division in NFRDI

'95 **Commission Decision** of 23 October 1995 laying special conditions for the import of bivalve molluscs, echinoderms, tunicates and marine gastropods originating in the Republic of Korea(95/453/EC)

'98 Shellfish Sanitation Agreement for raw consumption oyster to be shipped to **Japan** between Korea and Japan

Approved Farming Areas & Labs.

344km²

	Area (ha)	Survey area (ha)	Initial designation	Shellfish
1	2,050	5,000	1974	Oyster
2	9,492	12,700	1984	Oyster
3	3,107	12,300	1987	Oyster
6	5,860	9,800	1999	Mussel
7	5,290	8,000	2004	Arkshell
4	4,188	11,200	1987	Oyster
5	4,398	8,000	1999	Clam
T	34,385	67,000		

Sanitation Standards for the designated area of shellfish production for export

1. Water Quality

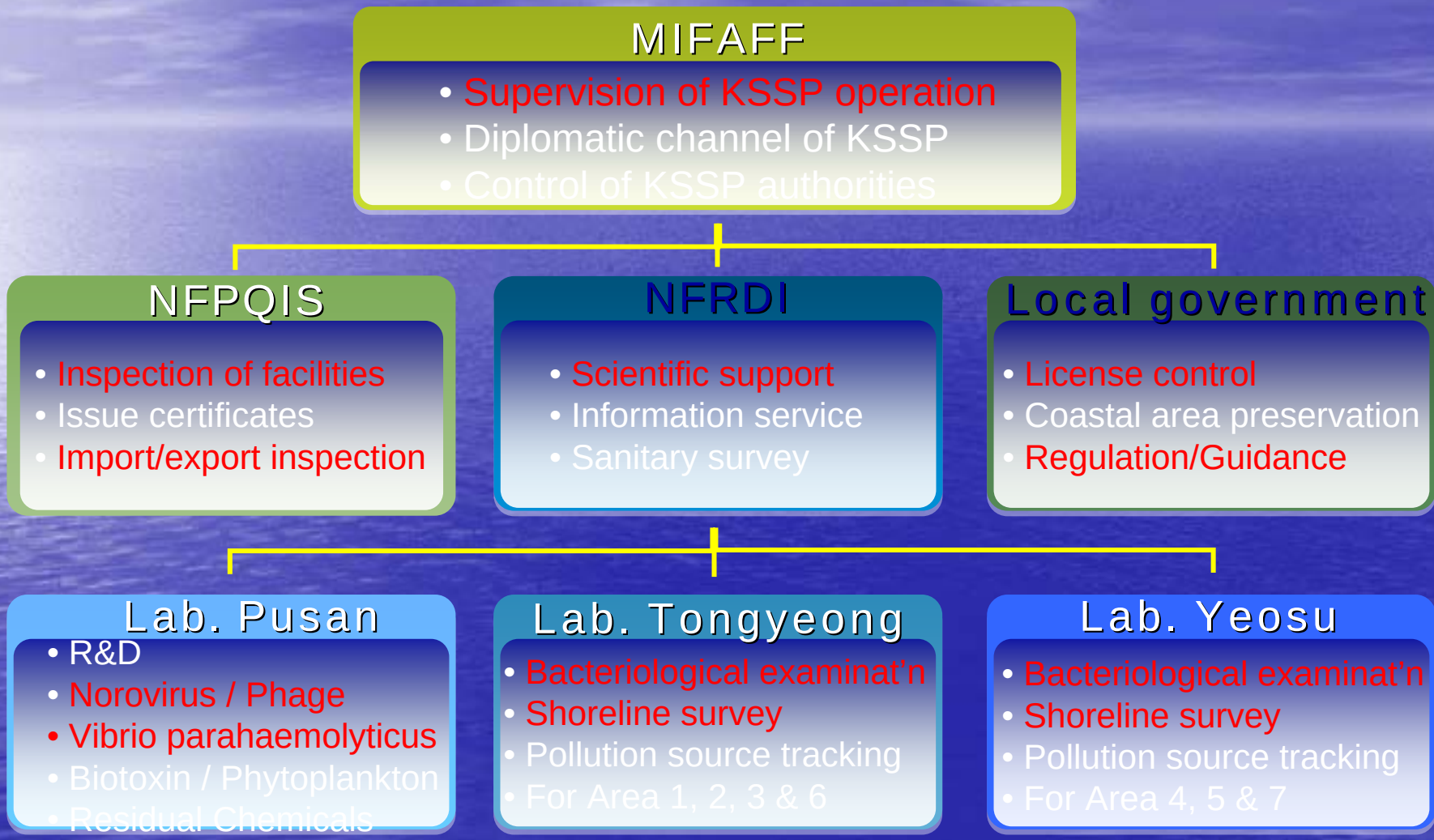
- Most Probable Number (MPN) method for fecal coliforms.
- Median or geometric mean of MPN : less than 14/100ml
- 90th percentile value : less than **43/100ml**

Sanitation Standards for the designated area of shellfish production for export

2. Sanitation Standard for Shellfish Produced

- Shellfish Poisons
  - (a) Paralytic Shellfish Poison (PSP): less than 80㎍ /100g
  - (b) Amnesic Shellfish Poisons (ASP): less than 20ppm
  - (c) Diarrhetic Shellfish Poisons (DSP): less than 0.05MU/g
- Oxytetracycline : Not detected
- Pathogenic Bacteria. Food Poisoning Bacteria : Not detected

Operation of KSSP

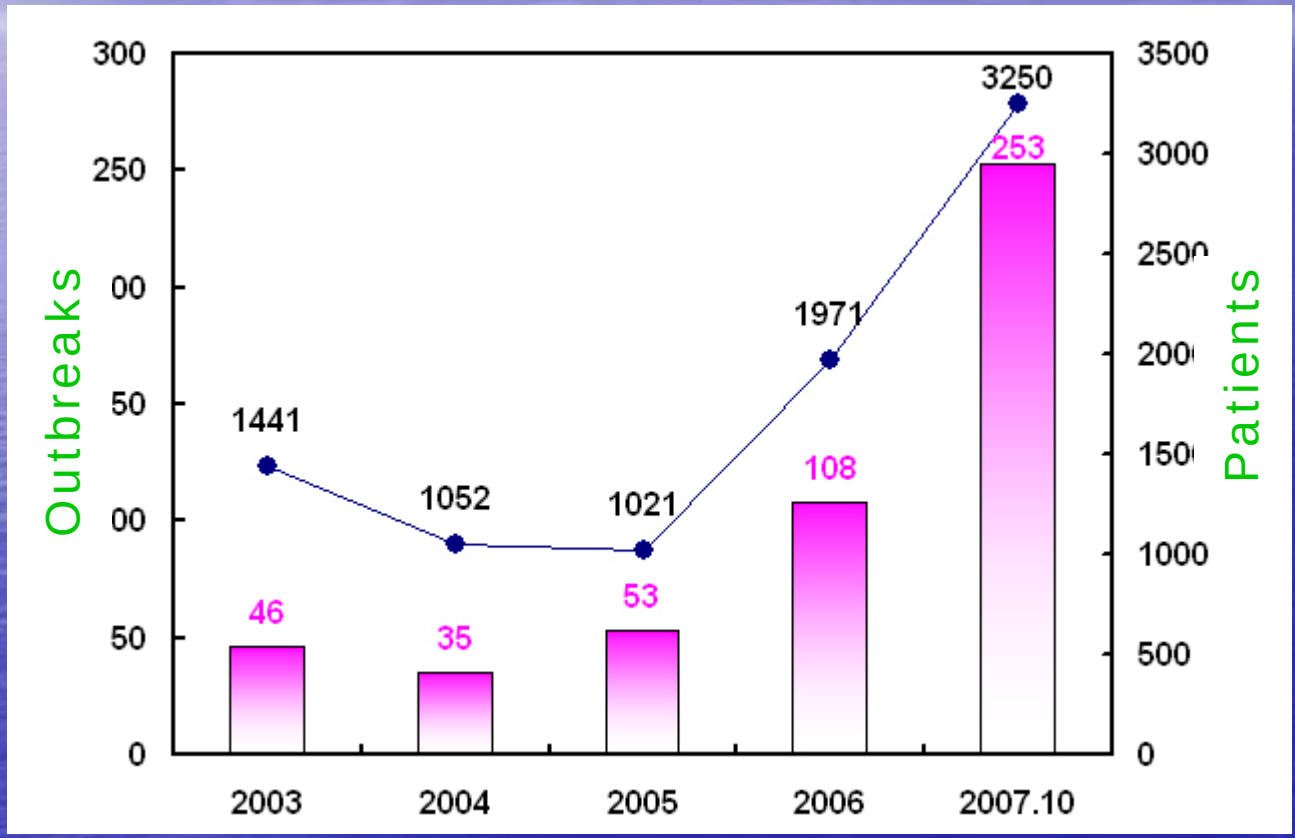


Evaluation of KSSP

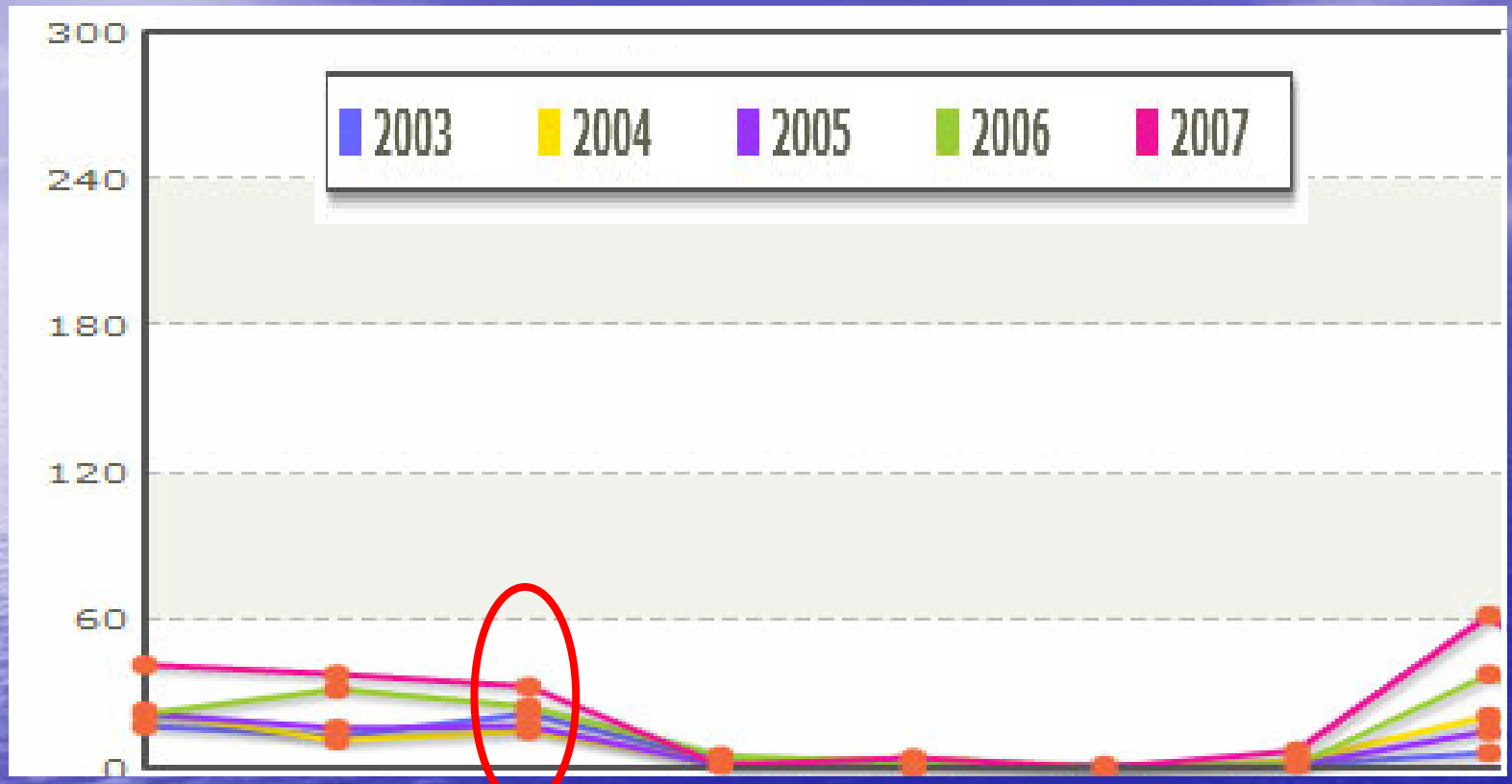
- **The regulatory authority and related institute (NFRDI) and local government (City and County) have evaluate the KSSP plan and results implemented annually.**
- **USFDA mission has evaluated the program every two year according to the Shellfish Sanitation agreement between MIFAFF and USFDA.**
- **In 1994 and 2005, an evaluation officer from EU Committee checked KSSP designated area and shellfish processing facilities.**
- **Other foreign countries who concluded Seafood Sanitation Agreement such as Japan also has checked the program as the need arises.**


Vibrio Parahaemolyticus

Outbreaks of Food Poisoning in Korea



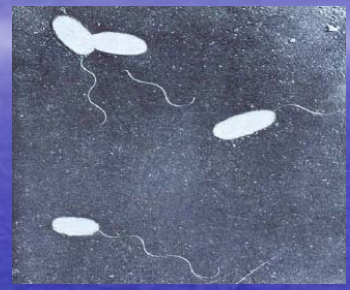
Outbreaks by bacterial strains



Vibrio species

Pathogenic species of *Vibrio*

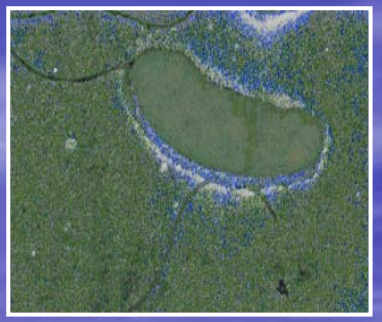
- *V. cholerae*
- *V. vulnificus*
- *V. parahaemolyticus*



Vibrio Clinical Characteristics

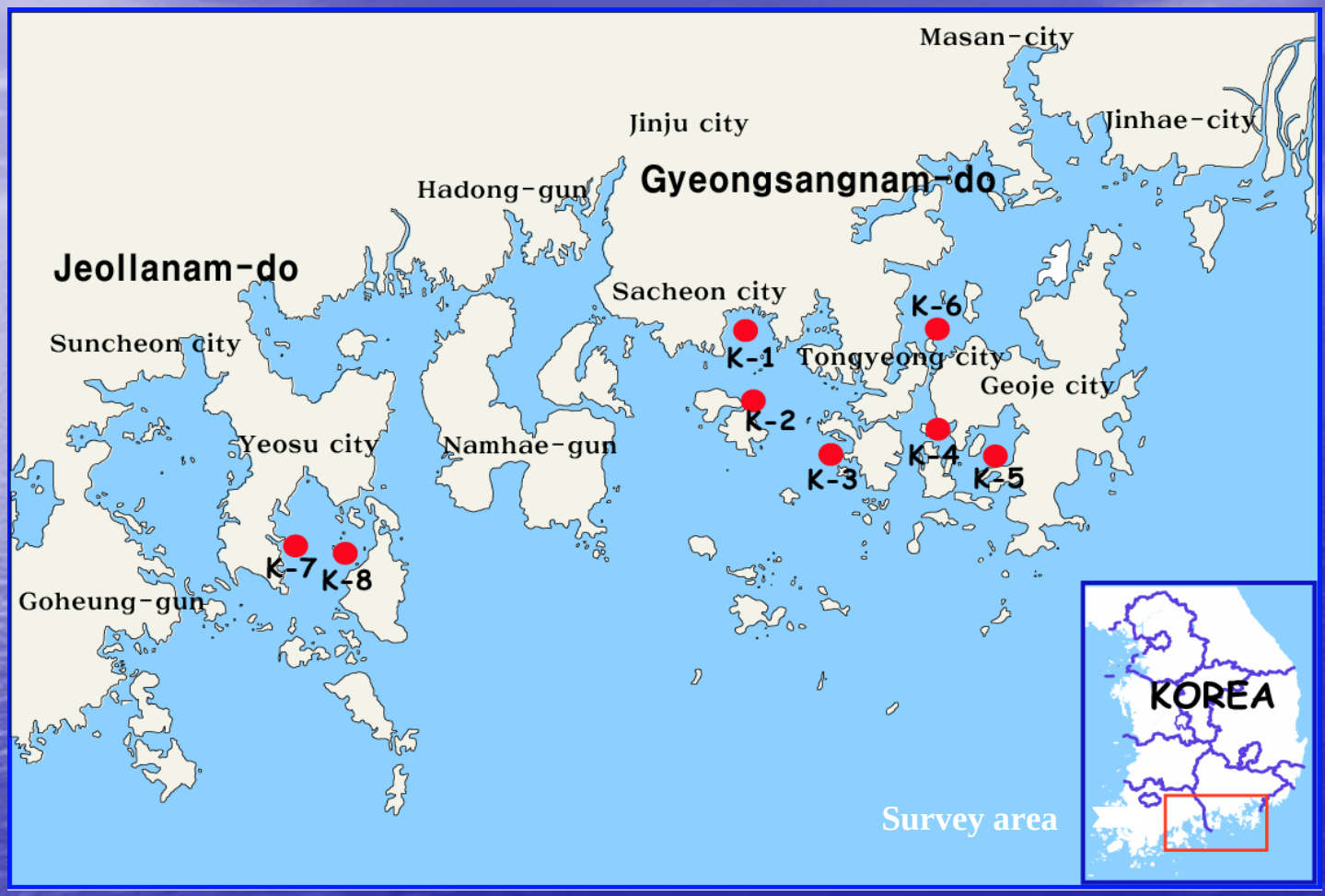
Organism	Incubation Period	Gastro enteritis	Wound infection	Primary septicemia
Vibrio Vulnificus	12 - 72 hrs	+	++	++
Vibrio Parahaemolyticus	12 and 24 hrs (Range 4-30 hrs)	++	+	(+)
Vibrio cholerae	Few hrs to 5 d (Usually 2-3 days)	++		

Vibrio parahaemolyticus



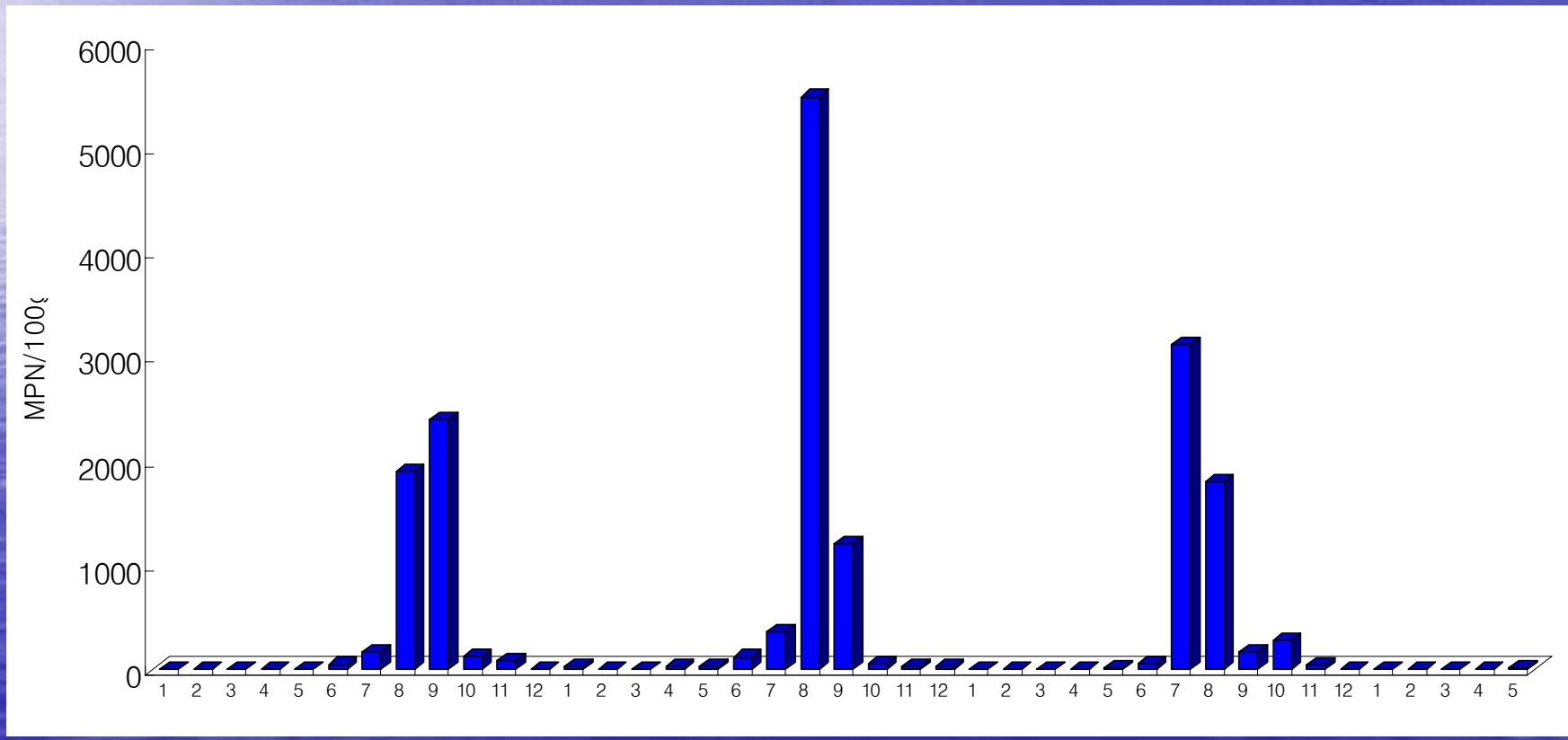
- First identified in 1950 in Japan
- Occurs naturally in warm marine and estuarine water
- More Vp in the water in warmer months

- Transmission
  - Consuming raw or undercooked molluscan shellfish
  - Cross contamination with raw seafood
- Pathogenic
  - Thermostable direct hemolysin (TDH)
  - Thermostable direct hemolysin-related hemolysin (TRH)
- Prevention
  - Cook to 145˚F
  - Avoid cross contamination
  - Use only approved sources for shellfish

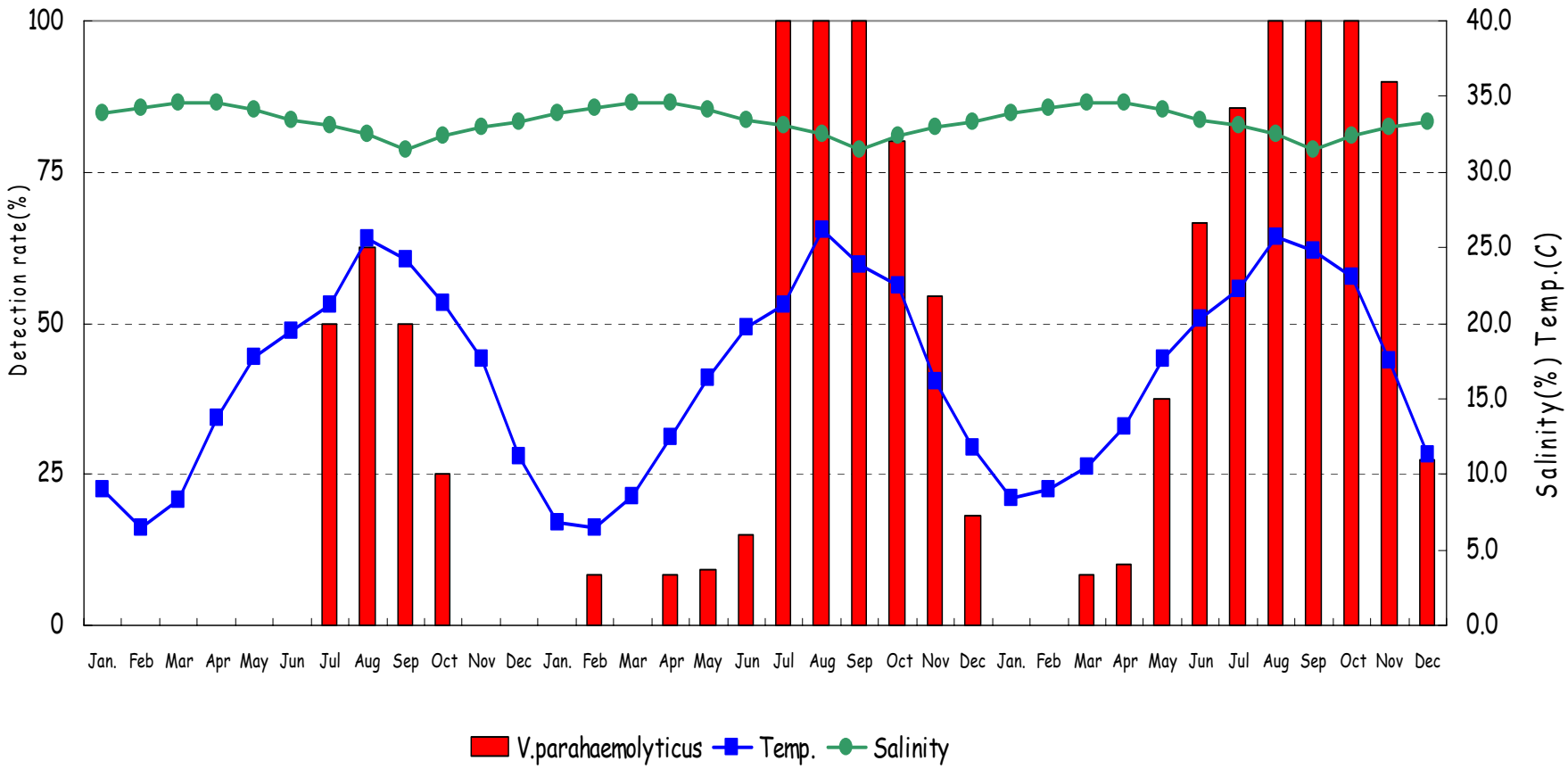


Sampling stations for monitoring of *V. parahaemolyticus*

MPN of total *V.parahaemolyticus* in oyster from sampling stations (2005-2007)



Monthly detection rate of *V. parahaemolyticus* in oyster (2005-2007)

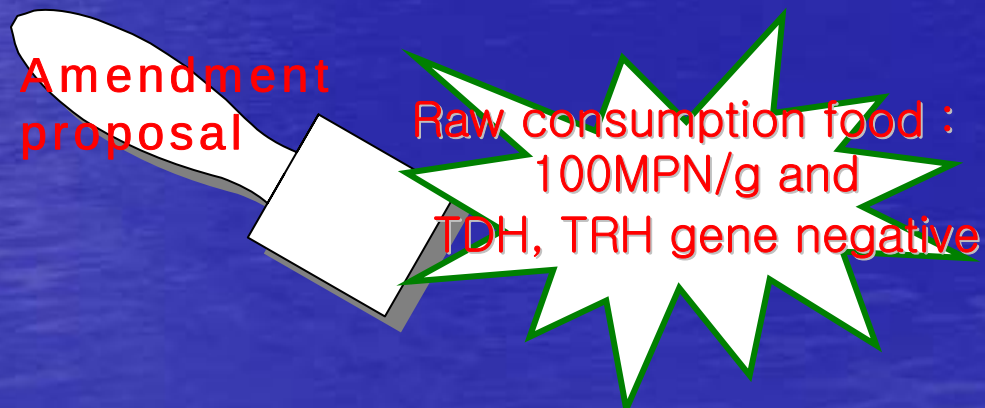


Isolates and pathogen*(tdh+, trh+)* isolates (2005~2007)

No. of sample	No. of isolates		
	V. parahaemolyticus	*Tdh*- positive VP	*Trh*- positive VP
644	2540	3(0.1%)	16(0.6%)

Amendment proposal of Regulatory limit

	JAPAN	USA	KOREA
Regulatory limit	◆ Raw fishes and shellfishes (Fresh): less than 100MPN/g ◆ Raw fishes and shellfishes (chilled food): 100MPN/g ◆ Raw oyster: less than 100MPN/g ◆ Octopus: Negative ◆ Crab: Negative	◆ In the absence of such state data, use 100/gm for the Pacific and 1000/gm for the Atlantic/Gulf as provided in the FDA Risk Assessment.	◆ Raw consumption food : Negative



NFRDI

with Customers...

fisheries industry and to deal with Focussing on aquaculture, the I as korea's leading oceanographic data center aims at inviting domain ds anges through collection & maintena nce of information on o